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EQUIVALENT ROUTE WINDS FOR HELICOPTER  
AIR ROUTES AT HEIGHTS OF 5,000, 10,000, AND  
18,000 FEET. VOLUME I

D. G. Brown, et al

Boeing Vertol Company  
Philadelphia, Pennsylvania

April 1973

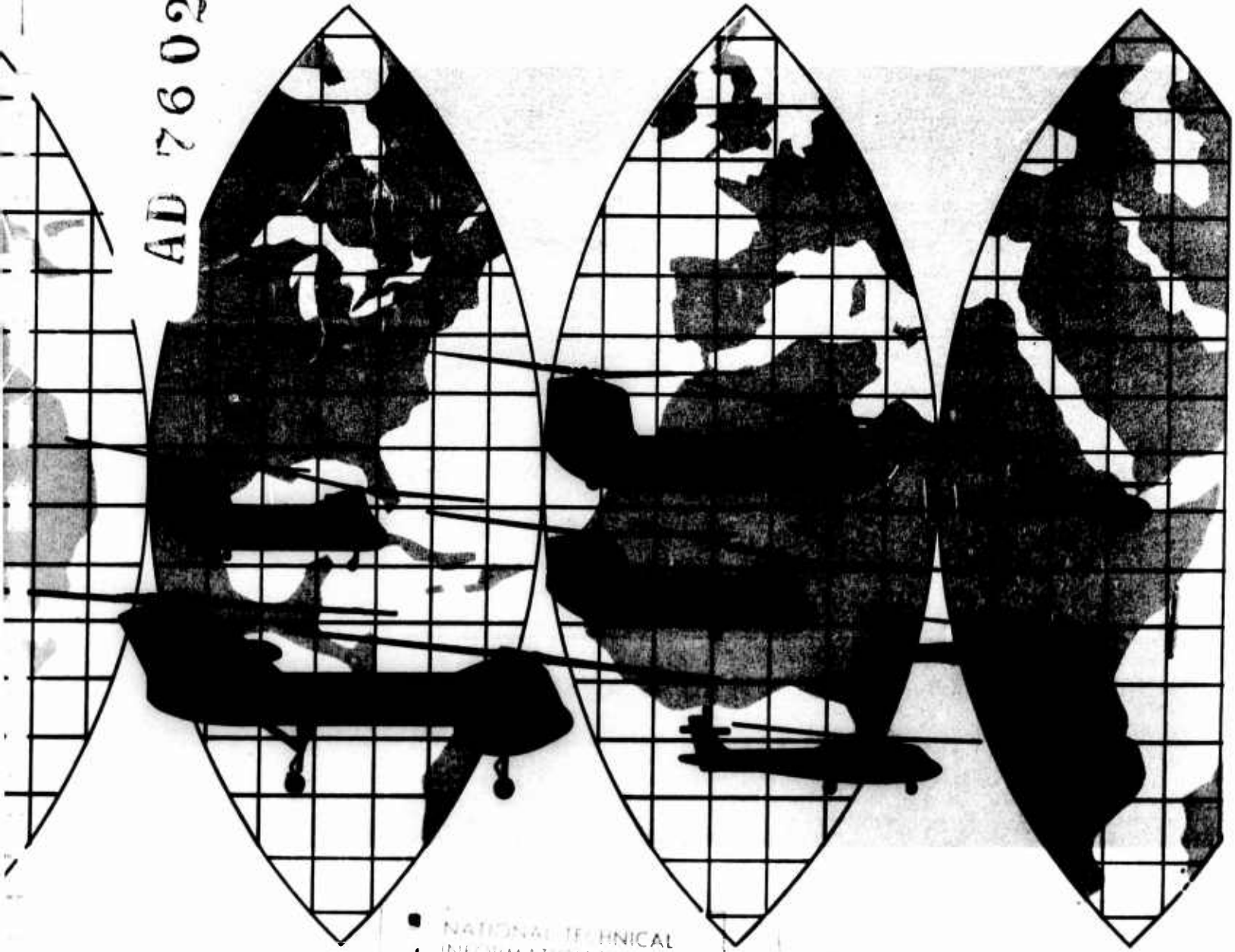
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# EQUIVALENT ROUTE WINDS FOR HELICOPTER AIR ROUTES

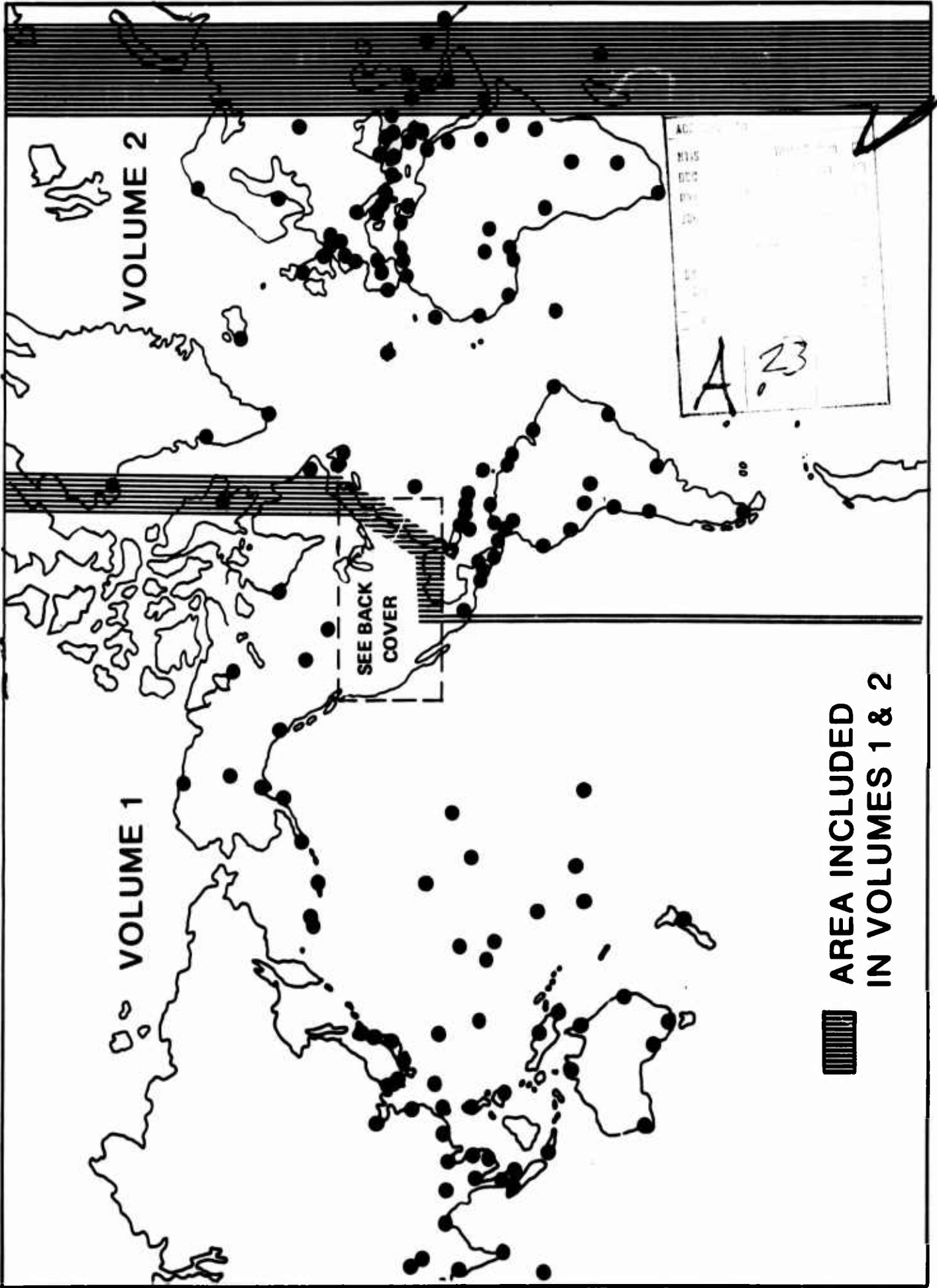
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ACQ	
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REV	
JOB	

A 23

ERRATA SHEET  
FOR DOCUMENT D210-10600-1

Sheet III, Line 2 reads FORWARD - should read FOREWARD

Sheet VII, Title reads FORWARD - should read FOREWARD

Sheet 8. Para. 4.3, Line 1 reads 125-knot - should read 120-knot

Sheet 8. Para. 4.3, Equation (6) reads:

$$D' \approx 1/2 (D-R) + \frac{62.5}{A} (D+R)$$

Should read:

$$D' \approx 1/2 (D-R) + \frac{60.0}{A} (D+R)$$

Sheet 8. Para. 4.3, Equation (7) reads:

$$R' \approx -1/2 (D-R) + \frac{62.5}{A} (D+R)$$

Should read:

$$R' \approx -1/2 (D-R) + \frac{60.0}{A} (D+R)$$

Sheet 8. Para. 4.3, Line 11 reads 125 knots - should read 120 knots

Sheet 288 Line 10 reads FORT SILL elevation 119 - should read 1190

**EQUIVALENT ROUTE WINDS FOR HELICOPTER AIR ROUTES**

**At Heights Of 5,000, 10,000, and 18,000 Feet**

**Volume I**

**By**

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**APRIL 1973**

**THE BOEING VERTOL COMPANY  
PHILADELPHIA, PA.**

**D210-10600-1**

CONTENTS

	<u>PAGE</u>
ABSTRACT	V
FORWARD	VII
LIST OF ILLUSTRATIONS	IX
LIST OF TABLES	IX
1.0 INTRODUCTION	1
2.0 DEFINITIONS	1
3.0 COMPUTATIONS	1
4.0 USE OF TABLES	6
5.0 OCCURRENCE OF HEADWINDS ON BOTH DIRECT AND RETURN FLIGHTS	9
6.0 RELIABILITY OF RESULTS	10
7.0 CONCLUSION	10
REFERENCES	11

ABSTRACT

Equivalent headwinds or equivalent winds are computed using Sawyer's method for approximately 4400 strategic world air routes contained in Volumes I & II. The seasonal mean equivalent wind and its standard deviation and the annual 50-, 75-, and 85- percent reliability equivalent winds are tabulated. Route winds are computed for the 5000-, 10,000-, and 18,000 foot levels. An IBM 360/65 program was used to compute the equivalent winds. Input data for the program consist, for each level, of a grid composed of the mean vector wind and the standard vector deviation at the intersection of each 5° of latitude with each 10° of longitude between 60°S and 60°N and at the intersection of each 5° of latitude and each 20° of longitude south and north of 60°S and 60°N respectively. In addition to the equivalent winds, great circle distances are computed and tabulated for each route.



FORWARD

Ten years ago, The Boeing Company published documents on equivalent route winds for upper altitudes for domestic, international and military air routes for use in the airline industry: "Equivalent Winds for North American Air Routes," D6-9176; "Equivalent Winds for World Air Routes," D6-9177; and "Great Circle Equivalent Route Winds for Military Application," D6-9175. Since then, the helicopter industry has had a need for lower altitude wind data for helicopter routes and speeds.

Tables of winds for the lower altitudes were prepared and the computer program used for the earlier documents was modified to incorporate minor improvements in technique in order to correct inaccuracies which could occur for lower speed aircraft and to operate on the IBM 360/65 system.

Airfield bases listed in this document are only a sample of the total number available and are not chosen on major importance. It should be noted that one airfield may represent other stations within a radius of 50 miles, since the difference in the azimuths of the flight routes would be nominal, thus reflecting little if any changes in the calculated results of equivalent headwinds. Additional air routes may be requested by writing to the Boeing Vertol Company in care of the author.

LIST OF ILLUSTRATIONS

<u>FIGURE</u>		<u>PAGE</u>
1	GREAT CIRCLE DISTANCE	4
2	HYPOTHETICAL SEASONAL WIND DISTRIBUTION	4
3	GREAT CIRCLE ROUTE LENGTH	9

<u>TABLE</u>		
1	ERROR FACTORS	7
2	EQUIVALENT WINDS FOR THE 5,000-, 10,000-, AND 18,000 FOOT LEVELS	17
3	LIST OF AIRPORTS	287
4	ROUTE INDEX	293

EQUIVALENT WINDS FOR HELICOPTER AIR ROUTES  
AT HEIGHTS OF 5,000, 10,000 and 18,000 FEET

## 1.0 INTRODUCTION

The increasing ability (usually with aerial refueling and/or auxiliary tanks) for helicopters to deploy over long distances has established a requirement for route wind statistics with which to make long-term estimates of the economic and strategic capabilities of these aircraft. To meet this need for route-wind data, Boeing-Vertol analysts have computed seasonal and annual equivalent winds for principal air routes.

## 2.0 DEFINITIONS

### 2.1 Equivalent Route Wind

The equivalent wind for an air route may be defined as a uniform wind, which when directed along the track at all points, results in the same average ground speed as that actually attained. Alternately, the equivalent route wind is the difference between the average airspeed and the average groundspeed throughout the flight.

### 2.2 Reliability Equivalent Route Wind

The reliability equivalent wind is the equivalent headwind which is not exceeded (a route wind which can be relied upon) a given percent of occasions or time during a given period.

## 3.0 COMPUTATIONS

### 3.1 Equations

#### 3.1.1. Equivalent Route Wind

Sawyer's theory of equivalent headwinds has been applied extensively to the computation of equivalent route winds<sup>1-9</sup>. This method involves use of the mean vector wind and the standard vector deviation, two parameters which completely define the circular normal distribution of winds generally found in the free atmosphere. Charts and tabulations of the mean vector wind and the standard vector deviation are available in many meteorological publications<sup>10-19</sup>.

The principal assumptions of Sawyer's theory are (1) the wind speed does not exceed the speed of the aircraft and (2) the distribution of winds in the free atmosphere during a given season can be approximated by the circular normal distribution. Based on these and other assumptions, the basic equation for the average equivalent headwind,  $EW$ , over a route and expressed in terms of the mean vector wind and the standard vector deviation,  $\sigma$ , at points along the

3.1.1. Equivalent Route Wind (cont'd.)

route is:

$$EW = \frac{\sum_{i=1}^N z_i}{\sum_{i=1}^N t_i} - A$$

$z_i$  = length of i-th segment of route

$t_i$  = time to fly  $z_i$

$A$  = airspeed of aircraft over route

but  $t_i = z_i / \bar{g}_i$

where  $\bar{g}_i$  = mean ground speed on i-th segment

$$= A - \frac{1}{2A} \left( \bar{v}_i^2 + \frac{\sigma_1^2}{2} \right) + \bar{u}_i$$

$\bar{v}_i$  = mean vector wind component normal to track

$\bar{u}_i$  = mean vector wind component parallel to track

and  $z_i = Z/N$

$Z$  = great circle route distance

$N$  = number of equal length segments  $z_i$

$$EW = \frac{Z}{\sum_{i=1}^N \frac{Z/N}{\bar{g}_i}} - A$$

$$EW = \frac{Z}{\sum_{i=1}^N 1/\bar{g}_i} - A$$

**3.1.1. Equivalent Route Wind (cont'd.)**

or, equivalent headwind is the harmonic mean\* of the ground speeds less airspeed. By convention, when mean ground speed is less than airspeed, equivalent wind is a headwind and will be negative.

\*The earlier Boeing documents used the arithmetic mean for headwind. Since the airspeed in their case was much greater than windspeed, error would be small. The harmonic mean is technically correct, and for lower airspeed, required to eliminate overestimates.

**3.1.2. Route Standard Deviation**

Correlation studies and physical considerations reveal that vector winds at points along a route are related to one another<sup>1,21</sup>. For this reason, the mean vector wind and the standard vector deviation at points along a route while sufficient to determine the average value of the route equivalent wind, are insufficient to determine its variability. For example, strong winds at points along a route may or may not occur simultaneously. If they do not occur together, there is a tendency for the headwind components to average out such that the average value of the extreme winds is less than the values of the extreme winds at individual points over the route. Sawyer<sup>1</sup> has shown this to be the case.

The route standard deviation provides a measure of the variability of the equivalent route wind. The relationship between the route standard deviation and the average value of the standard vector deviation at points along the route is:

$$\sigma_t = S \sqrt{\frac{\sum_{i=1}^N \sigma_i^2}{N}}$$

where:

$\sigma_t$  = Route standard deviation (tabulated value)

S = Factor to convert root mean square standard vector deviation of wind over a route, into the route standard deviation of the equivalent route wind. The value of S decreases with increasing route length and exhibits some variation with season, latitude and route orientation<sup>1</sup>.

The values of S used in preparing Table 3 are those listed in Graystone<sup>6</sup>.

**3.1.3. Great Circle Distance**

Route lengths in nautical miles are computed over the great-circle

3.1.3. Great Circle Distance (cont'd.)

course, i.e., the least distance on a sphere, between terminals. The expression used to compute great circle distances is:

$$S = 60 \cos^{-1}(\sin \psi_1 \sin \psi_2 + \cos \psi_1 \cos \psi_2 \cos (\lambda_1 - \lambda_2))$$

where:

S = Great circle distance  
in nautical miles

$\psi$  = Latitude

$\lambda$  = Longitude

$\cos^{-1}$  = Angle expressed  
in degrees

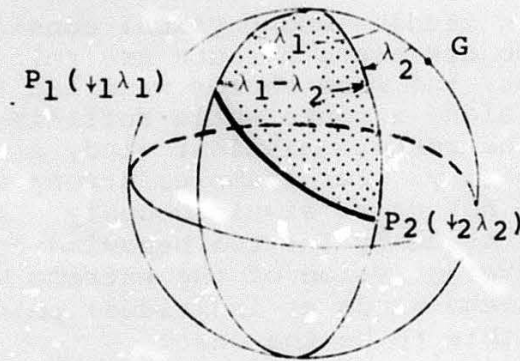


Fig. 1

Great Circle Distance

South latitudes and east longitudes are considered negative and north latitudes and west longitudes are considered positive.

3.2 Annual Equivalent Route Winds

Annual equivalent route winds for the 50%, 75%, and 85% level are computed from the seasonal mean values of equivalent route winds and their standard deviations. The technique involves an iterative procedure by which wind speeds are found such that 50, 75, and 85 percent of the total area under the four seasonal wind distribution curves, lies to their right. With reference to Figure 2, the 50, 75, and 85 annual equivalent winds are estimated to be -5, -11, and -13 knots respectively. (From the

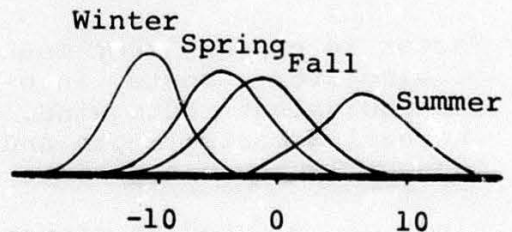


Fig. 2. Hypothetical Seasonal Wind Distribution

### 3.2 Annual Equivalent Route Winds (cont'd.)

definition, these are the headwinds - headwinds are negative - which will not be exceeded X% of the time. If the distribution of winds are entirely positive (tailwinds) the technique is the same. To assure a headwind value which will not be exceeded, one must get the lowest value of tailwind which meets the reliability level.

### 3.3 Input Data

The most recent and internally consistent summaries of statistical wind data available were used. Wind statistics were obtained primarily from Crutcher<sup>5</sup> and the NAVAIR publications while the airfield coordinates were obtained from standard reference sources. The mean vector wind and the standard vector deviation together with the coordinates of each terminal form the input data for an IBM 360/65 program. The wind parameters for the four seasons and for the 5000 (850 mb), 10,000 (700 mb), and 18,000 (500 mb) foot levels, were obtained by computing them at the intersection of each 5° of latitude with each 10° of longitude between 60°N and 60°S and at the intersection of each 5° of latitude with each 20° of longitude north of 60°N and south of 60°S.

### 3.4 Method

Equivalent route winds are computed by first dividing the route into an integral number of segments of 200 miles or less in length and then calculating the segment flight time resulting from the wind vectors at the mid-points of these segments. This is accomplished by weighing the four nearest wind values (at grid points) in proportion to their proximity to the point on the route. The times are summed for the entire route, and resulting average ground speed is calculated. Equivalent wind results by subtracting average airspeed from the average ground speed.

By convention, a positive sign denotes a tailwind; a negative sign, a headwind.

### 3.5 Tabulations

Equivalent winds for the 5,000-, 10,000-, 18,000- foot levels are tabulated for routes between selected airfields (Table 3). The route wind tabulations are organized alphabetically by the terminals that identify each route. In the index, each route is referenced under both of its terminals (Table 4). Included in the data are:

### 3.5 Tabulations (cont'd.)

1. The direct and return seasonal mean equivalent route wind and its standard deviation and the annual 50-, 75-, and 85- percent reliability equivalent route wind in knots.
2. The great circle distance in nautical miles.

An alphabetical listing of terminals with their geographical coordinates is provided in Table 3.

### 4.0 USE OF TABLES

#### 4.1 Normal Curve

Brooks<sup>10</sup> et al found that in any one season the distribution of equivalent route winds about the mean closely approximates the normal law of errors. According to this law, the mean and its standard deviation completely define the distribution of winds about the mean. In turn, this error distribution very nearly approximates the normal or Gaussian frequency distribution defined as:

$$Y = \frac{1}{\sigma \sqrt{2\pi}} e^{-x^2/2\sigma^2}$$

where:

Y = The frequency ordinate at distance x from the mean

$\sigma$  = The standard deviation

#### 4.2 Estimating Reliability Equivalent Route Winds

Computation of reliability equivalent route winds deserves special attention since deviations of the relative frequency of extreme wind speeds from the assumed normal law of errors may be appreciable, particularly at levels and in regions affected by jet streams. The frequency of extreme values is probably higher than that predicted from the assumed model. For this reason, reliability equivalent winds for percentages less than 5 and greater than 95 are likely unreliable.

Two methods for estimating equivalent winds for reliabilities other than for the tabulated mean values involve use of error factors and secondly, use of arithmetic probability paper.

##### 4.2.1. Error Factor Method

For a given route, reliability equivalent winds are computed by subtracting the product of k times the standard deviation from the



4.2.1. Error Factor Method (cont'd.)

mean equivalent wind, where k is a factor derivable from the error function. Values of k are given in Table 1 or can be found from tables of the normal curve of error. These methods are accurate only for estimating seasonal reliabilities. The seasonal curves approximate the normal law of errors, but the annual curve does not. Therefore, to get an annual reliability requires an iterative technique as described in 3.2.

The error factors method is illustrated by computing the 85 percent reliability equivalent route wind over the great circle - Ft. Rucker to Ft. Eustis air route, in winter at 5,000 feet.

TABLE 1. ERROR FACTORS

Reliability Percent (Area under normal curve to +k)	+k (Number of standard deviations from the mean)
50	0.0
60	0.25
70	0.52
80	0.84
85	1.04
90	1.28
95	1.65

From Table 1, the error factor is 1.04.

- a. The DIRECT reliability equivalent headwind which should not be exceeded on 85 percent of occasions is a wind of -23 knots:

$$-11 - (1.04 \times 12) = -23 \text{ knots.}$$

or, Mean - 1.04  $\sigma_t$  (See 3.2)

- b. The RETURN reliability equivalent headwind which can be relied on 85 percent of occasions is a wind of -2.5 knots;

$$10 - (1.04 \times 12) = -2.5 \text{ knots.}$$

or, Mean - 1.04  $\sigma_t$  (See 3.2)

4.2.2. Arithmetic Probability Paper Method

As previously stated, in any season the distribution of equivalent route winds about the mean closely approximates the normal law of errors and the normal or Gaussian frequency distribution defined in (4). Arithmetic probability paper is arranged with the percent cumulative frequency scale printed on the ordinate such that the integral of the normal

4.2.2. Arithmetic Probability Paper Method (cont'd.)

$$Q(x) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^x e^{-x^2/2} dx \quad (5)$$

frequency curve plots as a straight line while the abscissa has a linear scale. The sign convention is followed for equivalent wind speeds (+ for a tailwind and - for a headwind). These two lines give the frequency distribution of equivalent winds over the route.

4.3 Variation in Airspeed

The tabulated equivalent wind data were computed for a 125-knot airspeed. For airspeeds much above this value, the new values may be approximated by assuming the wind speed is the result of the arithmetic mean of the ground speeds.

Expressions to use are:

$$D' = 1/2 (D - R) + \frac{62.5}{A} (D + R) \quad (6)$$

$$R' = -1/2 (D - R) + \frac{62.5}{A} (D + R) \quad (7)$$

If D and R are of equal value and of opposite sign, the tabulated values are the same for any airspeed. If  $D \perp R$ , i.e., a cross wind component is present,  $D'$  and  $R'$  will differ slightly from D and R.

Caution should be exercised when attempting to use airspeeds less than 125 knots, because simplifications used in the basic Sawyer method will cause increasing error as wind speeds at any segment approach aircraft speed.

Percent reliability equivalent headwinds computed for the new airspeed, A, will differ by the same amount as the mean values, i.e.,  $D - D'$ , because standard deviations are not sufficiently affected by changes in airspeed<sup>2</sup>.

4.4 Great Circle Route Length

The route length in nautical miles is computed over the great-circle course, i.e., the least distance on a sphere, between terminals (Fig. 3). For completeness, a great circle may be defined as the intersection of the surface of a sphere and a plane which passes through the center of the sphere. A nautical mile is the length

#### 4.4 Great Circle Route Length (cont'd.)

on one minute of arc along a great circle on the earth's surface, i.e., the earth's circumference is  $360 \times 60 = 21,600$  n. mi. In terms of statute miles, 1 n. mi. = 1.1508 miles.

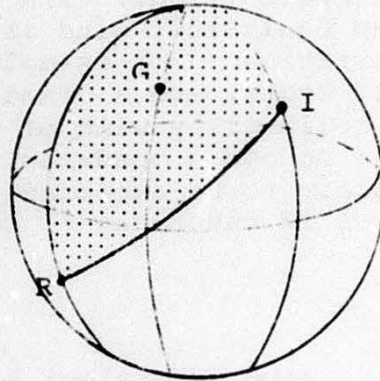


Figure 3 Great Circle Route Length

#### 4.5 Equivalent Route Length

The equivalent route length, for a given reliability equivalent wind, is the distance that an aircraft would have flown in still air on a flight having the same duration as that required with given percent equivalent wind. The equivalent route length may be expressed as

$$L_x = \frac{DA}{A + W_x} \quad (11)$$

where:

$L_x$  = Equivalent route length in knots for x percent reliability equivalent wind  $W_x$

D = Great circle distance in nautical miles

A = Airspeed in knots

#### 5.0 OCCURRENCE OF HEADWINDS ON BOTH DIRECT AND RETURN FLIGHTS

Over routes characterized by prevailing light winds or by strong winds perpendicular to track the direct and return route winds can both appear as a headwind. This situation occurs when the contribution to the mean equivalent wind from the wind components at right angles to the track exceeds the contribution from the wind components along the track. The effect of winds at right angles to track on the ground speed becomes apparent when it is realized that an

## 5.0 OCCURRENCE OF HEADWINDS ON BOTH DIRECT AND RETURN FLIGHTS (cont'd.)

airplane could make no progress along the intended track with a wind at right angles to the track and equal to its airspeed.

Reliability equivalent headwinds for some routes appear as headwinds for the direct and return flight. The situation can occur over routes where the mean equivalent wind is about the same magnitude as its standard deviation. For example, a route having a mean equivalent wind of 12 knots, and a standard deviation of 15 knots, has an 85 percent reliability wind of -3 knots. In this example a tailwind has not become a headwind, but rather a headwind of 3 knots is not likely to be exceeded on 85 percent of occasions and a tailwind of 12 knots can be relied on 50 percent of occasions.

## 6.0 RELIABILITY OF RESULTS

The reliability of the tabulated equivalent headwinds as being representative of the actual route winds over great circle routes depends largely upon the assumption that wind distributions in the free atmosphere can be treated by the circular normal distribution. This distribution requires that the zonal and meridional components of wind be uncorrelated and that their standard deviation be equal. From physical considerations, however, some degree of ellipticity must be present, otherwise there would be no mean transport of energy in the atmosphere as is observed. For most conditions, the degree of ellipticity is small and the assumed circular normal distribution acceptable. Brooks<sup>10</sup> pointed out that the assumption of circularity is likely to be weakest in frontal zones, in the vicinity of jet streams and in areas characterized by distinct seasonal wind variation such as the boundary region between a monsoon circulation and the circulation above.

The tabulated values are intended as long term estimates of enroute winds and as such the actual winds in any one season may differ appreciably from them. This condition particularly occurs where all routes closely parallel the mean position of the jet stream. Where air routes routinely traverse normal to the jet stream, however, only small differences between the tabulated and observed route winds should occur.

## 7.0 CONCLUSION

The application of equivalent winds can aid agencies concerned with the problems of aircraft logistics to estimate the long term capabilities of helicopters to deploy over long distances. Considerable effort has been expended by Boeing-Vertol since 1965 to display temperature probability variations with altitude. Many government agencies are using our data on that subject. By combining that data with the wind data of this document, one can estimate fairly accurately the effects on helicopter performance.

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TABLE 3

EQUIVALENT ROUTE WINDS FOR HELICOPTER AIR ROUTES  
AT HEIGHTS OF 5,000, 10,000, AND 18,000 FOOT LEVELS

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION				
	DIRECT						RETURN						JAN	APR	JUL	OCT	
	JAN	APR	JUL	OCT	A75	A85	JAN	APR	JUL	OCT	A75	A85					
ARADAN																	
5000	5	5	3	4	4	3	-1	-5	-4	-3	-5	-9	-10	6	7	6	6
10000	0	3	5	3	2	-2	-3	-1	-4	-3	-4	-9	-10	8	6	7	7
18000	-8	-1	6	-5	-2	-10	-12	2	-2	-6	5	-1	-8	12	11	7	8
ABADAN																	
5000	-5	-5	-8	-8	-7	-12	-14	5	5	9	5	6	0	9	10	8	8
10000	-13	-12	-8	-8	-11	-18	-20	11	11	8	7	9	1	12	11	10	11
18000	-29	-25	-11	-11	-18	-33	-33	22	21	11	8	14	4	19	16	11	13
ABADAN																	
5000	5	7	10	1	5	1	0	-4	-7	-10	-1	-6	-11	6	6	6	5
10000	11	9	3	2	5	0	0	-12	-9	-3	-2	-7	-12	7	7	6	6
18000	29	21	2	8	13	4	2	-33	-24	-2	-9	-16	-29	11	10	6	8
ABADAN																	
5000	4	5	10	5	6	3	-1	-4	-6	-10	-5	-7	-13	9	10	9	8
10000	4	8	6	5	5	-1	-2	-7	-10	-6	-5	-7	-14	11	11	9	10
18000	9	9	6	-4	4	-5	-8	-19	-17	-7	1	-10	-21	16	15	10	12
ABADAN																	
5000	5	8	7	2	5	3	0	-5	-8	-7	-1	-6	-11	7	7	7	6
10000	14	12	3	4	7	2	0	-15	-12	-3	-4	-9	-15	8	8	7	7
18000	34	27	4	12	17	7	4	-37	-29	-5	-13	-20	-34	13	12	8	9
ABADAN																	
5000	4	7	1	1	3	-1	-2	-3	-6	-1	0	-3	-7	6	6	6	5
10000	12	11	2	5	7	1	0	-13	-11	-2	-5	-8	-14	7	7	5	7
18000	34	29	5	15	19	9	6	-35	-30	-6	-16	-21	-33	12	11	8	9
ABADAN																	
5000	4	8	3	1	3	3	-1	-3	-7	-3	0	-4	-8	6	6	6	5
10000	14	12	2	4	7	2	0	-14	-12	-2	-4	-8	-14	7	7	6	6
18000	36	29	3	14	19	7	5	-37	-30	-4	-14	-21	-34	12	10	7	8
ABADAN																	
5000	2	3	-5	0	0	-5	-8	-2	-3	5	0	0	-6	9	9	8	8
10000	10	7	-2	2	3	-6	-6	-12	-9	2	-3	-6	-14	11	11	10	11
18000	11	10	7	14	10	3	-1	-21	-18	-8	-16	-16	-26	16	15	11	13
ABADAN																	
5000	6	8	4	3	5	3	-1	-5	-8	-4	-3	-5	-11	8	8	8	7
10000	17	14	3	6	9	2	0	-17	-15	-2	-6	-10	-18	9	10	9	9
18000	37	32	9	16	21	10	6	-39	-33	-9	-17	-23	-37	16	13	9	11

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

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EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION							
	DIRECT						RETURN						JAN	APR	JUL	OCT				
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85						
ADAK NS																				
5000	TO																377 M.MI.			
10000	-6	-7	-9	-12	-9	-19	-22	4	6	8	10	7	-3	-5	17	15	13	15		
18000	-12	-9	-12	-18	-13	-24	-27	9	7	11	17	11	0	-2	18	17	14	16		
	-16	-18	-17	-24	-19	-34	-37	9	14	14	21	14	0	-3	23	22	18	21		
ADAK NS																				
5000	TO																1753 M.MI.			
10000	-9	-9	-7	-14	-10	-17	-19	7	8	7	12	8	1	0	11	10	8	10		
18000	-18	-14	-10	-21	-16	-24	-26	16	11	9	19	13	5	4	11	12	9	11		
	-28	-23	-13	-30	-24	-35	-38	21	19	11	26	18	8	6	16	15	12	15		
ADAK NS																				
5000	TO																385 M.MI.			
10000	7	5	9	8	7	-2	-5	-9	-6	-10	-10	-9	-19	-22	17	15	12	15		
18000	15	9	12	15	12	1	0	-17	-11	-13	-17	-15	-26	-29	18	16	14	16		
	20	15	17	19	17	3	0	-25	-18	-20	-23	-22	-36	-40	24	21	19	21		
ADAK NS																				
5000	TO																1189 M.MI.			
10000	0	3	6	3	3	-3	-5	-1	-3	-7	-4	-4	-11	-13	11	10	9	10		
18000	6	4	8	7	6	-1	-3	-9	-5	-8	-8	-8	-16	-18	14	12	10	12		
	12	7	10	9	9	-1	-4	-17	-10	-12	-13	-13	-24	-27	19	16	14	16		
ADAK NS																				
5000	TO																1039 M.MI.			
10000	1	3	8	4	4	-3	-5	-3	-4	-8	-5	-6	-13	-15	12	11	9	11		
18000	8	4	8	8	7	-1	-3	-11	-6	-9	-10	-10	-18	-20	14	13	11	13		
	14	9	11	11	11	0	-3	-19	-12	-14	-15	-15	-27	-30	20	17	15	17		
ADAK NS																				
5000	TO																1468 M.MI.			
10000	2	3	6	4	3	-2	-4	-4	-4	-6	-5	-5	-12	-13	11	9	8	9		
18000	9	4	7	8	6	0	-2	-12	-6	-8	-10	-9	-17	-19	13	11	10	11		
	17	10	12	13	12	2	0	-21	-13	-14	-17	-17	-27	-30	17	15	14	15		
ADAK NS																				
5000	TO																899 M.MI.			
10000	5	4	9	6	6	-1	-4	-7	-5	-9	-7	-8	-16	-18	13	12	10	12		
18000	11	6	9	11	9	0	-2	-13	-8	-10	-13	-11	-21	-23	15	13	12	13		
	18	11	14	14	14	1	-1	-23	-14	-17	-18	-18	-31	-34	21	18	17	18		
ADAK NS																				
5000	TO																1421 M.MI.			
10000	-10	-5	-8	-4	-4	-7	-15	4	2	6	1	3	-4	-6	14	11	9	11		
18000	-9	-6	-7	0	-6	-14	-15	3	1	4	-3	1	-6	-8	12	11	9	11		
	-15	-9	-2	-3	-7	-17	-20	0	-2	-2	-7	-3	-13	-15	17	14	11	14		
ADAK NS																				
5000	TO																1834 M.MI.			
10000	-11	-10	-8	-14	-11	-18	-20	9	9	7	13	9	2	1	11	10	8	10		
18000	-20	-14	-10	-22	-17	-25	-27	17	12	9	19	14	6	4	11	11	9	11		
	-30	-25	-14	-32	-24	-36	-39	23	20	11	27	19	9	7	15	14	11	14		

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WIND DIRECTION	WIND DIRECTION												STANDARD DEVIATION						
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	APR	JUL	OCT			
ADAMS	PERMANENT												1340 N.M.I.						
5000	0	2	6	2	2	-4	-5	0	-2	-6	-2	-2	-3	-10	-11	11	9	8	9
10000	4	3	7	5	6	-2	-4	-6	-4	-9	-6	-6	-7	-14	-16	13	11	10	11
15000	7	6	9	7	7	-2	-5	-12	-9	-10	-10	-10	-11	-21	-23	17	14	13	15
ADAMS	SHEMVA												342 N.M.I.						
5000	-6	-7	-9	-17	-9	-19	-22	4	6	3	10	10	7	-3	-5	17	15	13	15
10000	-13	-9	-12	-19	-16	-25	-28	10	7	11	17	11	11	0	-2	10	17	14	17
15000	-16	-14	-17	-25	-20	-34	-38	10	14	14	21	14	14	0	-3	24	22	18	21
ADELAIDE	WATSELANE												848 N.M.I.						
5000	1	5	9	7	5	-1	-2	-1	-5	-9	-7	-7	-6	-13	-14	6	9	10	10
10000	4	6	12	10	11	3	1	-7	-9	-15	-16	-12	-20	-22	10	10	11	12	
15000	15	14	23	21	20	10	8	-15	-20	-28	-33	-24	-35	-38	11	14	16	16	
ADELAIDE	CROSTOWN												1223 N.M.I.						
5000	3	1	3	7	1	-4	-5	0	-1	-3	-3	-2	-2	-8	-9	7	6	9	9
10000	4	4	5	7	3	-1	-3	-2	-4	-7	-8	-6	-12	-13	6	6	9	9	
15000	3	4	4	4	3	-3	-5	-5	-6	-12	-12	-9	-17	-19	9	11	13	12	
ADELAIDE	DARDIN												1411 N.M.I.						
5000	1	2	-1	-2	0	-5	-6	-1	-3	0	1	-1	-6	-7	7	7	7	8	
10000	5	2	-2	-3	0	-5	-7	-6	-3	0	0	-2	-8	-9	6	6	8	8	
15000	-4	-3	-10	-10	-7	-16	-16	1	1	1	3	1	-5	-6	9	10	12	11	
ADAMS	WELLSVILLE												347 N.M.I.						
5000	9	10	9	10	4	0	-1	-7	-11	-9	-11	-10	-18	-20	10	12	12	13	
10000	10	14	13	15	17	3	1	-11	-12	-15	-17	-15	-24	-27	13	13	14	15	
15000	17	21	21	21	21	9	6	-13	-24	-25	-34	-26	-39	-42	15	18	23	20	
ADAMS	WATSELANE												1671 N.M.I.						
5000	0	2	4	7	3	-2	-3	0	-3	-3	-6	-4	-10	-11	7	7	8	8	
10000	4	7	14	14	10	4	2	-5	-8	-15	-15	-11	-18	-19	6	6	8	9	
15000	14	17	27	24	20	12	10	-15	-19	-31	-31	-24	-33	-36	9	11	12	12	
ADELAIDE	PFFLA												1142 N.M.I.						
5000	-7	-12	-14	-12	-12	-11	-19	7	11	14	12	10	9	7	6	8	9	9	
10000	-14	-17	-21	-21	-13	-25	-28	13	16	20	20	16	9	7	9	10	13	12	
15000	-19	-25	-29	-41	-28	-43	-43	18	23	25	34	25	14	12	12	14	16	16	
ADELAIDE	PFFLA												1598 N.M.I.						
5000	0	0	2	2	0	-3	-5	3	0	-2	-2	-2	-6	-7	7	6	7	7	
10000	3	2	4	4	2	-2	-3	0	-2	-6	-7	-4	-10	-11	7	7	7	8	
15000	7	3	3	4	2	-3	-4	-4	-5	-10	-10	-7	-14	-16	8	9	11	10	

OPERATIONS COMPUTED FOR A 12-KNOT AIR-SPEED.  
 000-INDICATES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 15000-15000 KNOTS ASSUMED.

EQUIVALENT READINGS AND STANDARD DEVIATION IN SPTS 630 GREAT CIRCLE AIR ROUTES

STATION	MONTHS												STANDARD DEVIATION			
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC				
AREA BUT																
5000	0	0	1	0	0	0	0	-1	0	-1	0	0	-1	-5	-6	1942 No.MI.
10000	0	0	1	3	0	0	-3	-4	-1	-2	-4	-2	-7	-8	6	6
18000	0	0	-1	-1	0	-6	-7	-7	-1	-2	-4	-3	-9	-10	7	9
AREA INF																
5000	6	10	0	0	3	1	1	-8	-11	-9	-11	-10	-16	-10	7	1739 No.MI.
10000	12	14	11	14	12	4	4	-13	-13	-13	-16	-15	-22	-23	10	10
18000	21	25	22	27	23	16	12	-26	-28	-25	-30	-27	-36	-38	12	13
AREA NAD																
5000	-5	-4	-6	-3	-9	-10	-11	5	5	0	4	5	0	0	6	1230 No.MI.
10000	-4	-6	-5	-1	-5	-10	-11	2	4	5	1	3	-1	-3	8	6
18000	-2	-5	-6	5	-2	-10	-11	-4	1	5	-6	-1	-8	-10	12	11
AREA NAY																
5000	-3	0	13	-3	-1	-5	-6	3	0	-13	3	0	-7	-10	4	1647 No.MI.
10000	0	0	0	-6	-1	-5	-6	0	0	0	5	0	-3	-4	6	5
18000	7	4	-9	-2	-1	-7	-9	-8	-5	13	2	0	-8	-9	8	8
AREA NBN																
5000	-6	-6	-2	-4	-5	-10	-11	6	6	1	4	4	0	-1	7	857 No.MI.
10000	-1	-4	-4	-4	-6	-9	-10	-10	3	5	14	3	-2	-3	8	6
18000	4	0	-8	4	0	-6	-9	-10	-2	7	-4	-2	-10	-12	12	11
AREA NCH																
5000	-3	0	0	-3	0	-5	-6	2	0	-8	3	0	-5	-7	5	1646 No.MI.
10000	4	2	-1	-3	0	-4	-5	-5	-3	1	4	-1	-6	-7	6	5
18000	14	8	-8	0	2	-5	-7	-18	-11	0	0	-5	-15	-18	9	9
AREA NCT																
5000	-1	0	5	-2	3	-4	-4	1	0	-6	3	0	-5	-6	5	1948 No.MI.
10000	6	5	0	-2	1	-3	-4	-7	-6	1	2	-2	-8	-9	6	5
18000	19	12	-7	3	4	-2	-5	-23	-15	6	-4	-9	-19	-22	9	8
AREA NEM																
5000	-4	-3	-4	-3	-4	-9	-9	3	3	3	3	3	-1	-2	6	1304 No.MI.
10000	0	-2	-6	-2	-2	-7	-8	-2	0	4	2	0	-4	-5	7	6
18000	6	0	-6	6	0	-5	-7	-11	-5	3	-8	-5	-13	-15	12	10
AREA NEN																
5000	-3	-2	1	-2	-2	-6	-7	2	1	-2	3	0	-3	-4	6	1332 No.MI.
10000	4	1	-3	-3	0	-6	-6	-5	-4	3	3	0	-6	-7	9	5
18000	14	7	-7	3	3	-4	-6	-19	-11	7	-4	-6	-16	-19	11	10

READINGS--COMPUTED FOR A 120-KT AIRSPEED.  
 000--THREE ANNUAL EQUIVALENT READINGS FOR INDICATED PER CENT RELIABILITIES.  
 PLUS SIX DECIPTS READINGS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

STATION	MONTHS												STANDARD DEVIATION	
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC		
ALAMEDA NAS	MILWAUKEE													
5000	3	6	3	1	2	-3	-4	-4	-4	-3	-3	-3	-3	10
10000	5	9	6	5	5	-3	-3	-3	-3	-7	-15	-17	-17	15
18000	7	12	8	9	-4	-7	-7	-7	-7	-15	-27	-31	-31	23
ALAMEDA NAS	CANNON AFB												636 %MI.	
5000	1	2	0	-2	0	-4	-4	-4	-4	0	-5	-6	-6	8
10000	11	13	6	7	7	1	0	0	0	-9	-16	-18	-18	12
18000	26	21	13	14	16	6	3	3	3	-19	-32	-35	-35	19
ALAMEDA NAS	CAMPBELL AFB												929 %MI.	
5000	7	7	0	0	-1	-3	-3	-3	-3	-1	-6	-7	-7	6
10000	14	11	3	7	8	1	0	0	0	-9	-16	-18	-18	11
18000	24	22	9	14	17	7	5	5	5	-20	-32	-36	-36	17
ALAMEDA NAS	CHICAGO												1238 %MI.	
5000	4	5	3	4	4	3	-1	-1	-1	-5	-10	-11	-11	6
10000	16	10	9	11	11	5	3	3	3	-12	-19	-20	-20	10
18000	28	20	18	20	20	12	9	9	9	-24	-34	-37	-37	16
ALAMEDA NAS	CHURCHILL												1502 %MI.	
5000	6	3	1	4	3	-1	-3	-3	-3	-4	-10	-11	-11	6
10000	4	3	5	5	4	-1	-2	-2	-2	-7	-12	-13	-13	9
18000	4	6	10	7	7	-1	-3	-3	-3	-13	-21	-24	-24	14
ALAMEDA NAS	CORPUS CHRISTI												1659 %MI.	
5000	1	0	-2	-2	-1	-4	-6	-6	-6	0	-4	-5	-5	6
10000	11	9	0	4	5	0	-2	-2	-2	-6	-13	-15	-15	10
18000	24	19	2	11	12	2	0	0	0	-16	-29	-32	-32	16
ALAMEDA NAS	FORDWORTH												1011 %MI.	
5000	6	4	0	3	2	-2	-4	-4	-4	-3	-9	-11	-11	9
10000	1	2	3	5	2	-3	-5	-5	-5	-5	-12	-14	-14	12
18000	-1	2	6	7	2	-8	-11	-11	-11	-9	-19	-22	-22	16
ALAMEDA NAS	FOLIA AFB												1807 %MI.	
5000	6	3	1	1	2	-2	-3	-3	-3	-3	-7	-9	-9	6
10000	15	12	3	7	8	2	1	1	1	-10	-17	-19	-19	5
18000	29	24	8	16	18	8	6	6	6	-21	-33	-36	-36	14
ALAMEDA NAS	EFTSLON AFB												1839 %MI.	
5000	1	3	0	2	1	-3	-6	-6	-6	-3	-8	-9	-9	5
10000	-5	-1	-2	1	-2	-8	-10	-10	-10	0	-6	-8	-8	11
18000	-16	-5	-8	-7	-9	-19	-21	-21	-21	3	-6	-8	-8	16

MEANWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*\*--INDICATES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 PLUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION					
	DIRECT			EQUIVALENT			RETURN			RETURN			JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	**450	A75	A85	JAN	APR	JUL	OCT	**450	A75	A85				
ALAMEDA NAS	TO ELLINGTON AFB															1423 N.M.I.		
5000	2	1	-1	-1	0	-5	-6	-3	-2	1	0	-1	-6	-7	8	7	5	7
10000	13	10	1	6	6	0	0	-14	-11	-1	-6	-8	-15	-17	10	9	6	8
18000	26	21	5	13	14	5	3	-31	-25	-6	-15	-18	-31	-34	16	14	8	13
ALAMEDA NAS	TO ELLSWORTH AFB															950 N.M.I.		
5000	4	4	2	4	3	-1	-2	-5	-4	-2	-4	-4	-9	-10	8	8	6	7
10000	11	7	8	8	8	1	0	-13	-8	-8	-9	-10	-17	-18	11	10	8	10
18000	19	15	18	15	16	6	3	-26	-19	-19	-19	-21	-32	-34	19	17	11	16
ALAMEDA NAS	TO ELMENDORF AFB															1747 N.M.I.		
5000	0	2	0	1	0	-5	-6	-1	-3	0	-2	-2	-7	-8	5	8	6	8
10000	-8	-2	-3	-1	-4	-11	-12	4	0	2	-1	0	-6	-7	12	10	8	10
18000	-19	-9	-10	-10	-12	-22	-25	11	2	7	3	5	-4	-6	17	15	11	14
ALAMEDA NAS	TO EL TORO MCAS															324 N.M.I.		
5000	5	5	2	2	3	-2	-3	-5	-5	-2	-2	-4	-10	-11	10	9	7	8
10000	10	9	0	4	5	-3	-5	-11	-10	0	-5	-6	-16	-18	15	14	9	12
18000	17	12	3	7	8	-3	-6	-23	-17	-5	-10	-13	-27	-31	23	20	13	18
ALAMEDA NAS	TO ENGLAND AFB															1502 N.M.I.		
5000	3	3	0	0	1	-3	-4	-3	-3	0	0	-2	-7	-8	8	7	5	7
10000	14	11	3	7	8	2	0	-16	-12	-3	-7	-9	-16	-18	10	9	7	8
18000	28	23	7	15	16	7	5	-33	-26	-8	-17	-20	-32	-35	16	14	8	13
ALAMEDA NAS	TO FORT BENNING															1837 N.M.I.		
5000	5	4	2	2	3	-1	-2	-6	-5	-2	-2	-4	-9	-10	8	7	5	6
10000	17	12	5	8	9	4	2	-18	-13	-5	-9	-11	-18	-20	9	9	6	8
18000	31	24	10	17	19	10	8	-36	-28	-11	-20	-23	-35	-38	15	13	8	12
ALAMEDA NAS	TO FORT BLISS															850 N.M.I.		
5000	1	2	0	-2	0	-4	-5	-1	-2	0	3	0	-5	-6	8	7	5	6
10000	11	9	2	5	6	0	-2	-12	-10	-2	-5	-7	-15	-17	12	10	7	10
18000	24	19	5	11	13	2	0	-29	-23	-7	-14	-17	-30	-34	19	17	10	15
ALAMEDA NAS	TO FORT CAMPBELL															1643 N.M.I.		
5000	5	4	3	2	3	-1	-2	-6	-5	-3	-3	-5	-9	-11	8	8	5	7
10000	17	12	7	10	11	4	3	-18	-12	-7	-10	-12	-19	-20	10	9	7	9
18000	31	23	14	19	20	11	9	-36	-26	-15	-22	-24	-35	-38	16	14	9	13
ALAMEDA NAS	TO FORT CAPSON															815 N.M.I.		
5000	1	2	0	-1	0	-4	-5	-1	-2	0	1	0	-5	-6	7	7	5	6
10000	12	9	6	8	8	1	0	-13	-9	-6	-8	-9	-16	-18	12	11	8	10
18000	25	20	15	16	18	7	4	-29	-23	-15	-18	-21	-33	-36	20	18	11	17

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS						RETURN						STANDARD DEVIATION					
	JAN	APR	JUL	OCT	A75	A85	JAN	APR	JUL	OCT	A75	A85	JAN	APR	JUL	OCT		
ALAMEDA NAS													1271 N.M.I.					
5000	2	2	0	-1	0	-4	-5	-2	-2	0	1	-1	-5	-7	8	7	5	7
10000	13	10	2	6	7	0	0	-14	-11	-2	-6	-8	-15	-17	10	9	7	9
16000	27	22	6	14	15	5	3	-31	-25	-8	-16	-19	-31	-35	17	15	9	14
ALAMEDA NAS													687 N.M.I.					
5000	1	2	0	-1	0	-6	-5	-1	-2	0	1	-1	-5	-7	9	7	5	7
10000	11	9	1	4	5	-1	-3	-12	-10	-1	-5	-7	-15	-17	13	11	8	10
18000	22	17	4	9	11	0	-2	-27	-21	-5	-12	-15	-29	-32	20	18	11	16
ALAMEDA NAS													1699 N.M.I.					
5000	5	5	3	3	3	0	-2	-6	-5	-3	-3	-5	-10	-11	8	8	6	7
10000	17	11	8	10	11	5	3	-19	-12	-8	-11	-13	-19	-21	10	9	7	9
18000	31	22	15	20	20	11	9	-36	-26	-16	-23	-24	-36	-38	16	14	9	14
ALAMEDA NAS													1272 N.M.I.					
5000	3	3	2	2	2	-2	-3	-3	-4	-2	-2	-3	-8	-9	8	8	6	7
10000	14	9	7	9	9	3	1	-16	-10	-7	-10	-11	-18	-19	11	10	7	9
18000	27	21	16	18	19	10	7	-32	-24	-16	-21	-23	-34	-37	17	16	10	15
ALAMEDA NAS													558 N.M.I.					
5000	2	2	-2	2	0	-5	-6	-3	-2	3	-2	-1	-7	-9	11	9	6	9
10000	-3	0	1	1	0	-8	-11	0	-1	-1	-3	-2	-10	-12	15	14	9	12
18000	-11	-5	-1	-3	-5	-18	-22	0	-1	-2	-3	-2	-15	-18	23	20	14	20
ALAMEDA NAS													1840 N.M.I.					
5000	4	4	1	1	2	-2	-3	-5	-4	-1	-1	-3	-8	-9	8	7	5	6
10000	16	12	4	8	9	3	2	-17	-13	-4	-8	-10	-17	-19	9	8	6	8
18000	30	24	9	16	18	9	7	-35	-28	-10	-19	-22	-34	-37	14	13	8	12
ALAMEDA NAS													1157 N.M.I.					
5000	2	2	0	0	0	-4	-5	-2	-2	0	0	-1	-6	-7	8	8	5	7
10000	14	11	5	7	8	2	0	-15	-11	-5	-8	-10	-17	-19	11	10	7	9
18000	28	22	11	16	18	7	5	-32	-26	-12	-18	-21	-33	-37	18	16	10	15
ALAMEDA NAS													1209 N.M.I.					
5000	2	2	0	0	0	-3	-5	-2	-2	0	0	-1	-6	-7	8	7	5	7
10000	14	11	3	7	8	1	0	-15	-11	-3	-7	-9	-16	-18	11	9	7	9
18000	28	22	9	15	17	7	5	-32	-25	-10	-17	-20	-32	-35	17	15	9	14
ALAMEDA NAS													1580 N.M.I.					
5000	5	5	3	4	4	0	-1	-6	-5	-3	-5	-5	-10	-11	8	8	6	7
10000	16	9	10	11	11	5	3	-17	-10	-10	-12	-13	-19	-20	10	9	7	9
18000	27	20	19	20	21	12	10	-33	-23	-19	-23	-24	-34	-37	16	15	9	14

\* HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.

\*\* A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES. MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FFFT	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION								
	DIRECT						RETURN						JAN	APR	JUL	OCT					
	JAN	APR	JUL	OCT	00150	A75	A85	JAN	APR	JUL	OCT	00150	A75	A85	JAN	APR	JUL	OCT			
ALAMEDA NAS	TO																	508 N.MI.			
5000	3	4	0	2	1	-2	-3	-3	-3	0	-2	-2	-7	-9	4	8	5	7			
10000	10	7	7	7	7	0	-1	-12	-8	-7	-7	-9	-16	-18	14	12	8	11			
18000	19	15	16	14	15	3	0	-25	-20	-17	-17	-20	-32	-36	22	20	13	19			
ALAMEDA NAS	TO																	1707 N.MI.			
5000	5	4	2	2	3	-1	-2	-6	-5	-2	-2	-4	-9	-10	8	8	5	7			
10000	17	12	6	9	10	4	2	-18	-13	-6	-10	-12	-19	-21	10	9	7	9			
18000	31	24	12	18	19	10	8	-36	-27	-13	-21	-23	-35	-38	15	14	8	13			
ALAMEDA NAS	TO																	1332 N.MI.			
5000	1	3	-1	2	0	-4	-5	-2	-4	1	-2	-2	-8	-9	10	8	6	8			
10000	-5	-2	-2	0	-2	-9	-11	1	0	1	-2	0	-7	-8	12	11	8	10			
18000	-16	-6	-8	-8	-10	-20	-23	7	0	5	0	2	-7	-10	18	16	12	16			
ALAMEDA NAS	TO																	1689 N.MI.			
5000	-5	-1	-3	-3	-3	-9	-11	3	0	3	1	1	-4	-5	10	8	7	9			
10000	-11	-5	-5	-5	-7	-14	-16	8	2	4	2	3	-3	-5	13	11	9	10			
18000	-23	-13	-13	-14	-16	-26	-29	15	6	10	7	9	0	-3	18	15	12	15			
ALAMEDA NAS	TO																	578 N.MI.			
5000	4	3	-2	3	1	-4	-5	-4	-3	2	-3	-2	-8	-10	10	9	6	8			
10000	0	1	3	4	2	-5	-7	-3	-3	-3	-5	-4	-12	-14	15	13	8	12			
18000	-4	0	5	0	0	-12	-15	-6	-6	-8	-7	-7	-20	-23	22	20	13	19			
ALAMEDA NAS	TO																	1449 N.MI.			
5000	4	3	2	1	2	-2	-3	-4	-4	-2	-1	-3	-8	-9	8	8	5	7			
10000	16	12	5	9	10	3	2	-17	-12	-5	-9	-11	-18	-20	10	9	7	9			
18000	30	23	12	17	19	9	7	-34	-26	-12	-20	-22	-34	-37	16	15	9	14			
ALAMEDA NAS	TO																	1820 N.MI.			
5000	6	5	3	4	4	0	-1	-7	-6	-3	-4	-5	-10	-12	8	7	6	7			
10000	17	11	9	11	11	5	4	-19	-13	-9	-12	-13	-20	-22	10	9	7	9			
18000	31	22	17	21	21	13	11	-37	-26	-18	-24	-26	-36	-39	15	14	9	13			
ALAMEDA NAS	TO																	537 N.MI.			
5000	3	4	1	0	1	-3	-4	-3	-3	-1	0	-2	-7	-8	9	8	6	7			
10000	11	9	2	5	6	-1	-3	-12	-10	-2	-6	-7	-16	-18	14	12	8	11			
18000	23	18	6	11	13	1	-1	-28	-21	-8	-13	-17	-30	-34	21	19	12	17			
ALAMEDA NAS	TO																	1549 N.MI.			
5000	4	4	2	1	2	-2	-3	-5	-4	-2	-2	-4	-8	-10	8	8	5	7			
10000	14	12	6	9	10	4	2	-18	-13	-6	-9	-12	-18	-20	10	9	7	9			
18000	30	23	12	18	19	10	8	-35	-27	-13	-20	-23	-34	-37	16	14	9	13			

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 \*\*\*INUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN FEET	EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION						
	DIRECT			EQUVALENT			RETURN			JAN	APR	JUL	OCT	JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85					
ALAMEDA NAS TO MEXICO CITY																			
5000	-3	-4	-3	-2	-4	-7	-8	3	3	4	2	3	0	-1	7	6	4	6	1625 N.M.I.
10000	5	4	-2	0	0	-4	-5	-7	-5	2	0	-2	-8	-10	8	8	5	7	
18000	14	11	-2	3	5	-2	-4	-20	-15	1	-5	-9	-19	-22	13	11	7	10	
ALAMEDA NAS TO MINN-ST PAUL																			
5000	5	4	3	5	4	0	-2	-5	-5	-3	-5	-5	-10	-11	8	8	6	8	1359 N.M.I.
10000	14	9	10	10	10	4	2	-15	-9	-10	-11	-12	-18	-19	10	10	7	9	
18000	23	17	19	18	19	9	7	-29	-21	-20	-22	-23	-33	-36	17	15	10	15	
ALAMEDA NAS TO MINOT AFB																			
5000	7	4	2	5	4	0	-2	-7	-4	-2	-5	-5	-10	-12	9	8	6	8	1101 N.M.I.
10000	10	4	8	8	8	1	0	-12	-7	-8	-9	-9	-16	-18	11	10	8	10	
18000	15	12	17	14	14	4	1	-23	-17	-19	-19	-20	-30	-33	18	16	11	16	
ALAMEDA NAS TO NELLIS AFB																			
5000	4	5	2	0	2	-3	-4	-4	-4	-2	0	-3	-8	-10	10	8	6	8	368 N.M.I.
10000	12	9	4	7	7	0	-2	-13	-10	-6	-7	-8	-17	-20	15	14	9	12	
18000	24	19	10	13	15	3	0	-29	-22	-12	-15	-19	-33	-37	23	21	13	19	
ALAMEDA NAS TO NEW ORLEANS																			
5000	3	3	0	0	1	-3	-4	-4	-3	0	0	-2	-7	-8	8	7	5	6	1650 N.M.I.
10000	14	11	2	7	8	2	0	-16	-12	-2	-7	-9	-16	-18	9	8	6	8	
18000	28	23	6	15	16	7	5	-33	-26	-7	-17	-20	-32	-35	15	13	8	12	
ALAMEDA NAS TO NIAGARA FALLS																			
5000	7	5	4	6	5	0	0	-8	-6	-4	-6	-6	-11	-13	8	8	6	7	1972 N.M.I.
10000	17	11	11	12	12	6	5	-19	-12	-11	-13	-14	-20	-22	9	9	7	8	
18000	29	20	20	21	22	13	11	-35	-24	-21	-25	-26	-36	-38	15	14	9	13	
ALAMEDA NAS TO ONTARIO AFB																			
5000	5	5	2	3	3	-2	-3	-5	-5	-2	-2	-4	-10	-11	11	9	7	8	256 N.M.I.
10000	9	9	0	4	4	-3	-5	-11	-10	0	-4	-6	-16	-18	16	15	9	12	
18000	15	9	2	6	7	-5	-8	-22	-15	-4	-9	-12	-26	-30	24	21	13	19	
ALAMEDA NAS TO PITTSBURGH																			
5000	7	5	4	5	5	0	0	-8	-6	-4	-5	-6	-11	-12	8	7	6	7	1935 N.M.I.
10000	14	12	10	11	12	6	5	-20	-13	-10	-12	-14	-20	-22	9	9	7	8	
18000	31	22	18	21	22	13	11	-37	-26	-19	-25	-26	-36	-39	15	14	8	13	
ALAMEDA NAS TO REGINA																			
5000	7	4	1	4	3	-1	-2	-8	-4	-1	-4	-4	-10	-12	9	8	5	8	1061 N.M.I.
10000	7	5	7	7	6	0	-1	-10	-6	-7	-8	-8	-15	-17	11	10	8	10	
18000	9	9	14	10	10	0	-2	-18	-14	-16	-15	-16	-27	-29	18	16	12	16	

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 MINUS SIGN DENOTES HEADWINDS.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT				RETURN				W E A D W I N D S				JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	00350	075	085	JAN	APR	JUL	OCT	00350	075	085				
ALAMEDA NAS																		
5000	4	3	2	3	-1	-2		-5	-5	-3	-3	-4	-9	-11				1506 N.M.I.
10000	16	10	8	10	4	3		-17	-11	-8	-11	-12	-10	-20				0
18000	29	22	16	19	20	11	9	-34	-25	-16	-22	-24	-34	-37				10
																		16
ALAMEDA NAS																		
5000	6	5	4	5	0	-1		-7	-5	-4	-5	-6	-11	-12				1804 N.M.I.
10000	17	10	10	11	5	4		-19	-11	-10	-12	-13	-20	-21				4
18000	29	20	19	20	21	12	10	-34	-24	-20	-24	-25	-35	-38				9
																		15
ALAMFDA NAS																		
5000	6	5	4	6	5	0		-7	-5	-4	-6	-6	-11	-12				1776 N.M.I.
10000	16	9	11	11	11	5	4	-18	-11	-11	-12	-13	-19	-21				8
18000	27	19	20	20	21	12	10	-33	-23	-21	-24	-25	-35	-37				5
																		15
ALAMEDA NAS																		
5000	3	3	-2	2	0	-7	-6	-4	-3	2	-2	-2	-8	-10				531 N.M.I.
10000	-1	0	2	3	1	-7	-9	-2	-2	-3	-4	-3	-11	-13				11
18000	-4	-2	3	0	-1	-14	-10	-4	-4	-4	-6	-6	-10	-21				15
																		22
ALAMEDA NAS																		
5000	4	3	0	3	2	-2	-3	-5	-3	0	-3	-3	-8	-9				1507 N.M.I.
10000	-1	1	0	2	0	-5	-7	-1	-2	-1	-4	-3	-8	-10				8
18000	-5	0	1	0	-1	-10	-12	-2	-4	-4	-5	-4	-13	-15				16
																		15
ALFET																		
5000	1	0	-2	-1	-1	-6	-7	-2	0	2	0	0	-5	-7				1555 N.M.I.
10000	3	1	0	2	1	-4	-5	-3	-1	0	-2	-2	-8	-9				7
18000	-1	0	0	2	0	-8	-10	-1	-3	-1	-4	-3	-11	-13				8
																		12
ALFET																		
5000	0	0	-2	-1	-1	-4	-7	0	2	2	0	0	-4	-5				1002 N.M.I.
10000	3	1	1	3	2	-2	-4	-4	-2	-2	-4	-4	-8	-10				7
18000	4	0	0	2	1	-5	-7	-7	-3	-2	-5	-5	-12	-13				7
																		11
ALFET																		
5000	0	0	-4	0	-1	-7	-8	0	0	4	0	0	-5	-6				1532 N.M.I.
10000	1	-1	-3	0	-1	-7	-8	-2	0	3	0	0	-4	-6				9
18000	1	-2	-5	-2	-2	-10	-12	-3	0	3	0	0	-7	-9				5
																		12
ALFET																		
5000	0	0	-4	0	-2	-7	-8	0	0	4	0	0	-4	-5				1748 N.M.I.
10000	1	-1	-4	-1	-2	-7	-9	-1	1	3	0	0	-4	-6				8
18000	0	-3	-5	-3	-3	-10	-12	-3	1	4	1	0	-6	-8				9
																		12

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 +-INDICATES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN PFBT	F L Y A L E N T M E A D M I N O S												STANDARD DEVIATION						
	DIRECT			RETURN			RETURN			RETURN			JAN	APR	JUL	OCT			
	JAN	APR	JUL	OCT	00450	A75	ABS	JAN	APR	JUL	OCT	00450	A75	ABS	JAN	APR	JUL	OCT	
ALERT																			
5000	0	0	0	-1	-1	-6	-7	0	0	0	1	0	-5	-6	6	0	7	8	1187 N.M.I.
10000	-4	-2	-3	-3	-4	-10	-11	3	1	3	3	2	-3	-5	10	10	0	9	
18000	-8	-4	-4	-5	-6	-15	-17	6	2	3	3	3	-5	-7	15	14	12	13	
ALERT																			
5000	-1	-1	-3	-1	-2	-7	-8	1	0	3	1	1	-3	-4	6	7	7	7	1809 N.M.I.
10000	1	0	-1	-1	-1	-6	-7	-2	0	1	0	0	-5	-6	6	7	7	7	
18000	1	-2	-2	-2	-2	-8	-10	-4	0	1	0	-1	-7	-9	12	10	9	9	
ALERT																			
5000	0	-4	-4	-1	-2	-7	-9	-1	0	4	1	0	-4	-5	8	7	6	7	1971 N.M.I.
10000	0	-2	-4	-2	-2	-8	-9	-1	1	4	1	1	-4	-5	9	8	7	7	
18000	0	-4	-6	-4	-4	-11	-13	-2	1	4	2	1	-6	-8	12	11	10	10	
ALERT																			
5000	0	1	-3	0	0	-6	-8	-1	-1	3	-1	0	-6	-8	10	8	8	8	1220 N.M.I.
10000	2	0	-3	0	0	-6	-8	-2	0	3	-1	0	-6	-8	9	8	8	9	
18000	1	0	-5	0	-1	-10	-12	-4	-1	4	0	0	-9	-11	13	13	11	11	
ALERT																			
5000	-1	1	0	1	0	-5	-8	1	-1	0	-1	0	-7	-8	10	9	8	10	422 N.M.I.
10000	-2	0	-3	-2	-2	-10	-11	2	0	3	1	1	-6	-7	12	11	9	11	
18000	-7	-4	-4	-3	-5	-16	-19	5	2	3	1	2	-8	-11	18	17	15	16	
ALERT																			
5000	0	0	-3	-1	-1	-7	-8	-1	0	2	0	0	-5	-7	8	8	8	9	1443 N.M.I.
10000	3	1	1	3	2	-3	-4	-4	-2	-1	-4	-3	-9	-10	8	8	8	8	
18000	4	1	0	3	2	-5	-7	-6	-3	-2	-5	-5	-12	-14	12	11	11	10	
ANDERSON AF4																			
5000	0	3	4	3	2	-2	-3	-2	-4	-4	-3	-4	-9	-10	6	7	7	7	1761 N.M.I.
10000	-3	0	3	2	0	-5	-6	-3	-3	-3	-4	-4	-9	-10	6	6	7	8	
18000	-7	-6	1	-1	-3	-11	-13	-13	-4	-3	-5	-7	-14	-16	11	11	9	11	
ANDERSON AF4																			
5000	10	9	1	5	6	1	0	-10	-9	-2	-5	-7	-12	-13	7	5	7	7	1419 N.M.I.
10000	10	9	3	3	6	1	0	-10	-9	-3	-3	-7	-12	-13	7	5	8	7	
18000	2	3	4	5	3	-1	-2	-3	-3	-4	-5	-4	-9	-10	7	7	7	7	
ANDERSON AF4																			
5000	2	0	-3	-3	-1	-5	-6	-3	0	3	3	0	-3	-4	5	5	5	5	1743 N.M.I.
10000	1	2	-2	-1	0	-4	-5	-2	-1	2	2	0	-4	-4	5	5	5	5	
18000	0	0	-1	0	-1	-4	-5	0	0	0	0	0	-4	-5	6	5	6	5	

\* HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\* --D-FYTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION												
	EQUIVALENT HEADWINDS												JAN	APR	JUL	OCT									
EQUIVALENT HEADWINDS												RETURN													
EQUIVALENT HEADWINDS												JAN	APR	JUL	OCT	A75	A85	A75	A85						
ANDERSON AFR	DARWIN												-5	-3	1	0	-2	-6	-7	5	5	5	5	1771 N.M.I.	
5000	3	-1	0	1	-2	-3																			
10000	3	1	2	2	3	-1																			
18000	4	3	2	3	3	0	-1																		
ANDERSON AFR	DAVAC												-13	-9	0	0	-6	-12	-14	7	5	7	7	1205 N.M.I.	
5000	13	0	0	6	0	-2																			
10000	11	9	3	3	6	1	0																		
18000	5	4	5	6	5	0	0																		
ANDERSON AFR	FNI METOK ATOLL												13	15	11	9	12	7	6	6	6	6	6	6	1024 N.M.I.
5000	-13	-15	-10	-8	-12	-17	-18																		
10000	-10	-8	-9	-10	-10	-14	-15																		
18000	-11	-3	-8	-9	-8	-14	-15																		
ANDERSON AFR	HONG KONG												-5	-5	-2	-5	-5	-9	-10	6	5	7	7	1826 N.M.I.	
5000	4	5	2	5	4	0	-1																		
10000	3	5	1	1	2	-1	-2																		
18000	-8	-5	3	1	-2	-8	-10																		
ANDERSON AFR	IMAKUNI												-1	-4	-4	-3	-4	-9	-10	8	7	7	7	1414 N.M.I.	
5000	0	3	4	3	2	-2	-4																		
10000	-7	0	2	1	-1	-7	-9																		
18000	-18	-13	0	-4	-8	-17	-20																		
ANDERSON AFR	IADU JIMA AB												-6	-8	-6	-5	-7	-12	-14	9	7	8	8	702 N.M.I.	
5000	6	8	6	5	6	0	0																		
10000	7	4	5	5	5	0	-1																		
18000	11	2	3	4	4	-2	-4																		
ANDERSON AFR	KADENA AB												-2	-5	-4	-5	-5	-10	-11	8	7	8	7	1231 N.M.I.	
5000	1	4	4	5	3	-1	-2																		
10000	0	10	3	2	3	-2	-4																		
18000	-9	-8	2	0	-3	-11	-13																		
ANDERSON AFR	KIMPU AR												1	-2	-3	-1	-2	-6	-7	7	7	7	7	1733 N.M.I.	
5000	-2	1	3	0	0	-4	-5																		
10000	-11	-2	1	-1	-3	-9	-11																		
18000	-24	-17	-1	-8	-13	-22	-24																		
ANDERSON AFR	KWAJALEIN MS												13	15	11	9	12	8	7	6	5	5	5	5	1373 N.M.I.
5000	-13	-15	-11	-8	-12	-16	-17																		
10000	-11	-8	-10	-10	-10	-14	-15																		
18000	-13	-5	-9	-10	-10	-15	-16																		

\* HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\* A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWIND							RETURN							STANDARD DEVIATION			
	JAN	APR	JUL	OCT	A75	A85	A85	JAN	APR	JUL	OCT	A75	A85	A85	JAN	APR	JUL	OCT
ANDEFSON AFB															1638 N.M.I.			
5000	0	4	5	3	3	-2	-3	-2	-4	-5	-3	-4	-9	-10	8	7	7	7
10000	-2	0	3	2	0	-5	-6	-3	-3	-3	-4	-4	-9	-11	9	8	7	8
18000	-7	-6	1	-1	-3	-11	-13	-13	-4	-3	-5	-7	-14	-16	11	11	9	10
ANDEFSON AFB															1391 N.M.I.			
5000	2	0	-4	-4	-2	-6	-7	-3	0	4	4	0	-3	-4	5	5	5	5
10000	0	0	-3	-1	-1	-5	-6	0	0	3	1	0	-2	-3	5	5	5	5
18000	-1	0	-2	-1	-1	-5	-7	0	0	1	1	0	-4	-5	7	5	7	6
ANDEFSON AFB															1551 N.M.I.			
5000	-1	2	4	1	1	-3	-4	0	-3	-4	-2	-3	-8	-9	7	7	7	7
10000	-9	-1	2	0	-2	-8	-10	3	-1	-2	-1	-1	-6	-7	8	8	7	8
18000	-21	-15	0	-6	-10	-19	-22	3	7	-1	2	2	-4	-5	10	9	8	9
ANDEFSON AFB															1670 N.M.I.			
5000	0	2	3	3	1	-2	-3	0	-3	-3	-3	-3	-7	-8	7	6	7	6
10000	-8	3	1	0	-1	-7	-8	3	-5	-2	0	-1	-7	-8	8	7	8	7
18000	-21	-16	1	-4	-10	-19	-21	8	10	-1	2	4	-2	-3	9	8	7	8
ANDEFSON AFB															1489 N.M.I.			
5000	2	4	3	5	3	0	-2	-3	-5	-3	-5	-5	-9	-10	7	6	7	6
10000	0	7	2	1	2	-2	-3	-3	-8	-3	-2	-5	-10	-11	7	6	8	7
18000	-10	-8	2	0	-4	-11	-12	4	4	-3	-1	0	-5	-6	8	8	7	8
ANDEFSON AFB															1347 N.M.I.			
5000	1	4	5	4	3	-1	-2	-3	-5	-5	-4	-5	-10	-11	8	7	7	7
10000	-2	1	3	3	1	-4	-5	-3	-3	-3	-4	-4	-9	-11	9	8	7	8
18000	-7	-6	2	0	-3	-10	-12	-11	-3	-3	-4	-6	-13	-15	11	11	9	10
ANDEFSON AFB															999 N.M.I.			
5000	6	2	-4	-4	0	-6	-7	-6	-2	4	4	0	-6	-7	6	6	7	7
10000	1	2	-2	0	0	-4	-5	-2	-2	2	0	-1	-4	-5	5	5	5	6
18000	1	2	0	1	0	-3	-5	-3	-2	0	-1	-2	-7	-8	7	6	7	7
ANDEFSON AFB															1295 N.M.I.			
5000	-6	-11	-8	-8	-9	-13	-14	5	11	8	8	8	3	2	6	6	6	6
10000	-3	-3	-5	-7	-5	-9	-10	2	3	5	7	4	0	-1	7	6	5	6
18000	-3	4	-3	-3	-2	-7	-9	1	-4	3	2	0	-5	-7	9	8	7	8
ANDREWS AFB															1784 N.M.I.			
5000	-11	-8	-6	-8	-9	-14	-16	10	7	6	7	7	2	0	9	9	6	8
10000	-24	-15	-12	-14	-16	-23	-25	22	13	12	13	14	8	6	10	10	7	9
18000	-40	-27	-21	-28	-28	-39	-42	34	23	20	24	24	15	13	15	14	9	14

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 \*\*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 \*PLUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWINDS										STANDARD DEVIATION				
	JAN	APR	JUL	OCT	**450	A75	A85	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT
ANDREWS AFB	CANNON AFB														
5000	-12	-10	-7	-7	-9	-16	-17	11	9	7	7	8	2	0	11
10000	-26	-19	-9	-12	-16	-25	-27	25	18	9	11	15	7	5	11
18000	-45	-32	-13	-25	-27	-42	-46	40	28	13	22	23	12	10	17
ANDREWS AFB	CARSWELL AFB														
5000	-13	-10	-6	-6	-9	-16	-17	12	9	6	6	7	1	0	11
10000	-27	-19	-8	-11	-16	-25	-28	25	18	8	10	14	6	4	12
18000	-46	-32	-11	-25	-27	-43	-47	41	28	10	21	22	10	8	17
ANDREWS AFB	CHERRY PT MCAS														
5000	-1	0	0	-1	-1	-9	-11	-1	0	0	0	-1	-9	-11	14
10000	-3	-5	-1	-2	-3	-12	-15	-5	0	0	1	-1	-10	-13	16
18000	-15	-5	-1	-4	-7	-21	-25	-6	-7	0	1	-3	-16	-19	22
ANDREWS AFB	CHICAGO														
5000	-15	-11	-7	-9	-11	-19	-21	13	10	7	8	9	1	0	14
10000	-29	-20	-14	-13	-19	-29	-32	27	18	13	12	16	7	4	15
18000	-48	-32	-20	-29	-31	-47	-51	42	28	19	24	26	14	11	21
ANDREWS AFB	CHURCHILL														
5000	-7	-5	-4	-6	-6	-12	-14	5	3	4	4	4	-2	-4	10
10000	-15	-9	-11	-10	-12	-19	-21	11	7	9	8	8	1	0	11
18000	-25	-17	-17	-17	-19	-29	-32	13	11	13	10	11	2	0	16
ANDREWS AFB	CORPUS CHRISTI														
5000	-12	-9	-5	-5	-8	-14	-16	11	8	5	4	6	0	0	10
10000	-23	-17	-6	-8	-13	-22	-24	21	15	5	7	11	3	2	11
18000	-41	-29	-5	-20	-23	-38	-41	35	23	3	17	17	5	3	16
ANDREWS AFB	EDMONTON														
5000	-12	-6	-5	-9	-8	-15	-16	10	5	5	8	6	0	0	10
10000	-22	-13	-13	-15	-16	-23	-25	20	12	13	14	14	8	6	10
18000	-35	-23	-20	-26	-26	-36	-38	29	19	18	21	21	12	10	14
ANDREWS AFB	EGLIN AFB														
5000	-11	-8	-4	-4	-7	-14	-16	10	7	4	3	5	-1	-2	12
10000	-21	-16	-6	-7	-12	-22	-24	17	13	6	6	10	1	0	13
18000	-39	-25	-7	-20	-21	-37	-41	29	17	6	16	15	4	1	18
ANDREWS AFB	ELLINGTON AFB														
5000	-13	-9	-5	-5	-8	-15	-17	12	9	5	5	7	1	0	11
10000	-24	-18	-7	-9	-14	-23	-26	22	16	6	8	12	4	2	11
18000	-43	-30	-6	-22	-24	-40	-44	37	24	5	18	19	6	4	17

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MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT			RETURN			HEADWIND						DEVIATION					
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT
ANDREWS AFB	TO ELLSWORTH AFB																	
5000	-14	-9	-7	-9	-10	-17	-19	12	8	6	8	8	1	0	11	11	8	10
10000	-26	-17	-14	-15	-18	-25	-28	24	15	13	14	16	8	6	12	12	9	11
18000	-43	-29	-22	-29	-30	-42	-46	37	25	21	25	26	15	13	17	17	10	17
ANDREWS AFB	TO EL TORO MCAS																	
5000	-9	-7	-5	-4	-7	-11	-13	8	7	5	4	5	1	0	8	8	5	7
10000	-21	-16	-9	-11	-14	-21	-23	19	14	9	10	12	6	5	9	9	7	8
18000	-40	-29	-15	-23	-26	-38	-40	35	25	15	20	22	13	11	14	13	8	13
ANDREWS AFB	TO ENGLAND AFB																	
5000	-13	-10	-5	-5	-3	-16	-18	12	9	5	5	7	0	-1	11	11	8	10
10000	-25	-18	-7	-9	-14	-24	-27	23	17	7	8	13	4	2	12	12	8	12
18000	-44	-30	-8	-23	-25	-41	-45	38	25	7	19	20	7	5	18	17	10	17
ANDREWS AFB	TO FORT BENNING																	
5000	-11	-8	-4	-4	-7	-15	-17	10	7	4	4	6	-1	-3	12	12	6	11
10000	-22	-17	-7	-8	-13	-23	-26	18	14	7	6	10	2	0	14	14	9	13
18000	-41	-27	-9	-22	-23	-40	-44	32	19	8	18	17	5	2	20	20	11	19
ANDREWS AFB	TO FORT BLISS																	
5000	-12	-9	-6	-6	-8	-14	-16	11	8	6	6	7	2	0	10	9	6	8
10000	-25	-18	-8	-11	-15	-24	-26	23	17	7	10	13	6	4	10	10	7	10
18000	-44	-31	-11	-23	-26	-40	-44	39	28	11	20	22	11	9	15	15	8	14
ANDREWS AFB	TO FORT BRAGG/POPE																	
5000	-7	-5	-2	-3	-5	-13	-15	5	3	2	3	3	-4	-6	14	13	9	12
10000	-15	-12	-5	-6	-9	-19	-22	7	8	4	5	5	-3	-5	16	16	10	14
18000	-32	-18	-7	-18	-17	-33	-37	15	6	5	11	8	-3	-6	22	22	12	21
ANDREWS AFB	TO FORT CAMPBELL																	
5000	-15	-11	-6	-8	-10	-18	-20	14	10	6	7	8	1	0	13	13	9	11
10000	-29	-21	-11	-12	-18	-28	-31	28	20	11	11	16	7	5	14	14	10	13
18000	-49	-33	-16	-28	-30	-47	-51	45	28	15	25	26	12	9	21	21	12	20
ANDREWS AFB	TO FORT CAPSON																	
5000	-12	-9	-7	-8	-9	-16	-17	11	9	7	8	8	2	1	10	10	7	9
10000	-26	-18	-11	-13	-17	-25	-28	24	16	11	12	15	7	6	11	11	8	11
18000	-45	-31	-18	-28	-29	-43	-46	40	27	17	24	25	14	12	17	16	10	16
ANDREWS AFB	TO FORT HOOD																	
5000	-13	-10	-6	-6	-9	-16	-17	12	9	6	5	7	1	0	11	10	7	9
10000	-26	-19	-7	-10	-15	-25	-27	24	17	7	9	13	5	3	11	11	8	11
18000	-45	-31	-9	-23	-26	-41	-45	40	26	3	20	21	9	6	17	16	9	16

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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION						
	DIRECT						RETURN						JAN	APR	JUL	OCT			
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50					A75	A85	
ANDREWS AFB	TO															1688 N.MI.			
5000	-10	-8	-6	-5	-8	-13	-15	9	8	6	5	5	6	1	0	9	9	6	8
10000	-24	-18	-8	-10	-15	-23	-25	22	17	7	10	13	13	6	4	10	9	7	9
18000	-42	-31	-12	-23	-26	-39	-42	37	27	11	19	21	21	11	9	15	14	8	13
ANDREWS AFB	TO															432 N.MI.			
5000	-15	-11	-7	-8	-10	-19	-21	14	10	7	8	9	9	1	0	14	13	9	11
10000	-31	-22	-12	-12	-19	-30	-33	29	21	12	11	17	17	7	5	15	15	10	14
18000	-50	-34	-17	-30	-31	-48	-53	46	30	17	26	27	27	14	11	22	21	12	21
ANDREWS AFB	TO															841 N.MI.			
5000	-15	-11	-7	-9	-11	-18	-20	14	10	7	8	9	9	2	0	13	12	8	10
10000	-29	-20	-12	-14	-19	-28	-31	28	19	12	13	17	17	8	6	13	13	10	12
18000	-48	-32	-19	-30	-31	-46	-50	44	29	18	26	27	27	15	12	19	19	11	19
ANDREWS AFB	TO															620 N.MI.			
5000	-11	-8	-4	-4	-7	-14	-16	9	7	4	3	5	5	-1	-3	12	11	8	11
10000	-21	-16	-6	-7	-12	-22	-25	17	13	6	6	10	10	1	0	13	13	9	13
18000	-39	-25	-7	-21	-21	-37	-41	29	17	6	16	15	15	3	1	19	19	10	18
ANDREWS AFB	TO															1063 N.MI.			
5000	-14	-10	-7	-7	-10	-17	-18	12	10	7	7	8	8	2	0	11	11	8	9
10000	-27	-20	-9	-12	-17	-26	-29	26	18	9	11	15	15	6	5	12	12	9	11
18000	-47	-32	-13	-26	-28	-44	-48	42	28	12	22	24	24	12	9	18	17	10	17
ANDREWS AFB	TO															1091 N.MI.			
5000	-13	-10	-6	-6	-9	-16	-17	12	9	6	6	7	7	1	0	11	11	7	9
10000	-27	-19	-8	-11	-16	-25	-28	25	18	8	10	14	14	6	4	12	12	8	11
18000	-46	-32	-11	-25	-27	-43	-47	41	28	10	21	22	22	10	8	17	17	9	16
ANDREWS AFB	TO															1525 N.MI.			
5000	0	0	1	2	0	-6	-7	-1	-1	-2	-3	-2	-2	-9	-10	10	10	8	9
10000	0	0	0	1	0	-6	-8	-5	-2	-2	-4	-4	-4	-11	-12	11	11	9	10
18000	2	0	0	1	0	-9	-11	-15	-6	-4	-10	-9	-9	-19	-22	15	15	11	15
ANDREWS AFB	TO															555 N.MI.			
5000	-14	-10	-7	-8	-10	-18	-20	13	9	7	8	8	8	1	0	14	13	9	11
10000	-28	-19	-14	-13	-18	-29	-31	26	17	13	11	16	16	6	4	15	15	11	14
18000	-47	-31	-20	-28	-30	-46	-50	39	27	19	23	25	25	13	9	21	21	13	21
ANDREWS AFB	TO															1610 N.MI.			
5000	-10	-8	-5	-7	-8	-13	-15	9	7	5	7	7	7	1	0	9	9	6	8
10000	-24	-16	-12	-13	-16	-24	-25	22	14	11	13	14	14	8	6	10	10	8	9
18000	-42	-28	-20	-28	-29	-40	-43	36	24	19	24	24	24	15	13	16	15	9	14

\* HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\* A--DIFNOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 † MINUS SIGN ON NOTES 4-ADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUILVALENT HEADWINDS						STANDARD DEVIATION											
	DIRECT		RETURN		STANDARD DEVIATION		DIRECT		RETURN		STANDARD DEVIATION							
	JAN	APR	JUL	OCT	MAY	NOV	JAN	APR	JUL	OCT	MAY	NOV						
ANDREWS AFB TO HOMESTEAD AFB	-5	-4	-2	-2	-4	-10	-12	4	3	2	2	2	3	-5	10	10	7	10
5000	-7	-7	-3	-3	-5	-13	-15	3	4	2	3	2	-4	-6	12	12	8	11
10000	-17	-10	-4	-10	-10	-20	-23	2	0	3	5	2	-6	-9	16	16	9	15
ANDREWS AFB TO HUNTER AAF	-8	-5	-2	-3	-5	-12	-14	6	4	2	2	3	-3	-5	12	12	9	11
5000	-15	-12	-4	-5	-9	-18	-21	9	8	4	4	5	-2	-4	14	14	9	13
10000	-32	-19	-6	-18	-17	-33	-36	17	9	5	12	9	-1	-4	20	20	11	19
ANDREWS AFB TO HUNTSVILLE	-14	-17	-5	-6	-9	-17	-19	13	9	5	6	7	0	-1	13	12	8	11
5000	-27	-20	-9	-10	-15	-27	-30	25	19	9	9	14	5	3	14	14	10	13
10000	-47	-31	-12	-16	-27	-44	-49	41	25	12	22	22	10	7	20	20	11	19
ANDREWS AFB TO JACKSONVILLE	-8	-5	-2	-2	-5	-12	-14	6	4	2	2	3	-3	-5	12	11	8	11
5000	-14	-12	-4	-5	-9	-18	-20	8	8	3	4	5	-2	-4	14	13	9	13
10000	-30	-18	-5	-16	-16	-30	-34	15	8	4	10	8	-2	-4	19	19	10	18
ANDREWS AFB TO KEY WEST	-6	-4	-2	-2	-4	-10	-12	4	4	3	2	3	-2	-4	10	10	7	9
5000	-9	-7	-3	-4	-6	-13	-15	4	4	3	3	3	-3	-4	12	11	7	10
10000	-19	-11	-4	-11	-11	-21	-24	5	2	3	6	3	-5	-7	16	16	9	14
ANDREWS AFB TO LAMPSON AFB	-12	-7	-5	-9	-8	-14	-15	11	7	5	8	7	2	1	9	8	6	8
5000	-24	-14	-12	-15	-16	-23	-25	22	13	12	14	14	8	7	9	9	7	9
10000	-38	-25	-22	-28	-28	-38	-41	33	22	20	24	24	15	13	14	14	9	14
ANDREWS AFB TO LITTLE ROCK	-14	-11	-6	-7	-10	-17	-19	13	10	6	6	8	1	0	12	12	8	10
5000	-28	-20	-10	-11	-17	-27	-30	27	19	10	10	15	6	4	13	13	9	13
10000	-48	-33	-13	-27	-29	-45	-49	43	28	12	23	24	11	8	19	19	11	18
ANDREWS AFB TO LOCKPORT	-14	-12	-7	-9	-11	-20	-22	15	11	7	8	9	1	0	14	14	9	12
5000	-32	-23	-14	-12	-20	-31	-34	30	21	14	11	18	8	5	16	16	11	14
10000	-51	-35	-19	-30	-32	-50	-54	46	31	18	25	28	14	10	23	23	13	22
ANDREWS AFB TO LOMING AFB	7	5	6	6	6	-2	-6	-10	-7	-7	-7	-8	-16	-18	14	13	10	11
5000	15	10	9	11	11	1	0	-21	-14	-10	-14	-15	-25	-27	16	15	11	14
10000	26	13	12	19	16	4	0	-39	-22	-17	-27	-25	-40	-44	22	21	13	21

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*\*--DEFINIES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 +MINUS SIGN DENOTES TADWINDS.



EQUIVALENT HEADINGS AND STANDARD DEVIATION IN CENTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN POUNDS	MONTHLY AVERAGE RETURN												STANDARD DEVIATION								
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
ANDREWS AFB	LONE AFB												1739 N.M.I.								
5000	-19	-8	-5	-7	-13	-14	9	7	5	5	6	1	0	9	0	0	7				
10000	-23	-17	-9	-15	-22	-24	21	16	9	10	13	7	5	16	9	7	9				
15000	-42	-30	-14	-24	-39	-42	37	27	14	20	22	13	11	15	14	0	13				
ANDREWS AFB	MEMPHIS												600 N.M.I.								
5000	-14	-11	-6	-7	-10	-19	13	10	6	6	0	1	0	13	12	0	11				
10000	-20	-20	-10	-11	-17	-30	26	19	10	10	15	6	4	14	14	10	13				
15000	-44	-32	-13	-27	-44	-49	43	28	13	23	24	11	9	20	19	11	19				
ANDREWS AFB	MERCY CITY												1039 N.M.I.								
5000	-8	-7	-3	-2	-5	-12	7	7	3	2	4	0	-1	0	0	5	7				
10000	-15	-12	-3	-4	-15	-17	13	10	3	4	6	1	0	9	9	6	4				
15000	-31	-21	-1	-14	-17	-31	24	16	3	11	11	2	0	12	12	7	11				
ANDREWS AFB	MINN-ST PAUL												015 N.M.I.								
5000	-14	-4	-7	-9	-17	-20	12	0	7	0	0	1	0	13	12	9	11				
10000	-27	-19	-14	-14	-24	-30	24	14	13	13	16	7	5	13	14	10	13				
15000	-44	-24	-21	-25	-33	-47	37	25	23	23	25	13	10	20	19	12	19				
ANDREWS AFB	MIYOT AFB												1197 N.M.I.								
5000	-13	-8	-6	-9	-9	-10	11	7	9	0	7	1	0	11	11	0	10				
10000	-24	-15	-14	-15	-17	-27	22	14	14	13	15	7	6	12	12	9	11				
15000	-40	-27	-22	-28	-39	-44	33	22	20	23	23	13	10	17	17	11	17				
ANDREWS AFB	NELLIS AFB												1010 N.M.I.								
5000	-9	-7	-5	-7	-12	-13	0	7	5	5	6	1	0	0	0	6	7				
10000	-22	-16	-10	-12	-15	-24	20	14	10	11	13	7	5	10	9	7	9				
15000	-41	-29	-17	-25	-27	-42	35	25	16	21	22	14	12	15	14	0	13				
ANDREWS AFB	NEW ORLEANS												039 N.M.I.								
5000	-12	-9	-4	-4	-7	-14	11	0	4	4	6	0	-1	11	11	7	10				
10000	-23	-17	-6	-8	-13	-25	20	15	6	7	11	3	1	12	12	0	12				
15000	-41	-24	-9	-21	-23	-42	34	21	5	17	17	5	2	10	17	10	17				
ANDREWS AFB	NIAGARA FALLS												274 N.M.I.								
5000	-7	-5	-3	-2	-5	-10	4	2	3	1	2	-3	-7	15	14	10	12				
10000	-15	-10	-7	-4	-11	-22	6	4	4	1	3	-4	-8	16	16	11	15				
15000	-26	-20	-10	-12	-17	-36	4	9	6	0	4	-8	-12	23	23	14	23				
ANDREWS AFB	PATRICK AFB												601 N.M.I.								
5000	-4	-4	-2	-2	-4	-11	4	3	2	1	2	-4	-5	11	11	0	10				
10000	-10	-9	-3	-4	-7	-17	4	5	2	3	3	-4	-6	13	13	0	12				
15000	-22	-13	-4	-12	-12	-24	7	1	3	7	4	-5	-8	10	10	10	17				

HEADINGS--COMPUTED FOR A 120-KT AIRSPEED.  
 000--DEFINITE ANNUAL EQUIVALENT HEADINGS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DEFINES HEADINGS.

STATEMENTS OF RECEIPTS AND PAYMENTS FOR THE YEAR ENDING 1937

ACCOUNT	RECEIPTS												BALANCE
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
ACCOUNTS RECEIVABLE	10	10	10	10	10	10	10	10	10	10	10	10	10
SALES	10	10	10	10	10	10	10	10	10	10	10	10	10
RENTS	10	10	10	10	10	10	10	10	10	10	10	10	10
INTEREST	10	10	10	10	10	10	10	10	10	10	10	10	10
OTHER	10	10	10	10	10	10	10	10	10	10	10	10	10
TOTAL RECEIPTS	50	50	50	50	50	50	50	50	50	50	50	50	50
PAYMENTS	10	10	10	10	10	10	10	10	10	10	10	10	10
DEBT SERVICE	10	10	10	10	10	10	10	10	10	10	10	10	10
OPERATING EXPENSES	10	10	10	10	10	10	10	10	10	10	10	10	10
TOTAL PAYMENTS	20	20	20	20	20	20	20	20	20	20	20	20	20
NET INCREASE	30	30	30	30	30	30	30	30	30	30	30	30	30
BALANCE JAN 1	10	10	10	10	10	10	10	10	10	10	10	10	10
BALANCE DEC 31	40	40	40	40	40	40	40	40	40	40	40	40	40

MEMORANDUMS—COMPUTED FOR A 120-CT AIRSPEED.  
 \*\*\*—DEVOTES ANNUAL EQUIVALENT READINGS FOR INDICATED PER CENT OBLIGATIONS.  
 MINUS SIGN DENOTES DEBITING.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEBY	EQUIVALENT HEADWINDS						RETURN						STANDARD DEVIATION			
	JAN	APR	JUL	OCT	MAY	AUG	JAN	APR	JUL	OCT	MAY	AUG	JAN	APR	JUL	OCT
ATTU																
5000	-9	-6	-13	-9	-17	-19	6	7	5	11	7	6	12	11	9	11
10000	-16	-7	-20	-14	-23	-25	14	11	7	17	11	4	12	12	9	12
18000	-27	-11	-29	-22	-34	-37	20	17	9	23	16	5	17	16	13	16
ATTU																
5000	5	9	3	6	-2	-4	-7	-5	-9	-10	-8	-17	15	13	11	13
10000	11	9	14	10	0	-2	-13	-8	-11	-16	-12	-23	16	15	13	15
18000	14	13	14	14	1	-1	-19	-16	-17	-21	-19	-32	22	19	17	19
ATTU																
5000	0	4	3	3	-3	-5	-1	-2	-6	-4	-4	-10	11	9	8	9
10000	6	6	6	5	-2	-4	-8	-4	-7	-9	-7	-15	13	11	10	11
18000	9	7	7	7	-2	-4	-14	-9	-9	-12	-11	-22	17	15	13	15
ATTU																
5000	1	2	7	4	3	-3	-2	-3	-7	-5	-5	-12	11	10	9	10
10000	7	3	6	7	5	-2	-10	-4	-7	-9	-8	-16	13	12	10	12
18000	11	7	8	10	8	-1	-16	-11	-11	-14	-13	-24	18	16	14	16
ATTU																
5000	1	2	5	3	2	-4	-2	-2	-5	-4	-4	-9	10	8	7	8
10000	7	2	5	6	4	-3	-10	-4	-6	-8	-7	-14	12	10	9	10
18000	13	7	9	11	9	0	-18	-11	-12	-14	-14	-24	16	14	12	14
ATTU																
5000	4	3	8	6	5	-2	-5	-4	-8	-7	-7	-14	12	11	9	11
10000	9	4	7	10	7	0	-11	-5	-8	-11	-9	-18	14	12	11	12
18000	14	9	11	13	11	0	-19	-12	-14	-16	-16	-27	19	16	15	17
ATTU																
5000	-4	0	-4	-1	-3	-10	-1	-2	3	-1	0	-8	13	11	9	11
10000	-2	0	-1	3	0	-9	-4	-4	0	-7	-4	-12	12	11	9	10
18000	-6	1	6	4	1	-8	-9	-12	-9	-14	-12	-21	16	14	11	13
ATTU																
5000	-9	-9	-6	-13	-10	-17	7	7	6	12	7	0	14	11	9	11
10000	-18	-14	-8	-20	-15	-24	15	11	7	18	12	4	12	12	9	12
18000	-29	-23	-11	-30	-23	-38	21	17	8	24	17	6	16	15	12	15
ATTU																
5000	0	1	5	1	1	-4	-1	-1	-6	-2	-3	-9	11	9	8	9
10000	3	2	7	5	4	-2	-6	-3	-7	-6	-6	-13	12	10	9	10
18000	7	5	6	6	6	-3	-11	-8	-8	-9	-9	-19	16	14	13	14

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT						RETURN						JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50					A75	A85
ATTU																1747 N.M.I.		
5000	-11	-9	-6	-12	-10	-17	-18	8	8	6	11	8	1	0	11	10	8	10
10000	-21	-14	-8	-20	-16	-24	-26	17	11	7	17	12	5	3	11	11	8	11
18000	-33	-25	-11	-31	-25	-37	-39	23	18	9	25	18	8	5	15	14	11	14
BAGHDAD																1747 N.M.I.		
5000	4	7	9	1	5	0	0	-4	-7	-9	-1	-6	-10	-11	6	6	6	5
10000	11	9	4	4	6	2	0	-12	-10	-4	-4	-8	-13	-14	7	7	6	6
18000	29	21	4	10	14	5	4	-32	-24	-5	-11	-17	-29	-31	11	10	6	8
BAGHDAD																519 N.M.I.		
5000	5	6	10	5	6	0	0	-5	-6	-10	-5	-7	-13	-14	8	9	8	8
10000	8	10	7	5	7	0	-1	-11	-11	-7	-6	-9	-16	-18	11	11	9	10
18000	15	16	8	1	9	0	-2	-25	-22	-9	-4	-14	-26	-29	17	14	10	11
BAGHDAD																1293 N.M.I.		
5000	5	8	7	2	5	1	0	-5	-7	-7	-2	-6	-10	-11	6	7	6	6
10000	13	11	4	5	8	2	1	-14	-12	-4	-6	-9	-15	-17	8	8	7	7
18000	32	26	7	13	18	8	6	-36	-29	-8	-14	-21	-33	-36	13	11	8	9
BAGHDAD																1522 N.M.I.		
5000	4	6	1	1	2	-1	-2	-3	-6	-1	-1	-3	-7	-8	6	6	5	5
10000	11	10	3	6	7	2	1	-11	-10	-3	-6	-8	-13	-14	7	7	6	7
18000	31	27	10	17	20	12	10	-32	-28	-10	-17	-21	-31	-34	12	10	8	8
BAGHDAD																1702 N.M.I.		
5000	4	7	2	1	3	0	-1	-3	-7	-2	-1	-4	-7	-8	6	5	5	4
10000	12	11	3	6	7	2	1	-13	-11	-3	-6	-9	-14	-15	7	7	6	6
18000	32	27	7	15	19	10	8	-34	-28	-8	-16	-21	-32	-34	11	10	7	8
BAGHDAD																363 N.M.I.		
5000	5	7	1	4	4	-1	-3	-5	-6	-1	-3	-4	-10	-12	9	9	8	8
10000	16	15	5	10	11	3	1	-17	-15	-5	-10	-12	-20	-22	12	11	10	11
18000	29	26	15	21	22	11	9	-32	-28	-16	-21	-24	-35	-38	18	16	12	13
BAGHDAD																877 N.M.I.		
5000	5	7	5	4	5	0	0	-5	-7	-5	-3	-5	-10	-12	7	8	7	7
10000	15	13	5	8	10	3	2	-16	-14	-5	-8	-11	-18	-20	9	9	8	9
18000	33	29	12	16	20	11	9	-36	-31	-12	-17	-23	-35	-38	15	13	9	10
BANGKOK																1624 N.M.I.		
5000	0	-3	-12	1	-3	-8	-10	0	4	12	-1	2	-1	-2	5	5	6	5
10000	-4	-4	-8	0	-4	-9	-10	4	4	8	0	3	0	-1	6	5	7	5
18000	-9	-5	3	-1	-3	-9	-11	7	5	-3	1	1	-3	-4	9	8	6	6

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 \*MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	E U I V A L E N T H E A D W I N D S *												STANDARD DEVIATION				
	DIRECY						RETURN						JAN	APR	JUL	OCT	
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50					A75
BANGKOK 5000	-1	-2	-3	1	-2	-6	-7	2	3	2	-1	1	-3	-4	6	6	868 N.M.I.
10000	-7	-5	0	-5	-11	-12		7	7	5	0	4	-1	-2	7	7	8 7
18000	-15	-9	2	0	-5	-13	-16	13	8	-2	0	3	-3	-5	11	10	8 8
BANGKOK 5000	-1	-2	8	-6	-1	-6	-7	1	2	-8	6	0	-4	-6	5	5	1160 N.M.I.
10000	0	2	6	0	1	-2	-3	0	-1	-6	0	-2	-7	-8	7	5	8 7
18000	2	2	-3	-2	-1	-6	-7	-2	-2	3	3	0	-5	-6	8	8	7 6
BANGKOK 5000	5	0	-18	0	-1	-10	-14	-4	0	13	0	0	-4	-5	5	5	1294 N.M.I.
10000	3	2	-11	1	0	-5	-7	-2	-2	11	-1	0	-4	-5	5	5	7 5
18000	5	3	3	4	0	-1		-5	-2	-3	-5	-4	-9	-10	8	7	7 6
BANGKOK 5000	1	2	13	-4	2	-3	-5	0	-2	-12	4	-2	-9	-10	6	6	457 N.M.I.
10000	3	4	7	3	4	-1	-2	-3	-3	-7	-2	-4	-9	-11	8	6	8 8
18000	1	0	-2	-1	-1	-7	-8	-1	0	2	1	0	-6	-7	10	9	9 8
BANGKOK 5000	0	-2	5	-5	-1	-5	-6	0	3	-5	0	0	-4	-5	5	4	1529 N.M.I.
10000	-1	0	3	-1	0	-4	-5	1	0	-3		-1	-4	-5	6	4	6 6
18000	-1	-1	-5	-7	-4	-9	-10	1	1	5	7	3	-1	-2	7	6	7 6
BANGKOK 5000	3	0	-2	-4	-1	-5	-6	-2	1	2	5	1	-2	-3	6	4	1260 N.M.I.
10000	2	2	0	-2	0	-4	-5	-2	-2	0	3	0	-5	-6	6	5	7 6
18000	-1	0	-2	-2	-2	-7	-8	1	0	2	2	1	-3	-4	8	7	7 6
BANGKOK 5000	2	7	12	0	4	-1	-2	-1	-6	-12	0	-5	-11	-12	7	7	521 N.M.I.
10000	2	2	3	2	2	-3	-4	-2	-2	-4	-2	-3	-8	-10	8	7	9 7
18000	0	0	0	3	0	-6	-8	-2	0	0	-3	-2	-8	-10	11	10	9 9
BANGKOK 5000	1	6	10	-4	3	-2	-4	-1	-6	-10	4	-4	-9	-11	6	6	924 N.M.I.
10000	5	5	6	2	4	0	-1	-5	-5	-6	-1	-5	-10	-11	8	6	8 7
18000	8	5	-1	3	3	-3	-4	-11	-6	1	-3	-5	-12	-13	10	9	8 8
BANGKOK 5000	2	6	7	-4	2	-2	-4	-2	-5	-7	4	-3	-8	-9	6	5	1696 N.M.I.
10000	10	9	6	3	7	2	1	-11	-9	-6	-3	-8	-12	-14	7	5	7 6
18000	18	12	0	5	8	1	0	-23	-15	3	-5	-11	-20	-22	8	8	7 7

\* HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	F Q U I V A L E N T H E A D W I N D S *												STANDARD DEVIATION							
	DIRECT						RETURN						JAN	APR	JUL	OCT				
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50					A75	A85		
BANGKOK	TO KAPACHI																1999 N.M.I.			
5000	-1	-5	-7	1	-3	-8	-9	2	5	7	0	3	0	-1	5	5	5	5		
10000	-9	-7	-5	0	-6	-10	-11	9	7	5	1	5	1	0	5	5	6	5		
18000	-22	-12	3	-3	-7	-17	-20	18	11	-3	3	6	-1	-2	9	8	6	6		
BANGKOK	TO KIMPO AB																1989 N.M.I.			
5000	3	6	7	-2	3	-1	-2	-3	-6	-8	2	-4	-9	-10	5	6	7	5		
10000	8	7	4	1	5	0	-1	-11	-9	-5	-2	-7	-12	-14	7	6	7	6		
18000	15	10	4	7	8	2	1	-25	-16	-5	-9	-13	-21	-24	9	8	7	7		
BANGKOK	TO LAMOPE																1782 N.M.I.			
5000	-3	-4	-1	0	-2	-6	-7	3	4	0	0	1	-2	-3	5	5	6	5		
10000	-11	-8	-3	-1	-6	-11	-12	10	7	3	1	5	0	0	6	5	6	5		
18000	-24	-15	3	-4	-10	-20	-22	20	14	-3	4	8	0	-2	9	8	7	7		
BANGKOK	TO MANDALAY																546 N.M.I.			
5000	1	0	1	3	1	-4	-5	-1	0	-3	-2	-2	-7	-8	7	7	9	7		
10000	-4	-4	-4	1	-3	-9	-10	4	4	4	-1	2	-3	-4	8	7	9	7		
18000	-12	-8	2	2	-3	-12	-14	10	7	-2	-2	2	-5	-7	12	10	9	9		
BANGKOK	TO MEDAN																632 N.M.I.			
5000	1	-3	-8	-3	-4	-9	-10	-1	3	7	4	3	-1	-3	7	6	6	7		
10000	2	0	-2	-2	0	-5	-7	-1	0	1	3	0	-4	-5	7	6	8	7		
18000	1	1	0	1	0	-4	-6	-1	-1	0	-1	-1	-7	-8	10	8	8	7		
BANGKOK	TO NEW DELHI																1576 N.M.I.			
5000	-3	-4	-2	0	-3	-6	-7	3	4	1	0	1	-2	-3	5	5	6	5		
10000	-10	-8	-3	-1	-6	-11	-12	10	8	3	1	5	0	0	6	6	7	6		
18000	-23	-14	3	-3	-8	-19	-22	19	13	-3	3	6	-1	-3	10	9	7	7		
BANGKOK	TO PENANG																517 N.M.I.			
5000	0	-2	-7	-3	-3	-8	-10	0	3	6	4	3	-1	-2	7	6	6	8		
10000	2	0	0	-3	0	-5	-7	-1	0	0	3	0	-5	-6	8	6	8	7		
18000	0	1	0	0	0	-6	-7	0	-1	0	0	0	-6	-8	10	9	9	8		
BANGKOK	TO PEIPIING																1751 N.M.I.			
5000	2	4	8	-2	2	-2	-3	-2	-4	-8	2	-3	-8	-9	6	6	7	5		
10000	1	3	2	-1	1	-3	-4	-4	-4	-2	0	-3	-7	-9	7	6	7	6		
18000	4	4	3	4	3	-1	-3	-15	-9	-4	-6	-9	-15	-17	10	8	7	8		
BANGKOK	TO PUSAN EAST																1998 N.M.I.			
5000	3	6	7	-2	3	-1	-2	-3	-6	-8	2	-4	-9	-10	5	6	6	5		
10000	10	9	5	3	5	1	0	-13	-10	-5	-3	-8	-13	-15	7	6	7	6		
18000	19	12	3	8	9	3	2	-28	-18	-4	-10	-14	-24	-26	9	8	7	7		

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.

\*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
MINUS SIG. DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION PER CENT - GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION PER CENT - GREAT CIRCLE AIR ROUTES											
	SINGAPORE			HONGKONG			CANBERRA			CHICAGO		
	JAN	APR	OCT	JAN	APR	OCT	JAN	APR	OCT	JAN	APR	OCT
BANGKOK	400 No. MI.											
5000	0	-1	7	0	-9	0	0	-6	-7	0	-6	-7
10000	3	3	6	1	3	-2	-3	-9	-10	-3	-9	-10
18000	-1	0	-4	-7	-3	-10	-11	2	-3	2	-3	-5
BANGKOK	1549 No. MI.											
5000	3	7	9	-3	-1	3	-4	-9	-10	-4	-9	-10
10000	8	7	5	1	5	1	-7	-12	-13	-7	6	7
18000	15	10	2	6	7	1	0	-11	-22	-11	6	7
BANGKOK	779 No. MI.											
5000	1	0	-3	-4	-2	-9	-7	1	-2	1	-2	-3
10000	3	2	0	-2	0	-4	-5	-7	-7	-1	-5	-7
18000	-1	0	-2	-2	-2	-7	-8	0	-6	0	-4	-6
BANGKOK	1355 No. MI.											
5000	7	6	8	-7	3	-2	-3	-8	-10	-3	-8	-10
10000	8	3	6	2	6	1	2	-7	-12	-7	6	7
18000	14	9	0	4	6	0	-1	-13	-18	-8	6	7
BOISE	815 No. MI.											
5000	-1	-2	-3	-3	-3	-7	-8	2	-2	2	-2	-3
10000	11	7	2	4	5	0	-2	-7	-14	-7	10	9
18000	21	14	6	14	12	2	0	-27	-30	-17	15	17
BOISE	1093 No. MI.											
5000	0	0	-2	0	-1	-6	-7	0	-4	0	-4	-5
10000	13	8	3	7	7	1	0	-15	-18	-9	10	9
18000	24	17	8	16	15	5	2	-30	-35	-19	16	15
BOISE	1882 No. MI.											
5000	9	7	5	6	6	1	0	-10	-14	-8	6	7
10000	21	13	9	11	13	6	5	-23	-24	-15	9	9
18000	33	23	17	22	22	14	12	-39	-41	-27	14	13
BOISE	1245 No. MI.											
5000	9	6	5	7	6	0	0	-9	-14	-8	9	9
10000	20	11	11	14	13	7	5	-21	-24	-15	10	10
18000	31	21	21	24	23	13	11	-35	-40	-27	17	15
BOISE	1224 No. MI.											
5000	6	2	2	5	3	-2	-4	-7	-13	-5	10	10
10000	4	3	5	5	4	-1	-3	-7	-14	-7	9	8
18000	4	6	10	6	6	-2	-4	-12	-24	-13	15	14

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--REMOVES ANNUAL EQUIVALENT HEADWINDS FIG INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT RETURN				H E A D W I N D S *				RETURN				JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT
ROISE	CORPUS CHRISTI																	
5000	-1	-2	-4	-2	-3	-7	-9	1	2	5	2	2	-2	-3	8	7	5	7
10000	9	5	0	4	4	-1	-3	-11	-7	0	-5	-6	-12	-14	10	8	7	8
18000	17	13	2	11	9	0	-1	-26	-19	-4	-15	-15	-27	-30	16	14	9	14
ROISE	DUFFER AFB																	
5000	10	7	6	8	7	2	1	-11	-8	-6	-8	-9	-14	-15	9	8	6	8
10000	22	13	12	13	14	3	7	-24	-15	-12	-14	-16	-23	-25	9	9	7	9
18000	35	23	21	24	24	16	14	-40	-27	-22	-28	-29	-39	-42	15	14	9	14
ROISE	EDMONTON																	
5000	5	2	0	3	2	-4	-5	-6	-2	0	-3	-3	-10	-12	11	10	8	10
10000	-2	0	1	3	0	-7	-8	-1	-1	-1	-5	-3	-10	-12	12	11	9	11
18000	-7	-1	3	-3	-2	-14	-17	-2	-4	-6	-4	-5	-16	-19	19	18	14	18
ROISE	EGLIN AFB																	
5000	3	3	1	2	2	-2	-3	-4	-3	-1	-3	-3	-8	-9	8	8	6	7
10000	16	10	4	9	3	3	1	-17	-11	-4	-10	-11	-18	-19	9	9	7	9
18000	27	20	10	18	17	8	6	-33	-25	-11	-21	-22	-33	-36	15	14	8	13
ROISE	FIELSON AFB																	
5000	1	2	0	0	0	-4	-5	-2	-2	0	-1	-2	-6	-8	8	7	6	7
10000	-7	-2	-3	0	-3	-9	-11	5	1	2	-1	1	-4	-5	10	9	7	8
18000	-18	-7	-7	-11	-11	-23	-23	12	2	4	5	5	-3	-5	15	13	11	13
ROISE	ELLINGTON AFB																	
5000	0	0	-2	0	-1	-6	-7	0	0	2	0	0	-4	-5	8	8	6	7
10000	12	7	1	6	6	0	-1	-14	-8	-1	-7	-8	-15	-16	10	9	7	9
18000	22	16	5	14	13	3	1	-29	-21	-7	-17	-18	-30	-33	16	15	9	14
ROISE	ELLSWORTH AFB																	
5000	7	5	4	6	5	0	-1	-7	-5	-3	-6	-6	-12	-13	10	9	7	9
10000	17	9	9	13	11	4	2	-18	-10	-9	-13	-13	-20	-22	11	11	9	11
18000	26	18	21	22	21	10	7	-30	-21	-22	-25	-25	-37	-40	20	19	13	18
ROISE	ELMENDORF AFB																	
5000	0	2	0	1	0	-4	-5	-1	-2	0	-2	-1	-7	-8	9	7	6	8
10000	-9	-3	-4	-1	-5	-11	-13	6	1	3	0	2	-4	-5	11	9	8	9
18000	-20	-9	-10	-14	-13	-23	-26	14	4	7	8	8	-1	-3	16	14	12	14
ROISE	EL TORO MCAS																	
5000	-3	-2	0	-1	-2	-7	-8	3	2	0	1	1	-3	-4	9	8	6	7
10000	0	0	-4	-1	-2	-9	-11	-3	-1	4	0	0	-7	-10	13	12	8	11
18000	-3	-4	-8	-3	-5	-17	-20	-6	-2	6	-1	0	-13	-16	21	19	12	18

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	F Q U I V A L E N T H E A D W I N D S *												STANDARD DEVIATION					
	DIRECT				RETURN				RETURN				JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	**A5J	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT
BOISE	1339 N.M.I.																	
5000	1	1	0	0	ENGLAND AFB	-4	-5	-2	-1	0	-1	-1	-6	-7	8	8	6	7
10000	14	9	3	8	8	1	0	-16	-10	-3	-9	-10	-17	-18	10	9	7	9
18000	25	18	8	17	15	6	4	-32	-23	-10	-20	-20	-32	-35	16	15	9	14
BOISE	1609 N.M.I.																	
5000	5	4	2	4	FURT BENNING	-1	-2	-6	-5	-3	-4	-5	-10	-11	8	8	6	7
10000	17	11	6	10	10	4	2	-19	-13	-6	-11	-12	-19	-21	10	9	7	9
18000	29	21	13	20	19	10	8	-35	-26	-14	-23	-24	-35	-38	15	14	9	14
BOISE	845 N.M.I.																	
5000	-4	-3	-3	-4	FORT BLISS	-8	-9	4	3	4	5	4	0	0	7	7	4	6
10000	9	4	0	3	3	-2	-4	-9	-5	0	-3	-4	-11	-13	11	9	8	9
18000	14	9	0	8	6	-3	-6	-22	-15	-3	-12	-12	-25	-28	19	17	11	16
BOISE	1786 N.M.I.																	
5000	8	7	5	6	FORT BRAGG/POPE	1	0	-10	-7	-4	-6	-7	-12	-14	8	8	6	7
10000	21	13	9	12	13	7	5	-22	-14	-9	-12	-14	-21	-23	9	9	7	9
18000	33	23	16	22	22	13	11	-39	-27	-17	-26	-26	-38	-41	15	14	9	14
BOISE	1374 N.M.I.																	
5000	6	5	3	5	FORT CAMPBELL	0	-2	-7	-6	-3	-5	-6	-11	-13	9	9	7	8
10000	19	11	8	12	12	5	4	-20	-12	-8	-13	-13	-21	-22	10	10	8	9
18000	31	21	16	22	21	12	9	-36	-25	-17	-25	-25	-36	-39	16	15	10	15
BOISE	595 N.M.I.																	
5000	-1	0	-1	-2	FORT CARSON	-6	-8	1	0	2	2	1	-3	-4	8	8	6	7
10000	14	8	5	9	8	1	0	-14	-8	-5	-9	-9	-17	-18	12	10	9	10
18000	25	16	12	18	16	5	2	-30	-20	-14	-21	-21	-34	-37	21	19	12	18
BOISE	1810 N.M.I.																	
5000	10	7	5	7	FORT EUSTIS	1	0	-11	-8	-5	-8	-8	-14	-15	9	8	6	8
10000	22	14	11	13	14	8	7	-24	-15	-12	-14	-16	-23	-25	9	9	7	9
18000	35	23	20	24	24	15	13	-40	-27	-21	-28	-28	-39	-42	15	14	9	14
BOISE	1157 N.M.I.																	
5000	0	-1	-3	-1	FORT MOOD	-7	-8	0	0	3	1	0	-4	-5	8	8	6	7
10000	12	7	1	6	6	0	-1	-14	-8	-2	-7	-8	-15	-16	10	9	7	9
18000	22	16	6	14	13	3	1	-29	-21	-8	-18	-18	-30	-33	17	15	10	15
BOISE	771 N.M.I.																	
5000	-4	-3	-2	-3	FORT HUACHUCA	-7	-9	4	4	3	3	3	0	-1	7	7	4	6
10000	6	2	-1	1	1	-5	-7	-7	-3	1	-2	-3	-10	-12	12	10	8	10
18000	8	5	-3	4	2	-8	-10	-17	-11	0	-9	-8	-21	-24	20	18	11	16

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DEFOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION					
	DIRECT				RETURN				RETURN				RETURN					
	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT		
BOISE	1409 N.M.I.																	
5000	8	6	4	6	5	0	-1	-9	-7	-4	-6	-7	-13	-14	9	9	7	8
10000	20	12	9	13	13	6	5	-21	-13	-9	-14	-14	-22	-23	10	10	8	9
18000	32	22	18	23	23	13	11	-37	-25	-19	-27	-27	-38	-41	16	15	10	15
BOISE	988 N.M.I.																	
5000	5	4	3	5	4	-1	-2	-5	-5	-3	-5	-5	-11	-12	9	9	7	8
10000	18	10	8	12	11	4	3	-19	-11	-8	-13	-13	-20	-22	11	10	8	10
18000	30	20	17	22	21	11	8	-34	-23	-18	-25	-25	-36	-39	18	17	11	16
BOISE	341 N.M.I.																	
5000	-2	-1	-2	0	-2	-8	-9	1	1	3	0	1	-4	-6	11	9	7	9
10000	-15	-8	-5	-5	-8	-17	-19	13	7	5	3	6	-1	-3	15	13	9	13
18000	-28	-17	-14	-21	-20	-34	-38	22	12	11	16	14	1	-1	23	21	15	21
BOISE	485 N.M.I.																	
5000	-4	-4	1	-2	-2	-8	-10	4	4	0	3	2	-3	-4	10	8	6	8
10000	-6	-4	-6	-5	-6	-14	-15	3	3	6	4	4	-3	-5	14	13	8	12
18000	-14	-11	-13	-11	-13	-25	-28	4	5	11	6	7	-5	-9	23	20	13	19
BOISE	1631 N.M.I.																	
5000	4	3	2	3	2	-1	-3	-5	-4	-2	-3	-4	-9	-10	8	8	6	7
10000	16	11	5	10	10	4	2	-18	-12	-5	-10	-11	-18	-20	9	9	7	9
18000	28	21	11	19	18	9	7	-34	-25	-12	-22	-22	-34	-37	15	14	8	13
BOISE	984 N.M.I.																	
5000	0	0	-1	0	-1	-5	-7	-1	0	1	0	0	-5	-6	8	8	6	7
10000	14	9	4	8	8	1	0	-15	-9	-4	-9	-9	-16	-18	11	10	8	9
18000	25	18	10	17	16	6	4	-31	-22	-12	-20	-20	-32	-36	18	16	10	16
BOISE	1070 N.M.I.																	
5000	0	0	-2	-1	-1	-6	-7	0	0	2	0	0	-4	-5	8	8	6	7
10000	13	8	3	7	7	0	0	-15	-9	-3	-8	-9	-16	-18	11	9	8	9
18000	23	17	8	16	14	5	2	-30	-21	-10	-19	-19	-31	-34	18	16	10	15
BOISE	1235 N.M.I.																	
5000	9	6	5	7	6	0	0	-10	-6	-5	-8	-8	-14	-15	9	9	7	9
10000	20	11	11	14	13	7	5	-21	-12	-11	-15	-15	-22	-24	10	10	8	10
18000	31	21	22	24	24	14	11	-35	-24	-22	-27	-27	-38	-41	17	16	11	16
BOISE	240 N.M.I.																	
5000	-2	0	0	-1	-1	-6	-8	2	0	0	1	0	-4	-5	9	9	6	8
10000	13	7	4	8	7	0	-1	-14	-8	-4	-8	-9	-17	-19	13	12	9	11
18000	23	14	10	16	15	2	-1	-28	-18	-13	-20	-19	-33	-37	23	21	14	20

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION						
	DIRECT						RETURN						JAN	APR	JUL	OCT			
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50					A75	A85	
BOISE													1786 N.MI.						
5000	6	5	3	4	HUNTER AAF	4	0	-1	-7	-6	-3	-5	-6	-11	-12	8	8	6	7
10000	18	12	7	10		11	5	3	-20	-13	-7	-11	-13	-20	-22	9	9	7	9
18000	30	22	13	20		20	11	9	-36	-26	-14	-23	-24	-35	-38	15	14	8	13
BOISE													1462 N.MI.						
5000	6	5	3	4	HUNTSVILLE	4	0	-2	-7	-5	-3	-4	-5	-10	-12	9	9	6	7
10000	18	11	7	11		11	5	3	-20	-13	-7	-12	-13	-20	-22	10	9	7	9
18000	30	21	14	21		20	11	9	-36	-25	-15	-24	-24	-36	-39	16	15	9	14
BOISE													1818 N.MI.						
5000	6	4	2	3	JACKSONVILLE	3	-1	-2	-6	-5	-2	-4	-5	-10	-11	8	8	6	7
10000	17	11	5	9		10	4	2	-19	-13	-6	-10	-12	-19	-21	9	9	7	8
18000	29	21	11	19		18	10	8	-35	-26	-13	-22	-23	-34	-37	14	13	8	13
BOISE													1122 N.MI.						
5000	0	2	0	0	JUNEAU	0	-5	-6	-1	-2	1	-1	-1	-7	-8	10	8	6	9
10000	-9	-4	-4	-1		-5	-12	-14	6	3	3	0	2	-4	-5	12	10	8	10
18000	-20	-10	-9	-14		-13	-24	-27	14	4	6	8	7	-2	-5	18	16	13	16
BOISE													1593 N.MI.						
5000	-3	0	-2	-1	KODIAK	-2	-7	-9	2	0	2	0	1	-4	-5	10	8	6	8
10000	-12	-5	-5	-5		-7	-14	-16	9	3	5	2	4	-2	-3	12	10	8	10
18000	-24	-13	-13	-18		-17	-28	-30	18	8	10	12	11	1	0	17	15	12	15
BOISE													254 N.MI.						
5000	0	0	-2	0	LAFSON AFB	-1	-7	-8	-1	0	3	0	0	-6	-8	11	10	7	10
10000	-11	-5	-3	-1		-5	-14	-16	9	4	2	0	3	-5	-7	14	13	9	13
18000	-23	-13	-8	-16		-15	-29	-33	15	7	4	9	8	-5	-8	23	21	15	21
BOISE													1228 N.MI.						
5000	3	3	1	3	LITTLE ROCK	2	-2	-4	-4	-4	-2	-3	-3	-9	-10	9	9	6	8
10000	17	10	6	10		10	3	2	-18	-11	-6	-11	-12	-19	-21	10	10	8	9
18000	29	20	13	20		19	9	7	-34	-24	-14	-23	-23	-35	-38	17	16	10	15
BOISE													1502 N.MI.						
5000	9	7	5	7	LOCKPOURNE	5	1	0	-10	-7	-5	-8	-8	-14	-15	9	9	7	8
10000	21	12	11	14		14	7	6	-22	-14	-11	-14	-15	-22	-24	10	10	8	9
18000	33	22	20	24		24	14	12	-38	-26	-21	-28	-28	-39	-42	16	15	10	15
BOISE													630 N.MI.						
5000	-4	-3	-2	-1	LUKE AFB	-3	-8	-9	4	3	2	3	2	-1	-2	8	7	5	6
10000	5	2	-1	1		1	-5	-7	-7	-3	1	-2	-3	-10	-12	13	11	8	10
18000	6	3	-3	3		1	-10	-12	-14	-10	0	-8	-8	-21	-24	21	19	12	17

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 -MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION						
	DIRECT						RETURN						JAN	APR	JUL	OCT			
BOISE	TO	JAN	APR	JUL	OCT	•••A50	A75	A85	JAN	APR	JUL	OCT	•••A50	A75	A85	JAN	APR	JUL	OCT
5000	7	11	7	6	8	7	2	1	-12	-8	-6	-6	-9	-14	-16	9	9	6	8
10000	13	22	13	12	16	15	6	7	-24	-15	-13	-15	-17	-24	-25	9	10	7	9
18000	23	34	23	21	25	25	16	14	-40	-27	-22	-28	-29	-39	-42	15	14	9	14
BOISE	TO	JAN	APR	JUL	OCT	MEMPHIS			-5	-4	-2	-4	-4	-10	-11	9	9	6	8
5000	4	4	4	2	3	3	-2	-3	-19	-12	-7	-12	-13	-20	-22	10	10	8	9
10000	17	17	11	6	11	10	4	2	-35	-25	-15	-24	-24	-36	-39	17	15	10	15
18000	29	29	21	14	20	20	10	8											
BOISE	TO	JAN	APR	JUL	OCT	MEXICO CITY			5	6	6	4	5	1	0	6	6	4	6
5000	-5	-6	-5	-5	-3	-5	-9	-10	-5	-2	2	0	-1	-7	-8	6	7	6	7
10000	3	1	-2	3	0	0	-4	-6	-5	-2	2	0	-1	-7	-8	6	7	6	7
18000	8	6	-2	3	3	2	-4	-6	-16	-12	1	-7	-8	-17	-20	13	12	7	11
BOISE	TO	JAN	APR	JUL	OCT	MINN-ST PAUL			-9	-6	-4	-7	-7	-13	-15	10	10	8	10
5000	9	5	5	5	7	6	0	-1	-9	-6	-4	-7	-7	-13	-15	10	10	8	10
10000	18	9	11	14	12	12	5	3	-19	-10	-11	-14	-14	-21	-23	11	11	9	10
18000	28	19	22	24	23	23	12	9	-32	-22	-23	-27	-26	-37	-40	18	17	12	16
BOISE	TO	JAN	APR	JUL	OCT	MINOT AFB			-10	-4	-3	-6	-6	-13	-15	10	10	8	10
5000	9	4	4	9	6	5	0	-2	-10	-4	-3	-6	-6	-13	-15	10	10	8	10
10000	14	7	9	12	10	10	3	1	-16	-8	-9	-12	-12	-19	-21	11	11	9	10
18000	19	14	20	18	17	17	6	3	-26	-18	-21	-23	-22	-34	-37	19	18	13	18
BOISE	TO	JAN	APR	JUL	OCT	MELLIS AFB			4	3	1	4	2	-2	-3	9	8	5	7
5000	-4	-3	-1	-3	-3	-3	-8	-9	4	3	1	4	2	-2	-3	9	8	5	7
10000	3	1	-2	0	0	0	-7	-9	-5	-2	2	-1	-1	-9	-12	14	12	9	11
18000	3	0	-5	0	0	-1	-13	-16	-13	-7	2	-6	-5	-19	-22	22	20	13	19
BOISE	TO	JAN	APR	JUL	OCT	NEW CUMBERLAND			-11	-8	-6	-8	-9	-14	-16	9	9	6	8
5000	10	7	6	6	8	7	2	1	-11	-8	-6	-8	-9	-14	-16	9	9	6	8
10000	22	13	12	14	14	14	6	7	-23	-14	-12	-15	-16	-23	-25	10	10	7	9
18000	34	23	21	25	25	25	16	14	-39	-26	-22	-28	-28	-39	-41	15	14	9	14
BOISE	TO	JAN	APR	JUL	OCT	NEW ORLEANS			-3	-2	0	-1	-2	-7	-8	8	8	6	7
5000	2	1	0	0	0	0	-4	-5	-3	-2	0	-1	-2	-7	-8	8	8	6	7
10000	14	9	3	8	8	8	2	0	-16	-10	-3	-9	-10	-17	-18	9	9	7	9
18000	25	19	8	16	16	16	6	4	-32	-24	-10	-20	-21	-32	-35	15	14	9	13
BOISE	TO	JAN	APR	JUL	OCT	NIAGARA FALLS			-11	-7	-6	-8	-8	-14	-16	9	9	7	8
5000	10	6	6	6	8	7	1	0	-11	-7	-6	-8	-8	-14	-16	9	9	7	8
10000	21	12	13	15	15	15	8	7	-22	-13	-13	-16	-16	-23	-25	10	10	8	9
18000	32	21	23	25	25	25	15	13	-37	-25	-24	-28	-28	-38	-41	15	15	10	14

• HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 •••--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADINGS AND STANDARD DEVIATION IN NOTES FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADINGS AND STANDARD DEVIATION IN NOTES FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	MEXICO			MEXICO			MEXICO			MEXICO			JAN	APR	JUL	OCT		
	JAN	APR	JUL	UCL	00ASO	A75	A85	JAN	APR	JUL	OCT	00ASO	A75	A85				
NOISE																		
5000	-3	-2	0	0	0	-7	-8	3	2	0	1	1	-4	-5	9	8	575	M.MI.
10000	-1	-1	-4	-2	-3	-10	-12	-1	0	4	1	1	-6	-9	14	12	6	7
18000	-6	-6	-9	-5	-7	-19	-22	-3	0	7	0	1	-11	-14	22	19	12	18
NOISE																		
5000	4	3	1	3	2	-2	-3	-5	-4	-1	-3	-4	-8	-10	8	8	1940	M.MI.
10000	16	11	4	8	9	3	2	-17	-12	-5	-9	-11	-17	-19	9	8	5	7
18000	27	21	10	17	17	9	7	-34	-25	-11	-20	-22	-33	-36	14	13	8	8
NOISE																		
5000	10	7	2	3	7	1	0	-11	-7	-5	-8	-8	-14	-15	9	9	1603	M.MI.
10000	21	13	12	14	14	8	6	-23	-14	-12	-15	-16	-23	-25	10	10	7	8
18000	33	22	21	24	24	15	13	-38	-26	-22	-28	-28	-39	-41	15	15	10	14
NOISE																		
5000	2	1	1	3	0	-4	-5	-3	-2	-1	0	-2	-7	-8	8	7	1867	M.MI.
10000	-7	-1	-2	0	-3	-4	-10	5	1	2	-1	1	-4	-5	9	8	7	8
18000	-15	-5	-5	-9	-9	-17	-19	10	1	3	4	4	-3	-5	13	12	10	12
NOISE																		
5000	9	3	2	5	4	-2	-3	-10	-4	-2	-5	-5	-12	-14	11	10	626	M.MI.
10000	9	5	7	9	7	0	-1	-12	-6	-8	-10	-9	-16	-18	11	10	8	10
18000	11	10	15	11	12	0	-2	-19	-14	-18	-18	-18	-29	-32	19	18	13	18
NOISE																		
5000	6	4	4	6	5	0	-1	-7	-6	-4	-6	-6	-12	-13	9	9	1220	M.MI.
10000	19	11	9	13	12	5	4	-20	-12	-9	-13	-14	-21	-23	11	10	7	8
18000	31	21	18	23	22	12	10	-36	-24	-19	-26	-26	-37	-40	17	16	10	15
NOISE																		
5000	10	6	5	8	7	1	0	-11	-7	-5	-8	-8	-14	-16	9	9	1455	M.MI.
10000	20	11	12	14	14	7	6	-22	-13	-12	-15	-16	-23	-24	10	10	8	9
18000	32	21	22	25	24	15	12	-36	-25	-23	-28	-28	-38	-41	16	15	10	15
NOISE																		
5000	7	4	4	5	5	0	0	-9	-7	-4	-5	-7	-12	-13	8	8	1753	M.MI.
10000	20	13	3	11	12	6	4	-21	-14	-8	-12	-14	-21	-23	9	9	6	7
18000	31	22	15	21	21	12	10	-38	-27	-16	-25	-26	-37	-40	15	14	9	14
NOISE																		
5000	11	6	6	8	7	2	0	-12	-7	-6	-9	-9	-14	-16	9	9	1901	M.MI.
10000	21	12	13	15	15	8	7	-23	-14	-14	-16	-17	-24	-25	9	10	7	9
18000	33	22	23	25	25	16	14	-38	-25	-24	-29	-29	-39	-41	15	14	9	14

HEADINGS--COMPUTED FOR A 120-KT AIRSPEED.  
 000--DEFINES ANNUAL EQUIVALENT HEADINGS FOR INDICATED P.M. CENT RELIABILITIES.  
 PLUS SIGN IN NOTES HEADINGS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION						
	S O U T H W E S T				M E A D W I N D S				R E T U R N				JAN	APR	JUL	OCT			
	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	UCT	00450	A75	A85	JAN	APR	JUL	OCT	
<b>BOISE</b>																			
5000	10	5	5	6	MURKIN				-11	-6	-5	-8	-8	-14	-15	9	9	1410 N.M.I.	
10000	20	11	13	15	14	7	6	-21	-12	-13	-15	-16	-22	-24	10	10	10	8	10
18000	30	20	23	24	24	14	12	-35	-23	-24	-26	-28	-38	-40	16	15	10	15	15
<b>BOISE</b>																			
5000	0	0	-2	0	YAKIMA				0	0	3	0	1	-5	-7	11	10	256 N.M.I.	
10000	-14	-7	-4	-4	-7	-16	-18	12	6	4	2	5	-2	-4	15	13	9	13	9
16000	-24	-16	-12	-19	-18	-32	-36	20	11	9	14	13	0	-3	23	22	15	21	15
<b>BOISE</b>																			
5000	1	2	0	1	YELLOWKNIFE				-4	-2	0	-2	-2	-8	-10	9	9	1136 N.M.I.	
10000	-4	-1	-1	0	-2	-8	-10	2	0	0	-1	0	-6	-7	10	9	8	9	9
18000	-10	-2	-1	-5	-5	-14	-17	2	-1	-1	0	0	-10	-12	15	14	11	15	15
<b>BURBANK</b>																			
5000	3	6	10	0	CALCUTTA				-2	-5	-10	0	-4	-9	-11	6	6	899 N.M.I.	
10000	11	11	5	2	7	1	0	-11	-10	-4	-1	-7	-13	-14	7	7	8	7	7
18000	22	12	-3	4	7	-1	-3	-24	-13	3	-4	-8	-19	-22	12	11	8	8	8
<b>BURBANK</b>																			
5000	2	4	10	3	COLOMBO				-2	-3	-12	-3	-5	-10	-12	5	6	837 N.M.I.	
10000	-2	-4	6	1	0	-5	-7	3	4	-7	0	0	-5	-7	6	7	8	7	7
18000	5	-1	-2	2	0	-5	-6	-6	1	2	-2	-1	-7	-9	10	9	7	7	7
<b>BURBANK</b>																			
5000	-4	-7	-12	0	DUMMAY				5	7	12	0	5	0	0	6	6	1326 N.M.I.	
10000	-11	-9	-3	-1	-6	-12	-13	11	8	3	1	5	0	0	7	7	6	6	6
18000	-31	-21	0	-6	-13	-26	-29	29	20	0	6	11	1	0	11	10	6	6	8
<b>BURBANK</b>																			
5000	5	2	1	2	MIRIGN GARCIA				-4	-2	-3	-2	-3	-6	-7	4	4	1506 N.M.I.	
10000	0	0	-2	0	-1	-5	-5	0	-1	1	0	0	-4	-4	5	5	6	5	5
18000	2	-1	0	3	0	-3	-4	-3	1	0	-2	-1	-6	-7	6	6	6	6	5
<b>BURBANK</b>																			
5000	3	6	6	0	MIRIGN				-3	-6	-8	0	-4	-9	-10	5	5	1859 N.M.I.	
10000	11	11	5	2	7	2	1	-11	-10	-6	-2	-8	-13	-14	6	5	7	5	5
18000	21	12	-3	4	7	0	-2	-23	-13	3	-5	-9	-18	-21	9	8	6	6	6
<b>BURBANK</b>																			
5000	-1	-6	-7	1	KAPACHE				2	6	7	0	3	-1	-3	7	7	8	7
10000	-6	-3	-2	0	-3	-9	-10	5	2	2	0	2	-3	-4	8	9	8	8	8
18000	-25	-13	1	-6	-9	-21	-24	21	10	-1	6	7	-1	-3	14	13	8	10	10

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*\*--NOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES TAILWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WIND IN KNOTS	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION			
	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												JAN	APR	JUL	OCT
	JAN	APR	JUL	OCT	00450	A75	A85	00450	A75	A85	00450	A75				
NEWBAY	LAWHE												767 N.M.I.			
5000	0	-1	4	0	0	-4	0	-4	0	0	-5	-6	7	7	7	6
10000	2	4	1	-1	1	-4	-5	-5	-2	-2	-7	-9	6	8	7	7
15000	-3	0	-1	-2	-2	-6	-11	-11	-1	-1	-9	-11	13	12	8	9
ADMIRALTY	MANDALAY												1315 N.M.I.			
5000	4	6	9	0	4	3	-1	3	0	-5	-9	-11	5	6	7	6
10000	12	11	5	2	7	2	0	-11	-11	-5	-2	-13	7	6	8	6
15000	22	12	-3	5	7	0	-2	-24	-13	3	-5	-19	10	9	7	7
ADMIRALTY	MEDAN												1776 N.M.I.			
5000	0	1	13	-1	1	-2	-3	1	-1	-14	1	-2	4	5	5	5
10000	-1	-1	8	1	0	-3	-4	1	1	-6	-1	-6	-7	5	5	5
15000	0	0	-3	-1	-1	-6	-7	-2	0	4	1	0	-4	8	7	5
ADMIRALTY	NEW MELBOURNE												615 N.M.I.			
5000	0	0	6	-1	0	-4	-5	0	0	-6	1	-1	-7	7	7	7
10000	2	6	2	-1	2	-3	-4	-6	-7	-1	1	-3	8	8	8	7
15000	4	4	-1	0	1	-6	-8	-14	-6	1	0	-4	13	13	9	9
ADMIRALTY	PENANG												1803 N.M.I.			
5000	-1	1	13	-2	0	-3	-4	1	0	-14	2	-1	-8	4	5	5
10000	0	0	8	0	1	-3	-3	0	0	-6	0	-2	5	5	6	5
15000	1	1	-4	-2	-1	-6	-7	-2	-1	4	1	0	8	7	6	5
ADMIRALTY	TEHRAN												1495 N.M.I.			
5000	-3	-6	-7	0	-4	-9	-10	3	6	7	0	3	0	6	6	5
10000	-4	-6	-3	-3	-5	-10	-11	7	5	3	3	4	0	7	7	6
15000	-29	-21	-5	-10	-15	-26	-28	24	17	4	9	12	4	11	10	8
ADMIRALTY	ZMEDAN												902 N.M.I.			
5000	-2	-6	8	1	-4	-7	-11	3	7	8	-1	3	-1	7	7	6
10000	-7	-9	-2	-1	-4	-9	-10	6	4	3	1	3	-1	7	8	7
15000	-28	-14	0	-9	-12	-24	-27	23	14	0	7	9	1	13	12	9
ADMIRALTY	CCORITOMAN												840 N.M.I.			
5000	0	4	3	1	2	-3	-4	0	-9	-3	-1	-3	-8	8	7	8
10000	0	-1	-3	-1	-2	-6	-9	0	0	1	0	0	-5	9	8	9
15000	-1	-5	-12	-9	-6	-17	-20	1	3	10	5	4	-3	10	11	13
ADMIRALTY	DARWIN												1524 N.M.I.			
5000	1	7	5	3	3	-1	-2	-3	-6	-4	0	-4	-8	7	6	7
10000	7	3	-5	-1	0	-5	-6	-7	-4	3	0	-2	-8	7	7	7
15000	-4	-7	-22	-11	-11	-23	-22	3	5	18	10	8	1	6	9	10

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 STANDARD DEVIATION--ANNUAL EQUIVALENT HEADWINDS ARE INDICATED PER CENT RELIABILITIES.  
 \* PLUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT CITY	EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION			
	DISTRICT				EQUVALENT HEADWINDS				RETURN				JAN	APR	JUL	OCT
	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	00450	075	085	0850
AF ISHANE	733 No.MI.															
5000	-3	-5	-7	-5	-5	-12	-19		3	5	6	6	6	-2	-3	9
10000	-4	-8	-12	-11	-10	-16	-20		5	7	11	8	7	0	-2	11
18000	-15	-15	-20	-23	-10	-20	-32		13	11	12	14	12	2	0	12
AF ISHANE	830 No.MI.															
5000	-4	-1	7	1	0	-6	-8		4	1	-7	-3	-1	-8	-10	9
10000	3	6	15	13	9	2	0		-3	-6	-16	-13	-10	-17	-19	10
18000	11	14	33	24	19	9	7		-12	-16	-37	-27	-22	-34	-37	11
AF ISHANE	1922 No.MI.															
5000	0	-5	-11	-8	-6	-12	-14		0	5	10	8	5	0	-1	7
10000	-8	-11	-19	-19	-14	-21	-23		7	10	18	18	12	6	5	7
18000	-16	-20	-32	-39	-26	-37	-40		15	19	29	36	23	14	12	9
AF ISHANE	1133 No.MI.															
5000	0	2	3	3	1	-2	-3		0	-2	-3	-3	-2	-7	-8	7
10000	-3	-1	-2	0	-2	-7	-8		3	1	0	-1	0	-4	-6	6
18000	0	-2	-9	-3	-3	-11	-12		-1	1	3	0	0	-6	-7	9
AF ISHANE	1610 No.MI.															
5000	-3	-1	6	1	0	-5	-6		3	1	-6	-1	-1	-6	-7	7
10000	3	6	14	12	8	2	1		-3	-6	-15	-12	-10	-16	-17	6
18000	9	12	25	19	15	8	6		-10	-13	-30	-22	-19	-28	-30	9
AF ISHANE	1634 No.MI.															
5000	-1	2	3	3	1	-2	-3		1	-2	-3	-2	-2	-6	-7	6
10000	-2	-1	0	1	-1	-5	-6		2	1	-1	-1	0	-4	-5	6
18000	3	-2	-8	-3	-3	-9	-10		0	1	3	0	0	-4	-5	7
AF ISHANE	1357 No.MI.															
5000	2	3	4	5	3	-2	-4		-3	-4	-5	-6	-5	-11	-13	8
10000	5	6	9	9	7	0	-2		-6	-7	-11	-11	-9	-17	-19	10
18000	11	17	19	20	16	7	4		-15	-21	-23	-26	-22	-31	-34	12
CALCUTTA	1872 No.MI.															
5000	0	1	2	-3	0	-4	-5		0	-1	-3	3	0	-4	-5	5
10000	6	6	5	2	4	0	0		-7	-6	-5	-1	-5	-10	-11	6
18000	16	11	-3	2	5	-1	-3		-18	-12	3	-2	-7	-16	-17	8
CALCUTTA	1067 No.MI.															
5000	3	0	-10	0	-1	-7	-8		-2	0	8	0	0	-4	-5	5
10000	-2	-3	-6	0	-3	-8	-9		2	2	5	0	1	-2	-3	6
18000	1	0	1	0	0	-5	-6		-3	0	-1	0	-1	-7	-8	10

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.

\*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.

MINUS SIGN DENOTES HEADWINDS.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT			INDIRECT			INDIRECT			INDIRECT			JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85				
CALCUTTA TO DA NANG	2	4	3	-1	1	-2	-3	-2	-4	-4	2	-2	-7	-8	6	6	7	6
5000	9	9	6	2	6	1	0	-9	-8	-6	-2	-7	-12	-13	7	6	8	6
10000	18	11	-3	2	6	-2	-3	-19	-12	3	-2	-7	-16	-19	10	9	8	8
CALCUTTA TO HANOI	4	7	3	0	3	-1	-2	-4	-6	-4	0	-4	-9	-10	6	6	8	6
5000	13	12	6	3	8	2	1	-13	-12	-6	-3	-9	-15	-17	8	7	9	7
10000	26	14	-3	6	10	0	-2	-27	-17	3	-6	-11	-23	-26	11	10	8	9
CALCUTTA TO HONG KONG	3	7	3	-2	2	-2	-3	-3	-5	-3	2	-3	-8	-9	6	6	7	6
5000	14	13	6	3	9	3	1	-14	-12	-6	-3	-9	-15	-16	7	6	8	6
10000	29	19	-3	7	12	0	-1	-30	-19	3	-7	-13	-25	-28	10	9	7	8
CALCUTTA TO KARACHI	-3	-7	-4	0	-4	-8	-10	4	7	4	0	3	-1	-2	6	6	7	6
5000	-15	-10	-3	-1	-7	-14	-15	15	11	3	2	7	1	0	7	7	7	6
10000	-34	-21	3	-7	-13	-28	-31	33	20	-3	7	12	0	-1	11	11	8	8
CALCUTTA TO LAHORE	-5	-6	1	0	-3	-8	-9	5	6	-1	0	2	-2	-3	6	6	7	6
5000	-13	-8	-1	-2	-7	-13	-14	13	8	1	3	6	0	-1	7	7	8	7
10000	-30	-20	3	-8	-13	-26	-29	26	19	-3	8	11	1	-1	12	11	9	9
CALCUTTA TO MANDALAY	7	7	3	1	4	0	-2	-7	-6	-4	-1	-5	-10	-12	7	7	9	7
5000	14	13	5	4	9	2	0	-14	-13	-5	-3	-9	-16	-18	9	8	10	8
10000	28	16	-3	6	10	0	-2	-29	-17	3	-7	-12	-24	-27	13	12	10	10
CALCUTTA TO MEDAN	1	-1	0	-3	-1	-5	-6	-1	2	-2	4	0	-3	-5	5	5	6	6
5000	3	2	2	-1	1	-2	-4	-3	-2	-2	1	-2	-6	-7	6	5	7	6
10000	4	3	-2	-2	0	-5	-6	-6	-4	2	2	-1	-7	-9	9	8	7	7
CALCUTTA TO NEW DELHI	-5	-6	0	0	-3	-8	-9	6	7	0	0	3	-2	-3	7	7	8	6
5000	-15	-10	-1	-3	-8	-14	-16	15	10	1	3	7	0	-1	8	8	9	7
10000	-32	-20	3	-7	-13	-27	-30	28	19	-3	7	11	0	-2	13	12	9	10
CALCUTTA TO PENANG	0	0	1	-3	0	-4	-5	0	1	-2	3	0	-4	-4	5	5	6	6
5000	3	3	3	-1	1	-2	-3	-3	-3	-3	2	-2	-6	-8	6	5	7	6
10000	4	4	-2	-2	0	-5	-6	-7	-4	2	2	-1	-8	-9	9	8	7	7

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

CITY IN FEET	EQUIVALENT HEADWINDS IN KNOTS												STANDARD DEVIATION					
	JAN	APR	JUL	OCT	475	495	JAN	APR	JUL	OCT	475	495	JAN	APR	JUL	OCT		
CALCUTTA																1747 N.M.I.		
5000	6	4	5	-1	3	-1	-2	-6	-4	-5	1	-4	-8	5	6	6	5	
10000	10	10	2	2	6	0	0	-13	-11	-4	-3	-8	-14	7	7	7	6	
18000	25	16	5	10	13	5	4	-32	-20	-6	-12	-17	-27	10	9	8	8	
CALCUTTA																1263 N.M.I.		
5000	1	1	3	-2	0	-3	-4	-1	-1	-4	2	-1	-5	5	5	7	6	
10000	6	6	5	0	4	0	-1	-6	-6	-5	0	-5	-10	7	6	8	6	
18000	9	6	-3	-1	1	-4	-5	-11	-7	3	1	-3	-10	9	8	7	7	
CALCUTTA																1833 N.M.I.		
5000	7	7	4	-1	4	0	-2	-6	-6	-4	1	-4	-9	5	6	7	5	
10000	17	14	5	4	9	3	2	-18	-14	-5	-4	-11	-17	7	6	7	6	
18000	35	23	1	12	16	5	3	-39	-26	-2	-12	-19	-33	10	9	7	8	
CALCUTTA																1563 N.M.I.		
5000	1	0	1	-3	0	-4	-5	-1	0	-2	3	0	-4	5	5	5	6	
10000	3	3	3	-1	1	-2	-3	-3	-3	-3	1	-2	-6	6	5	7	5	
18000	2	-2	-2	-2	0	-5	-6	-5	-3	2	2	-1	-6	8	7	7	6	
CALCUTTA																1816 N.M.I.		
5000	3	7	2	-2	2	-2	-3	-3	-7	-3	2	-3	-8	5	6	7	5	
10000	17	14	5	3	9	3	1	-17	-14	-5	-3	-10	-17	7	6	7	6	
18000	35	23	-2	9	15	2	0	-36	-24	1	-9	-16	-30	9	8	7	7	
CALCUTTA																1536 N.M.I.		
5000	-3	-7	-2	0	-3	-7	-8	4	7	3	0	3	0	5	5	6	5	
10000	-14	-10	-2	-2	-7	-13	-15	14	10	2	3	7	1	6	6	6	6	
18000	-35	-24	1	-9	-16	-30	-33	33	23	-1	9	14	2	11	10	7	8	
CANNON AFB																309 N.M.I.		
5000	5	3	1	4	3	-4	-6	-6	-4	-1	-4	-4	-12	13	13	9	11	
10000	18	13	1	7	9	0	-1	-19	-14	-1	-8	-11	-20	13	12	10	12	
18000	32	26	4	16	17	4	1	-36	-29	-5	-18	-21	-37	21	18	11	18	
CANNON AFB																1301 N.M.I.		
5000	11	9	6	5	7	1	0	-12	-10	-6	-6	-	-15	10	10	7	9	
10000	24	18	6	9	13	5	3	-26	-19	-6	-10	-15	-24	11	11	8	10	
18000	40	30	9	20	23	11	8	-44	-33	-9	-23	-27	-41	16	15	9	15	
CANNON AFB																856 N.M.I.		
5000	8	7	8	6	7	0	-1	-9	-8	-8	-7	-9	-15	12	12	8	10	
10000	17	13	8	10	11	3	1	-20	-14	-8	-11	-14	-22	12	12	10	12	
18000	28	21	12	15	17	7	4	-36	-26	-13	-21	-23	-37	19	18	11	17	

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN INDICATES TAILWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION				
	DIRECT			RETURN			EQUVALENT HEADWINDS			STANDARD DEVIATION			JAN	APR	JUL	OCT	
	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	
CANNON AFB	CHURCHMILL																
5000	0	0	3	0	0	-5	-7	0	-1	-3	-1	-2	-6	-9	9	9	1508 N.MI.
10000	-3	-1	0	-2	-2	-8	-9	0	0	-2	0	-1	-7	-8	9	9	9
18000	-5	-1	1	-3	-2	-11	-13	-5	-4	-5	-3	-5	-13	-15	15	13	10
CANNON AFB	CORPUS CHRISTI																
5000	0	-2	-7	0	-3	-10	-12	0	1	7	0	2	-5	-7	12	11	507 N.MI.
10000	6	4	-3	2	1	-5	-7	-9	-6	3	-2	-3	-12	-14	12	11	8
18000	12	11	-2	8	5	-4	-7	-22	-18	1	-11	-11	-25	-28	19	16	10
CANNON AFB	DOVER AFB																
5000	12	9	7	7	8	2	1	-13	-10	-7	-7	-10	-16	-18	10	10	1363 N.MI.
10000	25	13	9	11	15	7	5	-27	-19	-9	-12	-16	-25	-28	11	11	8
18000	41	24	13	22	24	13	10	-45	-32	-14	-26	-28	-42	-46	16	16	9
CANNON AFB	EDMONTON																
5000	0	0	2	0	0	-5	-6	0	0	-2	0	-1	-6	-8	9	8	1229 N.MI.
10000	-12	-6	-2	-7	-7	-14	-15	9	4	2	6	5	-1	-2	10	9	8
18000	-21	-11	-5	-15	-13	-24	-26	12	6	2	9	6	-2	-4	16	15	10
CANNON AFB	EGLIN AFB																
5000	7	5	2	4	4	-2	-3	-8	-6	-3	-4	-5	-12	-14	11	11	7
10000	19	14	1	7	9	1	0	-20	-15	-2	-8	-11	-20	-23	11	11	8
18000	33	27	3	17	18	5	3	-37	-30	-3	-19	-22	-37	-40	17	16	9
CANNON AFB	ELLINGTON AFB																
5000	3	0	-2	2	0	-6	-8	-4	-1	2	-2	-1	-9	-11	12	12	504 N.MI.
10000	13	9	-1	5	5	-2	-4	-15	-10	1	-6	-7	-16	-18	12	11	9
18000	23	20	0	13	12	0	-2	-31	-25	0	-15	-17	-32	-36	19	17	10
CANNON AFB	ELLSWORTH AFB																
5000	0	3	6	2	2	-4	-6	0	-3	-6	-3	-3	-10	-12	10	11	8
10000	-4	-1	1	-2	-2	-9	-11	1	0	-2	0	0	-8	-10	12	12	9
18000	-10	-4	0	-6	-4	-16	-20	-2	-3	-3	0	-3	-14	-16	20	18	11
CANNON AFB	FLYING MCAS																
5000	-2	-2	0	3	-1	-5	-6	2	2	1	-2	0	-4	-5	8	7	5
10000	-13	-11	-4	-4	-9	-16	-18	12	11	4	6	7	1	0	12	10	8
18000	-32	-26	-10	-15	-20	-33	-36	28	24	9	13	16	6	3	19	17	10
CANNON AFB	ENGLAND AFB																
5000	0	4	1	4	3	-3	-5	-7	-5	-2	-4	-5	-12	-14	12	12	8
10000	18	13	1	7	9	0	-1	-19	-14	-1	-8	-11	-20	-22	12	12	9
18000	31	26	2	16	17	4	1	-16	-29	-2	-18	-20	-36	-40	19	17	10

\*HEADWINDS--COMPUTED FOR A 120-KT AIR-SPEED.  
 \*\*--OPDATES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 WINDS SIGN. NEGATIVE HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATIONS IN KNOTS FOR GREAT CIRCLE AIR ROUTES

OFFICE IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATIONS IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION						
	DIRECT			EQUINOXIAL			WINTER			SUMMER			JAN	APR	JUL	OCT			
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85					
CANNON AFB																			
5000	8	7	4	5	5	0	-2	-9	-8	-4	-5	-7	-13	-15	11	11	7	9	927 N.M.I.
10000	21	16	4	9	11	3	1	-22	-17	-4	-9	-13	-22	-24	11	11	8	11	
18000	36	29	6	18	20	8	5	-40	-22	-6	-21	-24	-39	-43	17	16	9	15	
CANNON AFB																			
5000	-6	-6	-5	-4	-6	-12	-14	6	6	6	4	5	0	-2	11	10	7	10	219 N.M.I.
10000	-13	-12	-4	-6	-9	-17	-19	11	11	4	6	7	0	-1	13	11	9	12	
18000	-28	-23	-8	-12	-17	-31	-34	20	18	8	9	12	1	-1	21	19	11	18	
CANNON AFB																			
5000	11	9	6	6	7	1	0	-12	-9	-6	-6	-8	-15	-17	11	10	7	9	1200 N.M.I.
10000	24	16	6	9	13	5	3	-25	-19	-6	-10	-15	-24	-27	11	11	8	11	
18000	40	30	9	20	22	10	8	-44	-33	-4	-23	-26	-41	-45	17	16	9	15	
CANNON AFB																			
5000	9	8	7	6	7	0	-1	-10	-9	-7	-6	-8	-15	-17	12	12	8	10	783 N.M.I.
10000	23	17	6	10	13	4	2	-24	-18	-6	-11	-15	-24	-27	12	12	9	12	
18000	38	29	9	19	21	9	6	-42	-32	-10	-22	-25	-41	-45	19	18	10	17	
CANNON AFB																			
5000	1	4	7	4	4	-2	-4	-1	-4	-6	-4	-4	-11	-13	11	11	6	10	267 N.M.I.
10000	-7	-3	0	-2	-3	-11	-14	4	1	-1	1	0	-7	-9	14	12	10	12	
18000	-16	-11	-1	-9	-9	-22	-26	4	2	0	4	1	-9	-12	22	20	12	19	
CANNON AFB																			
5000	11	9	7	7	8	2	0	-12	-10	-7	-7	-9	-16	-17	11	10	7	9	1307 N.M.I.
10000	25	18	8	11	14	7	5	-26	-19	-9	-11	-16	-25	-27	11	11	8	10	
18000	41	29	12	21	23	12	10	-45	-32	-13	-25	-27	-42	-46	17	16	9	15	
CANNON AFB																			
5000	3	0	-2	2	0	-7	-8	-4	-1	2	-2	-1	-9	-11	13	12	8	11	349 N.M.I.
10000	14	9	-1	5	5	-2	-4	-16	-11	1	-6	-8	-17	-20	13	12	9	12	
18000	24	20	1	13	13	0	-1	-32	-25	-1	-16	-17	-33	-37	20	18	11	17	
CANNON AFB																			
5000	-3	-4	-2	0	-3	-8	-10	3	4	2	0	2	-3	-4	10	9	5	8	391 N.M.I.
10000	-14	-12	-4	-6	-9	-17	-19	13	12	4	6	8	0	-1	13	11	9	11	
18000	-32	-27	-8	-14	-19	-33	-37	27	24	8	12	16	4	2	20	18	10	17	
CANNON AFB																			
5000	10	8	7	6	7	0	-1	-11	-9	-7	-7	-9	-16	-18	12	12	8	10	865 N.M.I.
10000	23	17	7	11	13	5	3	-24	-18	-7	-11	-15	-24	-27	12	12	9	12	
18000	38	27	11	19	21	10	7	-42	-31	-11	-23	-25	-41	-44	19	17	10	17	

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--KNOTS ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 N--MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES										STANDARD DEVIATION							
	DIRECT					RETURN					JAN	APR	JUL	OCT				
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85				
CANNON AFB	TO FORT LEAVENWORTH																	
5000	6	7	9	5	6	0	-2	-7	-8	-9	-6	-8	-16	-18	13	12	9	11
10000	15	12	6	8	9	1	0	-17	-13	-6	-9	-11	-20	-22	13	13	10	12
18000	25	20	9	13	15	4	1	-33	-25	-10	-17	-20	-34	-38	21	19	11	18
CANNON AFB	TO FORT LEWIS																	
5000	0	1	1	2	1	-3	-4	-1	-1	-1	-2	-2	-6	-7	7	7	5	7
10000	-13	-7	-3	-6	-7	-14	-16	12	7	3	5	6	0	-1	11	9	7	9
18000	-27	-18	-10	-18	-18	-29	-32	21	14	8	14	13	3	0	18	16	11	16
CANNON AFB	TO FORT ORD																	
5000	-2	-2	0	2	0	-5	-6	2	2	0	-2	0	-4	-5	8	7	5	6
10000	-13	-11	-4	-7	-9	-16	-18	12	10	4	6	7	0	0	12	10	7	10
18000	-31	-25	-11	-16	-20	-32	-36	27	22	10	14	16	6	4	19	17	10	15
CANNON AFB	TO FORT RUCKEL																	
5000	7	6	3	5	5	-1	-2	-8	-7	-3	-5	-6	-13	-14	11	11	7	9
10000	20	15	2	8	10	2	0	-21	-16	-2	-8	-12	-21	-23	11	11	8	11
18000	34	28	4	17	19	6	4	-39	-31	-5	-19	-23	-38	-41	17	16	9	15
CANNON AFB	TO FORT STILL																	
5000	6	6	5	6	5	-1	-3	-6	-6	-6	-6	-7	-14	-16	13	13	9	11
10000	20	16	4	9	11	2	0	-21	-17	-4	-9	-13	-23	-25	14	13	10	12
18000	35	29	8	17	20	7	4	-38	-31	-8	-19	-22	-39	-43	22	19	11	18
CANNON AFB	TO FORT WOLTERS																	
5000	4	3	0	4	2	-5	-7	-5	-4	-1	-4	-4	-12	-14	13	13	9	11
10000	18	13	1	7	9	0	-1	-19	-14	-1	-8	-11	-20	-23	13	12	10	12
18000	31	25	4	16	17	4	1	-36	-29	-4	-18	-20	-37	-41	21	19	11	18
CANNON AFB	TO GEN MITCHELL																	
5000	7	7	8	6	7	0	-1	-9	-7	-8	-7	-8	-15	-17	12	11	8	10
10000	16	12	8	9	11	3	1	-19	-13	-8	-11	-13	-21	-24	12	12	10	12
18000	24	20	12	15	17	4	3	-35	-25	-14	-20	-23	-36	-39	19	18	11	17
CANNON AFB	TO HILL AFB																	
5000	2	3	5	4	3	-1	-2	-2	-3	-4	-4	-4	-9	-10	8	8	6	7
10000	-12	-7	-2	-6	-7	-14	-16	10	6	2	5	5	-1	-3	12	10	9	10
18000	-27	-19	-7	-16	-16	-30	-33	20	14	5	13	11	0	-1	21	18	11	17
CANNON AFB	TO HOMESTEAD AFB																	
5000	2	3	0	2	1	-4	-5	-3	-3	0	-2	-2	-8	-9	9	9	6	8
10000	13	10	0	5	6	0	-2	-15	-11	0	-5	-8	-15	-17	4	4	7	9
18000	26	23	0	12	14	2	0	-31	-27	0	-15	-18	-31	-34	14	13	7	12

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.

\*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES. MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	F U L L Y A I L E N T H E A D W I N D S												STANDARD DEVIATION					
	D I R E C T						R E T U R N						JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85				
CANNON AFB	TO HUNTER AAF																	
5000	9	7	4	5	0	-1		-10	-8	-4	-5	-7	-13	-15	11	10	7	9
10000	21	16	4	8	11	3	1	-22	-17	-4	-9	-13	-22	-24	11	11	8	10
18000	36	29	6	18	21	8	5	-40	-32	-6	-21	-24	-39	-42	16	15	9	15
CANNON AFB	TO HUNTSVILLE																	
5000	9	8	6	6	7	0	-1	-10	-9	-6	-6	-8	-15	-17	12	12	8	10
10000	23	17	5	10	13	4	2	-24	-18	-5	-10	-14	-24	-26	12	12	9	12
18000	38	30	8	19	21	9	6	-42	-33	-8	-22	-25	-41	-45	19	17	10	16
CANNON AFB	TO JACKSONVILLE																	
5000	7	6	3	4	4	-1	-2	-8	-7	-3	-5	-6	-12	-14	10	10	7	9
10000	19	15	3	7	10	2	0	-21	-16	-3	-9	-12	-21	-23	11	10	8	10
18000	34	28	5	17	19	7	5	-38	-31	-5	-19	-23	-37	-40	16	15	8	14
CANNON AFB	TO JUNEAU																	
5000	0	1	1	0	0	-4	-5	0	-1	0	-1	-1	-5	-6	7	7	5	7
10000	-12	-4	-3	-8	-7	-13	-14	10	5	3	4	5	0	-1	9	8	7	8
18000	-23	-13	-8	-17	-15	-25	-27	17	8	6	12	10	1	0	14	13	10	13
CANNON AFB	TO KEY WEST																	
5000	1	1	-1	1	0	-5	-6	-2	-2	1	-1	-1	-7	-8	9	9	6	8
10000	12	9	-1	4	5	-1	-3	-13	-10	1	-5	-7	-14	-16	9	9	7	9
18000	24	22	0	11	13	1	0	-29	-25	0	-13	-16	-29	-32	14	13	7	12
CANNON AFB	TO LAFAYETTE																	
5000	0	1	2	2	1	-3	-4	-1	-1	-1	-2	-2	-6	-7	8	7	5	7
10000	-13	-7	-3	-6	-7	-14	-16	11	6	2	5	5	0	-2	11	9	8	9
18000	-27	-17	-9	-18	-17	-29	-32	20	12	6	14	12	1	0	18	16	11	16
CANNON AFB	TO LITTLE ROCK																	
5000	3	7	6	6	6	-1	-2	-9	-8	-6	-6	-8	-15	-17	13	13	9	11
10000	22	17	4	9	12	3	1	-23	-18	-5	-10	-14	-24	-26	13	12	10	12
18000	37	29	8	18	20	3	5	-41	-32	-8	-21	-24	-40	-44	20	18	10	17
CANNON AFB	TO LOGANSPORT																	
5000	10	9	7	7	7	1	0	-11	-9	-7	-7	-9	-16	-17	11	11	8	9
10000	23	15	8	11	13	5	3	-24	-18	-8	-12	-15	-24	-27	12	12	9	11
18000	37	26	12	20	22	10	8	-43	-30	-13	-24	-26	-41	-44	18	17	10	16
CANNON AFB	TO LOGGING AFB																	
5000	10	7	9	8	8	2	1	-12	-8	-8	-9	-10	-15	-17	10	9	7	8
10000	20	14	11	13	14	7	5	-23	-15	-12	-15	-16	-24	-25	10	10	8	10
18000	33	21	17	21	22	13	10	-40	-26	-19	-26	-27	-38	-41	15	15	9	14

HEADWINDS COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*STATES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 \*PLUS SIGN DENOTES HEADWINDS.

STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

ROUTE	MONTH												STANDARD DEVIATION			
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	APR	JUL	OCT
453 N.M.I.	9	8	5	8	13	10	9	11	21	18	11	17	9	8	5	8
1407 N.M.I.	10	10	7	9	11	11	8	10	16	16	9	15	10	10	7	9
658 N.M.I.	13	12	8	10	13	12	9	12	20	18	10	17	13	12	8	10
924 N.M.I.	9	9	6	8	9	8	7	8	15	12	7	12	9	9	6	8
783 N.M.I.	11	12	9	11	12	12	10	12	20	18	11	17	11	12	9	11
838 N.M.I.	10	11	8	10	12	11	9	11	19	17	11	17	10	11	8	10
584 N.M.I.	6	8	5	7	12	10	9	10	20	18	11	17	6	8	5	7
1305 N.M.I.	11	10	7	9	11	11	8	10	17	16	9	16	11	10	7	9
721 N.M.I.	12	11	8	10	12	11	9	11	18	16	9	16	12	11	8	10

\* HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*--DEPOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 \*\*\*MINUS SIGN DEPOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT				EQUVALENT HEADWINDS				RETURN				JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT
CANNON AFB	TO	8	8	7	8	1	0	-11	-8	-8	-8	-9	-16	-17	11	10	8	9
5000	10	15	9	12	13	6	4	-23	-16	-10	-13	-16	-24	-26	11	11	9	11
10000	34	23	14	20	21	11	8	-41	-24	-16	-25	-27	-39	-43	17	16	10	16
18000																		
CANNON AFB	TO	2	0	3	-1	-5	-6	2	2	1	-2	0	-4	-5	8	7	5	7
5000	-13	-11	-4	-6	-9	-16	-18	12	11	4	6	7	1	0	12	10	8	10
10000	-31	-26	-11	-15	-20	-32	-36	28	23	17	13	16	6	4	19	17	10	15
18000																		
CANNON AFB	TO	5	2	7	3	-1	-3	-6	-5	-2	-4	-5	-10	-12	10	9	6	8
5000	17	13	1	6	8	1	0	-18	-14	-1	-7	-10	-18	-20	10	10	7	9
10000	31	25	2	15	17	1	2	-36	-24	-3	-17	-21	-35	-38	15	14	8	13
18000																		
CANNON AFB	TO	11	8	7	7	8	1	-12	-9	-7	-9	-9	-16	-18	11	11	8	9
5000	23	17	9	11	14	6	4	-25	-18	-3	-12	-16	-25	-27	12	12	9	11
10000	38	26	13	21	22	11	9	-44	-30	-14	-25	-27	-41	-45	18	17	10	16
18000																		
CANNON AFB	TO	1	3	0	0	-5	-7	0	-1	-3	-1	-2	-8	-9	10	10	8	9
5000	-7	-3	0	-4	-4	-11	-13	4	2	0	2	1	-5	-6	11	10	9	10
10000	-14	-7	-1	-9	-7	-19	-22	2	0	-2	2	0	-10	-12	18	16	11	16
18000																		
CANNON AFB	TO	9	8	8	5	7	0	-10	-9	-8	-7	-9	-16	-18	12	12	9	10
5000	20	15	7	10	12	4	2	-22	-16	-7	-11	-14	-23	-25	13	12	10	12
10000	34	25	10	17	19	7	5	-39	-29	-11	-21	-24	-39	-43	20	18	11	18
18000																		
CANNON AFB	TO	9	7	8	7	7	1	-11	-8	-5	-8	-9	-16	-17	11	11	8	9
5000	20	14	9	11	13	5	3	-22	-15	-9	-12	-15	-23	-25	12	12	9	11
10000	32	22	14	18	20	9	7	-39	-27	-15	-23	-25	-38	-41	18	17	10	16
18000																		
CANNON AFB	TO	10	8	6	5	7	0	-11	-9	-6	-6	-8	-15	-16	11	10	7	9
5000	23	18	5	9	13	4	2	-24	-19	-5	-10	-14	-24	-26	11	11	8	11
10000	39	30	8	19	22	9	7	-43	-33	-3	-22	-26	-41	-44	17	16	9	15
18000																		
CANNON AFB	TO	11	9	8	8	8	3	-13	-9	-3	-8	-10	-16	-17	10	10	7	9
5000	24	17	10	12	15	7	6	-26	-19	-11	-13	-17	-25	-28	11	11	8	10
10000	39	26	15	22	23	13	11	-45	-30	-17	-27	-28	-42	-45	16	15	9	15
18000																		

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--EQUVALENT ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 \*PLUS SIGN DENOTES HEADWINDS.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION					
	DIRECT						RETURN						JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50					A75	A85
CANNON AFB	TO																	
5000	8	6	8	7	7	0	-1	-9	-7	-8	-7	-8	-15	-17	11	11	8	10
10000	17	12	9	10	11	4	2	-20	-14	-9	-12	-14	-22	-24	12	12	9	11
18000	27	19	13	15	17	7	5	-36	-25	-15	-22	-24	-36	-39	18	17	10	16
CANNON AFB	TO																	
5000	1	1	2	2	1	-2	-6	-1	-1	-1	-2	-2	-6	-7	6	7	5	7
10000	-13	-7	-3	-6	-7	-14	-16	12	6	3	5	6	0	-1	11	9	8	9
18000	-27	-18	-10	-18	-18	-29	-32	21	13	7	14	12	2	0	18	16	11	16
CANNON AFB	TO																	
5000	-1	0	1	-1	0	-6	-7	0	0	-1	0	0	-6	-7	8	8	7	8
10000	-11	-5	-3	-8	-7	-13	-14	8	4	2	6	4	0	-1	8	8	7	8
18000	-18	-9	-5	-13	-11	-23	-22	10	4	2	7	5	-2	-4	13	12	9	12
CAPSHELL AFB	TO																	
5000	12	9	6	5	7	1	0	-13	-10	-5	-5	-8	-15	-17	11	10	7	9
10000	25	18	6	8	13	5	3	-26	-19	-6	-9	-15	-25	-27	11	11	8	11
18000	41	30	7	20	22	9	7	-44	-33	-7	-22	-26	-41	-45	17	16	9	15
CAPSHELL AFB	TO																	
5000	7	6	6	4	5	-1	-3	-9	-7	-6	-5	-7	-15	-16	13	12	9	10
10000	14	10	6	7	9	0	-1	-18	-13	-6	-9	-12	-20	-23	13	13	10	12
18000	21	15	8	10	12	1	-1	-33	-22	-10	-16	-19	-33	-37	20	19	11	18
CAPSHELL AFB	TO																	
5000	-1	0	2	-1	0	-6	-8	0	0	-2	0	-1	-7	-8	10	9	8	9
10000	-5	-2	-1	-4	-4	-10	-11	0	0	0	1	0	-6	-7	9	10	8	9
18000	-9	-5	-2	-7	-6	-15	-17	-3	-2	-1	0	-2	-11	-13	15	14	9	14
CAPSHELL AFB	TO																	
5000	-6	-6	-8	-2	-6	-14	-15	5	6	9	1	5	-2	-4	13	12	8	11
10000	-6	-5	-3	-1	-4	-12	-14	3	3	4	1	2	-4	-6	12	11	9	12
18000	-11	-6	-3	-1	-5	-16	-19	-1	-2	3	-2	0	-11	-14	19	17	10	16
CAPSHELL AFB	TO																	
5000	13	9	6	8	8	1	0	-14	-10	-6	-6	-9	-16	-18	11	11	7	9
10000	25	18	8	10	14	6	4	-27	-20	-9	-11	-16	-26	-28	12	12	8	11
18000	41	28	11	21	23	11	9	-46	-32	-12	-25	-27	-43	-47	17	17	9	16
CAPSHELL AFB	TO																	
5000	-5	-2	0	-4	-3	-9	-10	3	1	0	3	1	-4	-5	9	9	7	8
10000	-14	-7	-4	-10	-9	-16	-17	12	6	3	8	7	0	0	10	9	8	9
18000	-25	-15	-8	-18	-16	-27	-29	16	9	5	13	10	1	-1	15	14	10	14

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 \*PLUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES																	
	DIRECT						RETURN						STANDARD DEVIATION					
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT
CAPSWELL AFB	TO	EGLIN AFB												575 N.M.I.				
5000	8	6	3	4	5	-2	-3	-9	-7	-3	-4	-6	-13	-15	12	12	8	10
10000	19	14	1	7	9	0	-1	-20	-15	-1	-8	-11	-21	-23	12	12	9	12
18000	33	28	1	16	18	4	1	-38	-30	-1	-18	-21	-37	-41	18	17	10	16
CAMPBELL AFB	TO	ELLINGTON AFB												223 N.M.I.				
5000	0	-1	-4	1	-1	-9	-11	-1	0	4	-1	0	-7	-9	13	13	8	11
10000	4	2	-3	2	0	-7	-9	-8	-5	3	-3	-3	-12	-14	13	12	9	12
18000	8	9	-3	7	3	-7	-9	-20	-17	3	-11	-10	-24	-28	20	18	10	17
CAMSWELL AFB	TO	ELLSWORTH AFB												769 N.M.I.				
5000	-4	-1	2	-3	-2	-9	-11	3	0	-2	2	0	-7	-8	11	12	9	10
10000	-11	-6	-1	-7	-4	-15	-17	7	4	0	4	3	-3	-5	12	12	9	12
18000	-21	-12	-5	-14	-13	-25	-28	4	5	3	4	5	-4	-7	19	18	11	17
GARDNERS AFB	TO	FL TUON WCAS												1018 N.M.I.				
5000	-3	-3	-1	0	-2	-7	-8	2	3	1	-1	0	-4	-5	9	8	5	7
10000	-15	-12	-2	-6	-9	-16	-18	14	12	3	6	8	1	0	11	9	7	9
18000	-33	-28	-7	-16	-20	-33	-37	30	25	5	14	17	6	4	17	15	9	14
CAMPBELL AFB	TO	ENGLAND AFB												264 N.M.I.				
5000	7	5	2	4	4	-3	-5	-8	-6	-2	-4	-5	-13	-15	13	13	9	11
10000	18	13	0	7	8	0	-2	-19	-14	0	-8	-10	-20	-23	13	13	9	13
18000	31	26	0	16	16	2	0	-36	-29	0	-18	-20	-37	-41	20	18	11	18
CAMPBELL AFB	TO	FORT RENNING												634 N.M.I.				
5000	10	8	4	5	6	0	-2	-11	-9	-4	-5	-7	-15	-17	12	12	8	10
10000	22	16	3	8	11	2	0	-23	-17	-3	-9	-13	-23	-25	12	12	9	12
18000	39	30	3	18	20	4	3	-41	-32	-4	-20	-24	-40	-44	18	17	10	17
CAMPBELL AFB	TO	FORT BLISS												457 N.M.I.				
5000	-7	-5	-3	-3	-5	-12	-14	6	5	3	3	4	-2	-4	12	11	8	10
10000	-14	-15	-1	-7	-11	-20	-22	18	14	1	7	9	1	0	12	11	9	11
18000	-37	-30	-4	-17	-21	-37	-40	34	28	4	15	18	5	2	20	17	10	16
CAMPBELL AFB	TO	FORT BRAGG/POPE												931 N.M.I.				
5000	12	9	6	5	7	1	0	-13	-10	-6	-5	-9	-16	-18	11	11	7	10
10000	25	18	6	9	13	2	2	-26	-19	-9	-9	-14	-25	-27	12	12	8	11
18000	41	30	7	20	22	9	6	-44	-33	-7	-22	-26	-42	-45	17	17	9	16
CAMPBELL AFB	TO	FORT CAMPBELL												543 N.M.I.				
5000	11	9	7	5	7	0	-1	-12	-10	-7	-5	-9	-17	-19	13	13	9	11
10000	23	16	6	9	12	3	1	-24	-17	-6	-10	-14	-24	-27	13	13	10	13
18000	37	26	7	17	19	6	4	-42	-31	-7	-21	-24	-41	-45	20	19	10	18

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 000--DEPOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DEPOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWIND IN KNOTS												STANDARD DEVIATION					
	DIRECT				RETURN				RETURN				RETURN					
	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT		
CAPSWELL AFB	503 N.M.I.																	
5000	-3	-1	1	-2	-1	-4	-11	2	0	-2	2	0	-7	-9	12	12	9	10
10000	-14	-10	-1	-7	-8	-17	-20	13	8	1	6	6	-1	-3	13	12	13	12
18000	-30	-23	-6	-17	-18	-32	-36	21	16	5	14	12	1	-1	21	18	11	18
CAPSWELL AFB	1065 N.M.I.																	
5000	13	10	6	6	8	2	0	-13	-10	-6	-6	-9	-16	-17	11	11	7	9
10000	25	18	8	9	14	5	4	-27	-20	-8	-10	-16	-26	-28	12	12	8	11
18000	42	28	10	21	23	11	8	-66	-32	-11	-24	-27	-43	-46	17	17	9	16
CAPSWELL AFB	650 N.M.I.																	
5000	-5	-4	-1	-1	-3	-9	-11	4	4	1	1	2	-3	-4	10	10	6	9
10000	-19	-14	-1	-7	-10	-19	-21	17	13	1	6	8	0	0	12	10	8	10
18000	-35	-29	-4	-16	-20	-35	-38	32	27	4	14	17	5	2	19	16	9	15
CAPSWELL AFB	640 N.M.I.																	
5000	11	9	7	5	7	0	-1	-12	-10	-7	-6	-9	-16	-18	13	12	8	10
10000	22	16	6	9	12	3	1	-24	-17	-7	-10	-14	-24	-27	13	13	10	13
18000	36	24	9	17	19	7	4	-62	-30	-9	-21	-24	-40	-44	20	18	10	18
CAPSWELL AFB	415 N.M.I.																	
5000	3	4	6	1	3	-4	-6	-6	-5	-7	-2	-5	-13	-15	13	13	9	11
10000	5	4	3	1	3	-5	-7	-10	-7	-4	-3	-6	-15	-17	14	13	10	13
18000	4	4	3	0	2	-8	-11	-20	-14	-4	-7	-11	-24	-27	21	19	11	19
CAPSWELL AFB	1430 N.M.I.																	
5000	-1	0	0	0	0	-5	-6	0	0	0	0	0	-4	-5	8	7	5	7
10000	-15	-9	-4	-8	-9	-16	-18	13	8	3	7	7	1	0	10	9	7	9
18000	-30	-20	-11	-20	-20	-31	-34	23	16	9	16	15	5	3	16	15	10	14
CAPSWELL AFB	1218 N.M.I.																	
5000	-3	-3	0	0	-2	-6	-8	2	2	0	0	0	-3	-5	8	7	5	7
10000	-15	-12	-3	-7	-9	-16	-18	14	11	3	7	8	1	0	11	9	7	9
18000	-32	-26	-9	-17	-20	-32	-36	28	23	8	14	16	6	4	17	15	9	14
CAPSWELL AFB	618 N.M.I.																	
5000	9	7	3	4	5	-1	-3	-10	-8	-3	-4	-6	-14	-16	12	12	8	10
10000	20	15	2	8	10	1	0	-21	-16	-2	-8	-12	-22	-24	12	12	9	12
18000	35	29	2	17	19	5	2	-39	-31	-2	-19	-22	-38	-42	18	17	10	18
CAPSWELL AFB	751 N.M.I.																	
5000	7	6	6	4	4	-1	-3	-8	-7	-6	-5	-7	-14	-16	13	12	9	10
10000	13	9	6	6	8	0	-1	-17	-12	-6	-8	-11	-20	-22	13	13	10	12
18000	19	13	8	8	11	0	-2	-32	-21	-9	-15	-18	-32	-36	20	19	11	18

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES T-HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT			EQUVALENT			HEADWIND			RETURN			JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	00450	A75	A95	JAN	APR	JUL	OCT	00450	A75	A95	JAN	APR	JUL	OCT
CARSWELL AFR TO MILL AFR																		
5000	-1	0	2	0	0	-5	-6	0	0	-2	0	-1	-6	-8	9	9	8	8
10000	-15	-10	-2	-3	-9	-16	-18	13	8	2	7	7	0	-1	11	10	8	10
18000	-31	-23	-8	-19	-19	-32	-36	24	18	7	16	14	4	2	19	17	10	16
CARSWELL AFR TO HOMESTEAD AFR																		
5000	1	2	0	1	0	-4	-6	-3	-3	0	-1	-2	-7	-9	16	9	6	8
10000	12	9	0	4	5	-1	-2	-14	-11	0	-4	-7	-15	-17	10	10	7	9
18000	25	23	0	11	13	1	0	-30	-24	0	-13	-17	-30	-33	14	14	8	13
CARSWELL AFR TO MUMTER AAF																		
5000	17	8	4	4	6	0	-1	-11	-8	-4	-5	-7	-14	-16	11	11	7	10
10000	22	16	4	7	11	3	1	-22	-17	-4	-8	-12	-22	-24	12	12	8	11
18000	37	29	4	14	20	7	4	-41	-32	-4	-20	-24	-39	-43	17	16	9	15
CARSWELL AFR TO MUMTSVILLE																		
5000	11	9	6	5	7	0	-1	-12	-10	-6	-5	-8	-16	-18	13	12	8	11
10000	23	17	5	9	12	3	1	-24	-18	-5	-10	-14	-24	-27	13	13	9	13
18000	39	29	5	19	21	7	4	-43	-32	-5	-21	-24	-41	-45	20	18	10	18
CARSWELL AFR TO JACKSONVILLE																		
5000	8	7	3	4	5	-1	-2	-9	-7	-3	-4	-6	-13	-14	11	11	7	9
10000	19	15	2	7	10	2	0	-21	-16	-2	-7	-11	-21	-23	11	11	8	11
18000	35	28	2	17	19	5	2	-38	-31	-3	-19	-22	-37	-41	17	16	9	15
CARSWELL AFR TO KEY WEST																		
5000	0	1	-1	0	0	-5	-7	-1	-2	1	-1	-1	-7	-8	10	9	6	8
10000	10	8	-1	4	4	-2	-3	-12	-9	1	-4	-6	-13	-15	10	10	7	9
18000	21	21	-1	10	11	0	-1	-27	-24	1	-12	-15	-28	-31	14	14	8	13
CARSWELL AFR TO LARSON AFR																		
5000	-1	0	0	0	0	-5	-7	0	0	0	0	0	-5	-6	8	8	6	7
10000	-15	-9	-3	-8	-9	-16	-17	13	8	3	7	7	1	0	10	10	7	9
18000	-29	-20	-11	-20	-20	-31	-34	23	15	8	16	14	5	2	16	15	10	15
CARSWELL AFR TO LITTLE ROCK																		
5000	10	8	7	5	7	2	-2	-11	-9	-7	-5	-8	-16	-18	14	13	9	11
10000	21	16	5	8	11	2	0	-23	-17	-5	-9	-13	-24	-26	14	13	10	13
18000	35	26	5	16	18	5	2	-40	-30	-5	-19	-22	-39	-43	21	19	11	19
CARSWELL AFR TO LOGGAPUNE																		
5000	11	9	7	6	8	1	0	-12	-9	-6	-6	-8	-16	-18	12	12	8	10
10000	22	16	7	10	13	4	2	-25	-17	-8	-11	-15	-25	-27	13	13	9	12
18000	36	24	10	19	20	8	6	-43	-29	-11	-22	-25	-40	-44	19	18	10	17

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.

\*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.

+MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN FEET	E S U L V A L E N T M E A D M I V C S P												STANDARD DEVIATION					
	MIPFCY				RETURN				RETURN				JAN	APP	JUN	OCT		
	JAN	APP	JUL	OCT	00A50	A75	A85	JAN	APP	JUL	OCT	00A50	A75	A85	JAN	APP	JUN	OCT
CASSELL AFB	TO	7	7	7	8	2	0	-13	-8	-8	-8	-10	-16	-17	10	10	7	8
SCCO	11	7	7	7	8	2	0	-24	-16	-11	-14	-16	-24	-26	11	11	8	10
10000	21	14	10	12	13	6	5	-42	-27	-17	-26	-27	-39	-43	16	15	9	15
18000	34	20	14	20	20	11	8											
CASSELL AFB	TO	3	0	0	-2	-7	-9	2	2	0	0	0	-4	-5	10	9	6	8
SCCO	-17	-13	-2	-7	-10	-18	-20	16	13	2	6	8	1	0	12	10	8	10
10000	-34	-29	-6	-16	-20	-35	-38	31	26	5	15	17	5	3	19	16	10	15
18000																		
CASSELL AFB	TO	9	7	7	8	1	0	-14	-10	-5	-7	-9	-16	-16	11	11	7	9
SCCO	12	9	7	7	8	1	0	-27	-20	-9	-11	-16	-26	-28	12	12	8	11
10000	24	18	13	14	14	6	4	-46	-32	-13	-26	-28	-43	-47	17	17	9	16
18000	41	27	12	22	23	17	9											
CASSELL AFB	TO	9	7	7	8	1	0	-11	-9	-7	-5	-8	-16	-18	14	13	9	11
SCCO	11	9	7	7	8	1	0	-24	-17	-5	-10	-14	-24	-27	13	13	10	13
10000	23	17	5	9	12	3	1	-42	-31	-6	-20	-23	-40	-45	21	19	11	18
18000	34	28	6	17	20	6	3											
CASSELL AFB	TO	-7	-9	-7	-1	-7	-14	7	8	7	1	5	0	-1	10	9	6	9
SCCO	-7	-9	-7	-1	-7	-14	-14	5	5	3	1	3	-2	-3	9	9	7	9
10000	-7	-5	-2	-2	-4	-10	-12	6	3	2	2	3	-4	-6	14	13	7	12
18000	-13	-8	-2	-4	-6	-15	-17											
CASSELL AFB	TO	1	2	2	0	2	-7	-2	-3	-5	-1	-3	-11	-13	12	12	9	11
SCCO	2	2	2	0	1	-6	-8	-7	-4	-3	-2	-5	-13	-15	13	13	10	12
10000	0	1	2	-1	0	-10	-13	-16	-11	-5	-6	-9	-21	-24	20	18	11	18
18000																		
CASSELL AFB	TO	-4	-1	1	-4	-2	-9	3	0	-2	3	0	-6	-8	11	11	9	10
SCCO	-9	-5	-1	-6	-6	-13	-15	4	3	0	4	2	-4	-6	12	12	9	11
10000	-14	-10	-4	-12	-17	-22	-24	3	2	1	5	2	-7	-10	18	17	11	16
18000																		
CASSELL AFB	TO	-2	0	0	-1	-6	-9	1	1	0	0	0	-5	-6	9	8	6	8
SCCO	-2	0	0	-1	-6	-9	-9	15	12	3	7	8	1	0	11	10	8	10
10000	-14	-12	-3	-7	-10	-17	-19	29	24	7	15	17	6	4	18	16	10	15
18000	-14	-27	-8	-17	-20	-34	-37											
CASSELL AFB	TO	12	9	7	6	1	0	-13	-10	-6	-7	-9	-16	-18	11	11	7	9
SCCO	12	9	7	6	1	0	0	-27	-19	-9	-11	-16	-26	-28	12	12	9	11
10000	25	17	9	10	14	6	4	-46	-31	-12	-25	-27	-42	-46	18	17	10	16
18000	40	26	11	21	22	10	8											

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 00A--NEGATIVE ANNUAL FOUR VALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION						
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	
CARSWELL AFB	NEW ORLEANS												412 N.MI.						
	5000	4	1	3	3	-3	-5	-7	-5	-1	-4	-4	-12	-14	12	12	8	11	
	10000	16	12	0	6	8	0	-2	-18	-13	0	-7	-10	-19	-21	12	12	9	12
18000	29	25	0	15	15	1	-1	-35	-29	0	-17	-19	-36	-40	19	18	10	17	
CARSWELL AFB	NIAGARA FALLS												1069 N.MI.						
	5000	11	7	6	6	7	0	-1	-12	-9	-6	-7	-9	-16	-17	12	11	8	9
	10000	21	14	8	10	12	4	3	-24	-16	-9	-12	-15	-24	-26	12	12	9	11
18000	33	20	11	18	18	8	5	-42	-27	-13	-23	-25	-39	-43	18	17	10	17	
CARSWELL AFB	CKNAED AFB												1084 N.MI.						
	5000	-3	-3	0	0	-2	-8	-8	3	2	1	-1	0	-3	-5	8	8	5	7
	10000	-15	-12	-3	-6	-9	-16	-18	14	12	3	6	8	1	0	11	9	7	9
18000	-33	-27	-8	-16	-20	-33	-36	29	24	7	14	16	6	4	17	15	9	14	
CARSWELL AFB	PATRICK AFB												911 N.MI.						
	5000	5	5	2	3	3	-2	-3	-6	-6	-2	-4	-5	-11	-13	10	10	7	9
	10000	16	13	1	6	8	0	0	-18	-14	-1	-6	-9	-18	-21	11	11	7	10
18000	31	26	1	15	17	4	1	-35	-29	-1	-17	-20	-35	-38	16	15	8	14	
CARSWELL AFB	PITTSBURGH												948 N.MI.						
	5000	11	9	6	6	7	0	0	-13	-10	-6	-7	-9	-16	-18	12	11	8	10
	10000	23	16	8	10	13	5	3	-25	-18	-9	-11	-16	-25	-27	12	12	9	12
18000	37	24	11	19	20	9	6	-44	-29	-12	-24	-26	-41	-45	18	18	10	17	
CARSWELL AFB	REGINA												1107 N.MI.						
	5000	-5	-1	1	-4	-2	-9	-11	3	0	-1	3	0	-5	-7	10	11	8	10
	10000	-11	-6	-2	-8	-7	-14	-16	7	4	1	6	4	-2	-4	11	11	9	10
18000	-20	-12	-6	-15	-13	-24	-27	8	5	2	8	5	-4	-6	17	16	10	15	
CARSWELL AFB	SCOTT AFB												503 N.MI.						
	5000	9	8	7	4	6	0	-2	-10	-8	-7	-5	-8	-16	-18	13	13	9	11
	10000	17	12	6	7	10	1	0	-20	-14	-6	-9	-12	-22	-24	13	13	10	13
18000	27	19	7	12	14	3	0	-37	-25	-8	-17	-20	-36	-40	21	19	11	18	
CARSWELL AFB	SELFRIDGE AFB												909 N.MI.						
	5000	10	7	6	6	7	0	-1	-11	-8	-5	-6	-8	-15	-17	12	12	9	10
	10000	19	13	7	9	11	3	1	-22	-15	-3	-11	-14	-23	-25	12	13	9	12
18000	29	19	10	15	16	6	3	-39	-26	-12	-21	-23	-37	-41	19	18	10	17	
CARSWELL AFB	SHAW AFB												852 N.MI.						
	5000	11	9	5	5	7	0	-1	-12	-10	-5	-5	-8	-15	-17	11	11	8	10
	10000	24	18	5	8	12	4	2	-24	-19	-5	-9	-14	-24	-27	14	12	8	12
18000	40	30	6	19	21	8	5	-43	-33	-6	-22	-25	-41	-45	18	17	9	16	

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

STATION IN LEFT	MONTHS												STANDARD DEVIATION						
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	APR	JUL	OCT			
CASSELL AFB	WESTOVER AFB																		
5000	12	9	7	7	8	2	0	-14	-10	-7	-7	-7	-10	-16	-18	11	10	7	9
10000	25	17	10	11	15	7	5	-27	-19	-10	-12	-17	-26	-28	11	11	8	11	
18000	39	25	13	22	22	12	9	-46	-30	-15	-26	-28	-42	-46	17	16	9	16	
CASSELL AFB	MURTSMITH																		
5000	6	6	6	5	0	-2	-10	-7	-6	-6	-8	-15	-16	12	11	8	10		
10000	15	13	7	3	9	7	0	-19	-13	-8	-10	-13	-21	-23	12	12	9	12	
18000	21	15	9	12	13	3	1	-35	-23	-12	-19	-21	-34	-38	18	18	10	17	
CASSELL AFB	YAKIMA																		
5000	-1	0	1	0	0	-5	-6	0	0	-1	0	0	-5	-6	8	8	6	7	
10000	-15	-9	-3	-8	-9	-16	-17	13	8	3	7	7	1	0	10	9	7	9	
18000	-33	-23	-11	-20	-20	-31	-34	23	16	9	16	15	5	3	16	15	10	15	
CASSELL AFB	VFLUKNIFE																		
5000	-4	-1	0	-5	-3	-8	-10	3	0	0	4	1	-4	-5	8	8	7	8	
10000	-12	-6	-5	-9	-8	-14	-15	5	5	4	8	6	1	0	8	8	7	8	
18000	-20	-11	-8	-15	-14	-22	-24	12	6	5	10	7	0	-1	13	12	9	12	
CHEEY PT MCAS	CHICAGO																		
5000	-12	-9	-5	-6	-8	-16	-18	10	8	5	5	6	0	-2	13	12	8	11	
10000	-24	-17	-10	-9	-15	-25	-27	20	14	9	7	12	3	1	14	14	10	13	
18000	-41	-29	-14	-23	-25	-41	-45	28	22	12	16	18	6	4	20	20	11	19	
CHEEY PT MCAS	CHURCHILL																		
5000	-6	-4	-4	-5	-5	-11	-13	4	3	3	3	3	-2	-4	10	9	8	9	
10000	-14	-9	-9	-9	-11	-17	-19	9	6	7	6	7	0	-1	10	10	8	10	
18000	-24	-17	-15	-16	-18	-27	-30	10	10	11	8	9	1	-1	15	14	10	14	
CHEEY PT MCAS	CORPUS CHRISTI																		
5000	-12	-9	-4	-4	-7	-14	-15	11	8	4	4	6	0	0	10	9	6	9	
10000	-21	-17	-4	-7	-12	-21	-23	20	16	4	6	10	3	1	10	10	7	10	
18000	-39	-30	-2	-19	-22	-37	-40	36	26	2	16	18	5	3	15	15	8	14	
CHEEY PT MCAS	DOVER AFB																		
5000	2	2	2	2	2	-6	-8	-5	-3	-2	-3	-4	-12	-14	14	13	9	13	
10000	2	5	3	3	3	-6	-8	-10	-10	-4	-5	-7	-17	-20	16	16	10	14	
18000	6	1	3	8	4	-8	-11	-26	-13	-5	-15	-14	-29	-33	22	22	12	21	
CHEEY PT MCAS	EDMONTON																		
5000	-11	-6	-5	-8	-8	-14	-15	10	5	4	7	6	0	0	9	9	7	9	
10000	-22	-13	-12	-14	-15	-22	-24	19	12	11	12	13	7	5	9	9	7	9	
18000	-35	-23	-18	-25	-25	-35	-37	27	19	16	20	19	11	9	14	13	9	13	

\* HEADWINDS - COMPUTED FOR A 120-KT AIRSPEED.  
 \*\* Δ - NEGATIVE ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AT STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FLEET	EQUIVALENT HEADWINDS AT STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION						
	DIRECT			EQUIVALENT			HEADWINDS*			PERCENT			JAN	APR	JUL	OCT			
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85					
CHEERY PT MCAS TO FOLIN AFR	-12	-9	-4	-4	-8	-15	-17	11	8	5	3	6	0	-2	11	11	8	11	554 N.M.I.
10000	-22	-18	-5	-6	-12	-22	-25	20	17	5	6	11	2	0	13	13	8	11	
18000	-40	-30	-6	-20	-23	-39	-43	35	25	6	19	19	6	4	18	18	10	17	
CHEERY PT MCAS TO ELLINGTON AFR	-2	-9	-4	-4	-7	-14	-16	12	9	5	4	7	1	0	10	10	7	9	979 N.M.I.
5000	-23	-18	-5	-7	-13	-22	-25	22	17	5	7	11	3	2	11	11	7	11	
10000	-41	-31	-3	-20	-23	-39	-42	38	28	3	18	20	6	3	16	16	9	15	
CHEERY PT MCAS TO ELLSWORTH AFR	-13	-9	-6	-3	-9	-16	-17	12	8	6	7	8	1	0	10	10	7	9	1338 N.M.I.
5000	-24	-16	-11	-13	-14	-24	-26	22	14	10	11	13	6	4	11	11	8	11	
10000	-41	-28	-18	-27	-28	-40	-43	33	23	16	22	22	12	10	16	16	10	16	
CHEERY PT MCAS TO ENGLAND AFR	-13	-10	-5	-4	-8	-15	-17	12	9	5	4	7	0	-1	11	11	7	10	815 N.M.I.
5000	-24	-19	-6	-8	-14	-24	-26	23	18	6	7	12	4	2	12	12	8	12	
10000	-43	-32	-6	-22	-25	-41	-45	40	29	5	19	21	7	5	17	17	9	16	
CHEERY PT MCAS TO FORT BENNING	-13	-10	-5	-4	-8	-16	-18	12	9	5	4	7	0	-1	12	12	8	11	426 N.M.I.
5000	-25	-20	-6	-7	-14	-25	-28	23	19	5	6	12	3	1	14	14	9	13	
10000	-43	-32	-8	-22	-25	-42	-46	40	28	8	20	21	8	6	19	19	10	18	
CHEERY PT MCAS TO FORT BLISS	-11	-9	-5	-5	-8	-13	-15	10	8	5	4	6	1	0	9	9	6	8	1485 N.M.I.
5000	-24	-18	-5	-9	-14	-23	-25	23	17	5	8	12	4	3	10	10	7	9	
10000	-42	-32	-7	-21	-25	-39	-42	39	30	7	18	22	9	7	15	14	8	13	
CHEERY PT MCAS TO FORT CAMPBELL	-14	-11	-6	-6	-9	-17	-19	14	10	6	5	8	0	0	13	12	8	11	527 N.M.I.
5000	-28	-21	-8	-9	-16	-27	-30	26	20	8	8	14	5	3	14	14	9	13	
10000	-46	-34	-12	-25	-28	-45	-49	40	31	12	21	24	11	8	20	20	11	19	
CHEERY PT MCAS TO FORT CARSON	-12	-9	-6	-7	-9	-15	-17	11	8	6	6	7	1	0	10	10	7	9	1353 N.M.I.
5000	-25	-18	-8	-11	-15	-24	-26	23	16	8	10	13	6	4	11	11	8	10	
10000	-43	-31	-14	-25	-27	-41	-44	38	28	13	22	23	12	10	16	16	9	15	
CHEERY PT MCAS TO FORT EUSTIS	0	0	0	0	0	-8	-10	-2	-1	0	-1	-1	-10	-12	14	13	9	13	194 N.M.I.
5000	-3	0	1	1	0	-9	-12	-4	-6	-2	-3	-4	-13	-16	16	16	10	14	
10000	-2	-5	0	3	-1	-14	-17	-18	-7	-2	-11	-9	-23	-27	22	22	12	21	

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT						RETURN						JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	**A50	A75	A95	JAN	APR	JUL	OCT	**A50	A75	A95				
CHEERY PT MCAS TO FORT HOOD	-13	-10	-5	-5	-8	-15	-17	12	9	5	4	7	0	0	11	10	7	9
5000	-24	-19	-5	-8	-14	-23	-26	23	18	5	7	12	4	2	11	11	8	11
10000	-43	-32	-5	-21	-25	-40	-44	40	29	4	19	21	7	5	16	16	9	15
CHEERY PT MCAS TO FORT HUACHUCA	-10	-8	-5	-4	-7	-12	-14	9	7	5	3	5	0	0	9	8	6	7
5000	-23	-13	-5	-9	-14	-22	-24	22	17	5	8	12	5	3	9	9	7	9
10000	-41	-32	-8	-21	-25	-39	-42	37	29	7	18	21	9	7	14	13	7	13
CHEERY PT MCAS TO FORT KNCK	-14	-10	-6	-6	-9	-17	-19	13	10	6	5	6	0	-1	13	12	9	11
5000	-27	-20	-9	-9	-16	-27	-29	25	19	9	7	14	4	2	14	14	10	13
10000	-44	-33	-13	-24	-27	-44	-48	37	29	12	20	22	10	7	20	20	11	20
CHEERY PT MCAS TO FORT LEAVENWORTH	-14	-10	-6	-7	-9	-17	-19	13	9	6	6	8	1	0	12	11	8	10
5000	-27	-19	-9	-11	-16	-26	-29	25	18	9	10	14	6	4	13	13	9	12
10000	-45	-32	-14	-24	-28	-43	-47	38	29	14	22	23	12	9	18	18	10	17
CHEERY PT MCAS TO FORT RUCKER	-12	-9	-4	-4	-7	-15	-17	11	9	5	4	7	0	-1	12	11	8	11
5000	-23	-18	-6	-6	-13	-23	-26	21	17	6	6	11	3	0	13	13	9	13
10000	-41	-30	-7	-21	-23	-40	-44	36	26	7	18	19	7	4	19	19	10	17
CHEERY PT MCAS TO FORT SILL	-13	-10	-6	-6	-9	-16	-17	12	10	6	5	7	1	0	11	11	7	9
5000	-27	-20	-7	-10	-15	-26	-28	25	19	7	9	14	5	3	12	12	8	11
10000	-45	-34	-9	-24	-27	-43	-46	41	31	9	21	23	11	8	17	16	9	16
CHEERY PT MCAS TO FORT WOLTERS	-13	-10	-6	-5	-9	-15	-17	12	9	6	5	7	1	0	11	10	7	9
5000	-26	-19	-6	-9	-15	-25	-27	25	18	6	8	13	5	3	11	11	8	11
10000	-44	-33	-7	-22	-26	-41	-45	41	30	7	20	22	9	7	17	16	9	15
CHEERY PT MCAS TO FORTISHER	0	0	1	2	0	-5	-6	-1	-1	-2	-3	-2	-8	-9	9	9	7	9
5000	0	0	0	1	0	-6	-8	-5	-2	-2	-4	-4	-10	-12	11	10	8	10
10000	2	-1	0	1	0	-8	-10	-15	-6	-4	-10	-9	-18	-21	14	14	10	14
CHEERY PT MCAS TO GEN MITCHELL	-12	-9	-5	-6	-8	-14	-14	10	8	5	5	6	0	-2	13	12	9	11
5000	-24	-17	-10	-9	-15	-25	-27	19	13	9	7	11	2	0	14	14	10	13
10000	-40	-23	-14	-22	-25	-40	-44	26	21	12	15	17	6	3	20	20	11	19

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--MINUTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT						RETURN						JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85				
CHEFFY PT MCAS TO MILL AFB	-10	-7	-4	-5	-7	-12	-13	8	7	4	5	5	0	0	9	8	6	7
10000	-23	-15	-9	-12	-15	-22	-24	21	14	9	11	13	6	5	10	10	7	9
18000	-40	-29	-16	-25	-27	-39	-42	34	25	15	22	22	13	11	15	14	9	14
CHEFFY PT MCAS TO HOMESTEAD AFB	-6	-5	-3	-2	-4	-11	-12	5	5	3	2	3	-2	-4	11	10	7	10
10000	-8	-8	-3	-4	-6	-13	-15	5	5	3	3	3	-3	-5	12	12	8	11
18000	-16	-12	-4	-10	-10	-20	-23	4	3	3	7	4	-4	-7	17	16	9	14
CHEFFY PT MCAS TO HUNTER AAF	-11	-9	-4	-3	-7	-14	-17	10	3	4	3	6	-1	-3	12	12	9	12
10000	-21	-17	-5	-6	-12	-22	-25	18	15	5	5	10	1	0	14	14	9	13
18000	-39	-28	-8	-20	-22	-38	-42	31	22	7	17	17	5	2	20	20	11	18
CHEFFY PT MCAS TO HUNTSVILLE	-14	-11	-5	-5	-9	-17	-19	14	10	6	5	8	1	0	12	12	8	11
10000	-27	-21	-7	-8	-15	-26	-29	26	20	7	7	13	4	2	14	14	9	13
18000	-46	-35	-10	-24	-27	-45	-49	43	32	10	21	24	10	7	20	19	11	19
CHEFFY PT MCAS TO JACKSONVILLE	-10	-8	-4	-3	-6	-14	-16	9	7	4	3	5	-1	-3	12	12	8	11
10000	-19	-15	-4	-5	-10	-20	-23	14	13	4	4	8	0	-2	14	13	9	13
18000	-33	-24	-6	-18	-19	-34	-38	24	17	6	14	13	2	0	19	19	10	17
CHEFFY PT MCAS TO KEY WEST	-6	-6	-3	-3	-5	-11	-13	5	5	3	2	3	-2	-4	10	10	7	10
10000	-9	-8	-3	-4	-6	-13	-15	6	6	3	3	4	-2	-4	12	11	7	11
18000	-17	-13	-4	-10	-10	-21	-24	7	5	4	7	5	-3	-5	16	16	8	14
CHEFFY PT MCAS TO LITTLE ROCK	-14	-11	-5	-5	-9	-16	-18	14	10	6	5	8	1	0	12	11	8	10
10000	-27	-21	-7	-10	-16	-27	-29	26	20	7	9	14	5	3	13	13	9	13
18000	-45	-34	-10	-24	-27	-44	-48	42	31	10	21	23	11	8	19	18	10	17
CHEFFY PT MCAS TO LOCKPORT	-11	-9	-5	-5	-8	-16	-18	10	9	5	4	6	-1	-3	13	13	9	12
10000	-23	-17	-8	-6	-13	-24	-27	19	13	7	5	10	1	-1	15	15	10	14
18000	-38	-29	-11	-19	-23	-39	-43	23	21	10	12	15	3	0	21	21	12	20
CHEFFY PT MCAS TO LORING AFB	5	4	4	4	4	-3	-5	-8	-6	-5	-5	-6	-14	-16	13	12	9	11
10000	10	9	6	8	8	0	-2	-17	-13	-8	-10	-12	-21	-24	15	14	10	13
18000	19	9	8	15	12	0	-2	-35	-20	-12	-23	-22	-36	-40	20	20	12	19

• HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.

\*\*A--DEFINIES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES. MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUILIBRIUM												STANDARD DEVIATION				
	DIRECT						RETURN						JAN	APR	JUL	OCT	
	JAN	APR	JUL	OCT	A75	A85	JAN	APR	JUL	OCT	A75	A85					
CHEFFY PT MCAS	TO	LUKE AFB	8	7	5	3	5	0	0	0	0	0	9	8	6	7	1754 No.MI.
5000	-9	-4	-7	-12	-13	21	17	6	9	12	5	4	10	9	7	9	
10000	-23	-6	-14	-22	-24	37	29	10	19	22	11	9	14	13	8	13	
18000	-41	-32	-21	-25	-42												
CHEFFY PT MCAS	TO	MCGUIRE AFB	-6	-4	-2	-3	-4	-12	-14				14	13	9	12	327 No.MI.
5000	3	2	2	-5	-7	-13	-12	-5	-6	-9	-19	-21	16	16	10	14	
10000	4	7	4	5	4	-29	-16	-7	-18	-16	-32	-36	22	22	12	21	
18000	10	3	4	10	6												
CHEFFY PT MCAS	TO	MEMPHIS	14	10	6	5	8	1	0				12	12	8	11	644 No.MI.
5000	-14	-11	-5	-9	-17	27	20	7	8	14	5	2	13	13	9	13	
10000	-28	-21	-7	-16	-27	42	32	10	21	24	10	8	19	19	10	18	
18000	-46	-35	-10	-24	-48												
CHEFFY PT MCAS	TO	MEXICO CITY	5	6	2	1	3	-1	-2				8	8	5	7	1501 No.MI.
5000	-6	-7	-2	-4	-9	11	10	1	3	5	0	-1	8	8	6	8	
10000	-13	-11	-1	-7	-14	24	17	0	10	11	1	0	12	11	6	10	
18000	-28	-21	0	-12	-29												
CHEFFY PT MCAS	TO	MINN-ST PAUL	11	8	5	6	7	0	-1				12	11	8	10	958 No.MI.
5000	-12	-9	-5	-7	-8	20	14	10	9	12	4	2	13	13	9	12	
10000	-24	-16	-11	-11	-15	29	21	14	18	19	8	6	19	18	11	18	
18000	-40	-28	-16	-24	-43												
CHEFFY PT MCAS	TO	MINOT AFB	11	7	5	7	7	0	0				10	10	8	10	1348 No.MI.
5000	-12	-8	-5	-8	-9	20	13	11	11	13	6	4	11	11	8	11	
10000	-23	-15	-12	-13	-16	35	27	12	20	22	12	10	16	16	10	16	
18000	-38	-26	-18	-25	-38												
CHEFFY PT MCAS	TO	NELLIS AFB	8	6	4	3	5	0	-1				8	8	6	7	1851 No.MI.
5000	-9	-7	-4	-6	-11	20	15	7	9	12	5	4	9	9	7	9	
10000	-22	-16	-7	-10	-21	35	27	12	20	22	12	10	14	13	8	13	
18000	-40	-30	-13	-23	-41												
CHEFFY PT MCAS	TO	NEW CUMBERLAND	-1	0	0	-1	-1	-9	-11				14	13	9	12	319 No.MI.
5000	-1	-1	0	-1	-9	-3	-4	-1	-3	-3	-12	-15	16	16	10	14	
10000	-5	0	0	1	-11	-15	-4	-1	-10	-7	-21	-25	22	22	12	21	
18000	-7	-8	0	1	-3	-20	-4	-1	-10	-7	-21	-25					
CHEFFY PT MCAS	TO	NEW ORLEANS	11	9	5	4	6	0	-1				11	11	7	10	728 No.MI.
5000	-12	-9	-4	-4	-7	21	17	5	6	11	3	1	12	12	9	12	
10000	-23	-18	-5	-7	-13	37	27	4	18	19	6	3	17	17	9	16	
18000	-41	-31	-5	-20	-39												

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION										
	JAN			APR			JUL			OCT			JAN		APR		JUL		OCT				
CHEFFY PT MCAS	TO																			501 N. MI.			
5000	-4	-4	-2	-1	-3	-11	-13	1	2	1	0	0	1	-6	-8	13	13	9	12				
10000	-10	-6	-3	-1	-5	-15	-17	1	0	1	0	0	0	-8	-11	15	15	10	14				
18000	-17	-15	-5	-5	-10	-23	-27	-5	3	2	-4	-1	-13	-17		21	21	12	20				
CHEFFY PT MCAS	TO																			442 N. MI.			
5000	-8	-6	-3	-2	-5	-12	-14	7	5	3	2	4	4	-2	-4	14	11	8	11				
10000	-12	-11	-3	-4	-7	-16	-18	8	5	3	3	5	-2	-4		13	13	8	12				
18000	-23	-17	-4	-13	-13	-26	-29	11	5	4	9	7	-2	-5		18	18	10	16				
CHEFFY PT MCAS	TO																			371 N. MI.			
5000	-7	-6	-3	-2	-5	-13	-15	5	4	3	1	3	-4	-6		14	13	9	12				
10000	-17	-11	-5	-3	-9	-19	-22	9	5	4	1	4	-4	-6		15	15	10	14				
18000	-28	-22	-8	-11	-16	-31	-35	7	11	5	2	6	-6	-9		22	21	12	21				
CHEFFY PT MCAS	TO																			1525 N. MI.			
5000	-12	-7	-5	-8	-8	-15	-16	10	6	5	7	6	0	0		10	10	7	9				
10000	-22	-14	-12	-13	-16	-23	-25	20	12	11	11	13	6	4		10	11	8	10				
18000	-37	-25	-18	-25	-26	-37	-40	28	20	16	19	20	10	8		15	15	10	15				
CHEFFY PT MCAS	TO																			666 N. MI.			
5000	-14	-10	-6	-6	-9	-17	-19	13	10	6	6	8	1	0		12	12	8	11				
10000	-27	-20	-9	-10	-16	-27	-29	25	18	9	9	14	5	3		14	14	9	13				
18000	-45	-33	-13	-25	-28	-44	-48	38	29	13	21	23	11	8		19	19	11	19				
CHEFFY PT MCAS	TO																			539 N. MI.			
5000	-9	-7	-4	-3	-6	-14	-16	6	5	4	2	4	-3	-5		13	13	9	11				
10000	-19	-13	-7	-5	-11	-21	-23	12	8	6	3	7	-1	-4		15	15	10	13				
18000	-32	-24	-10	-15	-19	-34	-38	13	14	3	6	9	-2	-5		21	21	12	20				
CHEFFY PT MCAS	TO																			186 N. MI.			
5000	-14	-10	-5	-4	-8	-17	-19	13	10	5	4	7	0	-2		13	12	9	12				
10000	-26	-21	-7	-7	-15	-26	-29	24	20	7	6	13	3	1		15	15	9	14				
18000	-45	-33	-10	-24	-26	-44	-48	42	30	10	21	23	9	6		21	21	11	20				
CHEFFY PT MCAS	TO																			483 N. MI.			
5000	5	3	3	3	3	-4	-6	-7	-5	-4	-4	-5	-13	-16		14	13	9	12				
10000	8	9	5	6	6	-2	-4	-16	-14	-7	-8	-11	-21	-24		16	16	10	14				
18000	15	6	6	12	9	-2	-5	-33	-18	-9	-20	-19	-34	-38		21	21	12	20				
CHEFFY PT MCAS	TO																			647 N. MI.			
5000	-8	-6	-4	-3	-6	-13	-15	6	5	4	2	4	-3	-5		13	12	9	11				
10000	-17	-12	-7	-6	-11	-20	-22	10	7	6	3	6	-2	-4		14	14	10	13				
18000	-30	-22	-11	-14	-19	-32	-36	10	12	8	5	8	-3	-6		21	20	12	20				

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

F-111 EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN FEET	EQUIVALENT HEADWIND IN KNOTS												STANDARD DEVIATION						
	JAN			APR			JUL			OCT			A75		A85		A75		A85
CHICAGO	CHURCHILL												1032 N.M.I.						
5000	-4	-3	-2	-4	-4	-4	-11	-13	-13	2	2	1	2	2	1	-5	-7		
10000	-11	-6	-8	-9	-9	-16	-16	-18	-18	8	4	5	6	5	5	-1	-3		
18000	-18	-12	-13	-14	-15	-25	-28	-28	-28	8	7	8	7	7	7	-2	-5		
CHICAGO	CORPUS CHRISTI												972 N.M.I.						
5000	-9	-7	-6	-6	-7	-14	-15	-15	-15	7	5	5	3	5	5	-1	-2		
10000	-15	-11	-4	-6	-9	-17	-19	-19	-19	11	8	4	4	6	6	0	-2		
18000	-29	-19	-5	-12	-15	-28	-32	-32	-32	16	10	4	6	8	8	-1	-3		
CHICAGO	DOVER AFB												591 N.M.I.						
5000	14	10	7	9	9	1	0	0	0	-15	-11	-7	-9	-11	-11	-19	-21		
10000	28	19	14	12	17	8	5	5	5	-30	-21	-14	-14	-20	-20	-30	-33		
18000	43	28	20	25	27	14	11	11	11	-49	-33	-21	-30	-32	-32	-48	-52		
CHICAGO	EDMONTON												1234 N.M.I.						
5000	-11	-5	-4	-9	-8	-15	-17	-17	-17	10	4	4	8	6	6	0	-2		
10000	-21	-12	-12	-16	-16	-23	-25	-25	-25	19	11	12	15	14	14	7	5		
18000	-32	-21	-19	-26	-24	-35	-38	-38	-38	28	17	17	23	20	20	11	8		
CHICAGO	EGLIN AFB												693 N.M.I.						
5000	-1	0	0	0	0	-8	-9	-9	-9	0	0	0	0	0	0	-7	-9		
10000	-2	0	0	0	-1	-9	-11	-11	-11	-3	-3	0	-1	-2	-2	-10	-12		
18000	-9	-2	1	-1	-2	-14	-17	-17	-17	-10	-9	-3	-6	-7	-7	-18	-22		
CHICAGO	ELLINGTON AFB												822 N.M.I.						
5000	-8	-6	-5	-3	-6	-13	-15	-15	-15	6	5	5	2	4	4	-2	-4		
10000	-15	-10	-5	-6	-9	-17	-20	-20	-20	10	7	4	4	6	6	-1	-3		
18000	-28	-17	-3	-11	-14	-27	-31	-31	-31	13	8	1	4	5	5	-4	-7		
CHICAGO	ELLSWORTH AFB												683 N.M.I.						
5000	-13	-8	-6	-10	-10	-18	-20	-20	-20	12	7	6	9	8	8	0	-1		
10000	-23	-14	-13	-14	-17	-26	-28	-28	-28	22	12	13	15	15	15	6	4		
18000	-38	-26	-23	-29	-29	-41	-45	-45	-45	34	22	22	26	25	25	13	11		
CHICAGO	EL TORO MCAS												1490 N.M.I.						
5000	-4	-6	-5	-3	-5	-10	-12	-12	-12	5	5	5	3	4	4	0	-1		
10000	-16	-11	-9	-10	-12	-18	-20	-20	-20	14	10	8	9	10	10	4	2		
18000	-33	-25	-17	-21	-23	-34	-37	-37	-37	27	21	16	17	19	19	10	8		
CHICAGO	ENGLAND AFB												678 N.M.I.						
5000	-7	-5	-3	-2	-5	-12	-14	-14	-14	5	3	3	2	3	3	-3	-5		
10000	-13	-8	-4	-5	-8	-16	-19	-19	-19	7	4	3	3	4	4	-4	-6		
18000	-26	-15	-3	-10	-12	-26	-30	-30	-30	9	4	0	2	3	3	-7	-10		

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
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 \*MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION					
	DIRECT						RETURN						JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50					A75	A85
CHICAGO													585 N.MI.					
5000	1	1	0	1	0	-6	-8	-3	-3	-1	-2	-3	-10	-12	13	12	9	11
10000	1	2	1	1	1	-7	-9	-8	-6	-2	-3	-5	-14	-16	14	14	10	13
18000	-2	2	3	2	1	-10	-13	-17	-14	-5	-10	-11	-24	-27	20	20	11	19
CHICAGO													1073 N.MI.					
5000	-9	-7	-7	-6	-8	-14	-15	7	7	7	6	6	0	0	11	10	7	9
10000	-19	-14	-7	-10	-13	-21	-23	16	13	7	9	11	3	1	11	11	9	11
18000	-35	-26	-12	-19	-22	-35	-38	27	21	11	14	17	7	4	18	16	10	16
CHICAGO													586 N.MI.					
5000	9	7	5	5	6	-1	-3	-11	-8	-5	-5	-8	-15	-17	13	12	9	11
10000	19	13	8	7	11	2	0	-23	-16	-9	-8	-14	-24	-26	14	14	10	13
18000	24	20	11	15	16	4	1	-38	-27	-13	-22	-24	-39	-43	20	20	12	20
CHICAGO													320 N.MI.					
5000	0	0	0	0	0	-9	-11	-2	-1	0	0	-1	-9	-12	15	14	10	12
10000	-2	0	0	0	-1	-10	-13	-4	-3	-1	-1	-3	-12	-14	15	15	11	14
18000	-9	-2	0	-1	-3	-16	-20	-12	-8	-3	-8	-8	-21	-25	22	22	13	21
CHICAGO													795 N.MI.					
5000	-9	-8	-7	-8	-8	-16	-17	8	7	7	8	7	0	-1	12	11	9	10
10000	-21	-13	-11	-13	-15	-23	-26	19	12	10	12	13	4	2	13	13	10	12
18000	-36	-27	-19	-25	-26	-40	-43	32	23	18	21	22	11	8	20	19	11	18
CHICAGO													567 N.MI.					
5000	13	10	7	8	9	1	0	-14	-11	-7	-8	-10	-18	-20	14	13	9	11
10000	26	18	13	11	16	6	4	-29	-20	-13	-12	-18	-29	-32	15	15	11	13
18000	40	27	18	23	25	12	9	-47	-32	-19	-28	-30	-46	-50	21	21	12	21
CHICAGO													799 N.MI.					
5000	-9	-7	-6	-4	-7	-14	-16	7	6	6	4	5	-1	-3	12	12	8	10
10000	-17	-12	-6	-8	-11	-19	-22	13	9	5	6	8	0	-1	12	13	9	12
18000	-32	-21	-8	-15	-18	-31	-35	19	13	6	8	10	0	-2	19	18	10	17
CHICAGO													1240 N.MI.					
5000	-7	-7	-6	-5	-7	-12	-14	7	6	6	5	5	0	-1	10	9	7	8
10000	-18	-13	-7	-10	-12	-19	-21	16	12	7	9	10	3	2	11	10	9	10
18000	-35	-24	-13	-19	-22	-35	-38	27	21	12	15	17	8	5	17	16	9	15
CHICAGO													261 N.MI.					
5000	3	3	1	2	2	-6	-8	-5	-4	-2	-3	-4	-13	-15	15	14	10	12
10000	6	4	3	3	3	-5	-6	-13	-9	-5	-5	-8	-14	-21	15	16	12	15
18000	5	6	5	6	5	-7	-11	-25	-17	-8	-16	-16	-31	-35	23	23	13	22

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.

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MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS						STANDARD DEVIATION											
	JAN	APR	JUL	OCT	A85	A85	JAN	APR	JUL	OCT	A85	A85						
CHICAGO	TO FORT LEAVENWORTH																	
5000	-12	-8	-7	-8	-9	-18	-20	10	7	7	8	7	0	-2	14	14	10	12
10000	-23	-15	-11	-14	-16	-26	-29	21	13	10	12	13	4	1	15	15	12	14
18000	-40	-27	-18	-25	-27	-42	-46	33	22	17	20	22	9	6	22	22	13	21
CHICAGO	TO FORT LEWIS																	
5000	-11	-6	-4	-8	-8	-14	-15	10	5	4	7	6	0	0	9	9	7	9
10000	-21	-12	-11	-15	-15	-22	-24	20	11	11	14	13	7	5	10	10	8	9
18000	-34	-23	-21	-28	-26	-37	-39	30	19	20	25	23	13	11	15	15	10	15
CHICAGO	TO FORT ORD																	
5000	-6	-5	-3	-4	-5	-10	-11	5	5	3	3	3	0	-2	8	8	6	7
10000	-17	-11	-9	-11	-12	-19	-20	15	10	9	10	10	4	3	10	9	7	9
18000	-33	-24	-18	-23	-24	-34	-37	27	20	18	19	20	11	9	16	15	9	14
CHICAGO	TO FORT RUCKES																	
5000	0	0	0	0	0	-7	-9	-2	-2	0	-1	-2	-9	-11	13	12	8	11
10000	0	0	0	0	0	-8	-10	-6	-5	-1	-2	-4	-12	-15	13	14	10	13
18000	-5	0	2	0	0	-11	-14	-14	-11	-4	-8	-9	-21	-24	19	19	11	18
CHICAGO	TO FORT SILL																	
5000	-10	-8	-7	-6	-8	-16	-18	8	7	7	5	6	-1	-2	13	13	9	11
10000	-20	-14	-8	-10	-13	-22	-25	16	12	7	9	10	2	0	13	13	10	13
18000	-36	-24	-12	-19	-22	-36	-40	25	18	10	13	15	4	1	20	19	11	19
CHICAGO	TO FORT WOLTERS																	
5000	-9	-7	-7	-5	-7	-15	-17	7	6	7	4	6	-1	-3	13	12	9	10
10000	-18	-13	-7	-9	-12	-21	-23	15	11	6	7	9	1	0	13	13	10	12
18000	-34	-23	-10	-17	-20	-34	-38	22	15	8	10	12	1	-1	20	19	11	18
CHICAGO	TO FORTBISHER																	
5000	1	0	3	4	2	-4	-4	-3	-1	-4	-6	-4	-11	-12	10	10	9	10
10000	3	0	2	3	2	-4	-6	-7	-2	-4	-6	-5	-12	-14	10	10	9	10
18000	5	2	2	4	3	-5	-8	-15	-7	-7	-11	-10	-20	-22	15	14	11	14
CHICAGO	TO HILL AFB																	
5000	-8	-6	-5	-7	-7	-13	-15	7	6	5	6	5	0	-1	10	10	7	9
10000	-20	-12	-11	-14	-15	-22	-24	19	11	11	13	13	6	4	11	11	9	10
18000	-36	-25	-21	-26	-27	-38	-41	31	22	20	23	23	13	10	18	17	11	16
CHICAGO	TO HOMESTEAD AFB																	
5000	0	0	0	0	0	-4	-7	-1	-2	0	-1	-1	-8	-9	10	10	7	9
10000	3	3	0	1	1	-5	-6	-9	-6	-1	-2	-5	-12	-14	11	11	8	11
18000	4	6	2	3	3	-5	-7	-19	-15	-3	-9	-11	-22	-25	16	16	9	15

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EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWIND IN KNOTS												STANDARD DEVIATION					
	DIRECT			RETURN			MAY			JULY			OCTOBER			JAN	APP	JUL
CHICAGO TO HUNTER AAF	4	2	2	2	2	2	-7	-5	-2	-3	-3	-5	-5	-12	-14	12	12	680 N.M.I.
5000	9	7	4	3	5	-2	-15	-11	-5	-5	-5	-9	-9	-18	-20	13	13	8 11
10000	9	11	6	7	7	-2	-27	-20	-8	-15	-15	-17	-30	-33	19	19	9 13	
18000																	11 18	
CHICAGO TO HUNTSVILLE	0	0	0	0	0	0	-2	-2	0	-1	-1	-2	-10	-12	14	13	443 N.M.I.	
5000	-1	0	0	0	0	0	-5	-4	-1	-2	-2	-3	-13	-15	14	15	9 11	
10000	-7	-1	1	0	-1	-14	-13	-10	-4	-8	-8	-9	-21	-25	14	21	11 14	
18000																	12 20	
CHICAGO TO JACKSONVILLE	2	1	2	1	1	-5	-5	-4	-1	-2	-2	-3	-10	-12	12	11	757 N.M.I.	
5000	5	5	2	2	3	-4	-12	-9	-1	-4	-4	-7	-16	-18	13	13	8 10	
10000	5	4	4	5	5	-7	-23	-18	-6	-12	-12	-14	-27	-30	19	18	9 12	
18000																	10 18	
CHICAGO TO JUNEAU	-9	-4	-3	-9	-7	-12	8	3	3	8	8	5	0	-1	8	8	1991 N.M.I.	
5000	-18	-10	-10	-15	-14	-20	16	9	10	14	14	12	6	5	9	9	7 8	
10000	-28	-18	-16	-23	-21	-30	24	15	13	20	20	17	9	7	13	12	7 8	
18000																	9 12	
CHICAGO TO KEY WEST	-1	0	0	0	-1	-7	0	0	0	0	0	0	-6	-8	10	10	1089 N.M.I.	
5000	1	1	0	0	0	-6	-6	-5	0	-1	-1	-3	-10	-12	11	11	7 9	
10000	0	4	1	1	1	-7	-16	-13	-3	-7	-7	-9	-20	-22	16	15	8 10	
18000																	9 14	
CHICAGO TO LARSON AFB	-11	-6	-4	-8	-8	-14	10	6	4	7	7	6	0	0	9	9	1368 N.M.I.	
5000	-22	-12	-12	-15	-16	-23	21	11	11	15	15	14	7	5	10	10	7 9	
10000	-35	-23	-22	-28	-27	-37	31	20	21	25	25	23	14	11	16	15	8 10	
18000																	9 14	
CHICAGO TO LITTLE ROCK	-7	-2	-4	-4	-5	-13	5	3	3	3	3	3	-4	-6	14	13	469 N.M.I.	
5000	-15	-9	-5	-7	-9	-19	9	6	4	4	4	5	-3	-5	14	15	9 11	
10000	-24	-17	-7	-13	-15	-30	12	7	4	4	4	6	-5	-8	14	15	11 14	
18000																	12 20	
CHICAGO TO LOCKPORT	12	8	6	7	7	0	-14	-9	-5	-8	-8	-9	-18	-20	15	14	265 N.M.I.	
5000	23	15	12	11	15	6	-25	-18	-12	-13	-13	-17	-28	-31	16	16	10 12	
10000	35	24	17	22	23	10	-44	-29	-19	-28	-28	-29	-45	-49	23	23	12 15	
18000																	13 22	
CHICAGO TO LOUISIANA	13	7	9	10	9	2	-14	-8	-7	-11	-11	-11	-16	-20	15	12	904 N.M.I.	
5000	23	13	17	17	15	7	-26	-15	-15	-14	-14	-19	-28	-30	14	14	9 10	
10000	37	21	11	20	25	13	-42	-26	-24	-31	-31	-30	-43	-47	14	14	13 12	
18000																	12 19	

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
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 \*\*\*SIGN DENOTES HEADWINDS.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION					
	DIRECT			RETURN			EQUVALENT HEADWINDS			STANDARD DEVIATION								
	JAN	APR	JUL	OCT	MAY	AUG	JAN	APR	JUL	OCT	MAY	AUG	JAN	APR	JUL	OCT		
CHICAGO	LUKE AFB																	
5000	-7	-6	-5	-5	-6	-12	-13	6	6	6	4	5	0	-1	9	1262 N.M.I.		
10000	-18	-13	-8	-11	-13	-20	-22	15	12	8	10	11	4	2	11	9 7 8		
18000	-35	-26	-16	-21	-24	-35	-38	28	22	15	17	19	10	7	17	10 8 10 16 9 15		
CHICAGO	MCGUIRE AFB																	
5000	14	10	8	9	9	2	0	-16	-11	-8	-9	-11	-19	-21	14	613 N.M.I.		
10000	28	19	15	14	18	9	6	-30	-21	-15	-15	-20	-30	-33	15	13 9 11		
18000	44	29	21	26	28	15	12	-49	-33	-22	-31	-32	-48	-52	21	15 11 13 21 12 20		
CHICAGO	MEMPHIS																	
5000	-5	-3	-2	-2	-3	-11	-13	2	1	2	1	1	-6	-8	14	427 N.M.I.		
10000	-10	-6	-3	-4	-6	-15	-18	4	2	2	2	2	-6	-8	14	13 9 11		
18000	-22	-11	-4	-8	-10	-24	-28	2	0	1	0	0	-11	-14	22	15 11 14 21 12 20		
CHICAGO	MEXICO CITY																	
5000	-7	-7	-4	-2	-5	-11	-12	6	6	4	1	4	-1	-2	9	1469 N.M.I.		
10000	-11	-8	-3	-4	-7	-13	-15	8	6	3	3	4	0	-2	9	9 6 8		
18000	-23	-15	-1	-9	-11	-22	-25	13	8	0	4	5	-2	-4	14	9 7 9 13 7 12		
CHICAGO	MINN-ST PAUL																	
5000	-12	-8	-6	-9	-9	-18	-20	11	7	5	8	7	-1	-3	15	290 N.M.I.		
10000	-22	-14	-13	-15	-16	-26	-29	20	12	12	14	14	4	2	15	14 11 13		
18000	-38	-25	-21	-27	-27	-42	-46	30	20	19	22	22	8	5	23	16 12 14 22 14 22		
CHICAGO	MINOT AFB																	
5000	-12	-7	-5	-10	-9	-17	-19	11	6	5	9	7	0	-2	13	679 N.M.I.		
10000	-22	-13	-13	-16	-16	-25	-28	20	12	13	15	14	6	4	13	13 10 12		
18000	-35	-23	-22	-27	-27	-39	-43	30	19	20	23	22	10	7	20	13 14 11 13 13 19		
CHICAGO	NELLIS AFB																	
5000	-6	-5	-4	-4	-5	-11	-12	5	5	4	4	4	0	-2	9	1303 N.M.I.		
10000	-17	-11	-9	-11	-12	-19	-21	16	10	9	11	11	4	3	11	9 6 8		
18000	-34	-25	-18	-23	-25	-36	-39	29	21	17	19	20	11	8	17	10 8 10 16 10 15		
CHICAGO	NEW CUMBERLAND																	
5000	14	10	8	9	9	2	0	-15	-11	-8	-9	-11	-19	-21	14	510 N.M.I.		
10000	28	19	15	13	18	8	6	-30	-21	-15	-15	-20	-31	-33	15	13 9 11		
18000	44	28	21	26	28	15	11	-49	-32	-22	-31	-32	-48	-52	22	15 11 14 22 13 21		
CHICAGO	NEW ORLEANS																	
5000	-5	-3	-2	-1	-3	-10	-12	2	1	2	0	1	-5	-7	13	726 N.M.I.		
10000	-9	-5	-2	-3	-5	-13	-15	2	1	2	0	1	-6	-8	13	12 8 10		
18000	-19	-9	0	-4	-8	-20	-24	1	-1	-1	-1	-1	-11	-14	19	13 9 12 18 10 18		

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 \*PLUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION					
	DIRECT						RETURN						JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50					A75	A85
CHICAGO													401 N.M.I.					
5000	14	8	8	10	9	1	0	-15	-9	-8	-10	-11	-19	-22	14	14	10	12
10000	26	17	15	16	18	8	6	-28	-18	-15	-17	-20	-30	-32	15	16	11	14
18000	41	25	21	27	27	13	10	-46	-29	-23	-31	-31	-47	-51	23	22	14	22
CHICAGO													1534 N.M.I.					
5000	-6	-5	-4	-3	-5	-10	-11	5	5	4	2	3	0	-2	8	8	6	7
10000	-16	-11	-9	-10	-12	-18	-20	14	10	8	10	10	4	2	10	9	7	9
18000	-33	-25	-17	-21	-23	-34	-37	27	21	16	17	19	10	8	16	15	9	14
CHICAGO													898 N.M.I.					
5000	1	2	1	2	1	-5	-6	-3	-3	-1	-2	-3	-9	-11	11	11	7	10
10000	5	4	2	2	3	-4	-5	-11	-8	-3	-3	-6	-14	-16	12	12	5	11
18000	5	8	4	4	5	-4	-7	-22	-17	-5	-11	-13	-25	-28	17	17	10	16
CHICAGO													358 N.M.I.					
5000	14	9	7	9	9	0	-1	-15	-10	-7	-9	-10	-19	-22	15	14	10	12
10000	27	18	14	14	17	8	5	-29	-20	-14	-15	-19	-30	-33	15	16	11	14
18000	43	27	20	26	27	14	10	-48	-31	-21	-30	-31	-47	-52	23	22	13	22
CHICAGO													858 N.M.I.					
5000	-11	-6	-5	-9	-8	-16	-18	10	5	5	8	6	0	-2	12	12	10	12
10000	-21	-12	-13	-6	-16	-24	-26	20	11	12	14	14	6	4	14	13	10	12
18000	-34	-22	-21	-27	-26	-37	-40	28	18	18	23	21	10	7	18	17	12	17
CHICAGO													227 N.M.I.					
5000	-7	-4	-3	-4	-5	-13	-16	4	2	3	3	3	-5	-7	15	14	10	12
10000	-14	-9	-5	-7	-9	-19	-22	8	5	4	5	5	-4	-6	15	16	12	15
18000	-27	-16	-9	-13	-16	-30	-34	9	6	6	3	6	-7	-10	23	23	13	22
CHICAGO													228 N.M.I.					
5000	14	8	8	10	9	1	-1	-15	-9	-8	-10	-11	-20	-22	15	14	10	13
10000	26	16	14	15	17	7	4	-27	-18	-15	-16	-19	-30	-32	16	16	12	15
18000	41	25	21	26	27	13	9	-46	-29	-22	-30	-31	-47	-51	23	23	14	23
CHICAGO													594 N.M.I.					
5000	7	6	4	4	5	-2	-4	-9	-7	-4	-4	-6	-14	-16	13	12	9	11
10000	13	10	6	5	8	0	-2	-19	-14	-7	-7	-12	-21	-24	14	14	10	13
18000	16	15	8	11	11	0	-2	-33	-24	-11	-18	-20	-35	-38	20	20	11	19
CHICAGO													683 N.M.I.					
5000	15	9	8	10	10	2	0	-16	-10	-8	-10	-11	-19	-21	13	13	9	11
10000	28	18	15	14	18	9	7	-30	-20	-16	-17	-21	-30	-33	15	15	10	13
18000	43	27	22	29	28	16	13	-48	-31	-23	-32	-33	-48	-52	21	21	13	20

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.

\*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWIND												STANDARD DEVIATION				
	DIRECT						RETURN						JAN	APR	JUL	OCT	
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50					A75
CHICAGO 5000 10000 18000	TU 10 18 27	4 11 16	6 10 15	8 12 18	6 12 18	-2 2 4	-4 0 1	-12 -22 -37	-5 -13 -23	-6 -12 -18	-9 -14 -25	-8 -15 -25	-17 -26 -40	-20 -28 -45	15 16 23	14 12 23	248 N.MI.
CHICAGO 5000 10000 18000	TO -11 -21 -35	-6 -12 -23	-4 -11 -22	-8 -15 -28	-8 -15 -27	-14 -22 -37	-15 -24 -40	10 20 31	6 11 20	7 14 21	7 14 25	6 13 23	0 7 14	0 5 12	9 10 16	9 8 15	1418 N.MI.
CHICAGO 5000 10000 18000	TO -7 -16 -26	-3 -9 -16	-3 -11 -16	-9 -13 -20	-6 -13 -20	-12 -19 -29	-14 -20 -31	6 14 20	2 8 13	2 10 13	7 12 16	4 11 15	-2 3 6	-3 3 4	10 9 14	9 8 13	1546 N.MI.
CHITOSE AB 5000 10000 18000	TO -5 -15 -24	-5 -13 -18	-5 -6 -6	-9 -9 -13	-4 -11 -16	-9 -17 -25	-10 -19 -27	4 10 14	5 11 10	5 6 5	0 7 8	3 8 9	-1 3 2	-2 1 0	7 8 10	7 7 10	1980 N.MI.
CHITOSE AB 5000 10000 18000	TO -7 -19 -35	-6 -14 -24	-5 -6 -9	-1 -10 -18	-5 -13 -21	-10 -19 -31	-12 -21 -34	6 15 23	6 12 17	5 6 8	1 8 13	4 10 14	0 4 7	-1 2 5	7 8 11	7 8 10	1030 N.MI.
CHITOSE AB 5000 10000 18000	TO -9 -20 -31	-6 -15 -23	-4 -7 -10	-7 -16 -24	-7 -15 -22	-14 -24 -34	-16 -26 -38	6 12 13	5 11 13	4 6 8	6 13 15	5 10 12	-1 2 1	-3 0 -1	11 13 18	11 10 13	601 N.MI.
CHITOSE AB 5000 10000 18000	TO 0 -3 -12	-2 -3 -7	-4 -3 -4	-3 -5 -8	-3 -4 -8	-9 -11 -17	-10 -13 -20	-1 -5 -14	1 0 -7	4 3 1	2 2 -1	1 0 -5	-4 -7 -15	-6 -9 -18	10 11 15	9 9 14	1001 N.MI.
CHITOSE AB 5000 10000 18000	TO -6 -17 -32	-5 -15 -21	-4 -6 -9	-3 -12 -18	-5 -13 -20	-11 -20 -31	-12 -22 -33	4 10 13	5 12 10	4 6 7	2 10 10	3 9 9	-2 2 1	-3 0 0	9 11 14	9 10 13	1198 N.MI.
CHITOSE AB 5000 10000 18000	TO -13 -25 -37	-8 -18 -28	-4 -7 -12	-9 -20 -23	-9 -18 -26	-16 -27 -39	-18 -30 -42	11 21 27	7 16 22	4 7 10	9 18 23	7 15 20	0 6 8	-1 4 5	10 12 18	11 13 16	749 N.MI.

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN	EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION						
	HONGKONG				PEIPING				SHEWAN				TOKYO				JAN	APR	JUL
FFFT	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	
CHITOSE AN TO PEIPING																			
5000	-13	-8	-4	-8	-9	-15	-17	11	7	4	7	7	1	0	9	9	11	11	11
10000	-24	-18	-6	-18	-17	-25	-27	21	17	6	16	14	7	5	11	10	9	10	10
18000	-38	-28	-12	-28	-27	-38	-41	32	24	11	25	22	12	9	15	11	11	13	13
CHITOSE AN TO PUSAN EAST																			
5000	-11	-7	-4	-8	-8	-15	-17	8	6	4	7	6	0	-2	10	11	9	11	11
10000	-23	-17	-7	-18	-16	-26	-28	17	14	7	16	13	4	2	13	13	10	10	10
18000	-35	-26	-11	-26	-24	-37	-40	21	17	9	19	16	5	2	18	14	13	16	16
CHITOSE AN TO SHANGHAI																			
5000	-12	-7	-5	-5	-7	-13	-15	9	6	4	4	5	0	-1	8	9	8	9	9
10000	-22	-14	-7	-15	-15	-23	-25	17	14	5	17	12	4	2	11	11	9	10	10
18000	-37	-26	-11	-21	-24	-35	-38	25	19	10	17	17	8	5	15	13	11	13	13
CHITOSE AN TO SHENYEA																			
5000	6	7	6	11	7	0	-1	-8	-9	-6	-13	-9	-17	-19	12	11	9	11	11
10000	14	11	7	18	12	4	2	-17	-13	-8	-20	-15	-23	-25	12	12	9	12	12
18000	20	17	9	24	17	6	3	-27	-21	-11	-29	-22	-34	-37	17	16	13	16	16
CHITOSE AN TO TAIPEI																			
5000	-7	-6	-5	-2	-6	-11	-12	5	4	5	1	4	-1	-2	8	8	8	8	8
10000	-19	-15	-6	-12	-13	-20	-22	13	13	6	10	10	4	2	10	9	8	9	9
18000	-35	-23	-9	-18	-21	-32	-34	20	15	8	12	13	5	3	13	12	9	11	11
CHITOSE AN TO TOKYO																			
5000	-2	-3	-3	-4	-4	-11	-13	0	2	3	3	1	-5	-7	12	12	9	12	12
10000	-8	-6	-4	-10	-7	-16	-19	-2	1	3	5	1	-7	-9	14	14	11	13	13
18000	-12	-10	-4	-13	-10	-23	-26	-10	-3	1	0	-3	-15	-19	20	19	15	19	19
CHITOSE AN TO WAKE ISLAND																			
5000	5	0	-2	0	0	-5	-7	-8	-1	1	0	-2	-8	-10	9	8	7	8	8
10000	15	6	0	2	5	-1	-7	-20	-10	-1	-5	-9	-17	-19	9	9	7	8	8
18000	22	19	3	9	12	3	1	-40	-27	-6	-17	-22	-35	-38	12	11	9	11	11
CHITOSE AN TO GAMPUS CHEISTE																			
5000	0	-1	-3	0	-2	-7	-9	1	0	2	-1	0	-6	-7	9	9	7	9	9
10000	0	0	0	0	0	-6	-7	-3	-1	0	-3	-2	-8	-9	9	9	7	9	9
18000	-5	-3	-1	0	-3	-10	-12	-8	-4	-2	-6	-5	-13	-15	13	12	9	12	12
CHITOSE AN TO UOUEA AFB																			
5000	4	4	4	4	4	-1	-3	-7	-5	-4	-6	-6	-13	-14	10	10	8	10	10
10000	11	7	10	8	9	2	0	-15	-9	-11	-11	-12	-19	-21	11	11	9	10	10
18000	13	12	14	11	12	3	0	-25	-17	-17	-18	-20	-29	-32	16	15	11	15	15

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 000--EVENTS ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 +PLUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WIND IN KTS	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT			ECLIPSE			HEADWIND			RETURN			JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	00350	A75	A85	JAN	APR	JUL	UCT	00A50	A75	A85				
CHURCHILL	EDMONTON																	
5000	-9	-2	-4	-10	-6	-14	-16	7	2	3	8	4	-2	-4	12	10	10	12
10000	-9	-4	-8	-10	-9	-16	-17	7	5	7	8	6	0	-1	10	10	10	10
18000	-16	-13	-13	-17	-15	-25	-28	11	11	11	12	11	1	-1	16	15	13	16
CHURCHILL	EGLIN AFB																	
5000	1	1	3	1	3	-5	-6	-3	-2	-1	-3	-3	-9	-10	10	9	7	9
10000	3	2	3	3	2	-3	-4	-8	-5	-4	-6	-6	-12	-14	9	10	8	9
18000	1	3	5	4	3	-5	-7	-16	-11	-9	-11	-12	-21	-23	14	14	9	14
CHURCHILL	EIELSON AFB																	
5000	-3	-2	0	-9	-4	-10	-11	2	2	0	8	2	-3	-4	8	8	8	9
10000	-9	-6	-8	-9	-7	-14	-15	9	6	5	8	7	2	1	9	8	7	7
18000	-18	-13	-13	-16	-15	-23	-25	16	11	12	15	13	6	4	12	11	9	11
CHURCHILL	ELLINGTON AFB																	
5000	0	0	-2	0	-1	-7	-8	-1	0	1	-1	0	-6	-8	9	9	7	9
10000	0	0	0	1	0	-5	-7	-5	-2	-1	-4	-3	-10	-11	9	9	8	9
18000	-3	-1	0	0	-1	-9	-11	-9	-6	-3	-7	-6	-15	-17	14	13	9	13
CHURCHILL	ELLSWORTH AFB																	
5000	-1	0	-2	-2	-2	-9	-11	0	0	2	0	0	-7	-9	11	11	10	12
10000	0	0	-2	0	-1	-8	-10	-2	-1	0	-1	-1	-8	-10	10	11	10	11
18000	-4	-3	-7	-4	-5	-15	-17	-5	-1	2	-2	-1	-12	-14	16	15	12	16
CHURCHILL	ELMENDORF AFB																	
5000	-3	-2	-1	-9	-4	-10	-11	2	2	1	8	3	-2	-3	8	8	7	9
10000	-9	-6	-8	-9	-9	-14	-15	9	5	7	9	7	2	0	9	8	7	8
18000	-19	-13	-12	-17	-15	-23	-25	15	11	11	15	12	5	3	13	11	10	11
CHURCHILL	FLYING WINGS																	
5000	-5	-2	-3	-3	-4	-9	-10	4	2	3	2	2	-2	-3	6	7	6	8
10000	-4	-2	-5	-4	-4	-10	-11	1	1	4	2	2	-3	-4	8	8	7	8
18000	-11	-9	-12	-9	-11	-19	-21	1	4	9	3	4	-3	-6	14	13	9	12
CHURCHILL	ENGLAND AFB																	
5000	0	0	-1	1	0	-6	-7	-2	-1	0	-2	-1	-8	-9	10	9	8	9
10000	1	1	1	2	1	-4	-6	-6	-3	-2	-4	-5	-11	-12	9	10	8	9
18000	-1	0	2	2	0	-7	-10	-12	-8	-6	-9	-9	-18	-20	14	14	9	14
CHURCHILL	FORT BENNING																	
5000	2	2	1	2	1	-4	-5	-4	-3	-1	-3	-3	-9	-11	10	9	8	9
10000	5	3	4	4	4	-2	-4	-10	-6	-6	-6	-7	-14	-16	10	10	8	10
18000	3	5	6	5	4	-3	-6	-18	-12	-10	-13	-13	-22	-25	15	14	9	14

00A75-00A85--COMPUTED FOR A 120-KT AIRSPEED.  
 00A75-00A85--NOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 \*MINUS SIG. DENOTES HEADWINDS.

ANNUAL EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT TYPE	EQUIVALENT HEADWIND IN KNOTS												STANDARD DEVIATION					
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	APR	JUL	OCT		
CHLSCMILL	FORT BLISS												1692 N.M.I.					
5000	-1	-2	-4	-3	-3	-3	-10	-3	-3	2	2	1	-3	-4	8	8	7	8
10000	-1	-1	-3	-1	-2	-8	-9	-9	-9	0	0	0	-6	-7	9	9	7	9
18000	-7	-6	-7	-4	-7	-15	-17	-17	-17	-3	-2	0	-9	-11	14	13	9	13
CHLSCMILL	FORT BRAGG/RIPE												1538 N.M.I.					
5000	4	3	3	3	3	-3	-4	-4	-4	-6	-3	-5	-11	-13	10	10	8	9
10000	9	6	7	6	7	0	-1	-1	-1	-14	-9	-8	-10	-17	10	10	8	10
18000	9	9	10	7	8	0	-2	-2	-2	-23	-16	-15	-17	-29	15	14	10	15
CHLSCMILL	FORT CAMPBELL												1350 N.M.I.					
5000	2	2	0	2	1	-5	-6	-6	-6	-4	-3	-4	-3	-10	11	10	8	10
10000	5	3	4	4	4	-2	-4	-4	-4	-10	-6	-7	-9	-16	10	11	9	10
18000	4	5	6	5	5	-4	-6	-6	-6	-17	-11	-13	-13	-25	16	15	10	15
CHLSCMILL	FORT CARSON												1273 N.M.I.					
5000	0	-1	-3	-2	-2	-9	-10	-10	-10	0	0	1	0	-7	10	10	8	10
10000	0	0	-3	0	-1	-8	-9	-9	-9	-2	-1	-1	-1	-9	10	10	8	10
18000	-5	-4	-7	-4	-6	-15	-17	-17	-17	-4	0	-2	-1	-13	15	14	11	14
CHLSCMILL	FORT FUSTIS												1409 N.M.I.					
5000	5	3	4	4	4	-2	-4	-4	-4	-7	-5	-4	-6	-12	10	10	8	10
10000	10	7	9	8	8	1	0	0	0	-15	-9	-11	-12	-19	11	11	9	10
18000	12	11	13	10	11	2	0	0	0	-25	-17	-17	-19	-32	16	15	11	15
CHLSCMILL	FORT MOOD												1663 N.M.I.					
5000	0	0	-3	0	-1	-7	-9	-9	-9	-1	0	2	0	-8	9	9	8	9
10000	0	0	0	1	0	-5	-7	-7	-7	-4	-2	0	-3	-10	9	9	8	9
18000	-3	-2	-1	0	-2	-10	-12	-12	-12	-9	-4	-2	-6	-16	14	13	9	13
CHLSCMILL	FORT HUACHUCA												1759 N.M.I.					
5000	-2	-2	-3	-3	-3	-8	-9	-9	-9	1	2	3	2	-4	8	7	6	8
10000	-2	-2	-4	-2	-3	-8	-10	-10	-10	0	0	3	0	-6	8	8	7	8
18000	-8	-7	-10	-6	-8	-16	-18	-18	-18	-1	1	6	0	-8	14	12	9	12
CHLSCMILL	FORT KNOX												1290 N.M.I.					
5000	2	2	1	2	1	-5	-6	-6	-6	-4	-3	-2	-4	-11	11	10	9	10
10000	7	4	4	5	4	-1	-3	-3	-3	-11	-5	-7	-8	-17	11	11	9	10
18000	7	6	9	6	6	-2	-5	-5	-5	-19	-13	-12	-14	-27	16	15	11	15
CHLSCMILL	FORT LEAVENWORTH												1163 N.M.I.					
5000	1	1	0	1	0	-6	-8	-8	-8	-3	-2	0	-2	-9	11	11	9	11
10000	3	2	1	3	2	-4	-6	-6	-6	-7	-4	-3	-5	-12	10	11	9	11
18000	1	1	0	1	0	-8	-11	-11	-11	-12	-7	-5	-9	-18	16	15	11	15

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*\*--DEFINES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DUFFY				M E A D W I N D S				RETURN				JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	00450	075	085	JAN	APR	JUL	OCT	00450	075	085	JAN	APR	JUL	OCT
CHURCHILL																		
SCOO	-9	-3	-3	-8	-6	-13	-14	0	3	3	7	5	-1	-2	10	9	8	10
10000	-10	-6	-7	-11	-9	-15	-17	0	6	6	9	7	1	0	10	9	8	9
18000	-17	-13	-13	-18	-16	-25	-27	10	10	11	12	10	1	0	15	14	11	14
CHURCHILL																		
SCOO	-6	-3	-2	-5	-4	-9	-11	6	2	2	4	3	-1	-2	8	7	6	8
10000	-7	-4	-6	-6	-6	-12	-13	4	3	5	4	4	-1	-2	9	8	7	8
18000	-13	-10	-13	-12	-13	-21	-23	4	6	10	6	6	-1	-4	14	13	10	13
CHURCHILL																		
SCOO	1	1	0	2	0	-4	-6	-3	-2	-1	-3	-3	-9	-10	10	9	7	9
10000	4	3	3	3	3	-3	-4	-9	-6	-5	-6	-7	-13	-15	10	10	8	9
18000	2	7	6	6	4	-4	-6	-17	-12	-10	-12	-13	-22	-24	14	14	9	14
CHURCHILL																		
SCOO	0	0	-2	0	-1	-7	-9	-2	0	1	-2	-1	-7	-9	10	10	8	10
10000	1	0	0	1	0	-6	-7	-5	-2	-1	-4	-3	-10	-12	10	10	8	10
18000	-2	-2	-1	0	-2	-11	-13	-9	-4	-2	-6	-5	-15	-17	15	14	10	14
CHURCHILL																		
SCOO	0	0	-2	0	-1	-7	-8	-1	0	2	-1	0	-6	-8	9	9	8	9
10000	0	0	0	1	0	-6	-7	-4	-2	-1	-3	-3	-9	-11	9	10	8	9
18000	-3	-2	-1	0	-2	-10	-12	-9	-4	-2	-7	-6	-14	-17	15	13	9	13
CHURCHILL																		
SCOO	4	1	5	7	4	-3	-4	-4	-2	-6	-8	-5	-13	-15	10	10	11	11
10000	6	4	5	7	5	-1	-3	-7	-5	-6	-8	-7	-14	-16	11	11	10	11
18000	10	8	7	11	8	0	-3	-13	-11	-9	-14	-12	-22	-25	15	15	13	15
CHURCHILL																		
SCOO	3	2	1	3	2	-5	-7	-4	-3	-2	-5	-4	-11	-13	11	11	10	12
10000	8	4	6	6	6	-1	-3	-11	-6	-8	-8	-9	-16	-18	11	12	10	11
18000	9	7	9	7	8	-2	-4	-19	-12	-13	-14	-15	-25	-28	17	16	12	16
CHURCHILL																		
SCOO	-5	-1	-3	-4	-4	-10	-11	4	1	3	3	2	-3	-4	9	9	8	10
10000	-4	-2	-5	-4	-4	-10	-12	1	1	4	2	2	-3	-5	9	9	8	9
18000	-9	-8	-12	-9	-10	-19	-21	0	3	8	2	3	-5	-8	15	14	11	14
CHURCHILL																		
SCOO	3	2	2	2	2	-3	-5	-5	-3	-2	-4	-4	-10	-11	10	9	7	9
10000	7	5	5	5	5	-1	-2	-12	-7	-7	-7	-9	-15	-17	10	10	8	9
18000	6	7	8	5	6	-1	-4	-20	-16	-12	-13	-15	-24	-26	14	14	9	14

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 004--0075--ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 PLUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEADING IN FEET	EQUVALENT HEADWINDS							STANDARD DEVIATION							
	JAN	FEB	MAR	APR	MAY	JUN	JUL	JAN	FEB	MAR	APR	MAY	JUN	JUL	OCT
CHURCHMILL															
5000	2	2	0	2	1	1	4	-6	-4	-3	-1	-3	-3	-10	-11
10000	5	3	4	4	4	4	-2	-4	-10	-6	-6	-6	-8	-14	-16
18000	3	4	6	5	4	4	-4	-6	-17	-12	-10	-13	-13	-23	-25
CHURCHMILL															
5000	2	2	1	2	1	1	4	-5	-4	-3	-2	-4	-4	-9	-11
10000	6	4	4	4	4	4	-1	-3	-11	-7	-5	-6	-8	-14	-16
18000	7	6	7	5	5	5	-2	-4	-19	-14	-11	-13	-14	-23	-25
CHURCHMILL															
5000	4	3	3	3	3	3	10	5	5	3	3	10	5	-1	-2
10000	-11	-7	-8	-12	-10	-16	-17	-17	10	7	8	12	9	3	1
18000	-19	-15	-12	-18	-16	-25	-27	-25	16	13	11	17	14	5	3
CHURCHMILL															
5000	-2	-2	-2	-2	-4	-9	-11	-11	2	2	2	7	3	-2	-3
10000	-10	-6	-7	-10	-9	-14	-16	-16	5	5	7	9	7	2	0
18000	-18	-14	-12	-17	-16	-23	-25	-25	15	12	11	15	13	5	3
CHURCHMILL															
5000	-9	-3	-3	-7	-6	-12	-14	-14	8	2	3	6	4	-1	-3
10000	-9	-6	-7	-10	-8	-15	-16	-16	7	5	6	8	6	0	-1
18000	-14	-12	-13	-16	-15	-24	-27	-27	8	9	11	10	9	0	-2
CHURCHMILL															
5000	1	0	0	1	0	0	6	-7	-3	-2	0	-2	-2	-9	-10
10000	3	2	1	3	2	2	-4	-6	-7	-4	-3	-5	-5	-12	-14
18000	0	1	2	2	1	1	-7	-9	-13	-8	-7	-10	-10	-19	-21
CHURCHMILL															
5000	4	3	2	3	2	2	3	-5	-5	-4	-3	-5	-5	-12	-13
10000	9	5	7	6	6	6	0	-2	-13	-8	-9	-9	-10	-17	-19
18000	10	9	10	8	9	9	7	-2	-22	-15	-15	-16	-17	-27	-30
CHURCHMILL															
5000	9	7	7	7	7	7	0	-1	-10	-5	-7	-10	-9	-16	-18
10000	13	7	13	13	11	6	2	2	-15	-9	-14	-14	-14	-21	-23
18000	19	12	20	18	17	7	4	4	-24	-15	-22	-23	-22	-32	-34
CHURCHMILL															
5000	-4	-2	-3	-3	-4	-8	-10	-10	3	2	3	2	2	-2	-3
10000	-3	-2	-4	-3	-4	-9	-10	-10	0	1	3	1	1	-4	-5
18000	-8	-3	-11	-7	-10	-18	-20	-20	0	2	8	1	3	-5	-8

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*\*--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT FT	EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT			EQUVALENT			RETURN			STANDARD DEVIATION			JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT
CHURCHILL 5000 10000 18000	TO	4	4	4	5	6	-2	-3	-8	-5	-5	-6	-13	-15	11	10	9	10
	TO	12	7	10	9	9	2	0	-15	-9	-12	-11	-19	-21	11	11	9	10
	TO	14	12	15	12	13	3	1	-25	-17	-18	-19	-20	-30	16	15	11	15
CHURCHILL 5000 10000 18000	TO	1	1	0	1	0	-5	-7	-3	-2	0	-3	-2	-9	10	10	8	10
	TO	3	2	2	3	2	-4	-5	-8	-5	-4	-6	-6	-13	10	11	9	10
	TO	1	2	4	4	2	-6	-8	-15	-10	-8	-12	-11	-21	15	15	10	15
CHURCHILL 5000 10000 18000	TO	1	1	0	1	0	-7	-9	-3	-2	0	-3	-2	-10	12	11	10	12
	TO	4	3	3	4	4	-3	-5	-9	-5	-5	-7	-7	-15	11	12	10	11
	TO	5	4	4	4	4	-5	-8	-14	-9	-9	-11	-11	-21	17	16	12	16
CHURCHILL 5000 10000 18000	TO	-1	0	-2	-2	-2	-10	-12	0	0	2	0	0	-7	12	12	11	13
	TO	0	0	-2	0	-1	-9	-10	-2	-1	0	-2	-2	-9	11	12	10	11
	TO	-3	-2	-6	-3	-4	-14	-17	-5	-1	1	-2	-2	-12	17	15	13	16
CHURCHILL 5000 10000 18000	TO	-5	-2	-3	-4	-4	-9	-11	4	2	3	3	3	-2	8	8	7	8
	TO	-4	-2	-5	-4	-4	-10	-11	1	1	4	2	2	-3	8	8	7	8
	TO	-10	-8	-12	-9	-10	-19	-21	0	3	9	3	4	-4	14	13	10	13
CHURCHILL 5000 10000 18000	TO	5	3	4	4	4	-2	-4	-7	-4	-5	-6	-6	-13	11	10	9	10
	TO	11	7	10	8	9	2	0	-15	-9	-11	-11	-12	-19	11	11	9	10
	TO	14	11	14	11	12	2	0	-24	-17	-18	-18	-20	-29	16	15	11	16
CHURCHILL 5000 10000 18000	TO	0	0	0	1	0	-5	-7	-2	-1	0	-2	-2	-7	9	9	7	9
	TO	2	1	1	2	1	-4	-6	-7	-4	-3	-5	-5	-11	9	10	8	9
	TO	-1	1	4	2	1	-6	-9	-13	-9	-7	-10	-10	-18	14	13	9	13
CHURCHILL 5000 10000 18000	TO	5	3	4	5	4	-2	-4	-7	-4	-5	-6	-6	-13	11	11	9	11
	TO	11	7	10	9	9	1	0	-14	-9	-12	-12	-12	-20	11	12	10	11
	TO	15	11	15	12	13	3	0	-24	-16	-18	-19	-20	-30	16	16	12	16
CHURCHILL 5000 10000 18000	TO	-5	-2	-2	-3	-3	-6	-10	5	2	2	3	2	-2	8	7	6	8
	TO	-5	-3	-5	-4	-5	-10	-11	2	1	5	3	2	-2	8	8	7	8
	TO	-11	-10	-12	-10	-11	-19	-21	2	4	9	4	5	-3	14	13	9	13

• HEADWINDS—COMPUTED FOR A 120-KT AIRSPEED.  
 ••—MINUTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 •••—MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN POUNDS	EQUVALENT HEADWINDS												STANDARD DEVIATION					
	DIRECT						RETURN						JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	A75	A85	JAN	APR	JUL	OCT	A75	A85						
CHURCHMILL	TO	2	1	1	PATRICK	AFB	-4	-3	-2	-3	-3	-9	-10	9	9	7	8	1913 N.M.I.
SCOO	2	4	4	4			-10	-6	-6	-6	-7	-13	-15	9	9	7	9	
10000	5	6	7	5	5	-2	-4	-10	-10	-12	-14	-22	-25	13	13	9	13	
18000	5	6	7	5	5	-2	-4	-10	-10	-12	-14	-22	-25	13	13	9	13	
CHURCHMILL	TO	3	3	4	PITTSBURGH		-6	-4	-4	-6	-5	-13	-14	11	11	9	11	1215 N.M.I.
SCOO	4	6	9	8		0	-14	-8	-10	-10	-11	-18	-20	11	11	9	11	
10000	10	10	13	10	11	1	-1	-23	-16	-17	-18	-28	-31	16	16	11	16	
18000	12	10	13	10	11	1	-1	-23	-16	-17	-18	-28	-31	16	16	11	16	
CHURCHMILL	TO	0	0	0	PROUDHOF	BAV	1	0	0	4	0	-5	-6	9	8	8	10	1494 N.M.I.
SCOO	-2	-6	-4	-9			8	5	9	9	7	2	1	8	8	7	7	
10000	-9	-6	-4	-9			15	11	13	14	13	6	4	12	11	9	10	
18000	-17	-12	-14	-15	-15	-22	-24	15	11	13	14	13	6	12	11	9	10	
CHURCHMILL	TO	-1	-3	-5	REGINA		2	0	3	3	2	-6	-7	12	11	11	13	619 N.M.I.
SCOO	-3	-2	-4	-3			0	0	2	1	0	-6	-8	11	11	10	11	
10000	-7	-7	-9	-8	-8	-18	-21	0	3	5	2	-7	-10	16	15	13	16	
18000	-7	-7	-9	-8	-8	-18	-21	0	3	5	2	-7	-10	16	15	13	16	
CHURCHMILL	TO	1	0	1	SCOTT	AFB	-3	-2	-1	-3	-3	-10	-11	11	10	9	11	1222 N.M.I.
SCOO	2	3	3	4			-9	-5	-5	-7	-7	-14	-16	11	11	9	11	
10000	5	3	3	4			-16	-10	-10	-13	-13	-22	-25	16	15	11	15	
18000	4	3	5	5	4	-5	-7	-16	-10	-10	-13	-22	-25	16	15	11	15	
CHURCHMILL	TO	3	2	4	SELFRIDGE	AFB	-6	-4	-3	-6	-5	-12	-14	11	11	9	11	1056 N.M.I.
SCOO	4	6	8	8			-13	-8	-10	-10	-11	-18	-20	11	12	10	11	
10000	10	10	12	10	11	0	-1	-22	-15	-16	-17	-28	-31	17	16	12	16	
18000	12	10	12	10	11	0	-1	-22	-15	-16	-17	-28	-31	17	16	12	16	
CHURCHMILL	TO	3	2	3	SHAW	AFB	-5	-4	-3	-4	-4	-11	-12	10	9	8	9	1582 N.M.I.
SCOO	8	5	6	5			-13	-8	-8	-8	-10	-16	-18	10	10	8	10	
10000	7	8	9	5	7	-1	-3	-21	-15	-13	-14	-25	-28	15	14	10	14	
18000	7	8	9	5	7	-1	-3	-21	-15	-13	-14	-25	-28	15	14	10	14	
CHURCHMILL	TO	1	2	3	THULE		1	-1	-3	-4	-2	-8	-10	8	9	9	9	1191 N.M.I.
SCOO	-3	1	0	0			2	-2	0	-1	-1	-7	-8	9	9	9	9	
10000	0	0	0	0	0	-8	-11	-3	-3	-1	-3	-12	-14	13	13	12	13	
18000	0	0	0	0	0	-8	-11	-3	-3	-1	-3	-12	-14	13	13	12	13	
CHURCHMILL	TO	7	4	5	WESTOVER	AFB	-9	-5	-6	-7	-7	-14	-16	11	10	9	10	1277 N.M.I.
SCOO	13	8	11	11	10	3	1	-16	-9	-13	-13	-21	-22	11	11	9	11	
10000	14	12	16	14	14	5	2	-25	-17	-20	-20	-31	-33	16	15	11	15	
18000	14	12	16	14	14	5	2	-25	-17	-20	-20	-31	-33	16	15	11	15	

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*\*--NOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

ROUTE IN FEET	EQUIVALENT HEADWIND IN KNOTS												STANDARD DEVIATION			
	PERCENT ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PERCENT RELIABILITIES.												JAN	APR	JUL	OCT
	JAN	APR	JUL	OCT	90ASO	975	ABS	JAN	APR	JUL	OCT	90ASO	975	ABS		
CMURCHILL		TO													943 N.MI.	
5000	4	3	4	3	3	-4	-6	-6	-4	-4	-6	-5	-13	-15	12	
10000	11	6	9	8	8	1	0	-13	-8	-11	-11	-11	-19	-21	11	
18000	13	10	13	11	11	1	-1	-21	-14	-17	-17	-18	-28	-31	17	
CMURCHILL		TO													1196 N.MI.	
5000	-9	-3	-3	-7	-6	-12	-14	8	3	3	6	4	-1	-3	10	
10000	-10	-4	-7	-10	-9	-15	-16	7	5	6	8	6	0	-1	10	
18000	-16	-13	-13	-16	-15	-24	-27	9	9	11	11	10	0	-1	15	
CMURCHILL		TO													637 N.MI.	
5000	-5	-2	-3	-11	-5	-13	-16	5	2	3	10	4	-2	-4	11	
10000	-12	-7	-11	-12	-11	-14	-20	11	7	10	12	10	3	1	10	
18000	-20	-15	-16	-14	-14	-27	-30	14	14	15	18	15	6	4	15	
CLARK AFR		TO													715 N.MI.	
5000	2	5	-4	7	2	-2	-4	-2	-4	4	-6	-3	-8	-9	6	
10000	0	0	-4	0	-1	-6	-7	0	0	4	0	0	-4	-5	8	
18000	-5	-4	3	2	-1	-7	-9	5	4	-3	-2	0	-5	-7	9	
CLARK AFR		TO													1770 N.MI.	
5000	2	0	-3	-4	-2	-5	-6	-3	0	4	4	1	-2	-3	5	
10000	-2	-1	-2	-3	-3	-6	-7	2	1	2	3	2	-1	-2	5	
18000	-2	-1	-3	-2	-3	-6	-7	2	1	3	2	2	-1	-2	6	
CLARK AFR		TO													570 N.MI.	
5000	-3	-2	-1	-5	-3	-7	-9	2	3	2	5	2	-1	-2	6	
10000	-5	-2	-3	-4	-4	-9	-10	5	3	3	4	3	-1	-2	8	
18000	-3	-3	-4	-4	-4	-9	-11	3	3	4	5	3	-1	-2	8	
CLARK AFR		TO													1517 N.MI.	
5000	5	1	-4	-3	0	-5	-6	-5	-1	5	3	0	-4	-5	5	
10000	5	1	-3	-2	0	-4	-5	-5	-1	3	2	0	-5	-6	5	
18000	3	1	2	3	1	-2	-3	0	-1	-2	-2	-2	-6	-7	6	
CLARK AFR		TO													908 N.MI.	
5000	2	2	-1	6	2	-2	-4	-2	-2	0	-6	-3	-8	-9	6	
10000	-2	-2	-3	-1	-3	-8	-9	1	2	3	1	1	-3	-4	8	
18000	-12	-9	3	0	-4	-12	-14	11	8	-3	0	3	-3	-5	9	
CLARK AFR		TO													560 N.MI.	
5000	5	5	3	3	4	-1	-2	-4	-5	-3	-3	-4	-9	-11	7	
10000	2	3	0	1	1	-4	-5	-3	-3	-1	-1	-3	-8	-10	9	
18000	-9	-5	3	1	-2	-9	-11	5	4	-1	-1	0	-6	-7	10	

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
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 - MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION					
	M F A D M I N D S *												RETURN					
	JAN	APR	JUL	JCT	00A50	A75	AB5	JAN	APR	JUL	OCT	00A50	A75	AB5	JAN	APR	JUL	OCT
CLARK AFB	IMAKUPT																	
5000	3	5	5	-2	2	-2	-4	-4	-5	-5	2	-3	-9	-10	7	7	8	7
10000	11	5	4	7	1	0	0	-12	-12	-6	-5	-9	-15	-17	9	8	9	8
18000	14	9	4	5	7	1	0	-26	-15	-5	-7	-13	-22	-25	10	10	8	9
CLARK AFB	IMD JIMA AB																	
5000	4	3	2	-1	1	-3	-5	-5	-3	-2	4	-2	-7	-9	7	6	8	7
10000	7	3	2	1	2	-2	-4	-9	-1	-3	-2	-4	-10	-11	8	6	8	8
18000	20	13	0	4	8	1	0	-23	-15	-1	-4	-11	-20	-22	9	8	8	8
CLARK AFB	KAUFNA AB																	
5000	4	5	5	-1	2	-3	-4	-4	-2	-5	3	-3	-9	-11	6	7	9	8
10000	9	4	5	3	6	0	-1	-10	-9	-6	-3	-8	-14	-15	9	7	10	9
18000	15	10	2	4	7	0	-1	-19	-13	-2	-4	-10	-18	-20	10	10	9	9
CLARK AFB	KIMPC AB																	
5000	2	4	5	-3	1	-3	-5	-2	-4	-5	3	-2	-8	-9	7	7	8	7
10000	2	6	4	1	3	-2	-3	-7	-8	-4	-2	-6	-12	-13	8	7	9	8
18000	2	1	4	1	2	-4	-5	-15	-8	-4	-3	-8	-15	-17	10	10	8	9
CLARK AFB	MANDALAY																	
5000	1	0	-2	5	0	-3	-4	-1	0	2	-5	-1	-5	-6	5	5	7	6
10000	-5	-5	-1	-1	-5	-9	-10	4	4	5	1	3	-1	-2	7	5	8	6
18000	-14	-11	3	-1	-6	-14	-16	14	10	-3	1	4	-2	-4	9	8	7	7
CLARK AFB	MEDAN																	
5000	1	1	-10	1	-1	-4	-8	-1	-1	11	-1	0	-4	-5	5	4	5	6
10000	2	0	-6	-2	-1	-6	-7	-1	0	6	2	1	-2	-3	6	4	7	6
18000	0	1	4	5	2	-2	-3	0	-1	-4	-5	-3	-8	-9	7	6	7	6
CLARK AFB	MISAWA AB																	
5000	5	5	5	0	3	-1	-2	-6	-2	-5	0	-5	-10	-11	7	7	7	7
10000	11	11	6	7	8	3	1	-15	-13	-6	-9	-12	-18	-19	8	8	8	8
18000	17	12	6	9	10	4	2	-30	-20	-7	-13	-17	-27	-29	10	10	8	9
CLARK AFB	PENANG																	
5000	1	2	-10	2	0	-6	-8	-1	-1	11	-2	0	-4	-5	5	4	5	7
10000	1	0	-6	-2	-1	-6	-7	-1	0	3	2	1	-2	-3	6	4	7	6
18000	0	1	4	5	2	-2	-3	0	-1	-4	-5	-3	-8	-9	7	6	7	6
CLARK AFB	PEIPIING																	
5000	0	1	3	-3	0	-5	-6	0	-2	-4	3	-1	-6	-7	6	7	7	6
10000	-5	-1	1	-4	-3	-8	-9	1	0	-1	3	0	-5	-6	8	7	8	8
18000	-13	-9	2	-5	-6	-14	-15	0	2	-3	2	0	-6	-7	10	9	9	8

\* HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
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 \*\*\* MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

MONTH IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES									STANDARD DEVIATION				
	EQUIVALENT HEADWINDS						STANDARD DEVIATION			JAN	APR	JUL	OCT	
	JAN	APR	JUL	OCT	A75	A55	JAN	APR	JUL	OCT	A75	A55	RETURN	
CLARK AFB 5000 10000 18000	TU 3 5 8	PUSAN EAST -3 3 4	-3 5 6	2 5 4	-3 0 -1	-4 -1 -2	-3 -5 -5	-5 -5 -5	-3 -8 -5	-3 -8 -5	-8 -14 -19	-10 -15 -21	7 9 10	1285 N.MI. 7 8 8 8 9
CLARK AFB 5000 10000 18000	TU 0 1 -2	SAIGON -8 -6 3	5 0 3	0 -1 0	-5 -8 -6	0 -4 -6	0 -3 -3	8 6 -3	-5 0 -3	-1 0 -1	-6 -4 -7	-7 -5 -8	5 7 8	853 N.MI. 5 5 8 8 7
CLARK AFB 5000 10000 15000	TU 3 5 0	SHANGHAI -2 4 1	2 1 1	2 3 0	-2 -2 -6	-4 -4 -7	-3 -5 -9	-5 -4 -4	2 -1 -7	-3 -5 -5	-8 -10 -12	-10 -12 -14	7 8 10	965 N.MI. 7 7 10 10 9
CLARK AFB 5000 10000 18000	TU 3 1 0	SINGAPORE -7 -5 3	-1 -3 4	-1 -6 -2	-7 -7 -3	-7 -6 -3	-2 -1 -1	8 5 -3	1 3 -4	0 0 -3	-4 -4 -7	-5 -8 -8	5 6 7	1289 N.MI. 5 6 7 6 6
CLARK AFB 5000 10000 18000	TU 4 8 3	TAIPEI -1 5 2	3 6 3	3 0 2	-2 -1 -3	-4 -1 -5	-4 -6 -5	-5 -5 -2	1 -3 -3	-4 -7 -5	-10 -13 -12	-11 -14 -13	8 9 10	593 N.MI. 8 7 10 10 9
CLARK AFB 5000 10000 18000	TU 4 12 22	TOKYO -1 6 5	3 6 12	3 2 4	-3 2 3	-3 1 3	-5 -2 -3	-5 -6 -6	1 -7 -12	-4 -11 -18	-9 -17 -28	-10 -18 -31	7 6 10	1599 N.MI. 7 8 8 8 9
CLARK AFB 5000 10000 18000	TU -3 -7 -7	WASH DC -2 -4 -7	-3 -6 -6	-3 -9 -10	-7 -9 -11	-7 -10 -11	2 4 4	1 4 7	2 6 5	1 5 1	-1 1 1	-2 0 1	5 5 6	1633 N.MI. 5 5 6 6 5
CLARK AFB 5000 10000 18000	TU -3 0 -3	DA NANG 17 10 -2	0 0 -3	3 1 -2	-3 -3 -9	-4 -3 -9	0 -17 -10	0 -10 3	0 0 4	-1 -6 3	-10 -6 -1	-13 -8 -2	4 5 7	1751 N.MI. 4 5 4 6 5
COLONIA 5000 10000 18000	TU 6 3 4	DIEGO GARCIA -2 -5 2	0 3 2	0 -3 2	-3 -5 -2	-4 -5 -3	-2 -1 2	1 4 -2	3 -2 4	-1 -3 -2	-5 -8 -8	-6 -9 -9	4 6 9	962 N.MI. 4 7 7 7 6

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
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 \*THIS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION					
	DIRECT						RETURN						JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	00450	075	085	JAN	APR	JUL	OCT	00450					075	085
COLOMBO	TO	0	-2	5	0	0	-3	-3	0	0	-6	0	-1	-5	-6	4	4	1795 N.M.I.
5000		-4	1	3	1	0	-4	-5	0	-1	-4	-1	-1	-5	-6	5	5	1795 N.M.I.
10000		-7	-3	-4	-5	-5	-9	-10	0	4	4	5	4	0	0	7	6	1795 N.M.I.
18000																		1795 N.M.I.
COLOMBO	TO	-2	2	14	0	1	-2	-3	0	-2	-15	0	-2	-9	-12	4	5	1729 N.M.I.
5000		1	0	9	0	1	-2	-3	0	0	-10	0	-2	-7	-8	5	5	1729 N.M.I.
10000		-1	0	-2	0	-1	-6	-7	0	0	2	0	0	-4	-5	8	7	1729 N.M.I.
18000																		1729 N.M.I.
COLOMBO	TO	-2	-4	-12	-1	-5	-10	-11	2	5	10	2	4	0	0	5	6	1304 N.M.I.
5000		0	2	-4	0	-1	-4	-7	0	-2	5	0	0	-4	-5	6	6	1304 N.M.I.
10000		-12	-3	2	-3	-4	-10	-12	9	1	-1	3	2	-3	-4	9	8	1304 N.M.I.
18000																		1304 N.M.I.
COLOMBO	TO	-1	-3	-1	-1	-2	-6	-7	2	3	0	2	1	-2	-3	5	5	1504 N.M.I.
5000		0	2	-1	-1	0	-4	-5	0	-2	0	1	0	-4	-6	6	6	1504 N.M.I.
10000		-9	-3	0	-3	-4	-10	-11	4	0	0	3	1	-3	-5	9	9	1504 N.M.I.
18000																		1504 N.M.I.
COLOMBO	TO	-2	2	13	2	2	-2	-3	2	-2	-13	-1	-3	-9	-11	5	6	1302 N.M.I.
5000		2	1	9	0	2	-2	-3	-2	-2	-9	0	-3	-8	-9	6	6	1302 N.M.I.
10000		-1	0	-2	1	-1	-6	-7	0	0	2	-1	0	-5	-6	9	8	1302 N.M.I.
18000																		1302 N.M.I.
COLOMBO	TO	-6	-2	19	2	0	-6	-7	6	2	-18	-3	0	-12	-15	4	5	1141 N.M.I.
5000		-3	-2	11	2	0	-4	-5	4	2	-11	-1	0	-7	-9	5	6	1141 N.M.I.
10000		-7	-3	-4	-6	-5	-10	-12	7	3	4	7	5	0	-1	9	7	1141 N.M.I.
18000																		1141 N.M.I.
COLOMBO	TO	-2	-3	0	-2	-2	-6	-7	2	3	-1	2	1	-2	-3	5	6	1309 N.M.I.
5000		0	2	0	-1	0	-4	-5	0	-3	0	1	-1	-5	-6	6	6	1309 N.M.I.
10000		-6	-1	0	-3	-3	-9	-11	3	0	0	3	1	-4	-5	10	9	1309 N.M.I.
18000																		1309 N.M.I.
COLOMBO	TO	-6	-2	19	1	0	-6	-7	7	2	-14	-2	0	-12	-16	4	5	1221 N.M.I.
5000		-3	-2	11	1	0	-4	-5	3	2	-11	-1	-1	-7	-9	5	5	1221 N.M.I.
10000		-7	-3	-4	-7	-5	-11	-12	7	3	4	7	5	0	0	8	7	1221 N.M.I.
18000																		1221 N.M.I.
COLOMBO	TO	-4	-1	18	-1	0	-5	-6	5	1	-18	1	0	-10	-14	4	5	1605 N.M.I.
5000		-2	-1	11	0	0	-3	-4	2	1	-11	0	0	-6	-8	5	4	1605 N.M.I.
10000		-5	-2	-4	-7	-5	-9	-11	5	3	4	8	5	0	0	8	6	1605 N.M.I.
18000																		1605 N.M.I.

• HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUVALENT HEADWINDS					STANDARD DEVIATION					
	JAN	APR	JUL	OCT	AUG	JAN	APR	JUL	OCT	AUG	
<b>COLOMBO</b>											
5000	-4	-1	14	3	0	-4	-5				1476 N.M.I.
10000	-2	0	10	3	1	-3	-4				5 5 6 6 6
18000	-9	-3	-4	-6	-6	-10	-11				8 6 6 5
<b>COLDWICK</b>											
5000	-2	-5	-12	0	-5	-10	-11				1726 N.M.I.
10000	-1	0	-5	0	-2	-6	-7				5 5 6 6 5
18000	-16	-7	0	-4	-6	-13	-15				9 8 6 6
<b>COOKTOWN</b>											
5000	-1	7	10	7	6	0	-1				853 N.M.I.
10000	4	5	1	6	4	0	-1				9 7 7 8 7
18000	7	-3	-8	0	-3	-9	-11				9 9 9 9 9
<b>COOKTOWN</b>											
5000	-3	0	4	4	1	-2	-3				1786 N.M.I.
10000	1	0	4	5	2	-1	-1				5 4 5 5 5
18000	4	2	3	3	3	0	-1				6 5 6 5
<b>COOKTOWN</b>											
5000	-3	-4	-3	0	-3	-6	-7				1900 N.M.I.
10000	-4	-4	-2	-2	-4	-6	-7				5 5 4 4 3
18000	-4	-2	-3	-4	-4	-8	-8				6 4 4 4 4
<b>COOKTOWN</b>											
5000	-3	-5	-4	-2	-4	-7	-8				1973 N.M.I.
10000	-4	-5	-3	-3	-4	-7	-8				5 5 4 4 3
18000	-5	-1	-3	-4	-4	-8	-9				4 4 4 4 4
<b>COOKTOWN</b>											
5000	0	-2	-3	-1	-2	-7	-8				1344 N.M.I.
10000	-1	-3	-4	-4	-3	-9	-11				7 7 8 8 8
18000	-4	-3	-5	-5	-5	-12	-14				6 8 9 9 9
<b>COOKTOWN</b>											
5000	-1	-5	0	-1	-2	-7	-8				1297 N.M.I.
10000	2	5	13	8	7	1	0				8 6 7 7 6
18000	4	8	21	12	10	3	1				8 7 7 7 7
<b>COOKTOWN</b>											
5000	4	3	-2	-3	0	-4	-6				1877 N.M.I.
10000	1	-6	-14	-12	-7	-14	-16				6 6 7 7 7
18000	-10	-11	-25	-24	-17	-26	-28				7 7 8 8 8

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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION					
	DIRECT			RETURN			U.S.			U.S.			JAN	APR	JUL	OCT		
COOKTOWN																		
5000	0	-1	0	0	0	-1	0	1	1	0	0	0	0	-4	-5	8	7	375 N.M.I.
10000	-6	-4	0	3	-2	-8	6	4	-1	-2	-2	1	1	-4	-6	8	8	7
18000	0	1	1	0	0	-6	0	-1	-1	0	0	-1	-7	-9		10	9	10
SUVA, FIJI																		
5000	-1	-1	-3	-1	-2	-7	1	2	3	2	2	2	2	-1	-2	7	5	1965 N.M.I.
10000	2	5	13	6	6	1	-2	-5	-13	-6	-7	-7	-12	-13		6	6	4
18000	3	6	14	5	6	1	-4	-6	-14	-6	-8	-8	-13	-15		7	7	5
VANIMO																		
5000	-2	0	2	3	0	-3	3	0	-2	-3	-1	-1	-5	-6		6	6	801 N.M.I.
10000	-1	-2	3	4	0	-5	3	3	-2	-3	0	0	-5	-6		6	6	5
18000	1	0	0	1	0	-4	-1	1	0	0	0	0	-5	-7		8	7	7
DOVE AFBS																		
5000	11	8	5	4	6	0	-12	-9	-5	-5	-8	-8	-14	-16		10	10	1285 N.M.I.
10000	21	16	6	7	11	4	-23	-17	-6	-8	-13	-13	-22	-24		11	11	7
18000	34	24	4	17	18	6	-42	-29	-5	-21	-24	-24	-38	-42		15	15	14
EDMONTON																		
5000	-2	0	2	-1	0	-6	1	0	-3	1	-1	-1	-6	-7		8	8	1710 N.M.I.
10000	-11	-6	-2	-7	-7	-13	8	4	1	6	4	4	-1	-2		9	8	8
18000	-21	-13	-5	-15	-13	-23	11	6	3	10	7	7	-1	-3		14	13	9
EGLIN AFBS																		
5000	9	7	3	3	5	-1	-9	-7	-3	-3	-6	-6	-13	-14		11	11	588 N.M.I.
10000	17	14	1	5	8	0	-18	-14	-1	-6	-10	-10	-19	-21		11	11	10
18000	33	26	-2	14	16	2	-35	-28	2	-15	-19	-19	-34	-37		16	16	9
ELLINGTON AFBS																		
5000	10	8	4	4	6	0	-11	-9	-6	-4	-8	-8	-15	-17		13	12	159 N.M.I.
10000	15	11	1	5	7	0	-15	-12	-1	-5	-8	-8	-17	-19		12	11	11
18000	25	19	-1	9	11	-1	-30	-22	1	-11	-14	-14	-29	-33		18	17	10
ELLSBOOTH AFBS																		
5000	-1	1	5	-1	0	-6	0	-2	-5	0	-2	-2	-8	-10		10	10	1064 N.M.I.
10000	-7	-3	0	-4	-3	-11	3	1	-1	3	1	1	-5	-7		11	10	8
18000	-14	-10	-2	-10	-9	-20	3	2	0	5	2	2	-6	-9		17	15	9
EL TOPO MCAS																		
5000	-1	0	2	2	0	-4	0	0	-2	-2	-1	-1	-6	-7		6	7	1112 N.M.I.
10000	-13	-10	0	-3	-6	-14	12	9	0	3	5	5	-1	-3		10	9	7
18000	-30	-25	0	-12	-16	-30	26	22	0	10	12	12	1	0		16	14	8

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 -MINUS SIG. DENOTES HEADWINDS.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN POUNDS	EQUIVALENT HEADWIND RETURN												STANDARD DEVIATION																				
	DUTY			ENGLAND AFB			FORT RENNING			FORT ALISS			FORT BRAGG/PDPE			FORT CAMPBELL			FORT CARSON			FORT FUSTIS			FORT MOOD			FORT MUACHUCA					
	JAN	APR	JUL	OCT	MAY	AUG	OCT	MAY	AUG	OCT	MAY	AUG	OCT	MAY	AUG	OCT	MAY	AUG	OCT	MAY	AUG	OCT	MAY	AUG	OCT	MAY	AUG	OCT	MAY	AUG	OCT	MAY	AUG
CORPUS CHRISTI TO																																	
5000	10	8	6	3	6	0	-2			-11	-8	-6	-3	-7	-15	-17	12	12	12	329 N.M.I.													
10000	16	13	2	5	8	0	-1			-17	-13	-1	-5	-9	-18	-21	12	12	8														
18000	27	20	-2	10	11	0	-3			-32	-24	2	-12	-15	-31	-35	18	17	10														
CORPUS CHRISTI TO																																	
5000	10	8	4	3	5	0	-2			-11	-8	-4	-3	-7	-14	-16	11	11	7	704 N.M.I.													
10000	19	15	2	6	9	1	0			-19	-15	-2	-6	-10	-19	-22	11	11	8														
18000	34	25	-1	14	16	2	0			-37	-28	1	-16	-20	-35	-39	16	16	9														
CORPUS CHRISTI TO																																	
5000	0	0	5	0	0	-4	-4			0	0	-5	-1	-2	-9	-10	11	10	7	534 N.M.I.													
10000	-11	-9	3	-3	-5	-14	-16			11	8	-3	2	3	-4	-5	11	10	8														
18000	-30	-24	2	-12	-15	-30	-33			24	20	-2	10	11	0	-3	18	15	9														
CORPUS CHRISTI TO																																	
5000	11	8	4	4	6	0	-1			-12	-9	-4	-4	-7	-14	-16	10	10	7	1038 N.M.I.													
10000	20	16	4	6	10	2	1			-21	-17	-4	-7	-12	-21	-23	11	11	7														
18000	36	24	1	16	18	4	2			-39	-29	-2	-18	-22	-37	-40	15	15	8														
CORPUS CHRISTI TO																																	
5000	10	8	6	3	6	0	-2			-11	-8	-6	-4	-8	-15	-16	12	11	8	731 N.M.I.													
10000	17	12	4	6	9	1	0			-19	-14	-4	-7	-11	-20	-22	12	12	8														
18000	27	14	0	11	11	0	-2			-35	-24	0	-14	-17	-33	-37	18	17	9														
CORPUS CHRISTI TO																																	
5000	0	2	6	0	2	-4	-6			0	-3	-6	0	-3	-10	-11	11	11	7	758 N.M.I.													
10000	-9	-5	1	-3	-4	-11	-13			5	3	-1	2	1	-4	-6	11	10	8														
18000	-21	-14	0	-11	-11	-24	-27			9	8	0	7	4	-4	-7	18	16	10														
CORPUS CHRISTI TO																																	
5000	11	8	5	4	6	0	0			-12	-9	-5	-4	-8	-14	-16	10	10	7	1210 N.M.I.													
10000	21	16	5	7	11	3	2			-23	-17	-5	-8	-13	-22	-24	11	11	7														
18000	36	24	3	17	18	6	3			-41	-29	-4	-20	-23	-38	-41	15	15	8														
CORPUS CHRISTI TO																																	
5000	5	6	9	2	5	-1	-3			-7	-6	-9	-2	-6	-14	-16	13	12	8	207 N.M.I.													
10000	3	3	4	1	2	-4	-6			-6	-4	-3	-2	-4	-12	-14	12	11	9														
18000	-1	-2	2	-2	-1	-11	-14			-10	-5	-2	-1	-4	-15	-18	19	17	10														
CORPUS CHRISTI TO																																	
5000	-1	0	4	2	1	-5	-6			0	0	-4	-2	-2	-8	-9	16	9	6	719 N.M.I.													
10000	-11	-10	2	-2	-5	-14	-16			12	9	-2	2	4	-2	-4	11	9	7														
18000	-31	-25	1	-12	-16	-30	-34			26	22	-1	11	12	0	-1	17	15	9														

• HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 ••• DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 • MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN PFFY	EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION				
	JAN	APR	JUL	OCT	A75	A85	A95	A105	A115	A125	A135	A145	JAN	APR	JUL	OCT	
CORPUS CHRISTI TO FORT KNICK	10	8	6	4	0	-1	-11	-8	-5	-4	-7	-14	-16	12	11	7	10
5000	17	12	6	6	9	1	-20	-14	-4	-7	-11	-20	-22	12	12	8	11
10000	27	18	0	11	12	0	-36	-24	-1	-15	-16	-33	-37	17	16	9	16
CORPUS CHRISTI TO FORT LEAVENWORTH	4	5	7	1	4	-2	-5	-6	-7	-1	-5	-12	-14	12	12	8	10
5000	4	4	3	1	3	-4	-9	-6	-3	-2	-5	-13	-15	12	12	9	11
10000	2	1	2	0	1	-8	-17	-11	-2	-4	-8	-19	-23	18	17	10	16
CORPUS CHRISTI TO FORT LEWIS	3	1	3	1	1	-2	-1	-1	-3	-1	-2	-6	-7	7	7	5	6
5000	-12	-7	-1	-5	-6	-12	10	6	1	4	4	0	-1	9	8	6	8
10000	-26	-18	-6	-16	-16	-27	18	13	4	12	10	2	0	15	13	9	13
CORPUS CHRISTI TO FORT ORD	-1	-1	2	2	0	-4	1	1	-1	-2	0	-5	-6	8	7	5	7
5000	-12	-10	0	-4	-6	-13	11	9	0	4	5	0	-2	10	9	6	8
10000	-29	-24	-3	-13	-16	-29	24	20	2	11	12	2	0	16	14	8	13
CORPUS CHRISTI TO FORT RUCKER	7	7	3	3	5	-1	-10	-8	-3	-3	-6	-13	-15	11	11	7	10
5000	18	14	1	5	8	0	-18	-15	-1	-6	-10	-19	-21	11	11	8	11
10000	33	26	-2	14	16	2	-36	-28	2	-16	-19	-35	-38	16	16	9	14
CORPUS CHRISTI TO FORT SILL	3	4	8	1	4	-3	-4	-5	-3	-1	-5	-13	-15	13	12	8	11
5000	0	1	3	0	0	-8	-3	-3	-3	0	-3	-10	-12	12	11	9	12
10000	-6	-5	3	-4	-2	-14	-6	-3	-3	0	-3	-13	-16	19	17	10	16
CORPUS CHRISTI TO FORT WOLTERS	4	5	9	1	5	-2	-5	-6	-8	-1	-6	-13	-15	13	12	8	11
5000	1	1	4	0	1	-5	-4	-3	-3	-1	-3	-11	-13	12	11	9	12
10000	-5	-4	3	-3	-2	-13	-7	-3	-3	0	-3	-14	-16	19	17	10	16
CORPUS CHRISTI TO GEN MITCHELL	6	5	6	3	5	-1	-8	-6	-6	-3	-6	-13	-15	11	11	8	9
5000	10	7	4	4	4	-1	-14	-10	-4	-6	-9	-16	-18	11	11	9	11
10000	14	9	3	5	6	-2	-27	-18	-4	-11	-14	-27	-30	17	16	9	16
CORPUS CHRISTI TO HILL AFB	1	2	6	2	3	-3	-1	-3	-5	-2	-3	-8	-10	9	8	6	7
5000	-10	-6	0	-4	-5	-12	8	5	0	3	3	-2	-4	10	9	7	9
10000	-25	-19	-3	-14	-14	-27	16	13	1	10	8	0	-2	17	15	9	14

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 00A--DENOTES ANNUAL FOUR VALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN POUNDS	EQUVALENT HEADWIND MEASUREMENT												STANDARD DEVIATION					
	MURPHY				RETURN				RETURN				JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	00A50	A75	A85	JAN	APR	JUL	OCT	00A50	A75	A85	JAN	APR	JUL	OCT
<b>CORPUS CHRISTI TO MCNESTAD AFR</b>																		
5000	0	2	-1	0	0	-6	-7	0	-3	2	0	0	-6	-7	9	9	6	8
10000	9	8	-2	3	4	-2	-4	-10	-8	2	-3	-5	-12	-14	9	9	7	9
18000	24	22	-3	9	12	0	-2	-26	-23	3	-10	-14	-26	-29	13	13	7	11
<b>CORPUS CHRISTI TO HUNTER AAF</b>																		
5000	9	8	3	3	5	0	-2	-10	-8	-3	-3	-6	-13	-14	10	10	7	9
10000	18	15	2	5	9	1	0	-19	-15	-2	-6	-10	-19	-21	11	11	7	10
18000	34	26	0	15	17	3	0	-37	-29	0	-17	-21	-36	-39	15	15	8	14
<b>CORPUS CHRISTI TO MOUNTSVILLE</b>																		
5000	11	9	4	3	6	0	-1	-11	-9	-5	-4	-7	-14	-16	12	11	7	10
10000	18	14	3	6	9	1	0	-20	-15	-3	-7	-11	-20	-23	12	12	8	11
18000	31	22	-1	12	14	0	-1	-36	-26	0	-15	-18	-34	-38	17	16	9	16
<b>CORPUS CHRISTI TO JACKSONVILLE</b>																		
5000	8	7	2	3	6	-1	-2	-8	-7	-2	-3	-5	-12	-13	10	10	7	9
10000	17	13	1	4	8	0	-1	-17	-14	-1	-5	-9	-18	-20	11	11	7	10
18000	33	26	-1	14	17	2	0	-35	-28	1	-15	-19	-34	-37	15	15	8	13
<b>CORPUS CHRISTI TO KEY WEST</b>																		
5000	-1	1	-3	-1	-2	-7	-8	0	-1	3	1	0	-5	-6	10	9	6	8
10000	8	7	-3	2	2	-3	-5	-8	-7	3	-2	-3	-10	-12	9	9	7	8
18000	22	21	-4	8	11	0	-3	-24	-22	4	-9	-13	-25	-28	13	12	7	11
<b>CORPUS CHRISTI TO LADSON AFR</b>																		
5000	0	1	3	1	1	-3	-4	-1	-1	-3	-1	-2	-6	-8	7	7	5	7
10000	-12	-7	-1	-4	-6	-13	-14	10	5	0	4	4	-1	-2	9	8	7	8
18000	-25	-18	-6	-16	-16	-26	-29	17	12	3	12	10	1	0	15	14	9	13
<b>CORPUS CHRISTI TO LITTLE ROCK</b>																		
5000	9	7	7	3	6	0	-2	-10	-8	-7	-3	-7	-15	-16	12	12	8	10
10000	13	10	3	4	7	0	-2	-15	-12	-3	-5	-9	-17	-20	12	12	9	12
18000	19	13	0	7	8	-2	-5	-29	-20	0	-10	-13	-28	-32	18	17	10	16
<b>CORPUS CHRISTI TO LOCKPORT</b>																		
5000	-10	8	5	4	6	0	-1	-11	-8	-5	-4	-7	-14	-16	11	11	7	9
10000	18	13	5	7	10	2	1	-21	-14	-5	-8	-12	-21	-23	11	11	8	11
18000	29	18	2	13	13	2	0	-37	-25	-3	-17	-19	-34	-38	17	16	9	15
<b>CORPUS CHRISTI TO LONG AFR</b>																		
5000	10	7	6	6	7	1	0	-12	-8	-6	-7	-9	-14	-16	9	9	6	8
10000	19	13	8	10	12	5	4	-23	-15	-9	-11	-14	-22	-24	10	10	7	9
18000	31	18	8	18	17	7	5	-40	-25	-12	-24	-24	-37	-40	15	14	8	14

HEADWINDS--COMPUTER FOR A 120-KT AIRSPEED.  
 000--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 - MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

MILES IN FEET	EQUVALENT HEADWIND M E A D W I N D S RETURN												STANDARD DEVIATION					
	JAN	APR	JUL	OCT	00A50	A75	A85	JAN	APR	JUL	OCT	00A50	A75	A85	JAN	APR	JUL	OCT
CORPUS CHRISTI TO LUXE AFB																		
5000	0	4	2	1	-3	-5	0	0	-4	-2	-2	-2	-7	-8	9	8	5	8
10000	-13	-9	1	-3	-13	-15	12	8	-1	2	4	-2	-2	-3	10	9	7	9
18000	-30	-25	0	-12	-16	-33	25	21	-1	11	12	0	0	-2	17	15	9	14
CORPUS CHRISTI TO McGUIRE AFB																		
5000	12	5	5	7	1	0	-12	-9	-5	-5	-8	-14	-14	-16	10	10	6	8
10000	21	16	6	8	11	4	-24	-17	-7	-9	-14	-23	-25	-25	11	11	7	10
18000	35	23	5	17	18	6	-42	-29	-6	-21	-24	-38	-42	-42	15	15	8	14
CORPUS CHRISTI TO MEMPHIS																		
5000	10	8	4	3	5	0	-11	-9	-6	-3	-7	-15	-17	-17	12	12	8	10
10000	16	12	3	5	8	0	-18	-13	-3	-6	-10	-19	-21	-21	12	12	9	12
18000	25	17	-1	9	10	-1	-33	-23	1	-13	-16	-31	-35	-35	18	17	9	16
CORPUS CHRISTI TO MEMPHIS CITY																		
5000	-7	-9	-5	0	-6	-12	6	9	5	0	5	0	-2	-2	10	9	6	9
10000	-6	-5	-2	-1	-4	-10	6	5	2	1	3	-2	-3	-3	9	9	7	8
18000	-13	-8	-1	-5	-6	-17	9	5	1	4	4	-3	-4	-4	14	12	7	11
CORPUS CHRISTI TO MINN-ST PAUL																		
5000	2	3	5	0	2	-4	-4	-4	-5	-1	-4	-11	-12	-12	11	11	8	10
10000	2	2	2	0	1	-5	-7	-5	-3	-2	-5	-12	-14	-14	11	11	9	11
18000	0	0	1	-1	0	-9	-11	-15	-10	-3	-5	-8	-18	-21	17	16	9	15
CORPUS CHRISTI TO MINOT AFB																		
5000	-2	3	-2	0	-7	-8	0	-1	-4	1	-1	-8	-9	-9	10	10	8	9
10000	-4	-3	0	-4	-3	-10	-12	2	0	2	0	-5	-7	-7	10	10	8	10
18000	-13	-8	-2	-9	-8	-20	-20	0	0	3	0	-8	-10	-10	16	15	9	14
CORPUS CHRISTI TO MELLIS AFB																		
5000	0	4	2	1	-3	-4	0	0	-3	-2	-2	-7	-8	-8	8	8	5	7
10000	-12	-9	0	-4	-6	-13	-15	11	8	3	4	-1	-3	-3	10	9	7	9
18000	-29	-23	-1	-13	-16	-29	-32	23	19	0	11	1	-1	-1	17	15	9	14
CORPUS CHRISTI TO NEW CUMBERLAND																		
5000	11	8	5	5	7	0	-12	-9	-5	-5	-8	-14	-16	-16	10	10	7	9
10000	20	15	4	7	11	3	-23	-17	-6	-8	-13	-22	-24	-24	11	11	8	10
18000	34	22	4	16	17	5	-41	-28	-6	-21	-23	-38	-41	-41	16	15	9	15
CORPUS CHRISTI TO NEW ORLEANS																		
5000	9	7	3	3	5	-1	-9	-7	-3	-3	-6	-13	-15	-15	12	11	7	10
10000	17	13	0	5	8	0	-17	-13	0	-5	-9	-18	-20	-20	11	11	8	11
18000	32	25	-3	13	15	0	-34	-27	3	-14	-18	-33	-37	-37	17	16	9	15

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 00A50--FIFTEEN ANNUAL FOUR VALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 075--SEVEN ANNUAL FOUR VALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.

EQUIVALENT HEADINGS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WIND IN FEET	EQUVALENT HEADINGS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION				
	EQUVALENT HEADINGS				EQUVALENT HEADINGS				EQUVALENT HEADINGS				JAN	APR	JUL	OCT	
	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	
<b>COBUS CHRISTI TO NIAGARA FALLS</b>																	
5000	7	5	5	6	0	-1	-11	-8	-5	-5	-7	-14	-16	11	10	7	9
10000	10	6	7	10	3	1	-21	-14	-7	-9	-13	-21	-23	11	11	8	10
15000	27	4	14	14	3	1	-30	-24	-7	-19	-21	-35	-38	16	15	9	15
<b>COBUS CHRISTI TO ONYARD AFB</b>																	
5000	0	2	2	0	-4	-5	0	0	-2	-2	-1	-6	-7	6	7	5	7
10000	-13	0	-3	-4	-14	-16	12	9	0	3	5	-1	-3	10	9	7	9
15000	-30	-1	-12	-16	-33	-33	26	21	0	10	12	1	0	16	14	8	13
<b>COBUS CHRISTI TO PATRICK AFB</b>																	
5000	5	1	2	2	-2	-1	-4	-6	-1	-2	-4	-9	-11	10	9	6	9
10000	14	0	2	0	0	-1	-14	-12	0	-4	-7	-15	-17	10	10	7	9
15000	24	-1	12	15	2	0	-31	-26	1	-13	-17	-30	-34	14	14	8	12
<b>COBUS CHRISTI TO PITTSBURGH</b>																	
5000	9	5	5	6	0	-1	-12	-9	-5	-5	-8	-15	-16	11	10	7	9
10000	19	5	7	10	3	1	-22	-15	-6	-8	-13	-21	-24	11	11	8	11
15000	30	3	14	14	3	1	-39	-26	-5	-19	-21	-36	-40	16	16	9	15
<b>COBUS CHRISTI TO REGINA</b>																	
5000	0	3	-2	0	-6	-8	1	-1	-3	1	-1	-7	-8	9	9	7	9
10000	-8	0	0	-5	-11	-13	4	2	0	4	2	-3	-5	10	9	8	9
15000	-14	-10	-3	-12	-20	-22	4	2	0	6	2	-5	-8	15	14	9	14
<b>COBUS CHRISTI TO SCOTT AFB</b>																	
5000	7	6	3	5	-1	-2	-9	-7	-4	-3	-7	-14	-15	12	11	8	10
10000	12	9	4	7	0	-2	-16	-11	-4	-5	-9	-18	-20	12	12	9	12
15000	18	11	2	6	-2	-4	-29	-19	-3	-11	-14	-28	-32	16	17	10	16
<b>COBUS CHRISTI TO SELLENGE AFB</b>																	
5000	9	5	4	5	0	-1	-10	-7	-5	-5	-7	-13	-15	11	10	7	9
10000	15	11	5	6	1	0	-19	-13	-6	-8	-12	-20	-22	11	11	8	11
15000	23	14	3	11	1	0	-35	-22	-5	-16	-18	-32	-36	17	16	9	15
<b>COBUS CHRISTI TO SWAN AFB</b>																	
5000	11	6	4	6	0	-1	-11	-9	-4	-4	-7	-14	-15	10	10	7	9
10000	20	15	3	6	10	2	-21	-16	-3	-6	-11	-20	-23	11	11	7	10
15000	35	26	0	15	17	3	-38	-29	-1	-18	-21	-36	-39	16	15	8	14
<b>COBUS CHRISTI TO WESTOVER AFB</b>																	
5000	11	9	6	5	7	1	-13	-9	-6	-6	-9	-15	-16	10	9	6	8
10000	21	15	7	8	12	3	-24	-17	-8	-10	-15	-23	-25	10	10	7	10
15000	34	22	6	14	18	5	-42	-24	-8	-22	-24	-38	-42	15	15	8	14

HEADING--COMPUTED FOR A 120-MT AIRSPEED.  
 000--DENOTES ANNUAL EQUIVALENT HEADINGS FOR INDICATED WIND DIRECTION.  
 MINUS SIGN DENOTES HEADINGS.

FOUR VALENT HEADINGS AND STANDARD DEVIATION IN VOTES FOR GREAT CIRCLE AIR ROUTES

MIGHT IN FFY	FOUR VALENT HEADINGS												STANDARD DEVIATION			
	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	0050	075	075	085	JAN	APR	JUL	OCT
COPPUS CMPTSTI	TO															
5000	5	5	5	5	0	-2	-9	-7	-5	-5	-7	-13	11	10	7	9
10000	13	9	5	6	0	1	-17	-12	-6	-8	-11	-19	11	11	8	11
18000	19	12	4	8	0	-1	-31	-20	-6	-15	-17	-30	16	16	9	15
CORPUS CMPTSTI	TO															
5000	1	3	1	1	-2	-4	-1	-1	-3	-2	-2	-7	7	7	5	6
10000	-12	-7	-1	-2	-6	-14	10	6	0	4	4	-1	9	6	5	8
19000	-26	-18	-4	-16	-16	-30	14	13	4	12	19	7	15	14	7	13
DA NANG	TO															
5000	-2	-4	1	-6	-3	-7	2	4	-1	0	2	-1	5	4	5	6
10000	-3	-1	1	-3	-2	-6	3	1	-1	2	1	-3	6	4	7	7
18000	0	0	-3	-6	-3	-9	0	3	3	6	2	-2	7	7	7	6
DA NANG	TO															
5000	2	0	-4	-4	-2	-7	-2	0	0	5	2	-2	5	4	5	6
10000	3	1	-2	-3	0	-6	-2	-1	2	3	0	-4	6	5	7	6
18000	0	1	0	0	0	-6	0	-1	0	0	0	-6	7	6	7	6
DA NANG	TO															
5000	1	4	4	5	3	-1	-1	-9	-2	-4	-4	-9	7	7	9	8
10000	-4	-3	-2	-2	-3	-10	4	3	2	2	2	-2	9	7	10	8
18000	-9	-8	2	3	-2	-13	7	7	-2	-3	1	-6	12	10	9	9
DA NANG	TO															
5000	2	6	9	-4	3	-3	-2	-6	0	0	-4	-10	7	7	9	8
10000	5	6	6	0	4	-3	-5	-6	0	0	-5	-11	9	7	10	8
18000	10	5	0	4	4	-4	-12	-7	3	-4	-6	-13	11	10	9	9
DA NANG	TO															
5000	3	9	6	-3	2	-2	-3	-6	3	3	-3	-8	6	6	7	6
10000	13	12	6	4	3	1	-15	-12	-4	-5	-10	-16	8	7	6	7
18000	24	15	4	9	12	4	-32	-21	-5	-10	-16	-27	16	9	7	8
DA NANG	TO															
5000	4	3	3	-5	1	-4	-4	-1	-3	3	-2	-6	6	5	6	6
10000	11	3	1	2	4	3	-12	-5	-4	-2	-6	-11	7	6	7	7
18000	23	16	3	5	10	2	-26	-14	3	-5	-12	-22	8	7	7	7
DA NANG	TO															
5000	3	5	5	-4	2	-4	-3	-5	3	3	-3	-8	6	6	7	7
10000	12	10	4	3	7	2	-13	-10	-4	-3	-9	-16	8	6	6	8
18000	22	15	3	6	10	2	-25	-17	3	-6	-12	-22	9	6	6	8

\* HEADINGS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*--VOTES ANNUAL FOUR VALENT HEADINGS FOR INDICATED PER CENT LIABILITIES.  
 MINUS SIG. DVOTES HEADINGS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUVALENT HEADWIND				RETURN				STANDARD DEVIATION											
	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	A75	A75	A85	JAN	APR	JUL	OCT					
<b>DA NANG</b>	<b>KIMPO AB</b>																			
5000	3	5	6	-3	2	-2	-4	-3	-5	-7	3	-3	-9	-10	6	7	7	6	1626 N.M.I.	
10000	7	7	4	0	4	-1	-2	-11	-8	-5	-1	-7	-12	-14	6	7	8	7		
18000	14	9	5	6	0	2	0	-25	-16	-5	-8	-13	-22	-24	10	9	8	8		
<b>DA NANG</b>	<b>MANDALAY</b>																			
5000	0	-2	-2	4	0	0	-7	0	2	1	-3	0	0	-5	-6	7	7	9	7	773 N.M.I.
10000	-8	-7	-6	-1	-6	-12	-13	6	7	6	2	5	0	-1	6	7	9	7		
18000	-17	-12	3	0	-6	-16	-16	16	11	-3	0	4	-3	-5	11	10	9	8		
<b>DA NANG</b>	<b>MEDAN</b>																			
5000	1	-2	-12	-1	-3	-9	-11	0	3	13	0	3	-1	-3	6	5	6	7	936 N.M.I.	
10000	0	0	-5	-3	-2	-7	-8	0	1	4	4	2	-2	-3	7	5	7	6		
18000	1	2	2	3	2	-3	-4	-2	-2	-2	-3	-3	-8	-9	8	8	8	7		
<b>DA NANG</b>	<b>NEW DELHI</b>																			
5000	-4	-5	-1	1	-3	-7	-8	4	5	0	-1	1	-2	-3	5	5	6	5	1875 N.M.I.	
10000	-13	-10	-4	-2	-8	-13	-14	12	10	4	3	7	2	1	6	5	7	5		
18000	-27	-17	3	-5	-11	-22	-25	24	16	-3	4	9	0	-2	9	8	7	7		
<b>DA NANG</b>	<b>PENANG</b>																			
5000	0	-2	-13	0	-3	-9	-11	0	3	13	0	3	-1	-2	6	5	6	7	796 N.M.I.	
10000	0	0	-5	-3	-2	-7	-8	0	1	4	4	2	-2	-3	7	5	8	7		
18000	1	2	2	2	1	-3	-5	-1	-2	-2	-2	-2	-8	-9	9	8	8	7		
<b>DA NANG</b>	<b>PEIPING</b>																			
5000	1	3	6	-3	1	-3	-4	-1	-3	-6	3	-2	-7	-8	6	7	7	6	1678 N.M.I.	
10000	-1	1	1	-3	-1	-6	-7	-1	-2	-2	3	-1	-6	-7	8	7	8	7		
18000	0	0	4	1	1	-4	-6	-11	-6	-4	-4	-7	-13	-14	10	9	9	8		
<b>DA NANG</b>	<b>PUSAN FAST</b>																			
5000	3	6	6	-3	7	-2	-3	-3	-6	-7	3	-4	-9	-10	6	7	7	6	1606 N.M.I.	
10000	10	10	5	2	6	1	0	-13	-10	-6	-3	-8	-14	-16	6	7	8	7		
18000	20	13	4	8	10	3	2	-29	-18	-5	-9	-15	-24	-27	10	9	8	8		
<b>DA NANG</b>	<b>SAIGUM</b>																			
5000	-2	-3	-11	-1	-4	-10	-11	2	3	11	0	3	-1	-2	6	6	8	8	326 N.M.I.	
10000	0	0	-3	-1	-1	-6	-8	0	0	3	1	0	-4	-5	6	6	9	8		
18000	-1	2	0	-2	0	-7	-8	1	-2	3	2	0	-6	-8	10	9	9	8		
<b>DA NANG</b>	<b>SHANGHAI</b>																			
5000	3	6	7	-3	3	-2	-3	-2	-6	-7	3	-3	-9	-10	6	7	8	7	1867 N.M.I.	
10000	8	7	5	0	5	0	-7	-10	-3	-5	0	-6	-12	-14	6	7	9	8		
18000	15	9	3	6	7	1	0	-24	-14	-3	-6	-11	-20	-23	10	9	8	8		

• HEADWINDS - COMPUTED FOR A 120-KT AIRSPEED.  
 • ± - DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PFD CENT RELIABILITIES.  
 • MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADINGS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUVALENT HEADINGS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION							
	JAN	APR	JUL	OCT	0050	APR	075	ABS	JAN	APR	JUL	OCT	0050	APR	075	ABS	JAN	APR	JUL	OCT
DA NANG	SINGAPORE																917 N.M.I.			
5000	0	0	-9	-4	-3	-8	-10	0	1	9	4	3	-1	-2	6	5	5	7		
10000	2	0	-3	-3	-1	-6	-7	-1	0	3	3	0	-3	-5	7	5	7	7		
18000	0	2	0	0	0	-4	-6	0	-2	0	0	-1	-6	-7	6	7	8	7		
DA NANG	TAIPEI																922 N.M.I.			
5000	2	5	7	-4	2	-1	-4	-2	-5	-7	5	-3	-8	-10	7	6	6	7		
10000	10	4	6	2	7	1	0	-10	-9	-6	-2	-8	-13	-14	8	6	9	8		
18000	17	12	0	5	8	3	0	-20	-14	7	-5	-10	-18	-20	10	9	8	8		
DARWIN	DAVAC																1214 N.M.I.			
5000	-4	0	4	3	0	-1	-4	3	3	-4	-3	-1	-5	-6	7	6	6	5		
10000	2	0	2	2	1	-2	-3	-2	3	-2	-2	-2	-6	-7	5	6	7	6		
18000	1	0	2	1	1	-1	-4	-2	0	-2	0	-1	-6	-7	7	6	7	6		
DARWIN	DJAKARTA																1676 N.M.I.			
5000	-2	6	7	7	5	1	0	3	-5	-7	-7	-5	-9	-10	7	6	6	6		
10000	6	5	6	7	6	2	1	-6	-6	-5	-7	-7	-10	-11	6	6	6	5		
18000	4	0	0	4	1	-3	-4	-4	3	3	-4	-3	-7	-8	7	7	7	6		
DARWIN	MELBOURNE																1694 N.M.I.			
5000	-2	-2	0	1	-1	-6	-7	2	2	3	-2	0	-5	-6	7	7	7	6		
10000	-4	-2	2	1	-1	-7	-8	4	1	-4	-4	-1	-6	-8	7	7	8	8		
18000	3	3	7	7	4	-1	-3	-5	-6	-14	-14	-10	-17	-19	6	10	11	11		
DARWIN	PERTH																1629 N.M.I.			
5000	3	5	1	1	2	-2	-3	-3	-5	-2	-1	-3	-8	-9	7	7	7	7		
10000	3	1	-4	-2	0	-6	-8	-4	-2	2	0	-1	-7	-8	7	6	9	9		
18000	-6	-7	-17	-14	-11	-19	-21	4	5	13	9	7	0	-1	9	10	12	10		
DARWIN	PORT MOUTON																970 N.M.I.			
5000	2	-5	-9	-6	-6	-11	-12	-1	6	9	9	6	1	0	7	6	5	5		
10000	0	-5	-5	-7	-5	-9	-11	0	6	6	8	6	0	-1	6	7	7	6		
18000	-3	1	2	-3	-1	-6	-8	3	-1	-2	4	0	-5	-6	6	7	6	7		
DARWIN	SINGAPORE																1010 N.M.I.			
5000	-4	1	5	4	3	-2	-3	4	-1	-2	-4	-2	-6	-6	6	6	3	5		
10000	3	2	3	5	3	3	-1	-3	-2	-4	-5	-4	-8	-9	5	5	6	5		
18000	4	2	3	4	3	3	-1	-4	-2	-3	-4	-4	-8	-9	6	6	6	5		
DARWIN	VANIMU																851 N.M.I.			
5000	2	-3	-4	-5	-3	-7	-8	-1	3	4	4	3	-1	-2	7	5	5	5		
10000	-3	-6	-5	-5	-5	-15	-11	1	6	5	5	4	0	3	6	7	7	6		
18000	-4	-1	-2	-3	-3	-8	-9	4	2	2	4	3	-1	-3	6	7	6	6		

HEADINGS--COMPUTED FOR A 120-KT AIRSPEED.  
 ABS--KNOTS ANNUAL EQUIVALENT HEADWINDS PLUS INDICATED PER CENT OF LIABILITIES.  
 MINUS STORM WINDS HEADWINDS.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	HEADWIND												STANDARD DEVIATION					
	JAN	APR	JUL	OCT	00450	075	AB5	JAN	APR	JUL	OCT	00450	075	AB5	JAN	APR	JUL	OCT
DAVAN	TO																	
5000	4	2	-1	-4	0	-3	-4	-5	-2	2	4	0	-4	-5	0	4	3	6
10000	8	2	-1	4	3	-1	-2	-8	-2	1	-4	-4	-8	-9	5	6	6	6
18000	4	4	5	5	4	0	0	-4	-3	-5	-5	-5	-9	-10	6	5	7	5
DAVAN	TO																	
5000	3	3	0	6	2	3	-1	-3	-3	0	-6	-3	-7	-8	5	4	6	7
10000	1	0	-1	1	0	-4	-5	-1	0	0	-1	-1	-5	-6	6	5	7	7
18000	-4	-2	4	4	0	-5	-4	3	2	-4	-4	-1	-6	-7	7	7	7	6
DAVAO	TO																	
5000	4	4	2	4	3	0	-1	-4	-4	-2	-4	-4	-8	-9	6	5	6	8
10000	4	3	2	3	3	-1	-2	-4	-3	-2	-3	-4	-8	-9	7	5	6	8
18000	-2	0	4	3	0	-4	-6	0	0	-4	-3	-2	-7	-8	8	7	8	7
DAVAO	TO																	
5000	1	2	4	0	1	-3	-4	-2	-3	-4	0	-3	-7	-8	7	6	7	7
10000	2	4	4	3	3	-1	-2	-6	-6	-5	-3	-6	-11	-12	7	6	6	8
18000	4	2	3	1	2	-2	-4	-15	-7	-3	-3	-7	-14	-15	9	8	7	8
DAVAO	TO																	
5000	1	0	2	0	0	-3	-5	-2	0	-2	0	-1	-6	-7	7	5	7	7
10000	1	0	2	1	0	-4	-5	-3	0	-2	-1	-2	-7	-8	7	6	6	8
18000	10	5	0	0	3	-2	-3	-13	-7	0	-1	-6	-12	-14	8	7	7	8
DAVAO	TO																	
5000	2	3	4	0	2	-2	-3	-3	-3	-4	0	-3	-8	-9	7	6	6	7
10000	3	4	5	2	3	-1	-2	-5	-5	-5	-2	-5	-10	-11	7	6	6	8
18000	4	3	2	2	3	-2	-3	-9	-5	-2	-2	-5	-11	-12	8	6	6	7
DAVAN	TO																	
5000	0	2	4	-1	0	-3	-4	-1	-2	-4	1	-2	-6	-7	6	6	7	6
10000	0	3	3	0	1	-3	-4	-3	-5	-4	-1	-4	-8	-10	7	6	7	7
18000	-2	-2	2	0	-1	-6	-7	-8	-3	-3	-1	-4	-10	-11	9	8	7	7
DAVAN	TO																	
5000	1	1	-2	5	0	-2	-3	-1	-1	1	-5	-2	-5	-6	4	4	5	6
10000	-1	-2	-3	0	-2	-6	-7	0	2	3	-1	0	-3	-4	6	4	6	6
18000	-7	-5	4	3	-1	-7	-8	6	4	-4	-3	0	-5	-6	7	6	6	6
DAVAO	TO																	
5000	2	1	-6	-3	-2	-6	-7	-3	-1	6	3	0	-3	-4	5	4	3	6
10000	3	1	-4	0	0	-4	-5	-3	0	4	0	0	-4	-5	5	5	6	6
18000	4	4	7	8	5	1	0	-4	-3	-6	-7	-6	-9	-10	6	5	6	5

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 \*MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWIND												STANDARD DEVIATION																										
	DIRECT				PENANG				POST MCBERY				PUSAN EAST				SAIGON				SHANGHAI				SINGAPORE				TAIPEI				TOKYO				VANING		
JAN	APR	JUL	OCT	00ASO	475	AB5	JAN	APR	JUL	OCT	00ASO	475	AB5	JAN	APR	JUL	OCT	00ASO	475	AB5	JAN	APR	JUL	OCT	00ASO	475	AB5	JAN	APR	JUL	OCT	00ASO	475	AB5	JAN	APR	JUL	OCT	
DAVAR	1	2	-6	-1	-5	-6	-2	-1	0	1	0	-3	-4	-2	0	3	4	1	-2	-3	-2	-2	-1	0	1	0	-3	-4	-2	-1	0	1	0	-3	-4	-2	-1	0	
5000	3	1	-4	0	-4	-5	-3	0	4	0	0	-4	-5	-3	0	4	0	0	-4	-5	-3	-3	0	4	0	0	-4	-5	-3	0	4	0	0	-4	-5	-3	0	4	
10000	4	3	7	0	5	1	-3	-3	-6	-7	-5	-9	-10	-3	-3	-6	-7	-5	-9	-10	-3	-3	-6	-7	-5	-9	-10	-3	-3	-6	-7	-5	-9	-10	-3	-3	-6	-7	
DAVAR	1	0	-3	-3	-2	-5	-2	0	3	4	1	-2	-3	-2	0	3	4	1	-2	-3	-2	-2	0	3	4	1	-2	-3	-2	0	3	4	1	-2	-3	-2	0	3	
5000	-5	-2	-4	-6	-5	-9	5	2	5	6	4	1	0	5	4	5	6	4	1	0	5	4	5	6	4	1	0	5	4	5	6	4	1	0	5	4	5	6	
10000	-7	-3	-6	-4	-5	-10	7	3	6	4	4	1	0	7	3	6	4	4	1	0	7	3	6	4	4	1	0	7	3	6	4	4	1	0	7	3	6	4	
DAVAR	1	2	4	3	1	-3	-2	-2	-4	0	-2	-7	-8	-2	-2	-4	0	-2	-7	-8	-2	-2	-4	0	-2	-7	-8	-2	-2	-4	0	-2	-7	-8	-2	-2	-4	0	
5000	1	5	4	2	3	-1	-4	-6	-4	-2	-5	-9	-11	-4	-6	-4	-2	-5	-9	-11	-4	-6	-4	-2	-5	-9	-11	-4	-6	-4	-2	-5	-9	-11	-4	-6	-4		
10000	1	0	3	3	1	-4	-11	-5	-3	-2	-5	-11	-13	-11	-5	-3	-2	-5	-11	-13	-11	-5	-3	-2	-5	-11	-13	-11	-5	-3	-2	-5	-11	-13	-11	-5	-3		
DAVAR	0	4	-5	4	0	-4	0	-3	4	5	-5	-1	-5	0	-3	5	-5	-1	-5	-9	0	-3	5	-5	-1	-5	-9	0	-3	5	-5	-1	-5	-9	0	-3	5		
5000	3	1	-2	1	0	-3	-3	0	2	2	-2	-1	-5	-3	0	2	2	-2	-1	-5	-3	-3	0	2	2	-2	-1	-5	-3	0	2	2	-2	-1	-5	-3	0	2	
10000	2	2	6	8	4	0	-2	-2	-6	-8	-8	-10	-11	-2	-2	-6	-8	-8	-10	-11	-2	-2	-6	-8	-8	-10	-11	-2	-2	-6	-8	-8	-10	-11	-2	-2	-6		
DAVAR	2	3	4	0	2	-3	-2	-3	2	-2	-3	-7	-8	-2	-3	2	-2	-3	-7	-8	-2	-3	2	-2	-3	-7	-8	-2	-3	2	-2	-3	-7	-8	-2	-3	2		
5000	0	3	4	1	2	-3	-3	-4	2	-2	-3	-4	-7	-3	-4	2	-2	-3	-4	-7	-3	-4	2	-2	-3	-4	-7	-3	-4	2	-2	-3	-4	-7	-3	-4	2		
10000	-3	-2	3	0	0	-6	-4	-1	0	-6	-7	-7	-7	-4	-1	-3	-1	-3	-7	-7	-4	-1	-3	-1	-3	-7	-7	-4	-1	-3	-1	-3	-7	-7	-4	-1	-3		
DAVAR	4	2	-4	-5	-1	-5	-4	-2	4	5	0	-4	-5	-4	-2	4	5	0	-4	-5	-4	-2	4	5	0	-4	-5	-4	-2	4	5	0	-4	-5	-4	-2	4		
5000	5	2	-3	0	1	-3	-5	-1	4	4	-1	-6	-7	-5	-1	4	4	-1	-6	-7	-5	-1	4	4	-1	-6	-7	-5	-1	4	4	-1	-6	-7	-5	-1	4		
10000	4	4	7	7	5	1	-4	-4	-3	-7	-4	-4	-4	-4	-3	-7	-4	-4	-4	-4	-4	-3	-7	-4	-4	-4	-4	-4	-3	-7	-4	-4	-4	-4	-3	-7	-4		
DAVAR	3	4	4	2	3	-1	-3	-2	3	-2	-3	-8	-9	-3	-3	3	-2	-3	-8	-9	-3	-3	3	-2	-3	-8	-9	-3	-3	3	-2	-3	-8	-9	-3	-3	3		
5000	4	4	4	3	3	-1	-2	-2	4	3	-2	-3	-8	-3	-4	4	-2	-3	-2	-3	-8	-3	-4	4	3	-2	-3	-8	-3	-4	4	3	-2	-3	-8	-3	-4		
10000	1	1	3	2	1	-3	-3	-2	3	2	-3	-4	-4	-3	-2	3	2	-3	-4	-4	-3	-2	3	2	-3	-4	-4	-3	-2	3	2	-3	-4	-4	-3	-2	3		
DAVAR	2	3	4	1	2	-3	-3	-2	4	2	-2	-3	-3	-3	-3	4	2	-2	-3	-3	-3	-3	4	2	-2	-3	-3	-3	-3	4	2	-2	-3	-3	-3	4	2		
5000	5	4	4	4	4	3	-4	-4	4	4	3	-4	-4	-4	-4	4	4	3	-4	-4	-4	-4	4	4	3	-4	-4	-4	-4	4	4	3	-4	-4	-4	4	4		
10000	10	7	3	4	5	0	-21	-13	-4	-7	-11	-19	-21	-3	-3	-4	-7	-11	-19	-21	-3	-3	-4	-7	-11	-19	-21	-3	-3	-4	-7	-11	-19	-21	-3	-3	-4		
DAVAR	0	0	-1	0	-1	-4	0	0	1	1	0	-3	-4	0	0	1	1	0	-3	-4	0	0	1	1	0	-3	-4	0	0	1	1	0	-3	-4	0	0	1		
5000	-7	-4	-4	-7	-6	-10	8	4	5	7	6	2	1	8	4	5	7	6	2	1	8	4	5	7	6	2	1	8	4	5	7	6	2	1	8	4	5		
10000	-10	-5	-8	-5	-7	-12	-13	-5	-7	-12	-13	-5	-7	-12	-13	-5	-7	-12	-13	-5	-7	-12	-13	-5	-7	-12	-13	-5	-7	-12	-13	-5	-7	-12	-13	-5	-7		

• HEADWINDS—COMPUTED FOR A 120-KT AIRSPEED.  
 • A—• DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION					
	DIRECT			EQUIVALENT HEADWINDS									JAN	APR	JUL	OCT		
	JAN	APR	JUL	DEC	00450	00450	00450	00450	00450	00450	00450	00450	00450	00450	00450	00450	00450	00450
DHAMPAN																		
5000	0	9	0	0	5	0	-1	-5	-8	-9	0	-6	-11	-13	7	7	922	
10000	16	12	2	2	7	0	0	-16	-13	-2	-2	-8	-16	-18	8	9	7	
18000	36	27	0	10	16	4	1	-37	-28	3	-10	-17	-33	-36	13	12	6	
DHAMPAN																		
5000	3	6	3	0	2	-1	-2	-3	-6	-3	0	-3	-8	-9	6	6	1369	
10000	14	12	1	3	7	1	0	-14	-12	-1	-3	-8	-14	-16	7	7	6	
18000	34	27	0	13	17	5	3	-36	-28	3	-13	-19	-33	-36	12	11	7	
DHAMPAN																		
5000	4	7	4	0	3	-1	-2	-3	-7	-4	0	-4	-8	-9	9	6	1439	
10000	15	12	2	2	7	1	0	-15	-12	-1	-2	-8	-14	-16	7	7	6	
18000	35	27	0	11	17	4	1	-37	-28	3	-11	-18	-33	-36	11	10	7	
DHAMPAN																		
5000	0	0	-7	-1	-3	-8	-10	0	0	7	2	2	-3	-5	6	9	537	
10000	3	0	-5	-2	-1	-8	-10	-6	-2	5	1	0	-8	-10	10	10	8	
18000	-2	-1	3	7	0	-8	-10	-10	-7	0	-10	-7	-16	-19	17	14	10	
DHAMPAN																		
5000	5	7	1	2	3	-1	-3	-5	-7	-2	-1	-4	-10	-11	8	8	600	
10000	17	14	0	3	8	0	-1	-17	-14	0	-3	-9	-17	-19	9	10	8	
18000	34	27	1	14	17	5	3	-37	-29	-1	-14	-19	-34	-37	15	13	9	
DIEGO GARCIA																		
5000	-3	-2	-6	-2	-4	-7	-8	4	2	4	2	3	0	0	4	4	1900	
10000	1	0	0	0	0	-3	-4	-1	3	0	0	-1	-4	-5	5	5	5	
18000	-5	0	0	-2	-2	-6	-7	3	-1	0	2	0	-3	-4	7	6	5	
DIEGO GARCIA																		
5000	7	5	6	5	5	3	2	-7	-4	-4	-5	-6	-9	-9	5	3	1164	
10000	7	4	2	4	4	0	-1	-7	-4	-2	-4	-5	-10	-11	6	7	6	
18000	3	-2	-3	-2	-1	-7	-9	-3	2	3	2	0	-5	-6	9	8	8	
DIEGO GARCIA																		
5000	-2	-1	2	5	0	-2	-3	2	2	-2	-4	0	-4	-5	4	3	1699	
10000	-5	1	1	-3	-3	-9	-9	5	5	-2	2	2	-2	-3	6	6	6	
18000	-7	-3	-3	-5	-5	-9	-10	7	4	4	6	5	1	0	8	6	5	
DIEGO GARCIA																		
5000	-3	-1	4	5	0	-1	-4	3	2	-4	-5	-1	-5	-6	4	3	1828	
10000	-4	-4	2	-2	-3	-7	-8	5	5	-3	2	2	-2	-3	6	5	6	
18000	-7	-3	-3	-6	-5	-9	-10	7	4	4	6	5	1	0	7	6	6	

MEANWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 --DENOTES ANNUAL EQUIVALENT MEANWINDS FOR INDICATED PER CENT RELIABILITY.  
 MINUS SIGN DENOTES TAILWINDS.

EQUIVALENT HEADINGS AND STANDARD DEVIATIONS IN AIRS FOR GREAT CIRCLE AIR ROUTES

WIGHT IN FEET	EQUVALENT HEADINGS AND STANDARD DEVIATIONS IN AIRS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	MEXICO			SINGAPORE			MADRID			MUNICH			MADRID			JAN	APR	JUL
	JAN	APR	JUL	UCT	00450	475	485	JAN	APR	JUL	UCT	00450	475	485				
DIFCO GARCIA	10	0	0	3	0	-2	-2	-1	0	0	-2	-1	-4	-4	5	3	3	5
5000	-5	-4	0	-2	-3	-7	-8	5	4	3	2	2	-1	-2	6	5	5	5
10000	-7	-3	-4	-5	-5	-9	-10	7	4	4	5	4	1	0	7	5	6	5
DJABATA	10	0	0	1	0	-5	-6	1	-1	-6	-4	-3	-7	-8	5	4	5	6
5000	-1	2	0	4	2	-1	-2	2	1	-2	-2	0	-4	-5	6	5	6	6
10000	-2	-1	1	2	0	-4	-5	2	1	-2	-2	0	-4	-5	7	6	6	6
10000	0	-2	0	1	0	-5	-6	3	1	0	-1	0	-4	-5	7	6	6	6
DJABATA	10	0	0	1	0	-5	-6	1	-1	-6	-4	-3	-7	-8	5	4	5	6
5000	0	1	2	4	2	-1	-2	3	0	-9	-3	-1	-5	-7	5	4	5	6
10000	-1	0	3	2	0	-3	-4	1	0	-9	-2	-1	-5	-7	5	5	6	6
10000	1	0	0	1	0	-4	-4	-2	0	1	0	0	-5	-6	7	6	6	5
DJABATA	10	0	0	1	0	-5	-6	1	0	-2	-2	-1	-5	-6	5	4	5	6
5000	-1	0	2	4	2	-1	-2	1	0	-2	-4	-1	-5	-6	5	4	5	6
10000	-2	-2	0	2	-1	-5	-6	2	2	3	-2	0	-3	-4	5	5	6	5
10000	-2	-2	2	2	0	-5	-6	1	1	-2	-2	-1	-5	-6	7	6	6	6
DJABATA	10	0	0	1	0	-5	-6	1	0	-2	-2	-1	-5	-6	5	4	5	6
5000	-3	1	2	4	2	-1	-2	3	0	-1	-2	0	-4	-5	7	5	5	7
10000	0	-3	1	0	-1	-6	-7	0	3	-2	0	0	-5	-6	7	7	8	7
10000	4	2	4	3	3	-2	-3	-5	-2	-4	-3	-4	-9	-11	9	7	8	7
DJABATA	10	0	0	1	0	-5	-6	1	0	-2	-2	-1	-5	-6	5	4	5	6
5000	-5	0	2	4	0	-4	-5	4	0	-2	-3	0	-5	-6	7	5	5	7
10000	-1	-2	1	1	0	-5	-7	1	3	-2	-1	0	-5	-6	7	7	8	7
10000	3	2	3	2	2	-7	-4	-3	-1	-3	-2	-3	-8	-9	9	7	8	7
DJABATA	10	0	0	1	0	-5	-6	1	0	-2	-2	-1	-5	-6	5	4	5	6
5000	-3	0	-1	-1	-2	-6	-9	1	0	1	1	1	-2	-3	6	5	6	7
10000	-1	3	3	1	1	-5	-5	1	-3	-5	-3	-3	-8	-10	7	7	9	8
10000	1	1	0	2	1	-4	-4	-2	-3	-4	-6	-4	-11	-12	9	9	10	9
DJABATA	10	0	0	1	0	-5	-6	1	0	-2	-2	-1	-5	-6	5	4	5	6
5000	-4	0	2	4	3	-3	-4	4	0	-2	-3	-2	-6	-7	6	6	7	6
10000	-2	-1	2	4	3	-5	-5	1	1	-2	-3	0	-5	-6	7	6	7	6
10000	0	0	0	0	0	-5	-6	-1	0	0	0	0	-5	-6	8	7	7	6
DJABATA	10	0	0	1	0	-5	-6	1	0	-2	-2	-1	-5	-6	5	4	5	6
5000	-6	1	3	3	0	-9	-5	4	0	-3	-3	-2	-6	-7	6	6	7	6
10000	-1	-2	3	3	0	-5	-6	1	2	-3	-3	0	-5	-6	7	5	5	7
10000	2	1	2	1	1	-3	-5	-2	-1	-2	-1	-2	-7	-9	4	8	8	7

HEADINGS--COMPUTED FOR A 120-KT AIRSPEED.  
 000--DENOTES ANNUAL FOURVALENT HEADINGS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADINGS.

FOUR QUANTILE HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WINDMILL IN SFT	DIRECT				REVERSE				STANDARD DEVIATION			
	JAN	JUL	DEC	APR	JAN	JUL	DEC	APR	JAN	APR	JUL	OCT
<p>ROUTE AFB TO ELLINGTON</p>												
5000	-12	-6	-9	-9	-15	-16			10	5	8	6
10000	-22	-13	-14	-15	-23	-25			20	12	14	8
15000	-35	-23	-21	-24	-36	-39			29	19	21	12
<p>ROUTE AFB TO ELLINGTON AFB</p>												
5000	-11	-8	-6	-7	-14	-16			10	7	4	6
10000	-22	-17	-6	-7	-22	-25			14	14	6	10
15000	-40	-26	-8	-21	-38	-42			31	19	17	16
<p>ROUTE AFB TO ELLINGTON AFB</p>												
5000	-11	-9	-5	-4	-15	-17			12	9	5	7
10000	-24	-19	-7	-9	-23	-26			22	17	7	12
15000	-41	-30	-7	-22	-40	-43			37	24	5	19
<p>ROUTE AFB TO ELLINGTON AFB</p>												
5000	-14	-9	-7	-9	-17	-19			13	8	7	9
10000	-24	-17	-14	-15	-26	-28			24	15	14	16
15000	-43	-29	-22	-29	-42	-45			37	25	21	26
<p>ROUTE AFB TO ENGLAND AFB</p>												
5000	-13	-10	-5	-5	-15	-17			12	9	5	7
10000	-24	-19	-8	-9	-25	-27			23	17	8	13
15000	-44	-30	-9	-24	-41	-45			39	25	7	20
<p>ROUTE AFB TO FORT GEORGE</p>												
5000	-12	-9	-4	-4	-15	-17			11	8	4	6
10000	-23	-18	-7	-8	-24	-27			19	15	7	11
15000	-43	-28	-10	-23	-41	-45			34	20	9	18
<p>ROUTE AFB TO FORT GEORGE</p>												
5000	-12	-9	-6	-6	-14	-16			11	9	6	7
10000	-25	-19	-8	-11	-24	-26			24	18	8	14
15000	-44	-31	-12	-24	-40	-44			39	28	11	20
<p>ROUTE AFB TO FORT GEORGE</p>												
5000	-9	-7	-4	-5	-15	-17			7	5	3	4
10000	-19	-16	-7	-8	-23	-25			13	12	6	8
15000	-38	-23	-10	-22	-38	-42			23	12	8	13
<p>ROUTE AFB TO FORT CAMPBELL</p>												
5000	-15	-11	-6	-6	-16	-20			14	10	6	7
10000	-30	-22	-17	-17	-29	-32			28	20	11	16
15000	-49	-33	-16	-24	-47	-51			45	28	15	25

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 ---DASHES ANNUAL FOUR QUANTILE HEADWINDS FOR INDICATED PER CENT LIABILITIES.  
 ---PLUS SIGN INDICATES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION				
	DUPREY				FOOTWRIGHT				HEADWINDS				JAN	APR	JUL	OCT	
	JAN	APR	JUL	OCT	00450	A75	A85	00450	A75	A85	00450	A75	A85	JAN	APR	JUL	OCT
DUVEE AFH																	
5000	-13	-10	-7	-3	-10	-10	-18							10	10	7	9
10000	-26	-18	-12	-14	-17	-25	-28							11	11	8	10
18000	-44	-31	-14	-20	-30	-43	-46							17	16	13	16
DUVEE AFH																	
5000	-13	-10	-6	-6	-9	-16	-17							11	10	7	9
10000	-26	-19	-8	-10	-16	-25	-27							11	11	8	11
18000	-45	-31	-9	-24	-26	-41	-45							17	16	9	15
DUVEE AFH																	
5000	-11	-9	-6	-6	-9	-14	-15							9	9	7	9
10000	-24	-19	-8	-11	-15	-23	-25							10	9	7	9
18000	-43	-31	-12	-23	-24	-40	-44							15	14	8	13
DUVEE AFH																	
5000	-15	-11	-7	-3	-10	-19	-21							13	13	9	11
10000	-31	-22	-13	-12	-19	-30	-34							15	15	13	14
18000	-51	-34	-18	-30	-32	-44	-53							21	21	12	20
DUVEE AFH																	
5000	-15	-11	-7	-9	-11	-16	-20							12	12	9	13
10000	-29	-21	-13	-14	-19	-29	-31							13	13	10	12
18000	-49	-33	-19	-30	-31	-47	-51							19	19	11	18
DUVEE AFH																	
5000	-11	-8	-4	-4	-7	-14	-16							13	11	8	11
10000	-22	-17	-7	-7	-13	-23	-25							13	13	9	12
18000	-40	-26	-8	-22	-22	-38	-42							19	19	10	18
DUVEE AFH																	
5000	-14	-10	-7	-7	-10	-16	-18							11	11	7	9
10000	-28	-20	-10	-12	-17	-27	-29							12	12	9	11
18000	-47	-32	-14	-26	-28	-43	-47							18	17	10	16
DUVEE AFH																	
5000	-13	-10	-6	-7	-9	-16	-13							11	11	7	9
10000	-27	-20	-9	-11	-16	-26	-24							12	12	8	11
18000	-46	-32	-12	-25	-27	-43	-46							17	16	9	16
DUVEE AFH																	
5000	0	0	1	2	0	-6	-7							10	10	6	9
10000	0	0	0	1	0	-4	-8							11	11	9	10
18000	2	0	-1	0	0	-9	-12							15	15	11	15

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.

\*\*A--FOOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES. MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADINGS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADINGS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION																							
	DUFFY			GEN MITCHELL			HILL AFB			HOMESTEAD AFB			MUNTER AAF			MUNTSVILLE			JACKSONVILLE			KEY WEST			LAWSON AFB			LITTLE ROCK								
	JAN	APR	JUL	OCT	APR	JUL	OCT	APR	JUL	OCT	APR	JUL	OCT	APR	JUL	OCT	APR	JUL	OCT	APR	JUL	OCT	APR	JUL	OCT	APR	JUL	OCT	APR	JUL	OCT	APR	JUL			
DOVER AFB																																				
5000	-15	-10	-7	-9	-10	-19	-21																													
10000	-29	-20	-14	-14	-19	-29	-32																													
18000	-48	-32	-21	-29	-31	-47	-51																													
DOVER AFB																																				
5000	-11	-8	-6	-7	-8	-14	-15																													
10000	-24	-16	-12	-14	-17	-24	-26																													
18000	-42	-26	-20	-28	-24	-40	-43																													
DOVER AFB																																				
5000	-6	-5	-3	-2	-4	-11	-12																													
10000	-9	-6	-3	-4	-4	-14	-16																													
18000	-19	-17	-4	-12	-11	-27	-25																													
DOVER AFB																																				
5000	-9	-4	-3	-3	-6	-13	-15																													
10000	-18	-14	-6	-6	-11	-20	-23																													
18000	-35	-22	-8	-19	-20	-35	-39																													
DOVER AFB																																				
5000	-14	-10	-5	-6	-9	-17	-19																													
10000	-28	-20	-10	-10	-16	-27	-30																													
18000	-47	-37	-13	-27	-28	-45	-49																													
DOVER AFB																																				
5000	-9	-6	-3	-3	-6	-13	-15																													
10000	-16	-13	-5	-6	-10	-19	-21																													
18000	-32	-20	-7	-18	-18	-32	-36																													
DOVER AFB																																				
5000	-6	-5	-3	-3	-5	-11	-12																													
10000	-10	-4	-3	-4	-7	-14	-16																													
18000	-21	-13	-4	-12	-12	-23	-26																													
DOVER AFB																																				
5000	-17	-7	-5	-3	-3	-8	-14																													
10000	-24	-14	-13	-15	-17	-23	-25																													
18000	-38	-26	-22	-28	-28	-38	-41																													
DOVER AFB																																				
5000	-15	-11	-6	-7	-10	-17	-19																													
10000	-29	-20	-10	-12	-17	-27	-30																													
18000	-48	-33	-14	-27	-29	-45	-49																													

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*--DEVIATES--EQUVALENT HEADINGS FOR INDICATED PER CENT RELIABILITIES.  
 \*\*\*--STANDARD DEVIATION HEADINGS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	F U L L Y A L E N T H E A D W I N D S												STANDARD DEVIATION					
	D I R E C T				R E T U R N				R E T U R N				JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	00450	475	485	JAN	APR	JUL	OCT	00450	475	485				
DOVE AFB																		
5000	-16	-12	-7	-9	-11	-20	-22	15	11	3	9	10	2	0	14	14	9	12
10000	-32	-23	-14	-13	-20	-31	-35	31	22	14	12	18	0	6	16	16	11	14
18000	-52	-35	-20	-31	-33	-50	-55	47	31	19	27	29	15	11	23	22	13	22
DOVE AFB																		
5000	6	4	6	6	5	-7	-4	-9	-6	-6	-7	-7	-16	-10	14	14	10	12
10000	13	9	8	10	9	0	-2	-20	-13	-10	-13	-14	-24	-27	16	16	11	14
18000	24	11	11	14	15	2	0	-37	-21	-15	-26	-24	-39	-43	22	22	13	21
DOVE AFB																		
5000	-10	-8	-6	-6	-8	-13	-14	5	7	6	5	6	1	0	5	0	6	7
10000	-23	-17	-9	-11	-15	-22	-24	21	16	9	10	13	7	5	10	9	7	9
18000	-42	-30	-15	-24	-26	-39	-42	37	27	14	20	22	13	11	15	14	0	13
DOVE AFB																		
5000	-15	-11	-6	-7	-10	-17	-19	13	10	6	7	8	1	0	12	12	6	10
10000	-29	-21	-10	-11	-17	-28	-31	27	19	10	10	15	6	4	13	13	14	13
18000	-44	-32	-14	-27	-29	-45	-49	43	28	13	24	25	12	9	19	19	11	19
DOVE AFB																		
5000	-8	-7	-3	-2	-5	-10	-12	7	7	3	2	4	0	-1	0	0	5	7
10000	-14	-12	-3	-4	-9	-16	-18	13	11	3	4	7	1	0	9	9	6	8
18000	-32	-22	-2	-15	-18	-29	-32	25	17	1	11	12	3	1	12	12	7	11
DOVE AFB																		
5000	-14	-9	-7	-9	-10	-18	-20	13	8	7	8	8	1	0	13	12	9	11
10000	-27	-18	-15	-15	-19	-28	-30	25	16	14	13	16	0	6	13	13	14	10
18000	-45	-30	-22	-29	-31	-45	-48	36	25	20	23	25	13	10	20	19	12	19
DOVE AFB																		
5000	-13	-8	-7	-9	-10	-17	-18	12	7	7	8	8	1	0	14	11	8	10
10000	-24	-16	-15	-15	-18	-26	-28	23	14	14	14	16	0	6	11	11	12	9
18000	-40	-27	-22	-23	-29	-41	-44	34	23	21	23	24	14	11	17	17	11	16
DOVE AFB																		
5000	-10	-8	-5	-6	-8	-13	-14	9	7	5	5	6	1	0	0	0	6	7
10000	-23	-16	-10	-12	-15	-22	-24	21	15	10	11	13	7	6	10	9	7	9
18000	-42	-29	-18	-25	-27	-39	-42	36	25	17	22	23	14	12	15	14	0	13
DOVE AFB																		
5000	-12	-9	-4	-5	-8	-15	-17	11	8	5	4	6	0	-1	11	11	7	10
10000	-23	-18	-7	-8	-14	-23	-25	20	16	7	7	11	4	2	12	12	8	11
18000	-42	-28	-7	-22	-24	-39	-43	35	22	6	10	10	6	4	17	17	10	16

\* HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\* A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WIND IN FEET	EQUVALENT HEADWIND IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION			
	DIRECT				RETURN				RETURN				JAN	APR	JUL	OCT
	JAN	APR	JUL	OCT	APR	APR	APR	APR	JAN	APR	JUL	OCT	APR	APR	APR	APR
DOVER AFB	NIAGARA FALLS															
5000	-10	-8	-5	-5	-7	-10	-18									
10000	-21	-14	-10	-8	-13	-24	-27									
18000	-34	-25	-14	-18	-22	-37	-42									
DOVER AFB	PATRICK AFB															
5000	-7	-5	-3	-2	-5	-12	-13									
10000	-12	-11	-4	-4	-3	-16	-18									
18000	-24	-16	-5	-14	-14	-27	-30									
DOVER AFB	PITTSBURGH															
5000	-15	-12	-7	-8	-11	-20	-22									
10000	-31	-22	-14	-12	-19	-31	-34									
18000	-50	-34	-23	-24	-32	-49	-54									
DOVER AFB	REGINA															
5000	-12	-7	-6	-9	-9	-15	-17									
10000	-24	-15	-14	-15	-17	-25	-27									
18000	-38	-26	-22	-27	-28	-39	-41									
DOVER AFB	SCOTT AFB															
5000	-16	-11	-7	-4	-11	-14	-21									
10000	-30	-22	-13	-13	-19	-30	-32									
18000	-50	-33	-18	-30	-31	-44	-52									
DOVER AFB	SELFRIDGE AFB															
5000	-14	-10	-7	-8	-10	-18	-21									
10000	-28	-19	-14	-12	-18	-29	-32									
18000	-44	-32	-20	-27	-30	-46	-50									
DOVER AFB	SHAW AFB															
5000	-10	-7	-3	-4	-6	-14	-16									
10000	-20	-16	-7	-6	-13	-23	-25									
18000	-39	-24	-10	-22	-22	-38	-43									
DOVER AFB	WESTOVER AFB															
5000	9	5	5	6	5	-2	-4									
10000	14	12	9	10	10	0	-1									
18000	25	12	11	18	15	1	-1									
DOVER AFB	Wurtsmith															
5000	-12	-9	-7	-7	-9	-17	-19									
10000	-25	-17	-13	-12	-17	-27	-30									
18000	-41	-24	-19	-24	-27	-42	-46									

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*--PREDICTS ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 +PLUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT												STANDARD DEVIATION																				
	DUTCH HARBOR			YELLOKNIFE			EDMONTON			EISELSON AFB			ELVERDORF AFB			FORT LEWIS			HICKAM AFB			JUNEAU			KODIAK			LARSON AFB					
	JAN	APR	JUL	JUL	OCT	APR	APR	MAY	SEP	APR	MAY	SEP	APR	MAY	SEP	APR	MAY	SEP	APR	MAY	SEP	APR	MAY	SEP	APR	MAY	SEP	APR	MAY	SEP			
500	-8	-4	-5	-9	-7	-13	-14	-14	-14	-4	-4	-4	-4	-4	-4	-2	-2	-2	-5	-5	-5	-6	-6	-6	-3	-3	-3	-3	-3	-3	-3	-3	-3
1000	-17	-10	-12	-13	-13	-19	-21	-21	-21	-4	-4	-4	-4	-4	-4	-2	-2	-2	-9	-9	-9	-3	-3	-3	-3	-3	-3	-1	-1	-1	-1	-1	-1
1800	-27	-19	-18	-21	-21	-30	-32	-32	-32	-4	-4	-4	-4	-4	-4	-2	-2	-2	-9	-9	-9	-3	-3	-3	-3	-3	-3	-1	-1	-1	-1	-1	-1
DUTCH HARBOR	TO																																
5000	5	3	4	5	5	4	-1	-2	-2	4	4	4	4	4	4	0	0	0	5	5	5	3	3	3	3	3	3	5	5	5	5	5	5
10000	11	6	7	11	8	2	0	0	0	8	8	8	8	8	8	5	5	5	8	8	8	6	6	6	6	6	6	8	8	8	8	8	8
18000	19	11	11	16	14	4	2	2	2	14	14	14	14	14	14	9	9	9	14	14	14	13	13	13	13	13	13	14	14	14	14	14	14
DUTCH HARBOR	TO																																
5000	-1	3	4	3	2	-4	-4	-4	-4	2	2	2	2	2	2	9	9	9	2	2	2	3	3	3	3	3	3	2	2	2	2	2	2
10000	4	4	7	7	5	-2	-5	-5	-5	7	7	7	7	7	7	5	5	5	7	7	7	6	6	6	6	6	6	7	7	7	7	7	7
18000	9	3	9	10	9	-2	-5	-5	-5	9	9	9	9	9	9	9	9	9	10	10	10	10	10	10	10	10	10	9	9	9	9	9	9
DUTCH HARBOR	TO																																
5000	0	3	7	3	3	-4	-6	-6	-6	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
10000	6	4	7	8	6	-3	-5	-5	-5	8	8	8	8	8	8	6	6	6	8	8	8	6	6	6	6	6	6	8	8	8	8	8	8
18000	13	9	10	11	10	-2	-5	-5	-5	10	10	10	10	10	10	10	10	10	11	11	11	11	11	11	11	11	11	10	10	10	10	10	10
DUTCH HARBOR	TO																																
5000	8	3	7	5	5	0	-2	-2	-2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
10000	13	8	8	10	9	2	0	0	0	8	8	8	8	8	8	9	9	9	8	8	8	9	9	9	9	9	9	8	8	8	8	8	8
18000	21	13	14	18	15	6	3	3	3	14	14	14	14	14	14	15	15	15	18	18	18	18	18	18	18	18	18	15	15	15	15	15	15
DUTCH HARBOR	TO																																
5000	-5	3	2	6	1	-5	-6	-6	-6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10000	-4	0	-3	4	-1	-7	-9	-9	-9	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
18000	-5	-1	0	1	-1	-9	-11	-11	-11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DUTCH HARBOR	TO																																
5000	2	3	5	4	3	-3	-4	-4	-4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
10000	8	4	6	8	6	-1	-3	-3	-3	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
18000	16	10	11	14	12	1	-1	-1	-1	11	11	11	11	11	11	12	12	12	14	14	14	14	14	14	14	14	14	12	12	12	12	12	12
DUTCH HARBOR	TO																																
5000	4	4	8	8	5	-3	-6	-6	-6	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
10000	9	4	8	11	8	-1	-4	-4	-4	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
18000	17	11	13	14	13	0	-3	-3	-3	13	13	13	13	13	13	13	13	13	14	14	14	14	14	14	14	14	14	13	13	13	13	13	13
DUTCH HARBOR	TO																																
5000	7	3	6	5	5	0	-2	-2	-2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
10000	12	7	8	9	8	2	0	0	0	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
18000	21	13	14	18	16	6	3	3	3	14	14	14	14	14	14	16	16	16	18	18	18	18	18	18	18	18	18	16	16	16	16	16	16

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	DIRECT							INDIRECT							STANDARD DEVIATION			
	JAN	APR	JUL	OCT	00A50	A75	A85	JAN	APR	JUL	OCT	00A50	A75	A85	JAN	APR	JUL	OCT
DUTCH HARBOR															1014 N.M.I.			
5000	-12	-3	-8	-4	-9	-14	-18	8	4	7	4	6	0	-2	13	10	9	10
10000	-14	-11	-11	-4	-10	-18	-20	9	7	9	0	6	-1	-3	12	11	9	10
18000	-23	-17	-8	-11	-15	-25	-27	10	7	3	1	4	-4	-6	16	14	11	13
DUTCH HARBOR															1096 N.M.I.			
5000	-2	5	1	1	1	-5	-7	1	-2	-6	-2	-3	-9	-11	11	9	8	10
10000	1	4	7	5	4	-3	-5	-3	-5	-4	-4	-6	-14	-16	14	11	10	11
18000	4	6	7	7	6	-4	-7	-10	-9	-10	-10	-10	-21	-23	18	15	14	15
DUTCH HARBOR															695 N.M.I.			
5000	-7	-5	-9	-10	-8	-17	-20	5	4	9	8	6	-2	-4	12	13	11	14
10000	-14	-4	-11	-16	-13	-23	-26	11	7	10	14	10	0	-2	16	15	13	15
18000	-20	-16	-17	-22	-19	-32	-36	14	13	14	18	14	1	-1	22	19	17	20
DUTCH HARBOR															1765 N.M.I.			
5000	8	3	7	6	6	0	-1	-10	-4	-7	-7	-7	-7	-14	11	9	7	9
10000	13	8	9	9	9	2	0	-14	-10	-9	-12	-12	-19	-21	13	10	9	10
18000	21	13	14	18	16	6	3	-27	-18	-17	-23	-21	-32	-35	17	15	13	15
DUTCH HARBOR															1673 N.M.I.			
5000	1	3	3	5	3	-2	-3	-2	-3	-3	-6	-4	-10	-11	9	8	7	8
10000	7	5	6	9	6	0	-1	-9	-5	-6	-9	-8	-14	-16	11	9	6	9
18000	14	10	10	13	11	2	0	-18	-12	-11	-16	-15	-24	-26	15	13	11	13
EDMONTON															1813 N.M.I.			
5000	7	3	2	5	4	-1	-2	-8	-4	-2	-6	-5	-11	-13	9	9	7	8
10000	14	9	6	10	9	3	2	-17	-10	-7	-12	-12	-18	-20	9	9	7	9
18000	19	14	10	15	14	6	4	-29	-19	-13	-21	-20	-30	-32	14	13	9	13
EDMONTON															1207 N.M.I.			
5000	-1	0	1	-4	-1	-7	-8	0	0	-1	3	0	-5	-6	9	8	7	9
10000	-10	-4	-5	-7	-7	-13	-15	9	3	5	5	5	0	-2	11	9	8	9
18000	-19	-7	-8	-14	-13	-22	-24	16	5	7	11	9	0	-1	15	13	11	13
EDMONTON															1646 N.M.I.			
5000	3	1	-1	3	1	-4	-5	-4	-1	0	-4	-2	-8	-10	9	9	7	8
10000	10	6	2	8	6	0	-1	-14	-7	-3	-9	-8	-15	-17	9	9	7	8
18000	14	9	4	12	9	0	-1	-24	-15	-7	-17	-15	-25	-28	14	13	9	13
EDMONTON															664 N.M.I.			
5000	6	3	1	5	3	-3	-5	-7	-3	-2	-6	-5	-12	-14	12	11	9	11
10000	17	9	7	12	11	3	2	-18	-9	-8	-14	-13	-20	-22	11	10	9	10
18000	22	12	10	18	16	3	1	-27	-15	-13	-23	-19	-31	-34	18	17	13	17

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												JAN	APP	JUL	OCT		
	EDMONTON			FARMINGTON			EDMONTON			EDMONTON			EDMONTON			JAN	APP	JUL
5000	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
10000	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
18000	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
10000	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
18000	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
10000	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
18000	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
10000	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
18000	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
10000	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
18000	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO

\* HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\* A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION					
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT
EDMONTON	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	2	0	-1	2	0	-5	-6	-4	-1	1	-3	-2	-8	-9	5	9	7	8
10000	10	5	2	7	5	0	-1	-13	-7	-3	-9	-8	-15	-16	9	9	7	9
18000	14	8	4	12	8	0	-1	-24	-14	-7	-17	-15	-25	-28	15	14	9	13
EDMONTON	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	-4	-2	-2	-2	-3	-7	-9	3	2	2	2	2	-2	-3	7	7	5	7
10000	4	1	-1	0	0	-4	-6	-6	-2	0	-1	-2	-8	-10	5	8	7	8
18000	3	0	-4	2	0	-9	-11	-13	-6	1	-8	-6	-17	-19	16	15	10	14
EDMONTON	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	10	5	3	7	6	2	-1	-11	-6	-4	-8	-8	-14	-16	10	10	8	9
10000	18	11	10	13	12	5	4	-20	-12	-11	-15	-15	-22	-24	10	10	8	10
18000	24	17	15	21	19	10	8	-33	-21	-17	-25	-24	-34	-37	15	14	10	14
EDMONTON	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	5	4	2	7	5	-1	-3	-10	-5	-2	-7	-6	-13	-15	10	10	8	10
10000	17	9	8	13	11	4	3	-19	-10	-9	-14	-13	-21	-22	10	10	9	10
18000	23	13	12	19	16	6	4	-29	-19	-15	-24	-21	-32	-35	16	15	11	15
EDMONTON	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	-10	-5	-2	-7	-6	-13	-15	10	5	2	6	5	-1	-3	11	10	8	11
10000	-12	-8	-5	-13	-10	-18	-20	9	7	5	12	8	0	-1	14	11	10	11
18000	-17	-13	-12	-18	-15	-28	-31	9	9	10	12	10	-2	-5	20	19	15	19
EDMONTON	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	-6	-3	0	-3	-3	-9	-10	5	3	0	3	2	-3	-4	9	8	5	8
10000	-4	-3	-3	-6	-4	-11	-13	1	2	3	5	2	-3	-5	12	10	7	10
18000	-8	-7	-9	-8	-9	-19	-22	-2	1	6	2	2	-9	-11	18	17	12	16
EDMONTON	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	7	4	2	6	4	-1	-2	-9	-5	-3	-6	-6	-12	-13	9	9	7	8
10000	15	9	7	10	10	4	2	-18	-11	-7	-12	-12	-19	-20	9	9	7	9
18000	20	14	11	17	15	6	4	-29	-20	-13	-22	-21	-30	-33	14	13	9	13
EDMONTON	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	4	1	0	3	1	-4	-5	-5	-2	0	-4	-3	-9	-10	5	9	7	9
10000	12	7	4	9	7	1	0	-15	-8	-5	-10	-10	-16	-18	10	9	8	9
18000	17	9	6	13	10	1	0	-25	-15	-9	-19	-17	-27	-30	16	15	10	14
EDMONTON	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	3	1	-1	3	1	-4	-5	-4	-1	0	-3	-2	-8	-9	9	9	7	8
10000	11	6	3	8	6	0	-1	-14	-7	-4	-9	-9	-15	-17	10	9	8	9
18000	15	8	5	12	9	0	-1	-24	-14	-9	-18	-16	-26	-29	15	14	10	14

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 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWIND IN KNOTS												STANDARD DEVIATION								
	DIRECT			INDIRECT									RETURN								
	JAN	APR	JUL	JAN	APR	JUL	OCT	**A50	**A75	A85	JAN	APR	JUL	OCT	**A50	**A75	A85	JAN	APR	JUL	OCT
EDMONTON TO FROBISHER	5	1	4	7	4	-1	-3	-5	-2	-4	-8	-5	-11	-13	9	6	9	1489 N.M.I.			
10000	5	4	5	7	5	0	-1	-6	-5	-6	-8	-7	-12	-14	9	8	9				
18000	8	9	8	10	8	0	-1	-12	-12	-10	-14	-13	-21	-22	12	12	11	12			
EDMONTON TO GEN MITCHELL	10	4	4	8	6	0	-2	-11	-5	-4	-9	-8	-15	-17	11	10	9	1202 N.M.I.			
10000	19	11	12	15	14	7	5	-21	-12	-13	-16	-16	-23	-25	10	11	9	10			
18000	28	18	18	23	21	11	9	-32	-21	-20	-26	-25	-35	-38	16	15	11	16			
EDMONTON TO HILL AFB	-4	-1	0	-1	-2	-8	-9	3	1	0	1	1	-4	-6	10	9	7	750 N.M.I.			
10000	4	2	0	0	1	-5	-7	-8	-3	0	-2	-4	-11	-12	11	10	9	11			
18000	6	0	-2	2	0	-10	-12	-15	-6	-1	-10	-8	-20	-23	18	17	13	18			
EDMONTON TO HUNTER AAF	9	5	3	6	5	0	-1	-10	-4	-3	-7	-7	-13	-14	9	9	7	1896 N.M.I.			
10000	17	10	8	11	11	5	3	-19	-12	-9	-12	-13	-20	-21	9	9	7	9			
18000	23	16	13	18	17	8	6	-32	-21	-15	-23	-22	-32	-35	14	13	9	14			
EDMONTON TO HUNTSVILLE	9	4	3	6	5	0	-2	-10	-5	-3	-7	-6	-13	-14	10	9	7	1599 N.M.I.			
10000	16	10	8	12	11	4	3	-19	-11	-9	-13	-13	-20	-22	10	10	8	10			
18000	22	15	12	19	16	7	5	-31	-20	-15	-24	-22	-32	-35	15	14	9	15			
EDMONTON TO JACKSONVILLE	8	4	3	6	5	0	-1	-9	-5	-3	-7	-6	-12	-13	9	8	7	1957 N.M.I.			
10000	15	10	7	10	10	4	2	-18	-12	-8	-12	-13	-19	-21	9	9	7	9			
18000	21	15	11	17	15	7	5	-31	-21	-14	-22	-22	-31	-34	13	13	8	13			
EDMONTON TO JUNEAU	-5	-1	-1	-6	-4	-10	-12	4	1	1	6	2	-3	-5	11	9	8	760 N.M.I.			
10000	-13	-8	-6	-13	-10	-18	-20	12	7	6	11	8	1	0	13	10	9	13			
18000	-23	-13	-10	-19	-16	-23	-30	20	10	8	16	13	2	0	17	16	13	17			
EDMONTON TO KODIAK	-3	-2	-1	-5	-3	-9	-10	2	1	1	4	1	-3	-5	10	8	7	1324 N.M.I.			
10000	-12	-6	-6	-10	-9	-15	-17	10	5	5	8	6	0	-1	12	9	8	12			
18000	-22	-13	-10	-18	-16	-26	-29	18	10	9	15	12	3	0	16	14	12	16			
EDMONTON TO LAPSON AFB	-9	-4	-1	-6	-5	-13	-14	9	4	1	5	4	-2	-4	11	11	9	441 N.M.I.			
10000	-8	-5	-4	-10	-7	-15	-17	5	4	3	9	5	-2	-4	13	11	10	13			
18000	-12	-10	-10	-13	-12	-24	-27	3	5	8	6	5	-6	-9	20	19	15	20			

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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWIND					STANDARD DEVIATION					
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT
EDMONTON	TO										
5000	7	3	2	6	4	-1	-3	-9	-4	-2	-6
10000	15	9	6	11	10	3	1	-17	-10	-7	-12
18000	20	13	10	17	14	5	3	-28	-18	-13	-22
EDMONTON	TO										
5000	10	5	4	8	6	0	-1	-11	-6	-5	-9
10000	19	11	12	14	13	7	5	-21	-12	-13	-15
18000	28	18	17	22	20	11	9	-34	-22	-19	-26
EDMONTON	TO										
5000	10	4	7	10	7	1	0	-11	-5	-7	-11
10000	17	9	14	15	13	7	6	-18	-10	-14	-16
18000	25	16	21	22	21	12	10	-29	-19	-23	-25
EDMONTON	TO										
5000	-4	-2	-1	-2	-3	-7	-9	4	2	2	2
10000	3	1	-1	0	0	-5	-7	-6	-2	1	-1
18000	2	0	-5	0	-1	-11	-13	-12	-5	1	-7
EDMONTON	TO										
5000	10	5	6	9	7	1	0	-12	-6	-6	-10
10000	20	12	13	15	14	8	6	-22	-13	-14	-16
18000	29	19	20	22	22	13	11	-35	-23	-21	-26
EDMONTON	TO										
5000	8	4	2	6	4	-1	-2	-9	-5	-3	-7
10000	16	9	7	12	10	4	2	-18	-11	-9	-13
18000	21	14	11	18	15	6	4	-30	-19	-14	-23
EDMONTON	TO										
5000	10	4	4	8	6	0	-2	-11	-5	-4	-9
10000	19	10	12	15	13	6	4	-20	-11	-12	-16
18000	27	17	17	23	20	10	8	-31	-20	-19	-26
EDMONTON	TO										
5000	9	3	3	9	5	-2	-4	-10	-4	-3	-8
10000	19	10	11	16	13	6	4	-20	-10	-11	-16
18000	27	15	15	23	19	8	5	-30	-18	-17	-25
EDMONTON	TO										
5000	-5	-3	0	-3	-3	-9	-10	4	2	1	2
10000	1	0	-2	-2	-1	-7	-9	-4	-1	1	0
18000	0	-2	-6	-1	-3	-13	-16	-10	-3	2	-5

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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION						
	JAN			APR			JUL			OCT			RETURN				JAN	APR	JUL
EDMONTON	TO NEW CUMBERLAND																		
5000	10	5	5	9	6	0	0	0	0	-12	-6	-6	-9	-9	-15	-17	-17	1678 N.M.I.	
10000	20	12	13	15	14	8	6	6	6	-22	-13	-14	-16	-17	-23	-25	-25	10 10 8 9	
18000	29	19	19	22	21	13	10	10	10	-35	-23	-21	-26	-26	-36	-39	-39	14 14 10 14	
EDMONTON	TO NEW ORLEANS																		
5000	5	3	1	5	3	-2	-3	-3	-3	-7	-4	-1	-5	-5	-10	-12	-12	1743 N.M.I.	
10000	13	7	4	9	8	1	0	0	0	-16	-9	-5	-11	-10	-17	-19	-19	9 9 7 9	
18000	17	12	9	15	12	4	2	2	2	-27	-18	-11	-20	-19	-28	-31	-31	14 13 9 13	
EDMONTON	TO NIAGARA FALLS																		
5000	10	4	2	9	5	0	-1	-1	-1	-11	-5	-6	-10	-8	-15	-17	-17	1496 N.M.I.	
10000	20	11	14	15	15	8	6	6	6	-21	-12	-14	-17	-16	-23	-25	-25	10 10 3 10	
18000	29	19	20	23	22	13	11	11	11	-33	-22	-22	-26	-26	-35	-38	-38	15 14 10 14	
EDMONTON	TO CUNARD AFH																		
5000	-5	-2	0	-2	-2	-3	-9	-9	-9	4	2	0	2	1	-3	-4	-4	1183 N.M.I.	
10000	-1	-1	-3	-4	-3	-9	-11	-11	-11	-1	0	2	2	0	-5	-7	-7	8 8 6 7	
18000	-4	-5	-8	-5	-6	-16	-18	-18	-18	-5	0	5	-1	0	-11	-13	-13	11 10 7 9	
EDMONTON	TO PITTSBURGH																		
5000	10	5	5	8	6	0	-1	-1	-1	-11	-6	-5	-9	-8	-15	-16	-16	1551 N.M.I.	
10000	20	11	13	15	14	7	6	6	6	-21	-13	-13	-16	-16	-23	-25	-25	10 10 8 10	
18000	29	19	19	22	21	12	10	10	10	-34	-22	-20	-26	-25	-35	-38	-38	15 14 10 14	
EDMONTON	TO PRUDHOE BAY																		
5000	0	0	1	-4	-1	-6	-8	-8	-8	0	0	-1	3	0	-6	-7	-7	1367 N.M.I.	
10000	-9	-3	-5	-6	-6	-12	-13	-13	-13	8	3	5	5	5	0	-1	-1	9 8 7 8	
18000	-17	-7	-3	-11	-11	-19	-21	-21	-21	14	5	7	8	8	0	-1	-1	13 12 10 11	
EDMONTON	TO FLORIDA																		
5000	10	3	2	3	5	-2	-4	-4	-4	-11	-3	-3	-9	-7	-15	-18	-18	377 N.M.I.	
10000	19	10	11	16	13	6	4	4	4	-20	-10	-11	-17	-15	-23	-25	-25	13 12 11 12	
18000	27	15	15	23	19	8	5	5	5	-29	-17	-16	-25	-22	-34	-37	-37	12 11 10 11	
EDMONTON	TO SCOTT AFH																		
5000	9	4	3	7	5	0	-2	-2	-2	-11	-5	-3	-8	-7	-14	-16	-16	1320 N.M.I.	
10000	18	10	9	13	12	5	3	3	3	-20	-11	-10	-14	-14	-21	-23	-23	10 10 8 10	
18000	25	15	14	21	18	8	6	6	6	-31	-20	-15	-25	-23	-33	-36	-36	16 15 10 15	
EDMONTON	TO SELFIDGE AFH																		
5000	10	4	5	9	6	0	-1	-1	-1	-11	-5	-5	-10	-8	-15	-17	-17	1380 N.M.I.	
10000	20	11	13	15	14	7	6	6	6	-21	-12	-14	-16	-16	-23	-25	-25	10 10 8 10	
18000	29	18	19	23	21	12	10	10	10	-33	-21	-21	-26	-25	-35	-38	-38	15 14 11 15	

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 MINUS SIGN DENOTES HEADWINDS.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT						RETURN						JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50					A75	A85
EDMONTON	SHAW AFR												1824 N.M.I.					
5000	9	5	4	7	6	0	-1	-11	-6	-4	-8	-8	-14	-15	9	9	7	9
10000	18	11	10	12	12	6	5	-20	-13	-10	-13	-14	-21	-22	9	9	7	9
18000	25	17	14	19	18	9	7	-33	-22	-16	-24	-23	-33	-36	14	13	9	13
EDMONTON	THULE												1697 N.M.I.					
5000	0	1	2	3	1	-4	-5	0	-1	-2	-4	-2	-8	-9	8	8	8	9
10000	-3	1	0	0	-1	-6	-7	2	-2	0	-1	-1	-6	-7	8	8	8	7
18000	-4	1	0	0	-1	-8	-10	0	-4	-1	-3	-2	-10	-11	11	11	10	11
EDMONTON	WESTOVER AFR												1755 N.M.I.					
5000	10	5	6	9	7	1	0	-12	-5	-7	-10	-9	-16	-17	10	9	8	9
10000	20	11	14	16	15	8	7	-21	-13	-14	-17	-17	-23	-25	10	10	8	9
18000	28	19	21	22	22	13	11	-34	-22	-22	-26	-26	-35	-38	14	13	10	14
EDMONTON	MURTSWICH												1293 N.M.I.					
5000	10	4	5	9	6	0	-1	-11	-5	-5	-10	-8	-15	-17	11	10	9	10
10000	20	11	13	16	14	3	6	-21	-12	-14	-17	-16	-23	-25	10	10	9	10
18000	29	18	20	23	22	12	10	-32	-21	-21	-26	-25	-35	-38	15	14	11	15
EDMONTON	YAKIMA												499 N.M.I.					
5000	-10	-5	-1	-6	-6	-13	-15	9	4	1	5	4	-2	-4	11	10	8	11
10000	-9	-6	-4	-11	-8	-16	-18	6	5	4	10	6	-1	-3	13	11	10	11
18000	-13	-10	-11	-15	-13	-25	-28	4	6	9	8	6	-5	-8	19	19	15	19
EDMONTON	YELLOWKNIFE												535 N.M.I.					
5000	0	0	0	-2	0	-8	-10	-1	-1	-1	0	-1	-9	-10	11	11	10	12
10000	-8	-2	-4	-6	-5	-12	-14	6	2	3	4	3	-3	-4	11	10	9	10
18000	-13	-4	-5	-8	-8	-18	-21	8	0	3	3	3	-6	-9	16	15	13	15
EGLIN AFR	ELLINGTON AFR												452 N.M.I.					
5000	-10	-7	-3	-4	-6	-13	-16	9	7	3	4	5	-1	-3	12	11	8	10
10000	-20	-15	-1	-6	-10	-20	-22	19	15	1	6	9	0	-1	12	12	8	11
18000	-37	-30	1	-17	-20	-37	-40	35	28	-1	15	18	2	0	17	17	9	16
EGLIN AFR	ELLSWORTH AFR												1162 N.M.I.					
5000	-8	-5	-2	-5	-5	-12	-13	6	4	2	5	4	-2	-3	10	10	8	9
10000	-17	-11	-5	-10	-11	-19	-21	13	9	4	8	8	1	0	11	11	8	11
18000	-30	-22	-11	-20	-20	-32	-35	19	16	10	15	14	5	2	17	16	9	15
EGLIN AFR	EL TOPO MCAS												1592 N.M.I.					
5000	-5	-4	-1	-1	-3	-8	-9	4	4	1	0	2	-2	-3	8	8	5	7
10000	-17	-13	-2	-7	-10	-17	-19	16	13	2	6	8	2	0	9	8	6	8
18000	-35	-29	-4	-17	-21	-34	-37	31	26	4	15	18	6	4	14	13	8	12

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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION				
	DIFFICULTY			EQUIVALENT			HEADWIND			RETURN			JAN	APR	JUL	OCT	
	JAN	APR	JUL	JUL	UCT	SEASU	A75	A85	A75	A85	A75	A85					
EGLIN AFB	315 N.M.I.																
5000	-9	-7	-2	FN	ENGLAND AFB	-13	-15	8	7	2	4	4	-2	-4	12	12	11
10000	-20	-15	-1	-7	-10	-21	-23	19	14	2	7	9	0	-1	13	13	9
18000	-38	-31	-1	-18	-21	-38	-42	34	28	0	16	18	3	0	18	18	17
FGLIN AFB	1022 N.M.I.																
5000	-8	-6	-2	-3	-5	-11	-13	7	5	2	3	4	-2	-3	10	10	9
10000	-19	-15	0	-7	-10	-19	-21	19	14	0	6	9	1	0	10	10	10
18000	-37	-30	0	-17	-21	-36	-39	34	28	0	15	16	4	1	16	15	14
EGLIN AFB	473 N.M.I.																
5000	11	9	4	3	5	0	-2	-11	-8	-4	-3	-7	-14	-16	12	11	8
10000	19	15	5	5	10	1	0	-21	-17	-5	-6	-12	-22	-24	13	13	9
18000	33	23	5	16	17	5	2	-39	-24	-5	-19	-21	-37	-41	19	18	10
EGLIN AFB	374 N.M.I.																
5000	0	0	0	0	0	-8	-10	-2	-1	0	0	-1	-9	-11	13	13	9
10000	-2	-2	0	-1	-1	-10	-12	-3	0	0	0	-1	-10	-12	14	14	9
18000	-8	-9	-3	-4	-6	-18	-21	-10	-1	3	-1	-2	-14	-17	20	19	11
EGLIN AFB	1024 N.M.I.																
5000	-7	-5	-2	-5	-5	-12	-13	6	4	2	4	3	-2	-4	11	11	7
10000	-19	-14	-3	-9	-11	-20	-22	17	12	3	8	9	1	0	11	11	8
18000	-35	-28	-8	-20	-22	-35	-39	28	21	8	17	17	7	5	17	16	9
EGLIN AFB	671 N.M.I.																
5000	10	7	4	3	5	-1	-2	-11	-8	-4	-4	-7	-14	-16	12	11	8
10000	18	14	6	6	10	2	0	-21	-17	-6	-7	-12	-22	-24	13	13	8
18000	31	19	6	16	16	4	2	-40	-27	-7	-20	-22	-38	-42	18	18	10
EGLIN AFB	571 N.M.I.																
5000	-9	-7	-3	-4	-6	-13	-15	9	6	3	4	5	-1	-3	12	11	8
10000	-20	-15	-1	-7	-10	-20	-23	19	14	1	7	9	1	0	12	12	8
18000	-38	-31	0	-18	-21	-38	-41	35	28	-1	16	18	2	0	17	17	9
EGLIN AFB	1224 N.M.I.																
5000	-7	-5	-1	-2	-4	-10	-11	6	4	1	2	3	-2	-3	9	9	6
10000	-17	-14	0	-4	-10	-18	-20	19	13	0	6	8	1	0	10	10	7
18000	-36	-30	-1	-17	-21	-35	-38	33	28	0	15	18	4	1	15	14	8
EGLIN AFB	446 N.M.I.																
5000	2	1	1	0	1	-6	-8	-4	-2	-1	0	-2	-10	-11	13	12	8
10000	1	0	1	0	0	-7	-9	-7	-4	-2	-2	-4	-13	-15	14	14	7
18000	0	-3	-2	0	-2	-13	-16	-17	-7	1	-5	-6	-19	-23	20	19	11

• HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 • • A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADINGS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WIND IN KNOTS	EQUILIBRIUM RETURN												STANDARD DEVIATION						
	JAN	APR	JUL	OCT	00ASD	A75	AdA	JAN	APR	JUL	OCT	00ASD	A75	AdA	JAN	APR	JUL	OCT	
EGLEN AFB	TO	FOOT LEAVENWORTH												674 N.M.I.					
5000	-4	-4	-1	-4	-4	-4	-13	4	3	1	3	2	-4	-6	12	12	8	10	
10000	-15	-11	-2	-7	-9	-10	-20	10	4	2	6	6	-1	-3	13	13	9	12	
15000	-29	-22	-8	-17	-18	-31	-35	14	14	7	11	10	0	-1	19	18	10	17	
EGLEN AFB	TO	FOOT LEAS												1934 N.M.I.					
5000	-5	-4	-2	-4	-4	-9	-10	4	3	2	3	2	-1	-2	8	8	5	7	
10000	-19	-11	-2	-10	-11	-17	-19	16	10	5	9	9	3	2	5	8	6	8	
15000	-32	-23	-13	-22	-22	-32	-35	26	18	11	18	17	9	7	14	13	8	13	
EGLEN AFB	TO	FOOT 750												1790 N.M.I.					
5000	-5	-4	-1	-1	-1	-4	-9	4	4	1	1	2	-2	-3	8	7	5	6	
10000	-17	-13	-3	-7	-11	-17	-19	15	12	3	7	8	2	1	9	8	5	8	
15000	-34	-28	-4	-14	-21	-33	-36	39	24	7	15	17	8	5	14	13	9	12	
EGLEN AFB	TO	FOOT SILL												650 N.M.I.					
5000	-8	-6	-3	-4	-6	-13	-15	7	5	3	4	4	-2	-4	12	12	8	10	
10000	-20	-15	-2	-9	-11	-21	-23	18	13	2	7	9	1	-1	12	12	9	12	
15000	-37	-30	-4	-14	-22	-37	-41	31	26	4	16	17	5	2	18	17	13	16	
EGLEN AFB	TO	FOOT WOLTERS												688 N.M.I.					
5000	-9	-7	-3	-4	-6	-13	-15	8	6	3	4	5	-2	-3	12	12	8	10	
10000	-20	-15	-1	-8	-11	-21	-23	19	14	1	7	9	0	-1	12	12	8	12	
15000	-38	-30	-1	-18	-21	-37	-41	33	28	1	16	18	4	1	18	17	9	16	
EGLEN AFB	TO	GFM MITCHELL												741 N.M.I.					
5000	0	-1	0	0	0	-7	-9	-1	0	0	0	-1	-7	-9	12	12	8	10	
10000	-4	-3	0	-1	-2	-10	-12	-2	0	0	0	-1	-9	-11	13	13	9	12	
15000	-10	-6	-3	-6	-7	-18	-22	-9	-2	1	-1	-2	-14	-17	19	19	11	18	
EGLEN AFB	TO	MILL AFB												1306 N.M.I.					
5000	-5	-3	-1	-2	-3	-9	-10	4	2	1	2	2	-3	-4	9	9	6	7	
10000	-18	-12	-4	-9	-11	-18	-20	16	11	4	8	9	2	1	10	9	7	9	
15000	-34	-26	-10	-20	-22	-34	-37	28	22	9	17	17	8	5	16	15	9	14	
EGLEN AFB	TO	MUNSTED AFB												642 N.M.I.					
5000	-2	0	-2	0	-1	-8	-9	2	0	2	0	0	0	-5	-7	11	10	7	9
10000	7	6	-1	1	2	-9	-8	-8	-7	1	-1	-3	-11	-13	12	11	8	10	
15000	18	17	0	7	9	0	-2	-23	-21	0	-8	-12	-25	-28	14	15	9	14	
EGLEN AFB	TO	MUNSTED AFB												291 N.M.I.					
5000	10	8	4	5	6	-1	-2	-10	-8	-8	-4	-7	-14	-16	12	12	8	11	
10000	20	16	2	5	10	1	0	-21	-17	-8	-6	-12	-22	-24	13	13	9	12	
15000	34	27	4	17	18	4	2	-36	-30	-4	-19	-21	-36	-42	19	19	13	17	

WEATHERING-COMPUTER FOR A 120-KT AIRSPEED.  
 000--0000'S ANNUAL EQUIVALENT HEADINGS FOR INDICATED WINDS AS SHOWN.  
 MINUS SIGN INDICATES HEADINGS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

ROUTE	EQUIVALENT HEADWINDS												STANDARD DEVIATION	
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC		
<b>EGLEN AFB</b>													250 N.M.I.	
5000	2	1	1	0	0	-7	-8	-4	-2	-1	0	-2	-10	-12
10000	0	0	1	0	0	-8	-10	-4	-3	-1	0	-2	-11	-13
18000	-4	-7	-4	-2	-5	-16	-19	-12	-3	3	-2	-3	-15	-19
<b>EGLEN AFB</b>													252 N.M.I.	
5000	7	7	3	4	5	-2	-3	-8	-7	-3	-4	-6	-13	-15
10000	18	15	3	5	7	3	-1	-19	-16	-3	-5	-10	-20	-23
18000	35	28	4	16	19	5	3	-37	-33	-3	-18	-21	-37	-41
<b>EGLEN AFB</b>													435 N.M.I.	
5000	-4	-1	-3	-1	-3	-7	-11	3	1	3	1	2	-4	-5
10000	3	3	-2	0	0	-6	-7	-5	-4	3	0	-1	-9	-11
18000	11	13	0	4	5	-3	-5	-18	-17	0	-6	-9	-21	-24
<b>FGLPM AFB</b>													1811 N.M.I.	
5000	-6	-4	-2	-4	-4	-9	-11	5	4	2	4	3	-1	-2
10000	-18	-11	-5	-10	-11	-18	-20	16	13	5	9	9	3	2
18000	-33	-23	-13	-22	-22	-33	-35	26	18	11	18	17	8	6
<b>EGLEN AFB</b>													389 N.M.I.	
5000	-6	-5	-1	-3	-4	-12	-14	4	4	1	3	2	-4	-6
10000	-16	-12	-1	-7	-9	-18	-21	12	9	1	6	6	-1	-3
18000	-31	-24	-5	-15	-18	-33	-37	19	14	4	12	12	1	0
<b>EGLEN AFB</b>													577 N.M.I.	
5000	5	3	2	1	2	-4	-6	-7	-4	-2	-2	-4	-11	-13
10000	6	4	3	3	3	-4	-6	-13	-8	-3	-4	-7	-16	-18
18000	10	3	1	5	4	-8	-9	-27	-14	-2	-12	-13	-27	-31
<b>EGLEN AFB</b>													1311 N.M.I.	
5000	9	6	5	5	6	0	-1	-10	-7	-5	-6	-7	-14	-15
10000	16	11	7	9	10	3	1	-21	-15	-9	-11	-14	-22	-24
18000	27	15	9	19	14	5	3	-39	-23	-12	-24	-23	-37	-40
<b>EGLEN AFB</b>													1324 N.M.I.	
5000	-9	-6	-1	-2	-4	-9	-10	5	4	1	1	2	-2	-3
10000	-14	-14	-1	-7	-10	-18	-20	17	13	1	7	9	1	0
18000	-34	-29	-3	-17	-21	-35	-38	32	27	3	15	18	6	3
<b>EGLEN AFB</b>													817 N.M.I.	
5000	19	7	4	4	6	0	-2	-11	-9	-4	-4	-7	-14	-16
10000	18	14	7	7	10	3	1	-22	-17	-7	-8	-13	-23	-25
18000	30	13	7	17	16	5	2	-40	-26	-8	-22	-23	-38	-42

• HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 • A--POSITIVE ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 • MINUS SIGN INDICATES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION				
	DIRECT				RETURN				RETURN				JAN	APP	JUL	OCT	
	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	JAN	APP	JUL	OCT	
EGLIN AFB	MEMPHIS																
5000	-3	-3	0	-2	-2	-10	-12	2	2	0	2	1	-6	-8	13	13	325 N.M.I.
10000	-11	-9	0	-5	-6	-15	-18	7	5	0	3	3	-4	-7	14	14	9
18000	-23	-21	-6	-12	-14	-28	-31	9	12	6	8	8	-2	-5	20	19	10
EGLIN AFB	MEXICO CITY																
5000	-4	-6	-1	0	-3	-9	-10	4	5	1	0	2	-2	-4	9	9	953 N.M.I.
10000	-9	-7	0	-2	-5	-11	-12	8	7	0	2	3	-1	-3	5	9	6
18000	-22	-17	3	-3	-10	-22	-24	19	14	-3	7	8	-1	-3	13	12	7
EGLIN AFB	MINN-ST PAUL																
5000	-4	-3	-1	-3	-3	-10	-12	2	2	0	2	1	-5	-7	12	11	920 N.M.I.
10000	-10	-7	-3	-6	-7	-15	-17	4	4	2	3	3	-4	-6	12	13	9
18000	-21	-15	-8	-14	-14	-26	-29	3	6	5	6	5	-5	-7	18	18	10
EGLIN AFB	WINDT AFB																
5000	-8	-5	-2	-5	-5	-12	-13	6	3	2	5	3	-2	-3	10	10	1263 N.M.I.
10000	-15	-10	-5	-9	-10	-17	-19	11	7	4	7	7	0	-1	11	11	8
18000	-27	-19	-11	-19	-19	-30	-33	14	12	9	12	11	2	0	16	16	10
EGLIN AFB	NELLIS AFB																
5000	-5	-4	-1	-1	-3	-8	-9	4	3	1	1	2	-2	-3	8	8	1464 N.M.I.
10000	-18	-13	-3	-8	-10	-18	-20	16	13	3	7	9	2	1	10	9	7
18000	-35	-29	-7	-18	-21	-35	-38	31	25	6	16	18	7	5	15	14	8
EGLIN AFB	NEW CUMBERLAND																
5000	9	6	4	4	5	-1	-3	-10	-7	-4	-4	-6	-14	-15	12	11	751 N.M.I.
10000	15	12	6	6	9	1	0	-20	-15	-6	-7	-12	-21	-24	13	13	9
18000	26	14	6	15	13	3	0	-38	-23	-7	-20	-21	-36	-40	18	18	10
EGLIN AFB	NEW ORLEANS																
5000	-10	-8	-3	-4	-6	-14	-16	9	7	3	4	5	-1	-3	12	12	186 N.M.I.
10000	-20	-16	-2	-6	-11	-21	-24	19	15	2	6	9	0	-1	13	14	9
18000	-39	-30	0	-18	-21	-38	-41	36	28	0	16	18	3	0	19	18	10
EGLIN AFB	NIAGARA FALLS																
5000	5	3	2	3	3	-3	-5	-8	-5	-3	-4	-5	-12	-14	12	11	839 N.M.I.
10000	10	7	4	5	6	-1	-3	-16	-11	-5	-6	-10	-18	-20	13	13	9
18000	14	6	3	9	7	-3	-5	-31	-17	-6	-17	-17	-31	-34	18	18	10
EGLIN AFB	CINAFIC AFB																
5000	-5	-4	-1	-1	-3	-8	-9	4	4	1	0	2	-2	-3	8	7	1659 N.M.I.
10000	-17	-13	-2	-7	-10	-17	-19	15	12	2	6	8	2	0	9	8	5
18000	-35	-28	-5	-17	-21	-34	-37	31	26	5	15	18	7	5	14	13	8

• HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 •••--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 • MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEADING IN DEGREES	EQUIVALENT HEADWINDS												STANDARD DEVIATION					
	DIRECT				EQUVALENT				RETURN				JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	0450	A75	A85	0450	A75	A85	0450	A75					A85	
0450	2	4	1	3	PATRICK AFR	2	-4	-5	-3	-5	0	-3	-3	-10	-12	11	11	337 N.M.I.
1000	13	11	1	3		6	-1	-3	-14	-12	-1	-4	-7	-16	-19	13	12	8 11
1800	28	24	3	12		14	3	1	-32	-27	-2	-14	-18	-33	-36	17	17	9 15
0450	6	4	3	3	PITTSBURGH	3	-3	-4	-9	-5	-3	-3	-5	-12	-14	12	12	675 N.M.I.
1000	11	8	4	4		4	-1	-3	-16	-11	-5	-6	-10	-18	-20	13	13	9 12
1800	16	9	3	10		4	-2	-4	-32	-18	-5	-16	-16	-31	-35	19	19	10 18
0450	-8	-5	-2	-6	REGINA	-6	-12	-14	6	3	2	5	3	-2	-3	10	10	7 9
1000	-15	-10	-6	-10		-11	-19	-20	12	8	5	8	8	1	0	10	10	8 10
1800	-27	-19	-12	-20		-14	-29	-32	15	12	9	14	12	3	1	15	15	9 14
0450	-2	-2	0	-2	SCOTT AFR	-2	-9	-11	0	0	0	1	0	-7	-8	13	12	513 N.M.I.
1000	-8	-5	0	-4		-5	-14	-16	2	3	0	2	1	-6	-8	13	14	10 13
1800	-17	-15	-5	-10		-11	-24	-27	0	5	5	4	3	-7	-10	20	19	11 18
0450	3	2	1	1	SELFRIDGE AFR	1	-5	-7	-5	-3	-2	-2	-3	-10	-12	12	12	748 N.M.I.
1000	4	3	2	2		2	-5	-7	-11	-7	-3	-4	-6	-15	-17	13	13	8 10
1800	5	0	0	3		1	-9	-11	-23	-11	-2	-11	-11	-24	-28	19	19	9 12
0450	11	8	4	3	SMAA AFR	6	-1	-2	-11	-8	-4	-3	-7	-14	-16	12	12	371 N.M.I.
1000	19	15	5	5		10	1	0	-21	-16	-5	-6	-12	-22	-24	13	13	8 11
1800	12	23	4	16		16	4	1	-38	-28	-4	-19	-21	-37	-41	19	19	10 17
0450	17	7	4	4	SPYGLASS AFR	6	3	-2	-11	-9	-9	-5	-7	-14	-16	11	11	973 N.M.I.
1000	17	14	7	7		10	2	1	-22	-17	-8	-9	-14	-23	-25	13	13	8 11
1800	29	17	8	17		16	5	3	-40	-25	-10	-23	-23	-38	-42	18	17	10 17
0450	2	1	1	1	BURTSWORTH	1	-7	-7	-4	-2	-1	-2	-3	-10	-11	12	11	852 N.M.I.
1000	2	1	1	1		1	-6	-8	-9	-5	-2	-4	-5	-13	-16	13	13	3 10
1800	5	-1	0	1		7	-11	-14	-20	-9	-2	-9	-9	-22	-25	19	18	9 12
0450	-5	-4	-2	-4	VAKIMA	-4	-9	-10	4	3	2	3	2	-1	-3	8	8	1845 N.M.I.
1000	-18	-11	-4	-10		-11	-18	-20	14	10	4	9	9	3	2	9	9	6 7
1800	-33	-23	-13	-22		-22	-33	-35	26	14	11	18	17	9	7	14	13	7 8

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 0450--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 1800--PLUS SIG. DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WIND IN KTS	EQUIVALENT HEADWIND IN KNOTS												STANDARD DEVIATION					
	JAN			APR			JUL			OCT			JAN	APR	JUL	OCT		
EISELSON AFB																		
SC00	2	1	0	4	1	-3	-4	-3	-1	0	-5	-3	-8	-9	6	7	6	8
LC00	11	5	6	8	7	2	0	-13	-6	-9	-9	-9	-14	-16	9	7	7	7
18000	18	8	8	13	11	3	1	-22	-11	-10	-17	-15	-23	-25	13	11	9	11
EISELSON AFB																		
SC00	0	-4	-5	-4	-4	-11	-13	-1	4	5	5	3	-4	-6	13	10	9	11
LC00	-2	-6	-5	-7	-6	-15	-17	1	5	5	6	4	-4	-7	16	13	12	13
18000	-6	-10	-7	-11	-9	-22	-25	1	8	5	9	5	-6	-9	22	18	16	18
EISELSON AFB																		
SC00	-3	-4	-1	-2	-3	-8	-10	2	3	1	2	1	-3	-4	10	8	6	8
LC00	3	0	2	-1	0	-6	-8	-5	0	-2	1	-2	-9	-10	12	10	3	10
18000	10	0	4	2	3	-6	-8	-16	-4	-7	-8	-9	-19	-22	17	15	12	14
EISELSON AFB																		
SC00	-2	-3	0	-3	-2	-7	-9	1	3	0	2	1	-3	-4	9	7	6	7
LC00	2	0	1	-3	0	-6	-8	-5	-1	-2	0	-2	-8	-10	11	9	7	9
18000	8	0	5	0	3	-6	-8	-16	-6	-7	-7	-9	-18	-21	16	14	10	13
EISELSON AFB																		
SC00	2	1	0	4	1	-3	-4	-3	-1	0	-5	-3	-8	-9	7	7	7	8
LC00	4	5	5	7	5	0	0	-4	-6	-5	-7	-6	-11	-12	6	7	7	7
18000	7	0	8	11	3	1	0	-9	-11	-9	-12	-11	-18	-19	11	11	9	10
EISELSON AFB																		
SC00	-2	-2	0	0	-1	-6	-7	1	1	0	0	0	-4	-5	6	7	5	7
LC00	6	2	2	0	2	-3	-4	-9	-3	-3	-2	-4	-10	-12	10	8	7	8
18000	13	4	4	7	6	-1	-3	-19	-9	-7	-12	-12	-21	-23	14	13	10	12
EISELSON AFB																		
SC00	-4	-3	-3	-2	-3	-10	-11	4	3	4	2	3	-3	-4	12	9	8	9
LC00	2	-3	0	-5	-2	-10	-12	-4	2	-1	4	0	-8	-10	14	11	10	11
18000	9	-2	2	0	1	-9	-12	-13	-1	-4	-4	-6	-17	-20	20	17	14	16
EISELSON AFB																		
SC00	2	-4	-5	-5	-4	-11	-13	-3	4	6	5	3	-4	-6	13	10	9	10
LC00	-3	-6	-6	-8	-6	-15	-18	1	5	5	7	4	-4	-6	16	13	12	13
18000	-9	-10	-7	-13	-10	-23	-26	2	8	5	10	6	-6	-9	22	18	16	18
EISELSON AFB																		
SC00	-2	-3	-1	-1	-2	-7	-9	1	2	1	0	1	-4	-5	9	8	6	8
LC00	4	0	2	-1	0	-5	-7	-7	-2	-3	0	-3	-10	-11	11	9	8	9
18000	11	1	4	4	4	-4	-7	-17	-6	-7	-10	-10	-20	-23	16	14	12	14

• HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 ••• DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 ••• MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN POUNDS	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION						
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	APR	JUL	OCT			
EISENHOWER AFB	MINUT AFB												1750 N.M.I.						
5000	3	1	2	0	6	2	-2	-4	-4	-2	0	-7	-4	-9	-10	6	7	8	
10000	12	5	7	9	9	3	2	1	-13	-6	-7	-10	-9	-15	-17	9	8	7	8
18000	17	9	9	12	12	4	2		-22	-12	-11	-18	-16	-24	-26	13	11	10	11
EISENHOWER AFB	PUEBLO CO												337 N.M.I.						
5000	2	2	5	1	1	1	-4	-6	-3	-2	-5	-3	-4	-11	-13	13	10	10	11
10000	-2	4	3	5	2	-5	-8		1	-4	-4	-5	-4	-12	-14	14	12	11	11
18000	-5	4	2	3	1	-10	-12		1	-6	-3	-6	-4	-15	-18	19	16	14	15
EISENHOWER AFB	MEXICO												1566 N.M.I.						
5000	2	1	0	2	1	1	-3	-5	-3	-1	0	-6	-3	-8	-10	9	8	7	8
10000	11	7	7	3	7	1	0		-12	-5	-7	-9	-9	-14	-16	9	8	7	8
18000	18	9	7	14	12	4	2		-21	-11	-10	-17	-15	-24	-26	13	12	10	12
EISENHOWER AFB	COLUMBIA												1375 N.M.I.						
5000	-1	-2	-6	-4	-4	-10	-12		0	2	9	3	3	-3	-5	11	9	8	9
10000	-4	-4	-7	-8	-7	-15	-17		6	2	7	6	5	-2	-4	13	11	10	11
18000	-14	-9	-10	-12	-12	-22	-25		10	6	8	9	8	-1	-4	17	15	13	15
EISENHOWER AFB	TULSA												1558 N.M.I.						
5000	0	0	1	0	0	-5	-7		0	0	-2	0	-1	-6	-7	8	8	7	8
10000	-1	2	3	2	1	-4	-5		0	-3	-3	-3	-3	-8	-9	8	8	8	8
18000	-1	4	4	4	2	-4	-6		-1	-5	-6	-6	-5	-12	-14	12	11	10	10
EISENHOWER AFB	YAKIMA												1308 N.M.I.						
5000	-3	-3	-1	-2	-3	-8	-9		2	3	1	1	1	-3	-4	9	8	6	8
10000	3	0	2	-2	0	-5	-7		-6	-1	-3	0	-3	-9	-11	11	9	8	9
18000	10	0	4	3	4	-5	-7		-16	-5	-7	-9	-9	-19	-22	16	14	12	14
EISENHOWER AFB	YELLOWKNIFE												871 N.M.I.						
5000	1	2	-1	7	1	-4	-6		-1	-2	1	-8	-3	-9	-11	10	9	8	10
10000	7	5	6	4	6	0	-1		-8	-5	-6	-6	-7	-13	-15	11	9	9	9
18000	14	9	9	12	10	2	0		-16	-11	-10	-14	-13	-22	-24	15	13	11	12
WASHINGTON AFB	ELLSWORTH AFB												987 N.M.I.						
5000	-4	0	2	-3	-1	-8	-10		2	0	-2	2	0	-7	-8	11	11	8	10
10000	-10	-6	-1	-6	-6	-14	-16		6	3	0	5	3	-3	-5	11	11	9	11
18000	-21	-14	-4	-14	-13	-24	-27		8	6	2	8	5	-4	-6	18	16	10	16
WASHINGTON AFB	EL TORN MCAS												1176 N.M.I.						
5000	-3	-2	0	1	-1	-6	-7		2	1	0	-1	0	-4	-6	8	8	5	7
10000	-14	-11	0	-5	-8	-15	-17		14	11	0	5	7	0	-1	10	9	7	9
18000	-33	-27	-2	-14	-18	-32	-35		29	24	2	12	15	4	1	16	14	8	13

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.

\*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.

\*\*MINUS SIGN DENOTES HEADWINDS.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT			RETURN			RETURN			RETURN			JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	00AS0	A75	A95	JAN	APR	JUL	OCT	00AS0	A75	A85				
ELLINGTON AFR TO ENGLAND AFR	10	8	6	3	6	0	-2	-11	-8	-6	-3	-7	-15	-17	13	12	8	11
5000	19	14	2	2	8	0	-1	-19	-15	-2	-6	-10	-20	-23	13	13	9	12
10000	30	22	-3	11	13	-1	-4	-35	-26	3	-14	-17	-34	-38	19	18	10	17
ELLINGTON AFR TO FORT HENNING	11	9	4	4	6	0	-2	-11	-8	-4	-4	-7	-14	-16	12	11	8	10
5000	20	16	3	7	10	2	0	-21	-16	-3	-7	-11	-21	-24	12	12	8	12
10000	36	27	0	16	18	3	0	-39	-30	0	-18	-21	-38	-41	18	17	9	16
ELLINGTON AFR TO FORT BLISS	10	8	6	3	6	0	-2	5	2	-1	1	1	-5	-6	11	10	7	10
5000	17	12	1	-5	-8	-17	-19	16	12	-1	5	7	-1	-2	11	10	8	11
10000	35	28	0	-15	-19	-34	-38	31	25	0	13	15	2	0	18	16	9	15
ELLINGTON AFR TO FORT BRAGG/POPE	12	9	5	4	7	0	0	-12	-9	-5	-4	-8	-14	-16	11	10	7	9
5000	22	17	5	7	12	3	1	-23	-18	-4	-7	-13	-23	-25	11	12	8	11
10000	38	27	2	17	19	5	2	-41	-31	-3	-20	-23	-39	-42	17	16	9	15
ELLINGTON AFR TO FORT CAMPBELL	10	7	5	3	5	-1	-3	-11	-8	-5	-3	-7	-14	-16	13	12	8	10
5000	17	12	4	6	9	0	-1	-20	-14	-4	-7	-11	-21	-23	13	13	9	12
10000	28	18	0	11	12	0	-3	-36	-25	0	-15	-18	-34	-38	19	18	10	17
ELLINGTON AFR TO FORT CAFSON	10	8	6	3	6	0	-2	2	0	-3	1	0	-7	-9	11	11	8	10
5000	17	12	1	-5	-8	-17	-19	10	6	0	5	4	-2	-4	12	11	9	11
10000	35	28	-2	-15	-19	-33	-37	17	14	1	12	9	0	-3	19	17	10	16
ELLINGTON AFR TO FORT FUSTIS	12	9	5	4	7	0	0	-13	-9	-5	-5	-8	-15	-17	11	10	7	9
5000	22	17	6	7	12	4	2	-24	-18	-6	-8	-14	-23	-26	11	11	8	11
10000	39	25	4	18	19	6	4	-43	-30	-6	-22	-24	-40	-43	17	16	9	15
ELLINGTON AFR TO FORT HOOD	10	8	6	3	6	0	-2	4	0	-2	2	0	-7	-8	13	12	8	11
5000	17	12	1	-5	-8	-15	-18	11	7	-2	4	4	-4	-6	13	12	9	12
10000	29	24	3	-14	-15	-31	-35	21	19	-3	11	10	-2	-5	20	18	10	17
ELLINGTON AFR TO FORT HUACHUCA	10	8	6	3	6	0	-2	3	2	-1	0	0	-5	-6	10	9	6	9
5000	17	12	1	0	-1	-7	-9	15	12	-1	5	7	0	-2	11	9	7	10
10000	34	23	0	-15	-19	-33	-37	31	26	0	13	16	2	0	17	15	9	14

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS										STANDARD DEVIATION				
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	RETURN	**A50	A75	A85
ELLINGTON AFB	TO														
5000	10	7	5	3	FORT KNICK	-1	-2	-11	-8	-5	-4	-7	-15	-16	677 N.M.I.
10000	17	12	5	6	9	1	0	-20	-14	-5	-7	-11	-21	-23	12 12 13 13 19
18000	28	18	1	12	12	0	-1	-37	-25	-2	-16	-19	-35	-39	18 10 10 17
ELLINGTON AFB	TO														
5000	1	3	5	0	2	-5	-7	-3	-4	-5	0	-4	-11	-13	586 N.M.I.
10000	0	0	2	0	0	-7	-9	-5	-4	-2	0	-3	-11	-13	13 12 13 12 19
18000	-4	-3	1	-4	-2	-13	-16	-12	-6	-2	-1	-5	-16	-19	18 10 17
ELLINGTON AFB	TO														
5000	-1	0	1	0	0	-5	-6	0	0	-1	0	-1	-5	-6	1648 N.M.I.
10000	-14	-8	-2	-7	-8	-14	-16	12	7	2	6	6	0	0	8 7 5 7
18000	-29	-20	-9	-14	-19	-29	-32	22	15	6	15	13	4	2	9 8 7 8 15
ELLINGTON AFB	TO														
5000	-3	-2	0	0	-1	-6	-7	3	2	0	0	0	-4	-5	1397 N.M.I.
10000	-14	-11	-1	-6	-8	-15	-17	13	10	1	5	6	0	0	8 7 5 7
18000	-32	-25	-5	-15	-18	-31	-34	27	22	4	13	14	4	2	16 14 8 13
ELLINGTON AFB	TO														
5000	10	7	3	4	5	-1	-2	-10	-8	-3	-4	-6	-14	-16	513 N.M.I.
10000	20	15	2	6	9	1	0	-20	-16	-2	-7	-11	-21	-23	12 11 12 12 17
18000	36	28	-1	16	18	2	0	-38	-30	1	-17	-21	-37	-41	12 12 8 11 17
ELLINGTON AFB	TO														
5000	-1	0	4	-1	0	-7	-9	0	-1	-4	1	-1	-9	-11	345 N.M.I.
10000	-8	-5	2	-3	-3	-12	-14	4	2	-2	2	0	-6	-8	13 13 12 9 12
18000	-20	-16	2	-11	-10	-24	-28	7	8	-2	7	3	-6	-9	26 18 10 17
ELLINGTON AFB	TO														
5000	-2	0	4	-2	0	-8	-10	1	0	-4	1	-1	-8	-10	242 N.M.I.
10000	-10	-8	3	-4	-4	-13	-15	6	4	-2	3	2	-5	-7	13 13 12 9 12
18000	-24	-19	3	-12	-12	-27	-31	12	12	-3	9	5	-5	-8	20 18 10 17
ELLINGTON AFB	TO														
5000	6	4	5	2	4	-2	-4	-7	-9	-5	-3	-6	-13	-14	865 N.M.I.
10000	9	6	4	4	5	-2	-3	-14	-9	-4	-5	-8	-16	-19	12 11 8 10
18000	12	7	1	4	5	-4	-7	-27	-16	-3	-11	-13	-27	-30	12 12 9 12 17
ELLINGTON AFB	TO														
5000	-1	0	3	0	0	-5	-6	0	-1	-3	0	-2	-7	-8	1070 N.M.I.
10000	-11	-9	-1	-5	-8	-14	-16	11	7	0	6	5	0	-2	9 9 6 8
18000	-29	-22	-5	-17	-17	-30	-33	21	17	9	14	12	2	0	16 9 8 9 17

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.

\*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS PER INDICATED PER CENT RELIABILITIES. MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT			EQUIVALENT			HEADWIND			RETURN			JAN	APR	JUL	OCT		
	JAN	APR	JUL	UCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85				
ELLINGTON AFB	0	2	-1	0	0	-5	-7	-1	-3	1	0	-1	-7	-8	10	9	6	9
5000	10	9	-1	3	4	-2	-3	-11	-9	1	-4	-6	-13	-15	10	10	7	9
10000	24	23	-2	10	12	0	-1	-27	-25	2	-11	-15	-28	-31	14	14	8	12
ELLINGTON AFB	10	8	4	4	6	0	-1	-11	-8	-3	-4	-7	-14	-16	11	11	7	10
5000	20	16	3	6	10	2	0	-21	-17	-3	-7	-12	-21	-24	12	12	8	11
10000	34	28	0	16	19	4	1	-39	-31	-1	-18	-22	-38	-41	16	16	9	15
ELLINGTON AFB	11	8	5	4	6	0	-2	-12	-9	-5	-4	-8	-15	-17	12	12	8	10
5000	20	15	4	6	10	1	0	-21	-16	-4	-7	-12	-22	-24	13	13	9	12
10000	33	23	0	14	15	1	-1	-38	-28	0	-17	-20	-37	-41	19	18	10	17
ELLINGTON AFB	8	7	3	4	5	-1	-2	-9	-7	-2	-4	-6	-13	-14	11	11	7	10
5000	19	15	2	6	9	1	0	-19	-15	-2	-6	-10	-19	-22	11	11	8	11
10000	35	28	0	16	18	4	1	-37	-30	0	-17	-21	-36	-40	16	16	9	15
ELLINGTON AFB	0	1	-2	0	-1	-7	-8	0	-1	2	0	0	-6	-7	10	10	6	9
5000	8	7	-2	3	3	-3	-4	-9	-8	2	-3	-4	-12	-14	10	10	7	9
10000	21	21	-3	9	11	0	-2	-25	-23	3	-10	-14	-26	-29	14	13	8	12
ELLINGTON AFB	-1	0	1	0	0	-5	-6	0	0	-1	0	0	-5	-6	8	8	5	7
5000	-14	-8	-2	-7	-9	-14	-16	12	7	2	6	6	0	0	9	8	7	8
10000	-28	-20	-8	-18	-18	-29	-32	21	14	6	14	12	4	1	15	14	9	13
ELLINGTON AFB	7	4	5	2	5	-2	-4	-9	-7	-6	-2	-6	-14	-16	13	13	8	11
5000	11	9	4	3	6	-1	-3	-14	-11	-4	-4	-8	-17	-19	13	13	9	13
10000	16	10	-3	5	5	-6	-8	-27	-18	3	-9	-11	-27	-31	20	18	10	18
ELLINGTON AFB	10	7	5	4	6	0	-2	-11	-8	-5	-4	-7	-14	-16	12	11	8	10
5000	18	13	6	7	10	2	0	-21	-15	-6	-8	-13	-22	-24	12	12	9	12
10000	29	18	3	13	14	2	0	-39	-25	-4	-18	-20	-36	-40	18	17	10	17
ELLINGTON AFB	10	7	6	6	7	1	0	-12	-8	-6	-7	-9	-15	-16	10	10	7	8
5000	20	13	9	10	12	5	3	-23	-15	-9	-12	-15	-23	-25	11	11	8	10
10000	32	18	9	19	18	8	5	-41	-26	-13	-25	-25	-38	-42	15	15	9	15

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	EQUIVALENT HEADWINDS			RETURN			RETURN			RETURN			JAN	APP	JUL	OCT		
	JAN	APR	JUL	DEC	**A50	A75	A85	JAN	APR	JUL	DEC	**A50	A75	A85	JAN	APP	JUL	OCT
ELLINGTON AFB	TO																	
5000	-3	-1	1	0	0	-6	-8	2	1	-1	0	0	-5	-7	10	9	6	8
10000	-16	-11	0	-5	-8	-16	-18	14	11	0	5	6	0	-2	11	9	7	10
18000	-33	-27	-1	-15	-18	-33	-36	29	24	0	13	15	2	0	17	15	9	14
ELLINGTON AFB	TO																	
5000	12	9	5	5	7	1	0	-13	-9	-5	-5	-8	-15	-17	11	10	7	9
10000	22	16	7	8	12	4	3	-25	-18	-7	-9	-15	-24	-26	11	11	8	11
18000	37	24	5	19	19	7	5	-44	-29	-8	-23	-25	-40	-44	16	16	9	15
ELLINGTON AFB	TO																	
5000	9	7	5	3	6	-1	-3	-10	-8	-4	-3	-7	-15	-17	13	12	8	11
10000	16	12	4	5	8	0	-1	-18	-13	-4	-6	-10	-20	-22	13	13	9	13
18000	25	16	-2	9	9	-7	-5	-34	-23	1	-13	-16	-32	-36	19	18	10	17
ELLINGTON AFB	TO																	
5000	-7	-9	-4	-1	-6	-12	-13	6	9	4	0	4	-1	-2	10	9	6	9
10000	-7	-6	-1	-2	-4	-10	-12	7	4	1	2	3	-1	-3	9	9	7	8
18000	-16	-11	0	-5	-7	-17	-19	12	7	0	4	4	-3	-4	14	12	7	11
ELLINGTON AFB	TO																	
5000	0	1	4	0	1	-5	-7	-2	-3	-4	0	-3	-10	-11	12	11	8	10
10000	0	0	1	0	0	-7	-9	-5	-3	-2	-1	-3	-11	-13	12	12	9	11
18000	-3	-2	0	-4	-2	-13	-15	-12	-7	-1	-3	-5	-16	-19	18	17	10	16
ELLINGTON AFB	TO																	
5000	-4	-1	1	-3	-2	-9	-10	2	0	-2	-1	-1	-6	-8	10	11	8	10
10000	-9	-5	-1	-6	-5	-13	-15	4	2	0	4	2	-4	-6	11	11	8	11
18000	-17	-11	-4	-12	-11	-21	-24	3	3	1	5	2	-6	-9	17	16	10	15
ELLINGTON AFB	TO																	
5000	-2	-1	2	1	0	-5	-6	1	0	-2	-1	-1	-6	-7	5	6	5	8
10000	-15	-11	-1	-6	-9	-15	-18	13	10	0	5	6	0	-1	10	9	7	9
18000	-32	-26	-4	-15	-18	-32	-35	27	22	3	13	14	3	1	17	15	9	14
ELLINGTON AFB	TO																	
5000	11	9	5	5	6	0	0	-13	-9	-5	-5	-8	-15	-17	11	10	7	9
10000	21	15	7	8	12	4	2	-24	-17	-7	-9	-14	-23	-26	11	12	8	11
18000	35	22	5	19	18	6	3	-43	-28	-7	-22	-24	-39	-43	17	16	9	16
ELLINGTON AFB	TO																	
5000	9	7	3	3	5	-2	-3	-10	-7	-3	-4	-6	-14	-16	12	12	8	11
10000	19	14	0	6	9	0	-2	-19	-15	0	-6	-10	-20	-23	12	13	9	12
18000	35	28	-4	15	17	1	-1	-37	-30	3	-16	-20	-36	-40	18	17	10	16

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.

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MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	F Q U I V A L E N T H E A D W I N D S												STANDARD DEVIATION						
	DIRECT				RETURN				RETURN				JAN	APR	JUL	OCT			
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85					
FLLINGTON AFB TO NIAGARA FALLS	10	7	5	5	6	6	0	-1	-11	-8	-5	-5	-7	-14	-16	11	11	1123	M.M.I.
5000	18	12	7	8	10	3	1	1	-22	-15	-7	-9	-13	-22	-24	12	12	8	11
10000	28	16	5	14	14	3	1	1	-39	-24	-8	-20	-22	-36	-40	17	17	10	16
FLLINGTON AFB TO OXNAFD AFB	-3	-2	0	1	-1	-6	-7	-7	2	1	0	-1	0	-4	-6	8	8	5	7
5000	-14	-11	0	-5	-8	-15	-17	-17	13	11	0	5	6	0	-1	10	9	7	9
10000	-32	-26	-3	-14	-18	-31	-34	-34	28	24	2	12	14	3	1	16	14	8	13
FLLINGTON AFB TO PATRICK AFB	5	1	3	3	3	-2	-4	-4	-5	-6	-1	-3	-4	-10	-12	10	10	7	9
5000	15	12	1	5	7	0	-1	-1	-16	-13	0	-5	-8	-17	-19	11	11	7	10
10000	31	26	0	14	16	3	0	0	-33	-29	0	-15	-19	-33	-36	15	15	8	13
FLLINGTON AFB TO PITTSBURGH	10	8	5	5	6	0	-1	-1	-12	-9	-5	-5	-8	-15	-16	11	11	7	9
5000	19	14	6	7	10	3	1	1	-23	-16	-7	-9	-13	-22	-25	12	12	8	11
10000	31	19	4	15	15	4	1	1	-40	-26	-6	-20	-22	-37	-41	17	17	9	16
FLLINGTON AFB TO REGINA	-4	-1	1	-4	-2	-9	-10	-10	3	0	-1	3	0	-5	-7	10	10	8	9
5000	-11	-6	-2	-7	-7	-14	-15	-15	7	4	1	5	4	-2	-4	10	10	8	10
10000	-20	-13	-5	-14	-12	-23	-26	-26	7	5	2	8	5	-3	-5	16	15	9	14
FLLINGTON AFB TO SCOTT AFB	7	6	5	2	4	-2	-4	-4	-8	-7	-5	-3	-6	-13	-15	13	12	8	10
5000	11	8	4	3	5	-1	-3	-3	-15	-10	-4	-5	-9	-17	-19	13	13	9	12
10000	15	9	3	5	5	-4	-7	-7	-29	-18	3	-11	-13	-28	-32	19	18	10	17
FLLINGTON AFB TO SFLPRNGE AFB	8	6	5	4	5	-1	-2	-2	-10	-7	-7	-5	-7	-14	-16	12	11	8	9
5000	15	10	6	6	8	1	0	0	-19	-13	-6	-8	-12	-20	-22	12	12	9	11
10000	23	14	3	11	11	0	-1	-1	-35	-22	-6	-17	-19	-33	-37	18	17	10	17
FLLINGTON AFB TO SHAW AFB	11	8	5	4	6	3	0	0	-12	-9	-4	-4	-7	-14	-16	11	11	7	10
5000	21	16	4	7	11	2	1	1	-22	-17	-4	-7	-12	-22	-24	12	12	8	11
10000	37	27	1	17	19	5	2	2	-40	-31	-2	-19	-23	-38	-42	17	16	9	15
FLLINGTON AFB TO WESTOVER AFB	12	8	8	6	7	1	0	0	-13	-9	-6	-6	-9	-15	-17	10	10	7	9
5000	22	16	8	9	13	5	3	3	-25	-18	-9	-10	-15	-24	-26	11	11	8	10
10000	36	22	7	19	19	7	5	5	-43	-29	-10	-24	-25	-40	-43	16	16	9	15

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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION																																																				
	DIRECT			MURKSMITH			YAKIMA			ELMENDORF AFB			EL TORO MCAS			ENGLAND AFB			FORT BENNING			FORT BLISS			FORT BRAGG/PDPE			FORT CAMPBELL																																					
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT																
ELLINGTON AFB	7	5	5	4	5	-1	-3	-9	-6	-5	-4	-6	-13	-15	-17	-11	-6	-8	-15	-19	-21	12	11	8	9	1053 M.MI.	12	11	8	9	12	12	12	9	11	17	17	10	16	17	17	10	16	17	17	10	16																		
ELLINGTON AFB	-1	0	1	0	0	-5	-6	0	0	-1	0	-1	-5	-6	0	0	-1	0	-1	-5	-6	0	0	0	1560 M.MI.	8	7	5	7	12	7	2	6	0	0	15	15	6	15	13	4	2	21	15	6	15	13	4	2	21	15	6	15	13	4	2									
ELLSWORTH AFB	-3	0	0	-4	-2	-7	-8	2	0	0	3	1	-3	-4	11	5	5	8	7	1	0	19	9	8	14	1895 M.MI.	8	7	6	7	11	5	8	7	8	13	12	10	12	13	12	10	12	13	12	10	12	13	12	10	12	13	12	10	12										
ELLSWORTH AFB	-3	-4	-3	-1	-3	-8	-9	3	4	3	1	2	-1	-2	6	4	7	6	5	0	-2	12	12	15	10	951 M.MI.	7	7	5	7	3	4	7	6	5	0	-2	12	12	15	10	9	17	17	11	16	18	17	11	16	18	17	11	16											
ELLSWORTH AFB	4	2	0	4	2	-4	-6	-6	-3	0	-5	-4	-11	-13	-14	-8	-3	-9	-9	-17	-19	-26	-19	-9	-17	949 M.MI.	11	11	8	10	-14	-8	-3	-9	-9	-17	-19	-26	-19	-9	-17	-19	-26	-19	-9	-17	-19	-26	-19	-9	-17	-19	-26												
ELLSWORTH AFB	9	5	3	6	5	-1	-2	-10	-7	-3	-6	-7	-14	-15	-19	-13	-7	-11	-23	-23	-38	-34	-24	-13	-23	1122 M.MI.	11	11	8	9	-10	-7	-3	-6	-7	-14	-15	-19	-23	-38	-34	-24	-13	-23	-38	-34	-24	-13	-23	-38	-34	-24	-13	-23	-38										
ELLSWORTH AFB	-2	-5	-6	-5	-5	-11	-12	1	5	6	5	4	-1	-2	0	1	3	0	0	-6	-7	-3	0	5	-1	796 M.MI.	9	9	7	8	-3	0	5	-1	0	-10	-13	1	5	6	5	4	-1	-2	0	1	3	0	0	-6	-7	19	17	11	16	19	17	11	16						
ELLSWORTH AFB	11	8	5	7	7	1	0	-13	-8	-5	-8	-9	-16	-17	-24	-16	-10	-13	-16	-24	-26	-40	-28	-13	-27	1247 M.MI.	11	11	8	9	-13	-8	-5	-8	-9	-16	-17	-24	-26	-40	-28	-13	-27	-27	-40	-43	-27	-40	-43	-27	-40	-43	-27	-40	-43	-27	-40	-43							
ELLSWORTH AFB	10	6	4	7	6	0	-2	-11	-7	-4	-8	-8	-16	-17	-21	-14	-9	-14	-15	-23	-26	-36	-25	-17	-26	859 M.MI.	12	12	9	11	-11	-7	-4	-8	-8	-16	-17	-21	-23	-26	-36	-25	-17	-26	-25	-38	-42	-25	-38	-42	-25	-38	-42	-25	-38	-42	-25	-38	-42						
ELLSWORTH AFB	19	12	9	12	12	4	2	-21	-14	-9	-14	-15	-23	-26	-21	-14	-9	-14	-15	-23	-26	-36	-25	-17	-26	859 M.MI.	12	12	9	11	-21	-14	-9	-14	-15	-23	-26	-36	-25	-17	-26	-25	-38	-42	-25	-38	-42	-25	-38	-42	-25	-38	-42	-25	-38	-42	-25	-38	-42						
ELLSWORTH AFB	29	19	15	22	20	9	6	-36	-25	-17	-26	-25	-38	-42	-36	-25	-17	-26	-25	-38	-42	-36	-25	-17	-26	859 M.MI.	19	18	11	18	-36	-25	-17	-26	-25	-38	-42	-36	-25	-17	-26	-25	-38	-42	-36	-25	-17	-26	-25	-38	-42	-36	-25	-17	-26	-25	-38	-42	-36	-25	-17	-26	-25	-38	-42

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EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUVALENT HEADWINDS												RETURN			STANDARD DEVIATION			
	JAN	APR	JUL	OCT	**450	A75	AB5	JAN	APR	JUL	UCT	**450	A75	AB5	JAN	APR	JUL	OCT	
ELLSWORTH AFB	FORT CARSON																		
5000	0	-4	-5	-4	-4	-10	-12	0	3	5	3	2	-4	-6	10	11	9	10	
10000	-1	0	-3	0	-2	-10	-11	-2	-1	3	-1	0	-9	-11	13	12	10	12	
18000	-6	-6	-8	-4	-7	-19	-22	-6	0	4	-3	-1	-14	-17	22	20	13	19	
ELLSWORTH AFB	FORT FUSTIS																		
5000	12	8	6	3	8	1	0	-13	-9	-6	-9	-10	-17	-18	11	11	8	10	
10000	24	15	13	13	16	6	6	-26	-17	-13	-14	-18	-26	-28	11	12	9	11	
18000	37	25	20	25	25	15	13	-43	-29	-21	-29	-30	-42	-45	17	17	10	16	
ELLSWORTH AFB	FORT HUDD																		
5000	2	0	-3	2	0	-7	-9	-3	0	3	-2	-1	-8	-10	11	11	8	10	
10000	5	2	0	4	2	-4	-6	-9	-5	0	-6	-5	-13	-15	12	11	9	11	
18000	4	4	1	7	4	-5	-8	-19	-12	-4	-13	-11	-23	-26	19	17	10	16	
ELLSWORTH AFB	FORT HUACHUCA																		
5000	-2	-5	-5	-3	-4	-9	-10	2	5	5	3	3	-1	-2	8	8	6	7	
10000	-4	-4	-5	-4	-5	-11	-13	2	3	5	3	3	-3	-4	11	10	8	10	
18000	-14	-12	-12	-8	-12	-22	-25	3	5	10	3	5	-5	-8	19	17	11	16	
ELLSWORTH AFB	FORT KNICK																		
5000	11	7	5	8	7	0	-1	-12	-8	-5	-9	-9	-17	-18	12	12	9	11	
10000	21	13	10	13	14	5	3	-23	-14	-11	-14	-16	-24	-27	12	13	10	12	
18000	32	21	17	24	22	11	9	-18	-26	-19	-28	-27	-40	-43	19	18	11	18	
ELLSWORTH AFB	FORT LEAVENWORTH																		
5000	10	5	3	7	6	-1	-3	-10	-6	-3	-8	-7	-15	-17	12	13	10	12	
10000	17	10	8	12	11	2	0	-19	-11	-9	-14	-14	-23	-25	13	14	11	13	
18000	26	16	14	20	18	6	3	-33	-21	-16	-25	-23	-37	-40	21	20	13	19	
ELLSWORTH AFB	FORT LEWIS																		
5000	-8	-5	-3	-6	-6	-12	-13	8	5	3	5	5	0	-2	10	9	7	9	
10000	-20	-11	-9	-13	-13	-21	-23	19	10	9	13	12	5	3	11	10	8	10	
18000	-31	-21	-20	-27	-25	-37	-40	28	18	19	24	22	10	8	18	18	13	17	
ELLSWORTH AFB	FORT MAD																		
5000	-4	-4	-2	-3	-4	-8	-10	4	4	2	3	3	-1	-2	8	7	6	7	
10000	-12	-7	-8	-8	-9	-16	-17	10	6	8	8	8	1	0	11	10	8	9	
18000	-25	-19	-18	-19	-20	-31	-34	18	14	17	14	15	5	2	19	17	11	16	
ELLSWORTH AFB	FORT RUCKER																		
5000	7	5	3	5	4	-1	-3	-9	-6	-3	-6	-6	-13	-15	11	10	8	9	
10000	15	10	5	9	9	2	0	-14	-12	-4	-11	-12	-20	-22	11	11	8	11	
18000	22	17	10	15	15	5	3	-32	-23	-12	-21	-21	-33	-36	17	16	10	15	

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EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN FEET	EQUIVALENT HEADWIND M E A D W I N D S												STANDARD DEVIATION						
	DIRRECT			FEYURN			FEYURN			FEYURN									
	JAN	APR	JUL	OCT	A50	A75	A85	A75	A50	OCT	A50	A75		A85					
ELLSWORTH AFR	TO	0	-2	3	0	-6	-8	-5	-1	1	-4	-2	-10	-12	11	12	9	11	647 N.M.I.
SCOO	4	0	1	6	4	-3	-5	-11	-6	-2	-8	-7	-15	-18	13	12	10	12	
10000	7	4	3	8	5	-5	-7	-21	-13	-6	-15	-13	-26	-29	20	19	11	18	
18000	9	5	3	8	5	-5	-7												
ELLSWORTH AFR	TO	0	-3	2	0	-7	-9	-4	0	2	-3	-1	-9	-11	11	12	9	10	759 N.M.I.
SCOO	3	0	3	5	3	-4	-6	-10	-5	-1	-7	-6	-14	-16	12	12	9	12	
10000	6	3	0	5	3	-4	-6	-20	-12	-5	-13	-12	-24	-27	19	18	11	17	
18000	7	4	2	7	4	-5	-8												
ELLSWORTH AFR	TO	1	4	5	3	-3	-4	-4	-1	-5	-6	-5	-11	-12	9	9	9	10	1621 N.M.I.
SCOO	3	1	4	5	3	-3	-4	-7	-3	-6	-7	-6	-12	-14	4	4	8	9	
10000	5	2	5	5	4	-1	-3	-14	-9	-11	-13	-12	-21	-23	13	13	10	13	
18000	7	4	3	7	4	-1	-3												
ELLSWORTH AFR	TO	12	14	15	15	6	4	-13	-7	-6	-10	-9	-18	-20	12	13	10	12	668 N.M.I.
SCOO	22	14	15	15	6	4	4	-23	-13	-14	-16	-17	-26	-28	13	14	11	13	
10000	34	22	23	26	25	14	11	-38	-26	-24	-26	-29	-42	-45	20	19	12	19	
18000																			
ELLSWORTH AFR	TO	-5	-4	-5	-5	-11	-13	5	5	4	5	4	-1	-2	9	10	7	9	448 N.M.I.
SCOO	-5	-4	-5	-5	-5	-11	-13	11	6	4	9	8	1	0	12	11	9	11	
10000	-13	-7	-9	-10	-10	-13	-14	18	15	13	16	17	5	2	21	19	13	19	
18000	-24	-19	-20	-21	-22	-34	-37												
ELLSWORTH AFR	TO	3	1	3	2	-2	-4	-4	-4	-1	-4	-4	-10	-11	4	4	6	8	1598 N.M.I.
SCOO	4	3	3	6	6	0	0	-15	-10	-4	-8	-9	-16	-18	10	10	7	9	
10000	12	3	6	13	12	4	2	-29	-22	-9	-18	-19	-30	-32	14	14	8	13	
18000	19	16	7	13	12	4	2												
ELLSWORTH AFR	TO	6	4	6	6	0	-1	-11	-7	-4	-7	-7	-14	-16	10	10	7	9	1280 N.M.I.
SCOO	9	6	7	10	11	4	2	-21	-14	-8	-11	-14	-22	-24	11	11	8	11	
10000	18	12	12	19	18	6	6	-36	-26	-14	-23	-24	-36	-39	16	16	9	15	
18000	26	20	12	19	18	6	6												
ELLSWORTH AFR	TO	4	4	6	6	0	-2	-11	-7	-4	-7	-8	-15	-16	11	11	8	10	966 N.M.I.
SCOO	9	4	7	11	11	3	1	-20	-13	-8	-12	-13	-22	-24	12	12	9	12	
10000	17	11	13	19	18	7	5	-35	-24	-15	-24	-24	-36	-40	18	17	11	17	
18000	26	18	13	19	18	7	5												
ELLSWORTH AFR	TO	5	3	5	5	-1	-2	-9	-6	-3	-6	-6	-13	-14	10	10	7	9	1329 N.M.I.
SCOO	9	5	6	9	10	3	1	-19	-13	-4	-10	-12	-20	-22	11	11	8	10	
10000	16	11	6	9	10	3	1	-34	-25	-12	-22	-22	-34	-38	16	15	9	15	
18000	24	18	11	17	16	7	5												

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 \*PLUS SIGN DENOTES HEADWINDS.



EQUIVALENT HEADINGS AND STANDARD DEVIATION IN FEET FOR GREAT CIRCLE AIR ROUTES

ROUTE	MONTHS												STANDARD DEVIATION				
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC					
ELL SWO TH AFB	7	6	2	2	0	1	1	1	1	4	2	3	2	-2	-3	6	1408 N.M.I.
SCOO	14	9	5	5	13	13	11	6	4	11	10	9	5	0	7	10	7
LCOO	21	14	10	10	16	14	14	11	10	17	14	13	15	14	11	10	10
ELL SWO TH AFB	7	6	2	2	0	1	1	1	1	4	2	3	2	-3	-4	9	1597 N.M.I.
SCOO	14	9	5	5	13	13	11	6	4	11	10	9	9	9	6	9	6
LCOO	21	14	10	10	16	14	14	11	10	17	14	13	14	13	10	10	10
ELL SWO TH AFB	7	6	2	2	0	1	1	1	1	4	2	3	2	-2	-3	6	1957 N.M.I.
SCOO	14	9	5	5	13	13	11	6	4	11	10	9	10	8	7	10	7
LCOO	21	14	10	10	16	14	14	11	10	17	14	13	14	13	10	10	10
ELL SWO TH AFB	7	6	2	2	0	1	1	1	1	4	2	3	2	-2	-3	6	689 N.M.I.
SCOO	14	9	5	5	13	13	11	6	4	11	10	9	10	10	7	10	7
LCOO	21	14	10	10	16	14	14	11	10	17	14	13	14	13	10	10	10
ELL SWO TH AFB	7	6	2	2	0	1	1	1	1	4	2	3	2	-2	-3	6	776 N.M.I.
SCOO	14	9	5	5	13	13	11	6	4	11	10	9	12	12	9	11	9
LCOO	21	14	10	10	16	14	14	11	10	17	14	13	13	12	10	11	11
ELL SWO TH AFB	7	6	2	2	0	1	1	1	1	4	2	3	2	-2	-3	6	945 N.M.I.
SCOO	14	9	5	5	13	13	11	6	4	11	10	9	12	12	9	11	9
LCOO	21	14	10	10	16	14	14	11	10	17	14	13	12	13	10	12	10
ELL SWO TH AFB	7	6	2	2	0	1	1	1	1	4	2	3	2	-2	-3	6	1464 N.M.I.
SCOO	14	9	5	5	13	13	11	6	4	11	10	9	10	10	7	10	7
LCOO	21	14	10	10	16	14	14	11	10	17	14	13	11	11	9	10	10
ELL SWO TH AFB	7	6	2	2	0	1	1	1	1	4	2	3	2	-2	-3	6	603 N.M.I.
SCOO	14	9	5	5	13	13	11	6	4	11	10	9	11	11	8	10	6
LCOO	21	14	10	10	16	14	14	11	10	17	14	13	11	12	9	10	7
ELL SWO TH AFB	7	6	2	2	0	1	1	1	1	4	2	3	2	-2	-3	6	1267 N.M.I.
SCOO	14	9	5	5	13	13	11	6	4	11	10	9	11	11	8	10	6
LCOO	21	14	10	10	16	14	14	11	10	17	14	13	11	12	9	10	7

HEADINGS—COMPUTED FOR A 120-KT AIRSPEED.  
 003—MONTHS ACTUAL FOUR-VALENT HEADINGS FOR INDICATED PER CENT OF LIABILITIES.  
 0105 SIG. POINTS HEADINGS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GPAY CIRCLE AIR ROUTES

WEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GPAY CIRCLE AIR ROUTES																		
	OBJECT			M E A O I N D S			REVERSE			STANDARD DEVIATION									
	JAN	APR	JUL	UCT	00ASU	A75	ABS	JAN	APR	JUL	UCT	00ASU	A75	ABS	JAN	APR	JUL	UCT	
FLLS02TH AFR	TO																		
5000	4	0	-2	3	0	-6	-8	-5	-1	1	-4	-2	-10	-12	11	12	9	11	647 M.M.I.
10000	7	4	1	6	4	-3	-5	-11	-6	-2	-8	-7	-15	-18	13	12	10	12	
18000	9	5	3	8	4	-4	-7	-21	-13	-6	-15	-13	-26	-29	20	19	11	18	
FLLS02TH AFR	TO																		
5000	3	0	-3	2	0	-7	-9	-4	0	2	-3	-1	-9	-11	11	12	9	10	759 M.M.I.
10000	6	3	0	5	3	-4	-6	-10	-5	-1	-7	-6	-14	-16	12	12	9	12	
18000	7	4	2	7	4	-5	-8	-20	-12	-5	-13	-12	-24	-27	19	18	11	17	
FLLS02TH AFR	TO																		
5000	3	1	4	5	3	-3	-4	-4	-1	-4	-6	-5	-11	-12	9	9	9	10	1621 M.M.I.
10000	5	2	5	5	4	-1	-3	-7	-3	-6	-7	-6	-17	-14	9	9	8	9	
18000	7	4	5	7	4	-1	-3	-14	-4	-11	-13	-12	-21	-23	13	13	10	13	
FLLS02TH AFR	TO																		
5000	12	4	7	9	6	3	-1	-13	-7	-7	-10	-9	-18	-20	12	13	10	12	668 M.M.I.
10000	22	17	14	15	15	4	4	-23	-14	-14	-16	-17	-26	-24	13	14	11	13	
18000	44	22	23	26	25	14	11	-38	-26	-24	-27	-24	-47	-44	20	19	12	19	
FLLS02TH AFR	TO																		
5000	-5	-9	-4	5	2	-2	-6	7	5	4	5	4	-1	-2	9	10	7	9	648 M.M.I.
10000	-13	-7	-4	10	6	0	-14	11	6	4	9	8	1	3	12	11	9	11	
18000	-24	-13	-20	21	22	14	11	14	15	17	16	17	5	7	21	19	13	19	
FLLS02TH AFR	TO																		
5000	4	3	1	3	2	-2	-6	-4	-4	-1	-4	-4	-10	-11	9	9	7	9	1598 M.M.I.
10000	12	3	3	6	6	0	0	-15	-10	-6	-8	-9	-16	-12	10	10	7	9	
18000	19	16	7	13	12	4	2	-29	-22	-9	-18	-19	-30	-32	14	14	6	13	
FLLS02TH AFR	TO																		
5000	9	6	4	6	6	0	-1	-11	-7	-4	-7	-7	-14	-16	10	10	7	9	1280 M.M.I.
10000	14	12	7	10	11	4	2	-21	-14	-8	-11	-14	-22	-24	11	11	6	11	
18000	26	20	12	19	18	8	6	-36	-26	-14	-23	-24	-36	-39	16	16	9	15	
FLLS02TH AFR	TO																		
5000	4	4	4	6	6	3	-2	-11	-7	-4	-7	-8	-15	-16	11	11	8	10	906 M.M.I.
10000	17	11	7	11	11	3	1	-20	-13	-8	-12	-13	-22	-24	12	12	9	12	
18000	26	18	13	19	18	7	5	-35	-24	-15	-24	-24	-36	-40	16	17	11	17	
FLLS02TH AFR	TO																		
5000	9	5	3	5	5	-1	-2	-9	-6	-3	-6	-6	-13	-14	10	10	7	9	1329 M.M.I.
10000	16	11	6	9	10	3	1	-19	-13	-4	-10	-12	-20	-22	11	11	6	10	
18000	24	18	11	17	16	7	5	-34	-25	-12	-22	-22	-34	-38	16	15	9	15	

\* HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*--DEMOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED WIND RELIABILITIES.  
 \*\*\* MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN KEY	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	JAN	APR	JUL	OCT	MAY	AUG	NOV	FEB	MAR	JUN	SEP	DEC	JAN	APR	JUL	OCT		
FLLSWORTH AFB TO JUNEAU	-6	-2	-1	-5	-4	-10	-11	5	1	1	4	2	-3	-4	1408	N.M.I.		
5000	-16	-9	-7	-12	-11	-18	-19	14	8	7	11	9	3	2	8	7	9	
10000	-24	-15	-12	-21	-19	-29	-31	22	11	10	17	14	5	2	10	9	10	
18000															15	14	11	16
ELLSWORTH AFB TO KEY WEST	3	2	0	3	1	-3	-4	-5	-3	0	-3	-3	-4	-10	1597	N.M.I.		
5000	10	7	2	6	6	0	-1	-14	-9	-3	-7	-8	-15	-17	9	9	6	8
10000	17	15	7	12	12	4	2	-27	-21	-8	-16	-17	-28	-31	9	9	7	9
18000															14	13	8	13
FLLSWORTH AFB TO KODIAK	-5	-2	-2	-4	-4	-4	-10	4	2	2	3	2	-2	-3	1957	N.M.I.		
5000	-15	-7	-7	-10	-10	-16	-18	13	6	6	9	8	2	1	6	7	6	8
10000	-25	-14	-13	-21	-18	-28	-30	21	11	11	17	14	6	3	10	8	7	8
18000															14	13	10	13
ELLSWORTH AFB TO LAESVIG AFB	-8	-5	-3	-5	-6	-12	-14	8	5	3	6	5	0	-2	689	N.M.I.		
5000	-20	-11	-9	-14	-14	-21	-23	19	10	9	13	12	5	3	10	10	7	10
10000	-32	-21	-20	-27	-25	-37	-40	29	18	19	24	22	10	7	11	11	9	10
18000															15	18	13	18
FLLSWORTH AFB TO LITTLE ROCK	7	4	2	6	4	-2	-4	-9	-5	-2	-6	-6	-14	-15	778	N.M.I.		
5000	14	9	5	10	9	1	0	-17	-11	-6	-11	-11	-20	-22	12	12	9	11
10000	21	14	10	16	14	3	1	-31	-21	-12	-21	-21	-33	-37	13	12	10	12
18000															19	18	11	17
FLLSWORTH AFB TO LOCKHURNE	12	7	6	9	8	0	0	-13	-8	-6	-9	-9	-17	-19	945	N.M.I.		
5000	23	14	12	14	15	7	5	-24	-15	-13	-15	-17	-26	-28	12	13	10	12
10000	35	23	20	25	24	13	11	-41	-27	-22	-29	-29	-62	-45	14	13	10	12
18000															19	18	11	18
FLLSWORTH AFB TO LORING AFB	11	5	6	10	8	1	0	-13	-6	-9	-11	-10	-17	-19	1464	N.M.I.		
5000	20	11	15	14	15	8	6	-22	-12	-15	-17	-17	-24	-26	10	10	8	10
10000	32	20	24	25	25	15	12	-37	-23	-25	-29	-29	-39	-42	11	11	9	10
18000															16	15	11	15
ELLSWORTH AFB TO LUKE AFB	-2	-4	-4	-2	-4	-8	-10	2	4	4	2	3	-1	-3	803	N.M.I.		
5000	-6	-5	-6	-5	-6	-13	-14	3	4	6	4	4	-2	-3	8	8	6	7
10000	-17	-14	-14	-11	-14	-25	-28	7	8	13	6	9	-1	-4	11	10	8	10
18000															19	17	11	16
ELLSWORTH AFB TO MCGUIRE AFB	13	8	7	9	9	2	0	-14	-9	-7	-9	-10	-17	-19	1287	N.M.I.		
5000	24	15	14	15	14	9	7	-24	-17	-15	-16	-19	-27	-29	11	11	8	10
10000	37	25	22	26	26	16	14	-43	-29	-23	-30	-31	-43	-46	11	12	9	11
18000															17	17	10	16

\* HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\* A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT FLIARILITIES.  
 + MINUS SIG. DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	DIRECTION		EQUIVALENT HEADWINDS												STANDARD DEVIATION			
	JAN	APR	JAN	JUL	OCT	MEMPHIS	MEMPHIS	MEMPHIS	MEMPHIS	JAN	APR	JUL	OCT	MEMPHIS	JAN	APR	JUL	OCT
ELLSWORTH AFB	TC																	
	5000	8	5	3	6	5	-1	-3										
	10000	16	10	6	11	10	2	0										
ELLSWORTH AFB	TC																	
	5000	-3	-6	-7	-1	-5	-10	-11										
	10000	-1	-1	-2	0	-1	-7	-8										
ELLSWORTH AFB	TC																	
	5000	11	5	5	7	7	0	-3										
	10000	20	10	14	15	14	5	3										
ELLSWORTH AFB	TC																	
	5000	0	0	2	0	0	0	-3										
	10000	-2	-2	3	0	0	-9	-11										
ELLSWORTH AFB	TC																	
	5000	-3	-4	-3	-2	-4	-3	-10										
	10000	-9	-4	-7	-7	-8	-14	-15										
ELLSWORTH AFB	TC																	
	5000	13	9	7	9	9	2	0										
	10000	24	15	14	14	16	8	6										
ELLSWORTH AFB	TC																	
	5000	5	2	0	4	2	-4	-5										
	10000	11	7	2	7	6	0	-2										
ELLSWORTH AFB	TC																	
	5000	12	6	7	9	3	1	0										
	10000	23	13	15	16	16	8	6										
ELLSWORTH AFB	TC																	
	5000	-3	-4	-2	-1	-3	-7	-9										
	10000	-9	-6	-7	-7	-9	-14	-16										

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 + PLUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT				INDIRECT				INDIRECT				JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	**A5	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85				
ELLSWORTH AFR																		
5000	6	5	2	5	4	-1	-2	-8	-6	-3	-5	-6	-12	-13	9	9	1462 N.M.I.	
10000	14	10	5	8	2	0	0	-17	-12	-5	-9	-11	-18	-20	10	10	7	8
18000	22	18	9	15	6	4	4	-32	-24	-11	-20	-21	-33	-36	15	15	9	14
FELLSWORTH AFR																		
5000	12	7	6	9	8	1	0	-13	-8	-7	-9	-10	-17	-19	11	11	1039 N.M.I.	
10000	23	14	14	15	16	8	6	-25	-16	-14	-16	-18	-26	-28	12	12	9	12
18000	36	24	22	26	26	14	13	-41	-28	-23	-30	-30	-42	-46	18	18	11	17
ELLSWORTH AFR																		
5000	-4	0	0	-4	-3	-12	-14	2	2	0	2	1	-6	-8	13	13	343 N.M.I.	
10000	-12	-7	-3	-9	-8	-16	-19	9	5	2	6	5	-2	-4	12	13	10	12
18000	-19	-10	-6	-15	-12	-25	-29	9	5	0	7	4	-7	-10	20	19	14	19
FELLSWORTH AFR																		
5000	11	6	4	8	7	0	-2	-12	-7	-5	-8	-8	-16	-18	12	12	696 N.M.I.	
10000	20	12	9	13	13	4	2	-21	-13	-10	-14	-15	-24	-26	13	13	10	13
18000	30	19	16	23	21	9	6	-36	-24	-19	-27	-26	-39	-42	20	19	12	18
ELLSWORTH AFR																		
5000	12	8	7	9	8	1	0	-13	-7	-7	-10	-10	-17	-19	14	12	867 N.M.I.	
10000	23	13	14	16	16	8	6	-24	-14	-15	-17	-18	-26	-28	12	13	10	12
18000	35	23	23	26	26	15	12	-39	-26	-24	-30	-29	-42	-45	19	18	12	18
FELLSWORTH AFR																		
5000	11	7	5	7	7	0	0	-12	-8	-5	-7	-8	-15	-17	11	10	1227 N.M.I.	
10000	20	13	9	11	12	5	3	-23	-15	-9	-12	-15	-23	-25	11	11	8	11
18000	30	21	14	21	20	10	8	-38	-27	-16	-25	-26	-38	-41	17	16	10	16
ELLSWORTH AFR																		
5000	13	7	8	9	9	2	0	-14	-8	-8	-10	-10	-17	-19	11	11	1331 N.M.I.	
10000	24	14	15	16	17	9	7	-25	-16	-15	-17	-19	-26	-28	14	12	9	11
18000	36	24	24	26	27	16	14	-41	-28	-25	-30	-31	-42	-45	17	16	11	16
ELLSWORTH AFR																		
5000	12	5	7	9	8	0	-1	-13	-6	-7	-10	-9	-17	-19	12	12	841 N.M.I.	
10000	22	12	15	16	16	8	6	-23	-13	-15	-17	-17	-26	-28	12	13	10	12
18000	34	22	24	26	26	14	12	-38	-25	-25	-29	-29	-41	-44	19	18	12	18
FELLSWORTH AFR																		
5000	-8	-5	-3	-6	-6	-12	-13	8	5	3	6	5	0	-2	10	9	7	9
10000	-20	-11	-9	-14	-14	-21	-23	19	10	9	13	12	5	3	11	10	9	10
18000	-32	-21	-21	-27	-25	-37	-40	28	18	19	24	21	10	7	19	18	13	18

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.

\*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.

↑INDUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT			EQUINOXIAL			M E A D W I N D S			RETURN			JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT
ELLSWORTH AFR	1129 N.M.I.																	
5000	-4	-2	0	-6	-3	-10	-12	3	1	0	4	1	-4	-6	10	9	10	
10000	-13	-4	-6	-11	-9	-15	-18	11	6	6	9	7	1	0	10	9	9	
18000	-21	-11	-9	-15	-14	-24	-26	15	7	6	11	9	0	-1	14	13	11	14
FLMENDORF AFR	1262 N.M.I.																	
5000	-2	-3	0	-3	-2	-8	-10	0	3	0	2	1	-4	-5	10	8	7	9
10000	4	0	3	-1	1	-6	-7	-7	-2	-4	-1	-4	-11	-13	13	10	9	10
18000	12	2	7	6	5	-4	-6	-19	-8	-10	-12	-12	-23	-26	18	16	13	16
FLMENDORF AFR	1812 N.M.I.																	
5000	-1	-3	0	-2	-2	-7	-9	0	2	0	1	0	-4	-5	9	7	6	8
10000	4	0	7	-1	0	-5	-7	-8	-2	-3	-1	-4	-11	-12	12	10	8	9
18000	11	2	7	3	5	-3	-6	-19	-9	-10	-10	-12	-22	-24	17	14	11	14
FLMENDORF AFR	1823 N.M.I.																	
5000	-1	-2	0	-1	-1	-6	-7	0	1	0	0	0	-4	-5	8	7	5	7
10000	7	2	3	1	3	-2	-3	-10	-4	-4	-3	-5	-11	-13	10	8	7	8
18000	15	6	7	7	3	0	-2	-21	-10	-9	-15	-14	-23	-26	15	13	11	13
FLMENDORF AFR	487 N.M.I.																	
5000	-4	-3	-2	-2	-3	-10	-11	3	3	2	1	2	-4	-5	12	9	8	9
10000	4	-1	2	0	0	-7	-9	-6	0	-2	0	-2	-11	-13	15	12	11	12
18000	12	3	5	5	6	-5	-8	-17	-6	-7	-10	-10	-23	-26	21	18	16	17
FLMENDORF AFR	226 N.M.I.																	
5000	4	-5	-6	-6	-4	-12	-14	-5	5	6	6	3	-5	-7	14	11	10	11
10000	-4	-6	-6	-9	-7	-17	-19	2	5	5	8	5	-4	-7	18	14	13	14
18000	-9	-11	-3	-14	-11	-25	-28	3	8	6	11	7	-6	-10	24	20	18	20
FLMENDORF AFR	1341 N.M.I.																	
5000	-1	-3	0	-2	-2	-7	-9	0	2	1	1	0	-4	-5	10	8	6	8
10000	6	1	3	0	2	-4	-6	-8	-2	-4	-1	-4	-11	-13	12	10	8	10
18000	14	4	7	3	8	-2	-4	-20	-8	-9	-14	-13	-24	-26	17	15	13	15
FLMENDORF AFR	1798 N.M.I.																	
5000	3	1	0	5	2	-2	-4	-4	-1	1	-6	-3	-8	-10	8	7	6	8
10000	12	5	6	9	7	2	0	-13	-6	-7	-11	-10	-15	-17	9	8	7	8
18000	20	10	9	15	13	4	2	-23	-13	-11	-19	-17	-25	-28	13	12	10	12
FLMENDORF AFR	1990 N.M.I.																	
5000	-1	-2	0	-2	-1	-5	-7	0	2	0	2	0	-3	-5	8	7	5	7
10000	5	1	2	0	1	-4	-5	-8	-3	-3	-2	-4	-10	-12	10	9	7	9
18000	13	6	6	5	7	-1	-3	-20	-10	-9	-12	-13	-22	-24	15	13	10	13

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DEFINES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT EFFICIENCIES.  
 \*\*\*A50 SIG. DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES															
	DIRECT				EQUINOXIAL				WINTER				SUMMER			
	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT
ELMENDORF AFB	TO	TO	TO	TO	PRUDHOM BAY	PRUDHOM BAY	PRUDHOM BAY	PRUDHOM BAY	JAN	APR	JUL	OCT	**A50	A75	A85	A85
5000	0	3	5	6	3	3	3	3	-1	-3	-5	-4	-4	-11	-12	12
10000	-1	5	4	5	3	3	3	3	0	-5	-5	-6	-5	-13	-14	14
18000	-2	6	3	5	3	3	3	3	-1	-8	-5	-8	-6	-17	-20	19
ELMENDORF AFB	TO	TO	TO	TO	REGINA	REGINA	REGINA	REGINA	JAN	APR	JUL	OCT	**A50	A75	A85	541 N.M.I.
5000	2	0	0	4	1	3	5	4	-4	-1	0	-5	-3	-8	-10	9
10000	11	5	6	9	7	7	7	7	-13	-6	-6	-10	-9	-15	-16	10
18000	19	9	9	15	12	4	2	2	-22	-12	-10	-18	-16	-24	-27	14
ELMENDORF AFB	TO	TO	TO	TO	SMENYA	SMENYA	SMENYA	SMENYA	JAN	APR	JUL	OCT	**A50	A75	A85	1613 N.M.I.
5000	-2	-3	-7	-6	-5	-12	-13	-13	1	2	7	4	3	-3	-5	11
10000	-10	-4	-7	-9	-3	-16	-18	-18	8	3	6	7	6	-2	-4	13
18000	-17	-13	-12	-14	-14	-25	-27	-27	12	7	9	10	9	-1	-4	18
ELMENDORF AFB	TO	TO	TO	TO	THULE	THULE	THULE	THULE	JAN	APR	JUL	OCT	**A50	A75	A85	1265 N.M.I.
5000	0	0	2	3	0	-5	-6	-6	0	0	-2	0	-1	-6	-7	8
10000	0	3	3	3	2	-3	-4	-4	0	-3	-4	-3	-3	-8	-9	8
18000	0	4	4	5	3	-4	-6	-6	-2	-6	-6	-7	-6	-13	-15	12
ELMENDORF AFB	TO	TO	TO	TO	YAKIMA	YAKIMA	YAKIMA	YAKIMA	JAN	APR	JUL	OCT	**A50	A75	A85	1772 N.M.I.
5000	-1	-3	0	-2	-2	-6	-9	-9	0	2	0	1	0	-4	-6	10
10000	5	0	3	7	1	-5	-7	-7	-8	-2	-4	-1	-4	-11	-13	8
18000	13	3	7	7	7	-3	-5	-5	-19	-8	-10	-13	-13	-23	-26	18
ELMENDORF AFB	TO	TO	TO	TO	VELLOKNIFE	VELLOKNIFE	VELLOKNIFE	VELLOKNIFE	JAN	APR	JUL	OCT	**A50	A75	A85	1339 N.M.I.
5000	1	2	0	7	2	-4	-5	-5	-1	-2	0	-7	-3	-9	-11	10
10000	7	4	5	7	5	0	-2	-2	-8	-5	-6	-7	-7	-13	-15	8
18000	14	10	9	13	11	2	0	0	-16	-12	-10	-15	-14	-23	-25	18
EL TOLC	TO	TO	TO	TO	ENGLAND AFB	ENGLAND AFB	ENGLAND AFB	ENGLAND AFB	JAN	APR	JUL	OCT	**A50	A75	A85	990 N.M.I.
5000	3	3	1	0	1	-3	-4	-4	-4	-3	-1	0	-2	-7	-8	8
10000	15	12	2	6	8	1	0	0	-16	-13	-2	-6	-9	-17	-19	10
18000	30	25	4	14	16	5	3	3	-34	-28	-5	-14	-20	-33	-36	16
EL TOLC	TO	TO	TO	TO	FORT HENNING	FORT HENNING	FORT HENNING	FORT HENNING	JAN	APR	JUL	OCT	**A50	A75	A85	1279 N.M.I.
5000	5	5	3	1	3	-1	-2	-2	-6	-5	-3	-1	-4	-9	-10	8
10000	17	14	4	7	9	3	2	2	-18	-15	-4	-8	-11	-18	-20	9
18000	33	27	7	16	19	8	6	6	-37	-30	-8	-18	-22	-35	-38	15
FL TOLC	TO	TO	TO	TO	FORT ALISS	FORT ALISS	FORT ALISS	FORT ALISS	JAN	APR	JUL	OCT	**A50	A75	A85	1645 N.M.I.
5000	0	0	0	-4	-1	-9	-7	-7	0	0	0	4	0	-4	-5	8
10000	12	10	2	4	6	0	-2	-2	-13	-10	-1	-4	-7	-15	-17	12
18000	27	23	4	11	14	3	0	0	-30	-25	-4	-13	-17	-31	-35	20

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	E O U I V A L E N T H E A D W I N D S * RETURN												STANDARD DEVIATION					
	DIRECT			A B S			A B S			A B S			JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	475	A85	JAN	APR	JUL	OCT	475	A85	JAN	APR	JUL	OCT		
EL TORO	MCAS	TO	FORT BRAGG/POPE												1911 N.M.I.			
5000	8	6	4	2	4	0	-1	-8	-7	-4	-3	-6	-11	-12	8	8	5	7
10000	19	15	6	8	11	5	3	-21	-16	-6	-9	-13	-20	-22	9	9	6	8
18000	35	27	11	18	21	11	9	-39	-30	-11	-21	-24	-37	-40	14	13	8	12
EL TORO	MCAS	TO	FORT CAMPBELL												1488 N.M.I.			
5000	6	6	4	2	4	0	-1	-7	-6	-4	-2	-5	-10	-12	8	8	6	7
10000	17	13	6	9	10	6	3	-18	-14	-6	-9	-12	-19	-21	10	9	7	9
18000	32	25	12	17	19	10	8	-37	-29	-12	-20	-23	-36	-39	16	14	8	13
EL TORO	MCAS	TO	FORT CARSON												696 N.M.I.			
5000	7	3	2	-2	1	-3	-4	-2	-3	-2	2	-2	-6	-7	7	7	5	6
10000	9	8	6	7	7	0	0	-10	-9	-6	-7	-8	-15	-17	12	10	8	10
18000	22	19	14	12	16	5	2	-28	-23	-15	-15	-20	-32	-35	20	18	11	16
EL TORO	MCAS	TO	FORT EUSTIS												2000 N.M.I.			
5000	8	7	5	4	5	1	0	-9	-8	-5	-4	-7	-12	-13	8	8	5	7
10000	19	15	8	10	12	6	5	-21	-16	-8	-11	-14	-21	-23	9	9	7	8
18000	35	26	14	19	22	13	11	-40	-29	-15	-23	-26	-38	-40	14	13	8	13
EL TORO	MCAS	TO	FORT HOOD												1031 N.M.I.			
5000	2	2	0	-1	0	-4	-5	-3	-2	0	1	-1	-6	-7	9	8	5	7
10000	14	11	1	5	7	0	-1	-15	-12	-1	-6	-8	-16	-18	11	9	7	9
18000	29	24	3	13	15	4	2	-33	-27	-4	-15	-19	-33	-36	17	15	9	14
FL TORO	MCAS	TC	FORT HUACHUCA												394 N.M.I.			
5000	0	0	0	-3	-1	-6	-7	0	0	0	3	0	-4	-5	9	8	5	7
10000	11	9	1	4	5	-1	-3	-12	-10	-1	-4	-7	-15	-17	13	11	8	11
18000	25	21	3	10	13	1	-1	-29	-24	-3	-11	-15	-30	-34	21	18	11	16
FL TORO	MCAS	TO	FORT KNCX												1559 N.M.I.			
5000	7	6	4	2	4	0	-1	-7	-6	-4	-3	-5	-10	-12	8	8	6	7
10000	17	13	7	9	11	4	3	-19	-14	-7	-10	-13	-19	-21	10	9	7	9
18000	32	25	13	18	20	11	9	-37	-28	-13	-21	-23	-36	-39	16	14	8	13
EL TORO	MCAS	TO	FORT LEAVENWORTH												1149 N.M.I.			
5000	4	5	4	1	3	-1	-2	-4	-5	-4	-1	-4	-9	-10	8	8	6	7
10000	13	10	7	8	9	2	1	-15	-11	-7	-9	-11	-18	-19	11	10	8	9
18000	27	22	14	16	18	9	6	-32	-25	-15	-19	-22	-34	-37	18	16	10	15
EL TORO	MCAS	TO	FORT LEWIS												835 N.M.I.			
5000	0	0	-2	0	0	-5	-7	0	0	2	0	0	-5	-6	9	8	6	7
10000	-7	-4	0	-1	-3	-11	-13	4	2	-1	0	0	-6	-8	13	12	8	11
18000	-16	-9	-1	-7	-8	-20	-23	6	3	-1	1	1	-9	-12	20	18	12	17

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
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 MINUS SIGN DENOTES HEADWINDS.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT				EQUIVALENT RETURN				EQUIVALENT RETURN				JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85				
EL TORO	FORT ORD																	
5000	-5	-5	-2	-1	-4	-9	-11	5	6	2	2	3	-2	-3	10	9	268	8
10000	-11	-10	0	-5	-6	-16	-18	10	10	1	4	5	-2	-4	15	14	9	12
18000	-25	-18	-6	-11	-14	-28	-32	19	14	4	8	10	-2	-5	23	20	13	18
EL TDFO	FORT RUCKER																	
5000	5	4	2	1	2	-1	-3	-6	-5	-2	-1	-4	-9	-10	8	8	1635	7
10000	16	13	3	7	9	3	1	-18	-14	-3	-7	-10	-18	-19	9	8	5	7
18000	32	26	5	15	18	7	5	-36	-29	-6	-17	-21	-34	-37	14	13	8	12
EL TORO	FORT SILL																	
5000	3	3	2	0	1	-3	-4	-3	-3	-2	0	-2	-7	-9	9	8	960	7
10000	14	12	4	7	8	2	0	-15	-13	-4	-7	-10	-17	-19	11	10	8	9
18000	30	25	9	14	18	7	4	-33	-28	-10	-16	-21	-34	-37	18	16	10	15
EL TDFO	FORT WALTERS																	
5000	2	2	1	-1	0	-4	-5	-3	-3	0	1	-1	-6	-8	9	8	987	7
10000	14	12	3	6	8	1	0	-15	-12	-2	-6	-9	-16	-18	11	9	7	9
18000	30	25	6	14	17	6	4	-33	-27	-7	-16	-20	-33	-36	17	15	9	14
EL TORO	GEN MITCHELL																	
5000	5	5	5	3	4	0	-1	-6	-5	-5	-3	-5	-10	-11	8	8	1499	7
10000	14	10	9	9	10	4	3	-16	-11	-9	-10	-12	-18	-20	10	9	6	7
18000	26	20	16	17	19	10	8	-33	-24	-17	-21	-23	-34	-37	16	15	9	14
EL TDFO	HILL AFB																	
5000	3	3	2	0	1	-2	-3	-3	-3	-2	0	-2	-7	-8	8	7	524	6
10000	2	2	6	3	3	-3	-5	-4	-3	-6	-4	-5	-12	-14	13	11	8	10
18000	6	7	12	5	8	-4	-7	-15	-13	-13	-9	-13	-25	-28	22	19	12	18
EL TDFO	HOMESTEAD AFB																	
5000	2	2	0	0	0	-3	-4	-2	-2	0	0	-1	-5	-6	7	7	1998	6
10000	13	10	0	4	6	0	-1	-14	-11	0	-5	-7	-14	-16	8	7	5	7
18000	27	24	0	12	15	3	1	-31	-26	-1	-13	-18	-30	-32	12	11	6	10
EL TDFO	HUNTER AAF																	
5000	6	5	3	1	3	0	-2	-7	-6	-3	-2	-5	-10	-11	8	7	1838	7
10000	18	14	4	7	10	3	2	-19	-15	-4	-8	-11	-19	-20	9	8	6	8
18000	33	27	7	16	19	8	6	-37	-30	-8	-18	-22	-35	-38	14	13	7	12
EL TORO	HUNTSVILLE																	
5000	6	5	4	1	3	-1	-2	-6	-6	-4	-2	-5	-10	-11	8	6	1532	7
10000	17	14	5	8	10	4	2	-19	-15	-5	-9	-12	-19	-21	10	9	7	9
18000	33	27	9	17	19	9	7	-37	-30	-10	-19	-23	-36	-39	15	14	8	13

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT						RETURN						JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50					A75	A85
EL TOPO	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES																	
5000	5	2	1	3	-1	-2	-6	-5	-2	-1	-1	-4	-9	-10	8	7	5	7
10000	17	13	3	7	9	3	-18	-14	-3	-7	-10	-18	-19	9	8	6	8	8
18000	32	26	5	15	18	7	-36	-29	-6	-17	-21	-34	-37	14	12	7	12	14
EL TOPO	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES																	
5000	0	1	-1	1	0	-4	-1	-2	1	-1	-1	-6	-7	9	7	5	7	7
10000	-7	-4	-1	0	-3	-10	3	2	1	-1	0	-5	-6	11	10	7	9	9
18000	-17	-8	-6	-9	-10	-23	8	2	3	2	3	-5	-8	16	15	11	14	14
EL TOPO	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES																	
5000	1	1	-1	0	-4	-5	-2	-1	1	1	0	-4	-5	7	7	4	6	6
10000	11	9	0	4	5	-1	-12	-10	1	-4	-6	-13	-14	8	7	5	7	7
18000	25	23	0	11	14	2	-29	-25	0	-12	-17	-28	-31	12	11	6	10	10
EL TOPO	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES																	
5000	1	1	-1	0	-5	-6	-2	-1	1	0	0	-6	-7	9	8	5	7	7
10000	-5	-2	2	0	-1	-11	2	1	-2	-1	0	-8	-9	13	12	8	11	11
18000	-12	-6	1	-4	-5	-17	2	0	-4	0	-1	-12	-15	20	18	12	17	17
EL TOPO	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES																	
5000	4	4	3	1	2	-2	-5	-5	-3	-1	-4	-9	-10	9	8	6	7	7
10000	16	13	5	8	10	3	-17	-14	-5	-8	-11	-18	-20	10	9	7	9	9
18000	32	26	10	16	19	9	-36	-29	-10	-18	-22	-35	-39	17	15	9	14	14
EL TOPO	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES																	
5000	7	6	5	3	5	0	-8	-7	-5	-4	-6	-11	-13	8	8	6	7	7
10000	17	13	8	10	11	5	-19	-14	-8	-11	-13	-20	-22	10	9	7	9	9
18000	32	24	15	19	21	12	-38	-28	-16	-22	-25	-36	-39	15	14	8	13	13
EL TOPO	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES																	
5000	2	3	2	-3	0	-4	-2	-2	-1	4	-1	-6	-7	9	8	6	8	8
10000	10	10	3	5	-1	-2	-11	-10	-3	-5	-7	-15	-17	14	12	8	11	11
18000	26	22	8	11	15	3	-29	-25	-8	-13	-18	-32	-36	22	19	12	17	17
EL TOPO	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES																	
5000	5	4	4	1	3	-1	-6	-5	-3	-1	-4	-9	-11	9	8	6	7	7
10000	17	14	5	8	10	4	-18	-14	-5	-9	-12	-19	-21	10	9	7	9	9
18000	32	26	10	16	19	9	-36	-29	-10	-19	-22	-36	-39	16	15	9	14	14
EL TOPO	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES																	
5000	-5	-7	-4	-3	-5	-9	5	7	5	3	5	1	0	7	6	4	6	6
10000	4	3	-3	-1	0	-5	-6	-4	4	1	-1	-7	-8	8	7	6	7	7
18000	13	11	-5	1	3	-4	-18	-15	4	-3	-7	-18	-21	13	11	7	10	10

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.

\*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.

†MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	F U L L Y A L E N H E A D W I N D S *												STANDARD DEVIATION						
	DIRECT				PETUFN				PETUFN				JAN	APP	JUL	OCT			
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85					
EL TORO																			
5000	MCAS	TO	MINN-ST PAUL																
10000	3	4	4	1	3	-1	-3	-4	-4	-4	-2	-4	-9	-10	8	6	7	1315 N.M.I.	
18000	10	7	8	8	8	2	0	-12	-8	-9	-9	-10	-16	-18	10	9	9		
	20	17	16	14	16	7	5	-27	-21	-17	-19	-21	-31	-33	17	15	10	14	
EL TORO																			
5000	MCAS	TO	MINOT AFB																
10000	4	3	3	1	2	-2	-3	-5	-3	-3	-2	-4	-9	-10	8	8	6	7	
18000	5	3	7	5	5	0	-2	-7	-4	-7	-6	-7	-12	-14	10	9	7	9	
	9	9	14	8	10	0	-2	-18	-14	-16	-13	-16	-25	-28	17	16	10	15	
EL TORO																			
5000	MCAS	TO	NELLIS AFB																
10000	3	2	3	-3	1	-4	-6	-3	-2	-3	4	-1	-7	-8	10	8	6	8	
18000	2	3	5	4	3	-4	-4	-4	-4	-4	-4	-5	-13	-15	15	13	9	12	
	11	12	12	7	10	-1	-5	-19	-17	-12	-10	-14	-27	-31	23	21	13	10	
EL TORO																			
5000	MCAS	TO	NEW CUMBERLAND																
10000	8	7	5	4	5	1	0	-9	-7	-5	-5	-7	-12	-13	8	8	5	7	
18000	19	14	9	10	12	6	5	-21	-15	-10	-11	-14	-21	-23	9	9	7	8	
	34	24	16	20	22	13	11	-40	-28	-17	-24	-26	-38	-41	14	14	8	13	
FL TORO																			
5000	MCAS	TO	NEW ORLEANS																
10000	4	3	0	0	1	-3	-4	-4	-3	0	0	-2	-7	-8	8	6	5	7	
18000	15	12	1	6	8	1	0	-16	-12	-1	-6	-9	-16	-18	9	8	6	8	
	30	25	2	14	16	5	2	-34	-28	-3	-16	-20	-33	-36	15	13	8	12	
EL TORO																			
5000	MCAS	TO	NIAGARA FALLS																
10000	7	6	5	4	5	0	0	-8	-6	-5	-5	-6	-11	-13	8	8	6	7	
18000	16	11	10	11	11	6	4	-19	-13	-10	-12	-14	-20	-21	9	9	7	8	
	30	22	17	19	21	12	10	-36	-26	-18	-23	-25	-35	-38	15	14	8	13	
EL TORO																			
5000	MCAS	TO	PATRICK AFB																
10000	4	4	1	1	2	-1	-2	-5	-4	-1	-1	-3	-8	-9	7	7	5	6	
18000	15	12	1	6	8	1	0	-16	-13	-1	-6	-9	-16	-18	8	8	6	8	
	30	26	3	14	17	6	4	-34	-28	-3	-16	-20	-33	-35	13	12	7	11	
EL TORO																			
5000	MCAS	TO	PITTSBURGH																
10000	7	6	5	4	5	0	0	-8	-7	-5	-4	-6	-11	-13	8	8	6	7	
18000	18	13	9	10	12	6	4	-20	-14	-9	-11	-14	-20	-22	10	9	7	9	
	32	24	16	19	21	13	11	-39	-27	-17	-23	-25	-37	-40	15	14	8	13	
EL TORO																			
5000	MCAS	TO	PEGINA																
10000	5	3	3	2	3	-1	-2	-6	-3	-2	-2	-4	-9	-10	8	7	6	7	
18000	2	2	5	3	3	-2	-4	-5	-3	-4	-4	-5	-11	-12	10	9	7	9	
	3	5	11	4	6	-4	-6	-13	-11	-14	-10	-13	-22	-25	17	16	11	15	

\* HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 + MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	DIRECT						RETURN						STANDARD DEVIATION				
	JAN	APR	JUL	OCT	MAY	AUG	JAN	APR	JUL	OCT	MAY	AUG	JAN	APR	JUL	OCT	
EL TORD	MCAS	TO										1371 N.M.I.					
5000	6	5	4	2	4	0	-2	-6	-6	-4	-2	-5	-10	-11	8	6	7
10000	15	12	7	9	10	4	2	-17	-13	-7	-10	-12	-19	-20	10	9	7
18000	30	24	13	17	19	10	8	-35	-27	-14	-20	-23	-35	-38	16	15	9
EL TORD	MCAS	TO										1718 N.M.I.					
5000	6	6	5	3	4	0	-1	-7	-6	-5	-4	-6	-11	-12	8	6	7
10000	16	11	9	10	11	5	3	-18	-12	-9	-11	-13	-19	-21	10	9	7
18000	29	21	17	18	20	12	9	-35	-25	-18	-22	-24	-35	-37	15	14	9
EL TORD	MCAS	TO										1846 N.M.I.					
5000	7	6	4	2	4	0	-1	-8	-7	-4	-2	-6	-11	-12	8	8	5
10000	19	15	5	8	11	4	3	-20	-16	-5	-9	-12	-20	-22	5	9	6
18000	34	27	9	17	20	10	8	-39	-30	-10	-20	-24	-37	-40	14	13	8
EL TORD	MCAS	TO										1712 N.M.I.					
5000	6	5	5	3	4	0	-1	-7	-5	-5	-4	-6	-11	-12	8	8	6
10000	14	10	9	10	10	4	3	-16	-11	-10	-11	-12	-18	-20	10	9	7
18000	26	20	17	17	19	10	8	-33	-24	-18	-22	-24	-34	-37	15	14	9
EL TORD	MCAS	TO										784 N.M.I.					
5000	1	0	-1	0	0	-5	-6	-1	0	2	0	0	-5	-6	9	8	6
10000	-6	-3	1	0	-2	-10	-12	3	1	-1	-1	0	-7	-9	13	12	8
18000	-13	-7	0	-5	-6	-18	-21	3	1	-3	0	0	-11	-14	20	19	12
EL TORD	MCAS	TO										1732 N.M.I.					
5000	3	2	0	1	1	-3	-4	-3	-2	0	-2	-2	-7	-8	7	7	5
10000	-4	-1	0	0	-1	-7	-8	1	0	-1	-1	0	-6	-7	9	8	6
18000	-9	-2	1	-3	-3	-12	-14	0	-2	-4	-2	-3	-11	-13	14	13	10
ENGLAND	AFR	TO										396 N.M.I.					
5000	11	8	4	4	6	0	-2	-11	-9	-4	-4	-7	-15	-17	12	12	8
10000	22	16	4	7	11	2	0	-22	-17	-4	-8	-13	-23	-25	13	13	9
18000	38	29	1	18	20	4	1	-41	-31	-2	-20	-23	-40	-44	19	18	10
ENGLAND	AFB	TO										707 N.M.I.					
5000	-8	-5	-2	-3	-5	-12	-13	7	4	1	3	3	-3	-4	11	11	7
10000	-19	-14	0	-7	-10	-19	-21	18	14	0	6	9	0	-1	11	10	8
18000	-37	-30	0	-17	-20	-36	-40	34	28	0	15	17	3	1	18	16	9
ENGLAND	AFR	TO										720 N.M.I.					
5000	12	9	5	4	7	0	-1	-13	-10	-5	-4	-8	-16	-17	11	11	8
10000	23	18	5	7	12	3	1	-24	-19	-5	-8	-14	-24	-26	12	12	8
18000	40	28	4	19	21	7	4	-43	-32	-5	-21	-24	-41	-45	18	17	10

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN POUNDS	EQUIVALENT HEADWINDS												STANDARD DEVIATION					
	DIRECT				RETURN				RETURN				JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	●●A50	A75	A85	JAN	APR	JUL	OCT	●●A50	A75	A85				
ENGLAND AFR	9	7	5	3	5	-1	-3	-11	-8	-4	-3	-7	-15	-17	13	13	9	11
5000	14	11	5	4	8	0	-2	-20	-13	-5	-7	-11	-21	-24	14	14	10	13
10000	26	15	0	10	10	-1	-4	-36	-23	-1	-15	-17	-34	-38	20	19	11	19
ENGLAND AFR	-5	-1	0	-4	-3	-10	-12	4	2	0	3	2	-4	-6	11	11	8	10
5000	-17	-12	-2	-8	-10	-19	-21	15	10	2	7	8	0	-1	12	12	9	11
10000	-33	-26	-7	-19	-20	-34	-38	25	20	6	16	15	4	2	19	17	10	16
ENGLAND AFR	12	9	5	5	7	0	0	-13	-10	-5	-5	-8	-15	-17	11	11	7	10
5000	23	17	7	4	11	4	2	-25	-19	-7	-9	-15	-24	-27	12	12	8	12
10000	39	27	2	19	20	7	4	-44	-31	-1	-23	-25	-41	-45	16	17	10	17
ENGLAND AFR	-10	-7	-4	-4	-6	-14	-16	5	7	4	4	5	-1	-3	13	12	8	11
5000	-21	-16	-1	-7	-11	-21	-24	20	15	1	7	10	1	-1	13	12	9	12
10000	-38	-31	2	-19	-21	-39	-42	34	29	-2	14	18	2	-1	19	18	10	17
ENGLAND AFR	-6	-4	-1	-1	-3	-4	-11	5	4	1	1	2	-3	-4	10	9	6	9
5000	-17	-14	0	-6	-9	-19	-20	17	13	0	5	5	0	-1	11	10	7	10
10000	-36	-29	-1	-15	-20	-35	-38	33	27	1	14	17	4	1	17	15	9	14
ENGLAND AFR	9	7	4	3	5	-2	-4	-11	-9	-4	-4	-7	-15	-17	13	13	9	11
5000	17	11	5	6	9	0	-1	-20	-14	-5	-7	-11	-21	-24	13	14	10	13
10000	27	16	2	11	12	0	-2	-37	-24	-3	-17	-19	-35	-39	20	19	11	18
ENGLAND AFR	-1	0	1	-1	0	-9	-10	0	-1	-2	1	-1	-9	-10	13	13	9	11
5000	-6	-4	0	-3	-3	-12	-14	0	1	0	2	0	-7	-9	13	13	10	13
10000	-15	-12	-5	-10	-10	-22	-25	-2	1	3	3	1	-10	-13	20	19	11	18
ENGLAND AFR	-3	-2	0	-2	-2	-7	-8	2	1	0	1	0	-3	-4	6	6	5	7
5000	-16	-10	-4	-9	-10	-16	-18	14	9	4	8	8	2	1	9	9	7	8
10000	-31	-22	-12	-21	-21	-32	-34	24	17	10	17	16	7	5	15	14	9	13
ENGLAND AFR	-4	-3	0	0	-2	-7	-8	3	3	0	0	1	-3	-4	8	7	5	7
5000	-16	-12	-3	-7	-9	-16	-18	14	11	3	7	8	2	0	10	9	7	8
10000	-33	-27	-8	-17	-20	-33	-36	29	21	7	15	16	7	5	16	14	8	13

● HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 ●●--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

FUELVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WIND IN FEET	E G U L Y A L E A T M E A D W I N D S												STANDARD DEVIATION																				
	DUMFRIES			FORT DUCKER			FORT SILL			FORT WOLTERS			GRY MITCHELL			MILL AFB			HOMESTEAD AFB			HUNTER AAF			MUNTSVILLE			JACKSONVILLE					
	JAN	APR	JUL	JAN	APR	JUL	JAN	APR	JUL	JAN	APR	JUL	JAN	APR	JUL	JAN	APR	JUL	JAN	APR	JUL	JAN	APR	JUL	JAN	APR	JUL	JAN	APR	JUL	JAN	APR	JUL
ENGLAND AFB	9	TO	3	4	5	-1	-3																										
5000	20	15	7	10	1	0																											
10000	36	29	1	17	19	4	1																										
ENGLAND AFB	-6	TO	-1	-4	-4	-12	-14																										
5000	-17	-13	0	-7	-9	-19	-22																										
10000	-33	-27	-2	-17	-19	-35	-38																										
ENGLAND AFB	-8	TO	-2	-4	-4	-13	-15																										
5000	-19	-14	0	-8	-10	-20	-23																										
10000	-37	-30	0	-18	-20	-37	-41																										
ENGLAND AFB	4	TO	3	2	2	-4	-5																										
5000	6	4	3	2	3	-4	-6																										
10000	7	3	0	1	2	-8	-11																										
ENGLAND AFB	-3	TO	0	-1	-1	-7	-8																										
5000	-16	-11	-3	-8	-10	-17	-19																										
10000	-32	-24	-8	-19	-20	-33	-36																										
ENGLAND AFB	0	TO	0	0	0	-5	-7																										
5000	10	8	0	3	4	-2	-4																										
10000	21	22	0	10	12	1	-1																										
ENGLAND AFB	10	TO	9	7	6	0	-2																										
5000	21	16	4	7	11	2	0																										
10000	38	29	3	14	20	6	3																										
ENGLAND AFB	11	TO	5	4	6	-1	-2																										
5000	20	14	4	7	11	1	0																										
10000	34	23	0	14	16	2	0																										
ENGLAND AFB	8	TO	3	4	5	-1	-3																										
5000	19	15	3	6	9	1	0																										
10000	35	29	2	16	19	5	2																										

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 000--DENOTES ANNUAL FOUR VALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 41415 SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWIND												STANDARD DEVIATION						
	DIRECT						RETURN						JAN	APR	JUL	OCT			
	JAN	APR	JUL	OCT	00A50	A75	A85	JAN	APR	JUL	OCT	00A50	A75	A85					
ENGLAND AFB	TO KEY WEST																		
5000	-1	0	-2	0	-1	-7	-9	0	-1	2	0	0	-6	-7	10	10	699	N.M.I.	
10000	3	6	-2	2	2	-4	-5	-10	-8	2	-3	-4	-12	-14	11	11	7	7	10
18000	19	19	0	8	9	0	-2	-24	-23	0	-10	-13	-26	-29	15	14	8	8	13
ENGLAND AFB	TO LAPSON AFB																		
5000	-3	-2	0	-2	-2	-7	-8	2	2	0	2	1	-3	-4	8	8	1553	N.M.I.	
10000	-14	-10	-4	-9	-10	-17	-18	15	9	4	8	8	7	1	9	9	6	6	7
18000	-31	-21	-11	-21	-20	-31	-34	24	16	9	17	15	6	4	15	14	9	9	14
ENGLAND AFB	TO LITTLE ROCK																		
5000	4	3	4	3	2	-5	-7	-5	-4	-4	0	-4	-12	-14	14	13	217	N.M.I.	
10000	3	2	3	2	2	-8	-4	-4	-5	-3	-1	-5	-14	-16	14	14	10	10	14
18000	1	-1	-5	-1	-2	-14	-17	-17	-4	4	-4	-5	-19	-23	21	20	11	11	19
ENGLAND AFB	TO LCCRCURVE																		
5000	10	7	5	7	6	0	-2	-11	-8	-4	-4	-7	-14	-16	13	12	685	N.M.I.	
10000	18	12	6	7	10	1	0	-22	-15	-6	-8	-13	-22	-25	13	13	9	9	13
18000	29	17	4	14	14	2	0	-39	-25	-6	-19	-21	-37	-41	19	19	10	10	18
ENGLAND AFB	TO LOPING AFB																		
5000	10	7	6	6	7	1	0	-12	-8	-6	-7	-9	-15	-16	10	10	1471	N.M.I.	
10000	20	13	9	11	12	5	4	-24	-16	-10	-12	-15	-23	-26	11	11	8	8	10
18000	32	19	11	20	18	8	4	-42	-26	-14	-26	-26	-39	-43	16	16	9	9	15
ENGLAND AFB	TO LUKE AFB																		
5000	-5	-3	0	-1	-3	-8	-10	4	3	0	0	1	-3	-5	9	9	1011	N.M.I.	
10000	-17	-13	-1	-7	-9	-18	-20	16	13	1	6	8	1	0	11	9	6	6	8
18000	-35	-29	-3	-17	-20	-35	-38	32	26	3	15	17	5	3	17	15	9	9	14
ENGLAND AFB	TO MCGUIRE AFB																		
5000	12	9	5	5	7	1	0	-13	-10	-5	-6	-9	-15	-17	11	11	1016	N.M.I.	
10000	23	17	8	9	13	5	3	-26	-19	-8	-10	-15	-25	-27	12	12	8	8	11
18000	38	24	8	20	20	8	6	-45	-30	-10	-24	-26	-41	-45	17	17	10	10	16
ENGLAND AFB	TO MEMPHIS																		
5000	9	6	5	2	5	-2	-4	-9	-7	-5	-2	-6	-14	-16	14	13	258	N.M.I.	
10000	17	9	4	7	7	-1	-1	-17	-12	-4	-5	-10	-19	-22	14	14	9	9	11
18000	20	11	-2	7	6	-5	-8	-32	-20	1	-12	-14	-31	-35	21	20	11	11	19
ENGLAND AFB	TO MEXICO CITY																		
5000	-7	-8	-4	0	-5	-11	-13	6	8	4	0	4	-1	-2	10	9	797	N.M.I.	
10000	-9	-7	-1	-2	-5	-11	-13	8	7	1	2	4	-1	-3	5	5	6	6	9
18000	-19	-14	1	-6	-8	-14	-22	15	10	-1	5	5	-2	-4	14	12	7	7	11

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 \*MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT			EQUIVALENT			HEADWINDS			RETURN			JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	00A50	A75	A85	JAN	APR	JUL	OCT	00A50	A75	A85	JAN	APR	JUL	OCT
ENGLAND AFB		TO																
5000	-1	0	1	-1	0	-8	-10	0	-1	-2	0	-1	-8	-10	12	12	9	10
10000	-3	-2	0	-2	-2	-13	-12	-2	0	-1	0	-1	-9	-11	12	13	10	12
18000	-9	-6	-3	-7	-6	-17	-20	-8	-3	1	0	-2	-13	-17	19	18	11	17
ENGLAND AFR		TO																
5000	-6	-3	0	-5	-4	-11	-13	4	1	0	4	1	-5	-6	11	11	8	10
10000	-17	-7	-3	-9	-8	-15	-17	7	5	2	6	4	-2	-4	11	11	9	11
18000	-21	-15	-8	-15	-14	-25	-28	8	6	5	9	6	-2	-5	17	16	10	16
ENGLAND AFR		TO																
5000	-3	-3	0	0	-2	-7	-9	3	2	0	0	1	-4	-5	9	8	6	8
10000	-17	-13	-2	-7	-10	-17	-19	15	12	2	7	8	1	0	10	9	7	9
18000	-34	-28	-7	-17	-20	-34	-37	30	25	6	15	17	6	4	17	15	9	14
ENGLAND AFR		TO																
5000	11	8	5	5	6	0	-1	-13	-9	-5	-6	-8	-16	-18	12	11	8	10
10000	22	16	8	8	13	4	2	-25	-18	-8	-9	-15	-24	-27	12	12	9	12
18000	36	22	7	19	19	7	4	-44	-29	-9	-23	-25	-41	-45	18	18	10	17
ENGLAND AFR		TO																
5000	5	4	0	3	2	-4	-6	-6	-5	0	-3	-4	-11	-14	13	13	8	11
10000	14	9	0	6	6	-2	-4	-16	-11	0	-6	-8	-18	-20	13	14	9	13
18000	24	23	0	13	13	0	-2	-32	-27	0	-16	-18	-34	-38	19	19	10	18
ENGLAND AFB		TO																
5000	9	6	5	5	6	0	-2	-11	-7	-5	-6	-8	-15	-16	12	11	8	10
10000	18	12	7	8	10	3	1	-22	-15	-8	-9	-14	-22	-25	12	12	9	12
18000	27	15	6	15	14	3	0	-39	-24	-9	-21	-22	-37	-41	18	18	10	17
ENGLAND AFR		TO																
5000	-4	-3	-1	0	-2	-7	-8	3	3	1	0	1	-3	-4	8	8	5	7
10000	-16	-12	-2	-6	-9	-16	-18	15	12	2	6	8	1	0	10	9	7	9
18000	-34	-28	-5	-16	-20	-33	-36	30	25	4	14	16	5	3	16	14	8	13
ENGLAND AFR		TO																
5000	4	5	1	3	3	-3	-5	-5	-6	-1	-3	-4	-11	-13	11	11	7	10
10000	15	12	1	5	7	0	-2	-17	-13	-1	-5	-9	-18	-20	12	12	8	11
18000	30	26	1	14	16	3	1	-34	-29	-1	-16	-20	-34	-38	16	16	9	14
ENGLAND AFR		TO																
5000	10	7	5	5	6	0	-2	-12	-8	-5	-5	-8	-15	-17	12	12	8	10
10000	20	13	7	8	11	3	1	-23	-16	-7	-9	-13	-23	-26	13	13	9	12
18000	31	19	6	16	16	4	2	-41	-26	-7	-21	-22	-38	-42	19	18	10	18

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
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 MINUS SIGN DENOTES HEADWINDS.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT				RETURN				RETURN				JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT
ENGLAND AFB																		
5000	-6	-3	0	-5	-4	-10	-12	5	2	0	4	2	-3	-5	10	10	8	9
10000	-13	-8	-4	-9	-9	-16	-18	9	6	3	7	6	0	-2	11	11	8	10
18000	-23	-16	-9	-17	-16	-27	-29	11	8	6	11	8	0	-2	16	15	10	15
ENGLAND AFB																		
5000	5	4	3	1	3	-4	-6	-7	-5	-3	-2	-5	-13	-15	14	13	9	11
10000	7	4	3	2	3	-4	-6	-12	-8	-3	-4	-7	-16	-18	14	14	10	13
18000	9	3	-1	1	2	-9	-11	-25	-14	0	-8	-11	-25	-29	20	19	11	19
ENGLAND AFB																		
5000	8	5	4	4	5	-1	-3	-10	-7	-4	-4	-6	-14	-16	12	12	8	10
10000	14	9	5	6	4	0	-1	-19	-12	-6	-8	-11	-20	-22	13	13	9	12
18000	21	12	4	10	10	0	-2	-35	-21	-6	-17	-18	-33	-37	19	18	10	18
ENGLAND AFB																		
5000	12	9	5	4	7	0	-1	-12	-9	-4	-4	-7	-15	-17	12	11	8	10
10000	23	17	5	7	11	3	1	-24	-18	-5	-8	-13	-24	-26	13	13	8	12
18000	39	29	3	18	20	6	3	-42	-32	-4	-21	-24	-41	-44	18	18	10	17
ENGLAND AFB																		
5000	12	8	6	6	7	1	0	-13	-9	-6	-6	-9	-15	-17	11	11	7	9
10000	23	16	9	10	13	6	4	-26	-18	-9	-11	-16	-25	-27	12	12	8	11
18000	37	22	9	20	20	8	6	-45	-29	-11	-25	-26	-41	-45	17	17	10	16
ENGLAND AFB																		
5000	6	4	4	3	6	-2	-4	-8	-5	-4	-4	-6	-13	-15	12	12	8	10
10000	11	7	5	5	6	-1	-3	-16	-10	-6	-7	-10	-18	-21	13	13	9	12
18000	15	8	3	7	7	-3	-5	-31	-18	-6	-15	-16	-30	-34	19	18	10	18
ENGLAND AFB																		
5000	-3	-2	0	-2	-2	-7	-8	2	1	0	1	0	-3	-5	6	8	6	7
10000	-16	-10	-4	-9	-10	-16	-18	14	9	4	8	8	2	1	9	9	7	8
18000	-31	-22	-11	-21	-21	-32	-35	24	17	9	17	15	6	4	15	14	9	14
ENIMETOK ATOLL																		
5000	3	9	8	9	7	3	2	-4	-9	-8	-8	-8	-12	-13	7	6	6	5
10000	0	1	6	6	3	-1	-2	-2	-2	-6	-7	-5	-9	-10	7	6	6	6
18000	6	-8	4	3	1	-5	-7	-11	6	-4	-4	-4	-10	-12	10	8	7	8
ENIMETOK ATOLL																		
5000	-11	-14	-14	-13	-14	-17	-17	11	15	15	14	14	10	10	6	4	4	4
10000	-5	-8	-9	-10	-9	-12	-13	5	8	10	11	9	5	4	7	6	4	4
18000	-4	0	-6	-6	-5	-10	-11	2	0	6	7	4	-1	-2	9	7	6	6

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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT				RETURN				RETURN				JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	00A50	A75	A85	JAN	APR	JUL	OCT	00A50	A75	A85	JAN	APR	JUL	OCT
S U L Y A L E N T H E A D M I N D S																		
KWAJALEIN IS																		
ENIETOK ATOLL	TO							11	14	12	9	11	7	6	8	7	6	4
5000	-12	-11	-9	-11	-16	-17		10	8	12	10	10	5	4	10	7	6	4
10000	-9	-11	-9	-10	-14	-15		13	2	10	10	8	2	0	8	6	6	6
18000	-13	-2	-10	-9	-15	-17									10	8	8	8
WIDWAY ISLAND																		
ENIETOK ATOLL	TO							0	2	7	5	3	-1	-2	7	6	5	6
5000	0	-3	-7	-6	-5	-9		1	0	5	5	2	-2	-3	8	7	5	6
10000	-2	0	-5	-5	-4	-8		-12	-4	2	2	-2	-10	-12	11	9	7	8
18000	7	3	-2	-3	0	-7												
PORT MORESBY																		
ENIETOK ATOLL	TO							-4	-5	-3	0	-3	-7	-8	5	5	5	3
5000	4	5	3	0	2	0		-4	-5	-3	-4	-5	-7	-8	5	4	4	4
10000	5	3	4	4	1	0		-6	-4	-5	-5	-6	-9	-10	5	5	6	5
18000	4	5	5	4	1	0									6	5	6	5
SUVA, FIJI																		
ENIETOK ATOLL	TO							-1	4	5	3	2	0	-1	6	5	4	3
5000	0	-4	-5	-3	-4	-7		4	1	3	3	2	0	-1	5	4	5	4
10000	-4	-1	-4	-3	-3	-7		3	0	3	2	1	-2	-3	6	5	6	5
18000	-4	1	-4	-2	-2	-8									6	5	6	5
TOKYO																		
ENIETOK ATOLL	TO							0	-5	-5	-5	-4	-9	-10	7	6	6	6
5000	0	4	5	5	3	-1		5	2	-3	-2	0	-5	-6	7	7	6	7
10000	-10	-4	3	1	-2	-9		-5	12	-1	1	0	-6	-8	10	9	8	9
18000	-17	-19	0	-6	-11	-20												
VANIMO																		
ENIETOK ATOLL	TO							-9	-7	-3	0	-5	-9	-10	5	5	5	4
5000	9	6	3	0	4	0		-7	-6	-6	-6	-7	-10	-11	5	5	4	4
10000	8	6	6	7	6	3		-12	-7	-9	-8	-9	-13	-14	6	5	6	5
18000	12	8	8	8	8	5												
WAKE ISLAND																		
ENIETOK ATOLL	TO							3	3	5	4	3	0	-1	6	7	6	6
5000	-4	-4	-6	-5	-5	-10		1	0	2	3	1	-3	-4	9	7	6	6
10000	-1	0	-2	-4	-2	-7		-3	1	0	1	0	-7	-8	11	9	9	9
18000	2	-1	0	-1	0	-8												
FORT BLISS																		
FORT BENNING	TO							8	6	3	4	5	-1	-2	10	10	7	9
5000	-9	-7	-4	-4	-6	-13		20	15	2	7	10	2	0	10	10	7	9
10000	-21	-16	-2	-8	-12	-23		36	29	3	17	20	6	4	16	15	8	14
18000	-39	-31	-3	-19	-23	-41												
FORT BRAGG/POPE																		
FORT BENNING	TO							-13	-9	-4	-4	-8	-15	-17	12	12	8	11
5000	12	9	5	4	7	0		-24	-19	-6	-7	-13	-24	-27	14	14	9	13
10000	22	17	6	6	11	2		-43	-31	-8	-22	-25	-42	-46	20	20	11	19
18000	38	26	7	19	20	7												

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EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	F O U I V A L E N T H E A D W I N D S *												STANDARD DEVIATION			
	DIFFICULT			A75			A85			RETURN			JAN	APR	JUL	OCT
	JAN	APR	JUL	OCT	A75	A85	JAN	APR	JUL	OCT	A75	A85	JAN	APR	JUL	OCT
<b>F O R T B E N N I N G</b>																
5000	-5	-4	-1	-2	-3	-11	-13	3	2	1	2	1	-5	1	-7	14
10000	-12	-10	-2	-4	-7	-17	-19	6	6	1	3	3	-4	3	-7	14
18000	-23	-20	-6	-12	-14	-28	-32	5	10	5	6	6	-5	6	-8	21
<b>F O R T C A M P B E L L</b>																
5000	-9	-7	-4	-5	-7	-13	-15	8	6	4	5	5	0	5	0	-2
10000	-21	-15	-5	-10	-13	-21	-23	19	14	5	10	11	3	2	2	11
18000	-39	-30	-10	-22	-24	-38	-42	32	26	10	19	20	9	7	7	18
<b>F O R T C A R S O N</b>																
5000	11	8	4	4	6	0	-2	-12	-9	-4	-4	-7	-15	-17	-17	12
10000	20	15	7	7	11	2	0	-23	-18	-7	-8	-14	-24	-27	-27	14
18000	34	21	8	19	18	6	3	-42	-28	-9	-24	-24	-40	-44	-44	20
<b>F O R T E U S T I S</b>																
5000	-11	-8	-4	-4	-7	-14	-16	10	8	4	4	6	0	6	0	-2
10000	-22	-17	-3	-3	-12	-22	-25	21	16	3	7	10	2	2	0	12
18000	-40	-31	-1	-19	-22	-39	-42	39	29	0	17	19	4	1	1	18
<b>F O R T M O C C</b>																
5000	-8	-6	-3	-3	-5	-11	-12	7	6	3	2	4	-1	4	-2	9
10000	-20	-15	-2	-8	-11	-19	-21	19	15	2	7	10	2	1	1	10
18000	-38	-31	-4	-18	-22	-37	-40	35	28	3	15	19	6	4	4	15
<b>F O R T H U A C H I C A</b>																
5000	-1	-1	0	-1	-1	-9	-11	0	0	0	0	0	-8	0	-10	13
10000	-5	-4	0	-1	-3	-12	-14	-1	0	0	0	0	-9	0	-11	14
18000	-11	-11	-3	-6	-7	-20	-23	-8	0	2	-1	-1	-14	-1	-17	21
<b>F O R T K N C X</b>																
5000	-9	-7	-3	-3	-6	-14	-16	8	6	3	5	5	-2	5	-3	13
10000	-20	-14	-5	-0	-12	-22	-24	16	12	5	8	5	1	0	0	13
18000	-35	-27	-10	-21	-22	-37	-41	24	20	9	16	16	4	2	2	20
<b>F O R T L E A V E N W O R T H</b>																
5000	-7	-5	-3	-5	-5	-10	-12	9	5	3	5	4	0	4	0	-1
10000	-19	-12	-7	-11	-12	-19	-21	18	11	7	10	11	5	3	3	8
18000	-34	-24	-15	-24	-24	-34	-37	28	19	14	20	19	11	9	9	14
<b>F O R T L E W I S</b>																
5000	-6	-5	-2	-2	-4	-9	-10	5	4	2	1	2	-1	2	-1	-2
10000	-16	-14	-5	-9	-11	-18	-20	16	13	5	8	5	4	2	2	8
18000	-36	-28	-11	-19	-22	-34	-37	31	25	10	17	19	10	9	9	15
<b>F O R T O R D</b>																
5000	-6	-5	-2	-2	-4	-9	-10	5	4	2	1	2	-1	2	-1	-2
10000	-16	-14	-5	-9	-11	-18	-20	16	13	5	8	5	4	2	2	8
18000	-36	-28	-11	-19	-22	-34	-37	31	25	10	17	19	10	9	9	15

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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION IN					
	DIRECT			RETURN			M A D M I N D S			JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	
	JAN	APR	JUL	OCT	**A50	A75	AR5	JAN	APR	JUL	OCT	**A50	A75	AR5				
FORT PENNING	FORT SILL																	
5000	-10	-8	-5	-7	-7	-15	-16	9	8	5	5	6	0	-2	12	12	8	10
10000	-23	-17	-4	-10	-13	-23	-26	22	16	4	9	12	3	1	12	12	9	12
18000	-41	-32	-7	-21	-24	-40	-44	36	29	6	19	20	7	5	19	17	10	17
FORT PENNING	FORT WOLTERS																	
5000	-11	-8	-4	-5	-7	-15	-17	10	8	4	5	6	0	-2	12	12	8	10
10000	-23	-17	-3	-9	-13	-23	-25	22	16	3	8	11	2	0	12	12	9	12
18000	-41	-32	-4	-20	-24	-40	-43	38	30	3	18	20	6	3	18	17	10	16
FORT PENNING	FROBISHER																	
5000	1	0	2	3	1	-4	-5	-3	-2	-3	-4	-4	-9	-10	9	9	7	8
10000	3	0	1	2	1	-4	-6	-8	-3	-3	-5	-5	-11	-13	10	10	7	9
18000	4	0	1	3	1	-6	-8	-18	-8	-5	-11	-10	-20	-22	13	13	9	13
FORT PENNING	GEN MITCHELL																	
5000	-3	-3	-1	-1	-2	-10	-12	1	1	0	1	0	-6	-8	13	12	9	11
10000	-8	-6	-2	-3	-5	-14	-16	1	2	1	1	1	-7	-9	14	14	10	13
18000	-17	-13	-5	-10	-11	-23	-27	-3	2	3	1	0	-10	-14	20	20	11	19
FORT PENNING	HILL AFB																	
5000	-6	-5	-2	-3	-4	-10	-11	5	4	2	3	3	-1	-3	9	9	6	8
10000	-19	-13	-6	-10	-12	-19	-21	18	12	6	10	11	4	2	10	10	8	9
18000	-36	-27	-12	-22	-23	-36	-39	30	23	11	19	19	9	7	16	15	9	14
FORT PENNING	HOMESTEAD AFB																	
5000	-3	0	-2	0	-2	-8	-10	2	0	2	0	1	-5	-6	11	10	7	10
10000	3	3	-1	0	0	-6	-8	-6	-5	1	0	-2	-10	-12	12	12	8	11
18000	10	10	0	3	4	-4	-6	-18	-17	0	-6	-9	-21	-24	16	16	9	14
FORT PENNING	HUNTER AAF																	
5000	9	8	4	4	6	-1	-3	-10	-8	-4	-4	-7	-15	-17	13	12	9	11
10000	21	17	5	5	11	1	0	-22	-18	-4	-6	-12	-23	-26	14	14	9	13
18000	37	29	6	18	20	6	4	-40	-32	-6	-20	-23	-40	-44	20	20	11	18
FORT PENNING	HUNTSVILLE																	
5000	-5	-5	-2	-3	-4	-12	-14	4	3	2	2	2	-5	-7	14	13	9	12
10000	-14	-11	-2	-5	-8	-18	-21	9	8	2	3	5	-3	-6	15	15	10	14
18000	-27	-23	-6	-14	-16	-31	-35	12	15	6	9	9	-1	-4	21	20	11	19
FORT PENNING	JACKSONVILLE																	
5000	4	5	1	3	3	-4	-5	-5	-5	-1	-3	-4	-11	-13	12	12	8	11
10000	13	10	2	3	6	-2	-4	-16	-13	-2	-4	-8	-18	-21	14	14	9	13
18000	24	21	5	12	13	2	0	-32	-26	-5	-15	-18	-33	-37	19	19	10	17

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 ♦♦ A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	F C U I V A L E N T H E A D W I N D S * DIRECTION												STANDARD DEVIATION					
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT
FORT BENNING	TO																	
5000	-4	-2	-3	-1	-3	-9	-11	3	1	3	1	2	-4	-5	11	10	7	9
10000	0	0	-2	-1	-1	-8	-10	-3	-2	2	0	0	-8	-10	12	11	8	11
18000	3	6	0	0	1	-7	-9	-13	-12	0	-3	-6	-17	-20	16	16	9	14
506 N.M.I.																		
FORT BENNING	TO																	
5000	-8	-6	-3	-5	-5	-11	-12	7	5	3	5	4	0	-1	8	8	6	7
10000	-20	-12	-7	-12	-13	-20	-22	18	11	7	11	11	5	3	9	9	7	9
18000	-34	-24	-15	-24	-24	-34	-37	28	19	13	20	19	10	8	14	14	9	13
1792 N.M.I.																		
FORT BENNING	TO																	
5000	-11	-8	-4	-5	-7	-15	-17	9	8	4	4	5	-1	-3	13	13	9	11
10000	-22	-17	-4	-9	-13	-23	-26	20	15	4	8	11	1	0	14	14	10	13
18000	-40	-31	-8	-21	-24	-40	-44	33	28	7	18	19	7	4	20	19	11	18
389 N.M.I.																		
FORT BENNING	TO																	
5000	3	1	1	1	1	-6	-7	-5	-3	-1	-2	-3	-11	-13	13	12	9	11
10000	4	2	2	2	2	-6	-8	-11	-7	-3	-4	-6	-16	-18	14	14	10	14
18000	5	0	1	3	2	-9	-12	-24	-11	-2	-11	-11	-25	-29	21	20	11	19
437 N.M.I.																		
FORT BENNING	TO																	
5000	9	6	5	6	6	0	-1	-11	-7	-5	-6	-8	-14	-16	11	11	8	9
10000	16	11	8	9	10	3	1	-22	-15	-9	-11	-14	-23	-25	13	12	9	11
18000	28	15	11	19	17	6	4	-40	-24	-14	-25	-24	-38	-42	18	17	10	17
1163 N.M.I.																		
FORT BENNING	TO																	
5000	-7	-6	-3	-3	-5	-11	-12	6	5	3	2	3	-1	-2	9	9	6	8
10000	-20	-15	-3	-8	-11	-19	-21	19	15	3	8	10	3	1	10	9	7	9
18000	-38	-30	-6	-19	-23	-35	-39	34	28	6	17	19	8	6	15	14	8	13
1379 N.M.I.																		
FORT BENNING	TO																	
5000	10	7	4	5	6	0	-2	-12	-8	-4	-5	-7	-15	-17	12	12	8	11
10000	19	15	7	7	11	2	0	-23	-18	-9	-9	-14	-24	-27	14	14	9	13
18000	33	19	9	19	18	6	3	-42	-27	-11	-24	-25	-40	-44	19	19	11	18
670 N.M.I.																		
FORT BENNING	TO																	
5000	-10	-8	-3	-4	-6	-14	-17	8	7	3	4	5	-2	-4	13	13	9	11
10000	-21	-16	-4	-8	-12	-23	-25	18	14	4	7	10	0	-1	14	14	10	14
18000	-37	-30	-8	-19	-22	-38	-42	28	25	7	16	17	4	2	21	20	11	19
295 N.M.I.																		
FORT BENNING	TO																	
5000	-4	-7	-2	3	-4	-10	-11	5	6	2	0	3	-2	-3	9	9	6	8
10000	-11	-9	-1	-2	-6	-12	-14	10	8	1	2	4	-1	-2	9	9	6	8
18000	-24	-18	2	-9	-12	-23	-26	20	14	-2	7	8	-1	-3	13	12	7	11
1096 N.M.I.																		

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.

\*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT			FLUVALFNT			HEADWIND			RETURN			JAN	APR	JUL	OCT		
	JAN	APR	JUL	DEC	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85				
<b>FORT BENNING</b>																		
5000	-7	-5	-2	-4	-5	-12	-14	5	3	2	3	3	-3	-5	12	12	836 N.MI.	
10000	-14	-10	-5	-7	-9	-18	-20	8	7	4	5	5	-2	-4	13	13	8 10	
18000	-26	-19	-10	-17	-17	-30	-33	10	10	7	10	8	-1	-4	19	18	10 12	
<b>FORT BENNING</b>																		
5000	-9	-6	-3	-6	-6	-13	-15	8	5	3	5	5	-1	-3	11	11	1199 N.MI.	
10000	-18	-12	-7	-11	-12	-20	-22	14	9	6	9	9	1	0	11	12	8 10	
18000	-30	-21	-13	-21	-21	-32	-35	18	14	11	15	14	4	2	17	16	9 11	
<b>FORT BENNING</b>																		
5000	-6	-5	-3	-2	-4	-9	-11	5	5	2	2	3	-1	-2	6	8	1502 N.MI.	
10000	-19	-15	-5	-9	-12	-19	-21	18	14	5	8	10	4	2	10	9	6 7	
18000	-37	-30	-10	-20	-23	-36	-39	33	26	9	17	19	9	7	15	14	7 9	
<b>FORT BENNING</b>																		
5000	9	6	3	4	5	-1	-3	-11	-7	-3	-5	-7	-14	-16	12	12	603 N.MI.	
10000	16	12	6	5	9	1	-1	-21	-16	-7	-8	-13	-22	-25	14	14	8 11	
18000	27	15	7	16	14	3	0	-40	-24	-9	-22	-22	-38	-42	20	20	9 13	
<b>FORT BENNING</b>																		
5000	-11	-8	-4	-3	-7	-14	-16	11	8	4	3	6	-1	-2	12	12	305 N.MI.	
10000	-20	-16	-4	-6	-11	-21	-24	19	15	4	6	10	1	0	13	13	8 11	
18000	-38	-28	0	-17	-20	-37	-41	34	24	0	15	16	2	0	19	18	9 12	
<b>FORT BENNING</b>																		
5000	5	3	2	3	3	-4	-5	-7	-4	-2	-4	-5	-12	-14	12	12	693 N.MI.	
10000	9	6	4	5	5	-2	-4	-16	-10	-5	-6	-9	-18	-21	14	14	8 11	
18000	13	4	4	9	6	-4	-7	-31	-16	-7	-17	-17	-31	-35	20	19	9 13	
<b>FORT BENNING</b>																		
5000	-6	-5	-3	-1	-4	-9	-10	5	5	3	1	3	-1	-2	8	8	1708 N.MI.	
10000	-18	-14	-4	-8	-11	-18	-20	17	14	4	8	10	3	2	9	9	8 11	
18000	-36	-29	-9	-18	-22	-34	-38	32	26	8	16	19	9	7	15	13	6 8	
<b>FORT BENNING</b>																		
5000	0	2	0	2	0	-5	-7	-1	-3	0	-2	-2	-8	-10	11	11	340 N.MI.	
10000	8	7	1	2	4	-3	-5	-11	-9	0	-2	-5	-14	-16	13	13	8 10	
18000	17	16	3	7	9	0	-3	-26	-22	-3	-11	-14	-28	-32	18	18	9 12	
<b>FORT BENNING</b>																		
5000	6	3	2	3	3	-3	-5	-8	-5	-2	-3	-5	-12	-14	13	12	528 N.MI.	
10000	10	7	4	4	6	-2	-4	-16	-11	-5	-6	-10	-19	-21	14	14	8 11	
18000	15	6	4	10	8	-3	-6	-32	-17	-6	-17	-17	-32	-36	20	20	10 13	

\* HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GRAFAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GRAFAT CIRCLE AIR ROUTES												STANDARD DEVIATION								
	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GRAFAT CIRCLE AIR ROUTES												JAN	APR	JUL	OCT					
EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GRAFAT CIRCLE AIR ROUTES												RETURN			RETURN						
EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GRAFAT CIRCLE AIR ROUTES												JAN	APR	JUL	OCT	JAN	APR	JUL	OCT		
FORT BENNING												8	4	3	6	5	-1	-2	1385 N.M.I.		
5000	-9	-6	-3	-7	-7	-13	-15	14	9	7	9	9	2	1	10	10	8	9			
10000	-18	-12	-8	-11	-13	-20	-22	19	14	11	16	14	5	3	10	11	8	10			
18000	-30	-21	-14	-22	-21	-32	-35	11	13	7	10	9	-1	-4	16	15	10	15			
FORT BENNING												5	4	2	3	3	-4	-6	438 N.M.I.		
5000	-7	-5	-2	-3	-5	-12	-14	9	8	3	5	6	-2	-4	13	13	9	11			
10000	-15	-12	-3	-6	-9	-19	-21	11	13	7	10	9	-1	-4	14	14	10	14			
18000	-28	-22	-8	-16	-17	-32	-35	-4	-2	-1	-2	-3	-10	-12	21	20	11	19			
FORT BENNING												-4	-2	-1	-2	-3	-10	-12	612 N.M.I.		
5000	1	0	1	1	0	-6	-8	-9	-5	-2	-4	-5	-14	-16	13	12	8	11			
10000	1	1	1	1	1	-7	-9	-21	-9	-2	-4	-5	-14	-16	14	14	10	13			
18000	0	-2	0	1	0	-11	-14	-21	-9	-2	-10	-10	-23	-27	20	20	11	19			
FORT BENNING												-12	-9	-5	-4	-8	-16	-18	238 N.M.I.		
5000	12	9	5	4	7	7	-2	-24	-19	-6	-7	-13	-24	-27	13	12	9	11			
10000	22	18	6	6	12	2	0	-42	-31	-7	-21	-24	-41	-45	14	14	9	13			
18000	39	28	7	19	21	7	4	-12	-8	-5	-6	-8	-16	-18	20	20	11	19			
FORT BENNING												-12	-8	-5	-6	-8	-15	-17	825 N.M.I.		
5000	10	7	5	5	6	0	-2	-23	-17	-9	-10	-15	-24	-26	12	11	8	10			
10000	18	14	8	8	11	3	1	-42	-26	-12	-24	-25	-40	-44	13	13	9	12			
18000	31	18	10	19	18	6	3	-3	-1	0	-1	-2	-9	-11	19	19	11	18			
FORT BENNING												-3	-1	0	-1	-2	-9	-11	720 N.M.I.		
5000	0	0	0	0	0	-7	-9	-7	-4	-1	-3	-4	-13	-15	13	12	8	11			
10000	0	0	0	1	0	-8	-10	-17	-6	-2	-8	-8	-20	-24	13	14	10	13			
18000	-3	-4	-1	0	-2	-14	-17	-17	-6	-2	-8	-8	-20	-24	20	19	11	19			
FORT BENNING												6	5	3	5	4	0	-1	1830 N.M.I.		
5000	-7	-6	-3	-5	-6	-11	-12	18	11	6	10	10	4	3	8	8	6	7			
10000	-19	-12	-7	-11	-12	-19	-21	28	20	13	20	19	10	8	9	9	7	9			
18000	-34	-24	-15	-24	-24	-34	-37	6	5	3	5	4	0	-1	14	14	9	13			
FORT BLISS												-11	-9	-5	-5	-8	-14	-15	1384 N.M.I.		
5000	10	8	5	4	6	0	0	-24	-18	-5	-9	-14	-23	-25	10	9	6	8			
10000	24	17	5	8	12	4	3	-42	-32	-7	-21	-25	-39	-43	10	10	7	10			
18000	38	30	7	18	21	9	7	-10	-8	-6	-5	-8	-14	-16	15	14	8	14			
FORT BLISS												-10	-8	-6	-5	-8	-14	-16	979 N.M.I.		
5000	9	8	6	5	6	0	-1	-22	-17	-5	-10	-13	-22	-25	11	11	7	9			
10000	21	16	5	9	12	4	2	-40	-31	-8	-20	-23	-38	-42	11	11	8	11			
18000	34	27	8	17	19	8	6	-10	-8	-6	-5	-8	-14	-16	18	16	9	15			

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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION					
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT
FORT BLISS																		
5000	4	6	7	6	5	0	-1	-4	-6	-7	-5	-6	-12	-13	10	9	421 N.M.I.	
10000	0	3	4	2	2	-5	-7	-3	-5	-4	-3	-4	-12	-14	13	11	6	
18000	0	1	6	0	1	-9	-13	-11	-9	-7	-4	-8	-19	-22	21	19	9	
FORT EUSTIS																		
5000	11	8	6	6	7	2	0	-12	-9	-6	-6	-8	-14	-16	10	9	1505 N.M.I.	
10000	23	17	7	9	13	5	4	-25	-19	-7	-10	-15	-24	-26	10	10	6	
18000	39	28	10	20	22	11	9	-44	-32	-11	-23	-27	-41	-44	15	14	7	
FORT HOOD																		
5000	5	3	0	2	2	-4	-6	-6	-4	0	-2	-3	-10	-12	12	11	453 N.M.I.	
10000	17	13	0	6	8	0	-2	-18	-13	0	-6	-9	-18	-21	12	11	7	
18000	33	27	1	14	17	3	0	-36	-29	-1	-16	-20	-36	-39	19	17	9	
FORT HUACNUCA																		
5000	0	-1	1	4	0	-4	-6	0	1	0	-3	-1	-6	-7	10	9	202 N.M.I.	
10000	-14	-11	-1	-5	-8	-16	-18	14	11	1	5	7	0	-2	13	11	5	
18000	-33	-28	-3	-13	-17	-34	-38	30	26	2	12	15	2	0	21	18	9	
FORT KNOX																		
5000	9	8	6	5	6	0	0	-10	-8	-6	-6	-8	-14	-16	11	10	1067 N.M.I.	
10000	21	16	6	9	12	4	2	-22	-17	-6	-10	-14	-22	-25	11	11	7	
18000	35	27	9	17	20	9	6	-40	-30	-9	-21	-24	-38	-42	17	16	8	
FORT LEAVENWORTH																		
5000	6	7	8	5	6	0	-1	-7	-7	-8	-5	-7	-14	-16	11	11	720 N.M.I.	
10000	14	12	6	7	9	2	0	-16	-13	-6	-8	-11	-19	-21	12	11	8	
18000	23	20	9	11	14	4	1	-32	-25	-9	-16	-19	-33	-37	19	17	9	
FORT LEWIS																		
5000	2	2	1	3	1	-1	-2	-2	-2	-1	-3	-2	-6	-7	7	6	1180 N.M.I.	
10000	-11	-6	-1	-3	-5	-12	-14	9	5	1	2	3	-2	-3	11	9	4	
18000	-24	-16	-6	-14	-14	-26	-29	16	11	3	10	9	0	-3	18	16	7	
FORT ORD																		
5000	-1	-2	0	3	0	-5	-6	1	2	0	-2	0	-4	-5	8	7	816 N.M.I.	
10000	-12	-10	-2	-5	-7	-15	-17	11	9	2	5	6	0	-2	12	11	5	
18000	-29	-24	-6	-13	-17	-30	-34	25	20	5	11	13	3	0	19	17	7	
FORT RUCKER																		
5000	8	6	2	3	4	-1	-3	-8	-6	-3	-4	-6	-12	-13	10	10	1070 N.M.I.	
10000	19	15	1	7	9	1	0	-20	-15	-1	-7	-11	-20	-22	10	10	7	
18000	35	28	1	16	18	5	2	-38	-31	-1	-18	-22	-37	-40	16	15	8	

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 MINUS SIGN DENOTES HEADWINDS.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWIND RETURN												STANDARD DEVIATION				
	DIRECT			EQUIVALENT HEADWIND			RETURN			JAN	APR	JUL	OCT	JAN	APR	JUL	OCT
FORT BLISS																	
5000	TO	6	5	4	5	-1	-3	-7	-6	-4	-4	-6	-13	-15	12	11	435 N.M.I.
10000		17	15	3	7	9	1	-18	-15	-3	-8	-11	-20	-22	13	11	8 10
18000		31	26	6	13	16	5	-35	-29	-7	-16	-20	-36	-40	20	18	9 11 17
FORT WOLTERS																	
5000	TO	6	5	2	3	3	-3	-7	-5	-3	-3	-5	-12	-14	12	11	426 N.M.I.
10000		18	14	1	7	9	1	-19	-15	-1	-7	-11	-20	-22	12	11	8 10
18000		33	28	4	15	18	5	-36	-30	-4	-17	-20	-36	-40	20	17	9 11 17
FORT BLISS GEN MITCHELL																	
5000	TO	7	6	7	6	6	0	-8	-7	-7	-6	-8	-14	-15	11	10	1097 N.M.I.
10000		15	12	7	8	10	3	-18	-13	-7	-10	-12	-20	-22	11	11	8 9 11
18000		25	19	11	13	16	6	-34	-25	-12	-18	-21	-34	-37	18	16	10 16
FORT BLISS HILL AFB																	
5000	TO	4	4	6	5	4	0	-4	-4	-5	-5	-5	-9	-10	7	7	620 N.M.I.
10000		-7	-3	1	-2	-3	-10	6	2	-1	1	1	-5	-7	12	10	8 10
18000		-19	-13	0	-10	-9	-23	9	6	-2	6	3	-7	-9	20	18	11 17
FORT BLISS HCNMESTEAD AFB																	
5000	TO	2	2	-1	1	0	-4	-3	-3	1	-1	-1	-7	-8	9	8	1416 N.M.I.
10000		13	10	-1	4	5	0	-14	-11	1	-4	-7	-14	-16	9	8	5 7
18000		27	24	-1	12	14	2	-31	-26	1	-13	-17	-30	-33	13	12	6 8 11
FORT BLISS HUNTER AFB																	
5000	TO	8	7	3	4	5	0	-9	-7	-3	-4	-6	-12	-13	10	9	1283 N.M.I.
10000		20	16	2	7	10	2	-21	-16	-2	-8	-12	-21	-23	10	10	6 8 10
18000		36	29	3	17	20	7	-39	-31	-3	-19	-23	-37	-40	15	14	7 10 13
FORT BLISS MOUNTAINVILLE																	
5000	TO	9	7	5	4	6	0	-10	-8	-5	-5	-7	-14	-15	11	10	997 N.M.I.
10000		21	16	4	8	11	3	-22	-17	-4	-9	-13	-22	-24	11	11	7 9
18000		37	29	6	17	20	8	-40	-31	-6	-20	-23	-38	-42	17	16	8 11 15
FORT BLISS JACKSONVILLE																	
5000	TO	7	6	2	3	4	-1	-9	-6	-2	-3	-5	-11	-12	9	9	1271 N.M.I.
10000		19	14	1	6	9	1	-20	-15	-1	-7	-11	-19	-21	10	9	6 8
18000		34	28	1	16	19	5	-38	-30	-2	-18	-22	-36	-39	15	14	7 9 13
FORT BLISS JUNEAU																	
5000	TO	1	2	1	2	1	-2	-2	-2	-1	-2	-2	-6	-7	7	6	1965 N.M.I.
10000		-10	-5	-2	-3	-5	-11	7	3	2	1	3	-2	-3	9	8	4 6 8
18000		-21	-12	-6	-14	-13	-22	14	6	3	8	7	0	-2	14	13	9 12

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 \* MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION					
	DIRECT			EQUIVALENT			HEADWINDS			RETURN			JAN	APP	JUL	OCT		
	JAN	APP	JUL	OCT	♦♦A50	A75	A85	JAN	APP	JUL	OCT	♦♦A50	A75	A85	JAN	APP	JUL	OCT
FORT BLISS	TO																	
5000	1	1	-2	0	0	-5	-6	-2	-2	2	0	0	-6	-7	9	8	5	7
10000	11	9	-2	4	4	-1	-3	-12	-9	2	-4	-6	-13	-14	9	8	6	8
18000	25	23	-2	11	13	1	0	-29	-25	2	-12	-16	-29	-31	13	12	7	11
FORT BLISS	TC																	
5000	3	2	2	3	2	-1	-2	-3	-2	-2	-3	-3	-7	-8	7	7	5	6
10000	-10	-5	-1	-3	-5	-11	-13	8	4	0	2	3	-3	-4	11	9	7	9
18000	-22	-15	-4	-13	-13	-25	-28	14	9	1	9	7	-2	-4	18	16	10	15
FORT BLISS	LITTLE ROCK																	
5000	8	7	5	4	5	-1	-2	-8	-7	-6	-5	-7	-14	-16	12	11	8	10
10000	20	16	3	8	11	2	0	-21	-16	-3	-9	-12	-21	-24	12	11	9	11
18000	35	28	6	16	19	6	4	-39	-30	-6	-18	-22	-38	-41	19	17	10	16
FORT BLISS	LOCKBOURNE																	
5000	9	8	7	6	7	1	0	-11	-9	-7	-6	-9	-15	-17	11	10	7	9
10000	21	16	7	10	12	5	3	-23	-17	-7	-11	-14	-23	-25	11	11	8	10
18000	35	26	10	18	20	9	7	-41	-30	-11	-22	-25	-39	-42	17	16	9	15
FORT BLISS	LOPING AFB																	
5000	10	7	8	8	8	2	1	-11	-8	-8	-8	-9	-15	-16	9	9	6	8
10000	20	13	10	12	13	7	5	-22	-15	-11	-14	-16	-22	-24	10	10	7	9
18000	32	21	15	19	20	11	9	-39	-26	-17	-25	-26	-37	-40	15	14	9	13
FORT BLISS	LUKE AFB																	
5000	2	0	2	5	2	-2	-4	-2	0	-2	-4	-3	-8	-9	9	8	5	8
10000	-13	-9	0	-4	-6	-15	-17	12	9	1	4	5	-1	-3	13	10	8	11
18000	-31	-25	-2	-13	-16	-32	-36	27	22	1	11	13	0	-1	21	18	11	17
FORT BLISS	MCGUIRE AFB																	
5000	11	9	7	6	8	2	1	-12	-9	-7	-7	-9	-15	-16	10	9	6	8
10000	24	17	8	10	13	6	5	-25	-19	-9	-11	-16	-24	-26	10	10	7	9
18000	39	27	12	20	22	12	10	-44	-31	-13	-24	-27	-40	-44	15	14	8	14
FORT BLISS	MEMPHIS																	
5000	8	7	5	4	5	0	-2	-9	-8	-5	-5	-7	-14	-15	11	11	7	9
10000	21	16	4	8	11	3	1	-22	-17	-4	-9	-13	-22	-24	12	11	8	11
18000	36	28	6	16	19	7	4	-39	-31	-6	-19	-23	-38	-42	18	16	9	16
FORT BLISS	MEXICO CITY																	
5000	-7	-8	-7	-3	-7	-12	-13	7	8	8	3	6	1	0	9	8	5	8
10000	0	0	-4	-2	-2	-8	-9	-1	0	4	2	1	-4	-5	9	8	7	8
18000	2	3	-5	0	-1	-8	-10	-9	-8	5	0	-2	-12	-14	14	12	7	11

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUILIBRIUM WIND VELOCITY												STANDARD DEVIATION				
	JAN	FEB	JUL	SEP	OCT	NOV	DEC	JAN	FEB	JUL	SEP	OCT	JAN	APR	JUL	OCT	
FORT BLISS																	
5000	4	5	7	4	5	-1	-2	-5	-6	-7	-4	-4	-6	-12	-14	10	10
10000	4	7	6	5	6	0	-2	-12	-8	-6	-7	-7	-5	-16	-18	11	11
18000	13	12	5	8	10	0	-2	-25	-19	-11	-11	-11	-17	-28	-31	18	17
997 N.M.I.																	
1015 N.M.I.																	
5000	1	3	5	3	3	-2	-4	-2	-4	-5	-4	-4	-4	-10	-11	9	9
10000	-1	0	3	0	0	-6	-6	-2	-2	-4	-4	-4	-3	-9	-11	11	10
18000	-3	0	5	-1	0	-10	-12	-9	-9	-8	-8	-8	-9	-18	-20	18	16
506 N.M.I.																	
1511 N.M.I.																	
5000	10	8	7	10	7	2	0	-12	-9	-7	-7	-7	-9	-15	-15	15	9
10000	23	17	6	10	14	6	4	-25	-18	-8	-8	-8	-15	-24	-26	10	10
18000	38	26	12	20	22	11	9	-44	-31	-13	-13	-13	-25	-41	-44	20	15
846 N.M.I.																	
1463 N.M.I.																	
5000	6	4	1	2	2	-3	-4	-7	-5	-1	-3	-3	-4	-11	-12	11	10
10000	18	13	0	6	3	0	-1	-18	-14	0	-6	-6	-9	-18	-20	11	10
18000	33	27	0	15	17	3	0	-36	-29	0	-16	-16	-20	-35	-38	17	15
1353 N.M.I.																	
655 N.M.I.																	
5000	0	-1	0	4	0	-4	-5	0	1	0	-2	-2	0	-5	-5	8	7
10000	-12	-10	-2	-5	-7	-15	-17	11	10	2	4	4	6	0	-2	12	10
18000	-30	-25	-5	-13	-17	-31	-35	26	22	4	11	11	14	3	0	19	17
1364 N.M.I.																	
1364 N.M.I.																	
5000	5	4	1	3	3	-2	-3	-6	-5	-1	-3	-3	-4	-10	-11	9	9
10000	17	13	0	5	3	0	0	-19	-14	0	-6	-6	-9	-18	-20	9	9
18000	32	27	0	14	17	4	1	-35	-29	0	-16	-16	-20	-34	-37	14	13
1364 N.M.I.																	
1364 N.M.I.																	
5000	10	8	7	10	7	2	0	-11	-9	-7	-7	-7	-9	-15	-16	10	10
10000	22	16	8	10	13	6	4	-24	-17	-8	-11	-11	-15	-23	-25	11	10
18000	36	25	11	19	21	10	8	-42	-30	-12	-23	-23	-26	-39	-43	16	15

\* HEADWINDS--COMPUTED FOR A 120-KT AVERAGE WIND  
 \*\*--DENOTES ANNUAL EQUIVALENT HEADWIND FOR THE INDICATED PER CENT RELIABILITY.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWIND IN KNOTS												STANDARD DEVIATION																							
	DIFFICULTY			MAGINA			SCOTT AFB			SELFRIDGE AFB			SMAD AFB			WESTOVER AFB			WURTSMITH			YAKIMA			YELLOWKNIFE			FORT CAMPBELL								
	JAN	APR	JUL	JAN	APR	JUL	JAN	APR	JUL	JAN	APR	JUL	JAN	APR	JUL	JAN	APR	JUL	JAN	APR	JUL	JAN	APR	JUL	JAN	APR	JUL	JAN	APR	JUL	JAN	APR	JUL			
FORT BLISS																																		1121 N.M.I.		
5000	1	2	4	2	3	2	-2	-3	-4	-3	-4	-3	-4	-9	-10	8	8	8	10	9	8	10	10	7	10	10	7	10	10	7	10	10	7	10	10	7
10000	-4	-1	2	-1	-1	-1	1	0	-2	0	0	0	0	-7	-8	10	9	8	10	10	7	10	10	7	10	10	7	10	10	7	10	10	7	10	10	7
18000	-9	-3	3	-5	-3	-3	-2	-3	-6	0	-4	0	-4	-13	-15	17	15	15	17	15	15	17	15	15	17	15	15	17	15	15	17	15	15	17	15	15
FORT BLISS																																		899 N.M.I.		
5000	8	7	7	5	6	6	-9	-8	-7	-6	-8	-10	-8	-15	-16	11	11	9	11	11	9	11	11	9	11	11	9	11	11	9	11	11	9	11	11	9
10000	19	15	6	9	11	4	-20	-16	-6	-10	-13	-24	-13	-22	-24	12	11	9	12	11	9	12	11	9	12	11	9	12	11	9	12	11	9	12	11	9
18000	32	24	9	15	18	7	-38	-28	-9	-19	-22	-40	-22	-37	-40	18	17	10	18	17	10	18	17	10	18	17	10	18	17	10	18	17	10	18	17	10
FORT BLISS																																		1292 N.M.I.		
5000	9	7	7	6	7	1	-10	-8	-7	-7	-8	-16	-8	-15	-16	10	10	7	10	10	7	10	10	7	10	10	7	10	10	7	10	10	7	10	10	7
10000	19	14	9	10	12	5	-21	-15	-8	-11	-14	-24	-14	-22	-24	11	11	8	11	11	8	11	11	8	11	11	8	11	11	8	11	11	8	11	11	8
18000	31	22	12	16	18	9	-38	-27	-13	-21	-23	-40	-23	-37	-40	17	16	9	17	16	9	17	16	9	17	16	9	17	16	9	17	16	9	17	16	9
FORT BLISS																																		1308 N.M.I.		
5000	10	8	5	4	6	0	-10	-8	-5	-4	-7	-14	-7	-13	-14	10	9	6	10	9	6	10	9	6	10	9	6	10	9	6	10	9	6	10	9	6
10000	22	17	4	8	12	4	-23	-17	-4	-9	-13	-24	-13	-22	-24	10	10	7	10	10	7	10	10	7	10	10	7	10	10	7	10	10	7	10	10	7
18000	38	29	5	15	21	8	-41	-32	-6	-20	-24	-42	-24	-39	-42	15	14	8	15	14	8	15	14	8	15	14	8	15	14	8	15	14	8	15	14	8
FORT BLISS																																		1724 N.M.I.		
5000	11	8	7	7	8	2	-12	-9	-7	-7	-9	-16	-9	-15	-16	18	18	14	18	18	14	18	18	14	18	18	14	18	18	14	18	18	14	18	18	14
10000	23	17	9	11	14	7	-25	-18	-10	-12	-16	-26	-16	-24	-26	10	10	7	10	10	7	10	10	7	10	10	7	10	10	7	10	10	7	10	10	7
18000	37	25	14	20	22	12	-43	-30	-15	-25	-27	-43	-27	-40	-43	15	14	8	15	14	8	15	14	8	15	14	8	15	14	8	15	14	8	15	14	8
FORT BLISS																																		1318 N.M.I.		
5000	8	6	7	6	6	0	-9	-7	-7	-7	-8	-14	-8	-14	-14	10	10	7	10	10	7	10	10	7	10	10	7	10	10	7	10	10	7	10	10	7
10000	16	12	8	9	10	4	-19	-14	-8	-11	-13	-23	-13	-21	-23	11	11	8	11	11	8	11	11	8	11	11	8	11	11	8	11	11	8	11	11	8
18000	26	19	12	15	16	7	-35	-25	-14	-20	-22	-38	-22	-35	-38	17	16	9	17	16	9	17	16	9	17	16	9	17	16	9	17	16	9	17	16	9
FORT BLISS																																		1100 N.M.I.		
5000	3	2	2	3	2	-1	-3	-2	-2	-3	-3	-8	-3	-7	-8	7	7	4	7	7	4	7	7	4	7	7	4	7	7	4	7	7	4	7	7	4
10000	-10	-5	-1	-3	-5	-11	9	4	1	2	3	-4	3	-2	-4	11	9	7	11	9	7	11	9	7	11	9	7	11	9	7	11	9	7	11	9	7
18000	-23	-16	-5	-14	-14	-29	15	10	2	9	8	-1	8	-1	-4	18	16	10	18	16	10	18	16	10	18	16	10	18	16	10	18	16	10	18	16	10
FORT BLISS																																		1066 N.M.I.		
5000	1	1	2	0	1	-3	-2	-1	-2	-1	-2	-8	-2	-7	-8	7	7	6	7	7	6	7	7	6	7	7	6	7	7	6	7	7	6			
10000	-9	-3	-1	-5	-5	-10	6	2	1	4	3	-1	3	-1	-2	8	7	6	8	7	6	8	7	6	8	7	6	8	7	6	8	7	6	8	7	6
18000	-16	-7	-2	-11	-9	-20	7	2	0	5	2	-4	2	-4	-6	13	12	9	13	12	9	13	12	9	13	12	9	13	12	9	13	12	9	13	12	9
FORT BLISS																																		426 N.M.I.		
5000	-14	-11	-6	-6	-9	-17	13	10	6	5	8	0	8	0	-1	13	12	9	13	12	9	13	12	9	13	12	9	13	12	9	13	12	9	13	12	9
10000	-28	-21	-8	-9	-16	-30	26	20	4	8	14	4	14	4	2	14	14	10	14	14	10	14	14	10	14	14	10	14	14	10	14	14	10	14	14	10
18000	-46	-34	-12	-25	-28	-49	40	30	11	21	23	10	23	10	7	21	20	11	21	20	11	21	20	11	21	20	11	21	20	11	21	20	11	21	20	11

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*\*--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	C S U L Y A L F A T M E A P M J J A S O												STANDARD DEVIATION					
	JAN	APR	JUL	OCT	00450	A75	A45	JAN	APR	JUL	OCT	00450	A75	A45	JAN	APR	JUL	OCT
F00T CARSON																		
F00T BRAGG/POPE	TO																	
5000	-12	-9	-6	-7	-9	-15	-17	11	8	5	6	7	1	0	10	10	1253	ML.MI.
10000	-24	-17	-8	-12	-15	-26	-26	23	16	4	11	13	6	4	21	11	0	11
18000	-42	-31	-14	-25	-27	-40	-44	37	27	15	22	23	12	10	17	16	0	15
F00T EUSTIS																		
F00T BRAGG/POPE	TO																	
5000	7	5	3	3	4	-3	-5	-9	-6	-3	-4	-6	-14	-16	14	13	212	ML.MI.
10000	11	11	6	4	4	-1	-3	-10	-15	-6	-7	-11	-22	-24	16	16	0	13
18000	21	11	7	14	12	3	-3	-36	-22	-8	-20	-20	-36	-41	22	22	0	14
F00T WOOD																		
F00T BRAGG/POPE	TO																	
5000	-13	-13	-5	-5	-8	-15	-17	17	9	5	4	7	0	0	11	10	0	9
10000	-24	-19	-5	-8	-14	-23	-26	23	18	5	8	12	4	2	11	11	0	11
18000	-43	-32	-5	-21	-25	-43	-44	40	29	4	19	21	7	4	17	16	0	15
F00T MUMFORD																		
F00T BRAGG/POPE	TO																	
5000	-10	-8	-5	-7	-7	-13	-14	9	7	5	4	6	0	0	9	9	0	0
10000	-23	-17	-5	-9	-13	-22	-24	22	17	5	8	12	5	3	16	9	0	0
18000	-41	-32	-6	-20	-24	-39	-42	37	29	7	18	21	9	7	15	14	0	13
F00T KNCI																		
F00T BRAGG/POPE	TO																	
5000	-13	-10	-5	-6	-9	-17	-19	12	9	6	5	7	0	-2	13	13	0	12
10000	-26	-20	-8	-8	-15	-26	-29	24	18	8	7	13	3	1	15	15	0	14
18000	-43	-32	-12	-24	-26	-41	-47	34	27	12	19	21	8	5	21	21	0	20
F00T LEAVENWORTH																		
F00T BRAGG/POPE	TO																	
5000	-14	-10	-6	-7	-9	-17	-19	13	9	6	6	8	1	0	12	12	0	10
10000	-26	-19	-9	-11	-16	-26	-28	24	18	9	10	14	6	4	13	13	0	12
18000	-44	-32	-14	-26	-28	-43	-47	38	27	14	22	23	11	9	19	19	0	18
F00T PUGLER																		
F00T BRAGG/POPE	TO																	
5000	-12	-9	-4	-4	-7	-15	-17	11	8	5	3	6	-1	-2	12	12	0	11
10000	-22	-17	-5	-6	-12	-23	-25	19	15	5	5	10	1	0	14	14	0	13
18000	-40	-28	-6	-20	-22	-39	-43	14	23	6	17	18	5	3	19	19	0	18
F00T SILL																		
F00T BRAGG/POPE	TO																	
5000	-13	-10	-6	-6	-9	-16	-18	12	9	6	5	7	1	0	11	11	0	10
10000	-24	-20	-7	-10	-14	-25	-28	25	19	7	9	14	5	3	12	12	0	12
18000	-45	-34	-9	-24	-27	-43	-47	41	31	9	21	23	10	8	18	17	0	16
F00T WALTERS																		
F00T BRAGG/POPE	TO																	
5000	-13	-10	-6	-5	-9	-15	-17	12	9	6	5	7	1	0	11	11	0	10
10000	-24	-19	-6	-9	-14	-25	-27	25	18	6	8	13	6	2	12	12	0	11
18000	-44	-33	-7	-22	-24	-41	-44	41	30	7	20	22	9	6	17	16	0	16

HEADING--COMPUTED FOR A 120-KT AIRSPEED.  
 --GIVES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION					
	JAN			APR			JUL			OCT			JAN	APR	JUL	OCT		
FORT BRAGG/POPE TO 5000	0	1	2	0	0	0	-2	-1	-2	-4	-4	-4	-3	-9	-10	9	9	1758 N.M.I.
10000	0	0	0	0	0	0	-6	-2	-2	-4	-4	-4	-4	-10	-12	10	10	6 10
15000	0	0	0	0	0	0	-16	-6	-6	-10	-10	-10	-9	-19	-21	14	14	10 14
FORT BRAGG/POPE TO 5000	-11	-8	-5	-5	-5	-8	9	7	5	4	4	6	6	-1	-3	13	12	620 N.M.I.
10000	-22	-15	-9	-4	-13	-23	17	12	8	5	10	10	10	1	0	14	14	10 13
15000	-37	-26	-13	-21	-23	-36	22	19	11	13	15	3	15	3	0	20	20	12 20
FORT BRAGG/POPE TO 5000	-9	-7	-4	-5	-7	-12	8	6	4	5	5	5	5	0	-1	9	9	1590 N.M.I.
10000	-22	-15	-9	-12	-14	-22	21	14	9	11	13	6	13	6	5	10	10	6 8
15000	-40	-29	-15	-25	-26	-38	34	24	15	22	22	13	22	13	10	16	15	9 14
FORT BRAGG/POPE TO 5000	-5	-4	-2	-2	-4	-10	4	3	3	1	2	2	2	-3	-5	11	10	505 N.M.I.
10000	-4	-3	-2	-3	-4	-11	2	2	2	2	2	2	2	-5	-6	12	12	7 10
15000	-11	-7	-3	-7	-7	-17	0	-1	3	3	3	1	1	-8	-11	17	16	9 15
FORT BRAGG/POPE TO 5000	-9	-6	-3	-3	-5	-13	7	5	3	2	2	4	4	-3	-5	12	12	217 N.M.I.
10000	-16	-12	-3	-6	-9	-18	11	9	3	3	6	6	6	-2	-4	14	14	9 14
15000	-32	-21	-5	-16	-17	-33	19	11	5	11	10	10	10	0	-3	20	20	11 19
FORT BRAGG/POPE TO 5000	-14	-11	-5	-5	-9	-17	14	10	6	5	8	8	8	0	-1	13	12	307 N.M.I.
10000	-28	-21	-7	-8	-15	-27	27	20	7	7	14	14	14	4	2	14	14	9 14
15000	-47	-35	-10	-24	-27	-45	43	32	10	22	24	10	24	10	7	20	20	11 19
FORT BRAGG/POPE TO 5000	-9	-5	-3	-2	-5	-12	7	5	3	1	3	3	3	-3	-5	12	12	314 N.M.I.
10000	-13	-11	-3	-4	-8	-17	9	8	3	3	5	5	5	-2	-4	14	14	8 11
15000	-28	-18	-6	-14	-19	-29	15	9	4	9	8	8	8	-2	-4	19	19	10 18
FORT BRAGG/POPE TO 5000	-5	-3	-3	-2	-4	-10	5	4	3	2	3	3	3	-2	-4	10	10	652 N.M.I.
10000	-7	-6	-2	-3	-5	-12	4	3	2	3	2	2	2	-3	-5	12	11	7 11
15000	-14	-9	-3	-8	-10	-21	3	1	3	5	3	3	3	-5	-8	16	16	9 14
FORT BRAGG/POPE TO 5000	-11	-7	-5	-7	-8	-13	10	7	5	7	7	7	7	2	0	8	8	1936 N.M.I.
10000	-23	-14	-10	-13	-15	-22	21	13	10	12	13	13	13	7	6	9	9	6 8
15000	-37	-25	-19	-27	-27	-39	31	21	17	23	22	13	22	13	11	14	14	9 13

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*--DENOTES ANNUAL FOUR VALFNT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 \*MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	E Q U I V A L E N T H E A D W I N D S												STANDARD DEVIATION					
	D I R E C T						R E T U R N						JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	450	475	485	JAN	APR	JUL	OCT	450	475	485				
F O R T B R A G G / P O P E																		
5000	-14	-11	-5	-5	-9	-16	-19	13	10	6	5	8	1	0	12	12	649	N.M.I.
10000	-27	-20	-7	-10	-16	-26	-29	26	19	7	9	14	5	3	13	13	8	10
18000	-46	-34	-10	-24	-27	-44	-48	43	31	9	22	24	10	7	19	19	9	13
F O R T B R A G G / P O P E L O C K B O U R N E																		
5000	-9	-7	-4	-4	-6	-14	-16	7	6	4	3	4	-2	-4	13	13	331	N.M.I.
10000	-20	-14	-6	-5	-11	-21	-24	14	10	6	3	7	-1	-3	15	15	9	12
18000	-33	-25	-10	-16	-20	-35	-39	15	16	8	8	11	-1	-4	22	21	10	14
F O R T B R A G G / P O P E L O F I N G A F B																		
5000	7	5	5	5	5	-1	-3	-9	-6	-5	-6	-7	-14	-16	12	12	866	N.M.I.
10000	13	10	7	9	9	1	0	-20	-14	-9	-11	-14	-23	-25	14	14	9	11
18000	23	11	10	17	14	2	0	-37	-22	-14	-25	-24	-38	-41	20	19	12	19
F O R T B R A G G / P O P F L U K E A F B																		
5000	-9	-8	-5	-6	-7	-12	-13	8	7	5	3	5	0	0	9	8	1652	N.M.I.
10000	-22	-17	-6	-9	-13	-21	-23	21	16	6	9	12	5	3	10	9	6	7
18000	-41	-32	-10	-21	-25	-39	-42	37	28	10	18	21	11	8	15	14	8	13
F O R T B R A G G / P O P E M C G U I R E A F B																		
5000	7	5	4	4	4	-3	-5	-10	-7	-4	-5	-7	-15	-17	14	13	359	N.M.I.
10000	13	12	7	7	9	0	-1	-20	-16	-8	-9	-13	-23	-26	16	15	10	14
18000	23	12	9	16	14	1	-1	-38	-23	-11	-23	-22	-38	-43	22	21	12	21
F O R T B R A G G / P O P E M E M P H I S																		
5000	-14	-11	-5	-5	-9	-17	-19	14	10	6	5	8	0	0	13	12	542	N.M.I.
10000	-28	-21	-7	-9	-16	-27	-30	27	20	7	8	14	4	2	14	14	8	11
18000	-46	-34	-10	-25	-27	-45	-49	43	31	10	22	24	10	7	20	19	11	19
F O R T B R A G G / P O P E M E X I C O C I T Y																		
5000	-7	-7	-2	-1	-4	-10	-11	6	6	2	1	3	-1	-2	8	8	1425	N.M.I.
10000	-13	-10	-1	-3	-7	-13	-15	11	9	1	3	5	0	-1	9	8	5	7
18000	-28	-21	0	-12	-15	-27	-29	23	17	0	10	11	1	0	12	12	6	8
F O R T B R A G G / P O P E M I N N - S T P A U L																		
5000	-12	-8	-5	-7	-8	-16	-17	10	7	5	6	6	0	-1	12	12	877	N.M.I.
10000	-23	-16	-10	-11	-15	-24	-26	19	13	9	9	12	3	1	13	13	8	10
18000	-38	-27	-16	-24	-25	-39	-43	27	20	14	17	18	7	5	19	19	10	12
F O R T B R A G G / P O P E M I N O T A F B																		
5000	-12	-8	-5	-8	-9	-15	-17	10	7	5	7	7	0	-1	11	10	1266	N.M.I.
10000	-22	-15	-11	-12	-15	-23	-25	19	12	10	11	12	5	3	11	11	8	10
18000	-37	-25	-18	-25	-26	-37	-40	28	20	16	19	20	10	7	17	16	9	11

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION						
	DIRECT						RETURN						JAN	APR	JUL	OCT			
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50					A75	A85	
FORT BRAGG/POPE TO NELLIS AFB	-9	-7	-4	-4	-6	-11	-13	-9	-7	-4	3	5	0	-1	8	8	6	7	1750 N.M.I.
10000	-22	-16	-7	-10	-14	-21	-23	20	15	7	9	12	5	4	10	9	7	9	
18000	-40	-30	-13	-22	-25	-38	-41	35	27	12	19	21	12	9	15	14	8	13	
FORT BRAGG/POPE TO NEW CUMBERLAND	3	2	1	2	1	-6	-8	-6	-3	-1	-3	-4	-12	-14	14	13	9	12	321 N.M.I.
10000	4	5	3	4	3	-5	-7	-13	-10	-4	-6	-8	-18	-21	16	15	10	14	
18000	8	1	4	9	5	-7	-10	-29	-14	-6	-17	-15	-31	-35	22	22	12	21	
FORT BRAGG/POPE TO NEW ORLEANS	-12	-9	-4	-4	-7	-15	-17	11	8	4	3	6	0	-2	11	11	8	10	661 N.M.I.
10000	-22	-18	-5	-7	-13	-23	-25	21	16	5	6	11	2	0	12	13	8	12	
18000	-41	-30	-4	-20	-23	-39	-43	36	25	4	17	18	5	3	18	18	10	16	
FORT BRAGG/POPE TO NIAGARA FALLS	-1	-2	-1	0	-1	-9	-11	-1	0	0	-1	0	-8	-10	13	13	9	11	478 N.M.I.
10000	-4	-2	-1	0	-2	-11	-13	-4	-2	0	-2	-2	-11	-14	15	15	10	14	
18000	-9	-9	-2	0	-5	-18	-21	-14	-2	-1	-9	-6	-20	-23	21	21	12	21	
FORT SPAGG/POPE TO OKMARD AFB	-8	-7	-4	-3	-6	-11	-12	7	6	4	2	4	0	-1	8	7	5	7	1968 N.M.I.
10000	-20	-16	-6	-9	-13	-20	-22	18	15	6	9	11	5	4	9	8	6	8	
18000	-39	-30	-12	-21	-25	-37	-40	34	26	12	18	21	11	9	14	13	8	12	
FORT SPAGG/POPE TO PATRICK AFB	-6	-4	-2	-1	-4	-11	-12	5	3	2	1	2	-4	-5	11	11	8	11	422 N.M.I.
10000	-8	-7	-2	-2	-5	-13	-15	3	3	2	2	2	-5	-7	13	13	8	12	
18000	-17	-10	-3	-9	-9	-21	-24	3	1	3	5	3	-7	-9	18	18	10	16	
FORT SPAGG/POPE TO PITTSBURGH	-4	-4	-2	-1	-3	-11	-13	1	2	2	0	1	-6	-8	14	13	9	12	328 N.M.I.
10000	-10	-6	-2	-1	-5	-14	-17	1	1	1	0	0	-8	-10	15	15	10	14	
18000	-17	-15	-4	-5	-10	-24	-27	-6	3	1	-4	-1	-14	-18	22	22	12	21	
FORT SPAGG/POPE TO REGINA	-11	-7	-5	-8	-8	-15	-16	10	6	5	7	6	0	0	10	10	8	9	1445 N.M.I.
10000	-22	-14	-11	-13	-15	-23	-24	19	12	10	11	12	5	4	10	10	8	10	
18000	-36	-24	-18	-25	-25	-36	-39	27	19	15	19	19	10	7	16	15	10	15	
FORT BRAGG/POPE TO SCOTT AFB	-14	-10	-6	-6	-9	-17	-19	13	9	6	6	8	0	-1	13	12	8	11	568 N.M.I.
10000	-27	-20	-9	-10	-16	-27	-30	24	18	9	9	14	5	2	14	14	10	13	
18000	-44	-32	-13	-25	-27	-43	-47	37	28	13	21	23	10	7	20	20	11	19	

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.

\*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
MINUS SIGN DENOTES HEADWINDS.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT			EQUVALENT			HEADWINDS*			RETURN			JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT
<b>FORT BRAGG/AFB</b>																		
5000	TO	7	5	4	5	5	-2	-4	-10	-7	-4	-5	-7	-15	-17	13	13	483 N.M.I.
10000		-7	-6	-3	-2	-5	-13	-15	4	4	3	1	2	-4	-6	13	13	9 11
18000		-15	-10	-5	-4	-9	-18	-21	7	6	4	1	4	-4	-6	15	15	10 14
		-26	-20	-8	-12	-16	-30	-34	5	9	5	2	5	-7	-10	21	21	12 21
<b>FORT BRAGG/POPE</b>																		
5000	TO	7	5	4	5	5	-2	-4	-10	-7	-4	-5	-7	-15	-17	13	13	519 N.M.I.
10000		13	12	7	8	9	0	-1	-20	-16	-8	-10	-13	-23	-26	15	15	9 12
18000		24	12	9	17	14	2	0	-39	-23	-12	-23	-23	-39	-43	21	21	10 14
<b>FORT BRAGG/POPE</b>																		
5000	TO	-6	-5	-3	-2	-4	-12	-14	4	4	3	1	2	-4	-6	13	13	596 N.M.I.
10000		-14	-10	-6	-4	-9	-18	-20	6	5	4	1	4	-4	-6	14	14	9 11
18000		-25	-19	-9	-12	-16	-29	-33	4	8	5	1	4	-7	-10	21	21	10 13
<b>FORT BRAGG/POPE</b>																		
5000	TO	-11	-7	-4	-7	-8	-13	-14	10	7	5	6	6	1	0	8	8	1982 N.M.I.
10000		-27	-14	-10	-13	-15	-21	-23	21	13	9	12	13	7	5	9	9	6 7
18000		-37	-25	-19	-27	-27	-37	-39	31	21	17	23	22	13	11	14	13	7 8
<b>FORT CAMPBELL</b>																		
5000	TO	-10	-8	-6	-7	-8	-15	-17	9	7	5	7	6	0	-1	12	11	828 N.M.I.
10000		-23	-16	-8	-13	-15	-24	-26	21	14	8	12	13	5	3	12	12	8 10
18000		-41	-29	-14	-25	-26	-40	-44	36	26	14	22	22	11	9	19	18	9 12
<b>FORT CAMPBELL</b>																		
5000	TO	14	10	6	7	8	1	0	-15	-11	-6	-7	-10	-18	-20	13	12	526 N.M.I.
10000		28	20	11	10	16	7	4	-30	-22	-11	-11	-18	-29	-32	14	14	9 11
18000		45	30	15	25	26	13	10	-49	-34	-15	-28	-30	-47	-51	21	20	10 13
<b>FORT CAMPBELL</b>																		
5000	TO	-12	-9	-6	-5	-8	-16	-18	11	9	6	4	7	0	-1	13	12	601 N.M.I.
10000		-23	-16	-5	-9	-13	-23	-25	21	15	5	8	11	2	0	13	13	8 10
18000		-40	-29	-4	-19	-22	-38	-42	34	24	3	15	17	4	1	19	18	9 12
<b>FORT CAMPBELL</b>																		
5000	TO	-8	-7	-5	-4	-6	-12	-14	7	7	5	4	5	0	-1	10	10	1171 N.M.I.
10000		-21	-16	-5	-9	-13	-21	-23	20	15	5	9	11	4	2	11	10	7 8
18000		-39	-30	-8	-19	-23	-37	-40	35	27	8	17	20	8	6	17	15	8 10
<b>FORT CAMPBELL</b>																		
5000	TO	-12	-9	-5	-7	-8	-17	-19	11	8	5	7	7	0	-2	14	13	386 N.M.I.
10000		-24	-17	-8	-13	-16	-26	-28	22	15	8	12	13	4	2	14	15	9 11
18000		-42	-29	-14	-26	-26	-42	-47	35	24	14	22	22	9	6	22	21	11 14

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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FFFT	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT				EQUIVALENT				RETURN				JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	00A50	A75	A85	JAN	APR	JUL	OCT	00A50	A75	A85	JAN	APR	JUL	OCT
FORT CAMPBELL	1670 N.M.I.																	
5000	-9	-6	-4	-6	-7	-12	-13	8	5	4	6	5	0	0	8	8	6	8
10000	-20	-12	-8	-13	-13	-20	-22	19	11	8	12	12	5	4	10	9	7	9
18000	-35	-23	-18	-26	-25	-35	-38	30	19	16	23	21	12	10	15	14	9	14
FORT CAMPBELL	1640 N.M.I.																	
5000	-6	-5	-3	-2	-4	-9	-10	5	5	3	2	3	-1	-2	8	8	5	7
10000	-18	-13	-7	-10	-12	-19	-21	16	12	7	9	10	4	3	10	9	7	9
18000	-36	-27	-14	-21	-24	-35	-38	31	23	14	18	20	11	9	16	14	9	13
FORT CAMPBELL	342 N.M.I.																	
5000	0	0	0	1	0	-7	-9	-2	-2	0	-1	-2	-9	-11	13	13	9	11
10000	1	2	0	1	0	-7	-9	-7	-6	0	-2	-4	-13	-15	14	14	10	14
18000	-2	4	4	2	2	-9	-12	-15	-15	-4	-8	-10	-23	-26	20	20	11	19
FORT CAMPBELL	545 N.M.I.																	
5000	-12	-10	-7	-6	-9	-17	-19	11	9	7	6	8	0	-1	13	13	9	11
10000	-25	-15	-7	-12	-15	-25	-28	24	17	7	11	14	5	2	13	13	10	13
18000	-44	-32	-10	-23	-26	-42	-46	40	29	9	20	22	9	6	20	19	11	18
FORT CAMPBELL	570 N.M.I.																	
5000	-12	-10	-7	-5	-9	-17	-19	11	9	7	5	7	0	-1	13	13	9	11
10000	-24	-17	-6	-10	-14	-24	-27	23	16	6	9	12	3	1	13	13	10	13
18000	-42	-31	-8	-21	-24	-41	-45	38	27	7	17	19	7	4	20	19	10	18
FORT CAMPBELL	1764 N.M.I.																	
5000	1	0	3	4	2	-4	-5	-3	-1	-4	-5	-4	-10	-11	9	9	8	9
10000	3	1	2	3	2	-4	-5	-8	-3	-3	-6	-5	-12	-13	10	10	8	9
18000	5	1	2	4	2	-5	-7	-17	-8	-6	-11	-11	-20	-22	14	14	10	14
FORT CAMPBELL	367 N.M.I.																	
5000	-2	-1	0	0	-1	-9	-12	0	0	0	0	0	-9	-11	15	14	10	12
10000	-4	-3	-1	-1	-3	-12	-14	-2	0	0	0	-1	-10	-13	15	15	11	14
18000	-12	-8	-3	-8	-8	-21	-25	-8	-2	0	-1	-3	-16	-19	22	22	13	21
FORT CAMPBELL	1169 N.M.I.																	
5000	-7	-5	-3	-5	-5	-11	-13	6	5	3	4	4	-1	-2	9	9	7	8
10000	-20	-13	-8	-12	-13	-21	-23	19	12	8	12	12	5	3	11	10	8	10
18000	-38	-27	-16	-25	-26	-38	-41	33	23	15	22	22	11	9	18	16	10	16
FORT CAMPBELL	764 N.M.I.																	
5000	0	0	0	0	0	-6	-8	0	-1	0	0	0	-7	-8	11	10	7	9
10000	4	4	0	1	1	-5	-7	-8	-7	0	-2	-4	-12	-14	12	12	8	11
18000	8	10	2	4	5	-3	-5	-20	-18	-2	-8	-11	-23	-26	16	16	9	15

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION					
	DIRECT			EQUVALENT			RETURN			M E A D W I N D S *			JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	**450	475	AB5	JAN	APR	JUL	OCT	**450	475	AE5	JAN	APR	JUL	OCT
<b>FORT CAMPBELL</b>																		
5000	7	6	3	3	4	-2	-4	-9	-7	-3	-4	-6	-14	-16	13	12	8	11
10000	15	12	4	5	8	0	-2	-19	-15	-4	-6	-11	-21	-23	14	14	9	13
18000	22	21	7	13	14	3	0	-34	-27	-7	-17	-20	-35	-35	20	19	11	19
<b>FORT CAMPBELL</b>																		
5000	4	4	2	3	3	-4	-5	-5	-5	-2	-3	-4	-11	-13	12	12	0	11
10000	10	9	2	3	5	-2	-4	-15	-12	-3	-4	-9	-18	-20	13	13	9	13
18000	14	15	5	9	9	0	-3	-28	-23	-6	-14	-16	-31	-34	19	19	10	18
<b>FORT CAMPBELL</b>																		
5000	-2	0	-1	0	-1	-7	-9	0	0	1	0	0	-6	-7	11	10	7	9
10000	2	2	-1	0	0	-6	-8	-6	-5	1	-1	-3	-10	-12	11	11	8	11
18000	3	7	1	2	2	-6	-8	-16	-15	-1	-4	-9	-20	-23	16	16	9	14
<b>FORT CAMPBELL</b>																		
5000	-9	-6	-4	-7	-7	-12	-14	8	6	4	6	5	0	0	9	9	6	8
10000	-21	-12	-9	-13	-14	-21	-22	19	11	9	13	12	6	4	10	9	7	9
18000	-35	-23	-16	-26	-25	-36	-39	30	19	10	23	21	12	9	15	15	10	14
<b>FORT CAMPBELL</b>																		
5000	-13	-10	-6	-6	-9	-18	-20	12	9	6	5	7	0	-2	15	14	9	12
10000	-26	-18	-7	-11	-15	-27	-29	24	16	7	10	13	3	1	15	15	11	15
18000	-45	-31	-9	-23	-25	-43	-48	40	26	8	19	21	7	4	22	21	12	20
<b>FORT CAMPBELL</b>																		
5000	11	7	5	6	6	-1	-3	-12	-8	-5	-7	-8	-17	-19	14	14	9	12
10000	21	14	8	9	12	2	0	-24	-17	-9	-11	-15	-26	-28	15	15	11	14
18000	33	19	11	18	18	5	2	-43	-27	-13	-24	-25	-42	-46	22	22	13	21
<b>FORT CAMPBELL</b>																		
5000	11	7	7	9	8	1	0	-13	-8	-7	-9	-10	-17	-18	12	11	8	10
10000	21	13	11	13	14	6	4	-25	-16	-12	-15	-17	-26	-28	13	13	9	12
18000	34	19	16	23	21	10	8	-43	-26	-19	-29	-28	-42	-46	19	18	11	18
<b>FORT CAMPBELL</b>																		
5000	-7	-7	-5	-4	-6	-12	-13	6	6	5	3	4	0	-1	10	9	6	8
10000	-20	-16	-6	-10	-13	-21	-23	19	15	6	9	11	4	2	11	10	8	10
18000	-39	-30	-11	-20	-24	-37	-41	34	27	11	18	20	10	8	17	15	9	14
<b>FORT CAMPBELL</b>																		
5000	14	10	6	8	9	1	0	-15	-11	-6	-8	-10	-18	-20	13	12	8	11
10000	28	20	12	11	17	7	5	-30	-21	-12	-12	-18	-29	-32	14	14	10	13
18000	44	27	16	25	26	13	10	-50	-32	-17	-29	-30	-47	-51	20	20	11	20

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	DIRECT					EQUIVALENT HEADWINDS*					RETURN					STANDARD DEVIATION				
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT		
<b>FORT CAMPBELL TO MEMPHIS</b>																				
5000	-12	-9	-5	-5	-8	-17	-19	11	8	5	4	4	6	-1	-3	15	14	155 N.M.I.		
10000	-24	-16	-6	-10	-14	-25	-28	21	13	6	8	11	1	0	15	15	10	12		
18000	-42	-28	-8	-21	-23	-41	-45	35	21	7	16	17	4	1	23	22	11	15		
<b>FORT CAMPBELL TO MEXICO CITY</b>																				
5000	-7	-8	-3	-1	-5	-11	-12	7	7	3	1	4	-1	-2	9	9	1201 N.M.I.			
10000	-12	-9	-2	-3	-7	-13	-15	10	8	2	3	5	0	-2	9	9	6	8		
18000	-25	-17	1	-9	-11	-24	-26	18	11	-1	6	6	-1	-3	14	13	7	12		
<b>FORT CAMPBELL TO MINN-ST PAUL</b>																				
5000	-8	-5	-2	-5	-5	-14	-16	6	4	2	4	3	-4	-6	14	13	557 N.M.I.			
10000	-15	-10	-6	-9	-10	-19	-22	10	7	5	6	6	-1	-4	14	14	10	12		
18000	-28	-18	-12	-20	-19	-32	-36	12	10	8	12	10	-1	-4	21	20	11	13		
<b>FORT CAMPBELL TO MINOT AFB</b>																				
5000	-11	-6	-4	-8	-8	-15	-17	9	5	3	7	5	-1	-3	12	12	923 N.M.I.			
10000	-19	-12	-9	-13	-14	-22	-24	16	10	8	11	11	3	1	12	13	10	12		
18000	-32	-21	-16	-24	-23	-35	-38	22	15	13	18	16	6	3	18	18	11	17		
<b>FORT CAMPBELL TO NELLIS AFB</b>																				
5000	-7	-6	-4	-3	-5	-11	-12	6	5	4	3	4	0	-2	9	9	1324 N.M.I.			
10000	-19	-14	-7	-10	-13	-20	-22	18	13	7	10	11	5	3	10	10	6	7		
18000	-38	-28	-13	-22	-24	-37	-40	33	25	13	19	21	11	9	17	15	8	9		
<b>FORT CAMPBELL TO NEW CUMBERLAND</b>																				
5000	13	9	6	8	8	1	0	-14	-10	-6	-8	-10	-18	-20	13	13	543 N.M.I.			
10000	27	19	11	11	16	6	4	-29	-21	-12	-12	-18	-29	-32	14	15	9	11		
18000	43	25	15	25	25	12	9	-49	-31	-16	-29	-30	-47	-51	21	21	10	13		
<b>FORT CAMPBELL TO NEW ORLEANS</b>																				
5000	-7	-5	-3	-1	-4	-12	-14	6	4	3	1	3	-4	-5	13	13	419 N.M.I.			
10000	-13	-9	-3	-3	-7	-16	-18	8	5	3	2	4	-3	-5	13	14	8	11		
18000	-26	-14	1	-9	-10	-25	-29	11	4	-2	3	2	-8	-10	20	19	9	13		
<b>FORT CAMPBELL TO NIAGARA FALLS</b>																				
5000	10	6	5	7	6	-1	-2	-12	-7	-5	-7	-8	-16	-18	14	13	551 N.M.I.			
10000	19	12	9	10	12	2	0	-24	-16	-10	-11	-15	-25	-28	15	15	9	11		
18000	28	15	12	18	17	5	2	-41	-24	-14	-25	-25	-40	-45	21	21	11	14		
<b>FORT CAMPBELL TO OXNARD AFB</b>																				
5000	-7	-6	-4	-2	-5	-10	-12	6	5	4	2	4	0	-2	8	8	1543 N.M.I.			
10000	-18	-14	-6	-10	-12	-19	-21	16	13	6	9	10	4	2	10	9	6	7		
18000	-37	-28	-13	-20	-23	-35	-39	32	25	12	17	19	10	8	16	14	7	9		

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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION						
	DIRECT						RETURN						JAN	APR	JUL	OCT			
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50					A75	A85	
FORT CAMPBELL TO PATRICK AFB																			
5000	1	2	1	2	1	-5	-7	-3	-3	-1	-2	-3	-10	-11	12	11	0	10	614 No.MI.
10000	8	7	1	2	4	-3	-5	-12	-10	-1	-3	-6	-15	-17	13	12	0	12	
18000	12	13	4	7	8	-1	-4	-25	-21	-4	-12	-14	-28	-31	18	18	10	16	
FORT CAMPBELL TO PITTSBURGH																			
5000	12	8	5	7	7	0	-2	-13	-9	-5	-7	-9	-17	-19	14	13	9	11	412 No.MI.
10000	23	16	10	10	14	4	2	-27	-18	-10	-11	-16	-27	-30	15	15	11	14	
18000	36	21	13	21	21	8	5	-46	-28	-15	-27	-27	-44	-49	22	22	12	21	
FORT CAMPBELL TO REGINA																			
5000	-10	-6	-4	-8	-7	-15	-16	9	5	3	7	5	-1	-2	11	11	9	10	1108 No.MI.
10000	-19	-12	-9	-13	-14	-21	-23	16	10	8	11	11	3	1	11	12	9	11	
18000	-32	-21	-16	-24	-23	-34	-37	22	15	13	19	16	6	4	17	16	11	16	
FORT CAMPBELL TO SCOTT AFB																			
5000	-10	-7	-4	-6	-7	-16	-18	8	6	4	5	5	-2	-5	15	14	10	12	163 No.MI.
10000	-20	-15	-6	-10	-13	-24	-26	16	12	6	8	10	0	-2	15	16	12	15	
18000	-36	-26	-12	-22	-23	-43	-43	23	19	10	17	16	3	0	23	22	13	22	
FORT CAMPBELL TO SELFIDGE AFB																			
5000	6	4	3	5	4	-3	-5	-9	-5	-4	-5	-6	-14	-16	14	13	9	12	416 No.MI.
10000	12	8	6	7	9	-1	-3	-18	-12	-7	-9	-12	-21	-24	15	15	11	14	
18000	16	9	7	10	9	-2	-6	-33	-18	-10	-19	-19	-34	-38	22	22	13	21	
FORT CAMPBELL TO SHAW AFB																			
5000	12	9	5	5	7	0	-2	-13	-9	-5	-5	-8	-16	-18	13	12	9	11	379 No.MI.
10000	22	17	7	7	12	3	1	-25	-19	-7	-8	-15	-25	-28	14	14	10	14	
18000	33	27	10	18	20	7	5	-42	-32	-10	-22	-25	-42	-46	21	20	11	19	
FORT CAMPBELL TO WESTOVER AFB																			
5000	13	9	7	8	8	1	0	-14	-10	-7	-8	-10	-17	-19	13	12	8	10	767 No.MI.
10000	26	18	12	12	16	7	5	-29	-20	-13	-14	-19	-29	-31	14	14	10	13	
18000	41	24	16	25	24	12	9	-48	-30	-18	-30	-30	-46	-50	20	20	11	19	
FORT CAMPBELL TO WURTSMITH																			
5000	4	1	2	3	2	-5	-7	-6	-3	-3	-4	-4	-12	-14	14	13	9	11	504 No.MI.
10000	6	4	3	4	4	-5	-7	-13	-8	-5	-7	-9	-18	-20	15	15	11	14	
18000	7	3	4	5	4	-7	-11	-26	-13	-8	-14	-15	-29	-33	22	21	13	21	
FORT CAMPBELL TO YAKIMA																			
5000	-9	-6	-4	-6	-7	-12	-13	8	6	4	6	5	0	0	9	8	6	8	1582 No.MI.
10000	-21	-12	-9	-13	-14	-21	-22	19	11	8	12	12	5	4	10	9	7	9	
18000	-35	-24	-18	-25	-25	-36	-39	30	20	16	23	21	12	10	15	15	10	14	

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EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT						RETURN						JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50	A75	A85				
<b>FORT CAMPBELL</b>																		
5000	-7	-3	-2	-7	-5	-11	-13	5	2	2	6	3	-2	-3	9	9	7	9
10000	-15	-9	-9	-12	-12	-18	-19	12	7	8	10	9	3	1	9	9	7	9
18000	-25	-16	-13	-20	-18	-27	-30	17	11	11	14	13	5	3	13	12	9	13
<b>FORT CARSON</b>																		
5000	11	9	7	8	8	2	1	-12	-9	-7	-8	-9	-16	-17	10	10	7	9
10000	24	16	11	12	15	7	6	-26	-18	-11	-13	-17	-25	-28	11	11	8	11
18000	40	27	17	24	25	15	12	-45	-31	-17	-27	-29	-42	-46	17	16	9	16
<b>FORT CARSON</b>																		
5000	1	-1	-4	1	-1	-8	-10	-2	0	3	-1	0	-7	-9	12	11	8	10
10000	10	6	0	5	4	-3	-5	-13	-8	0	-6	-7	-15	-17	12	12	9	11
18000	16	13	2	11	9	-1	-4	-27	-20	-3	-15	-15	-29	-33	20	18	10	17
<b>FORT CARSON</b>																		
5000	-3	-5	-4	-2	-4	-9	-10	3	5	5	2	3	0	-2	8	8	5	7
10000	-7	-8	-5	-5	-7	-14	-15	5	7	5	5	5	-1	-3	12	10	9	10
18000	-21	-17	-12	-10	-15	-26	-29	11	11	11	6	9	-1	-3	20	18	11	17
<b>FORT CARSON</b>																		
5000	10	8	6	7	7	0	0	-11	-8	-6	-7	-8	-15	-17	11	11	8	10
10000	22	15	9	12	14	6	4	-23	-16	-9	-13	-15	-24	-26	12	12	9	12
18000	37	26	15	23	23	12	10	-41	-29	-16	-26	-27	-41	-44	19	18	10	17
<b>FORT CARSON</b>																		
5000	7	7	6	7	6	0	-2	-8	-7	-7	-7	-8	-15	-17	12	12	9	11
10000	19	12	9	12	12	4	2	-20	-12	-9	-12	-13	-22	-25	14	13	10	13
18000	32	24	16	21	22	10	7	-37	-27	-16	-24	-25	-39	-43	22	20	12	19
<b>FORT CARSON</b>																		
5000	0	0	0	0	0	-5	-6	0	0	0	0	0	-4	-6	8	8	5	7
10000	-15	-8	-5	-8	-9	-16	-18	14	8	5	7	8	1	0	11	10	8	10
18000	-29	-19	-14	-22	-21	-33	-36	25	15	12	18	16	5	3	19	17	12	17
<b>FORT CARSON</b>																		
5000	-1	-2	0	2	0	-5	-6	2	2	0	-1	0	-4	-5	8	7	5	6
10000	-12	-9	-6	-8	-9	-16	-18	11	8	6	7	7	1	0	12	11	8	10
18000	-29	-23	-15	-18	-21	-33	-36	25	20	15	15	18	7	4	20	18	11	16
<b>FORT CARSON</b>																		
5000	7	5	3	5	4	-1	-3	-8	-6	-3	-5	-6	-12	-14	11	11	7	9
10000	18	13	4	9	10	2	1	-20	-14	-4	-10	-12	-21	-23	11	11	8	11
18000	30	24	9	18	18	8	6	-37	-29	-9	-21	-23	-37	-40	17	16	9	15

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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN FFET	DIRECT						EQUIVALENT HEADWINDS						RETURN						STANDARD DEVIATION																	
	JAN	APR	JUL	OCT	A75	A85	JAN	APR	JUL	OCT	A75	A85	JAN	APR	JUL	OCT	A75	A85	JAN	APR	JUL	OCT														
FORT CAPSON	TO FORT SILL																																			
5000	3	1	0	3	1	-7	-4	-2	0	-3	-2	-10	-12	12	12	390 M.MI.																				
10000	15	10	3	8	0	-1	-17	-11	-3	-9	-10	-19	-21	13	13	9 11																				
18000	25	19	8	16	15	4	-32	-24	-9	-19	-20	-34	-38	22	19	10 12																				
FORT CARSON	TO FORT WOLTERS																																			
5000	2	0	-2	1	0	-9	-3	0	2	-2	-1	-8	-10	12	12	481 M.MI.																				
10000	12	7	1	6	6	-4	-14	-9	-1	-7	-8	-17	-19	13	12	10 12																				
18000	20	15	4	13	11	0	-29	-22	-6	-17	-17	-32	-35	21	18	11 18																				
FORT CAPSON	TO FAORISHER																																			
5000	2	1	4	4	2	-4	-3	-2	-5	-6	-4	-10	-12	8	8	1975 M.MI.																				
10000	4	2	5	4	3	-1	-7	-3	-6	-6	-6	-12	-13	8	9	8 8																				
18000	7	5	7	6	6	-1	-15	-10	-11	-12	-12	-20	-22	13	12	9 12																				
FORT CARSON	TO GEN MITCHELL																																			
5000	8	7	7	7	7	0	-9	-7	-7	-8	-8	-15	-17	11	12	804 M.MI.																				
10000	18	11	10	12	12	4	-20	-12	-11	-13	-14	-23	-25	13	13	10 12																				
18000	30	22	18	21	21	10	-37	-26	-19	-25	-26	-39	-42	20	19	11 18																				
FORT CARSON	TO HILL AFB																																			
5000	1	2	3	4	2	-3	-1	-2	-3	-4	-3	-8	-9	7	8	362 M.MI.																				
10000	-13	-8	-5	-9	-9	-18	13	8	5	9	8	1	0	12	10	9 10																				
18000	-30	-21	-14	-21	-21	-38	26	18	12	18	17	5	2	22	20	12 19																				
FORT CAPSON	TO HOMESTEAD AFB																																			
5000	3	3	0	2	1	-3	-4	-4	0	-3	-3	-9	-10	9	9	1464 M.MI.																				
10000	13	10	1	6	7	0	-16	-11	-1	-7	-9	-16	-18	10	9	6 8																				
18000	25	21	5	13	14	5	-32	-26	-5	-16	-19	-31	-34	14	13	8 12																				
FORT CAPSON	TO MUNTER AAF																																			
5000	9	7	4	5	5	0	-9	-7	-4	-5	-7	-13	-14	10	10	1220 M.MI.																				
10000	20	15	6	9	11	4	-22	-16	-6	-10	-13	-22	-24	11	11	8 10																				
18000	33	26	10	19	20	9	-39	-30	-10	-22	-24	-38	-42	17	16	9 15																				
FORT CAPSON	TO HUNTSVILLE																																			
5000	9	7	5	6	6	0	-10	-8	-5	-6	-8	-15	-16	11	11	897 M.MI.																				
10000	21	15	6	11	12	4	-22	-16	-7	-12	-14	-23	-25	12	12	8 10																				
18000	34	26	11	21	21	10	-40	-30	-12	-24	-25	-40	-43	19	17	10 17																				
FORT CAPSON	TO JACKSONVILLE																																			
5000	7	6	3	5	5	0	-8	-7	-3	-5	-6	-12	-14	10	10	1241 M.MI.																				
10000	18	13	4	8	10	3	-20	-15	-4	-9	-12	-20	-22	11	10	7 9																				
18000	31	25	9	18	19	9	-37	-29	-9	-21	-23	-36	-40	16	15	8 10																				

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 ♦♦--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWIND IN KNOTS												STANDARD DEVIATION						
	DIRECT			RETURN			A75			A85			JAN	APR	JUL	OCT			
FORT CARSON	TO																		
5000	-1	0	0	JUNEAU			0	0	0	0	0	0	0	0	0	8	7	5	1650 N.M.I.
10000	-13	-7	-4	-8	-14	-16	-8	-14	-16	6	4	6	11	6	6	10	8	7	8
18000	-24	-13	-10	-16	-26	-28	-16	-26	-28	19	9	7	19	9	7	15	14	10	13
FORT CARSON	TO																		
5000	2	2	0	KEY WEST			1	-4	-5	-3	-3	0	-3	-3	0	9	9	6	1441 N.M.I.
10000	12	9	0	6	0	-1	6	0	-1	-14	-10	0	-14	-10	0	9	9	7	8
18000	22	20	3	12	12	3	12	12	3	-30	-24	-4	-30	-24	-4	14	13	7	12
FORT CARSON	TO																		
5000	0	0	0	LARSON AFB			0	-5	-6	0	0	0	0	0	0	8	8	6	816 N.M.I.
10000	-15	-8	-5	-9	-16	-18	-9	-16	-18	14	8	4	14	8	4	11	10	8	8
18000	-29	-18	-13	-21	-32	-35	-21	-32	-35	24	14	10	24	14	10	19	18	12	17
FORT CARSON	TO																		
5000	7	5	4	LITTLE ROCK			5	-2	-3	-8	-6	-4	-8	-6	-4	12	12	9	646 N.M.I.
10000	19	13	5	10	11	2	11	2	0	-21	-14	-6	-21	-14	-6	13	12	10	12
18000	32	25	11	20	20	6	20	6	6	-38	-28	-11	-38	-28	-11	20	18	11	18
FORT CARSON	TO																		
5000	10	8	7	LOCKPORT			8	1	0	-11	-9	-7	-11	-9	-7	11	11	8	1015 N.M.I.
10000	23	15	10	13	14	6	14	6	5	-24	-16	-11	-24	-16	-11	12	12	9	9
18000	38	26	17	24	24	13	24	13	11	-43	-29	-18	-43	-29	-18	18	18	10	17
FORT CARSON	TO																		
5000	10	6	8	LORING AFB			8	2	0	-11	-7	-8	-11	-7	-8	10	10	7	1600 N.M.I.
10000	20	11	13	14	14	7	14	7	5	-22	-13	-13	-22	-13	-13	11	11	8	9
18000	32	20	20	23	23	13	23	13	11	-38	-25	-22	-38	-25	-22	16	15	10	15
FORT CARSON	TO																		
5000	-2	-4	-3	LUKE AFB			-3	-7	-9	2	4	3	2	4	3	8	8	5	482 N.M.I.
10000	-9	-9	-6	-7	-8	-15	-8	-15	-17	8	8	6	8	8	6	13	10	9	7
18000	-25	-21	-15	-13	-18	-33	-13	-30	-33	18	16	14	18	16	14	21	19	11	17
FORT CARSON	TO																		
5000	11	9	7	MCGUIRE AFB			8	2	1	-13	-10	-7	-13	-10	-7	10	10	7	1395 N.M.I.
10000	25	16	12	13	15	8	15	8	7	-26	-18	-12	-26	-18	-12	11	11	8	9
18000	40	26	19	25	26	15	26	15	13	-45	-30	-19	-45	-30	-19	17	16	10	16
FORT CARSON	TO																		
5000	8	6	4	MEMPHIS			6	-1	-2	-9	-7	-5	-9	-7	-5	12	12	8	741 N.M.I.
10000	20	14	6	11	12	3	12	3	1	-21	-15	-6	-21	-15	-6	13	12	10	10
18000	34	25	11	20	20	9	20	9	6	-39	-29	-12	-39	-29	-12	20	18	10	17

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION						
	DIRECT						RETURN						JAN	APR	JUL	OCT			
	JAN	APR	JUL	OCT	A75	A85	JAN	APR	JUL	OCT	A75	A85							
FORT CARSON TO MEXICO CITY																			
5000	-6	-7	-8	-3	-7	-12	-13	5	7	8	3	6	0	0	9	8	5	8	1192 M.MI.
10000	-1	-1	-3	0	-2	-7	-9	-1	0	3	0	0	-5	-6	9	8	7	8	
18000	-1	0	-3	0	-2	-9	-11	-7	-6	3	-3	-2	-12	-14	14	13	7	12	
FORT CARSON TO MINN-ST PAUL																			
5000	4	5	7	5	5	-2	-3	-5	-6	-7	-6	-7	-7	-14	11	12	9	11	636 M.MI.
10000	12	6	9	8	8	0	-1	-15	-8	-10	-10	-11	-19	-22	13	13	10	12	
18000	20	16	15	15	16	5	2	-28	-21	-17	-21	-22	-34	-37	20	19	12	18	
FORT CARSON TO MINOT AFB																			
5000	0	1	4	1	1	-5	-7	0	-2	-4	-2	-3	-10	-11	11	11	9	11	594 M.MI.
10000	-2	-1	3	-1	0	-8	-10	-1	0	-4	0	-2	-10	-12	12	12	10	12	
18000	-4	0	4	-2	0	-12	-15	-7	-6	-9	-5	-8	-19	-22	20	19	12	18	
FORT CARSON TO MELLIS AFB																			
5000	-1	-2	0	2	-1	-5	-6	1	2	1	-2	0	-4	-5	7	7	5	7	510 M.MI.
10000	-12	-9	-7	-8	-9	-16	-18	11	9	7	8	8	1	0	12	10	9	10	
18000	-29	-23	-16	-17	-21	-33	-37	24	20	15	15	17	6	3	21	19	12	18	
FORT CARSON TO NEW CUMBERLAND																			
5000	11	9	7	8	8	2	0	-12	-9	-7	-9	-10	-16	-18	11	10	7	9	1291 M.MI.
10000	24	16	12	13	15	8	6	-26	-17	-12	-14	-17	-26	-28	11	11	9	11	
18000	39	26	19	24	25	15	12	-44	-30	-19	-28	-29	-42	-46	17	17	10	16	
FORT CARSON TO NEW ORLEANS																			
5000	4	3	0	3	2	-4	-5	-5	-6	-1	-4	-4	-11	-12	11	11	8	9	893 M.MI.
10000	15	10	1	7	7	0	-1	-17	-12	-2	-8	-10	-18	-20	11	11	8	11	
18000	25	21	6	15	15	4	2	-33	-26	-6	-18	-20	-34	-37	18	16	9	16	
FORT CARSON TO NIAGARA FALLS																			
5000	10	7	7	8	7	1	0	-11	-8	-7	-9	-9	-16	-17	11	11	8	9	1195 M.MI.
10000	21	13	12	13	14	6	5	-23	-15	-12	-15	-16	-24	-27	12	12	9	11	
18000	35	23	19	23	23	13	11	-41	-27	-20	-27	-28	-40	-44	18	17	10	16	
FORT CARSON TO OXNAPD AFB																			
5000	-2	-3	-1	2	-1	-6	-7	2	3	2	-2	1	-3	-4	7	7	5	6	739 M.MI.
10000	-10	-9	-6	-7	-8	-15	-17	9	8	6	7	7	0	0	12	10	8	10	
18000	-28	-23	-15	-16	-20	-32	-35	23	19	14	13	16	6	3	20	18	11	16	
FORT CARSON TO PATRICK AFB																			
5000	5	5	2	4	3	-1	-3	-6	-5	-2	-4	-5	-10	-12	9	9	7	8	1356 M.MI.
10000	16	12	3	7	9	2	0	-18	-13	-3	-8	-10	-18	-20	10	10	7	10	
18000	29	24	7	16	17	7	5	-35	-28	-7	-19	-21	-34	-37	15	14	8	13	

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCULAR AIR ROUTES

HEIGHT IN FFFT	DIRECTION												STANDARD DEVIATION	
	JAN	APR	JUL	OCT	**A50	A75	A85	JAN	APR	JUL	OCT	**A50		A75
FORT CARSON	PITTSBURGH												1137 M.MI.	
5000	11	8	8	8	1	0	0	-12	-9	-7	-9	-10	-16	-18
10000	23	15	1	13	15	7	5	-25	-16	-11	-14	-16	-25	-27
18000	38	25	16	24	24	14	11	-43	-29	-19	-28	-29	-42	-45
FORT CARSON	PEGINA												705 M.MI.	
5000	-1	0	2	0	0	-6	-8	0	-1	-3	-1	-2	-8	-10
10000	-7	-3	0	-4	-4	-11	-13	3	2	-1	2	1	-6	-7
18000	-13	-5	0	-9	-7	-19	-22	2	0	-4	1	-1	-12	-14
FORT CARSON	SCOTT AFB												692 M.MI.	
5000	9	7	6	7	7	0	-1	-10	-8	-6	-7	-8	-15	-17
10000	21	13	9	12	13	5	2	-22	-14	-9	-13	-15	-24	-26
18000	35	25	16	22	23	11	9	-40	-28	-16	-25	-26	-40	-44
FORT CARSON	SELFRIDGE AFB												1023 M.MI.	
5000	9	7	7	8	7	1	0	-10	-8	-7	-8	-9	-15	-17
10000	21	13	11	13	14	6	4	-22	-14	-12	-14	-16	-24	-26
18000	34	23	19	22	23	12	10	-40	-27	-20	-27	-28	-40	-44
FORT CARSON	SHAW AFB												1203 M.MI.	
5000	10	8	5	6	7	1	0	-11	-8	-5	-6	-8	-14	-16
10000	22	16	7	10	13	5	3	-23	-17	-7	-11	-14	-23	-25
18000	36	27	12	21	22	11	9	-41	-31	-12	-24	-26	-40	-43
FORT CARSON	WESTOVER AFB												1478 M.MI.	
5000	11	8	8	8	8	2	1	-12	-9	-8	-9	-10	-16	-18
10000	23	15	12	14	15	8	6	-25	-17	-13	-15	-18	-25	-27
18000	37	25	20	24	25	15	13	-43	-29	-21	-29	-30	-42	-45
FORT CARSON	MURKSMITH												1018 M.MI.	
5000	8	6	7	8	7	0	-1	-10	-7	-7	-8	-8	-15	-17
10000	19	11	11	12	13	5	3	-21	-12	-12	-14	-15	-23	-25
18000	30	21	18	21	21	11	8	-37	-25	-20	-25	-26	-38	-42
FORT CARSON	YAKIMA												839 M.MI.	
5000	0	0	0	0	0	-5	-6	0	0	0	0	0	-5	-6
10000	-15	-8	-5	-9	-9	-16	-18	14	8	5	8	8	1	0
18000	-29	-19	-14	-22	-21	-33	-36	24	15	11	18	16	5	2
FORT CARSON	YELLOWKNIFE												1470 M.MI.	
5000	-2	0	0	-2	-1	-7	-8	1	0	-1	1	0	-5	-7
10000	-11	-5	-4	-8	-7	-13	-15	9	4	3	7	5	0	-1
18000	-19	-9	-6	-14	-12	-21	-24	11	4	2	8	5	-2	-4

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A---DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GAFAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWIND							STANDARD DEVIATION						
	JAN	APR	JUL	OCT	00A5U	A75	A85	JAN	APR	JUL	OCT	00A5U	A75	A85
FORT EUSTIS														
5000	-13	-10	-6	-5	-9	-15	-17	12	9	6	5	7	1	6
10000	-26	-19	-7	-10	-15	-25	-27	24	18	7	9	13	5	3
18000	-45	-32	-8	-23	-26	-42	-45	40	27	7	20	21	9	6
FORT MUACHUCA														
5000	-10	-8	-6	-5	-8	-13	-15	9	8	6	5	6	1	0
10000	-24	-18	-7	-10	-15	-23	-25	22	17	7	9	13	6	4
18000	-42	-31	-11	-22	-25	-39	-42	38	28	11	19	22	11	9
FORT KNICK														
5000	-15	-11	-7	-8	-10	-16	-17	15	11	7	7	9	1	0
10000	-30	-22	-12	-12	-19	-30	-31	27	21	12	11	17	7	5
18000	-50	-34	-17	-29	-31	-49	-50	44	30	15	24	27	14	11
FORT LEAVENWORTH														
5000	-15	-11	-7	-9	-11	-16	-20	14	10	7	6	9	2	0
10000	-29	-20	-12	-13	-18	-28	-31	27	19	12	12	16	8	6
18000	-49	-33	-18	-29	-31	-45	-50	44	29	17	25	26	14	12
FORT GUCKER														
5000	-11	-8	-4	-4	-7	-14	-16	10	7	4	3	5	-1	-3
10000	-21	-17	-6	-7	-13	-22	-25	18	14	6	6	10	2	0
18000	-40	-27	-8	-21	-22	-39	-42	31	19	7	17	16	5	2
FORT SILL														
5000	-14	-10	-7	-11	-10	-17	-18	13	10	7	7	8	2	0
10000	-27	-20	-9	-11	-17	-26	-29	26	19	9	11	15	7	5
18000	-47	-33	-13	-26	-28	-44	-48	42	29	12	22	24	12	9
FORT WALTERS														
5000	-13	-10	-6	-9	-9	-16	-17	12	10	6	6	6	1	0
10000	-27	-19	-8	-11	-16	-25	-28	25	18	4	10	14	6	4
18000	-44	-32	-11	-24	-27	-42	-46	42	28	10	21	23	11	8
FORT SMITH														
5000	0	0	1	2	0	-4	-7	-1	-1	-2	-3	-2	-9	-10
10000	0	0	0	1	0	-6	-11	-5	-7	-2	-4	-4	-10	-12
18000	2	0	0	1	0	-9	-11	-15	-6	-4	-10	-9	-19	-22
FORT MITCHELL														
5000	-14	-10	-7	-8	-10	-15	-20	12	9	7	7	8	0	-1
10000	-28	-19	-13	-12	-18	-28	-31	25	17	12	11	14	4	4
18000	-46	-31	-19	-27	-29	-45	-49	37	26	18	21	24	11	8

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 00A5U--MONTHLY ANNUAL EQUIVALENT HEADWINDS FOR INDICATED AIR SPEED AND TEMPERATURES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADINGS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN LEFT	S. S. U. I. V. A. L. E. N. T. M. F. A. D. I. N. O. S. RETURN												STANDARD DEVIATION							
	JAN	APR	JUL	OCT	0000	A75	A85	JAN	APR	JUL	OCT	0000	A75	A85	JAN	APR	JUL	OCT		
FORT EUSTIS 5000 10000 18000	TO																			
	MILL AFB	-10	-8	-5	-7	-8	-13	-15	9	7	5	6	6	1	0	9	1632 N.M.I.			
		-24	-16	-11	-13	-16	-23	-25	22	14	11	12	14	7	6	10	10	6	8	
FORT FUSTIS 5000 10000 18000	TO																			
	HONESTON AFB	-5	-4	-2	-2	-4	-10	-12	4	3	3	2	3	3	-4	10	704 N.M.I.			
		-8	-7	-3	-4	-6	-13	-15	3	4	3	3	3	3	-3	12	10	7	10	
FORT FUSTIS 5000 10000 18000	TO																			
	HUNTER AFB	-9	-6	-3	-3	-6	-13	-15	7	5	3	2	4	4	-3	12	429 N.M.I.			
		-17	-14	-5	-6	-10	-20	-22	11	10	4	4	6	6	-1	14	14	9	13	
FORT FUSTIS 5000 10000 18000	TO																			
	HUNTSVILLE	-14	-10	-5	-6	-9	-17	-19	13	10	5	6	6	0	0	13	533 N.M.I.			
		-28	-20	-9	-10	-16	-27	-30	26	19	9	9	14	5	3	14	12	6	11	
FORT FUSTIS 5000 10000 18000	TO																			
	JACKSONVILLE	-9	-7	-2	-2	-6	-13	-15	42	27	12	23	23	11	0	20	20	11	19	
		-26	-18	-12	-12	-20	-30	-33	17	10	5	11	9	0	-3	19	14	10	13	
FORT FUSTIS 5000 10000 18000	TO																			
	KEY WEST	-4	-3	-3	-2	-4	-11	-12	5	4	3	2	3	2	-4	10	657 N.M.I.			
		-9	-8	-3	-4	-6	-13	-15	5	5	3	3	3	3	-4	12	11	7	9	
FORT FUSTIS 5000 10000 18000	TO																			
	LARSON AFB	-12	-7	-2	-8	-9	-19	-19	11	7	5	6	7	2	1	9	1934 N.M.I.			
		-24	-16	-12	-15	-16	-23	-25	22	13	12	14	14	8	7	9	9	6	8	
FORT FUSTIS 5000 10000 18000	TO																			
	LITTLE ROCK	-38	-26	-21	-20	-29	-38	-41	33	22	20	24	24	15	13	14	14	9	13	
		-15	-11	-6	-7	-10	-17	-19	14	10	6	6	6	1	0	12	772 N.M.I.			
FORT FUSTIS 5000 10000 18000	TO																			
	LOCKPORT	-28	-20	-9	-11	-17	-27	-30	27	19	9	10	15	6	4	13	12	12	8	10
		-48	-33	-13	-26	-24	-45	-49	64	29	12	23	24	12	9	19	19	10	10	18
FORT FUSTIS 5000 10000 18000	TO																			
	LOCKPORT	-15	-11	-7	-8	-10	-19	-21	14	11	7	7	9	1	0	14	309 N.M.I.			
		-31	-22	-13	-11	-19	-30	-33	29	20	13	10	17	7	4	16	13	9	12	14
FORT FUSTIS 5000 10000 18000	TO																			
	LOCKPORT	-50	-34	-18	-28	-31	-48	-53	43	30	17	23	26	12	9	22	22	13	16	22
		-19	-14	-7	-18	-19	-34	-38	20	11	6	13	11	0	-2	20	20	11	19	19

0 HEADINGS--COMPUTED FOR A 120-KT AIRSPEED.  
 000--DENOTES ANNUAL EQUIVALENT HEADINGS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADINGS.

EQUIVALENT HEADINGS AND STANDARD DEVIATIONS IN POINTS FOR DIFFERENT CIRCLES AND ROUTES

MILITARY IN FEET	EQUIVALENT HEADINGS AND STANDARD DEVIATIONS IN POINTS FOR DIFFERENT CIRCLES AND ROUTES												STANDARD DEVIATION			
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	APR	JUL	OCT
<b>PORT FUSTIS TO LUGING AFB</b>																
5000	7	5	5	5	-2	-4	-9	-6	-7	-7	-16	-18	14	13	10	11
10000	13	10	8	10	1	-1	-20	-14	-13	-14	-24	-26	16	15	10	13
18000	24	12	11	10	15	3	-38	-22	-16	-26	-39	-43	22	21	13	20
<b>PORT FUSTIS TO LUGING AFB</b>																
5000	-10	-6	-5	-5	-7	-13	9	7	5	5	6	1	9	8	6	7
10000	-23	-17	-8	-11	-15	-22	21	16	8	10	13	6	10	9	7	9
18000	-47	-31	-14	-23	-26	-34	37	27	13	20	22	12	15	14	8	13
<b>PORT FUSTIS TO MICHIGAN</b>																
5000	-15	-11	-8	-7	-10	-20	47	10	9	6	8	1	13	12	8	11
10000	-24	-21	-10	-11	-17	-30	27	19	7	10	15	6	14	14	9	13
18000	-45	-33	-13	-27	-29	-46	44	29	12	23	24	11	20	19	11	19
<b>PORT FUSTIS TO MICHIGAN CITY</b>																
5000	-8	-7	-2	-2	-5	-12	7	7	2	1	3	0	8	8	5	7
10000	-15	-12	-3	-4	-9	-17	13	10	3	3	6	0	9	9	6	8
18000	-31	-22	-1	-14	-17	-29	24	17	0	11	12	2	12	12	7	11
<b>PORT FUSTIS TO WINNIPEG PAUL</b>																
5000	-14	-9	-7	-9	-10	-19	12	8	7	8	8	1	12	12	9	11
10000	-24	-18	-16	-14	-18	-27	24	15	13	12	15	7	13	14	10	12
18000	-44	-29	-20	-28	-29	-47	36	24	19	22	24	12	20	19	12	15
<b>PORT FUSTIS TO WINNIPEG AFB</b>																
5000	-13	-8	-6	-9	-9	-18	11	7	6	8	7	1	11	11	8	10
10000	-24	-16	-14	-15	-18	-27	22	14	13	13	15	7	11	12	9	11
18000	-47	-27	-21	-27	-28	-43	33	22	19	22	23	13	17	17	11	16
<b>PORT FUSTIS TO WILKES AFB</b>																
5000	-9	-7	-5	-7	-12	-15	6	7	5	4	5	1	6	6	6	7
10000	-22	-14	-9	-11	-14	-22	20	15	9	11	13	7	16	9	7	9
18000	-41	-29	-16	-25	-27	-39	36	26	16	21	23	14	15	14	8	13
<b>PORT FUSTIS TO WILKES AFB</b>																
5000	-12	-4	-5	-7	-7	-14	11	8	4	4	6	0	11	11	7	10
10000	-23	-14	-9	-11	-13	-23	20	16	6	7	11	3	12	12	8	12
18000	-41	-28	-6	-21	-23	-38	34	22	4	17	17	5	18	17	10	16
<b>PORT FUSTIS TO NIAGARA FALLS</b>																
5000	-6	-6	-3	-2	-5	-13	4	4	3	1	2	-5	15	14	10	12
10000	-15	-9	-6	-4	-9	-19	6	4	4	1	3	-5	16	16	11	14
18000	-25	-20	-9	-11	-16	-33	3	9	5	0	4	-9	23	23	13	22

MEANINGS--COMPUTED FOR A 120-FT AIRSPEED.  
 000--POINTS ANNUAL EQUIVALENT HEADINGS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN INDICATES HEADINGS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS PER HOUR CYCLE AIR ROUTES

ITEM IN FEET	EQUIVALENT HEADWIND MEASUREMENT DATA												STANDARD DEVIATION					
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	APR	JUL	OCT		
<b>PORT FUSTIS</b>																		
5000	-6	-5	-2	-2	-4	-11	-13	5	4	2	1	2	-3	-5	11	11	8	11
10000	-11	-9	-3	-6	-7	-15	-17	5	6	3	3	4	-3	-5	13	13	8	12
15000	-23	-14	-6	-13	-13	-25	-28	8	4	3	6	5	-4	-7	18	18	10	16
<b>PORT FUSTIS</b>																		
5000	-13	-10	-6	-6	-9	-18	-20	11	9	6	5	7	-1	-3	15	14	10	12
10000	-27	-18	-11	-9	-16	-27	-30	22	15	10	7	13	3	0	16	16	11	15
15000	-64	-31	-16	-23	-27	-64	-68	30	24	14	14	19	6	2	23	23	13	22
<b>PORT FUSTIS</b>																		
5000	-12	-7	-6	-7	-9	-16	-17	11	6	6	8	7	1	0	10	10	8	10
10000	-23	-14	-11	-11	-17	-24	-26	21	13	13	13	14	7	5	11	11	9	10
15000	-38	-24	-21	-26	-27	-38	-41	31	21	19	21	22	13	10	16	15	10	15
<b>PORT FUSTIS</b>																		
5000	-15	-11	-7	-6	-10	-18	-20	14	10	7	8	9	1	0	13	12	9	11
10000	-30	-22	-12	-13	-19	-29	-32	29	20	12	12	17	8	5	14	14	10	13
15000	-69	-34	-17	-29	-31	-67	-71	65	30	17	25	27	14	11	20	20	12	20
<b>PORT FUSTIS</b>																		
5000	-12	-9	-6	-6	-8	-17	-19	10	8	6	5	7	-1	-3	14	14	9	12
10000	-25	-17	-12	-9	-16	-26	-29	20	14	10	7	12	2	0	16	16	11	14
15000	-62	-29	-16	-23	-26	-62	-67	28	22	14	14	18	5	2	22	22	13	22
<b>PORT FUSTIS</b>																		
5000	-10	-7	-3	-4	-6	-14	-16	8	6	3	3	4	-2	-4	13	12	9	12
10000	-19	-16	-6	-7	-12	-22	-25	14	12	6	5	8	0	-2	15	15	10	14
15000	-39	-24	-8	-21	-22	-38	-43	26	14	7	16	14	2	0	21	21	12	20
<b>PORT FUSTIS</b>																		
5000	8	5	5	4	4	-2	-4	-11	-7	-5	-7	-8	-16	-19	15	14	10	12
10000	15	13	8	10	11	1	-1	-22	-17	-10	-12	-15	-26	-29	17	17	11	14
15000	25	13	11	18	15	2	0	-40	-23	-14	-26	-25	-41	-45	23	23	13	22
<b>PORT FUSTIS</b>																		
5000	-11	-4	-5	-5	-7	-16	-18	8	7	5	4	5	-1	-3	14	13	9	11
10000	-22	-15	-11	-9	-14	-24	-27	14	11	9	7	10	1	-1	15	15	11	14
15000	-37	-26	-16	-20	-24	-39	-43	21	18	13	11	15	2	0	22	22	13	21
<b>PORT FUSTIS</b>																		
5000	-12	-7	-5	-8	-8	-14	-15	11	7	5	7	7	2	0	14	14	9	11
10000	-24	-14	-12	-14	-16	-23	-25	22	13	12	13	14	8	7	15	15	11	14
15000	-38	-26	-21	-28	-28	-38	-41	33	22	20	24	24	15	13	24	24	14	13

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 --DRAWS ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DRAWS HEADWINDS.

EQUIVALENT HEADINGS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WIND IN KNOTS	WIND DIRECTION												STANDARD DEVIATION				
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	APR	JUL	OCT	
FOOT WIND	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	654 No.M.I.
9000	-4	-3	0	0	-2	-4	-9	-9	-9	0	0	0	0	-5	-6	10	6
10000	-17	-13	0	-6	-9	-17	-20	-20	-20	5	5	5	5	0	-1	10	8
10000	-34	-29	-1	-15	-19	-35	-38	-38	-38	13	13	13	13	3	0	15	9
FOOT WIND	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	702 No.M.I.
9000	11	6	6	5	7	3	-1	-1	-1	-9	-6	-5	-5	-8	-16	12	8
10000	21	15	4	4	11	3	1	1	1	-4	-4	-4	-4	-13	-25	13	9
10000	34	23	5	15	17	5	2	2	2	-6	-6	-6	-6	-22	-42	19	10
FOOT WIND	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	511 No.M.I.
9000	3	4	4	1	1	1	-4	-4	-4	-5	-5	-5	-5	-6	-13	13	9
10000	4	4	1	1	1	1	-5	-5	-5	-7	-7	-7	-7	-6	-15	13	10
10000	4	1	1	1	1	1	-4	-4	-4	-11	-11	-11	-11	-10	-23	20	11
FOOT WIND	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	1496 No.M.I.
9000	0	0	1	1	0	-4	-5	-5	-5	0	0	0	0	-1	-5	8	5
10000	-14	-8	-3	-7	-6	-14	-16	-16	-16	12	7	2	4	6	0	7	7
10000	-24	-20	-9	-19	-18	-29	-32	-32	-32	22	15	7	15	13	4	16	14
FOOT WIND	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	1246 No.M.I.
9000	-3	-2	0	1	-1	-6	-7	-7	-7	2	2	0	-1	0	-4	7	5
10000	-14	-11	-2	-6	-8	-13	-17	-17	-17	13	10	2	6	7	0	9	7
10000	-37	-26	-7	-15	-19	-32	-35	-35	-35	27	22	6	13	15	5	17	15
FOOT WIND	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	623 No.M.I.
9000	9	7	3	4	5	-1	-3	-3	-3	-10	-8	-3	-4	-6	-14	12	11
10000	20	15	2	7	10	1	0	0	0	-21	-16	-2	-7	-11	-21	12	8
10000	36	29	0	17	19	3	0	0	0	-39	-31	0	-18	-22	-38	17	9
FOOT WIND	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	215 No.M.I.
9000	1	0	1	1	1	1	-5	-7	-7	-2	-4	-7	0	-4	-12	14	13
10000	-3	0	1	-1	0	-9	-11	-11	-11	-1	-1	-3	0	-2	-10	13	9
10000	-11	-8	1	-7	-5	-19	-22	-22	-22	-3	0	-1	2	-2	-13	21	11
FOOT WIND	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	837 No.M.I.
9000	7	5	4	4	5	-1	-3	-3	-3	-8	-7	-6	-4	-7	-14	12	12
10000	12	9	4	4	7	0	-2	-2	-2	-16	-11	-6	-7	-10	-18	12	9
10000	17	12	6	7	9	0	-3	-3	-3	-31	-20	-6	-14	-17	-31	19	10
FOOT WIND	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	917 No.M.I.
9000	0	1	1	1	1	-5	-5	-5	-5	0	-1	-3	-1	-2	-7	9	6
10000	-11	-6	-1	-6	-7	-14	-16	-16	-16	12	7	1	6	6	0	11	10
10000	-24	-22	-6	-17	-18	-30	-34	-34	-34	21	14	4	14	12	2	18	16

MEASUREMENTS--COMPUTED AND A 120-KT ALLOWED.  
 000--RENTS--NORMAL SURVEY HEADINGS FOR INDICATED PER CENT RELIABILITIES.  
 WINDS S.W. OF THESE MEASUREMENTS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATIONS IN KNOTS FOR GREAT CIRCLE AIR ROUTES

CITY IN FLEET	MONTHLY WIND VELOCITY												STANDARD DEVIATION
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
<b>FIRST WIND</b>	<b>WINDSPEED</b>												967 N.M.I.
9000	1	2	3	3	4	4	4	4	4	4	4	4	
10000	11	9	-1	4	5	-1	-3	-1	-3	-1	-3	-1	
12000	25	23	-2	11	13	1	-1	-1	-1	-1	-1	-1	
<b>FIRST WIND</b>	<b>WINDSPEED</b>												841 N.M.I.
9000	10	6	4	4	6	0	-1	-1	-1	-1	-1	-1	
10000	21	14	3	7	11	2	0	0	0	0	0	0	
12000	37	29	1	17	19	5	2	2	2	2	2	2	
<b>FIRST WIND</b>	<b>WINDSPEED</b>												582 N.M.I.
9000	11	7	6	4	7	0	-1	-1	-1	-1	-1	-1	
10000	27	16	4	4	11	7	0	0	0	0	0	0	
12000	37	27	2	17	19	4	1	1	1	1	1	1	
<b>FIRST WIND</b>	<b>WINDSPEED</b>												821 N.M.I.
9000	6	7	3	3	5	-1	-2	-2	-2	-2	-2	-2	
10000	19	14	7	6	9	1	0	0	0	0	0	0	
12000	35	29	0	16	19	4	1	1	1	1	1	1	
<b>FIRST WIND</b>	<b>WINDSPEED</b>												924 N.M.I.
9000	0	1	-1	0	0	-5	-7	-7	-7	-7	-7	-7	
10000	10	6	-2	3	4	-2	-4	-4	-4	-4	-4	-4	
12000	27	21	-2	10	11	0	-1	-1	-1	-1	-1	-1	
<b>FIRST WIND</b>	<b>WINDSPEED</b>												1388 N.M.I.
9000	0	0	1	0	0	-4	-5	-5	-5	-5	-5	-5	
10000	-14	-8	-7	-7	-8	-14	-16	-16	-16	-16	-16	-16	
12000	-24	-19	-9	-10	-10	-20	-32	-32	-32	-32	-32	-32	
<b>FIRST WIND</b>	<b>WINDSPEED</b>												355 N.M.I.
9000	10	4	7	4	7	0	-2	-2	-2	-2	-2	-2	
10000	14	14	4	6	10	1	-1	-1	-1	-1	-1	-1	
12000	30	21	2	12	14	1	-1	-1	-1	-1	-1	-1	
<b>FIRST WIND</b>	<b>WINDSPEED</b>												876 N.M.I.
9000	11	4	5	4	7	0	-1	-1	-1	-1	-1	-1	
10000	21	15	6	4	12	3	1	1	1	1	1	1	
12000	34	22	7	16	18	6	3	3	3	3	3	3	
<b>FIRST WIND</b>	<b>WINDSPEED</b>												1661 N.M.I.
9000	11	7	7	7	7	2	0	0	0	0	0	0	
10000	21	16	9	11	13	6	4	4	4	4	4	4	
12000	33	20	12	23	19	10	7	7	7	7	7	7	

HEADWINDS—COMPUTED FOR A 120-KT AIRSPEED.  
 WINDS—ANNUAL FOUR VALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 PLUS SIGN INDICATES HEADWINDS.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

PORT	DUTY				RETURN				STANDARD DEVIATION									
	JAN	FEB	MAR	APR	JAN	FEB	MAR	APR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT
PORT WOOD	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	-3	-2	1	0	-1	-7	-8	2	1	-1	0	0	-5	-7	10	9	763 N.M.I.	
10000	-16	-17	0	-9	-9	-17	-19	15	11	0	5	7	0	-2	11	10	6	8
15000	-34	-28	-3	-14	-14	-34	-37	30	25	2	14	16	3	1	18	16	9	15
PORT WOOD	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	12	4	5	4	7	1	0	-13	-10	-5	-6	-9	-16	-17	11	10	1236 N.M.I.	
10000	24	17	8	0	11	6	4	-26	-19	-3	-10	-16	-25	-27	11	11	8	11
15000	40	26	9	20	21	10	7	-45	-31	-10	-24	-26	-41	-45	17	16	9	15
PORT WOOD	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	10	8	7	7	7	0	-2	-11	-9	-7	-5	-8	-16	-18	13	13	448 N.M.I.	
10000	21	15	4	7	11	2	0	-22	-16	-4	-8	-12	-22	-25	13	13	9	11
15000	34	24	1	14	16	2	0	-39	-29	-2	-18	-21	-38	-42	20	18	10	18
PORT WOOD	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	-7	-9	-9	-1	-4	-12	-14	7	9	4	1	5	0	-1	10	9	707 N.M.I.	
10000	-7	-5	-2	-2	-6	-13	-12	6	5	2	1	3	-2	-3	9	9	6	9
15000	-11	-8	-2	-2	-8	-15	-17	7	5	2	3	3	-3	-5	14	13	7	12
PORT WOOD	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	1	2	5	0	2	-5	-7	-3	-4	-5	-1	-4	-11	-13	12	12	850 N.M.I.	
10000	2	2	2	0	1	-6	-7	-7	-5	-3	-2	-6	-12	-14	12	12	9	10
15000	6	1	2	-1	5	-10	-12	-16	-11	-5	-6	-9	-21	-24	19	18	10	17
PORT WOOD	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	-6	3	2	-1	-1	-8	-10	2	0	-3	2	0	-7	-9	11	11	1042 N.M.I.	
10000	-8	-6	0	-6	-5	-12	-14	3	2	0	3	1	-5	-7	11	11	8	10
15000	-15	-9	-3	-11	-9	-20	-23	1	1	0	4	1	-8	-10	17	16	10	16
PORT WOOD	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	-2	-1	1	1	0	-5	-7	1	1	-1	-1	0	-5	-7	9	8	923 N.M.I.	
10000	-15	-11	-1	-4	-8	-14	-18	14	11	1	4	7	0	-1	11	9	6	8
15000	-32	-26	-8	-16	-19	-34	-36	28	23	5	14	15	4	2	18	16	9	15
PORT WOOD	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	12	9	6	6	7	1	0	-13	-10	-8	-6	-9	-16	-17	11	11	1143 N.M.I.	
10000	24	17	8	9	13	5	4	-26	-18	-8	-10	-15	-24	-27	12	11	8	11
15000	38	29	9	19	20	9	6	-44	-30	-10	-24	-26	-41	-45	17	16	9	16
PORT WOOD	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	8	5	2	3	4	-2	-4	-9	-6	-2	-4	-5	-13	-15	12	12	393 N.M.I.	
10000	16	13	0	4	8	0	-2	-19	-14	0	-7	-10	-20	-22	12	12	6	11
15000	33	27	-2	15	17	1	-1	-36	-30	2	-17	-20	-36	-40	18	17	10	16

HEADWINDS--COMPUTED ON A 120-KT AIRSPEED.  
 TOA--HOURS BEHALF EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 PLUS SIGN MEANS HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	DIRECTION												STANDARD DEVIATION			
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	APR	JUL	OCT
PORT MONROE	NIAGARA FALLS												1139 N.M.I.			
5000	10	7	6	6	7	0	0	0	0	0	0	0	-12	-8	-6	-6
10000	20	14	8	9	12	4	2	2	2	2	2	2	-23	-16	-8	-11
18000	31	19	9	16	17	6	4	4	4	4	4	4	-41	-26	-11	-22
PORT MONROE	OSWEGO AFB												1100 N.M.I.			
5000	-2	-7	0	1	-1	-3	-7	-7	-7	-7	-7	-7	2	2	0	-1
10000	-14	-11	-1	-6	-8	-15	-17	-17	-17	-17	-17	-17	13	11	1	5
18000	-32	-27	-5	-15	-19	-37	-36	-36	-36	-36	-36	-36	29	24	4	13
PORT MONROE	PATRICK AFB												900 N.M.I.			
5000	5	5	1	1	3	3	-2	-4	-4	-4	-4	-4	-6	-6	-1	-3
10000	14	13	1	1	7	7	0	-1	-1	-1	-1	-1	-17	-13	0	-6
18000	31	27	0	14	16	3	0	0	0	0	0	0	-35	-29	0	-16
PORT MONROE	PITTSBURGH												1011 N.M.I.			
5000	11	8	9	6	7	1	0	0	0	0	0	0	-12	-9	-6	-6
10000	22	15	7	9	12	4	2	2	2	2	2	2	-24	-17	-8	-10
18000	35	23	8	17	18	7	5	5	5	5	5	5	-43	-28	-9	-22
PORT MONROE	REGINA												1201 N.M.I.			
5000	-4	-1	1	-3	-2	-9	-10	-10	-10	-10	-10	-10	2	0	-2	2
10000	-10	-5	-1	-7	-6	-13	-15	-15	-15	-15	-15	-15	6	3	0	5
18000	-19	-11	-5	-13	-12	-22	-23	-23	-23	-23	-23	-23	6	4	1	7
PORT MONROE	SCOTT AFB												580 N.M.I.			
5000	8	7	7	4	6	-1	-3	-3	-3	-3	-3	-3	-10	-8	-7	-4
10000	16	11	5	6	9	0	-1	-1	-1	-1	-1	-1	-19	-13	-5	-7
18000	24	16	5	10	12	1	-1	-1	-1	-1	-1	-1	-34	-24	-4	-15
PORT MONROE	SELFRIDGE AFB												984 N.M.I.			
5000	9	7	6	5	6	3	1	1	1	1	1	1	-11	-8	-6	-6
10000	18	12	7	8	10	3	1	1	1	1	1	1	-21	-15	-7	-10
18000	27	17	8	13	14	4	1	1	1	1	1	1	-30	-25	-10	-19
PORT MONROE	SHAW AFB												880 N.M.I.			
5000	11	9	5	4	6	0	-1	-1	-1	-1	-1	-1	-12	-9	-5	-5
10000	23	17	4	7	11	3	1	1	1	1	1	1	-23	-18	-4	-8
18000	39	29	3	16	20	6	4	4	4	4	4	4	-42	-32	-3	-20
PORT MONROE	WESTOVER AFB												1368 N.M.I.			
5000	17	9	7	6	8	2	0	0	0	0	0	0	-13	-10	-6	-7
10000	28	17	9	10	14	6	5	5	5	5	5	5	-26	-19	-9	-11
18000	38	24	11	20	21	10	8	8	8	8	8	8	-45	-30	-12	-25

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 000--DISPLAYS ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

JOURNAL OF MONTHLY AND QUARTERLY STANDARD DEVIATION IN MONTHS FOR GREAT CIRCLE AIR ROUTES

PORT IN AREA	STANDARD DEVIATION IN MONTHS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION			
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	APR	JUL	OCT
PORT MEXICO	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
10000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
10000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
PORT MEXICO	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
10000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
10000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
PORT MEXICO	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
10000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
10000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
PORT MEXICO	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
10000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
10000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
PORT MEXICO	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
10000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
10000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
PORT MEXICO	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
10000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
10000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
PORT MEXICO	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
10000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
10000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

STANDARD DEVIATION COMPUTED FOR A 120-DEGREE AIRSPACE.  
 MONTHLY AND QUARTERLY STANDARD DEVIATIONS FOR INDICATED PORTS AS SHOWN.  
 PLUS SIGN DENOTES WESTWARD.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	DIRECTION												STANDARD DEVIATION					
	JAN	APR	JUL	OCT	00A50	A75	A85	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT			
F U L L V A L L E Y M E A D M I N D S O																		
PORT MARCHUCA	TO FORT WOLFERS																	
500	4	1	0	2	-3	-5	-4	-4	-1	-1	-3	-9	-10	10	10	6	9	
1000	17	1	6	8	0	-1	-17	-14	-1	-6	-9	-18	-20	12	10	8	11	
18000	32	27	4	14	17	5	-35	-29	-4	-16	-20	-35	-39	19	16	10	16	
PORT MARCHUCA	TO GEN MITCHELL																	
500	6	6	6	5	0	-1	-7	-7	-6	-5	-7	-12	-14	10	9	7	8	
1000	15	11	7	9	10	3	-17	-13	-8	-10	-12	-19	-21	11	10	8	10	
18000	26	20	12	14	16	7	-33	-25	-14	-19	-22	-34	-37	17	16	9	15	
PORT MARCHUCA	TO HILL AFB																	
500	4	5	4	3	4	3	0	-4	-4	-4	-3	-4	-8	-9	7	6	4	6
1000	-4	0	3	0	0	-7	-9	2	0	-3	0	-1	-7	-9	12	10	8	10
18000	-11	-6	5	-5	-3	-16	-20	0	0	-7	0	-3	-13	-16	20	18	11	17
PORT MARCHUCA	TO HOMEHEAD AFB																	
500	1	2	-1	0	0	-5	-2	-2	1	0	-1	-6	-7	8	7	5	7	
1000	13	10	-1	4	6	0	-2	-14	-10	1	-4	-7	-14	-16	8	8	6	8
18000	27	24	-1	11	14	2	0	-31	-26	1	-13	-18	-30	-33	13	11	7	11
PORT MARCHUCA	TO HUNTER AFB																	
500	7	6	3	3	0	-1	-8	-7	-3	-3	-6	-11	-13	9	8	6	8	
1000	19	15	2	7	10	2	1	-20	-16	-2	-7	-11	-20	-22	9	9	7	9
18000	35	28	3	16	19	6	4	-30	-31	-4	-18	-23	-36	-39	14	13	7	12
PORT MARCHUCA	TO MURKOVILLE																	
500	7	6	4	3	4	0	-2	-8	-7	-4	-3	-6	-12	-13	10	9	6	8
1000	20	15	4	8	11	3	1	-21	-16	-4	-9	-13	-21	-23	10	10	8	10
18000	35	28	6	16	19	7	5	-39	-31	-6	-19	-23	-37	-41	16	15	8	14
PORT MARCHUCA	TO JACKSONVILLE																	
500	6	5	2	2	3	-1	-2	-7	-6	-2	-2	-4	-10	-11	9	8	6	7
1000	16	14	1	6	9	1	0	-19	-15	-1	-7	-10	-19	-21	9	9	6	9
18000	34	28	2	15	18	5	3	-37	-30	-2	-17	-22	-35	-38	14	13	7	12
PORT MARCHUCA	TO JUNEAU																	
500	1	2	0	2	1	-2	-3	-2	-3	0	-2	-2	-6	-7	7	6	4	6
1000	-8	-4	-1	-1	-4	-9	-11	4	3	1	0	2	-3	-4	10	8	6	8
18000	-19	-11	-5	-12	-12	-21	-24	11	5	2	6	5	-3	-5	15	13	10	13
PORT MARCHUCA	TO KEY WEST																	
500	0	1	-2	3	-1	-5	-6	-1	-1	2	0	0	-5	-6	8	7	5	7
1000	11	9	-2	3	4	-1	-3	-12	-9	2	-4	-6	-13	-14	8	8	6	8
18000	25	23	-2	10	13	1	-1	-29	-25	2	-12	-17	-28	-31	12	11	6	10

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*\*DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADINGS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WINDSPEED IN KNOTS	MONTHS												STANDARD DEVIATION			
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	APR	JUL	OCT
5000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
10000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
15000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
20000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
25000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
30000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
35000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
40000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
45000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
50000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

DEFINITION: COMPUTED FOR A 120-DEGREE COURSE.  
 THE MONTHS' ANNUAL EQUIVALENT HEADINGS ARE INDICATED BY THE STANDARD DEVIATIONS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUVALENT HEADWIND M.F.A.D.M.I.N.D.S. BY QUARTER												STANDARD DEVIATION			
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	APR	JUL	OCT
FORT WACOMBA																
5000	2	1	2	3	2	2	-2	-3	-2	-2	-2	-2	-7	-7	8	7
10000	-9	-7	0	-2	-4	-12	-14	-14	0	2	3	3	-4	-5	13	11
18000	-23	-18	0	-9	-11	-26	-29	-29	-1	6	6	6	-5	-7	21	19
365 N.M.I.																
FORT WACOMBA																
5000	9	0	6	6	7	1	0	0	-6	-6	-8	-8	-13	-15	9	9
10000	22	16	0	10	13	6	5	5	-8	-11	-15	-15	-23	-25	10	10
18000	37	26	12	19	21	11	9	9	-13	-23	-26	-26	-39	-42	15	14
1696 N.M.I.																
FORT WACOMBA																
5000	5	1	0	1	1	-3	-4	-4	0	-1	-3	-3	-9	-10	10	9
10000	17	13	0	6	8	1	0	0	0	-6	-9	-9	-17	-19	10	9
18000	32	27	0	14	17	1	0	0	-29	-16	-20	-20	-34	-37	16	14
1047 N.M.I.																
FORT WACOMBA																
5000	8	7	6	6	5	1	0	0	-7	-6	-8	-8	-13	-15	9	9
10000	19	14	9	10	12	6	4	4	-15	-9	-14	-14	-21	-23	10	10
18000	32	23	14	18	20	11	9	9	-27	-15	-22	-22	-37	-40	15	14
1636 N.M.I.																
FORT WACOMBA																
5000	0	0	0	3	0	-4	-6	-6	0	0	-3	-3	-6	-7	9	8
10000	-12	-10	-1	-4	-7	-15	-17	-17	9	1	4	5	-1	-3	13	11
18000	-29	-24	-4	-12	-16	-30	-34	-34	25	20	3	12	1	-1	20	18
469 N.M.I.																
FORT WACOMBA																
5000	5	4	0	2	2	-2	-3	-3	-5	0	-2	-3	-8	-10	8	8
10000	16	12	0	5	7	0	0	0	-17	-13	0	-9	-17	-18	9	8
18000	32	27	0	14	17	4	2	2	-35	-29	0	-21	-33	-36	13	12
1554 N.M.I.																
FORT WACOMBA																
5000	9	7	6	5	6	1	0	0	-3	-3	-6	-6	-13	-15	9	9
10000	20	15	8	10	12	6	4	4	-22	-17	-8	-11	-22	-24	10	10
18000	35	25	12	18	20	11	8	8	-41	-29	-13	-22	-38	-42	16	15
1547 N.M.I.																
FORT WACOMBA																
5000	3	3	4	2	3	-1	-2	-2	-4	-3	-3	-2	-8	-9	8	7
10000	-1	0	3	0	0	-5	-7	-7	-1	-1	-4	-2	-9	-10	10	9
18000	-4	0	7	-1	0	-9	-12	-12	-6	-6	-10	-4	-17	-19	17	15
1159 N.M.I.																
FORT WACOMBA																
5000	7	6	6	6	5	0	-1	-1	-7	-7	-6	-4	-12	-14	10	10
10000	19	14	6	9	11	4	2	2	-19	-15	-6	-9	-20	-22	11	10
18000	31	25	10	15	18	8	6	6	-37	-26	-10	-19	-36	-39	17	16
1088 N.M.I.																

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 000--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 -1000 SIGN DENOTES HEADWINDS.

EQUIVALENT MEASUREMENTS AND STANDARD DEVIATIONS IN KNOTS FOR GREAT CIRCLE AIR ROUTES

EIGHT IN FEET	EQUIVALENT MEASUREMENTS AND STANDARD DEVIATIONS IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION			
	JAN	APR	JUL	OCT	NOV	DEC	JAN	APR	JUL	OCT	NOV	DEC	JAN	APR	JUL	OCT
5000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
10000	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
15000	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
20000	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
25000	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
30000	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
35000	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
40000	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
45000	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
50000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

MEASUREMENTS COMPUTED FOR A 120-KT AIRSPEED.  
 MEASUREMENTS COMPUTED FOR A 120-KT AIRSPEED.  
 MEASUREMENTS COMPUTED FOR A 120-KT AIRSPEED.





EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS IN KNOTS												STANDARD DEVIATION					
	JAN			APR			JUL			OCT			JAN	APR	JUL	OCT		
FORT KNOX	TO JACKSONVILLE																	
5000	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10000	6	5	2	1	3	4	4	3	4	3	4	5	5	4	3	3	4	5
18000	5	9	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5
FORT KNOX	TO KEY WEST																	
5000	-2	-1	-1	0	-2	-8	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
10000	0	1	-1	0	0	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7
18000	0	3	0	0	0	-8	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10
FORT KNOX	TO LAFSON AFB																	
5000	-10	-7	-4	-7	-7	-13	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15
10000	-22	-13	-10	-10	-15	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
18000	-30	-24	-19	-27	-26	-37	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40
FORT KNOX	TO LITTLE ROCK																	
5000	-13	-10	-5	-6	-9	-17	-19	-19	-19	-19	-19	-19	-19	-19	-19	-19	-19	-19
10000	-25	-17	-8	-11	-15	-26	-29	-29	-29	-29	-29	-29	-29	-29	-29	-29	-29	-29
18000	-44	-30	-10	-23	-25	-42	-47	-47	-47	-47	-47	-47	-47	-47	-47	-47	-47	-47
FORT KNOX	TO LOCKPORT																	
5000	11	7	5	7	7	7	-1	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
10000	22	15	9	10	13	3	1	1	1	1	1	1	1	1	1	1	1	1
18000	34	20	13	20	20	6	3	3	3	3	3	3	3	3	3	3	3	3
FORT KNOX	TO LORING AFB																	
5000	11	7	7	9	8	1	0	0	0	0	0	0	0	0	0	0	0	0
10000	21	13	12	14	14	6	4	4	4	4	4	4	4	4	4	4	4	4
18000	34	19	17	24	22	10	9	9	9	9	9	9	9	9	9	9	9	9
FORT KNOX	TO LUKE AFB																	
5000	-2	-7	-5	-4	-5	-12	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13
10000	-20	-15	-7	-10	-13	-21	-23	-23	-23	-23	-23	-23	-23	-23	-23	-23	-23	-23
18000	-39	-29	-12	-21	-24	-37	-41	-41	-41	-41	-41	-41	-41	-41	-41	-41	-41	-41
FORT KNOX	TO MCGUIRE AFB																	
5000	14	10	7	3	9	1	0	0	0	0	0	0	0	0	0	0	0	0
10000	29	21	13	12	17	8	6	6	6	6	6	6	6	6	6	6	6	6
18000	46	28	18	27	27	14	11	11	11	11	11	11	11	11	11	11	11	11
FORT KNOX	TO MEMPHIS																	
5000	-12	-9	-5	-5	-8	-17	-19	-19	-19	-19	-19	-19	-19	-19	-19	-19	-19	-19
10000	-24	-16	-7	-10	-14	-25	-28	-28	-28	-28	-28	-28	-28	-28	-28	-28	-28	-28
18000	-42	-27	-9	-21	-23	-40	-45	-45	-45	-45	-45	-45	-45	-45	-45	-45	-45	-45

• HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 • A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	WIND DIRECTION												STANDARD DEVIATION					
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	APR	JUL	OCT		
PORT KNOX	MEXICO CITY												1304 N.M.I.					
5000	-8	-8	-3	-3	-5	-11	-13	7	7	3	1	4	-1	-2	9	9	6	6
10000	-13	-9	-2	-6	-7	-14	-16	11	8	2	3	5	0	-1	9	9	7	9
15000	-26	-17	0	-10	-12	-24	-27	18	11	0	7	7	-1	-2	13	13	7	12
PORT KNOX	PITTSBURGH												531 N.M.I.					
5000	-10	-7	-4	-6	-7	-15	-10	6	6	3	5	5	-2	-4	14	13	10	12
10000	-19	-12	-9	-11	-13	-23	-25	14	10	8	9	10	1	-1	14	15	11	14
15000	-34	-22	-15	-23	-23	-37	-41	21	15	12	16	15	3	0	21	21	13	20
PORT KNOX	WIGHT AFB												912 N.M.I.					
5000	-11	-7	-4	-6	-8	-16	-17	10	6	4	7	6	0	-2	12	12	9	11
10000	-21	-13	-11	-14	-15	-24	-26	18	11	10	12	12	4	2	12	13	10	12
15000	-34	-23	-18	-26	-25	-37	-40	26	17	15	20	18	8	5	18	18	11	18
PORT KNOX	WELLS AFB												1369 N.M.I.					
5000	-7	-6	-4	-4	-6	-11	-12	6	5	4	3	4	0	-2	9	9	6	7
10000	-20	-14	-8	-11	-13	-21	-22	18	13	8	10	11	5	3	10	10	8	9
15000	-30	-20	-15	-23	-25	-37	-40	33	25	14	20	21	12	10	16	15	9	14
PORT KNOX	WPC COMBELLAND												647 N.M.I.					
5000	14	10	7	8	9	1	0	-15	-11	-6	-9	-10	-19	-21	14	13	9	11
10000	28	20	13	12	17	7	5	-30	-22	-13	-13	-19	-30	-33	15	15	11	14
15000	45	27	17	26	26	13	10	-50	-32	-18	-30	-31	-40	-52	22	22	12	21
PORT KNOX	NEW ORLEANS												515 N.M.I.					
5000	-8	-6	-3	-3	-5	-13	-15	6	4	3	2	3	-3	-5	13	12	8	11
10000	-15	-10	-4	-5	-9	-17	-20	10	7	4	3	5	-2	-4	13	13	9	13
15000	-29	-17	0	-12	-13	-28	-32	15	7	0	6	5	-5	-7	19	19	10	18
PORT KNOX	NIAGARA FALLS												647 N.M.I.					
5000	10	5	5	7	6	-1	-3	-12	-7	-5	-8	-8	-16	-18	14	13	9	11
10000	19	12	9	10	12	2	0	-24	-16	-10	-12	-15	-26	-28	15	15	11	14
15000	28	14	12	19	17	4	1	-41	-23	-15	-26	-25	-41	-45	22	22	13	21
PORT KNOX	GRAND AFB												1612 N.M.I.					
5000	-7	-6	-4	-4	-5	-10	-12	6	5	4	2	4	0	-2	8	8	6	7
10000	-18	-14	-7	-10	-12	-19	-21	16	13	7	9	10	4	3	10	9	7	9
15000	-37	-28	-14	-21	-24	-36	-39	32	24	14	18	20	11	9	15	14	8	13
PORT KNOX	PATRICK AFB												639 N.M.I.					
5000	0	1	0	1	0	-8	-7	-2	-2	0	-2	-2	-9	-10	11	11	8	10
10000	5	4	1	1	2	-5	-6	-10	-8	-1	-2	-5	-14	-16	13	13	8	12
15000	5	0	3	4	4	-5	-7	-21	-18	-3	-9	-12	-25	-28	18	18	10	14

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 --GIVES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 WINDS SHOW DIRECTION HEADWINDS.

EQUIVALENT HEADINGS AND STANDARD DEVIATION IN QUANTITIES FOR SPARE PARTS AND ACCESSORIES

EQUIVALENT HEADINGS AND STANDARD DEVIATION IN QUANTITIES FOR SPARE PARTS AND ACCESSORIES	EQUIVALENT HEADINGS AND STANDARD DEVIATION IN QUANTITIES FOR SPARE PARTS AND ACCESSORIES											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
<b>FIRST NAME</b>	12	17	11	6	0	-1						
5000	25	11	11	15	5	3						
10000	30	22	15	23	22	0						
<b>FIRST NAME</b>	11	-6	-4	-4	-4	-15	-17					
5000	-20	-13	-11	-14	-15	-23	-24					
10000	-33	-22	-18	-25	-26	-35	-34					
<b>FIRST NAME</b>	14	-13	-6	-6	-13	-21						
5000	-27	-20	-10	-13	-14	-22	-22					
10000	-46	-32	-16	-24	-27	-37	-37					
<b>FIRST NAME</b>	5	2	3	4	3	-7						
5000	9	4	4	6	5	-2	-5					
10000	12	5	6	8	7	-5	-5					
<b>FIRST NAME</b>	9	7	5	5	6	-1						
5000	18	14	6	5	13	1	-1					
10000	23	21	9	14	15	3	0					
<b>FIRST NAME</b>	13	9	7	9	9	1	3					
5000	27	19	13	13	17	0	5					
10000	42	25	18	26	26	13	19					
<b>FIRST NAME</b>	2	3	2	2	1	-6						
5000	3	2	2	3	2	-6	-9					
10000	2	0	2	2	1	-11	-14					
<b>FIRST NAME</b>	-10	-7	-6	-7	-7	-13						
5000	-21	-13	-10	-14	-15	-21	-23					
10000	-36	-24	-19	-27	-26	-37	-40					
<b>FIRST NAME</b>	-7	-4	-3	-3	-3	-12						
5000	-16	-9	-10	-12	-12	-18	-20					
10000	-24	-15	-14	-20	-19	-26	-30					

MEANINGS--COMPUTED FOR A 120-DY APPROX.  
 --REPRESENTS ANNUAL EQUIVALENT HEADINGS AND INDICATED PER CENT OF QUANTITIES.  
 MINUS SIGN DENOTES HEADINGS.

THE BOYING VEITH COMPANY

0110-10000-1

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN FEET PER HOUR CIRCLE AND COURSE

WEIGHT IN FEET	F. S. J. V. A. I. L. E. S. T. H. L. A. S. V. I. S. I. O. N.												STANDARD DEVIATION				
	JAN	APR	JUL	OCT	COURSE	AFS	MS	JAN	APR	JUL	OCT	COURSE	AFS	MS	JAN	APR	JUL
FORT LEAVENWORTH TO FORT LEWIS																	
5000	-7	-5	-3	-4	-6	-11	-13	4	5	3	3	3	4	0	0	0	0
10000	-19	-11	-8	-13	-13	-20	-22	10	10	6	12	11	11	3	3	0	0
18000	-33	-22	-18	-26	-23	-34	-36	20	16	17	23	21	11	11	0	0	0
FORT LEAVENWORTH TO FORT ORD																	
5000	-4	-4	-2	-1	-3	-8	-9	3	4	2	1	2	2	-2	-3	0	0
10000	-15	-10	-7	-10	-11	-17	-19	14	7	7	9	9	3	3	1	1	0
18000	-32	-24	-16	-20	-22	-34	-37	27	21	13	17	19	9	9	7	7	0
FORT LEAVENWORTH TO FORT PUCKER																	
5000	6	4	2	4	3	-3	-3	-8	-8	-2	-4	-3	-3	-13	-13	0	0
10000	13	10	3	7	7	0	-2	-17	-13	-4	-8	-10	-10	-20	-20	0	0
18000	19	17	0	13	13	2	0	-32	-23	-9	-10	-20	-20	-34	-34	0	0
FORT LEAVENWORTH TO FORT SILL																	
5000	-6	-7	-8	-3	-7	-15	-17	6	5	7	2	2	2	0	0	0	0
10000	-13	-10	-3	-4	-9	-20	-20	9	7	3	4	4	4	0	0	0	0
18000	-26	-19	-6	-12	-15	-29	-33	12	10	3	3	7	7	0	0	0	0
FORT LEAVENWORTH TO FORT WALTERS																	
5000	-5	-6	-7	-2	-6	-13	-13	3	3	7	1	1	1	0	0	0	0
10000	-11	-8	-4	-4	-7	-16	-16	6	3	4	2	2	2	0	0	0	0
18000	-22	-15	-3	-8	-12	-23	-29	7	6	4	2	2	2	0	0	0	0
FORT LEAVENWORTH TO FORT FISHER																	
5000	2	0	4	4	2	-3	-3	-3	-1	-3	-6	-6	-6	-10	-10	0	0
10000	4	1	3	4	3	-3	-4	-7	-3	-3	-6	-6	-6	-12	-12	0	0
18000	6	3	4	5	4	-3	-6	-15	-9	-9	-12	-11	-10	-20	-20	0	0
FORT LEAVENWORTH TO GEN MITCHELL																	
5000	9	6	6	7	6	-1	-3	-11	-7	-6	-8	-8	-8	-17	-17	0	0
10000	18	12	10	11	12	3	0	-21	-16	-10	-13	-15	-15	-25	-25	0	0
18000	29	19	16	17	19	6	3	-30	-23	-17	-23	-25	-25	-40	-40	0	0
FORT LEAVENWORTH TO HILL AFB																	
5000	-4	-4	-3	-4	-4	-10	-12	4	4	3	3	3	3	-2	-3	0	0
10000	-16	-10	-8	-12	-12	-20	-22	17	10	6	12	11	11	4	4	2	2
18000	-35	-24	-18	-25	-25	-37	-41	30	21	17	22	21	10	10	0	0	0
FORT LEAVENWORTH TO HONESTAD AFB																	
5000	2	2	0	2	1	-4	-6	-3	-3	0	2	2	2	-9	-9	0	0
10000	9	8	1	6	5	-1	-3	-13	-10	-1	-3	-7	-7	-15	-15	0	0
18000	17	16	4	10	10	1	0	-20	-22	-3	-10	-16	-16	-29	-29	0	0

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.

MS--DEFINITE ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITY.

MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADINGS AND STANDARD DEVIATION IN FEET FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADINGS AND STANDARD DEVIATION IN FEET FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION										
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV
FORT LEAVENWORTH TO 5000 10000 18000	7 14 20	4 6 10	3 5 17	1 2 13	0 2 7	-2 0 4	-10 -21 -30	-8 -16 -20	-9 -9 -22	-7 -13 -23	-14 -22 -30	14 13 10	11 13 16	11 13 17									
FORT LEAVENWORTH TO 5000 10000 18000	6 13 22	4 6 11	4 6 10	1 11 18	-2 2 6	-3 0 3	-11 -21 -30	-8 -15 -20	-6 -11 -23	-7 -13 -23	-14 -22 -30	14 13 10	11 13 17	11 13 17									
FORT LEAVENWORTH TO 5000 10000 18000	5 12 24	3 6 8	3 7 15	1 7 15	-2 1 5	-3 2 7	-6 -14 -27	-7 -14 -27	-5 -6 -19	-6 -11 -21	-13 -20 -29	12 12 10	11 13 17	11 13 17									
FORT LEAVENWORTH TO 5000 10000 18000	1 7 13	0 0 4	1 3 8	1 3 8	-5 -9 -13	-11 -20 -29	-2 2 12	-2 2 12	-1 5 15	-1 5 15	-6 -14 -27	10 11 15	10 11 15	12 10 12									
FORT LEAVENWORTH TO 5000 10000 18000	-7 -20 -33	-4 -8 -11	-3 -8 -13	-6 -13 -26	-12 -20 -36	-19 -22 -30	7 19 20	5 10 10	6 13 17	5 12 21	0 7 11	9 10 17	9 10 17	9 10 17									
FORT LEAVENWORTH TO 5000 10000 18000	3 7 9	0 2 5	0 2 7	1 4 7	-4 -4 -7	-6 -11 -16	-3 -4 -10	-3 -4 -10	-4 -7 -16	-4 -8 -15	-14 -27 -36	14 15 22	14 15 22	14 15 22									
FORT LEAVENWORTH TO 5000 10000 18000	13 26 43	9 12 18	7 12 26	9 17 26	1 7 14	11 11 11	-15 -22 -31	-10 -19 -26	-9 -15 -20	-7 -16 -26	-19 -28 -38	14 15 22	14 15 22	14 15 22									
FORT LEAVENWORTH TO 5000 10000 18000	12 22 35	7 13 20	8 13 26	9 14 24	2 8 13	13 14 13	-14 -25 -32	-9 -14 -26	-10 -17 -29	-10 -18 -29	-17 -26 -36	11 12 21	11 12 21	11 12 21									

\*HEADINGS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*--DENOTES ANNUAL EQUIVALENT HEADINGS FOR INDICATED PER CENT SILLIABILITY.  
 \*\*\* SIGN DENOTES HEADINGS.

THE ACEING VERVOL COMPANY

0210-20000-1

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN MPH'S FOR GREAT CIRCLE AIR COURSES

FLIGHT IN FEET	EQUILY ALE AT M F A D N I Y D S O												STANDARD DEVIATION					
	JAN	APR	JUL	DEC	00450	A75	A85	JAN	APR	JUL	DEC	00450	A75	A85	JAN	APR	JUL	DEC
FORT LEAVENWORTH TO LUKE AFB																		
5000	-5	-5	-5	-3	-3	-11	-12	4	5	5	3	4	-1	-2	9	9	9	9
10000	-16	-12	-7	-9	-11	-10	-20	14	11	7	0	9	2	1	12	10	0	0
18000	-33	-26	-14	-10	-22	-34	-30	27	22	13	15	10	7	5	19	17	10	0
FORT LEAVENWORTH TO MCGUIRE AFB																		
5000	14	10	7	9	9	2	0	-15	-11	-7	-9	-11	-10	-20	12	12	0	0
10000	28	19	13	13	17	8	6	-30	-21	-14	-15	-20	-29	-32	13	13	-10	0
18000	45	28	20	27	28	16	13	-49	-32	-20	-31	-32	-47	-51	19	19	11	0
FORT LEAVENWORTH TO MEMPHIS																		
5000	7	4	2	5	4	-3	-5	-9	-6	-3	-5	-6	-14	-17	14	14	10	11
10000	13	10	4	4	0	0	-2	-10	-13	-4	-10	-12	-21	-24	14	14	11	0
18000	20	16	9	15	14	2	0	-33	-24	-10	-21	-21	-36	-40	22	21	12	0
FORT LEAVENWORTH TO MEXICO CITY																		
5000	-6	-7	-6	-1	-6	-11	-12	5	7	6	1	4	0	-2	9	9	0	0
10000	-7	-6	-2	-2	-5	-11	-12	5	6	2	1	2	-2	-4	9	9	7	0
18000	-15	-10	-2	-5	-7	-17	-19	5	3	1	1	2	-3	-7	14	13	7	12
FORT LEAVENWORTH TO MINN-ST PAUL																		
5000	-1	0	2	0	0	-9	-11	0	-1	-3	-1	-2	-11	-13	14	14	11	13
10000	0	0	1	0	0	-9	-12	-4	-2	-3	-2	-3	-13	-15	14	13	11	0
18000	-3	0	1	-3	-1	-14	-10	-12	-8	-6	-6	-6	-21	-24	22	21	13	21
FORT LEAVENWORTH TO MINOT AFB																		
5000	-9	-5	-2	-7	-6	-14	-16	0	4	1	0	4	-3	-3	12	13	10	0
10000	-16	-9	-7	-11	-11	-20	-22	13	0	5	9	0	0	-2	13	13	11	0
18000	-26	-16	-12	-20	-18	-31	-34	15	10	4	13	11	0	-3	20	19	13	0
FORT LEAVENWORTH TO NELLIS AFB																		
5000	-4	-4	-3	-2	-4	-9	-10	4	4	3	2	3	-2	-3	9	9	0	0
10000	-16	-11	-8	-10	-11	-18	-20	14	10	0	9	10	3	1	11	10	0	0
18000	-33	-25	-16	-21	-23	-35	-30	20	22	15	10	19	9	7	19	17	10	0
FORT LEAVENWORTH TO NEW CUMBERLAND																		
5000	14	10	7	9	9	2	0	-15	-11	-7	-9	-11	-10	-20	13	12	0	0
10000	28	19	13	14	17	9	6	-29	-20	-13	-15	-19	-29	-31	13	13	10	0
18000	44	28	19	26	27	15	12	-49	-32	-20	-30	-31	-47	-51	20	19	11	0
FORT LEAVENWORTH TO NEW ORLEANS																		
5000	1	0	0	2	0	-6	-8	-3	-2	0	-2	-2	-9	-11	13	12	0	0
10000	4	3	0	1	2	-5	-7	-9	-6	0	-5	-5	-14	-16	13	13	0	0
18000	4	7	5	7	5	-4	-7	-20	-16	-6	-12	-13	-23	-20	19	18	10	0

• HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 • A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT PROBABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN FEET	F O U L Y A L E N Y M F A D M J J A S O												RETURN			STANDARD DEVIATION				
	JAN	APR	JUL	OCT	NOV	FEB	MAY	AUG	SEP	OCT	NOV	DEC	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT
FORT LEAVENWORTH TO NIAGARA FALLS																				
5000	13	8	7	9	9	9	1	0												
10000	24	16	12	14	16	16	7	5												
18000	38	24	19	24	25	25	13	10												
FORT LEAVENWORTH TO CINCINNATI AFB																				
5000	-4	-4	-3	-1	-1	-3	-8	-10												
10000	-14	-11	-7	-9	-10	-17	-19	-19												
18000	-32	-25	-15	-19	-22	-34	-37	-37												
FORT LEAVENWORTH TO PATRICK AFB																				
5000	5	4	2	4	4	3	-2	-4												
10000	13	10	3	6	7	7	0	-1												
18000	21	19	7	13	13	13	4	2												
FORT LEAVENWORTH TO PITTSBURGH																				
5000	14	9	7	9	9	9	1	0												
10000	27	18	12	14	17	17	8	5												
18000	43	27	19	26	27	27	14	11												
FORT LEAVENWORTH TO REGINA																				
5000	-9	-5	-2	-7	-6	-6	-14	-16												
10000	-17	-10	-8	-12	-12	-20	-20	-22												
18000	-27	-17	-13	-22	-20	-32	-35	-35												
FORT LEAVENWORTH TO SCOTT AFB																				
5000	12	8	6	6	6	6	0	0												
10000	24	16	9	14	15	15	5	2												
18000	39	24	16	25	24	24	11	8												
FORT LEAVENWORTH TO SELFRIDGE AFB																				
5000	12	8	7	7	7	7	1	0												
10000	23	15	12	14	15	15	6	4												
18000	37	23	18	23	24	24	11	8												
FORT LEAVENWORTH TO SHAW AFB																				
5000	11	8	5	6	6	7	0	-1												
10000	22	16	7	9	12	12	4	2												
18000	34	26	12	20	21	21	9	7												
FORT LEAVENWORTH TO WESTOVER AFB																				
5000	14	9	8	9	9	9	2	1												
10000	27	18	13	15	15	17	9	7												
18000	42	26	20	26	27	27	15	13												

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*\*--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN FEET	EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION						
	EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												JAN	APR	JUL	OCT			
EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES													RETURN						
EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES													JAN	APR	JUL	OCT	00450	075	085
MURTSMITH													-12	-7	-7	-9	-9	-17	-19
5000	TO	7	0	7	0	-2												500	
10000	TO	11	12	13	4	2												10	
18000	TO	17	19	20	8	5												14	
YAKIMA													-39	-25	-19	-25	-26	-40	-44
5000	TO	-3	-6	-6	-11	-13												1190	
10000	TO	-8	-13	-13	-20	-22												9	
18000	TO	-19	-26	-25	-36	-39												10	
YELLOWKNIFE													6	5	3	5	4	0	-2
5000	TO	-1	-7	-4	-11	-13												9	
10000	TO	-8	-12	-11	-17	-19												10	
18000	TO	-13	-18	-16	-26	-28												17	
FORT ORD													19	10	6	12	11	5	3
5000	TO	3	-1	0	-7	-8												9	
10000	TO	-1	-2	-1	-9	-11												9	
18000	TO	-2	-2	-2	-14	-17												14	
FORT MCKER													16	9	0	13	11	2	0
5000	TO	2	4	3	-1	-2												625	
10000	TO	6	10	10	4	3												9	
18000	TO	12	19	18	10	8												9	
FORT SILL													1	2	-2	1	3	-2	-4
5000	TO	0	0	0	-4	-6												11	
10000	TO	4	8	8	1	0												13	
18000	TO	11	16	16	7	4												22	
FORT WALTERS													-6	-5	-2	-4	-5	-10	-11
5000	TO	-1	-1	-1	-5	-6												1947	
10000	TO	3	6	7	0	0												9	
18000	TO	9	16	15	5	3												9	
GEN MITCHELL													-16	-9	-5	-8	-10	-16	-20
5000	TO	4	7	6	0	0												0	
10000	TO	11	14	13	7	5												9	
18000	TO	21	25	23	14	11												14	
MILL AFB													-11	-6	-4	-8	-8	-14	-15
5000	TO	1	0	0	-5	-6												9	
10000	TO	4	5	6	0	-2												10	
18000	TO	10	16	14	2	0												15	

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--NOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.



EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN FFET	MONTHS												STANDARD DEVIATION
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
FORT LEWIS	MARTINSVILLE												
5000	7	5	3	5	3	5	4	0	-1				
10000	10	11	7	11	11	11	5	3					
15000	20	19	15	21	21	20	11	9					
FORT LEWIS	JUNEAU												
5000	1	3	0	1	0	-5	-7						
10000	-6	-3	-3	0	-3	-11	-13						
15000	-17	-6	-9	-11	-11	-23	-20						
FORT LEWIS	KODIAK												
5000	-4	0	-3	-1	-3	-9	-11						
10000	-11	-6	-6	-5	-7	-15	-17						
15000	-23	-12	-13	-10	-17	-28	-31						
FORT LEWIS	LITTLE ROCK												
5000	4	3	2	4	3	-1	-2						
10000	17	10	6	10	10	4	7						
15000	27	10	13	20	10	9	7						
FORT LEWIS	LOCKBOURNE												
5000	10	6	5	7	6	1	0						
10000	21	12	11	14	14	0	6						
15000	31	20	20	25	23	14	12						
FORT LEWIS	LUKE AFB												
5000	-1	-1	0	-2	-1	-6	-7						
10000	7	4	0	1	2	-4	-5						
15000	13	0	1	7	6	-4	-6						
FORT LEWIS	MEMPHIS												
5000	5	4	3	5	4	0	-1						
10000	10	11	7	11	11	5	3						
15000	20	19	14	21	19	10	0						
FORT LEWIS	MINN-ST PAUL												
5000	10	5	4	7	6	0	0						
10000	20	11	11	14	13	7	5						
15000	29	10	20	25	22	12	10						
FORT LEWIS	MINTO AFB												
5000	10	4	3	7	5	0	-2						
10000	10	10	10	14	12	5	4						
15000	26	17	19	23	21	10	7						

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 000--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN FEET	EQUVALENT HEADWIND RETURN												STANDARD DEVIATION					
	JAN	APR	JUL	OCT	0050	A75	A85	JAN	APR	JUL	OCT	0050	A75	A85	JAN	APR	JUL	OCT
FORT LEWIS	732 N.M.M.																	
5000	-1	-1	1	-2	-1	-0	-7	1	1	-1	2	0	-4	-5	9	6	6	7
10000	7	3	0	1	2	-4	-6	-9	-5	-1	-2	-4	-12	-14	13	12	6	11
18000	12	7	2	6	6	-5	-8	-20	-13	-5	-12	-12	-25	-28	21	19	13	18
FORT LEWIS	1990 N.M.M.																	
5000	11	6	5	8	7	2	0	-12	-7	-5	-8	-8	-14	-15	8	6	6	8
10000	21	12	12	14	14	8	7	-23	-14	-13	-15	-16	-23	-24	9	9	7	8
18000	32	21	21	24	24	15	13	-37	-25	-22	-28	-28	-37	-40	14	13	9	13
FORT LEWIS	1817 N.M.M.																	
5000	2	2	0	2	1	-3	-4	-3	-2	0	-2	-2	-7	-8	6	7	5	7
10000	14	9	4	6	8	2	1	-16	-10	-4	-9	-10	-16	-18	9	8	7	8
18000	24	17	10	17	16	7	4	-31	-22	-11	-21	-21	-31	-34	14	13	9	13
FORT LEWIS	1839 N.M.M.																	
5000	11	5	5	8	7	1	0	-12	-6	-5	-9	-8	-14	-16	9	9	7	9
10000	21	12	13	15	15	9	7	-22	-13	-13	-16	-16	-23	-24	9	9	7	9
18000	31	20	21	24	23	14	12	-35	-23	-23	-28	-27	-37	-39	14	14	13	14
FORT LEWIS	706 N.M.M.																	
5000	0	0	2	0	0	-5	-7	0	0	-2	0	-1	-6	-7	10	6	6	6
10000	3	2	-1	0	0	-7	-9	-6	-3	1	0	-2	-10	-12	14	12	6	11
18000	5	1	-1	0	0	-10	-13	-15	-8	-1	-6	-7	-20	-23	21	19	12	16
FORT LEWIS	1853 N.M.M.																	
5000	11	6	5	7	7	1	0	-12	-7	-5	-8	-8	-14	-15	9	9	6	8
10000	21	12	12	14	14	8	6	-22	-13	-12	-15	-16	-22	-24	9	9	7	9
18000	32	20	20	25	23	15	12	-36	-24	-22	-28	-27	-37	-40	14	14	9	14
FORT LEWIS	1570 N.M.M.																	
5000	3	3	2	1	2	-2	-4	-4	-3	-2	-2	-3	-8	-10	9	7	6	8
10000	-4	0	-2	2	-1	-7	-8	2	0	1	-3	0	-6	-7	10	8	7	8
18000	-13	-2	-5	-5	-6	-15	-18	7	-1	3	0	1	-6	-9	15	13	11	12
FORT LEWIS	795 N.M.M.																	
5000	11	4	3	7	5	0	-2	-12	-5	-2	-7	-7	-14	-16	11	10	6	10
10000	16	9	9	13	11	4	7	-18	-10	-9	-14	-13	-20	-22	12	10	9	10
18000	22	15	17	21	18	7	4	-27	-18	-13	-24	-22	-33	-36	18	17	13	18
FORT LEWIS	1800 N.M.M.																	
5000	8	5	4	6	5	0	0	-9	-6	-4	-6	-7	-12	-13	9	8	6	8
10000	19	11	9	12	12	6	4	-20	-12	-9	-13	-14	-20	-22	10	9	7	9
18000	30	19	17	23	21	12	10	-34	-23	-19	-27	-25	-36	-39	14	13	10	14

• HEADWINDS—COMPUTED FOR A 120-KT AIRSPEED.  
 • A—NOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITY.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADINGS AND STANDARD DEVIATION IN SVOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FFET	E U I V A L E N T M E A S U R E M E N T S												STANDARD DEVIATION														
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT					
<b>FORT LEWIS</b>																											
5000	11	5	5	5	7	1	0																	1070	7	8	
10000	21	12	12	15	14	8	7																	9	7	9	
18000	31	20	21	25	23	14	12																	15	14	10	14
<b>FORT LEWIS</b>																											
5000	11	5	5	5	7	1	0																	1030	7	9	
10000	20	11	12	15	14	7	6																	10	9	8	9
18000	30	19	21	24	23	14	11																	15	14	10	14
<b>FORT LEWIS</b>																											
5000	5	4	2	4	3	2	-3																	9	9	7	10
10000	0	2	0	1	1	-5	-4																	12	9	8	9
18000	-7	7	1	1	0	-9	-11																	16	15	12	15
<b>FORT ORD</b>																											
5000	4	4	2	1	2	-1	-2																	8	7	5	6
10000	16	12	4	7	9	3	2																	9	8	6	8
18000	30	25	8	16	18	8	6																	14	13	8	12
<b>FORT ORD</b>																											
5000	2	3	1	0	1	-3	-4																	0	0	3	7
10000	14	11	5	7	8	2	0																	11	10	7	9
18000	28	23	11	15	18	7	5																	16	16	10	13
<b>FORT ORD</b>																											
5000	2	2	0	0	0	-4	-5																	0	0	3	7
10000	13	11	3	4	7	1	0																	11	9	7	9
18000	28	23	8	14	16	6	4																	17	15	9	14
<b>FORT ORD</b>																											
5000	5	4	3	4	3	3	-2																	8	8	6	7
10000	15	9	9	10	10	4	3																	10	9	7	9
18000	27	20	18	19	20	11	9																	16	15	9	14
<b>FORT ORD</b>																											
5000	3	4	0	1	1	-3	-4																	9	8	6	7
10000	8	6	7	6	6	2	-2																	14	12	8	11
18000	17	14	15	12	14	2	0																	22	20	12	18
<b>FORT WND</b>																											
5000	5	5	3	3	3	-1	-2																	8	8	5	7
10000	17	13	6	9	10	4	3																	16	9	7	9
18000	31	24	12	18	19	10	8																	15	14	8	13

\*HEADINGS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*--DENOTES ANNUAL EQUIVALENT HEADINGS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADINGS.

EQUIVALENT HEADINGS AND STANDARD DEVIATION IN NOTES FOR GREAT CIRCLE AIR ROUTES

CITY IN FEET	EQUIVALENT HEADINGS												STANDARD DEVIATION		
	JAN	APR	JUL	OCT	0050	075	ABS	JAN	APR	JUL	OCT	0050		075	ABS
FORT OGD															
5000	1	3	-1	1	0	-4	-4	-2	-1	1	-2	-2	-7	-9	1399 M.M.
10000	-5	-2	-2	0	-2	-9	-11	1	0	1	-2	0	-7	-8	0 6 0 10
18000	-16	-4	-8	-8	-10	-20	-23	7	0	5	0	2	-7	-10	10 16 12 15
FORT OGD															
5000	-5	-1	-3	-3	-3	-9	-11	3	0	3	1	1	-4	-5	1751 M.M.
10000	-11	-5	-5	-5	-7	-14	-16	8	2	4	2	3	-3	-4	0 7 9 10
18000	-23	-13	-13	-14	-16	-26	-29	15	6	10	7	9	0	-3	12 11 8 10 17 15 12 15
FORT OGD															
5000	3	3	-2	1	0	-4	-5	-3	-3	2	-2	-1	-7	-9	640 M.M.
10000	-1	0	1	1	1	-4	-4	-2	-2	-1	-4	-3	-11	-13	0 6 6 8
18000	-4	-1	4	0	0	-13	-16	-5	-5	-7	-6	-6	-19	-22	14 13 0 12 22 20 13 19
FORT OGD															
5000	4	4	2	1	2	-2	-3	-4	-4	-2	-1	-3	-8	-9	1439 M.M.
10000	15	12	5	0	9	3	1	-17	-13	-5	-9	-11	-16	-20	0 5 7 9
18000	30	24	11	17	19	9	7	-34	-27	-12	-19	-22	-34	-37	10 9 7 9 16 15 9 14
FORT OGD															
5000	6	5	4	4	4	9	0	-7	-6	-4	-4	-6	-10	-11	1826 M.M.
10000	17	11	9	11	11	5	4	-19	-13	-9	-11	-13	-19	-21	0 7 5 7
18000	31	22	17	20	21	13	11	-37	-26	-10	-24	-25	-36	-39	10 9 7 8 15 14 8 13
FORT OGD															
5000	3	4	2	0	1	-3	-4	-3	-4	-1	1	-2	-7	-9	499 M.M.
10000	11	10	2	5	6	-1	-3	-12	-10	-2	-6	-7	-16	-18	0 6 6 7
18000	24	19	7	11	14	2	0	-20	-22	-8	-13	-17	-30	-34	14 12 8 11 21 19 12 17
FORT OGD															
5000	4	4	2	1	2	-2	-3	-5	-5	-2	-1	-4	-8	-10	1541 M.M.
10000	16	12	5	9	10	3	2	-17	-13	-5	-9	-11	-18	-20	0 8 5 7
18000	30	26	12	17	19	10	8	-35	-27	-12	-20	-23	-34	-37	10 9 7 9 16 14 9 13
FORT OGD															
5000	-3	-4	-3	-2	-4	-7	-8	3	4	4	2	3	0	-1	1576 M.M.
10000	5	4	-2	3	3	-4	-5	-7	-5	3	0	-2	-8	-9	0 6 5 7
18000	14	11	-3	3	4	-3	-5	-20	-16	2	-4	-8	-19	-22	13 11 7 10
FORT OGD															
5000	4	4	3	4	3	-1	-2	-5	-4	-3	-4	-4	-9	-11	1370 M.M.
10000	13	7	9	9	9	3	1	-15	-8	-9	-10	-11	-17	-19	0 6 6 7
18000	22	17	10	17	10	9	6	-29	-21	-19	-21	-22	-32	-35	10 10 7 9 17 15 13 14

EXPLANATION—COMPUTED FOR A 120-KT AIRSPEED.  
 004—HEADINGS ANNUAL FOUR VALENT HEADINGS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN NOTES HEADINGS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN CUTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT in FFEY	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN CUTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION				
	DIRECT				INDIRECT				INDIRECT				JAN	APR	JUL	OCT	
	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	0050	075	085	AB5	
FORT ORD																	
5000	6	4	2	4	WINDT AFB	-1	-2	-4	-4	-2	-4	-4	-4	-10	-11	0	1136 N.M.P.
10000	9	5	0	7	3	1	0	-11	-6	-8	-8	-9	-9	-15	-17	11	10 7 9
18000	14	11	16	13	13	3	1	-22	-16	-18	-17	-19	-29	-31	17	16	11 15
FORT ORD																	
5000	5	5	3	0	MELLIS AFB	-2	-4	-5	-5	-2	1	-3	-9	-10	10	9	326 N.M.P.
10000	11	9	4	5	7	-1	-3	-12	-10	-4	-7	-8	-17	-19	15	14	9 12
18000	25	20	12	13	16	4	1	-29	-23	-12	-15	-19	-33	-37	23	21	13 18
FORT ORD																	
5000	3	3	0	0	MW (CLEANS	-3	-8	-4	-3	3	0	-2	-7	-8	8	7	5 6
10000	14	11	2	6	7	1	0	-16	-12	-2	-7	-9	-14	-19	9	8	6 8
18000	28	24	5	14	14	6	4	-33	-27	-6	-17	-20	-32	-35	15	13	8 12
FORT ORD																	
5000	7	5	4	4	NIAGARA FALLS	0	0	-8	-6	-4	-5	-6	-11	-12	8	7	6 7
10000	17	10	11	11	12	6	5	-19	-12	-11	-12	-14	-20	-21	5	9	7 8
18000	29	21	19	20	21	13	11	-35	-25	-20	-24	-26	-35	-38	15	14	9 13
FORT ORD																	
5000	5	6	2	2	CINCINNATI AFB	-2	-3	-5	-5	-2	-2	-4	-10	-11	11	9	196 N.M.P.
10000	10	10	0	4	5	-3	-5	-11	-11	0	-5	-6	-16	-19	16	15	9 12
18000	18	12	4	7	9	-3	-6	-24	-17	-5	-10	-13	-28	-31	24	21	13 19
FORT ORD																	
5000	7	6	4	4	PITTSBURGH	0	0	-8	-6	-4	-5	-6	-11	-12	8	7	5 7
10000	18	12	10	11	12	6	5	-20	-13	-10	-12	-14	-20	-22	9	9	7 8
18000	31	22	18	20	21	13	11	-37	-26	-18	-24	-25	-36	-39	15	14	8 13
FORT ORD																	
5000	7	3	1	4	REGINA	3	-1	-7	-3	-1	-4	-4	-10	-11	9	8	6 8
10000	6	4	7	6	5	0	-2	-4	-4	-7	-7	-8	-14	-15	11	10	7 9
18000	8	8	14	9	10	0	-2	-17	-13	-16	-14	-16	-26	-28	17	16	11 16
FORT ORD																	
5000	5	4	3	2	SCOTT AFB	3	-1	-5	-5	-3	-2	-4	-9	-10	8	8	6 6
10000	15	11	7	13	10	4	3	-17	-12	-7	-10	-12	-18	-20	10	9	7 5
18000	29	22	15	18	20	11	8	-34	-25	-16	-21	-23	-34	-37	16	15	9 14
FORT ORD																	
5000	6	5	4	4	SELFRIDGE AFB	0	-1	-7	-5	-4	-5	-6	-11	-12	8	8	6 7
10000	16	10	10	11	11	5	4	-18	-11	-10	-12	-13	-19	-21	9	9	7 8
18000	28	21	18	20	21	12	10	-34	-24	-19	-24	-25	-35	-37	15	14	9 13

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 000--07000S ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN PFBT	F U L L Y A I R F I L T P E A R M J A N D S T E P T E M B E R												STANDARD DEVIATION			
	JAN	APR	JUL	OCT	NOV	APR	MAY	JUN	JUL	OCT	NOV	APR		MAY	JUN	JUL
FORT ORD	1700 M.L.M.															
5000	4	4	4	5	4	0	-1	-7	-5	-4	-5	-4	-11	-12	0	0
10000	15	9	10	11	11	5	3	-17	-10	-11	-12	-13	-19	-20	9	9
18000	26	19	19	19	20	12	9	-30	-23	-20	-23	-20	-34	-30	13	14
FORT ORD	200 M.L.M.															
5000	2	2	2	2	0	-5	-4	-1	-2	2	-2	-1	-7	-9	10	9
10000	-2	0	2	2	0	-7	-9	-1	-2	-3	-4	-3	-11	-13	13	13
18000	-7	-2	2	-1	-2	-14	-10	-3	-4	-4	-5	-5	-17	-20	22	20
FORT DFW	1971 M.L.M.															
5000	4	3	0	2	2	-2	-4	-4	-3	0	-3	-3	-8	-9	0	7
10000	-1	0	0	2	0	-5	-7	-1	-2	-1	-4	-3	-8	-10	10	9
18000	-6	0	1	-1	-1	-10	-13	-2	-4	-4	-5	-4	-13	-15	15	14
FORT PUCKER	600 M.L.M.															
5000	-9	-7	-3	-5	-6	-14	-15	0	6	3	5	5	-1	-3	12	12
10000	-21	-16	-3	-9	-12	-22	-24	20	15	3	0	10	2	0	12	12
18000	-39	-31	-5	-20	-23	-38	-42	33	20	5	17	19	6	4	10	17
FORT PUCKER	600 M.L.M.															
5000	-10	-8	-3	-4	-6	-14	-16	9	7	3	4	5	-1	-3	12	11
10000	-21	-14	-2	-8	-12	-22	-24	20	15	2	0	10	1	0	12	12
18000	-39	-31	-2	-19	-22	-38	-42	35	20	2	17	19	3	2	10	17
FORT PUCKER	700 M.L.M.															
5000	-2	-2	0	-1	-2	-9	-11	0	0	0	0	0	-7	-9	13	12
10000	-6	-4	-1	-2	-4	-12	-14	0	0	0	0	0	-8	-10	13	13
18000	-14	-11	-4	-8	-9	-21	-24	-5	0	2	0	0	-11	-14	19	19
FORT PUCKER	1400 M.L.M.															
5000	-5	-4	-2	-3	-4	-9	-11	4	3	1	2	2	-2	-4	9	9
10000	-18	-13	-5	-10	-11	-19	-21	17	11	4	9	9	3	1	10	10
18000	-35	-27	-11	-21	-23	-35	-38	20	22	10	10	10	0	0	10	15
FORT PUCKER	620 M.L.M.															
5000	-3	0	-2	0	-2	-9	-10	2	3	2	0	0	-5	-7	11	10
10000	5	4	-1	0	1	-5	-7	-7	-6	1	0	-3	-11	-13	12	12
18000	14	14	0	5	7	-2	-4	-21	-19	0	-7	-11	-23	-27	10	16
FORT PUCKER	220 M.L.M.															
5000	10	8	4	4	6	-1	-2	-10	-9	-4	-4	-7	-15	-16	12	12
10000	21	17	5	5	11	1	0	-21	-17	-4	-6	-12	-22	-23	14	14
18000	37	28	5	18	20	6	3	-39	-31	-5	-19	-22	-39	-43	19	19

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT DELIABILITIES.  
 \*\*\*MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AID COURSES

HEIGHT IN FEET	E S L I V I L E T Y M E A D R I N D S O												STANDARD DEVIATION					
	JAN	APR	JUL	OCT	00450	075	A05	JAN	APR	JUL	OCT	00450	075	A05	JAN	APR	JUL	OCT
MUNTSVILLE																		
FORT RUCKER	TO																	
5000	-1	0	-1	-1	-9	-11		0	0	0	1	0	-7	-9	13	13	216	0
10000	-7	0	-2	-3	-13	-15		1	2	0	1	0	0	-8	-10	16	16	10
18000	-15	-5	-7	-10	-23	-26		-1	4	4	2	2	-9	-12	20	20	11	10
JACKSONVILLE																		
FORT RUCKER	TO																	
5000	6	7	2	4	-2	-4		-7	-7	-2	-4	-3	-13	-15	12	12	204	0
10000	17	14	3	4	8	0	-2	-19	-15	-3	-5	-10	-20	-23	16	13	9	13
19000	33	27	4	16	18	5	2	-37	-30	-4	-17	-21	-37	-41	19	19	10	17
KEY WEST																		
FORT RUCKER	TO																	
5000	-4	-2	-3	-3	-3	-11		3	1	3	1	2	-4	-5	11	10	7	7
10000	2	2	-2	0	-7	-4		-4	-3	2	0	-1	-8	-10	12	11	0	1-
18000	7	9	0	2	4	-7		-15	-14	1	-4	-7	-18	-21	16	15	9	13
LAWSON AFB																		
FORT RUCKER	TO																	
5000	-7	-5	-2	-5	-5	-10	-12	6	4	2	4	3	-1	-2	6	6	0	7
10000	-19	-12	-6	-11	-12	-19	-21	17	10	6	10	10	4	3	9	9	7	0
18000	-33	-23	-14	-23	-33	-36		27	19	12	19	18	9	7	14	14	9	13
LITTLE ROCK																		
FORT RUCKER	TO																	
5000	-8	-7	-2	-4	-5	-13	-15	7	6	2	4	4	-2	-4	13	13	0	11
10000	-19	-14	-3	-8	-11	-21	-23	16	12	2	7	8	0	-2	13	14	0	13
18000	-35	-29	-7	-18	-21	-37	-40	26	24	7	15	16	4	2	20	19	10	18
LOCKBURN																		
FORT RUCKER	TO																	
5000	3	2	1	1	1	-5	-7	-6	-3	-1	-2	-3	-11	-13	13	12	0	11
10000	4	3	2	2	2	-5	-7	-11	-7	-3	-4	-6	-15	-17	14	14	0	13
18000	6	0	0	2	2	-9	-11	-24	-12	-2	-11	-11	-25	-29	26	19	10	18
LOWLAND AFB																		
FORT RUCKER	TO																	
5000	8	6	5	5	3	-1		-10	-7	-5	-6	-7	-14	-15	13	10	7	9
10000	14	11	8	6	10	1		-21	-15	-9	-11	-14	-22	-24	12	12	0	11
18000	27	14	10	13	16	6	3	-39	-23	-13	-24	-24	-37	-41	17	17	10	14
LUKE AFB																		
FORT RUCKER	TO																	
5000	-6	-5	-2	-2	-4	-11		5	4	2	2	3	-2	-3	9	8	6	0
10000	-19	-14	-2	-7	-10	-20		18	14	2	7	9	2	0	10	9	7	0
18000	-37	-30	-4	-12	-22	-34	-39	33	27	4	16	18	6	4	15	14	6	13
MCQUIPPE AFB																		
FORT RUCKER	TO																	
5000	10	7	4	4	5	0	-2	-11	-8	-4	-5	-7	-14	-16	12	11	0	10
10000	18	14	7	7	11	2	0	-22	-17	-7	-8	-13	-23	-25	13	13	9	12
18000	30	18	8	17	16	5	2	-41	-26	-9	-22	-23	-39	-43	19	18	10	18

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION					
	DIRECT			EQUVALENT			HEADWINDS			PERCENT			JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	00450	075	ABS	JAN	APR	JUL	OCT	00450	075	ABS	JAN	APR	JUL	OCT
<b>FORT RUCKER</b>	<b>MEMPHIS</b>																	
5000	-6	-5	-2	-3	-4	-12	-14	5	4	2	3	3	-4	-4	13	13	13	13
10000	-16	-12	-2	-6	-9	-19	-21	12	10	2	5	6	-2	-4	14	14	14	14
18000	-30	-25	-7	-16	-18	-33	-37	18	19	7	12	12	1	0	20	20	20	20
<b>FORT RUCKER</b>	<b>MEXICO CITY</b>																	
5000	-5	-6	-1	0	-3	-9	-10	4	6	1	0	2	-2	-4	9	9	9	9
10000	-10	-8	0	-2	-5	-11	-13	9	8	0	2	4	-1	-2	9	9	9	9
18000	-23	-18	3	-8	-11	-22	-25	20	15	-3	7	0	-1	-3	13	12	12	10
<b>FORT RUCKER</b>	<b>PINNAC ST PAUL</b>																	
5000	-6	-4	-1	-3	-4	-11	-13	3	3	1	3	2	-4	-6	12	11	11	11
10000	-17	-9	-4	-6	-8	-16	-18	6	5	3	4	4	-3	-5	12	13	13	12
18000	-23	-17	-9	-15	-15	-27	-30	6	8	6	0	6	-3	-5	18	18	18	17
<b>FORT RUCKER</b>	<b>MINOT AFB</b>																	
5000	-8	-5	-2	-6	-6	-12	-14	7	4	2	5	4	-2	-3	11	10	10	10
10000	-16	-11	-6	-10	-11	-18	-20	12	8	5	8	8	1	0	11	11	11	11
18000	-28	-20	-12	-20	-20	-31	-34	16	13	9	14	12	3	0	16	16	16	15
<b>FORT RUCKER</b>	<b>NELLIS AFB</b>																	
5000	-5	-5	-2	-2	-4	-9	-10	4	4	2	1	2	-3	-3	8	8	8	8
10000	-18	-14	-4	-8	-11	-18	-20	17	13	4	8	10	3	1	18	18	18	17
18000	-36	-29	-8	-19	-22	-35	-38	32	26	8	16	18	0	0	15	14	14	13
<b>FORT RUCKER</b>	<b>NEW CUMBERLAND</b>																	
5000	8	6	3	4	5	-2	-3	-10	-7	-3	-4	-6	-14	-16	12	11	11	11
10000	15	12	6	6	9	1	0	-20	-15	-6	-7	-12	-21	-24	13	13	13	13
18000	25	14	6	15	13	2	0	-38	-23	-8	-20	-21	-36	-40	19	19	19	18
<b>FORT RUCKER</b>	<b>NEW ORLEANS</b>																	
5000	-10	-8	-3	-4	-6	-14	-16	10	8	4	3	5	-1	-3	12	12	12	12
10000	-20	-16	-3	-6	-11	-21	-24	20	16	3	6	10	1	0	13	13	13	13
18000	-38	-30	0	-18	-21	-38	-41	35	27	0	16	18	3	0	18	18	18	17
<b>FORT RUCKER</b>	<b>NIAGARA FALLS</b>																	
5000	5	3	2	3	3	-3	-5	-7	-4	-2	-3	-4	-11	-13	12	12	12	12
10000	9	6	4	4	5	-2	-4	-15	-10	-5	-6	-9	-18	-20	13	13	13	13
18000	12	4	3	9	6	-4	-7	-30	-16	-6	-16	-16	-30	-34	19	19	19	18
<b>FORT RUCKER</b>	<b>OXNARD AFB</b>																	
5000	-5	-5	-2	-1	-4	-8	-10	5	4	2	1	2	-1	-2	6	7	7	7
10000	-17	-14	-3	-7	-10	-17	-19	16	13	3	7	9	3	1	9	9	9	9
18000	-35	-29	-7	-17	-21	-34	-37	31	26	6	15	18	7	5	14	13	13	12

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 MINUS SIGN DENOTES HEADWINDS.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	JAN	APR	JUL	JULY	JULY	JULY	JULY	JULY	JULY	JULY	JULY	JULY	JAN	APR	JUL	OCT		
FORT RUCKER																300 lb. mt.		
5000	1	3	0	2	1	5	4	-2	-4	3	-2	-2	-9	-11	11			
10000	11	9	1	2	5	-2	-4	-13	-11	-1	-3	-7	-16	-18	13			
18000	24	21	3	10	12	2	0	-30	-25	-3	-13	-16	-31	-34	16			
FORT RUCKER																611 lb. mt.		
5000	6	3	2	2	3	-4	-5	-9	-5	-2	-3	-5	-12	-14	12			
10000	9	7	4	4	5	-2	-4	-15	-11	-4	-5	-9	-18	-20	13			
18000	14	6	3	9	7	-3	-6	-31	-17	-5	-16	-16	-31	-34	19			
FORT RUCKER																1630 lb. mt.		
5000	-9	-5	-3	-4	-4	-12	-14	7	4	2	5	4	-1	-3	10			
10000	-17	-11	-7	-11	-12	-19	-21	13	9	6	9	9	2	0	10			
18000	-29	-20	-13	-21	-20	-31	-34	17	13	10	15	13	4	2	13			
FORT RUCKER																490 lb. mt.		
5000	-4	-4	-1	-3	-3	-11	-13	2	2	1	2	1	-5	-7	13			
10000	-11	-9	-2	-5	-7	-16	-18	5	6	1	3	3	-5	-7	14			
18000	-23	-19	-6	-13	-14	-28	-31	5	9	5	7	6	-4	-7	26			
FORT RUCKER																670 lb. mt.		
5000	2	1	1	1	1	-5	-7	-5	-2	-1	-2	-3	-10	-12	12			
10000	2	1	1	2	1	-6	-8	-9	-6	-2	-4	-5	-14	-16	13			
18000	1	-1	0	2	0	-10	-13	-21	-9	-2	-10	-10	-23	-26	19			
FORT RUCKER																300 lb. mt.		
5000	11	6	4	3	6	-1	-2	-11	-9	-4	-4	-7	-15	-17	12			
10000	19	15	5	5	10	1	0	-21	-17	-5	-6	-12	-22	-25	14			
18000	33	23	5	17	17	5	2	-39	-28	-5	-19	-21	-38	-42	19			
FORT RUCKER																982 lb. mt.		
5000	9	7	4	5	6	2	-2	-11	-8	-4	-5	-7	-14	-16	11			
10000	17	14	7	8	11	2	1	-22	-17	-3	-9	-14	-23	-26	13			
18000	29	17	9	18	16	6	3	-41	-25	-11	-23	-24	-38	-42	18			
FORT RUCKER																600 lb. mt.		
5000	1	0	1	1	0	-5	-9	-4	-1	-1	-1	-2	-9	-11	12			
10000	0	0	0	1	0	-7	-9	-8	-4	-2	-3	-5	-13	-15	13			
18000	-1	-3	0	0	-1	-12	-15	-18	-7	-1	-8	-8	-21	-24	19			
FORT RUCKER																1000 lb. mt.		
5000	-6	-5	-2	-4	-5	-10	-11	5	4	2	4	3	-1	-2	8			
10000	-19	-12	-6	-11	-12	-19	-21	17	10	6	10	10	4	3	9			
18000	-33	-24	-14	-23	-23	-33	-36	27	19	12	19	18	10	8	14			

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EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT			EQUIVALENT			M.F.A.D.M.I.N.D.S.O.			RETURN			JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	0050	075	085	JAN	APR	JUL	OCT	0050	075	085	JAN	APR	JUL	OCT
<b>FORT STILL</b>																		
5000	11	9	7	7	LOCKGASNE	0	1	0	-13	-10	-7	-7	-9	-17	-19	13	12	797
10000	24	17	8	11	14	5	3	-25	-18	-9	-12	-16	-25	-28	13	13	10	10
18000	38	26	12	20	22	10	7	-44	-30	-13	-24	-26	-42	-46	19	18	11	88
<b>FORT STILL</b>																		
5000	11	7	8	8	LOPING AFB	0	2	0	-13	-9	-8	-9	-10	-16	-18	16	10	1526
10000	21	14	11	13	14	7	5	-24	-16	-12	-15	-17	-24	-26	11	11	8	10
18000	34	21	16	21	22	12	9	-42	-27	-10	-27	-28	-40	-43	16	16	10	15
<b>FORT STILL</b>																		
5000	-7	-4	-2	-1	LUKE AFB	-10	-3	-10	3	3	2	0	1	-3	-4	10	9	697
10000	-17	-14	-4	-3	-11	-19	-21	-21	16	13	4	7	9	2	0	12	10	8
18000	-35	-29	-9	-7	-21	-35	-39	-47	31	26	9	16	18	7	4	19	17	10
<b>FORT STILL</b>																		
5000	13	9	7	7	MCGUIRE AFB	0	2	0	-14	-10	-7	-8	-10	-17	-18	11	11	1176
10000	26	19	10	11	15	7	5	-28	-20	-10	-12	-17	-27	-29	12	12	9	11
18000	42	28	14	23	25	13	11	-47	-32	-15	-27	-29	-44	-47	17	17	10	16
<b>FORT STILL</b>																		
5000	18	3	7	6	MEMPHIS	-2	0	-2	-11	-9	-7	-6	-9	-17	-19	14	13	415
10000	24	18	5	10	13	4	1	-25	-18	-5	-11	-15	-25	-28	16	13	9	11
18000	40	30	8	20	22	8	5	-43	-33	-8	-22	-25	-42	-46	21	19	11	19
<b>FORT STILL</b>																		
5000	-7	-8	-7	-1	MEXICO CITY	-14	-6	-14	6	8	7	1	5	0	-1	18	9	914
10000	-6	-5	-3	-1	-4	-10	-12	-12	4	4	3	1	3	-2	-4	9	9	9
18000	-11	-7	-3	-3	-6	-14	-16	-16	3	1	3	1	2	-5	-7	14	13	7
<b>FORT STILL</b>																		
5000	1	2	5	1	WINN-ST PAUL	-7	-5	-7	-3	-4	-5	-2	-4	-11	-13	12	12	659
10000	3	2	3	1	2	-5	-8	-8	-8	-5	-4	-4	-6	-14	-16	13	13	10
18000	3	4	4	1	3	-8	-11	-11	-18	-13	-7	-9	-11	-23	-27	20	19	11
<b>FORT STILL</b>																		
5000	-5	-1	1	-4	MINOT AFB	-12	-10	-12	3	0	-2	3	0	-6	-8	11	12	827
10000	-9	-5	-1	-7	-6	-14	-16	-16	5	3	0	4	2	-4	-6	12	12	9
18000	-16	-9	-4	-12	-10	-22	-25	-25	3	1	1	4	2	-8	-11	19	17	11
<b>FORT STILL</b>																		
5000	-2	-2	0	0	NELLIS AFB	-7	-8	-8	2	2	0	0	0	-4	-6	9	9	818
10000	-16	-13	-5	-9	-11	-18	-20	-20	15	12	5	8	9	2	0	12	10	6
18000	-34	-27	-11	-18	-21	-35	-38	-38	30	26	10	16	18	7	5	19	17	10

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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN FEET	F U L J V A L E N T M E A D M I N D S O												STANDARD DEVIATION					
	DIRECT						RETURN											
	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT
<b>FORT SILL</b>																		
5000	TO	12	9	7	7	NEW CUMBERLAND	0	-13	-10	-7	-8	-10	-17	-18	12	11	8	9
10000		26	18	10	11	15	5	-27	-20	-10	-12	-17	-26	-29	12	12	9	11
18000		41	27	13	22	23	9	-67	-31	-14	-26	-28	-43	-47	18	17	10	17
<b>FORT SILL</b>																		
5000	TO	5	3	1	3	NEW ORLEANS	-6	-6	-4	-1	-4	-4	-11	-13	12	12	8	11
10000		15	10	0	6	7	-3	-17	-12	0	-7	-9	-18	-21	12	12	9	12
18000		25	22	2	14	14	0	-33	-27	-2	-17	-19	-34	-38	19	18	10	17
<b>FORT SILL</b>																		
5000	TO	11	8	7	7	NIAGARA FALLS	0	-12	-9	-7	-8	-9	-16	-18	12	11	8	10
10000		22	15	9	11	13	3	-25	-17	-10	-13	-16	-25	-27	12	12	9	12
18000		34	22	14	19	21	7	-42	-28	-15	-25	-26	-40	-44	18	18	10	17
<b>FORT SILL</b>																		
5000	TO	-3	-3	-2	0	OXFORD AFB	-8	3	3	2	0	1	-3	-4	6	6	5	7
10000		-15	-12	-4	-7	-9	-19	13	12	4	7	8	2	0	11	10	7	9
18000		-33	-27	-11	-17	-21	-37	29	24	10	14	17	7	5	18	16	10	15
<b>FORT SILL</b>																		
5000	TO	5	5	2	4	PATRICK AFB	-3	-6	-6	-2	-4	-5	-11	-13	10	10	7	9
10000		16	13	2	6	8	1	-18	-14	-2	-7	-10	-19	-21	11	11	8	10
18000		30	26	4	15	17	3	-35	-29	-4	-17	-20	-35	-38	16	15	8	14
<b>FORT SILL</b>																		
5000	TO	12	9	7	7	PITTSBURGH	0	-13	-10	-7	-7	-9	-17	-19	12	12	8	10
10000		24	17	9	11	14	4	-26	-19	-10	-12	-17	-26	-28	12	13	9	12
18000		39	25	13	21	22	8	-45	-30	-14	-25	-27	-42	-44	19	18	10	17
<b>FORT SILL</b>																		
5000	TO	-5	-2	0	-4	PEGINA	-12	4	1	-1	3	1	-5	-7	11	11	9	10
10000		-12	-6	-3	-8	-8	-17	8	4	2	6	4	-2	-4	11	11	9	11
18000		-20	-12	-6	-15	-13	-27	9	5	3	8	5	-4	-6	18	16	11	16
<b>FORT SILL</b>																		
5000	TO	9	8	6	6	SCOTT AFB	-2	-11	-9	-8	-6	-9	-17	-19	14	13	9	11
10000		20	15	7	9	12	1	-22	-16	-7	-11	-14	-24	-26	14	14	10	13
18000		33	24	9	16	18	3	-40	-29	-10	-21	-23	-40	-44	21	20	11	19
<b>FORT SILL</b>																		
5000	TO	10	7	7	7	SELFRIDGE AFB	-1	-11	-9	-7	-7	-9	-16	-18	12	12	8	10
10000		20	14	9	11	13	4	-23	-15	-9	-12	-15	-24	-27	13	13	10	12
18000		32	21	12	17	19	5	-40	-27	-14	-23	-25	-39	-43	19	18	11	18

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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWINDS IN KNOTS												STANDARD DEVIATION								
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
FORT SILL	11	9	6	6	7	5	7	0	-1	-12	-10	-6	-5	-8	-16	-18	12	11	8	10	
5000	24	18	9	13	4	2	4	2	2	-25	-19	-6	-10	-15	-25	-27	12	12	9	12	
10000	40	31	8	20	22	9	7	7	7	-44	-33	-8	-23	-26	-42	-46	18	17	9	16	
FORT WOLTERS	12	9	7	8	9	2	0	0	0	-14	-10	-7	-8	-10	-17	-18	11	11	7	9	
5000	25	18	11	12	15	3	6	6	6	-27	-19	-11	-14	-17	-26	-25	12	12	8	11	
10000	40	26	15	23	24	13	10	10	10	-46	-31	-16	-27	-25	-43	-47	17	17	10	16	
FORT WOLTERS	6	6	7	6	6	0	-2	-2	-2	-10	-7	-7	-7	-8	-15	-17	12	12	8	10	
5000	17	11	8	9	11	4	0	0	0	-20	-14	-9	-11	-14	-22	-25	13	13	10	12	
10000	26	17	11	14	15	3	2	2	2	-36	-24	-14	-21	-23	-36	-40	19	18	11	18	
FORT WOLTERS	-1	-1	0	0	-1	-6	-7	-7	-7	1	0	0	0	0	-4	-6	6	8	6	7	
5000	-16	-9	-4	9	-10	-17	-18	-18	-18	14	8	4	8	8	1	0	10	9	8	9	
10000	-30	-21	-12	-21	-20	-32	-35	-35	-35	25	16	10	17	16	6	3	17	16	10	15	
FORT WOLTERS	-5	-1	0	-5	-3	-9	-10	-10	-10	3	1	0	4	1	-4	-5	9	8	7	9	
5000	-12	-4	-5	-10	-9	-14	-16	-16	-16	10	5	4	8	6	1	0	9	8	7	8	
10000	-21	-11	-8	-16	-14	-23	-25	-25	-25	12	6	5	10	7	0	-1	13	12	9	12	
FORT WOLTERS	7	6	6	6	5	-1	-3	-3	-3	-9	-7	-7	-5	-7	-15	-17	13	12	9	10	
5000	13	10	6	7	8	0	-1	-1	-1	-17	-12	-7	-8	-11	-20	-22	13	13	10	12	
10000	20	14	8	9	12	1	-1	-1	-1	-32	-22	-10	-16	-19	-33	-36	19	18	11	18	
FORT WOLTERS	0	0	2	0	0	0	-5	-6	-6	0	-1	-3	-1	-2	-7	-8	9	9	6	8	
5000	-14	-9	-2	-7	-8	-16	-18	-18	-18	13	8	2	7	7	0	-1	11	10	8	10	
10000	-30	-23	-8	-18	-19	-32	-35	-35	-35	24	18	7	15	14	4	1	19	17	10	16	
FORT WOLTERS	2	3	0	1	1	-4	-5	-5	-5	-3	-3	0	-2	-2	-8	-9	10	9	6	8	
5000	12	9	0	4	5	-1	-2	-2	-2	-14	-11	0	-5	-7	-15	-17	10	10	7	9	
10000	25	23	0	12	13	2	0	0	0	-30	-26	0	-13	-17	-30	-33	14	14	8	13	
FORT WOLTERS	10	8	4	4	6	0	-1	-1	-1	-11	-8	-4	-5	-7	-14	-16	11	11	7	9	
5000	21	16	4	7	11	2	1	1	1	-22	-17	-3	-8	-12	-22	-24	12	12	8	11	
10000	37	29	4	18	20	7	4	4	4	-41	-32	-4	-20	-24	-39	-43	17	16	9	15	

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUILIBRIUM HEADWIND						RETURN						STANDARD DEVIATION				
	JAN	APR	JUL	OCT	A75	A85	JAN	APR	JUL	OCT	A75	A85	JAN	APR	JUL	OCT	
<b>FORT WOLTERS</b>																	
5000	11	9	6	5	7	0	-1	-12	-9	-6	-5	-8	-16	-10	13	12	574 N.M.I.
10000	23	17	5	9	12	3	1	-24	-18	-5	-10	-14	-24	-27	13	13	8 10
18000	39	29	5	18	20	7	4	-43	-32	-5	-21	-24	-41	-45	19	18	9 13
<b>FORT WOLTERS</b>																	
5000	8	7	3	4	5	-1	-2	-9	-7	-3	-4	-6	-13	-14	11	11	850 N.M.I.
10000	19	15	2	7	10	2	0	-21	-16	-2	-7	-11	-21	-23	11	11	7 9
18000	35	28	2	17	19	5	2	-38	-31	-3	-19	-22	-37	-41	17	16	8 11
<b>FORT WOLTERS</b>																	
5000	0	1	-1	0	0	-5	-7	-2	-2	1	-1	-1	-7	-8	10	9	907 N.M.I.
10000	10	8	-1	4	4	-2	-3	-12	-9	2	-4	-6	-13	-15	10	10	6 8
18000	22	21	-1	10	11	0	-1	-27	-24	1	-12	-15	-28	-31	14	14	7 9
<b>FORT WOLTERS</b>																	
5000	-1	0	1	0	0	-5	-6	0	0	-1	0	0	-5	-6	8	8	1297 N.M.I.
10000	-15	-9	-3	-8	-9	-16	-17	13	8	3	7	7	1	0	10	9	6 7
18000	-29	-20	-10	-20	-19	-31	-34	22	15	8	16	14	4	2	17	15	7 15
<b>FORT WOLTERS</b>																	
5000	10	8	7	5	7	0	-2	-11	-9	-7	-5	-8	-16	-18	14	13	321 N.M.I.
10000	22	16	5	8	12	2	0	-23	-17	-5	-9	-13	-24	-26	14	13	9 11
18000	36	27	5	16	18	5	2	-40	-30	-5	-19	-22	-39	-43	21	19	10 13
<b>FORT WOLTERS</b>																	
5000	11	9	7	6	8	1	0	-12	-9	-7	-6	-9	-16	-18	12	12	839 N.M.I.
10000	22	16	7	10	13	4	2	-25	-17	-8	-11	-15	-25	-27	13	13	6 10
18000	36	24	10	18	20	8	6	-43	-29	-11	-22	-25	-40	-44	19	18	9 12
<b>FORT WOLTERS</b>																	
5000	11	7	6	8	8	2	1	-13	-8	-8	-8	-10	-16	-17	10	10	1614 N.M.I.
10000	21	14	10	12	13	6	5	-24	-16	-11	-14	-16	-24	-26	11	11	7 8
18000	34	20	15	20	20	11	9	-42	-27	-17	-26	-27	-39	-43	16	15	8 10
<b>FORT WOLTERS</b>																	
5000	-9	-3	0	0	-2	-7	-9	2	2	0	0	0	-4	-6	10	9	719 N.M.I.
10000	-17	-13	-2	-7	-10	-18	-20	16	13	2	6	8	1	0	12	10	6 8
18000	-35	-28	-6	-16	-20	-34	-38	31	26	5	14	17	5	3	19	16	8 10
<b>FORT WOLTERS</b>																	
5000	12	9	7	7	8	2	0	-14	-10	-7	-7	-10	-16	-18	11	11	1209 N.M.I.
10000	25	18	9	10	14	6	4	-27	-20	-9	-11	-16	-26	-28	12	12	7 9
18000	41	27	12	22	23	12	9	-44	-32	-13	-26	-28	-43	-47	17	16	8 11

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUILIBRIUM WINDS												STANDARD DEVIATION			
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	APR	JUN	OCT
FORT WOLTERS																
5000	10	9	7	5	7	0	-2	-11	-9	-7	-5	-8	-16	-18	13	425 M.M.F.
10000	23	17	5	9	12	3	1	-24	-18	-5	-10	-14	-24	-27	13	9 11
18000	38	28	5	17	20	6	3	-42	-31	-5	-20	-23	-40	-45	20	13 10 13
MEXICO CITY																
5000	-7	-7	-7	-1	-7	-12	-14	7	8	7	1	5	0	-1	10	803 M.M.F.
10000	-6	-5	-3	-2	-4	-10	-12	5	6	3	1	3	-2	-4	9	6 9
18000	-12	-7	-2	-4	-5	-14	-17	5	2	2	2	2	-4	-6	14	9 7 9
MINNAPOLIS																
5000	1	2	5	0	2	-5	-7	-3	-4	-5	-1	-4	-11	-13	12	760 M.M.F.
10000	2	2	3	1	2	-5	-8	-8	-5	-4	-3	-5	-14	-16	13	9 14
18000	1	2	3	2	1	-9	-12	-17	-12	-5	-7	-10	-22	-25	20	13 10 12
WELLES AFB																
5000	-4	-1	2	-3	-2	-9	-11	3	0	-2	2	0	-6	-8	11	940 M.M.F.
10000	-8	-4	-1	-4	-5	-15	-15	4	2	0	4	2	-5	-6	12	9 10
18000	-14	-9	-4	-11	-10	-21	-24	2	1	0	4	1	-8	-11	18	7 11 16
NEW GAMBELAND																
5000	-2	0	7	0	-1	-9	-8	1	1	0	-1	0	-5	-6	9	863 M.M.F.
10000	-15	-12	-3	-7	-9	-17	-19	14	11	3	7	8	1	0	11	11 10 10
18000	-33	-27	-8	-17	-20	-34	-37	29	24	7	15	17	6	4	18	17 11 16
5000	12	9	7	6	8	1	0	-13	-10	-7	-7	-9	-16	-18	11	1113 M.M.F.
10000	25	17	9	10	14	6	4	-27	-19	-9	-11	-16	-26	-28	12	7 9 11
18000	40	24	11	21	22	11	8	-46	-31	-12	-25	-27	-43	-46	17	17 10 16
5000	6	4	1	3	3	-3	-5	-7	-6	-1	-4	-4	-12	-14	12	442 M.M.F.
10000	15	12	0	8	8	0	-2	-16	-13	0	-7	-10	-19	-21	12	12 9 12
18000	29	25	0	15	15	1	0	-35	-29	0	-17	-20	-36	-39	19	17 10 17
NIAGARA FALLS																
5000	11	8	7	5	7	1	0	-14	-9	-7	-7	-9	-16	-18	12	1092 M.M.F.
10000	21	14	6	10	12	3	3	-24	-16	-9	-12	-15	-24	-26	12	11 8 9
18000	33	21	12	19	19	3	6	-42	-27	-13	-23	-25	-39	-43	16	12 9 11
CANNON AFB																
5000	-3	-3	0	1	-1	-6	-8	2	2	1	-1	0	-4	-5	8	1053 M.M.F.
10000	-15	-12	-3	-6	-9	-15	-18	14	11	3	6	7	1	0	11	6 5 7
18000	-33	-27	-8	-16	-20	-33	-36	29	24	7	14	16	6	4	17	15 9 16

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT			EQUIVALENT			HEADWINDS			PERCENT			JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	4450	475	485	JAN	APR	JUL	OCT	4450	475	485	JAN	APR	JUL	OCT
<b>FORT WOLTERS</b>																		
5000	5	5	2	3	3	-2	-3	-6	-6	-2	-4	-5	-11	-13	10	10	7	9
10000	16	13	1	6	8	0	0	-18	-14	-1	-6	-9	-18	-21	11	11	7	10
18000	31	26	1	15	17	4	1	-35	-29	-1	-17	-28	-35	-38	15	15	8	14
<b>FORT WOLTERS TO PITTSBURGH</b>																		
5000	11	9	7	6	8	1	0	-13	-10	-7	-7	-9	-17	-18	12	11	8	10
10000	23	16	8	10	13	5	3	-25	-18	-9	-11	-16	-25	-27	12	12	9	12
18000	37	26	11	19	21	9	7	-44	-30	-12	-24	-26	-41	-45	18	17	10	17
<b>FORT WOLTERS TO REGINA</b>																		
5000	-4	-1	1	-4	-2	-9	-11	3	0	-2	3	0	-6	-7	10	10	8	10
10000	-11	-6	-2	-7	-7	-14	-16	7	4	1	5	4	-2	-4	11	11	9	10
18000	-19	-11	-5	-14	-12	-23	-26	7	4	2	7	6	-4	-7	17	16	10	15
<b>FORT WOLTERS TO SCOTT AFB</b>																		
5000	9	8	7	5	7	0	-2	-10	-9	-7	-5	-8	-16	-18	13	13	9	11
10000	18	13	6	8	10	2	0	-21	-15	-6	-9	-13	-22	-25	13	13	10	13
18000	28	20	7	13	15	3	1	-37	-26	-8	-18	-21	-36	-40	20	19	11	18
<b>FORT WOLTERS TO SELFRIDGE AFB</b>																		
5000	10	7	7	5	7	0	-1	-11	-8	-7	-6	-8	-15	-17	12	12	8	10
10000	19	13	8	9	11	4	2	-22	-15	-8	-11	-14	-23	-25	12	12	9	12
18000	30	19	10	15	16	6	3	-39	-26	-12	-21	-23	-37	-41	19	18	10	17
<b>FORT WOLTERS TO SHAW AFB</b>																		
5000	11	9	5	5	7	0	0	-12	-9	-5	-5	-8	-15	-17	11	11	7	10
10000	24	18	5	8	12	4	2	-24	-18	-5	-9	-16	-23	-26	12	12	8	11
18000	40	30	6	19	22	8	5	-43	-33	-6	-22	-25	-41	-45	17	17	9	16
<b>FORT WOLTERS TO WESTOVER AFB</b>																		
5000	12	9	7	7	8	2	0	-13	-10	-7	-8	-10	-16	-18	11	10	7	9
10000	25	17	10	11	15	7	5	-27	-19	-10	-12	-17	-26	-28	11	11	8	11
18000	39	25	13	22	22	12	9	-46	-30	-15	-26	-28	-42	-46	17	16	9	16
<b>FORT WOLTERS TO HURTSMITH</b>																		
5000	8	6	6	5	6	0	-2	-10	-7	-6	-6	-8	-15	-16	12	11	8	10
10000	16	11	7	8	10	2	0	-20	-13	-8	-10	-13	-21	-23	12	12	9	12
18000	24	16	10	12	14	4	1	-35	-23	-12	-19	-21	-34	-38	18	18	10	17
<b>FORT WOLTERS TO YAKIMA</b>																		
5000	-1	0	1	0	0	-5	-6	0	0	-1	0	-1	-5	-7	8	8	6	7
10000	-15	-9	-3	-8	-9	-16	-17	13	8	3	7	7	1	0	10	9	7	9
18000	-25	-20	-11	-20	-19	-31	-34	23	15	6	16	14	4	2	17	15	10	15

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.

▲--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES. MINUS SIGN DENOTES HEADWINDS.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION					
	DIRECT			EQUVALENT			HEADWIND			RETURN			JAN	APR	JUL	OCT		
YELLOWKNIFE																		
5000	-4	-1	0	-5	-3	-8	-10	3	0	0	4	1	-4	-5	8	8	7	8
10000	-12	-6	-4	-9	-8	-14	-15	9	5	3	8	6	0	0	8	8	7	8
18000	-20	-11	-7	-15	-13	-22	-24	11	6	4	10	7	0	-2	13	12	9	12
1000 N.M.I.																		
GEN MITCHELL																		
5000	-3	-1	-4	-6	-4	-11	-12	1	0	3	5	2	-4	-6	10	10	9	10
10000	-6	-2	-4	-6	-5	-12	-13	3	0	2	3	2	-4	-6	10	10	9	10
18000	-14	-7	-7	-11	-10	-19	-22	6	2	2	4	3	-5	-7	15	14	11	14
1422 N.M.I.																		
HUMT: AAF																		
5000	-3	-1	-2	-2	-3	-9	-10	0	0	1	2	0	-4	-6	9	9	7	8
10000	-7	-3	-2	-4	-4	-11	-12	1	0	0	2	0	-5	-6	10	10	7	9
18000	-17	-7	-4	-11	-10	-19	-21	3	0	0	3	1	-7	-9	14	13	9	13
1961 N.M.I.																		
HUNTSVILLE																		
5000	-3	-2	-3	-5	-4	-9	-11	1	0	2	3	1	-4	-5	9	9	7	8
10000	-8	-3	-3	-5	-5	-12	-13	3	0	1	3	1	-4	-6	10	10	8	9
18000	-17	-8	-6	-11	-11	-20	-22	5	1	1	3	2	-6	-8	14	13	10	13
1870 N.M.I.																		
JUNEAU																		
5000	-4	-2	-3	-9	-5	-10	-11	4	2	3	8	4	0	-2	7	7	7	8
10000	-6	-6	-5	-9	-7	-12	-13	6	6	4	8	6	1	0	8	7	7	7
18000	-11	-12	-9	-14	-12	-19	-21	8	10	8	12	9	2	0	11	11	9	10
1890 N.M.I.																		
LAPSON AFB																		
5000	-7	-2	-4	-8	-6	-11	-13	6	2	3	7	4	0	-2	8	8	7	8
10000	-8	-5	-6	-9	-8	-13	-14	6	5	5	7	5	0	0	8	8	7	8
18000	-14	-12	-11	-15	-13	-21	-23	8	9	9	10	9	1	0	12	11	10	12
1917 N.M.I.																		
LITTLE ROCK																		
5000	-4	-2	-4	-5	-4	-10	-11	2	1	3	4	2	-3	-4	9	9	7	8
10000	-8	-4	-4	-6	-6	-12	-14	4	1	2	3	2	-3	-4	9	9	8	9
18000	-17	-9	-7	-11	-11	-20	-22	6	3	2	4	3	-4	-6	13	13	9	13
1934 N.M.I.																		
LOCK RUFFE																		
5000	-3	-1	-3	-5	-4	-10	-11	1	0	2	4	1	-4	-6	10	10	8	9
10000	-7	-2	-3	-5	-5	-12	-14	2	0	1	2	1	-5	-7	11	11	9	10
18000	-15	-7	-6	-11	-10	-20	-22	4	0	0	3	1	-7	-9	15	15	11	14
1532 N.M.I.																		
LOPING AFB																		
5000	0	0	-1	-1	-1	-8	-10	-2	0	0	0	-1	-8	-10	11	11	13	11
10000	-2	0	0	-1	-1	-9	-11	-1	-1	0	-1	-1	-9	-11	13	12	13	12
18000	-9	-4	-1	-4	-5	-16	-19	0	0	-3	-3	-2	-13	-15	17	17	13	17
1000 N.M.I.																		

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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWIND RETURN							STANDARD DEVIATION							
	JAN	APR	JUL	OCT	MAY	AUG	NOV	JAN	APR	JUL	OCT				
FROBISHER 5000	-1	-1	-2	-3	-2	-9	-10	-1	0	1	1	0	-6	-8	1439
10000	-5	-1	-2	-3	-3	-10	-12	0	0	0	0	0	-7	-9	10
18000	-14	-5	-3	-9	-8	-18	-21	2	0	-1	0	0	-9	-12	16
FROBISHER 10000	-4	-2	-4	-5	-4	-10	-11	2	1	3	4	2	-3	-4	9
10000	-8	-3	-4	-6	-6	-12	-14	4	1	2	3	2	-3	-5	9
18000	-17	-9	-6	-11	-11	-20	-22	6	2	2	4	3	-5	-7	14
FROBISHER 5000	-3	-1	-5	-6	-4	-11	-12	2	0	4	5	2	-3	-5	9
10000	-7	-3	-5	-7	-6	-13	-14	4	1	4	4	3	-3	-5	10
18000	-14	-8	-8	-12	-11	-20	-22	7	3	4	6	4	-4	-6	14
FROBISHER 5000	-4	-1	-5	-7	-5	-11	-13	3	1	4	6	3	-2	-4	9
10000	-7	-4	-6	-7	-7	-13	-14	5	2	5	5	4	-2	-3	9
18000	-13	-9	-11	-13	-12	-21	-23	8	5	7	7	6	-1	-3	13
FROBISHER 5000	-1	-1	-2	-4	-3	-9	-10	0	0	1	2	0	-5	-7	10
10000	-5	-1	-2	-4	-4	-10	-12	1	0	0	1	0	-6	-8	11
18000	-14	-6	-4	-9	-8	-18	-21	3	0	0	1	0	-9	-11	15
FROBISHER 5000	-2	-1	-3	-4	-3	-10	-11	0	0	2	3	1	-5	-7	10
10000	-5	-1	-2	-4	-3	-11	-12	2	0	0	1	0	-6	-8	11
18000	-14	-6	-4	-10	-9	-19	-22	4	0	0	2	1	-8	-11	16
FROBISHER 5000	-2	-1	-3	-4	-3	-9	-11	0	0	2	3	1	-5	-7	10
10000	-6	-2	-2	-5	-4	-11	-13	2	0	0	2	0	-6	-7	11
18000	-15	-6	-5	-10	-9	-19	-22	3	0	0	2	1	-8	-10	15
FROBISHER 5000	-1	0	0	0	-1	-6	-7	0	0	0	0	0	-5	-7	9
10000	-3	-5	-5	-6	-5	-10	-12	3	4	5	6	4	0	-1	0
18000	-6	-10	-9	-11	-10	-17	-19	4	8	8	10	7	0	-1	0
FROBISHER 5000	-5	-2	-5	-7	-5	-12	-13	4	1	4	6	3	-2	-4	9
10000	-7	-4	-6	-7	-7	-13	-14	5	3	5	5	4	-1	-3	9
18000	-13	-10	-11	-13	-12	-21	-23	8	7	8	9	8	0	-2	13

HEADWINDS—COMPUTED FOR A 120-KT AIRSPEED.  
 --- DEMOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DEMOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	JAN	APR	JUL	OCT	00450	475	AB5	JAN	APR	JUL	OCT	00450	475	AB5	JAN	APR	JUL	OCT
FRONTSHER 5000 10000 18000	TO																	
	-3	-1	-4	-5	-4	-10	-11	2	0	3	4	2	-3	-5	9	9	1694	1694
	-7	-3	-4	-6	-5	-12	-14	3	1	2	3	2	-4	-5	10	10	0	0
FRONTSHER 5000 10000 18000	TO																	
	-3	-1	-4	-5	-4	-10	-11	1	0	3	4	2	-4	-6	10	10	1361	1361
	-7	-3	-4	-6	-5	-12	-14	2	0	1	2	1	-5	-7	11	11	9	9
FRONTSHER 5000 10000 18000	TO																	
	-3	-1	-4	-5	-4	-10	-11	5	1	1	3	2	-7	-9	15	15	11	11
	-7	-3	-4	-6	-5	-12	-14	0	0	1	2	0	-9	-9	9	9	7	7
FRONTSHER 5000 10000 18000	TO																	
	-3	-1	-4	-5	-4	-10	-11	1	0	0	2	0	-5	-7	10	10	0	0
	-7	-3	-4	-6	-5	-12	-14	3	0	0	2	0	-7	-9	14	14	10	10
FRONTSHER 5000 10000 18000	TO																	
	-3	-1	-4	-5	-4	-10	-11	0	-1	0	-3	-1	-7	-9	8	9	767	767
	-7	-3	-4	-6	-5	-12	-14	-4	-2	-3	-3	-4	-11	-13	12	11	10	11
FRONTSHER 5000 10000 18000	TO																	
	-3	-1	-4	-5	-4	-10	-11	-9	-4	-3	-5	-6	-16	-19	17	16	14	14
	-7	-3	-4	-6	-5	-12	-14	0	0	1	1	0	-9	-9	0	9	9	9
FRONTSHER 5000 10000 18000	TO																	
	-3	-1	-4	-5	-4	-10	-11	-1	0	1	1	0	-6	-8	10	10	1300	1300
	-7	-3	-4	-6	-5	-12	-14	0	-1	0	0	-1	-8	-10	12	12	9	11
FRONTSHER 5000 10000 18000	TO																	
	-3	-1	-4	-5	-4	-10	-11	2	0	-2	0	0	-10	-13	16	16	12	12
	-7	-3	-4	-6	-5	-12	-14	1	0	3	4	2	-4	-6	10	10	9	10
FRONTSHER 5000 10000 18000	TO																	
	-3	-1	-4	-5	-4	-10	-11	3	0	1	2	1	-5	-7	11	11	9	11
	-7	-3	-4	-6	-5	-12	-14	5	2	1	4	2	-6	-9	15	15	12	14
FRONTSHER 5000 10000 18000	TO																	
	-3	-1	-4	-5	-4	-10	-11	6	2	3	7	4	0	-2	8	7	7	8
	-7	-3	-4	-6	-5	-12	-14	7	5	5	8	6	1	0	8	7	7	7
FRONTSHER 5000 10000 18000	TO																	
	-3	-1	-4	-5	-4	-10	-11	8	9	9	10	9	1	0	12	11	10	12
	-7	-3	-4	-6	-5	-12	-14	6	1	3	8	3	-2	-3	8	9	9	10
FRONTSHER 5000 10000 18000	TO																	
	-3	-1	-4	-5	-4	-10	-11	6	5	3	7	5	0	-1	13	13	11	12
	-7	-3	-4	-6	-5	-12	-14	6	10	8	12	9	1	0	13	13	11	12
FRONTSHER 5000 10000 18000	TO																	
	-3	-1	-4	-5	-4	-10	-11	7	3	3	6	5	0	-2	10	10	9	9
	-7	-3	-4	-6	-5	-12	-14	18	11	11	13	13	6	4	11	11	9	10
FRONTSHER 5000 10000 18000	TO																	
	-3	-1	-4	-5	-4	-10	-11	30	21	20	23	23	12	10	18	17	11	12
	-7	-3	-4	-6	-5	-12	-14	7	3	3	6	5	0	-2	10	10	9	9

MEANWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 STD-DEVIATIONS--ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PFD CENT RELIABILITIES.  
 PLUS SIG. NOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WIND IN FEET	REGION												STANDARD DEVIATION						
	DIXIE			E. G. H. V. A. L. E. N. T.			H. E. A. D. M. I. N. D. S.			WESTERN			JAN	APR	JUL	OCT			
	JAN	APR	JUL	JAN	APR	JUL	JAN	APR	JUL	JAN	APR	JUL	JAN	APR	JUL	OCT			
<b>GEN MITCHELL</b>																			
5000	0	0	0	HONESTAD AFB									-2	-2	0	-1	-2	-8	-9
10000	3	1	1	HONESTAD AFB									-8	-6	-1	-2	-4	-12	-13
10000	3	6	2	HONESTAD AFB									-19	-15	-4	-9	-11	-22	-23
<b>GEN MITCHELL</b>																			
5000	4	3	2	MUNTER AFB									-6	-5	-2	-3	-4	-11	-13
10000	6	6	4	MUNTER AFB									-14	-10	-5	-5	-9	-17	-20
10000	6	10	6	MUNTER AFB									-26	-20	-8	-14	-16	-29	-33
<b>GEN MITCHELL</b>																			
5000	0	0	0	MUNTSVILLE									-2	-2	0	-1	-2	-10	-12
10000	-1	0	0	MUNTSVILLE									-5	-4	-1	-2	-3	-13	-15
10000	-7	-1	1	MUNTSVILLE									-13	-10	-4	-8	-9	-21	-25
<b>GEN MITCHELL</b>																			
5000	2	2	1	JACKSONVILLE									-4	-4	-1	-2	-3	-10	-12
10000	5	4	2	JACKSONVILLE									-12	-8	-3	-4	-7	-15	-18
10000	4	7	4	JACKSONVILLE									-22	-17	-6	-12	-14	-26	-29
<b>GEN MITCHELL</b>																			
5000	-9	-4	-3	JUNEAU									8	3	3	8	5	0	-1
10000	-18	-10	-10	JUNEAU									16	9	10	14	12	6	5
10000	-28	-18	-16	JUNEAU									24	15	14	20	17	9	8
<b>GEN MITCHELL</b>																			
5000	-1	0	0	KEY WEST									0	-1	0	0	0	-7	-8
10000	1	1	0	KEY WEST									-6	-5	0	-1	-3	-10	-12
10000	0	4	1	KEY WEST									-16	-13	-3	-7	-9	-20	-22
<b>GEN MITCHELL</b>																			
5000	-11	-6	-5	LAPSON AFB									10	5	5	8	6	1	0
10000	-21	-12	-12	LAPSON AFB									21	11	12	15	14	7	6
10000	-34	-23	-22	LAPSON AFB									30	20	21	25	23	14	11
<b>GEN MITCHELL</b>																			
5000	-7	-4	-3	LITTLE ROCK									4	3	3	2	2	-4	-6
10000	-14	-8	-5	LITTLE ROCK									8	5	3	4	4	-4	-6
10000	-26	-15	-7	LITTLE ROCK									9	5	4	3	5	-6	-9
<b>GEN MITCHELL</b>																			
5000	10	8	5	LICKINGBURNE									-12	-9	-6	-7	-9	-17	-20
10000	20	14	11	LICKINGBURNE									-24	-16	-12	-12	-16	-27	-29
10000	30	21	16	LICKINGBURNE									-41	-27	-18	-26	-27	-63	-67

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A---DEMOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DEMOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWIND IN D.S.										STANDARD DEVIATION										
	DIRECT		RETURN		JAN		JUL		OCT		JAN	APR	JUL	OCT							
GEN MITCHELL 5000 10000 18000	TC	LORING AFB	7	9	10	9	2	0	-14	-8	-9	-11	-11	-19	-21	13	12	9	11	804 N.M.I.	
			23	13	14	17	16	7	5	-26	-15	-15	-19	-19	-28	-30	14	14	10	13	
			37	21	22	26	25	13	10	-42	-26	-24	-31	-30	-44	-47	20	19	13	19	
GEN MITCHELL 5000 10000 18000	TO	LUKE AFB	-6	-6	-5	-6	-12	-13	6	6	6	4	5	0	-1	9	9	7	8	1276 N.M.I.	
			-17	-12	-9	-11	-12	-21	15	11	8	9	10	3	2	11	10	8	10		
			-34	-25	-16	-21	-23	-38	27	21	15	16	18	9	7	17	16	9	15		
GEN MITCHELL 5000 10000 18000	TO	MCGUIPPE AFB	14	9	8	9	1	0	-15	-10	-8	-9	-11	-19	-21	14	13	9	11	620 N.M.I.	
			24	18	15	14	18	8	-30	-20	-15	-15	-20	-30	-33	15	15	11	13		
			42	28	21	25	27	15	-48	-32	-22	-30	-32	-47	-51	21	21	13	20		
GEN MITCHELL 5000 10000 18000	TO	MEMPHIS	-4	-2	-2	-2	-3	-11	2	1	2	1	1	-6	-8	14	13	9	11	474 N.M.I.	
			-10	-5	-3	-4	-6	-15	3	1	1	1	1	-7	-9	14	15	11	14		
			-20	-10	-4	-7	-10	-23	-27	1	0	0	-1	0	-12	-15	21	21	12	20	
GEN MITCHELL 5000 10000 18000	TO	MEXICO CITY	-7	-7	-4	-2	-5	-11	6	6	4	1	4	-1	-2	9	9	6	8	1512 N.M.I.	
			-11	-8	-3	-4	-7	-13	8	6	3	3	4	0	-2	9	9	7	9		
			-23	-14	-1	-8	-10	-21	-24	12	7	0	4	4	-2	-4	14	13	7	12	
GEN MITCHELL 5000 10000 18000	TO	MINN-ST PAUL	-13	-6	-6	-9	-9	-18	12	7	6	9	8	0	-2	15	14	11	13	262 N.M.I.	
			-23	-14	-14	-16	-17	-27	22	13	14	15	15	6	3	15	16	12	15		
			-39	-24	-22	-28	-28	-43	33	21	21	24	24	10	7	23	22	14	22		
GEN MITCHELL 5000 10000 19000	TO	MINOT AFB	-12	-7	-6	-10	-9	-18	11	4	5	9	7	0	-2	13	13	10	13	650 N.M.I.	
			-22	-13	-14	-16	-17	-26	21	12	13	15	15	6	4	13	14	11	13		
			-35	-24	-22	-28	-27	-40	30	20	21	24	23	11	8	20	19	13	19		
GEN MITCHELL 5000 10000 18000	TO	NELLIS AFB	-6	-5	-5	-4	-6	-11	5	5	5	4	4	0	-1	9	9	6	8	1309 N.M.I.	
			-17	-11	-10	-11	-13	-19	15	10	9	10	10	4	3	10	10	8	9		
			-34	-24	-18	-23	-24	-35	28	21	18	19	20	11	9	17	16	10	15		
GEN MITCHELL 5000 10000 18000	TO	NEW CUMBERLAND	14	9	8	9	1	0	-15	-10	-8	-9	-11	-19	-21	14	13	9	11	519 N.M.I.	
			27	19	14	13	17	7	-29	-20	-15	-15	-20	-30	-33	15	15	11	14		
			42	27	21	25	27	14	-48	-32	-22	-30	-32	-46	-52	22	22	13	21		

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN FEET	EQUIVALENT HEADWIND RETURN												STANDARD DEVIATION					
	DIRECT			A75			A85			A75			A85			JAN	APR	JUL
GEN MITCHELL	TO																	
5000	-4	-3	-2	-1	-3	-10	-12											773 N.M.I.
10000	-8	-5	-2	-2	-5	-13	-15											12 12 8 10
18000	-19	-9	0	-6	-8	-20	-24											13 13 9 12
																		19 18 10 10
GEN MITCHELL	TO																	
5000	14	8	8	10	9	1	0											393 N.M.I.
10000	27	17	15	16	18	8	6											14 14 10 12
18000	42	25	22	27	27	14	11											15 16 12 14
																		23 22 14 22
GEN MITCHELL	TO																	
5000	-6	-5	-4	-3	-5	-10	-11											1540 N.M.I.
10000	-16	-10	-9	-10	-11	-18	-19											8 8 6 7
18000	-32	-24	-18	-21	-23	-33	-36											10 9 7 9
																		16 15 9 14
GEN MITCHELL	TO																	
5000	1	2	1	1	1	-5	-6											941 N.M.I.
10000	5	4	2	2	3	-4	-5											11 11 7 10
18000	5	7	4	4	4	-4	-7											12 12 8 11
																		17 17 10 16
GEN MITCHELL	TO																	
5000	13	9	7	8	8	0	-1											371 N.M.I.
10000	26	17	14	13	17	7	5											15 14 10 12
18000	40	26	20	25	26	13	10											15 16 11 14
																		23 22 13 22
GEN MITCHELL	TO																	
5000	-11	-6	-5	-10	-8	-16	-18											827 N.M.I.
10000	-21	-12	-14	-16	-16	-24	-27											12 12 10 12
18000	-34	-22	-21	-27	-26	-37	-40											12 13 10 12
																		18 17 12 17
GEN MITCHELL	TO																	
5000	-6	-3	-3	-4	-4	-13	-15											271 N.M.I.
10000	-12	-7	-5	-6	-8	-18	-20											15 14 10 12
18000	-24	-13	-8	-11	-14	-28	-32											15 16 12 15
																		23 22 13 22
GEN MITCHELL	TO																	
5000	14	8	8	10	9	1	-1											224 N.M.I.
10000	26	17	15	16	18	8	5											15 14 10 13
18000	41	26	22	27	27	14	10											16 16 12 15
																		24 23 14 23
GEN MITCHELL	TO																	
5000	7	5	3	3	4	-3	-5											632 N.M.I.
10000	12	9	6	4	7	-1	-3											13 12 9 11
18000	14	14	8	10	10	0	-3											14 14 10 13
																		20 20 11 19

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 --- DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT PBLIARILITIES.  
 N.M.I. SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT						RETURN						JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	00A50	A75	A85	JAN	APR	JUL	OCT	00A50	A75	A85				
<b>GEN MITCHELL</b>																		
TO	TO	WESTOVER AFB												600 N.MI.				
5000	15	9	9	10	10	2	0	-16	-10	-9	-10	-12	-20	-22	13	13	9	11
10000	28	18	15	16	18	9	7	-29	-20	-16	-17	-20	-30	-33	15	15	11	13
18000	43	27	23	27	28	16	13	-47	-31	-24	-32	-33	-47	-51	21	21	13	20
<b>GEN MITCHELL</b>																		
TO	TO	MURTSWETH												221 N.MI.				
5000	11	5	7	9	9	-1	-3	-1	-6	-7	-10	-9	-19	-21	15	15	11	13
10000	21	12	12	14	14	4	2	-24	-14	-13	-16	-17	-27	-30	16	16	12	15
18000	32	19	18	21	21	8	4	-60	-25	-21	-27	-28	-43	-47	24	23	14	23
<b>GEN MITCHELL</b>																		
TO	TO	YAKIMA												1400 N.MI.				
5000	-11	-4	-4	-8	-8	-14	-15	10	5	4	7	6	0	0	9	9	7	9
10000	-21	-12	-12	-15	-15	-22	-24	20	11	11	14	13	7	5	10	10	8	9
18000	-34	-23	-22	-28	-27	-37	-40	30	20	21	25	23	14	11	16	15	10	15
<b>GEN MITCHELL</b>																		
TO	TO	YELLOWKNIFE												1504 N.MI.				
5000	-7	-3	-3	-9	-6	-12	-14	6	2	3	7	4	-1	-3	10	9	8	10
10000	-16	-9	-11	-13	-13	-19	-20	14	8	10	12	11	4	3	9	9	8	9
18000	-25	-16	-16	-20	-19	-28	-31	20	13	14	16	15	7	5	14	13	10	13
<b>HANOI</b>																		
TO	TO	HONG KONG												472 N.MI.				
5000	1	6	4	6	6	1	-5	-1	-6	-4	6	-2	-8	-10	8	7	9	8
10000	11	10	6	2	7	0	0	-11	-10	-6	-1	-8	-14	-16	9	8	10	9
18000	25	17	-2	6	10	0	-2	-26	-17	2	-6	-11	-23	-25	12	10	9	10
<b>HANOI</b>																		
TO	TO	IMAKUNI												1602 N.MI.				
5000	5	7	5	5	3	-1	-3	-5	-7	-5	2	-4	-9	-10	6	7	7	6
10000	17	13	6	5	10	4	2	-19	-14	-6	-5	-11	-18	-20	8	7	8	7
18000	32	22	6	12	17	8	6	-40	-26	-6	-14	-20	-33	-36	10	9	8	8
<b>HANOI</b>																		
TO	TO	IMO JIMA AB												1968 N.MI.				
5000	4	6	2	4	2	-3	-4	-4	-6	-2	4	-3	-8	-9	6	6	7	6
10000	18	8	4	3	7	2	0	-19	-9	-4	-3	-9	-15	-17	7	6	7	7
18000	34	24	0	8	15	3	1	-36	-25	0	-8	-16	-31	-33	9	8	7	7
<b>HANOI</b>																		
TO	TO	KADENA AB												1244 N.MI.				
5000	2	7	4	4	1	-3	-5	-2	-7	-4	4	-2	-8	-10	7	7	8	6
10000	17	13	5	3	9	2	1	-17	-13	-6	-3	-11	-17	-19	8	7	9	8
18000	33	23	0	9	15	4	2	-35	-25	0	-9	-17	-30	-33	10	9	8	8
<b>HANOI</b>																		
TO	TO	KIMPO AB												1472 N.MI.				
5000	4	6	6	6	3	-2	-3	-4	-6	-6	2	-4	-9	-10	6	7	8	6
10000	10	10	4	1	6	0	-1	-14	-11	-5	-2	-9	-15	-16	8	7	8	8
18000	22	16	6	9	12	5	3	-32	-21	-7	-12	-17	-28	-30	11	10	8	9

◊ HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 ◊ A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 ◊ MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUILYAL E.M.I. HEADWINDS RETURN												STANDARD DEVIATION					
	DIRECT			L.A.M.I.			M.E.A.D.M.I.N.D.S.			RETURN			JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT
MANDI																		
5000	-5	TO	0	0	-3	-7	-8	5	6	0	0	2	-2	-3	5	5	6	5
10000	-16	-6	-3	-3	-9	-15	-17	16	12	3	4	0	2	1	6	6	7	6
18000	-32	-22	3	-9	-15	-27	-30	30	21	-3	0	13	1	0	10	9	7	7
MANDI																		
5000	-1	TO	4	2	-2	-8	-10	2	7	3	-1	2	-3	-4	7	7	10	7
10000	-11	-10	-6	-2	-8	-14	-16	11	10	6	3	7	1	0	9	8	10	8
18000	-25	-17	3	-6	-11	-22	-25	24	16	-3	6	9	0	-2	13	11	9	10
MANDI																		
5000	0	TO	-11	-2	-4	-9	-11	0	5	10	2	4	0	-1	6	5	6	6
10000	0	0	-3	-2	-1	-6	-7	0	0	3	3	1	-3	-4	7	5	7	6
18000	1	2	0	0	0	-4	-6	-2	-2	0	0	-1	-7	-8	9	8	7	7
MANDI																		
5000	-5	TO	0	0	-3	-7	-8	5	7	0	0	2	-1	-2	5	5	6	5
10000	-16	-13	-4	-3	-9	-16	-17	16	13	4	4	9	3	1	7	6	7	6
18000	-33	-22	3	-8	-15	-28	-31	31	21	-3	8	13	1	-1	10	9	7	8
MANDI																		
5000	0	TO	-10	-1	-4	-9	-11	0	5	10	1	4	-1	-2	6	6	6	7
10000	0	0	-3	-2	-1	-6	-7	0	0	2	3	1	-3	-4	7	5	6	6
18000	1	2	0	-1	0	-5	-6	-2	-2	0	0	-1	-7	-8	9	8	8	7
MANDI																		
5000	2	TO	6	-3	1	-3	-5	-2	-3	-4	3	-2	-8	-9	7	7	8	6
10000	0	2	1	-3	0	-6	-7	-4	-3	-2	2	-3	-9	-10	8	8	9	8
18000	4	5	5	3	4	-2	-4	-10	-12	-6	-6	-10	-18	-20	12	10	9	9
MANDI																		
5000	5	TO	6	-2	3	-1	-3	-5	-6	-6	2	-4	-9	-11	6	7	8	6
10000	14	12	5	3	8	2	0	-17	-13	-6	-4	-11	-17	-19	8	7	8	8
18000	28	19	6	11	15	7	5	-37	-24	-6	-13	-19	-31	-34	11	9	8	9
MANDI																		
5000	-1	TO	-5	-8	-3	-5	-10	2	5	7	3	4	0	-1	6	6	6	8
10000	2	1	0	0	0	-4	-5	-1	0	0	0	0	-5	-7	8	6	8	8
18000	1	4	-1	-4	0	-7	-8	-2	-4	1	4	0	-7	-8	10	9	9	8
MANDI																		
5000	7	TO	7	6	-4	2	-3	-3	-7	-6	4	-3	-9	-11	7	8	9	7
10000	12	10	5	1	7	0	-1	-15	-11	-5	-1	-8	-15	-17	9	8	9	8
18000	26	18	3	9	13	4	2	-33	-22	-4	-10	-17	-28	-31	11	10	9	9

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 00--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION			
	EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												JAN	APR	JUL	OCT
TO	EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION			
	EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												JAN	APR	JUL	OCT
HANOI 5000 10000 18000	SINGAPORE												5	5	6	6
	SINGAPORE												6	5	7	6
	SINGAPORE												8	7	7	6
HANOI 5000 10000 18000	TAIPEI												7	7	9	7
	TAIPEI												9	7	9	8
	TAIPEI												11	10	9	9
HANOI 5000 10000 18000	TOKYO												6	7	7	6
	TOKYO												8	7	7	7
	TOKYO												10	9	8	8
HICKAM AFB 5000 10000 18000	JOHNSTON ISLAND												9	6	6	6
	JOHNSTON ISLAND												10	7	6	7
	JOHNSTON ISLAND												14	10	8	9
HICKAM AFB 5000 10000 18000	MIDWAY ISLAND												10	7	6	7
	MIDWAY ISLAND												11	6	6	7
	MIDWAY ISLAND												15	11	8	10
HICKAM AFB 5000 10000 18000	NAK ISLAND												7	5	4	5
	NAK ISLAND												8	6	4	5
	NAK ISLAND												10	8	6	7
HILL AFB 5000 10000 18000	HOFSTAD AFB												8	8	5	7
	HOFSTAD AFB												9	8	6	8
	HOFSTAD AFB												13	12	7	12
HILL AFB 5000 10000 18000	HUTER AFB												9	9	7	9
	HUTER AFB												10	8	6	7
	HUTER AFB												15	14	8	14
HILL AFB 5000 10000 18000	MUNTSVILLE												5	9	7	8
	MUNTSVILLE												11	10	3	13
	MUNTSVILLE												17	16	9	15

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWIND												STANDARD DEVIATION					
	DIRECT			EQUALLY ELEMENT			HEADWIND			RETURN			JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT
MILL AFB																		
5000	5	4	2	3	3	-1	-2	-6	-5	-2	-3	-4	-9	-11	0	0	0	7
10000	17	12	5	9	10	3	2	-19	-13	-5	-10	-12	-19	-21	10	6	7	9
18000	29	23	10	18	18	9	7	-36	-27	-11	-21	-23	-35	-38	15	16	0	13
MILL AFB																		
5000	0	1	0	0	0	-5	-6	-1	-1	0	0	-1	-6	-7	9	8	6	8
10000	-11	-5	-4	-4	-6	-13	-14	8	4	3	2	4	-2	-3	11	9	8	9
18000	-22	-11	-9	-16	-15	-25	-28	15	6	6	10	9	0	-3	16	15	12	15
MILL AFB																		
5000	1	1	0	0	0	-4	-5	-2	-1	0	-1	-1	-6	-7	8	8	5	7
10000	12	8	1	6	6	0	0	-14	-10	-1	-6	-8	-14	-16	9	8	6	8
18000	23	20	5	13	14	5	3	-30	-24	-6	-16	-10	-30	-32	13	12	7	12
MILL AFB																		
5000	-2	0	-2	-1	-2	-7	-8	1	0	2	0	0	-4	-5	8	7	6	8
10000	-12	-5	-5	-5	-7	-14	-15	9	4	4	3	4	-1	-3	11	9	8	9
18000	-24	-14	-12	-18	-17	-27	-30	18	9	10	12	11	2	0	16	14	11	16
MILL AFB																		
5000	1	0	-1	0	0	-6	-7	-1	-	1	0	0	-5	-7	10	9	6	8
10000	-14	-7	-3	-5	-7	-15	-17	12	6	3	4	5	-1	-3	12	11	8	11
18000	-26	-16	-11	-19	-18	-31	-35	20	11	7	13	12	0	-3	21	20	14	19
MILL AFB																		
5000	4	2	1	2	2	-3	-4	-4	-3	-1	-3	-3	-9	-10	9	10	7	8
10000	17	11	6	10	10	3	2	-18	-12	-6	-11	-12	-19	-21	11	10	8	10
18000	30	22	12	20	19	9	6	-35	-26	-13	-22	-23	-36	-39	18	17	10	16
MILL AFB																		
5000	8	6	5	6	6	0	0	-9	-7	-5	-7	-7	-13	-15	9	8	7	8
10000	21	13	11	13	14	7	5	-22	-14	-11	-14	-15	-23	-25	11	10	8	10
18000	34	23	19	24	24	14	12	-39	-27	-20	-27	-28	-39	-42	17	16	10	15
MILL AFB																		
5000	9	5	7	8	7	1	0	-11	-6	-7	-9	-9	-16	-16	9	9	7	8
10000	19	10	13	14	13	7	6	-21	-11	-14	-16	-16	-22	-24	10	10	7	9
18000	29	19	23	23	23	14	12	-35	-23	-24	-28	-28	-37	-39	14	14	9	14
MILL AFB																		
5000	-4	-4	-3	-2	-4	-8	-9	4	5	4	2	3	0	-1	7	7	5	6
10000	1	0	-4	-1	-2	-8	-10	-3	0	4	0	0	-7	-9	13	10	8	10
18000	-3	-4	-9	-1	-5	-17	-20	-7	-2	7	-2	0	-13	-17	21	19	12	18

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT			EQUIVALENT			RETURN			M.E.A.D.M.I.N.D.S.			JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	00450	075	085	JAN	APR	JUL	OCT	00450	075	085	JAN	APR	JUL	OCT
HILL AFB																		
5000	9	7	6	7	7	1	0	-11	-8	-6	-8	-9	-14	-16	9	9	1691	N.M.I.
10000	22	14	12	13	14	8	6	-24	-15	-12	-14	-16	-24	-25	10	10	6	8
18000	36	24	20	24	25	16	13	-41	-28	-21	-28	-29	-40	-43	15	15	9	9
HILL AFB																		
5000	4	3	2	3	2	-2	-4	-5	-4	-2	-3	-4	-10	-11	9	9	1097	N.M.I.
10000	17	11	6	11	10	4	2	-19	-12	-6	-11	-12	-20	-22	11	10	8	10
18000	31	22	13	20	20	10	7	-36	-26	-14	-23	-24	-36	-40	18	16	10	16
HILL AFB																		
5000	-6	-6	-6	-7	-5	-10	-11	6	6	7	4	5	1	0	7	6	1457	N.M.I.
10000	2	0	-2	0	0	-5	-6	-4	-1	2	0	1	-6	-7	8	7	4	6
18000	5	4	-3	3	0	-6	-8	-14	-10	2	-5	-6	-16	-18	14	12	7	11
HILL AFB																		
5000	4	5	5	4	5	0	-2	-7	-5	-5	-6	-6	-13	-14	10	10	851	N.M.I.
10000	15	5	11	12	11	4	2	-17	-9	-11	-13	-13	-20	-22	11	11	9	10
18000	26	19	21	21	21	10	7	-31	-22	-22	-25	-25	-37	-35	19	18	12	11
HILL AFB																		
5000	7	3	4	5	4	-1	-3	-7	-4	-4	-5	-5	-12	-14	10	10	625	N.M.I.
10000	7	4	8	7	6	0	-2	-10	-5	-8	-8	-8	-15	-17	11	11	9	11
18000	11	10	16	11	12	0	-2	-20	-15	-19	-17	-18	-30	-33	19	18	13	18
HILL AFB																		
5000	-3	-4	-2	-1	-3	-7	-8	3	4	2	2	2	-1	-2	8	7	325	N.M.I.
10000	-4	-3	-6	-3	-5	-12	-14	2	3	6	3	3	-3	-5	13	11	9	11
18000	-13	-11	-13	-9	-12	-24	-27	3	5	11	3	6	-6	-10	23	20	13	19
HILL AFB																		
5000	9	7	6	7	7	1	0	-10	-8	-6	-8	-8	-14	-16	9	9	1588	N.M.I.
10000	22	14	12	13	14	8	4	-24	-15	-12	-14	-16	-24	-25	10	10	8	9
18000	35	24	20	24	24	15	13	-41	-28	-21	-28	-29	-40	-43	16	15	9	15
HILL AFB																		
5000	2	1	0	1	0	-4	-6	-3	-2	0	-1	-2	-7	-9	9	9	1254	N.M.I.
10000	14	9	2	8	8	1	0	-16	-11	-2	-8	-10	-17	-19	10	9	6	9
18000	25	20	7	16	15	6	4	-32	-25	-8	-19	-20	-33	-36	16	15	9	14
HILL AFB																		
5000	9	6	6	7	6	1	0	-10	-7	-6	-8	-8	-14	-15	9	9	1465	N.M.I.
10000	20	12	12	14	14	7	6	-22	-13	-13	-14	-16	-23	-25	10	10	8	10
18000	33	22	21	24	24	15	12	-38	-26	-22	-27	-28	-39	-41	16	15	10	15

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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWIND												STANDARD DEVIATION						
	DIRECT			EQUVALENT			HEADWIND			RETURN			JAN	APR	JUL	OCT			
HILL AFB	TO																		
	5000	-3	-3	-1	0	-2	-7	-8											532 N.M.I.
	10000	-5	-4	-6	-4	-5	-13	-14											7 5 7
18000	-18	-15	-14	-11	-15	-27	-30												13 12 8 11 22 19 12 18
PATRICK AFB	TO																		1717 N.M.I.
	5000	4	3	1	2	2	-2	-3											8 8 6 7
	10000	15	11	4	8	9	3	1											9 9 7 8
18000	28	22	9	17	17	9	7												14 13 8 12
PITTSBURGH	TO																		1634 N.M.I.
	5000	9	7	5	7	6	1	0											9 9 7 8
	10000	21	13	11	13	14	7	5											10 10 8 10
18000	35	23	20	24	24	15	12												16 16 10 15
REGINA	TO																		636 N.M.I.
	5000	7	2	3	3	3	2	-4											10 10 9 10
	10000	1	1	5	3	2	-4	-6											11 10 9 10
18000	0	3	10	3	4	-7	-10												19 18 13 17
SCOTT AFB	TO																		1022 N.M.I.
	5000	6	5	3	4	4	-1	-2											9 10 7 8
	10000	18	11	9	12	12	5	3											11 11 9 10
18000	32	22	17	23	22	12	10												18 17 10 16
SELFLEDGE AFB	TO																		1298 N.M.I.
	5000	8	6	6	7	6	0	0											9 10 7 9
	10000	20	12	12	13	14	7	5											11 11 8 10
18000	32	22	21	23	23	14	11												17 16 10 16
SHAW AFB	TO																		1548 N.M.I.
	5000	7	6	4	4	5	0	-1											9 9 6 8
	10000	20	13	7	10	11	5	3											10 10 7 9
18000	33	24	14	21	21	12	10												16 15 9 14
WESTOVER AFB	TO																		1753 N.M.I.
	5000	10	7	7	8	7	2	1											9 9 7 8
	10000	21	13	13	14	15	8	7											10 10 8 9
18000	34	23	22	24	25	16	14												15 15 9 14
WURTSMITH	TO																		1249 N.M.I.
	5000	8	5	6	7	6	0	0											9 10 7 9
	10000	19	10	12	13	13	6	4											11 11 9 10
18000	30	21	21	23	23	13	11												17 16 10 16

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUVALENT HEADWINDS							STANDARD DEVIATION										
	JAN	APR	JUL	OCT	MAY	SEP	FEB	JAN	APR	JUL	OCT	MAY	SEP	FEB				
HILL AFB																		
5000	0	0	-1	0	0	-6	-7	0	0	1	0	0	-5	-7	10	9	6	8
10000	-14	-8	-4	-6	-8	-15	-18	13	7	4	5	6	0	-2	13	12	9	11
18000	-27	-17	-12	-20	-19	-32	-36	22	13	9	15	14	1	-1	21	20	14	20
HILL AFB																		
5000	2	0	0	0	0	-5	-6	-3	-1	0	0	-1	-7	-9	9	8	7	9
10000	-8	-3	-2	-4	-5	-10	-12	5	2	1	2	2	-3	-4	9	8	7	8
18000	-14	-5	-2	-9	-8	-17	-20	6	0	0	3	1	-7	-9	15	14	11	14
HOMESTEAD AFB																		
5000	4	3	3	1	2	-3	-5	-5	-3	-3	-2	-4	-10	-12	11	10	7	10
10000	0	0	2	1	0	-4	-8	-2	-1	-2	-2	-2	-9	-11	12	12	8	11
18000	-8	-7	2	0	-2	-13	-16	-1	0	-2	-2	-2	-11	-13	17	16	9	14
HOMESTEAD AFB																		
5000	0	-1	1	0	0	-6	-8	-1	0	-1	0	-1	-7	-8	11	10	7	9
10000	-8	-6	0	-1	-4	-11	-14	5	4	0	0	1	-5	-7	12	12	8	11
18000	-20	-18	-2	-8	-11	-23	-26	10	11	1	4	5	-3	-5	16	16	9	14
HOMESTEAD AFB																		
5000	5	3	4	2	3	-2	-4	-5	-3	-3	-2	-4	-10	-12	11	10	7	10
10000	-1	-1	3	1	0	-7	-9	0	0	-2	-2	-1	-9	-10	12	12	8	11
18000	-11	-10	2	-1	-4	-15	-18	3	3	-2	-1	0	-9	-11	16	16	9	14
HOMESTEAD AFB																		
5000	-2	-3	0	-1	-2	-8	-9	0	2	0	1	0	-5	-7	10	10	7	9
10000	-12	-10	0	-4	-6	-14	-16	9	8	0	3	4	-2	-4	11	11	8	10
18000	-27	-23	-3	-12	-15	-29	-31	18	18	3	9	10	1	0	16	16	9	14
HOMESTEAD AFB																		
5000	0	0	0	0	0	-7	-7	-2	-1	0	0	-1	-7	-9	10	10	7	9
10000	-4	-3	0	0	-2	-9	-11	-1	0	0	-1	-1	-8	-10	12	12	8	11
18000	-11	-10	0	-2	-5	-16	-19	-4	0	0	-2	-2	-11	-13	16	16	9	15
HOMESTEAD AFB																		
5000	5	4	4	3	4	-2	-3	-7	-6	-4	-4	-6	-12	-13	10	10	7	9
10000	7	5	5	5	6	0	-1	-13	-11	-6	-7	-9	-16	-18	11	11	7	10
18000	12	7	6	11	8	0	-2	-27	-17	-8	-18	-17	-28	-31	15	15	9	14
HOMESTEAD AFB																		
5000	-2	-2	1	0	-1	-6	-7	1	2	0	0	0	-4	-5	8	7	5	7
10000	-14	-11	0	-5	-8	-14	-16	13	10	0	4	6	0	-1	8	8	6	8
18000	-31	-26	0	-14	-18	-30	-33	27	24	0	12	15	3	0	13	12	7	11

\* HEADWINDS - COMPUTED FOR A 120-KT AIRSPEED.  
 \*\* A - DEVIATES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWINDS										STANDARD DEVIATION								
	JAN	APR	JUL	OCT	00A50	A75	A85	JAN	APR	JUL	OCT	00A50	A75	A85	JAN	APR	JUL	OCT	
HOMESTEAD AFB																			
5000	5	4	3	2	3	2	3	-2	-4	-6	-5	-3	-3	-5	-11	-13	10	10	921 N.M.I.
10000	4	6	3	4	4	4	4	-3	-4	-10	-9	-4	-5	-7	-15	-17	12	12	7 10
18000	6	3	4	0	5	5	4	-6	-6	-21	-13	-5	-13	-12	-23	-26	16	16	8 11
MEMPHIS																			
5000	-1	-2	0	-1	-1	-1	-7	-9	0	0	1	0	1	0	-6	-7	11	10	759 N.M.I.
10000	-11	-9	0	-3	-6	-14	-16	-16	8	6	0	2	2	3	-3	-5	11	11	7 9
18000	-25	-22	-3	-11	-14	-27	-30	-30	15	16	2	7	7	8	0	-2	16	16	0 11
MEXICO CITY																			
5000	3	0	4	3	2	2	-2	-3	-3	0	-4	-3	-3	-3	-8	-9	8	8	1079 N.M.I.
10000	-3	-3	4	0	0	0	-6	-7	3	3	-4	0	0	0	-4	-6	8	7	5 7
18000	-15	-15	5	-4	-7	-16	-19	-19	14	14	-4	4	4	5	-2	-4	11	10	5 6
MINN-ST PAUL																			
5000	-4	-3	0	-2	-3	-9	-10	-10	2	2	0	2	2	1	-4	-6	10	10	1320 N.M.I.
10000	-12	-8	-3	-5	-7	-14	-16	-16	7	5	2	3	4	4	-2	-4	11	11	7 9
18000	-24	-18	-7	-14	-15	-26	-29	-29	10	10	5	7	7	7	-1	-3	15	15	8 10
MINOT AFB																			
5000	-6	-4	-1	-4	-4	-10	-11	-11	4	3	1	3	3	2	-2	-4	9	9	1604 N.M.I.
10000	-14	-10	-4	-8	-9	-16	-18	-18	10	7	4	6	6	6	0	0	9	10	7 8
18000	-27	-20	-9	-17	-18	-28	-31	-31	15	13	7	11	10	10	2	1	14	14	7 9
NELLIS AFB																			
5000	-2	-2	0	0	-1	-5	-7	-7	1	2	0	0	0	0	-3	-4	7	7	1002 N.M.I.
10000	-14	-11	0	-5	-8	-14	-16	-16	13	10	0	5	6	0	0	0	8	8	5 6
18000	-31	-26	-3	-15	-19	-30	-33	-33	27	23	2	13	15	4	2	2	13	12	6 7
NEW CUMBERLAND																			
5000	3	2	2	2	2	-3	-5	-5	-5	-4	-2	-2	-2	-4	-10	-11	10	10	903 N.M.I.
10000	2	3	2	3	2	-4	-6	-6	-7	-7	-2	-4	-5	-13	-15	-15	12	12	7 9
18000	1	0	3	5	2	-7	-9	-9	-17	-9	-4	-10	-10	-20	-23	-23	16	16	8 11
NEW ORLEANS																			
5000	0	-2	1	0	0	-6	-8	-8	-1	1	-1	0	0	0	-6	-8	10	10	501 N.M.I.
10000	-10	-9	1	-3	-5	-13	-15	-15	9	8	-1	2	3	-3	-5	-5	11	11	7 9
18000	-26	-24	0	-11	-14	-28	-31	-31	22	21	0	9	11	0	-1	-1	15	15	7 10
NIAGARA FALLS																			
5000	2	1	1	1	1	-4	-6	-6	-4	-2	-1	-1	-1	-2	-9	-10	10	10	1040 N.M.I.
10000	0	0	1	1	1	0	-8	-8	-5	-4	-1	-3	-4	-11	-13	-13	12	11	7 9
18000	-4	-5	1	2	-1	-11	-13	-13	-13	-5	-2	-8	-7	-17	-20	-20	16	16	8 11

HEADWINDS—COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A—DEMOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DEMOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWIND RETURN												STANDARD DEVIATION				
	DIRECT				EQUVALENT				RETURN				JAN	APR	JUL	OCT	
	JAN	APR	JUL	OCT	00A50	A75	A85	00A50	A75	A85	00A50	A75	A85	00A50	A75	A85	
HOMESTEAD AFB	TO																
5000	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	167 M.MI.
10000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
18000	-6	-6	4	1	-1	-11	-14	-5	-5	-4	-4	-3	-2	-2	-1	-10	11
HOMESTEAD AFB	TO																
5000	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	982 M.MI.
10000	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
18000	-5	-6	0	0	-2	-12	-15	-3	-2	-1	-2	-2	-6	-3	-10	-12	12
HOMESTEAD AFB	TO																
5000	-6	-4	-1	-5	-4	-10	-11	4	3	1	4	4	4	2	-2	-3	9
10000	-15	-10	-5	-9	-10	-16	-18	11	8	4	7	7	7	7	1	0	9
18000	-27	-20	-10	-18	-18	-28	-30	16	13	8	12	11	4	2	0	0	13
HOMESTEAD AFB	TO																
5000	-2	-2	0	-1	-1	-8	-9	0	1	0	1	0	1	0	-5	-7	11
10000	-10	-8	0	-3	-5	-13	-15	6	6	0	2	3	3	-3	-5	9	11
18000	-23	-19	-4	-11	-13	-25	-29	10	12	3	6	7	2	-4	15	16	16
HOMESTEAD AFB	TO																
5000	0	0	0	0	0	-4	-7	-2	0	0	0	-1	-7	-9	-10	10	20
10000	-4	-3	0	0	-2	-9	-11	-1	0	0	-1	-1	-8	-10	11	11	11
18000	-11	-10	-1	-3	-6	-16	-19	-5	0	0	-3	-2	-11	-14	15	16	16
HOMESTEAD AFB	TO																
5000	4	2	3	1	2	-3	-5	-5	-3	-2	-1	-3	-10	-11	11	10	511 M.MI.
10000	0	0	2	2	1	-4	-7	-3	-2	-1	-2	-2	-10	-11	12	12	7
18000	-5	-5	2	1	-1	-11	-14	-6	-3	-2	-4	-4	-13	-16	17	16	9
HOMESTEAD AFB	TO																
5000	5	4	3	3	3	-2	-3	-6	-5	-3	-3	-5	-11	-12	10	10	1077 M.MI.
10000	5	7	4	4	4	-2	-3	-11	-11	-4	-6	-8	-16	-18	12	12	7
18000	9	5	4	9	6	-2	-4	-24	-15	-6	-15	-14	-26	-29	16	16	9
HOMESTEAD AFB	TO																
5000	0	0	0	0	0	-6	-8	-1	0	0	0	-1	-7	-8	10	10	1149 M.MI.
10000	-5	-3	0	0	-2	-9	-11	-1	0	0	-1	-1	-8	-9	11	11	7
18000	-12	-10	-2	-4	-7	-17	-20	-5	0	0	-3	-2	-11	-14	16	16	9
HOMESTEAD AFB	TO																
5000	4	6	5	-2	3	-2	-4	-4	-7	-5	2	-4	-9	-11	7	8	8
10000	17	14	6	6	10	4	2	-20	-15	-6	-7	-13	-20	-21	9	8	7
18000	31	21	7	11	16	7	5	-40	-26	-8	-13	-20	-34	-37	12	11	9

HEADWINDS—COMPUTED FOR A 120-KT AIRSPEED.  
 00A—DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

FOUR VALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN FEET	EQUVALENT HEADWINDS												STANDARD DEVIATION					
	DIRECT				RETURN				RETURN				JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT
HONG KONG	TO IWO JIMA AB																	
5000	5	6	1	4	1	1	1	-5	-5	-2	4	-3	-8	-10	7	6	8	6
10000	20	7	3	3	7	0	0	0	-20	-9	-3	-9	-16	-18	8	7	8	8
10000	36	26	1	8	16	4	2	2	-38	-27	-1	-9	-18	-36	10	9	8	8
HONG KONG	TO KADENA AB																	
5000	3	7	3	4	1	1	1	-5	-3	-7	4	-3	-9	-11	8	8	9	7
10000	19	14	5	4	10	3	1	1	-28	-14	-5	-4	-11	-21	2	8	10	9
10000	35	25	1	9	16	4	1	1	-37	-27	-2	-9	-18	-36	12	11	9	10
HONG KONG	TO KIMPO AB																	
5000	3	5	5	-3	2	2	2	-4	-3	-5	6	3	-3	-9	7	8	8	7
10000	8	8	4	1	5	0	-2	-2	-13	-10	-5	-2	-8	-15	9	8	9	9
10000	15	10	7	6	9	1	0	0	-29	-18	-7	-9	-15	-25	12	11	9	10
HONG KONG	TO MANGALAY																	
5000	-1	-6	-4	3	-2	-7	-9	-9	2	6	3	-3	1	-3	6	7	8	6
10000	-12	-11	-6	-2	-8	-14	-16	-16	12	11	6	3	8	2	8	7	9	7
10000	-20	-19	2	-7	-13	-24	-27	-27	27	18	-2	7	11	1	11	9	8	8
HONG KONG	TO MEDAN																	
5000	8	-3	-11	8	-3	-8	-10	-10	8	4	11	0	3	-1	5	5	6	6
10000	-1	-2	-5	-2	-3	-7	-9	-9	1	2	5	2	2	-1	5	5	7	6
10000	-3	0	1	0	0	-5	-7	-7	2	0	-1	0	0	-5	8	7	7	6
HONG KONG	TO MISAHA AB																	
5000	6	6	5	9	4	8	-2	-2	-7	-7	-5	-1	-6	-11	7	7	7	7
10000	17	14	6	9	11	5	3	3	-21	-15	-7	-10	-14	-20	9	8	8	8
10000	27	19	8	14	16	8	6	6	-38	-26	-9	-19	-23	-34	11	10	8	10
HONG KONG	TO PENANG																	
5000	0	-4	-11	1	-3	-9	-10	-10	1	4	11	-1	3	-1	5	5	6	6
10000	-1	-2	-5	-2	-3	-7	-9	-9	1	3	5	2	2	-1	6	6	7	6
10000	-2	-1	1	0	-1	-4	-7	-7	2	0	-1	0	0	-5	8	7	7	6
HONG KONG	TO PEIPING																	
5000	8	1	4	4	0	-5	-7	-7	8	-1	-5	4	-1	-6	7	8	8	7
10000	-6	-1	0	-5	-3	-9	-11	-11	1	0	-1	5	0	-5	9	8	9	9
10000	-9	-5	4	-3	-3	-11	-13	-13	-7	-3	-5	8	-4	-11	12	11	9	10
HONG KONG	TO PUSAN EAST																	
5000	4	6	6	-3	3	-3	-4	-4	-4	-6	-6	3	-4	-10	7	8	8	7
10000	13	11	5	4	8	1	0	0	-17	-13	-6	-5	-11	-18	9	8	9	9
10000	25	16	7	9	13	5	3	3	-36	-23	-8	-12	-19	-31	12	11	9	10

OVERHEADS--COMPUTED FOR A 120-KT AIRSPEED.  
 +--SHOWS ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 - PLUS SIGN DENOTES HEADWINDS.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN FFET	F R M I V A L E N T H E A D W I N D S												STANDARD DEVIATION						
	MIPPECY			RETURN			MIPPECY			RETURN			JAN	APR	JUL	OCT			
	JAN	APR	JUL	OCT	00ASO	A7S	AB5	JAN	APR	JUL	OCT	00ASO	A7S	AB5					
HONG KONG																			
5000	TO	SAIGON															0	6	015
10000	-2	-4	-10	-4	-4	-4	-10	2	4	10	-2	3	-2	-3	6	7	7		
18000	-7	-3	-3	-3	-3	-3	-10	2	4	5	0	2	-2	-3	6	9	9		
HONG KONG																			
5000	TO	SHANGHAI															0	9	042
10000	3	6	6	4	2	4	-5	-3	-6	-6	4	-3	-10	-11	6	9	10		
18000	18	12	6	6	9	2	0	-29	-18	-6	-7	-14	-25	-28	10	11	10		
HONG KONG																			
5000	TO	SINGAPORE															5	5	1395
10000	0	-1	-9	-1	-3	-4	-9	0	1	9	1	2	-1	-2	5	5	6		
18000	-3	0	3	3	-1	-4	-7	0	1	5	2	1	-2	-3	6	7	6		
HONG KONG																			
5000	TO	TAIPEI															0	8	433
10000	2	7	4	4	2	4	-6	-1	-6	-4	5	-2	-8	-10	8	8	10		
18000	17	13	5	3	9	2	3	-17	-13	-4	-3	-11	-18	-20	10	8	11		
HONG KONG																			
5000	TO	TOKYO															7	7	1952
10000	5	7	5	0	4	-1	-2	-6	-7	-3	0	-3	-10	-11	7	7	7		
18000	20	16	6	0	12	5	3	-23	-17	-7	-9	-14	-22	-23	9	8	8		
HUNTER AAF																			
5000	TO	MUNTSVILLE															11	10	324
10000	-9	-8	-3	-4	-6	-14	-16	0	7	4	4	3	-1	-3	13	12	8		
18000	-21	-16	-4	-6	-11	-22	-25	18	15	4	5	9	0	-1	14	14	9		
HUNTER AAF																			
5000	TU	KEY WEST															10	10	449
10000	-5	-4	-3	-2	-4	-10	-12	5	4	4	2	3	-2	-4	10	10	7		
18000	-6	-4	-2	-4	-4	-13	-16	2	2	3	2	2	-4	-4	12	11	7		
HUNTER AAF																			
5000	TC	LAPSON AFB															14	13	1960
10000	-9	-6	-4	-4	-7	-12	-13	0	6	4	6	3	1	0	0	0	6		
18000	-20	-13	-8	-12	-13	-20	-22	19	12	7	11	11	5	4	9	9	7		
HUNTER AAF																			
5000	TO	LITTLE ROCK															14	13	578
10000	-11	-9	-4	-5	-7	-15	-17	10	8	4	4	6	0	-2	12	12	8		
18000	-23	-17	-5	-8	-13	-23	-26	21	16	4	7	11	2	0	13	13	9		
HUNTER AAF																			
5000	-4	-3	-1	-2	-4	-9	-9	35	28	7	14	20	7	5	19	18	10		
10000	-9	-8	-4	-5	-7	-15	-17	10	8	4	4	6	0	-2	12	12	8		
18000	-23	-17	-5	-8	-13	-23	-26	21	16	4	7	11	2	0	13	13	9		
HUNTER AAF																			
5000	-4	-3	-1	-2	-4	-9	-9	35	28	7	14	20	7	5	19	18	10		
10000	-9	-8	-4	-5	-7	-15	-17	10	8	4	4	6	0	-2	12	12	8		
18000	-23	-17	-5	-8	-13	-23	-26	21	16	4	7	11	2	0	13	13	9		

HEADWINDS--COMPUTED FOR A 1000 FT ALTITUDE.  
 STANDARD DEVIATION--COMPUTED FOR A 1000 FT ALTITUDE.  
 THIS SIDE OF THE GREAT CIRCLE ROUTE.

EQUIVALENT HEADINGS AND STANDARD DEVIATIONS IN CENTS PER GROSS CENTS AND POINTS

REG. IN EFF.	MONTHS												STANDARD DEVIATION		
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	APR	
MUNTERS AAF	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	-2	-2	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	13
10000	-7	-5	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	12
10000	-14	-13	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	14
MUNTERS AAF	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	20
5000	7	5	4	4	4	4	4	4	4	4	4	4	4	4	11
10000	12	10	7	6	6	6	6	6	6	6	6	6	6	6	11
10000	22	11	9	16	13	13	13	13	13	13	13	13	13	13	13
MUNTERS AAF	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	10
5000	-7	-6	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	9
10000	-20	-16	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	9
10000	-38	-31	-7	-19	-23	-37	-40	-40	-40	-40	-40	-40	-40	-40	14
MUNTERS AAF	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	9
5000	7	5	3	3	3	3	3	3	3	3	3	3	3	3	9
10000	12	11	5	6	6	6	6	6	6	6	6	6	6	6	9
10000	22	12	7	14	12	12	12	12	12	12	12	12	12	12	14
MUNTERS AAF	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	9
5000	-10	-8	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	12
10000	-22	-17	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	12
10000	-40	-31	-8	-20	-23	-40	-44	-44	-44	-44	-44	-44	-44	-44	19
MUNTERS AAF	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	9
5000	-5	-6	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	12
10000	-10	-9	0	0	0	0	0	0	0	0	0	0	0	0	12
10000	-25	-19	2	-9	-12	-24	-26	-26	-26	-26	-26	-26	-26	-26	19
MUNTERS AAF	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	9
5000	-9	-6	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	12
10000	-17	-12	-7	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	12
10000	-31	-22	-11	-19	-20	-33	-36	-36	-36	-36	-36	-36	-36	-36	19
MUNTERS AAF	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	9
5000	-10	-6	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	12
10000	-19	-13	-8	-11	-11	-21	-23	-23	-23	-23	-23	-23	-23	-23	12
10000	-33	-23	-14	-22	-22	-34	-37	-37	-37	-37	-37	-37	-37	-37	18
MUNTERS AAF	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	9
5000	-10	-6	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	12
10000	-19	-13	-8	-11	-11	-21	-23	-23	-23	-23	-23	-23	-23	-23	12
10000	-33	-23	-14	-22	-22	-34	-37	-37	-37	-37	-37	-37	-37	-37	18
MUNTERS AAF	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	9
5000	-7	-6	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	12
10000	-20	-15	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	12
10000	-38	-30	-10	-20	-24	-36	-39	-39	-39	-39	-39	-39	-39	-39	13

HEADINGS--COMPUTED FOR A 120-KT AIRSPEED.  
 004--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT DEVIABILITIES.  
 4805 SIGN 7--NOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIREC T			E			S			W			N			JAN	APR	JUL
	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT
<b>HUNTER AAF</b>																		
5000	5	3	2	2	2	-4	-6	-7	-4	-2	-3	-4	-12	-14	12	12	12	11
10000	7	7	3	4	5	-3	-5	-14	-11	-4	-5	-8	-10	-20	14	14	9	13
18000	13	5	4	10	7	-3	-6	-30	-17	-6	-17	-16	-31	-35	20	20	11	19
<b>HUNTER AAF</b>																		
5000	-10	-8	-3	-4	-4	-14	-15	10	8	4	4	6	0	-2	11	11	8	10
10000	-21	-17	-3	-6	-11	-22	-24	20	16	4	6	10	2	0	13	13	8	12
18000	-39	-30	-2	-10	-21	-30	-42	36	28	2	17	19	5	2	10	10	10	16
<b>HUNTER AAF</b>																		
5000	1	0	0	1	0	-5	-8	-4	-1	0	-2	-2	-9	-11	12	12	8	11
10000	0	0	1	2	0	-7	-9	-9	-5	-2	-4	-5	-14	-16	14	14	9	13
18000	0	-3	0	3	0	-11	-14	-21	-8	-3	-12	-10	-24	-27	20	20	11	19
<b>HUNTER AAF</b>																		
5000	-7	-6	-3	-2	-5	-9	-11	6	5	3	1	3	0	-1	8	7	5	6
10000	-19	-15	-4	-8	-11	-19	-20	17	14	4	7	9	3	2	9	9	6	8
18000	-37	-30	-9	-19	-23	-36	-39	33	27	8	16	19	9	7	14	13	7	12
<b>HUNTER AAF</b>																		
5000	-5	-2	-2	0	-3	-10	-12	4	1	2	0	1	-5	-7	12	11	8	11
10000	-2	-1	0	-1	-1	-9	-11	-1	0	1	0	0	-8	-10	13	13	8	12
18000	-2	0	-1	-2	-2	-12	-14	-9	-8	1	-1	-4	-15	-18	10	10	10	16
<b>HUNTER AAF</b>																		
5000	1	0	0	0	0	-7	-8	-3	-1	0	-1	-2	-9	-11	12	12	8	11
10000	0	0	0	1	0	-8	-10	-7	-4	-1	-3	-4	-13	-15	14	14	9	13
18000	-2	-5	0	2	-1	-13	-16	-18	-7	-2	-10	-9	-22	-25	20	20	11	19
<b>HUNTER AAF</b>																		
5000	-10	-6	-4	-7	-7	-13	-15	8	5	3	6	5	0	-2	10	10	7	9
10000	-19	-13	-9	-11	-13	-20	-22	16	10	8	9	10	3	2	10	10	8	10
18000	-32	-22	-15	-22	-22	-33	-36	21	16	12	17	15	7	5	15	15	9	14
<b>HUNTER AAF</b>																		
5000	-9	-7	-3	-4	-6	-14	-16	8	6	3	4	4	-2	-4	13	12	8	11
10000	-20	-15	-5	-7	-12	-21	-24	16	12	5	6	9	1	-1	13	13	9	13
18000	-35	-27	-9	-19	-21	-36	-40	22	20	8	14	14	3	1	19	19	11	18
<b>HUNTER AAF</b>																		
5000	-2	-2	-1	0	-2	-9	-11	0	0	1	0	0	-7	-9	12	12	8	11
10000	-6	-4	-1	0	-3	-12	-14	0	0	0	0	0	-8	-10	14	14	9	13
18000	-13	-12	-3	-5	-7	-20	-24	-4	0	0	-4	-2	-14	-18	20	20	11	19

\* HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*--DEFINIES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWIND												STANDARD DEVIATION					
	DIRECT						RETURN											
	JAN	APR	JUL	OCT	00A50	A75	A85	JAN	APR	JUL	OCT	00A50	A75	A85	JAN	APR	JUL	OCT
HUNTEP AAF	7	5	4	4	4	4	-4	-9	-7	-4	-4	-6	-14	-16	12	12	12	12
5000	13	11	6	7	8	0	-1	-19	-15	-7	-8	-12	-21	-24	14	14	14	11
10000	22	12	8	15	13	2	0	-37	-22	-10	-21	-21	-36	-40	19	19	19	18
HUNTEP AAF	-2	-2	-1	0	-2	-2	-11	0	1	1	0	0	-6	-8	12	12	12	12
5000	-7	-5	-2	-1	-4	-12	-14	0	0	1	0	0	-8	-10	13	13	13	12
10000	-14	-12	-4	-6	-9	-21	-24	-6	1	1	-3	-1	-13	-16	19	19	19	19
HUNTSVILLE	4	4	2	3	3	4	-5	-5	-5	-2	-3	-4	-11	-13	12	12	12	12
5000	12	10	2	3	6	-2	-4	-16	-12	-2	-4	-8	-18	-20	14	13	13	13
10000	19	19	5	10	11	1	-1	-31	-25	-6	-15	-10	-33	-36	19	19	19	17
HUNTSVILLE	-3	-1	-2	0	-2	-8	-10	1	0	2	0	0	-5	-6	11	10	7	9
5000	2	2	-1	0	0	-6	-8	-5	-4	1	0	-2	-9	-11	12	11	8	11
10000	5	8	1	2	3	-5	-7	-16	-15	-1	-6	-9	-20	-23	16	16	9	14
HUNTSVILLE	-8	-6	-3	-6	-6	-12	-13	7	5	3	6	5	0	-1	9	8	6	8
5000	-20	-12	-8	-13	-13	-20	-22	19	11	7	12	11	5	3	10	9	7	9
10000	-35	-24	-16	-25	-24	-35	-38	29	19	15	21	20	11	9	15	14	9	14
HUNTSVILLE	-13	-10	-5	-5	-8	-17	-19	12	10	6	5	7	0	-2	14	14	9	11
5000	-26	-19	-6	-11	-15	-26	-29	25	18	6	10	13	3	1	15	15	10	14
10000	-45	-34	-8	-24	-26	-44	-49	41	31	8	21	22	8	5	22	20	11	20
HUNTSVILLE	7	4	3	3	4	-3	-5	-9	-6	-3	-4	-6	-14	-16	14	13	9	12
5000	13	8	5	6	7	-1	-3	-19	-12	-6	-7	-11	-21	-24	15	15	10	14
10000	20	10	6	11	10	-1	-4	-35	-20	-7	-18	-19	-35	-39	22	21	12	21
HUNTSVILLE	10	6	6	7	7	0	-1	-12	-8	-6	-8	-9	-16	-18	12	11	8	10
5000	20	13	10	11	13	5	3	-24	-16	-11	-13	-16	-25	-27	13	13	9	12
10000	32	17	14	21	20	9	6	-42	-25	-17	-27	-27	-40	-44	18	18	11	17
HUNTSVILLE	-7	-6	-4	-3	-5	-11	-12	6	6	4	3	4	0	-2	9	9	6	8
5000	-21	-16	-5	-9	-13	-21	-23	19	15	5	9	11	4	2	10	10	6	10
10000	-39	-31	-9	-20	-24	-36	-41	35	28	8	17	20	9	6	16	15	9	14

\* HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\* DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES										STANDARD DEVIATION			
	DIRECT					RETURN					JAN	APR	JUL	OCT
	JAN	APR	JUL	OCT	00A50	A75	A85	JAN	APR	JUL	OCT	00A50	A75	A85
HUNTSVILLE TO MCGUIRE AFB	13	9	6	6	8	0	-1	-14	-10	-5	-7	-9	-17	-19
5000	25	18	10	10	14	6	4	-28	-20	-10	-11	-17	-27	-30
10000	40	25	13	23	23	10	6	-47	-31	-14	-27	-28	-45	-49
HUNTSVILLE TO MEMPHIS														
5000	-13	-10	-5	-5	-8	-17	-19	12	10	5	5	7	0	-2
10000	-26	-19	-6	-11	-15	-27	-30	25	18	6	10	14	3	1
18000	-45	-34	-9	-24	-26	-44	-49	40	31	9	21	23	9	5
HUNTSVILLE TO MEXICO CITY														
5000	-7	-7	-3	-1	-5	-10	-12	6	7	3	1	4	-1	-2
10000	-12	-9	-1	-3	-6	-13	-15	10	8	2	2	5	0	-1
18000	-25	-17	2	-9	-12	-23	-26	19	13	-2	7	7	-1	-3
HUNTSVILLE TO MINA-ST PAUL														
5000	-7	-5	-2	-4	-5	-13	-15	5	3	2	3	3	-4	-6
10000	-14	-10	-5	-9	-9	-19	-21	8	6	4	5	5	-2	-4
18000	-24	-18	-10	-18	-17	-31	-34	9	9	7	10	8	-3	-5
HUNTSVILLE TO MINOT AFB														
5000	-10	-6	-3	-7	-7	-14	-16	8	5	3	6	5	-1	-3
10000	-18	-12	-8	-12	-13	-21	-23	14	10	7	10	10	2	0
18000	-31	-21	-14	-22	-22	-34	-37	19	14	11	16	14	4	1
HUNTSVILLE TO NELLIS AFB														
5000	-7	-6	-3	-3	-5	-10	-12	6	5	3	2	3	-1	-2
10000	-20	-15	-6	-10	-13	-20	-22	18	14	5	9	11	4	3
18000	-38	-29	-11	-21	-24	-37	-40	33	25	11	18	20	10	8
HUNTSVILLE TO NEW ORLEANS														
5000	12	8	5	5	7	0	-1	-13	-9	-5	-6	-8	-16	-18
10000	23	16	9	9	13	5	2	-26	-19	-9	-10	-16	-26	-29
18000	37	22	11	21	20	8	5	-46	-29	-13	-26	-27	-44	-48
HUNTSVILLE TO NEW ORLEANS														
5000	-10	-7	-4	-2	-6	-14	-16	5	6	4	2	4	-2	-4
10000	-16	-12	-6	-5	-9	-18	-21	13	10	4	4	7	-1	-3
18000	-31	-20	1	-10	-14	-30	-34	20	11	-1	6	7	-3	-6
HUNTSVILLE TO MADISON FALLS														
5000	8	5	3	3	5	-2	-4	-10	-7	-4	-6	-7	-15	-17
10000	15	10	5	7	9	3	-1	-21	-13	-3	-9	-13	-22	-25
18000	22	11	4	14	12	1	-2	-37	-21	-11	-22	-22	-37	-41

HEADWINDS COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A\*\*--DEPOTES ANNUAL EQUIVALENT HEADWIND FOR INDICATED PER CENT PROBABILITIES.  
 \*MINS SIGN BEFORE 1000 FT.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWIND RETURN							STANDARD DEVIATION							
	JAN	APR	JUL	OCT	0000	A75	A85	JAN	APR	JUL	OCT				
<b>HUNTSVILLE TO OXNAFD AFB</b>															
5000	-6	-3	-2	-5	-9	-11	-11	6	5	3	1	3	-1	-2	1591 N.M.I.
10000	-18	-5	-9	-12	-19	-21	-21	17	14	5	8	10	4	2	0 5 7
18000	-37	-29	-11	-19	-23	-36	-39	32	26	10	17	19	10	8	10 9 7 9
<b>HUNTSVILLE TO PATRICK AFB</b>															
5000	1	2	0	2	1	-5	-7	-2	-3	0	-2	-2	-9	-11	497 N.M.I.
10000	9	7	1	2	4	-3	-5	-12	-10	-1	-3	-6	-15	-17	11 11 8 10
18000	16	16	4	8	9	0	-2	-26	-22	-4	-12	-15	-20	-32	13 13 8 12
<b>HUNTSVILLE TO PITTSBURGH</b>															
5000	9	6	4	5	5	-1	-3	-11	-7	-4	-5	-7	-15	-17	470 N.M.I.
10000	17	12	7	7	10	1	0	-23	-15	-8	-9	-14	-24	-26	13 13 9 11
18000	28	15	9	16	15	3	0	-41	-24	-10	-22	-23	-39	-43	14 15 10 14
<b>HUNTSVILLE TO REGINA</b>															
5000	-10	-6	-3	-7	-7	-14	-16	8	5	3	6	5	-1	-3	1227 N.M.I.
10000	-18	-12	-8	-12	-13	-20	-22	15	10	7	10	10	3	1	11 11 9 11
18000	-30	-20	-14	-23	-21	-33	-36	20	14	12	17	15	5	3	17 16 10 14
<b>HUNTSVILLE TO SCOTT AFB</b>															
5000	-7	-5	-2	-4	-5	-13	-15	5	4	2	3	3	-4	-6	200 N.M.I.
10000	-15	-12	-4	-7	-10	-20	-22	9	9	3	5	6	-3	-5	15 14 9 12
18000	-28	-22	-8	-17	-18	-33	-37	11	13	7	10	9	-2	-5	15 15 11 14
<b>HUNTSVILLE TO SELFIDGE AFB</b>															
5000	4	2	2	3	2	-5	-7	-7	-4	-2	-4	-5	-13	-15	512 N.M.I.
10000	7	4	3	4	4	-4	-6	-14	-9	-5	-6	-9	-18	-20	14 13 9 11
18000	9	3	4	6	5	-6	-9	-28	-14	-6	-15	-15	-29	-33	14 15 10 14
<b>HUNTSVILLE TO SHAW AFB</b>															
5000	13	10	5	5	7	0	-1	-13	-10	-5	-5	-8	-16	-19	315 N.M.I.
10000	25	19	6	7	13	3	1	-26	-20	-6	-8	-14	-26	-29	13 12 9 11
18000	40	31	9	20	23	9	6	-44	-34	-9	-23	-26	-43	-48	14 14 9 14
<b>HUNTSVILLE TO WESTOVER AFB</b>															
5000	12	8	6	7	7	1	0	-13	-9	-6	-7	-9	-16	-18	807 N.M.I.
10000	23	17	10	10	14	5	3	-27	-19	-11	-12	-17	-27	-29	12 12 8 10
18000	38	22	13	23	22	10	7	-46	-29	-15	-27	-28	-43	-48	14 14 9 12
<b>HUNTSVILLE TO WURTSMITH</b>															
5000	2	1	1	2	1	-6	-8	-5	-2	-2	-3	-3	-11	-13	610 N.M.I.
10000	4	2	2	3	2	-5	-7	-11	-6	-3	-5	-6	-15	-18	13 13 9 11
18000	3	0	1	2	1	-10	-13	-23	-11	-5	-12	-12	-26	-29	14 14 10 13

• HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 ••A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION						
	DIPEY						RETURN						JAN	APR	JUL	OCT			
	JAN	APR	JUL	OCT	000450	A75	A85	JAN	APR	JUL	OCT	000450	A75	A85					
HUNTSVILLE																			
5000	TO																		
10000	-8	-6	-3	-6	-11	-13	7	5	3	5	5	4	0	-1	1679	N.M.I.	8	6	7
18000	-20	-12	-8	-12	-20	-22	18	11	7	11	11	11	5	3	9	N.M.I.	9	7	9
	-35	-24	-16	-25	-24	-38	29	20	15	21	20	20	11	9	15	N.M.I.	14	9	14
HUNTSVILLE																			
5000	TO																		
10000	-7	-3	-2	-7	-5	-11	5	2	2	6	6	3	-2	-3	1965	N.M.I.	9	7	9
18000	-15	-9	-8	-12	-11	-19	12	7	7	10	9	9	3	2	8	N.M.I.	8	7	8
	-25	-16	-13	-19	-18	-29	16	11	10	14	12	12	4	2	13	N.M.I.	12	9	12
IMAKUNI																			
5000	TO																		
10000	6	2	-2	0	0	-7	-6	-2	2	0	0	-1	-8	-10	735	N.M.I.	10	9	9
18000	19	8	0	2	6	-4	-22	-11	0	-4	-9	-9	-19	-21	12	N.M.I.	11	10	10
	25	20	2	10	13	0	-42	-29	-4	-15	-22	-22	-37	-41	15	N.M.I.	14	11	13
IMAKUNI																			
5000	TO																		
10000	-2	-4	-5	2	-2	-13	1	4	5	-3	1	7	-5	-7	522	N.M.I.	10	11	9
18000	-12	-15	-6	-7	-10	-21	5	13	5	6	7	7	-1	-3	13	N.M.I.	12	11	11
	-32	-17	-8	-9	-16	-31	12	5	7	4	6	6	-2	-4	15	N.M.I.	14	11	13
IMAKUNI																			
5000	TO																		
10000	-15	-6	-2	-9	-9	-16	15	5	2	9	7	7	0	-2	334	N.M.I.	10	12	10
18000	-29	-17	-5	-15	-17	-30	26	15	5	14	14	14	4	2	14	N.M.I.	13	12	12
	-47	-34	-11	-28	-30	-48	40	30	10	25	25	25	12	9	18	N.M.I.	16	13	15
IMAKUNI																			
5000	TO																		
10000	9	6	4	7	6	0	-11	-7	-4	-7	-8	-8	-15	-17	506	N.M.I.	11	11	11
18000	18	14	7	15	13	4	-24	-17	-8	-17	-17	-17	-26	-28	13	N.M.I.	13	11	12
	21	19	10	20	17	5	-37	-28	-11	-27	-26	-26	-39	-42	18	N.M.I.	17	13	16
IMAKUNI																			
5000	TO																		
10000	-14	-7	-3	-8	-9	-17	14	6	3	8	7	7	1	0	426	N.M.I.	8	10	9
18000	-28	-18	-6	-15	-17	-29	27	17	5	15	15	15	6	4	11	N.M.I.	11	11	11
	-47	-34	-13	-28	-30	-43	44	32	12	27	28	28	16	13	15	N.M.I.	14	11	12
IMAKUNI																			
5000	TO																		
10000	-14	-6	-3	-9	-7	-19	14	6	2	9	7	7	0	-2	165	N.M.I.	14	12	11
18000	-31	-20	-8	-15	-13	-32	30	18	6	15	16	16	6	3	14	N.M.I.	14	12	13
	-51	-37	-13	-29	-32	-51	48	35	12	28	30	30	16	12	18	N.M.I.	17	14	15
IMAKUNI																			
5000	TO																		
10000	-3	-4	-7	3	-3	-9	3	4	7	-3	2	2	-2	-3	1988	N.M.I.	5	6	6
18000	-12	-11	-6	-4	-9	-15	10	10	5	4	7	7	2	1	7	N.M.I.	7	6	7
	-27	-14	-4	-3	-13	-25	14	11	3	6	4	4	2	1	8	N.M.I.	8	7	7

• HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 • A--MONTHS ANNUAL EQUIVALENT HEADWINDS IN KNOTS INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALANT WIND HEADWINDS												STANDARD DEVIATION						
	DIREC			M E A D W I N D S			R E V E R S E			JAN	APR	JUL	OCT	JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	0050	A75	AB5	JAN	APR	JUL	OCT	0050	A75	AB5	JAN	APR	JUL	OCT	
IMAKUNI																			
5000	-9	-6	-5	-2	-6	-13	-15	9	6	5	1	5	-1	-3	9	11	10	9	570 N.M.I.
10000	-27	-19	-7	-12	-16	-26	-28	24	10	6	11	14	5	3	12	12	11	11	
18000	-68	-34	-12	-22	-28	-43	-46	43	30	12	20	24	13	10	15	14	11	13	
IMAKUNI																			
5000	-4	-6	-5	2	-3	-10	-12	4	6	5	-2	2	-3	-5	9	9	9	8	781 N.M.I.
10000	-19	-17	-6	-9	-13	-21	-23	14	15	6	7	10	3	1	11	10	10	10	
18000	-40	-25	-9	-13	-20	-33	-37	28	18	9	10	15	6	4	14	12	10	11	
IMAKUNI																			
5000	13	7	4	6	7	0	-1	-13	-7	-4	-6	-8	-15	-17	11	11	9	11	300 N.M.I.
10000	30	21	8	17	18	8	6	-32	-22	-8	-17	-20	-31	-33	14	14	11	12	
18000	46	37	14	31	31	17	14	-52	-40	-15	-34	-35	-50	-54	18	17	14	16	
IWO JIMA AB																			
5000	-7	-6	0	3	-3	-10	-12	7	6	0	-3	2	-4	-6	10	9	10	8	739 N.M.I.
10000	-25	-9	-2	-4	-10	-20	-22	24	7	1	3	7	0	-2	10	10	10	10	
18000	-45	-32	-3	-12	-22	-39	-43	43	31	2	11	20	5	3	13	12	10	12	
IWO JIMA AB																			
5000	-9	-4	0	-3	-4	-10	-12	8	3	0	2	2	-3	-4	9	9	8	8	1066 N.M.I.
10000	-24	-13	-2	-7	-11	-21	-23	20	10	1	6	8	0	-1	11	10	9	10	
18000	-44	-31	-6	-19	-25	-39	-42	30	24	4	15	17	6	4	14	13	10	12	
IWO JIMA AB																			
5000	-5	-10	-9	-8	-9	-12	-13	4	10	9	9	8	4	3	6	5	5	5	1780 N.M.I.
10000	-3	-3	-6	-7	-5	-9	-10	1	2	7	7	4	0	-1	6	6	5	6	
18000	-11	6	-5	-4	-4	-10	-12	7	-7	5	4	2	-4	-6	9	7	7	7	
IWO JIMA AB																			
5000	-1	1	4	2	1	-5	-6	0	-2	-4	-3	-3	-9	-11	10	9	8	10	955 N.M.I.
10000	-5	0	3	2	0	-7	-9	-3	-3	-3	-5	-4	-11	-13	11	11	9	10	
18000	-14	-7	2	-1	-5	-15	-18	-12	-7	-4	-8	-8	-18	-20	15	15	12	14	
IWC JIMA AB																			
5000	-10	-5	-1	-4	-5	-11	-12	9	5	0	3	4	-1	-2	7	8	7	7	1538 N.M.I.
10000	-26	-15	-3	-10	-13	-22	-24	24	13	3	9	11	4	2	9	8	7	7	
18000	-46	-32	-8	-22	-27	-40	-43	37	28	7	19	22	11	9	12	11	9	10	
IWO JIMA AB																			
5000	-7	-3	1	-1	-3	-9	-11	7	3	-1	1	2	-4	-5	9	9	9	9	887 N.M.I.
10000	-24	-13	-1	-6	-11	-21	-23	20	10	0	4	7	0	-2	11	11	9	10	
18000	-44	-31	-5	-18	-24	-39	-42	30	24	4	13	17	6	3	14	13	11	12	

HEADWINDS—COMPUTED FOR A 120-KT AIRSPEED.  
 \*A—DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWIND M E A D M I N D S												STANDARD DEVIATION					
	DIRECT						RETURN											
	JAN	APR	JUL	OCT	**450	A75	A85	JAN	APR	JUL	OCT	**450	A75	A85	JAN	APR	JUL	OCT
IMO JIMA AB TO SHANGHAI	-6	-5	0	0	-3	-9	-11	6	5	0	0	2	-3	-4	0	0	0	1110 N.M.I.
5000	-27	-14	-3	-7	-12	-22	-24	26	12	2	6	10	2	0	10	9	9	0
10000	-68	-34	-5	-16	-25	-41	-45	43	32	5	15	22	9	6	12	11	9	10
IMO JIMA AB TO TAIPEI	-6	-6	-1	4	-3	-9	-10	6	6	1	-3	2	-4	-5	0	0	0	1077 N.M.I.
5000	-24	-9	-3	2	-9	-18	-21	23	6	2	3	7	0	-1	9	8	9	7
10000	-43	-31	-2	-10	-21	-37	-40	42	31	2	10	20	5	3	11	10	9	10
IMO JIMA AB TO TOKYO	-1	1	4	3	1	-5	-7	0	-2	-4	-3	-3	-9	-11	11	10	9	10
5000	-8	-2	3	2	-1	-9	-11	0	-1	-3	-3	-2	-10	-12	12	11	10	11
10000	-20	-11	1	-3	-3	-20	-23	-8	-4	-4	-5	-6	-16	-18	16	15	12	15
IMO JIMA AB TO VANIMO	0	-2	-5	-3	-3	-7	-8	0	2	5	3	2	-1	-2	6	5	6	6
5000	-4	-2	-3	-3	-4	-7	-8	3	2	3	3	2	-1	-2	6	5	6	6
10000	-8	-2	-2	-2	-4	-9	-10	5	1	2	1	2	-2	-3	7	6	7	7
IMO JIMA AB TO WAKE ISLAND	0	-4	-5	-7	-5	-9	-10	-1	3	5	7	3	-1	-2	7	7	6	6
5000	10	4	-2	-3	1	-4	-6	-12	-5	2	2	-3	-10	-11	8	7	6	7
10000	3	17	0	1	4	-3	-5	-14	-19	0	-2	-8	-18	-20	11	9	0	9
JACKSONVILLE TO KEY WEST	-5	-4	-3	-3	-5	-11	-12	5	4	4	3	4	-2	-3	11	10	7	9
5000	-3	-2	-3	-3	-3	-10	-12	1	1	3	3	2	-4	-6	12	11	8	10
10000	-3	-2	-2	-3	-3	-12	-14	-3	-4	3	1	0	-10	-12	16	15	9	13
JACKSONVILLE TO LITTLE ROCK	-8	-7	-3	-4	-6	-13	-15	7	6	3	4	4	-2	-3	12	12	8	10
5000	-20	-15	-3	-7	-11	-21	-23	17	14	3	6	9	0	-1	13	13	9	12
10000	-37	-30	-6	-19	-22	-37	-41	29	25	6	16	17	5	3	18	18	10	17
JACKSONVILLE TO LOCKPORTNE	0	-1	0	0	-1	-3	-10	-1	0	0	0	0	-7	-9	12	12	6	11
5000	-5	-3	0	0	-2	-11	-13	-1	0	0	-1	-1	-9	-11	13	13	9	13
10000	-10	-10	-2	-3	-6	-18	-21	-9	-1	0	-3	-3	-14	-18	19	19	11	18
JACKSONVILLE TO LORING AFB	7	5	4	4	4	-1	-3	-9	-6	-5	-5	-7	-13	-15	11	11	8	9
5000	12	10	6	7	8	1	0	-18	-13	-7	-9	-17	-20	-22	13	12	8	11
10000	21	11	8	15	12	3	0	-35	-21	-11	-22	-21	-34	-38	17	17	10	16

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\*MINUS SIGN DENOTES HEADWINDS.

F EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION					
	DIRECT			RETURN			HEADWIND			TYPICAL			JAN	APR	JUL	OCT		
JACKSONVILLE TO LUKE AFB	JAN	APP	JUL	OCT	***A50	A75	A85	JAN	APP	JUL	OCT	***A50	A75	A85	JAN	APR	JUL	OCT
5000	-6	-5	-2	-2	-4	-9	-10	5	5	2	2	3	-1	-2	0	0	5	7
10000	-19	-15	-2	-7	-11	-19	-21	10	14	2	7	9	2	1	9	9	6	9
18000	-37	-30	-4	-18	-22	-35	-38	33	27	4	16	10	7	4	14	13	7	12
JACKSONVILLE TO MCGUIRE AFB	JAN	APP	JUL	OCT	***A50	A75	A85	JAN	APP	JUL	OCT	***A50	A75	A85	JAN	APR	JUL	OCT
5000	7	5	3	3	4	-2	-4	-9	-6	-3	-3	-6	-13	-15	12	11	8	11
10000	11	10	5	5	7	0	-2	-17	-14	-5	-6	-10	-19	-22	16	13	9	12
18000	19	11	6	13	11	0	-1	-33	-21	-7	-18	-18	-33	-37	19	19	10	18
JACKSONVILLE TO MEMPHIS	JAN	APP	JUL	OCT	***A50	A75	A85	JAN	APP	JUL	OCT	***A50	A75	A85	JAN	APR	JUL	OCT
5000	-8	-7	-2	-4	-5	-13	-15	6	6	3	4	4	-2	-4	12	12	8	10
10000	-19	-14	-3	-6	-10	-20	-23	16	12	3	5	8	0	-2	13	13	9	13
18000	-35	-28	-6	-17	-20	-35	-39	26	23	6	14	15	4	1	19	18	10	17
JACKSONVILLE TO MEXICO CITY	JAN	APP	JUL	OCT	***A50	A75	A85	JAN	APP	JUL	OCT	***A50	A75	A85	JAN	APR	JUL	OCT
5000	-3	-5	0	0	-2	-7	-9	2	5	0	0	1	-3	-4	0	0	5	7
10000	-9	-8	0	-2	-5	-11	-12	8	7	0	2	3	-1	-3	8	8	6	7
18000	-23	-18	3	-8	-11	-22	-25	20	16	-3	7	8	-1	-3	12	11	6	10
JACKSONVILLE TO MINN-ST PAUL	JAN	APP	JUL	OCT	***A50	A75	A85	JAN	APP	JUL	OCT	***A50	A75	A85	JAN	APR	JUL	OCT
5000	-7	-5	-2	-4	-5	-12	-14	5	4	2	3	3	-3	-4	11	11	8	10
10000	-15	-11	-5	-7	-10	-18	-20	10	8	4	5	6	0	-2	12	12	9	11
18000	-28	-20	-10	-17	-18	-30	-33	13	12	8	10	10	0	-1	17	17	10	16
JACKSONVILLE TO MINOT AFB	JAN	APP	JUL	OCT	***A50	A75	A85	JAN	APP	JUL	OCT	***A50	A75	A85	JAN	APR	JUL	OCT
5000	-9	-6	-3	-6	-6	-13	-14	7	5	3	5	4	-1	-2	10	10	7	9
10000	-18	-12	-7	-10	-12	-19	-21	14	9	6	8	8	2	0	11	11	8	10
18000	-31	-22	-13	-21	-21	-32	-35	19	15	10	15	14	5	3	16	15	9	15
JACKSONVILLE TO MELLIS AFB	JAN	APP	JUL	OCT	***A50	A75	A85	JAN	APP	JUL	OCT	***A50	A75	A85	JAN	APR	JUL	OCT
5000	-6	-5	-2	-2	-4	-9	-10	5	4	2	2	3	-1	-2	0	0	5	7
10000	-19	-14	-6	-8	-11	-18	-20	17	13	4	7	9	3	2	9	9	6	8
18000	-36	-29	-8	-19	-22	-35	-38	32	26	8	16	19	9	7	14	13	8	12
JACKSONVILLE TO NEW CUMBERLAND	JAN	APP	JUL	OCT	***A50	A75	A85	JAN	APP	JUL	OCT	***A50	A75	A85	JAN	APR	JUL	OCT
5000	5	3	2	2	2	-4	-5	-7	-4	-2	-2	-4	-11	-13	12	11	8	11
10000	7	6	3	4	4	-3	-5	-13	-11	-4	-5	-8	-17	-19	14	13	9	12
18000	12	5	4	9	6	-3	-6	-29	-16	-6	-16	-16	-29	-33	19	19	10	18
JACKSONVILLE TO NEW ORLEANS	JAN	APP	JUL	OCT	***A50	A75	A85	JAN	APP	JUL	OCT	***A50	A75	A85	JAN	APR	JUL	OCT
5000	-8	-8	-2	-4	-6	-13	-15	8	7	3	4	5	-1	-3	11	11	8	10
10000	-19	-16	-2	-6	-10	-20	-23	19	15	3	5	9	1	0	12	13	8	12
18000	-37	-30	-2	-18	-21	-37	-40	35	28	2	16	18	5	2	17	17	9	16

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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION			
	DIRECT				RETURN				RETURN				RETURN			
	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT
<p><b>JACKSONVILLE TO NIAGARA FALLS</b></p>																
5000	2	0	0	-7	-4	-2	0	-2	-2	-9	-11	12	11	772 N.M.I.		
10000	1	1	2	-6	-9	-6	-2	-4	-5	-14	-16	13	13	8 10		
18000	1	-2	4	-10	-21	-9	-3	-12	-11	-23	-27	19	19	9 12		
<p><b>JACKSONVILLE TO CKNAFD AFB</b></p>																
5000	-6	-5	-2	-8	5	4	2	1	2	-1	-2	7	7	1901 N.M.I.		
10000	-10	-14	-3	-10	16	13	3	7	9	3	1	9	8	5 6		
18000	-36	-29	-7	-34	32	26	6	15	10	8	6	16	12	6 8		
<p><b>JACKSONVILLE TO PITTSBURGH</b></p>																
5000	2	0	0	-8	-4	-2	0	-1	-2	-9	-11	12	11	609 N.M.I.		
10000	0	1	1	-7	-7	-5	-1	-3	-4	-13	-15	13	13	8 11		
18000	0	-3	2	-11	-19	-8	-2	-10	-9	-22	-25	19	19	9 13		
<p><b>JACKSONVILLE TO REGINA</b></p>																
5000	-9	-6	-3	-12	7	4	3	5	4	-1	-2	13	9	1503 N.M.I.		
10000	-10	-12	-8	-20	14	9	7	9	9	3	1	10	10	7 9		
18000	-30	-21	-13	-34	19	15	11	15	14	6	3	15	14	8 10		
<p><b>JACKSONVILLE TO SCOTT AFB</b></p>																
5000	-7	-5	-2	-14	5	4	2	3	3	-3	-5	12	12	630 N.M.I.		
10000	-16	-12	-3	-18	11	9	3	4	6	-1	-3	13	13	8 10		
18000	-30	-24	-7	-36	16	16	6	11	11	0	-1	19	18	9 13		
<p><b>JACKSONVILLE TO SELFPRIDGE AFB</b></p>																
5000	-1	-1	0	-10	-1	0	0	0	0	-7	-9	12	11	733 N.M.I.		
10000	-4	-3	-1	-12	-2	-1	0	-1	-1	-9	-11	13	13	8 10		
18000	-10	-10	-2	-21	-10	-1	0	-4	-3	-15	-18	19	19	9 12		
<p><b>JACKSONVILLE TO SHAW AFB</b></p>																
5000	6	3	2	-4	-7	-4	-2	-1	-4	-11	-13	12	12	222 N.M.I.		
10000	5	2	2	-6	-10	-8	-2	-3	-6	-15	-17	14	14	8 11		
18000	6	3	2	-9	-21	-13	-2	-10	-10	-24	-27	19	19	9 13		
<p><b>JACKSONVILLE TO WESTOVER AFB</b></p>																
5000	7	5	4	-3	-9	-6	-4	-4	-6	-13	-15	12	11	832 N.M.I.		
10000	11	11	5	-1	-18	-14	-6	-7	-11	-20	-22	13	13	8 10		
18000	20	11	7	0	-34	-21	-9	-20	-20	-34	-37	18	18	9 12		
<p><b>JACKSONVILLE TO WURTSWITZ</b></p>																
5000	-1	-1	0	-10	-1	0	0	0	0	-7	-9	12	11	867 N.M.I.		
10000	-5	-4	-1	-13	-1	0	0	-1	-1	-9	-11	13	13	8 10		
18000	-12	-10	-3	-21	-8	0	0	-4	-3	-14	-17	16	16	9 12		

♦ HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 ♦♦--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 † MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	E. O. J. I. V. A. L. E. M. T. H. E. A. D. W. I. N. D. S. RETURN												STANDARD DEVIATION						
	DUTCH			A75			A85			A75			A85			JAN	APR	JUL	OCT
JOHNSTON ISLAND TO KWAJALEIN MS																			
5000	12	15	14	13	13	10	9	-13	-16	-13	-13	-15	-17	-18	6	5	4	4	1415 M.M.I.
10000	6	9	10	10	9	5	4	-6	-8	-10	-10	-9	-13	-14	7	6	5	4	
18000	5	2	6	6	4	0	-1	-6	-2	-6	-6	-6	-10	-12	9	7	6	6	
JOHNSTON ISLAND TO MIDWAY ISLAND																			
5000	4	6	4	4	3	0	-2	-5	-6	-5	-3	-5	-10	-12	10	7	7	7	814 M.M.I.
10000	-3	3	3	-1	0	-5	-7	2	-3	-3	0	-1	-7	-9	11	8	7	8	
18000	-15	-8	-1	-3	-6	-15	-17	11	7	1	2	4	-2	-4	16	11	8	10	
JOHNSTON ISLAND TO PAGO PAGO																			
5000	3	0	0	0	0	-1	-2	-4	0	-1	-1	-2	-5	-5	4	4	4	3	1865 M.M.I.
10000	-1	3	1	1	1	-2	-3	1	-3	-1	-1	-2	-5	-5	6	4	4	4	
18000	0	0	0	0	0	-4	-5	0	0	0	0	-1	-5	-6	7	6	6	5	
JOHNSTON ISLAND TO WAKE ISLAND																			
5000	7	12	13	13	11	7	6	-7	-11	-12	-13	-12	-15	-16	7	5	4	5	1367 M.M.I.
10000	2	7	8	8	6	2	1	-2	-6	-7	-7	-6	-10	-11	8	6	5	5	
18000	-8	-4	5	4	4	0	-7	6	3	-5	-4	-1	-7	-9	11	9	7	7	
JUNEAU TO KODIAK																			
5000	0	-2	-2	-3	-2	-9	-11	-1	1	1	2	0	-6	-8	13	10	9	10	569 M.M.I.
10000	-8	-3	-5	-6	-4	-15	-17	7	2	4	4	4	-4	-6	14	11	11	13	
18000	-19	-11	-10	-16	-14	-27	-30	15	8	8	12	10	-1	-5	22	18	16	18	
JUNEAU TO LABSON AFB																			
5000	-1	-3	0	-1	-1	-8	-9	0	2	0	0	0	-6	-7	11	9	7	10	868 M.M.I.
10000	6	3	3	0	2	-4	-6	-9	-4	-4	-2	-5	-13	-15	13	11	9	11	
18000	13	4	6	7	7	-4	-6	-19	-9	-9	-14	-13	-25	-28	19	17	14	17	
JUNEAU TO LUKE AFB																			
5000	-2	-2	0	-2	-2	-4	-8	1	2	0	1	0	-3	-4	8	7	5	7	1742 M.M.I.
10000	5	3	1	0	2	-3	-5	-8	-4	-2	-1	-6	-10	-12	10	9	7	8	
18000	11	4	3	6	5	-3	-5	-19	-10	-6	-12	-12	-21	-24	15	14	10	14	
JUNEAU TO MINN-ST PAUL																			
5000	7	3	2	8	4	0	-2	-9	-3	-3	-8	-6	-12	-14	9	8	7	9	1704 M.M.I.
10000	16	9	9	14	11	6	4	-17	-10	-10	-15	-13	-19	-21	9	8	7	8	
18000	24	14	13	20	17	8	6	-27	-17	-15	-23	-21	-30	-32	13	12	10	13	
JUNEAU TO MINOT AFB																			
5000	6	2	2	7	4	-1	-3	-8	-2	-2	-7	-5	-11	-13	16	9	7	9	1321 M.M.I.
10000	15	8	8	13	10	4	3	-16	-9	-8	-14	-12	-19	-20	16	9	8	9	
18000	23	13	11	19	16	7	4	-26	-15	-13	-22	-19	-29	-31	14	13	11	14	

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*\*--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	JAN	APR	JUL	OCT	EQUIVALENT HEADWINDS IN KNOTS					MAY	JUL	OCT	JAN	APR	JUL	OCT	STANDARD DEVIATION	
					JAN	APR	MAY	JUL	OCT									
JUNEAU 5000 10000 18000	TO	-2	-2	0	-2	-2	-6	-8	0	2	3	2	0	-3	-4	0	8	1538 N.M.I.
	NELLIS AFB	-2	0	-2	-2	-2	-6	-8	0	2	3	2	0	-3	-4	0	7	7
	JUL	1	1	0	1	1	-4	-6	-8	-4	-2	-1	-4	-10	-12	-4	11	9
JUNEAU 5000 10000 18000	TO	-1	-2	1	-1	-1	-6	-7	0	2	-1	1	0	-4	-6	0	9	1578 N.M.I.
	CRANFORD AFB	-1	-2	1	-1	-1	-6	-7	0	2	-1	1	0	-4	-6	0	7	6
	JUL	1	1	1	-1	-1	-4	-7	-6	-3	-1	0	-3	-9	-11	-3	11	10
JUNEAU 5000 10000 18000	TO	4	3	4	2	3	-2	-4	-5	-3	-4	-2	-4	-10	-12	-4	11	789 N.M.I.
	PERUNGOE FAY	4	3	4	2	3	-2	-4	-5	-3	-4	-2	-4	-10	-12	-4	12	8
	JUL	-3	3	0	5	3	-8	-8	-8	2	3	3	-5	-2	-9	-11	12	10
JUNEAU 5000 10000 18000	TO	6	2	2	7	4	-2	-3	-7	-2	-1	-7	-5	-11	-13	-5	16	1136 N.M.I.
	REGINA	6	2	2	7	4	-2	-3	-7	-2	-1	-7	-5	-11	-13	-5	16	9
	JUL	14	8	8	13	10	4	2	-16	-3	-8	-14	-12	-19	-20	-3	11	9
JUNEAU 5000 10000 18000	TO	-2	-2	-6	-4	-4	-10	-11	1	2	5	3	2	-2	-4	2	10	1729 N.M.I.
	SHEMYA	-2	-2	-6	-4	-4	-10	-11	1	2	5	3	2	-2	-4	2	8	7
	JUL	-10	-4	-7	-8	-8	-15	-17	8	2	6	6	5	-1	-3	5	12	10
JUNEAU 5000 10000 18000	TO	1	1	0	2	1	-4	-5	-1	-1	-1	-3	-2	-7	-8	-2	8	1711 N.M.I.
	TMULE	1	1	0	2	1	-4	-5	-1	-1	-1	-3	-2	-7	-8	-2	8	7
	JUL	0	3	1	3	1	-3	-4	0	-3	-1	-4	-3	-8	-9	-3	8	7
JUNEAU 5000 10000 18000	TO	-1	4	2	4	2	-5	-7	-1	-6	-3	-6	-5	-12	-14	-5	12	876 N.M.I.
	YAKIMA	-1	4	2	4	2	-5	-7	-1	-6	-3	-6	-5	-12	-14	-5	12	11
	JUL	-1	-3	0	-2	1	-4	-5	0	3	0	1	0	-5	-7	0	11	9
JUNEAU 5000 10000 18000	TO	5	4	2	9	4	-1	-3	-6	-4	-2	-10	-6	-13	-15	-6	10	639 N.M.I.
	YELLONKIFE	5	4	2	9	4	-1	-3	-6	-4	-2	-10	-6	-13	-15	-6	10	9
	JUL	8	6	5	11	7	0	-1	-9	-6	-5	-11	-8	-15	-17	-8	12	10
KADENA AB 5000 10000 18000	TO	-7	0	1	-3	-2	-5	-10	3	0	-2	5	6	-6	-7	0	9	676 N.M.I.
	KADENA AB	-7	0	1	-3	-2	-5	-10	3	0	-2	5	6	-6	-7	0	9	10
	JUL	-11	0	1	-3	-3	-11	-14	3	-4	-2	1	-1	-5	-10	-1	14	11

WINDS AND STANDARD DEVIATIONS COMPUTED FOR A 100-KT AIRSPEED.  
 \*\*3-DIGIT WINDS COMPUTED FROM WINDS AND STANDARD DEVIATIONS FOR TWO-DIGIT WINDS.  
 \*\*3-DIGIT WINDS COMPUTED FROM WINDS AND STANDARD DEVIATIONS FOR TWO-DIGIT WINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	DIRECTION												STANDARD DEVIATION					
	JAN	APR	JUL	OCT	0030	A75	A05	JAN	APR	JUL	OCT	0030	A75	A05	JAN	APR	JUL	OCT
E A S T																		
KADENA AB																		
5000	-2	-7	-3	3	-3	-3	-9	3	7	3	-3	2	-2	-4	6	6	7	6
10000	-18	-13	-6	-5	-11	-17	-10	17	13	5	3	9	3	1	7	6	6	7
18000	-37	-26	0	-10	-10	-32	-34	35	24	0	10	16	4	1	9	0	7	0
W E S T																		
KADENA AB																		
5000	5	5	2	5	4	-1	-3	-7	-6	-5	-2	-6	-12	-13	9	9	6	9
10000	12	14	6	11	10	3	1	-19	-16	-7	-12	-14	-22	-23	11	11	9	10
18000	16	14	9	12	13	4	2	-36	-24	-10	-19	-22	-33	-36	14	15	11	13
KADENA AB																		
5000	-8	-4	0	-5	-5	-11	-12	7	3	0	5	3	-1	-3	8	9	9	7
10000	-22	-10	-2	-11	-12	-20	-22	19	7	1	10	9	1	0	10	9	10	10
18000	-37	-27	-4	-19	-22	-34	-37	24	21	2	15	15	5	3	13	12	10	11
KADENA AB																		
5000	0	1	4	4	0	-7	-9	0	-2	-4	4	0	-8	-9	10	11	10	9
10000	-4	6	3	1	1	-4	-9	-3	-9	-4	-2	-5	-13	-15	12	12	11	11
18000	-6	-6	4	-2	-2	-12	-14	-16	-5	-5	-2	-7	-17	-19	15	14	11	12
KADENA AB																		
5000	-3	-3	-7	4	-3	-7	-9	3	3	7	-4	2	-2	-4	6	5	7	6
10000	-9	-8	-6	-2	-7	-12	-13	8	8	6	2	6	1	0	7	5	8	7
18000	-18	-12	0	-3	-8	-16	-18	14	9	0	3	6	0	-1	8	6	7	7
KADENA AB																		
5000	-4	-4	0	-1	-3	-9	-11	4	3	0	1	1	-4	-4	9	10	11	9
10000	-23	-9	-2	-7	-10	-20	-22	21	6	1	7	0	0	-2	12	11	11	11
18000	-40	-30	-1	-14	-21	-36	-39	30	20	0	13	17	4	1	14	13	11	12
KADENA AB																		
5000	-4	-7	-3	3	-3	-10	-12	4	7	3	-3	2	-4	-9	9	10	11	9
10000	-23	-15	-3	-5	-13	-22	-24	22	14	4	5	11	2	0	11	10	12	11
18000	-43	-31	-3	-11	-21	-37	-41	42	30	3	11	20	6	3	14	12	11	12
KADENA AB																		
5000	6	6	5	9	4	-2	3	-4	-4	-3	-1	-3	-12	-13	10	10	9	9
10000	18	17	7	11	13	5	3	-23	-19	-7	-12	-15	-24	-26	12	11	10	10
18000	31	22	16	16	19	6	6	-45	-30	-11	-21	-26	-40	-43	14	14	14	13
KADENA AB																		
5000	-2	-2	-4	-2	-3	-7	-9	0	2	4	2	2	-2	-3	6	5	6	6
10000	-5	-6	-3	-3	-5	-9	-10	4	5	5	3	4	0	0	6	5	6	6
18000	-5	-1	-4	-2	-4	-9	-9	2	0	4	2	2	-2	-3	9	6	6	6

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 0030--MONTHS ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT PROBABILITY.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FFEV	EQUIVALENT HEADWINDS												STANDARD DEVIATION				
	JAN	APR	JUL	OCT	APR	SEP	JAN	APR	JUL	OCT	APR	SEP	JAN	APR	JUL	OCT	
KARACHI	LAWYER															550	ML.MI.
SCOO	1	2	5	-1	1	-3	-4	0	-2	-5	1	-2	-7	-8	7	7	
13000	11	10	2	0	5	0	-1	-11	-10	-1	0	-6	-12	-14	6	6	
18000	21	15	-4	4	7	-2	-4	-28	-19	4	-5	-11	-24	-28	14	13	
KARACHI	MANDALAY															1000	ML.MI.
SCOO	5	7	4	5	4	3	-1	-4	-7	-4	0	-4	-6	-9	5	5	
13000	15	11	3	2	7	1	0	-15	-11	-3	-2	-8	-14	-16	6	6	
18000	35	19	-3	7	11	1	-1	-34	-20	3	-7	-13	-28	-31	10	10	
KARACHI	NEW DELHI															577	ML.MI.
SCOO	2	5	5	1	1	-2	-4	-1	-5	-5	1	-3	-8	-9	7	7	
13000	12	11	2	3	5	0	-1	-14	-11	-2	3	-7	-14	-14	6	6	
18000	21	11	-3	1	11	0	-2	-35	-23	1	-7	-14	-30	-33	14	13	
KARACHI	TAMPA															1025	ML.MI.
SCOO	-3	-4	-5	0	-4	-9	-10	4	6	3	3	3	0	-2	7	7	
13000	-10	-6	-3	-5	-7	-12	-14	9	7	3	5	6	1	6	6	6	
18000	-31	-25	-3	-11	-14	-29	-32	25	21	7	11	14	6	4	13	12	
KARACHI	ZAMPERAN															431	ML.MI.
SCOO	-3	-7	-7	1	-4	-10	-11	3	7	3	-1	3	-2	-3	8	8	
13000	-9	-6	-2	-2	-5	-11	-13	6	5	3	3	4	-1	-2	9	9	
18000	-32	-23	-2	-10	-15	-29	-32	26	20	2	9	12	2	3	15	14	
KEY WEST	LITTLE ROCK															622	ML.MI.
SCOO	3	-1	1	0	3	-4	-8	9	3	-1	0	0	-4	-8	10	10	
13000	-13	-8	1	-3	-5	-12	-15	7	6	-1	2	2	-4	-5	11	11	
18000	-23	-21	-3	-11	-13	-26	-29	14	15	2	7	8	0	-2	16	15	
KEY WEST	LOS ANGELES															908	ML.MI.
SCOO	1	1	1	1	1	-5	-5	-3	-2	-1	-1	-2	-8	-10	10	10	
13000	-2	-1	1	1	1	-7	-7	-2	-1	-1	-2	-2	-9	-11	11	11	
18000	-7	-7	0	-1	-4	-13	-15	-8	-1	3	-4	-3	-13	-16	16	16	
KEY WEST	LOS ANGELES															1500	ML.MI.
SCOO	4	4	3	4	4	-1	-2	-7	-6	-6	-6	-6	-11	-13	9	9	
13000	15	9	2	4	6	3	-1	-13	-13	-5	-8	-10	-17	-18	11	11	
18000	13	7	6	11	6	0	-1	-14	-17	-3	-19	-17	-28	-31	15	15	
KEY WEST	LONDON															1004	ML.MI.
SCOO	-1	-1	2	3	3	-5	-5	3	1	-3	0	-1	-5	-5	8	7	
13000	-11	-10	1	-6	-7	-13	-15	15	11	-1	4	5	2	3	13	11	
18000	-10	-25	1	-11	-17	-31	-31	25	21	-1	11	14	2	3	13	11	

STANDARD DEVIATION COMPUTED FOR GREAT CIRCLE AIR ROUTES. HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS PER GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	MONTHLY AVERAGE HEADWINDS												STANDARD DEVIATION			
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN	APR	JUL	OCT
KEY WEST	MERCURE AFB												907 N.M.M.			
	TO	3	4	3	2	3	2	3	2	3	3	3	10	10	7	9
	FROM	5	6	6	6	6	6	6	6	6	6	6	12	11	7	10
KEY WEST	MEMPHIS												700 N.M.M.			
	TO	0	-1	1	0	0	0	0	0	0	0	0	11	10	7	9
	FROM	-8	-6	1	-2	-4	-11	-13	-13	-13	-13	-13	11	11	6	10
KEY WEST	MERCER CITY												1001 N.M.M.			
	TO	3	0	5	4	3	1	3	4	4	4	4	6	6	5	7
	FROM	-3	-3	5	0	0	-5	-7	-7	-7	-7	-7	6	7	5	6
KEY WEST	MINN-ST PAUL												1340 N.M.M.			
	TO	-3	-2	0	-2	-2	-6	-9	-9	-9	-9	-9	10	9	7	9
	FROM	-10	-7	-2	-4	-6	-13	-15	-15	-15	-15	-15	10	11	6	10
KEY WEST	MONT AFB												1005 N.M.M.			
	TO	-5	-3	-1	-4	-4	-9	-11	-11	-11	-11	-11	9	9	6	8
	FROM	-13	-9	-4	-7	-9	-15	-17	-17	-17	-17	-17	9	10	7	9
KEY WEST	MELLS AFB												1006 N.M.M.			
	TO	-1	-1	1	0	0	-4	-4	-4	-4	-4	-4	7	7	5	6
	FROM	-13	-10	0	-5	-7	-13	-15	-15	-15	-15	-15	8	8	6	7
KEY WEST	NEW CUMBERLAND												972 N.M.M.			
	TO	4	3	2	2	2	-3	-4	-4	-4	-4	-4	10	10	7	9
	FROM	4	4	2	3	3	-3	-5	-5	-5	-5	-5	12	11	7	10
KEY WEST	NEW ORLEANS												549 N.M.M.			
	TO	1	0	3	0	0	-5	-4	-4	-4	-4	-4	10	10	7	9
	FROM	-8	-7	2	-2	-3	-11	-13	-13	-13	-13	-13	11	11	7	10
KEY WEST	NIAGARA FALLS												1122 N.M.M.			
	TO	2	1	1	1	1	-4	-6	-6	-6	-6	-6	10	10	7	9
	FROM	1	1	1	2	1	-5	-6	-6	-6	-6	-6	11	11	7	10
KEY WEST	MONTANA												1000 N.M.M.			
	TO	-1	-3	1	3	0	-9	-12	-12	-12	-12	-12	10	10	7	9
	FROM	-1	-3	1	3	0	-9	-12	-12	-12	-12	-12	11	11	7	10

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITY.  
 \*\*\*MINUS SIGN DENOTES HEADWINDS.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWIND										STANDARD DEVIATION									
	DIRECT					RETURN					JAN APR JUL OCT					JAN APR JUL OCT				
KEY WEST	PATRICK AFB										231 N.M.I.									
5000	4	5	4	4	4	-1	-3	-4	-5	-3	-4	-5	-3	-4	-4	-4	-11	-12	11	10
10000	3	3	3	4	3	-3	-5	-4	-3	-4	-4	-3	-3	-4	-4	-4	-11	-13	12	11
18000	2	1	3	4	2	-5	-8	-7	-6	-3	-5	-6	-3	-5	-5	-5	-14	-16	16	15
KEY WEST	PITTSBURGH										950 N.M.I.									
5000	3	1	1	1	1	-4	-6	-4	-3	-1	-3	-3	-1	-2	-3	-3	-9	-11	10	10
10000	0	0	1	2	0	-5	-7	-5	-4	-2	-4	-4	-2	-3	-4	-4	-10	-12	11	11
18000	-2	-4	1	2	0	-10	-12	-13	-5	-2	-7	-5	-2	-7	-7	-7	-17	-19	16	16
KEY WEST	AFGINA										1000 N.M.I.									
5000	-6	-3	-1	-4	-4	-9	-11	4	2	1	3	2	1	3	2	2	-2	-4	9	8
10000	-14	-9	-4	-8	-7	-15	-17	10	7	3	6	6	0	6	6	6	0	-1	9	9
18000	-25	-19	-10	-17	-17	-27	-29	15	12	7	11	10	3	11	10	10	3	1	13	13
KEY WEST	SCOTT AFB										937 N.M.I.									
5000	0	-1	0	0	0	-7	-8	0	0	0	0	0	0	0	0	0	-6	-8	10	10
10000	-8	-6	0	-2	-4	-11	-13	4	4	0	1	1	1	1	1	1	-5	-6	14	11
18000	-19	-17	-3	-9	-11	-22	-25	6	9	2	4	4	2	4	4	4	-4	-6	16	15
KEY WEST	SELFIDGE AFB										1000 N.M.I.									
5000	1	0	1	0	0	-5	-7	-3	-1	-1	-1	-1	-1	-1	-2	-2	-8	-10	10	10
10000	-2	-1	0	0	-1	-7	-9	-3	-1	-1	-2	-2	-2	-2	-2	-2	-9	-11	11	11
18000	-7	-8	0	-1	-4	-14	-16	-8	-1	0	-4	-3	0	-4	-3	-3	-13	-16	16	16
KEY WEST	SHAW AFB										370 N.M.I.									
5000	5	4	3	2	3	-2	-4	-5	-4	-3	-2	-4	-3	-2	-4	-4	-10	-12	10	10
10000	2	2	2	2	2	-4	-6	-5	-4	-2	-3	-4	-2	-3	-4	-4	-11	-13	12	11
18000	0	-1	2	3	0	-8	-10	-10	-6	-2	-6	-10	-6	-6	-6	-6	-16	-18	16	16
KEY WEST	WESTOVER AFB										1155 N.M.I.									
5000	5	4	3	3	3	-2	-3	-7	-5	-3	-3	-5	-3	-3	-5	-5	-11	-13	10	10
10000	7	7	4	5	5	0	-2	-12	-11	-4	-6	-8	-4	-6	-8	-8	-15	-17	11	11
18000	10	6	5	9	7	-1	-3	-25	-15	-6	-15	-15	-6	-15	-15	-15	-26	-29	16	15
KEY WEST	MURYSMITH										1197 N.M.I.									
5000	0	0	0	0	0	-6	-7	-2	-1	-1	-1	-2	-1	-1	-2	-2	-8	-9	10	10
10000	-3	-2	0	0	-1	-8	-10	-2	-1	0	-1	-1	0	-1	-1	-1	-8	-10	11	11
18000	-9	-8	-1	-2	-5	-15	-17	-7	-1	0	-4	-3	0	-4	-3	-3	-13	-15	16	15
KEY WEST	MANDALAY										1042 N.M.I.									
5000	-7	-6	-6	1	-5	-10	-11	6	6	6	-1	4	6	-1	4	4	0	-2	6	6
10000	-16	-13	-5	-3	-10	-16	-18	13	12	4	3	8	2	3	8	8	2	0	7	7
18000	-36	-24	-6	-14	-19	-31	-33	28	20	5	12	15	7	12	15	15	7	5	10	9

\* HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\* A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED DEP CENT AFFILIARITIES.  
 \*\*\* PLUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION							
	DIRECT			EQUVALENT			M E A D M I N D S			RETURN			JAN	APR	JUL	OCT				
KIMPO AB																10	11	9	10	704 N.M.I.
5000	14	8	4	MISAWA AB	0	1	0	-16	-8	-4	-10	-10	-17	-19	13	13	10	12		
10000	25	18	8	19	17	8	5	-28	-19	-8	-20	-19	-29	-31	18	16	13	16		
18000	35	27	12	27	24	12	9	-43	-32	-13	-31	-30	-43	-47						
KIMPO AB																9	11	10	9	503 N.M.I.
5000	-14	-7	-4	PEIPING	-9	-16	-17	14	7	4	7	8	1	0	12	11	11	11	11	
10000	-26	-18	-6	-15	-17	-26	-28	26	18	6	14	15	6	4	17	15	12	14	14	
18000	-45	-32	-13	-26	-29	-42	-46	43	31	13	27	27	15	12						
KIMPO AB																10	12	11	11	182 N.M.I.
5000	14	4	1	PUSAN EAST	7	-1	-3	-14	-5	-1	-9	-9	-16	-18	14	14	12	13	13	
10000	22	12	3	12	11	2	0	-25	-14	-4	-14	1	-25	-28	19	17	16	15	15	
18000	32	24	7	21	20	8	5	-42	-30	-9	-25	3	-40	-44						
KIMPO AB																9	6	6	6	1936 N.M.I.
5000	-3	-4	-7	SAIGON	-3	-8	-9	3	4	7	-2	2	-1	-2	7	6	7	7	7	
10000	-8	-7	-5	-1	-6	-11	-12	5	6	5	0	4	0	-2	9	6	6	6	6	
18000	-21	-12	-4	-6	-10	-18	-20	11	6	3	5	5	0	0	9	6	7	7	7	
KIMPO AB																9	11	10	9	400 N.M.I.
5000	-4	-3	-4	SHANGHAI	-3	-9	-11	2	3	4	-2	1	-5	-7	12	11	11	12	13	
10000	-12	-10	-4	-3	-8	-16	-18	6	8	4	1	4	-3	-5	16	15	12	13	13	
18000	-29	-19	-9	-11	-17	-28	-31	12	9	8	5	8	-1	-3						
KIMPO AB																8	10	9	8	708 N.M.I.
5000	-1	-3	-5	TAIPEI	-2	-8	-10	1	3	4	-3	0	-5	-6	11	10	10	10	11	
10000	-7	-8	-4	-1	-6	-13	-14	0	5	3	0	1	-5	-7	14	12	10	11	11	
18000	-22	-11	-7	-5	-11	-20	-23	3	1	6	0	2	-5	-7						
KIMPO AB																10	11	9	10	636 N.M.I.
5000	16	7	3	TOKYO	8	0	0	-16	-7	-3	-8	-9	-16	-18	10	11	9	10	10	
10000	31	20	7	17	18	8	5	-32	-21	-7	-18	-20	-30	-33	13	13	11	12	12	
18000	48	36	13	31	31	17	14	-51	-38	-14	-33	-34	-49	-52	17	16	13	15	15	
KODIAK																11	9	7	9	1350 N.M.I.
5000	2	0	2	LARSON AFB	1	-5	-6	-4	-1	-2	-2	-3	-9	-10	11	9	7	9	9	
10000	9	3	5	3	4	-2	-4	-11	-5	-6	-5	-7	-14	-16	13	10	9	10	10	
18000	17	8	10	12	11	0	-1	-23	-13	-13	-18	-17	-28	-31	18	16	13	16	16	
KODIAK																9	7	6	8	1824 N.M.I.
5000	4	2	2	MINDT AFB	3	-1	-3	-6	-2	-2	-6	-4	-10	-11	9	7	6	8	8	
10000	13	6	7	10	8	3	1	-14	-7	-7	-12	-10	-16	-18	10	8	7	8	8	
18000	21	11	11	17	14	6	4	-24	-14	-12	-21	-18	-27	-29	16	12	10	12	12	

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADINGS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN FEET	EQUIVALENT HEADINGS												STANDARD DEVIATION										
	DIRECT			RETURN			A75			A85			A75		A85		A75		A85				
	JAN	APR	JUL	OCT	JUL	APR	JAN	APR	JUL	OCT	JUL	APR	JAN	APR	JUL	OCT	JUL	APR	JAN	APR	JUL	OCT	
<b>KODIAK</b>																							
5000	2	0	2	0	2	0	0	0	0	0	0	0	-3	0	-2	-1	-2	-7	-8	9	7	6	7
10000	8	3	4	2	4	2	4	-2	-3	4	-3	4	-11	-5	-5	-5	-7	-13	-15	11	9	8	9
18000	16	8	9	9	10	1	-1	1	-1	10	1	-1	-24	-14	-12	-16	-16	-26	-29	16	14	11	14
<b>KODIAK</b>																							
5000	3	0	3	1	1	1	-3	-4	-2	1	1	1	-5	-1	-3	-3	-3	-9	-10	9	8	6	8
10000	8	3	4	2	4	4	-2	-4	-4	4	4	4	-11	-6	-5	-5	-7	-14	-15	12	10	8	9
18000	15	7	9	7	9	9	0	-2	-2	9	9	9	-23	-14	-12	-14	-16	-26	-28	17	14	11	14
<b>KODIAK</b>																							
5000	-2	3	6	4	3	3	-4	-5	-3	3	3	3	1	-3	-6	-4	-4	-10	-12	12	9	8	10
10000	0	5	5	5	4	4	-3	-5	-5	4	4	4	-1	-5	-5	-7	-5	-13	-15	14	11	10	11
18000	-1	6	4	7	4	4	-7	-10	-10	4	4	4	-3	-9	-5	-10	-8	-19	-21	19	16	14	16
<b>KODIAK</b>																							
5000	4	2	2	5	3	3	-2	-3	-3	3	3	3	-5	-2	-2	-6	-6	-10	-11	9	7	7	8
10000	12	6	7	10	8	2	1	1	1	8	2	1	-14	-7	-7	-11	-10	-16	-18	10	8	8	8
18000	20	11	10	17	14	5	3	3	3	14	5	3	-24	-14	-12	-20	-18	-27	-29	14	13	11	13
<b>KODIAK</b>																							
5000	-6	-4	-9	-7	-7	-7	-7	-14	-16	7	7	7	4	3	8	6	5	-2	-3	12	11	9	11
10000	-12	-6	-8	-12	-10	-18	-21	-21	-21	-10	-18	-21	10	4	7	10	7	0	-2	14	12	11	12
18000	-19	-12	-14	-16	-16	-27	-30	-30	-30	-16	-27	-30	14	9	11	13	11	0	-2	19	16	15	17
<b>KODIAK</b>																							
5000	0	0	2	0	0	0	-4	-5	-5	0	0	0	0	0	-2	-1	-1	-6	-7	8	7	7	7
10000	0	3	3	3	2	2	-2	-4	-4	2	2	2	0	-3	-4	-4	-3	-8	-10	8	7	7	7
18000	0	5	5	6	4	4	-3	-5	-5	4	4	4	-3	-7	-5	-8	-7	-14	-15	12	11	9	10
<b>KODIAK</b>																							
5000	2	0	2	0	1	1	-5	-6	-2	1	1	1	-4	0	-3	-1	-3	-9	-10	11	9	7	9
10000	8	3	5	2	4	4	-3	-4	-4	4	4	4	-11	-5	-6	-5	-7	-15	-17	13	11	9	11
18000	17	7	10	11	11	11	0	-2	-2	11	11	11	-23	-13	-13	-18	-17	-28	-31	18	16	13	16
<b>KODIAK</b>																							
5000	0	3	1	6	2	2	-3	-4	-4	2	2	2	-1	-3	-1	-7	-3	-9	-11	10	8	7	9
10000	7	4	5	9	5	0	-2	-2	-2	5	0	-2	-8	-5	-5	-8	-7	-13	-15	12	9	8	9
18000	13	10	8	14	11	1	0	0	0	11	1	0	-15	-12	-10	-16	-14	-23	-26	16	14	12	13
<b>KWJULFIN IS.</b>																							
5000	-1	-2	-7	-5	-5	-9	-10	-10	-10	-5	-9	-10	0	1	6	4	2	-1	-3	7	6	5	6
10000	-3	-1	-4	-5	-4	-8	-9	-9	-9	-4	-8	-9	2	0	4	5	3	-1	-2	8	7	5	6
18000	0	0	-3	-4	-2	-8	-10	-10	-10	-2	-8	-10	-5	-1	3	3	0	-6	-8	11	9	7	8

\* HEADINGS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\* DENOTES ANNUAL EQUIVALENT HEADINGS FOR INDICATED WIND PER CENT RELIABILITIES.  
 † PLUS SIGN DENOTES HEADINGS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION				
	DIRTY				CLEAN				RETURN				JAN	APR	JUL	OCT	
	JAN	APR	JUL	OCT	00ASO	075	AB5	00ASO	075	AB5	00ASO	075	AB5	JAN	APR	JUL	OCT
KWAJALFIN NS 5000 10000 18000	TO	0	0	0	0	0	-4	-4	-4	-4	-4	-4	-3	0	0	0	0
	TO	0	0	0	0	0	-4	-4	-4	-4	-4	-4	-1	-2	0	0	0
	TO	1	-1	0	0	0	-6	-6	-6	-6	-6	-6	1	-1	0	0	0
KWAJALFIN NS 5000 10000 18000	TO	-2	-7	-7	-6	-6	-9	-10	-10	-10	-10	-10	1	7	7	6	5
	TO	-5	-2	-7	-4	-5	-8	-9	-9	-9	-9	-9	5	2	6	4	4
	TO	-4	-1	-5	-2	-3	-8	-9	-9	-9	-9	-9	2	1	5	3	2
KWAJALFIN NS 5000 10000 18000	TO	3	6	5	3	4	1	0	0	0	0	0	-3	-6	-5	-3	-5
	TO	5	7	5	6	5	3	2	2	2	2	2	-5	-5	-5	-5	-5
	TO	7	3	6	6	5	1	0	0	0	0	0	-7	-3	-6	-6	-6
KWAJALEIN NS 5000 10000 18000	TO	0	-3	-3	-2	-3	-5	-6	-6	-6	-6	-6	0	2	3	2	2
	TO	-3	0	-3	-2	-2	-6	-7	-7	-7	-7	-7	3	0	2	2	2
	TO	-3	1	-3	-1	-2	-6	-7	-7	-7	-7	-7	2	-1	2	1	0
KWAJALFIN NS 5000 10000 18000	TO	1	7	5	1	3	0	-1	-1	-1	-1	-1	-2	-7	-5	0	-4
	TO	8	8	8	8	8	5	4	4	4	4	4	-8	-7	-7	-7	-7
	TO	13	8	10	9	9	6	5	5	5	5	5	-13	-7	-10	-9	-10
KWAJALEIN NS 5000 10000 18000	TO	0	2	0	1	0	-3	-4	-4	-4	-4	-4	-1	-4	-1	-2	-3
	TO	0	1	2	1	0	-3	-4	-4	-4	-4	-4	0	-1	-2	-1	-2
	TO	4	-3	3	1	1	-5	-6	-6	-6	-6	-6	-5	3	-4	-1	-2
LAMOFE 5000 10000 18000	TO	6	6	0	0	2	-1	-2	-2	-2	-2	-2	-6	-6	3	0	0
	TO	15	11	2	3	7	1	0	0	0	0	0	-15	-11	-2	-3	-3
	TO	29	20	-3	5	12	1	-1	-1	-1	-1	-1	-32	-21	3	-8	-14
LAMOFE 5000 10000 18000	TO	2	6	-2	0	1	-4	-5	-5	-5	-5	-5	-1	-6	2	0	0
	TO	5	2	0	2	2	-3	-4	-4	-4	-4	-4	-6	-2	0	-1	-1
	TO	17	15	-2	7	8	-1	-3	-3	-3	-3	-3	-24	-19	2	-8	-12
LAMOFE 5000 10000 18000	TO	-2	-5	0	0	-2	-4	-7	-7	-7	-7	-7	3	6	3	0	0
	TO	-8	-8	-2	-5	-6	-11	-12	-12	-12	-12	-12	8	7	3	5	5
	TO	-30	-27	-11	-17	-21	-30	-33	-33	-33	-33	-33	28	25	10	16	19

\* HEADWINDS—COMPUTED FOR A 120-KT AIRSPEED.  
 \*\* DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION					
	DIRECT				RETURN				RETURN				JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	00ASO	A75	A85	JAN	APR	JUL	OCT	00ASO	A75	A85	JAN	APR	JUL	OCT
<b>LANDRE</b>																		
5000	-2	-5	-3	1	-2	-7	-8	2	6	3	0	2	-2	-3	6	6	7	5
10000	-11	-10	-1	-2	-6	-12	-14	11	10	2	3	6	0	0	8	8	6	7
18000	-35	-28	0	-13	-19	-32	-35	33	27	0	12	17	4	1	13	12	9	10
<b>LARSON AFB</b>																		
5000	5	4	2	4	3	-1	-2	-6	-4	-2	-5	-5	-10	-11	9	8	6	8
10000	17	10	6	11	10	4	2	-19	-11	-6	-12	-12	-19	-21	10	9	7	9
18000	27	18	13	20	18	9	7	-33	-22	-15	-24	-23	-34	-37	16	15	10	16
<b>LARSON AFB</b>																		
5000	11	6	5	7	7	1	0	-11	-7	-5	-8	-8	-14	-15	9	9	7	8
10000	21	17	11	14	14	7	6	-23	-13	-12	-15	-16	-23	-25	10	10	8	9
18000	32	21	20	25	23	14	12	-37	-24	-21	-28	-27	-37	-40	15	14	10	14
<b>LARSON AFB</b>																		
5000	-3	-2	0	-2	-2	-7	-8	3	2	0	2	1	-2	-4	8	7	5	7
10000	6	3	0	0	1	-5	-6	-8	-4	0	-1	-3	-10	-12	12	10	8	10
18000	9	5	-1	4	3	-7	-10	-18	-11	-2	-10	-10	-22	-25	19	18	12	17
<b>LARSON AFB</b>																		
5000	11	6	6	8	7	2	1	-12	-7	-6	-9	-9	-14	-16	9	8	6	8
10000	22	13	13	14	15	9	7	-23	-14	-13	-15	-16	-23	-25	9	9	7	9
18000	32	21	21	24	24	15	13	-38	-25	-22	-28	-28	-38	-40	14	14	9	13
<b>LARSON AFB</b>																		
5000	6	5	3	5	4	0	-1	-7	-5	-3	-5	-5	-11	-12	9	8	6	8
10000	18	11	7	11	11	5	3	-19	-12	-7	-12	-13	-19	-21	10	9	7	9
18000	28	18	14	21	19	10	7	-34	-23	-16	-24	-24	-35	-38	16	15	10	14
<b>LARSON AFB</b>																		
5000	-5	-5	-4	-3	-5	-8	-9	5	5	5	3	4	1	0	6	6	4	5
10000	4	2	-1	0	0	-3	-5	-6	-3	1	-1	-2	-7	-9	8	7	5	7
18000	9	6	-1	4	3	-3	-5	-17	-12	0	-8	-9	-18	-20	13	11	7	11
<b>LARSON AFB</b>																		
5000	10	5	4	7	6	0	-1	-11	-5	-4	-8	-7	-14	-16	10	10	8	10
10000	20	11	11	15	13	7	5	-21	-11	-11	-15	-15	-22	-24	11	10	8	10
18000	29	19	21	25	23	12	10	-33	-22	-22	-28	-26	-37	-40	17	16	12	16
<b>LARSON AFB</b>																		
5000	11	5	3	7	6	0	-2	-11	-5	-3	-7	-7	-14	-16	11	10	8	10
10000	18	10	10	14	12	5	4	-19	-10	-10	-15	-14	-21	-23	11	10	9	10
18000	26	17	19	23	21	10	7	-30	-19	-21	-26	-24	-36	-39	18	17	13	17

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	E U L Y A L E N T H E A D M I V D S												STANDARD DEVIATION					
	DIRECT				RETURN				PERMAN				JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	00ASO	A75	ABS	JAN	APR	JUL	OCT	00ASO	A75	ABS	JAN	APR	JUL	OCT
LARSON AFB																		
5000	-3	-2	0	-2	-2	-7	-8	3	2	0	3	1	-3	-4	9	8	2	7
10000	5	2	0	0	-6	-8	-8	-7	-3	0	-1	-3	-10	-12	13	11	8	11
18000	7	3	-1	3	2	-9	-12	-17	-9	-1	-9	-9	-22	-25	21	19	13	10
LARSON AFB																		
5000	11	6	5	8	7	1	0	-12	-7	-5	-8	-8	-14	-16	9	9	7	8
10000	22	13	13	14	15	9	7	-23	-14	-13	-15	-16	-23	-25	9	9	7	9
18000	32	21	21	25	24	15	13	-30	-25	-22	-20	-20	-30	-41	14	14	9	14
LARSON AFB																		
5000	3	2	0	2	1	-3	-4	-4	-3	0	-3	-3	-8	-9	8	8	6	7
10000	15	9	4	8	8	2	1	-16	-10	-4	-9	-10	-16	-18	9	9	7	8
18000	24	17	10	17	16	7	5	-31	-22	-11	-21	-21	-31	-34	15	14	9	13
LARSON AFB																		
5000	11	5	5	8	7	1	0	-12	-6	-6	-9	-9	-15	-16	9	9	7	9
10000	21	12	13	15	15	8	7	-22	-13	-13	-16	-16	-23	-25	9	10	8	9
18000	31	20	22	25	24	15	12	-36	-23	-23	-28	-27	-37	-40	15	14	10	14
LARSON AFB																		
5000	-2	-1	2	0	0	-6	-7	1	1	-1	1	0	-4	-6	9	8	6	7
10000	1	0	-2	-2	-1	-8	-10	-4	-2	2	1	0	-8	-10	13	12	8	11
18000	0	-1	-5	-2	-3	-14	-17	-10	-4	2	-3	-3	-16	-19	20	19	12	18
LARSON AFB																		
5000	11	6	5	8	7	1	0	-12	-7	-5	-8	-8	-14	-16	9	9	7	8
10000	21	12	12	14	14	8	6	-23	-13	-13	-15	-16	-23	-25	9	10	7	9
18000	32	21	21	25	24	15	13	-37	-24	-22	-20	-20	-30	-40	15	14	10	14
LARSON AFB																		
5000	2	2	2	0	1	-3	-4	-3	-2	-2	0	-2	-7	-8	6	7	6	8
10000	-6	-1	-2	0	-2	-8	-10	4	0	2	-1	0	-4	-6	10	8	7	8
18000	-14	-4	-5	-7	-8	-16	-18	9	0	3	2	3	-4	-6	14	12	10	12
LARSON AFB																		
5000	12	4	3	7	6	-1	-2	-12	-5	-3	-7	-7	-15	-17	11	11	9	11
10000	16	9	9	13	11	4	2	-17	-9	-9	-14	-13	-20	-22	12	10	9	11
18000	21	14	17	19	17	6	3	-26	-17	-19	-24	-22	-34	-37	16	18	14	18
LARSON AFB																		
5000	8	4	4	7	6	0	0	-9	-6	-4	-7	-7	-13	-14	9	9	7	8
10000	20	11	9	13	12	6	4	-21	-12	-9	-14	-14	-21	-23	10	10	8	9
18000	30	19	17	24	21	12	10	-35	-23	-19	-27	-26	-36	-39	16	15	10	15

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 --DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT						RETURN						JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT
LARSON AFB	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	11	6	5	8	7	1	0	-12	-6	-5	-9	-8	-14	-16	9	9	7	9
10000	21	12	12	15	14	6	6	-22	-13	-13	-16	-16	-23	-25	10	10	8	9
18000	31	20	21	25	23	14	12	-35	-23	-23	-28	-27	-37	-39	15	14	10	14
LARSON AFB	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	9	6	4	6	6	1	0	-10	-7	-4	-7	-7	-13	-14	8	8	6	8
10000	20	12	9	12	12	6	5	-22	-14	-9	-13	-15	-22	-23	9	9	7	9
18000	30	20	16	22	21	12	10	-36	-25	-17	-26	-26	-36	-39	14	14	9	13
LARSON AFB	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	12	6	6	8	7	2	0	-12	-6	-6	-9	-9	-14	-16	9	9	7	8
10000	21	12	13	16	15	9	7	-23	-13	-14	-16	-17	-23	-25	9	9	7	9
18000	31	20	22	24	23	15	13	-36	-24	-23	-28	-28	-37	-39	14	13	9	13
LARSON AFB	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	11	5	5	8	7	1	0	-12	-6	-5	-9	-8	-14	-16	9	9	7	9
10000	20	11	13	15	14	8	6	-21	-12	-13	-16	-16	-23	-24	10	10	8	9
18000	30	19	22	25	23	14	12	-34	-22	-23	-28	-27	-36	-39	15	14	10	14
LARSON AFB	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	4	3	1	2	2	-3	-5	-5	-3	-1	-3	-3	-10	-11	9	9	8	10
10000	-2	0	0	1	0	-6	-8	0	-1	0	-3	-1	-8	-9	11	9	8	9
18000	-6	0	0	-1	-2	-12	-14	0	-4	-2	-4	-3	-13	-15	16	15	12	15
LITTLE ROCK	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	12	8	6	6	7	0	-2	-13	-9	-5	-6	-8	-17	-19	14	13	9	11
10000	23	15	8	10	13	4	2	-25	-17	-9	-11	-15	-26	-28	14	14	10	14
18000	37	23	11	19	20	8	5	-44	-29	-12	-24	-25	-42	-46	21	20	11	20
LITTLE ROCK	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	11	7	7	8	8	1	0	-13	-8	-7	-9	-10	-16	-18	11	11	8	9
10000	22	13	11	13	14	6	4	-25	-16	-12	-15	-17	-25	-28	12	12	9	11
18000	34	20	15	22	21	11	8	-43	-26	-18	-28	-28	-41	-45	17	17	10	17
LITTLE ROCK	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	-5	-5	-4	-2	-4	-10	-11	5	5	3	2	3	-1	-3	10	9	5	8
10000	-19	-15	-4	-9	-12	-20	-22	16	15	4	8	10	3	1	11	10	6	10
18000	-37	-30	-9	-19	-22	-37	-40	33	27	8	16	19	8	5	18	16	9	15
LITTLE ROCK	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	13	10	6	7	8	1	0	-15	-11	-6	-7	-10	-17	-19	12	12	8	10
10000	27	19	10	11	15	7	5	-29	-20	-11	-12	-18	-28	-30	13	13	9	12
18000	43	27	14	24	24	12	10	-48	-32	-15	-28	-29	-45	-49	19	18	10	18

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 00450--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUVALENT HEADWIND M.E.A.D.M.I.D.S.O.												STANDARD DEVIATION				
	DIRECT			RETURN			JAN			APR			JAN	APR	JUL	OCT	
	JAN	APR	JUL	OCT	00ASO	A75	A85	JAN	APR	JUL	OCT	00ASO	A75	A85			
LITTLE ROCK TO MEXICO CITY	-7	-8	-5	-1	-6	-11	-13	6	6	5	1	4	0	-2	10	9	1000 N.M.I.
5000	-10	-7	-2	-2	-6	-12	-13	8	6	2	2	4	-1	-3	9	9	6
10000	-20	-13	1	-7	-9	-20	-22	13	6	-1	4	4	-3	-5	14	13	7
18000																	12
LITTLE ROCK TO PINN-ST PAUL	-3	-1	0	-2	-2	-9	-11	0	0	-1	1	0	0	-10	13	13	600 N.M.I.
5000	-4	-4	-1	-4	-4	-13	-15	0	0	0	1	0	-8	-10	14	14	11
10000	-13	-8	-4	-10	-9	-21	-24	-4	-1	0	1	-1	-13	-16	21	20	13
18000																	19
LITTLE ROCK TO MINOT AFB	-8	-4	-1	-5	-5	-13	-15	6	3	1	5	3	-3	-5	11	12	800 N.M.I.
5000	-15	-9	-5	-10	-10	-18	-20	11	7	4	8	7	0	-2	12	12	11
10000	-25	-17	-11	-15	-18	-29	-32	13	9	7	12	9	0	-3	16	17	11
18000																	17
LITTLE ROCK TO NELLIS AFB	-5	-4	-2	-2	-4	-9	-10	4	4	2	1	2	-2	-4	9	9	1117 N.M.I.
5000	-18	-14	-5	-9	-12	-19	-21	17	13	5	9	10	3	1	11	10	8
10000	-36	-28	-11	-20	-23	-36	-39	32	25	11	17	19	9	7	17	16	10
18000																	15
LITTLE ROCK TO NEW CUMBERLAND	13	9	6	7	8	1	0	-14	-13	-6	-7	-9	-17	-19	13	12	793 N.M.I.
5000	26	18	10	11	15	6	4	-28	-20	-10	-12	-17	-27	-30	13	13	8
10000	62	26	13	23	24	11	8	-48	-31	-14	-27	-28	-45	-49	10	9	10
18000																	13
LITTLE ROCK TO NEW ORLEANS	-1	0	-1	1	-1	-8	-10	0	0	1	-1	0	-8	-10	13	13	312 N.M.I.
5000	1	1	-1	2	0	-8	-10	-6	-4	1	-3	-3	-12	-14	13	14	9
10000	0	5	5	4	3	-7	-10	-15	-15	-5	-9	-11	-23	-26	20	19	11
18000																	18
LITTLE ROCK TO NIAGARA FALLS	11	7	5	7	7	0	-1	-12	-8	-5	-7	-8	-16	-18	13	12	786 N.M.I.
5000	21	14	9	10	13	4	2	-24	-16	-10	-12	-16	-25	-27	13	14	10
10000	32	19	12	18	18	7	4	-42	-26	-14	-24	-25	-40	-44	20	19	13
18000																	19
LITTLE ROCK TO CUMBERLAND AFB	-5	-5	-3	-1	-4	-9	-10	4	4	3	0	2	-2	-3	6	6	1327 N.M.I.
5000	-17	-14	-5	-9	-11	-18	-20	15	13	5	8	9	3	2	10	9	6
10000	-35	-28	-11	-18	-22	-35	-38	31	25	10	16	19	9	6	16	15	7
18000																	9
LITTLE ROCK TO PATRICK AFB	4	5	1	3	3	-3	-5	-5	-5	-1	-3	-4	-10	-12	11	11	712 N.M.I.
5000	14	11	2	5	7	0	-2	-16	-13	-2	-6	-9	-18	-20	12	12	7
10000	25	22	5	13	14	4	1	-33	-27	-5	-16	-19	-33	-37	17	17	10
18000																	9

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.

\*\*--DENOTES ANNUAL EQUIVALENT HEADWINDS AND INDICATED PER CENT RELIABILITIES.

\*\*\*MINUS SIGN DENOTES HEADWINDS.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	00A50	A75	A85	JAN	APR	JUL	OCT	00A50	A75	A85	JAN	APR	JUL	OCT
LITTLE ROCK	TO																	
5000	6	7	7	7	0	-1	-13	-10	-6	-7	-9	-17	-19	13	12	8	11	657 N.M.I.
10000	24	16	9	10	14	5	-26	-18	-10	-12	-16	-26	-29	14	14	10	13	
18000	38	23	12	21	21	9	-45	-29	-13	-25	-26	-63	-47	20	20	11	19	
LITTLE ROCK	TO																	
5000	-8	-4	-2	-6	-5	-13	7	3	1	5	3	-3	-4	11	11	9	10	1079 N.M.I.
10000	-14	-10	-6	-11	-11	-19	12	8	5	9	8	1	0	11	11	9	11	
18000	-26	-17	-12	-20	-19	-30	16	11	8	14	11	1	0	17	16	11	16	
LITTLE ROCK	TO																	
5000	6	5	4	2	4	-4	-8	-6	-4	-3	-6	-14	-16	15	14	10	12	242 N.M.I.
10000	10	6	4	4	5	-3	-16	-9	-4	-6	-9	-19	-22	15	15	11	15	
18000	14	8	3	5	6	-8	-30	-18	-5	-12	-15	-31	-35	22	21	12	21	
LITTLE ROCK	TO																	
5000	9	6	5	6	6	-1	-11	-7	-5	-6	-8	-15	-17	13	13	9	11	634 N.M.I.
10000	17	11	7	9	10	1	-22	-14	-8	-11	-14	-23	-26	14	14	10	13	
18000	26	15	10	14	15	3	-39	-24	-12	-21	-23	-38	-42	20	20	12	19	
LITTLE ROCK	TO																	
5000	12	10	5	5	7	0	-13	-10	-5	-5	-8	-16	-18	13	12	8	11	500 N.M.I.
10000	25	19	6	9	13	4	-26	-20	-6	-10	-15	-26	-29	13	13	9	13	
18000	40	31	9	21	23	10	-45	-34	-9	-23	-26	-43	-47	19	19	10	18	
LITTLE ROCK	TO																	
5000	13	9	6	7	8	1	-14	-10	-6	-8	-10	-17	-19	12	11	8	10	1016 N.M.I.
10000	26	18	11	12	16	7	-28	-20	-11	-13	-18	-27	-30	13	13	9	12	
18000	41	25	15	24	24	12	-47	-31	-16	-28	-29	-44	-48	18	18	10	18	
LITTLE ROCK	TO																	
5000	7	4	4	5	4	-4	-9	-6	-4	-6	-7	-14	-16	13	13	9	11	701 N.M.I.
10000	13	8	6	7	9	0	-18	-11	-7	-9	-11	-21	-23	14	14	10	13	
18000	19	11	8	10	11	0	-33	-20	-11	-18	-20	-34	-37	20	20	12	19	
LITTLE ROCK	TO																	
5000	-5	-4	-2	-4	-4	-9	5	4	2	4	3	-1	-2	8	8	6	7	1456 N.M.I.
10000	-18	-11	-9	-11	-12	-18	17	10	5	10	10	4	2	10	9	7	9	
18000	-33	-23	-15	-24	-23	-34	28	18	13	20	18	9	7	16	15	10	14	
LITTLE ROCK	TO																	
5000	-6	-3	-1	-7	-5	-11	5	2	1	5	3	-2	-4	9	9	7	9	1853 N.M.I.
10000	-14	-8	-7	-11	-10	-16	11	6	6	9	7	2	0	9	9	7	8	
18000	-23	-14	-11	-13	-17	-25	14	9	3	12	10	2	0	13	12	9	12	

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*--DENOTES ANIMAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWIND RETURN												STANDARD DEVIATION				
	DIRECT						RETURN						JAN	APR	JUL	OCT	
	JAN	APR	JUL	OCT	00450	00450	00450	00450	00450	00450	00450	00450					
LOCKBOURNE	LORING AFB												700 N.M.I.				
5000	11	6	8	9	9	0	-13	-8	-3	-10	-10	-18	-20	13	13	9	11
10000	21	13	12	14	14	5	-25	-16	-13	-16	-17	-27	-29	15	14	10	13
18000	34	18	18	25	22	10	-43	-26	-21	-30	-29	-44	-47	21	20	13	20
LOCKBOURNE	LUKE AFB												1450 N.M.I.				
5000	-9	-7	-5	-5	-7	-12	8	7	5	5	6	0	0	9	9	6	8
10000	-21	-16	-8	-11	-14	-22	19	15	8	10	12	5	4	10	10	8	9
18000	-40	-29	-14	-23	-25	-38	34	25	14	19	21	12	9	16	15	9	14
LOCKBOURNE	MCGUIRE AFB												304 N.M.I.				
5000	15	11	8	9	10	2	-16	-12	-8	-10	-12	-20	-22	14	14	9	12
10000	31	22	15	13	19	9	-33	-23	-15	-14	-21	-32	-35	16	16	11	14
18000	48	30	20	28	29	15	-53	-34	-21	-32	-33	-51	-55	23	22	13	22
LOCKBOURNE	MEMPHIS												435 N.M.I.				
5000	-12	-9	-5	-5	-6	-16	11	8	5	5	6	0	-2	14	13	9	11
10000	-24	-16	-8	-10	-14	-25	21	14	8	9	12	3	1	14	15	10	14
18000	-43	-27	-11	-23	-24	-41	33	20	10	17	18	5	2	21	21	12	20
LOCKBOURNE	MEXICO CITY												1473 N.M.I.				
5000	-8	-7	-3	-2	-5	-11	7	7	3	2	4	0	-2	9	8	6	8
10000	-14	-10	-3	-4	-8	-14	11	8	3	3	5	0	-1	9	9	6	8
18000	-28	-18	0	-12	-14	-26	20	12	0	6	8	0	-1	13	12	7	12
LOCKBOURNE	MINN-ST PAUL												553 N.M.I.				
5000	-13	-8	-6	-8	-9	-18	11	7	6	7	7	0	-2	14	13	10	12
10000	-24	-16	-13	-14	-17	-27	21	14	12	12	14	5	3	14	15	11	14
18000	-41	-27	-20	-27	-28	-46	32	21	18	22	22	10	7	21	21	13	20
LOCKBOURNE	MINUT AFB												943 N.M.I.				
5000	-12	-7	-6	-9	-9	-16	11	6	5	8	7	0	-1	12	12	9	11
10000	-23	-14	-13	-15	-17	-25	21	12	12	14	14	6	4	12	13	10	12
18000	-38	-25	-21	-27	-27	-40	31	20	19	23	22	11	9	18	18	11	18
LOCKBOURNE	NELLIS AFB												1524 N.M.I.				
5000	-8	-7	-5	-5	-7	-12	7	6	5	4	5	0	0	9	8	6	7
10000	-20	-14	-9	-12	-14	-21	19	13	9	11	12	6	4	10	10	8	9
18000	-39	-27	-17	-24	-26	-37	33	24	16	21	22	13	10	16	15	9	14
LOCKBOURNE	NEW CUMBERLAND												282 N.M.I.				
5000	15	11	7	9	10	1	-16	-11	-7	-10	-11	-20	-22	15	14	9	12
10000	31	21	15	13	19	9	-32	-23	-15	-14	-21	-32	-35	16	16	11	15
18000	48	29	20	23	29	15	-52	-34	-21	-32	-33	-51	-55	23	23	13	22

\* HEADWINDS - COMPUTED FOR A 120-KT AIRSPEED.  
 \*\* A - DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION																							
	DIPECEY			NEW ORLEANS			NIAGARA FALLS			OKMARD AFB			PATRICK AFB			REGINA			SCOTT AFB			SELFRIDGE AFB			SHAW AFB			WFOSTON AFB								
	JAN	APR	JUL	TO	DEC	ABS	JAN	APR	JUL	TO	DEC	ABS	JAN	APR	JUL	TO	DEC	ABS	JAN	APR	JUL	TO	DEC	ABS	JAN	APR	JUL	TO	DEC	ABS	JAN	APR	JUL	TO	DEC	ABS
LOCKBOURNE 5000	-9	-6	-3	TO	NEW ORLEANS	-15	8	5	3	3	3	4	-2	-4	12	12	12	676 N.M.I.																		
10000	-18	-12	-5	-3	-5	-13	13	9	4	5	5	7	0	-2	13	13	9																			
18000	-34	-20	-3	-15	-16	-36	20	11	2	10	10	9	-1	-4	19	18	10																			
LOCKBOURNE 5000	9	4	4	TO	NIAGARA FALLS	-4	-11	-6	-5	-8	-8	-8	-17	-19	15	14	10	274 N.M.I.																		
10000	17	11	9	10	11	1	23	14	10	12	12	15	-25	-28	16	16	12																			
18000	24	11	12	13	15	2	39	21	-15	-25	-24	-40	-45	23	23	14																				
LOCKBOURNE 5000	-8	-6	-4	TO	OKMARD AFB	-12	7	6	5	3	3	5	0	-1	8	8	6	1751 N.M.I.																		
10000	-19	-14	-6	-4	-6	-11	17	12	3	10	10	11	5	3	10	9	7																			
18000	-37	-27	-16	-22	-24	-39	32	24	15	19	19	21	12	10	15	14	8																			
LOCKBOURNE 5000	-1	0	0	TO	PATRICK AFB	-9	0	-1	0	0	0	-1	-7	-9	11	11	8	694 N.M.I.																		
10000	0	0	0	0	0	-8	-5	-4	0	0	0	-2	-10	-12	13	13	8																			
18000	-5	0	0	-2	-1	-12	-12	-11	-1	-4	-4	-7	-18	-21	18	18	10																			
LOCKBOURNE 5000	-12	-7	-5	TO	REGINA	-18	10	6	5	8	8	7	0	-1	11	11	9	1119 N.M.I.																		
10000	-22	-13	-13	-14	-16	-24	20	12	12	14	14	14	6	5	11	11	9																			
18000	-36	-24	-20	-27	-26	-41	29	19	18	22	21	21	11	9	17	16	11																			
LOCKBOURNE 5000	-15	-10	-6	TO	SCOTT AFB	-21	14	10	7	8	8	9	1	0	15	14	9	335 N.M.I.																		
10000	-25	-20	-12	-14	-19	-32	27	19	12	13	13	17	7	5	15	15	11																			
18000	-48	-32	-18	-29	-30	-51	44	27	17	25	26	26	12	9	22	22	13																			
LOCKBOURNE 5000	-1	-2	0	TO	SELFIDGE AFB	-12	-1	0	0	-2	-2	-1	-9	-11	15	14	10	177 N.M.I.																		
10000	-4	-2	1	0	-2	-14	-4	-2	0	-3	-3	-3	-13	-15	16	16	12																			
18000	-10	-9	-2	-3	-6	-24	-12	-2	-2	-7	-6	-6	-20	-24	24	24	14																			
LOCKBOURNE 5000	3	3	2	TO	SHAW AFB	-7	-5	-4	-2	-2	-2	-4	-12	-14	13	13	9	360 N.M.I.																		
10000	5	4	2	1	2	-8	-12	-9	-3	-2	-7	-7	-16	-19	15	15	10																			
18000	0	0	0	0	0	-13	-21	-14	-5	-5	-13	-13	-27	-30	21	21	12																			
LOCKBOURNE 5000	14	9	8	TO	WFOSTON AFB	0	-15	-17	-8	-10	-11	-11	-19	-21	14	13	9	495 N.M.I.																		
10000	26	19	14	14	18	3	-31	-21	-15	-15	-20	-20	-31	-34	16	16	11																			
18000	44	26	20	23	28	14	-50	-32	-21	-32	-32	-49	-53	22	22	13																				

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 \*\*\*MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWIND HEADWINDS												STANDARD DEVIATION						
	DIRECT				RETURN				RETURN				JAN	APR	JUL	OCT			
	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	00ASO	A75	A85				
EQUILYALENT HEADWINDS																			
LOCKBOURNE																			
5000	-2	-3	-1	0	-2	-10	-13	0	1	0	-1	0	-9	-11	15	14	10	12	290 N.W.
10000	-6	-4	-3	-1	-4	-14	-16	-1	0	1	-1	0	-10	-13	16	16	12	15	
18000	-15	-11	-5	-7	-9	-24	-27	-6	0	0	-4	-2	-16	-20	23	23	14	22	
LOCKBOURNE																			
5000	-11	-7	-5	-8	-6	-14	-15	10	6	5	7	6	1	0	9	9	7	8	1001 N.W.
10000	-22	-13	-11	-15	-15	-22	-24	21	12	11	14	14	7	6	18	18	7	9	
18000	-37	-24	-21	-28	-27	-37	-40	32	21	20	25	23	14	12	15	14	10	14	
LOCKBOURNE																			
5000	-7	-4	-4	-8	-6	-12	-14	6	3	3	7	4	-1	-2	9	9	8	9	1778 N.W.
10000	-16	-9	-11	-13	-13	-19	-20	14	8	10	11	10	4	3	9	9	8	9	
18000	-27	-17	-17	-20	-20	-29	-31	20	13	14	16	15	7	5	13	13	9	13	
LOPING AFB																			
5000	-9	-6	-6	-7	-7	-16	-18	6	4	6	6	5	-2	-4	14	14	10	12	507 N.W.
10000	-20	-13	-10	-13	-14	-24	-27	13	9	8	10	9	0	-2	17	16	11	14	
18000	-37	-21	-16	-26	-24	-39	-43	23	11	11	16	15	1	-1	23	22	14	21	
LOPING AFB																			
5000	-13	-8	-7	-8	-9	-16	-18	11	7	7	8	8	1	0	11	11	8	9	1222 N.W.
10000	-25	-16	-12	-14	-17	-25	-27	21	13	11	12	13	6	4	12	12	9	11	
18000	-43	-26	-18	-28	-28	-41	-45	34	19	15	22	21	10	8	18	17	11	17	
LOPING AFB																			
5000	-14	-7	-9	-11	-11	-18	-20	13	6	9	11	9	2	0	12	12	9	11	1050 N.W.
10000	-24	-14	-16	-19	-19	-27	-29	22	12	15	17	16	8	6	13	13	10	12	
18000	-39	-25	-25	-30	-30	-42	-45	35	21	24	26	26	14	12	19	18	12	18	
LOPING AFB																			
5000	-12	-6	-9	-11	-10	-17	-19	11	5	9	10	8	1	0	11	11	8	10	1343 N.W.
10000	-22	-12	-16	-18	-17	-25	-27	20	11	15	16	15	8	6	11	11	9	11	
18000	-35	-22	-26	-28	-28	-38	-41	31	19	24	25	24	14	12	16	15	11	15	
LOPING AFB																			
5000	-11	-7	-7	-8	-9	-17	-19	8	5	7	7	6	-1	-3	14	14	10	12	541 N.W.
10000	-22	-14	-11	-15	-16	-26	-28	17	11	10	12	12	2	0	16	16	11	14	
18000	-40	-23	-18	-29	-27	-42	-46	29	15	14	21	19	5	2	22	22	14	21	
LOPING AFB																			
5000	-11	-8	-6	-6	-6	-14	-16	10	6	5	6	6	0	0	10	10	7	9	1445 N.W.
10000	-22	-15	-9	-11	-14	-22	-24	18	12	8	9	11	4	2	11	11	8	10	
18000	-40	-24	-12	-24	-24	-37	-41	29	16	9	18	16	6	4	16	16	9	15	

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 00A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION			
	WIND VELOCITY						RETURN						JAN	APR	JUL	OCT
	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	00450				
NIAGARA FALLS																
LOPING AFB	TN	-14	-8	-10	-11	-20	-22	7	9	10	9	1	-1	14	522	
5000		-25	-15	-14	-19	-29	-31	22	13	14	16	6	4	16	10	
10000		-43	-26	-24	-32	-45	-49	36	20	21	25	11	8	23	12	
18000															22	
PATRICK AFB																
LOPING AFB	TO	-8	-4	-4	-4	-12	-14	6	4	5	4	-1	-3	10	1271	
5000		-15	-12	-6	-8	-18	-20	9	9	5	7	3	-1	10	10	
10000		-31	-19	-10	-20	-31	-34	16	9	7	10	1	0	12	7	
18000														17	16	
PITTSBURGH																
LOPING AFB	TO	-13	-8	-8	-9	-19	-20	10	4	4	8	0	-1	14	699	
5000		-25	-15	-13	-16	-27	-31	21	12	12	14	5	3	15	13	
10000		-42	-25	-21	-30	-43	-47	33	18	18	24	9	6	22	21	
18000														22	21	
PEKING																
LOPING AFB	TU	-12	-6	-9	-11	-17	-19	11	5	8	6	1	0	10	1457	
5000		-21	-11	-16	-17	-24	-26	19	10	15	15	7	6	11	10	
10000		-33	-20	-25	-27	-34	-39	29	17	24	23	13	11	15	14	
18000														15	14	
SCOTT AFB																
LOPING AFB	TO	-14	-8	-8	-10	-18	-19	12	7	8	8	1	0	12	1091	
5000		-26	-16	-13	-17	-27	-29	23	14	12	15	7	5	13	12	
10000		-43	-26	-21	-30	-42	-46	36	20	19	24	12	10	19	18	
18000														19	18	
SELFREDGE AFB																
LOPING AFB	TO	-14	-8	-9	-11	-19	-21	13	7	9	9	1	0	14	687	
5000		-26	-15	-15	-19	-29	-31	23	13	14	17	7	5	15	13	
10000		-43	-26	-24	-32	-43	-49	37	21	21	27	13	10	21	21	
18000														21	21	
SHAW AFB																
LOPING AFB	TN	-9	-4	-5	-4	-7	-14	7	5	5	5	-1	-3	12	965	
5000		-20	-14	-9	-11	-13	-22	14	10	7	9	1	0	14	12	
10000		-38	-22	-14	-25	-36	-41	24	12	10	17	3	1	19	14	
18000														19	14	
THULF																
LOPING AFB	TO	-1	0	0	1	0	-6	0	-1	-1	-2	-1	-7	0	1775	
5000		0	0	0	1	0	-8	-3	-1	-2	-2	-3	-9	0	0	
10000		3	0	0	0	0	-10	-9	-4	-2	-5	-5	-14	10	7	
18000														13	13	
WESTCOE AFB																
LOPING AFB	TN	-8	-4	-7	-7	-8	-14	5	9	8	6	5	-3	15	347	
5000		-19	-11	-10	-14	-24	-27	12	6	8	10	9	0	17	15	
10000		-36	-20	-17	-27	-35	-44	23	11	11	16	15	1	24	23	
18000														24	23	

HEADWINDS—COMPUTED FOR A 120-KT AIRSPEED.  
 000—DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED DEPARTURE MONTHS.  
 MINUS SIGN DENOTES HEADWINDS.

SPRIT 202

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	WINDY H A M I L T O N												STANDARD DEVIATION					
	JAN	APR	JUL	OCT	0050	A75	A95	JAN	APR	JUL	OCT	0050	A75	A95	JAN	APR	JUL	OCT
LONE AFB 5000 10000	TO																	
	-15	-8	-10	-11	-11	-20	-22	13	7	10	11	10	2	0	14	13	10	11
	-20	-15	-16	-20	-20	-20	-32	24	13	15	16	17	8	5	15	15	11	13
LONE AFB 5000 10000	TO																	
	-8	-4	-6	-10	-8	-16	-15	7	3	5	9	6	0	-1	9	9	8	9
	-22	-15	-19	-21	-20	-20	-30	12	7	12	12	10	4	3	9	9	8	2
LONE AFB 5000 10000	TO																	
	9	7	6	6	6	1	0	-10	-8	-8	-6	-8	-13	-14	9	8	6	7
	21	16	9	11	13	7	5	-24	-17	-10	-12	-16	-23	-25	10	9	7	9
LONE AFB 5000 10000	TO																	
	37	26	15	21	23	14	11	-43	-30	-16	-25	-27	-40	-43	15	14	0	13
LONE AFB 5000 10000	TO																	
	5	5	5	2	3	-1	-2	-8	-8	-4	-3	-3	-11	-12	10	9	6	8
	18	15	5	6	11	3	2	-20	-16	-4	-9	-13	-21	-23	11	10	8	10
LONE AFB 5000 10000	TO																	
	34	28	9	17	20	9	7	-30	-20	-9	-19	-23	-37	-40	17	15	9	15
LONE AFB 5000 10000	TO																	
	-6	-7	-6	-3	-8	-10	-11	6	7	7	3	6	1	0	8	7	4	7
	2	1	-4	-1	-1	-6	-8	-4	-2	4	1	0	-6	-7	9	8	6	8
LONE AFB 5000 10000	TO																	
	4	0	-5	1	1	-6	-8	-15	-12	5	-2	-5	-16	-19	14	12	7	11
LONE AFB 5000 10000	TO																	
	3	4	5	3	3	-1	-3	-4	-3	-3	-4	-3	-11	-12	9	9	7	8
	18	7	8	7	6	1	0	-12	-8	-8	-8	-9	-16	-18	11	10	8	10
LONE AFB 5000 10000	TO																	
	19	16	15	13	15	5	3	-27	-21	-16	-10	-20	-31	-34	18	16	10	15
LONE AFB 5000 10000	TO																	
	3	3	4	2	3	-2	-3	-3	-3	-9	-2	-4	-9	-10	8	8	6	8
	7	2	6	3	3	-2	-4	-5	-3	-6	-4	-5	-11	-13	10	9	6	9
LONE AFB 5000 10000	TO																	
	6	6	12	4	7	-3	-6	-15	-12	-14	-10	-13	-23	-26	18	16	11	15
LONE AFB 5000 10000	TO																	
	1	0	2	2	1	-3	-4	-1	0	-1	-2	-2	-6	-8	9	8	5	7
	-10	-8	0	-3	-1	-14	-16	8	7	9	3	3	-4	-5	14	12	9	11
LONE AFB 5000 10000	TO																	
	-23	-17	-1	-10	-12	-26	-30	15	11	9	7	6	-5	-8	23	20	12	18
LONE AFB 5000 10000	TO																	
	9	7	6	5	6	1	0	-10	-8	-8	-6	-8	-13	-14	9	8	6	7
	21	15	9	11	13	7	5	-23	-17	-10	-12	-15	-23	-24	10	9	7	9
LONE AFB 5000 10000	TO																	
	36	26	15	20	22	13	11	-42	-29	-14	-24	-26	-39	-42	15	14	8	14

OPERATIONS--COMPUTED FOR A 120-DEGREE WIND. HEADWINDS--COMPUTED FOR A 120-DEGREE WIND. HEADWINDS--COMPUTED FOR A 120-DEGREE WIND. HEADWINDS--COMPUTED FOR A 120-DEGREE WIND.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT				RETURN				RETURN				JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	0050	A75	A85	JAN	APR	JUL	OCT	0050	A75	A85	JAN	APR	JUL	OCT
LUKE AFB																		
5000	4	3	0	0	1	-3	-5	-5	-3	0	-1	-3	-8	-10	9	9	1154	N.M.I.
10000	16	12	0	6	0	0	0	-17	-13	0	-6	-9	-17	-19	10	9	6	8
18000	31	26	1	14	16	4	1	-35	-29	-2	-16	-20	-34	-37	16	14	8	13
LUKE AFB																		
5000	8	6	6	5	6	1	0	-9	-7	-6	-6	-7	-13	-14	9	9	1662	N.M.I.
10000	18	13	10	11	12	6	5	-20	-14	-10	-12	-14	-21	-23	10	10	7	9
18000	32	22	16	19	21	12	9	-38	-27	-17	-23	-25	-37	-40	16	15	9	14
LUKE AFB																		
5000	-2	-3	-1	3	-1	-1	-8	2	3	2	-3	0	-4	-6	9	8	338	N.M.I.
10000	-11	-10	-3	-5	-7	-1	-17	10	10	3	5	6	-1	-2	14	12	8	11
18000	-29	-24	-8	-13	-17	-31	-34	26	21	7	11	14	2	0	22	19	12	17
LUKE AFB																		
5000	4	4	1	1	2	-2	-3	-5	-4	-1	-2	-3	-8	-9	8	8	1659	N.M.I.
10000	14	12	1	6	8	1	0	-17	-13	-1	-6	-9	-17	-18	9	8	5	7
18000	31	26	2	14	17	5	3	-35	-29	-2	-16	-21	-34	-37	13	12	7	12
LUKE AFB																		
5000	8	7	6	5	6	1	0	-9	-3	-6	-6	-8	-13	-14	9	9	1507	N.M.I.
10000	20	15	9	11	13	6	5	-22	-15	-9	-11	-14	-22	-24	10	10	6	7
18000	35	25	15	20	22	12	10	-40	-29	-16	-24	-26	-38	-42	16	15	9	14
LUKE AFB																		
5000	4	3	3	2	3	-1	-3	-4	-3	-3	-2	-4	-8	-10	8	8	1071	N.M.I.
10000	0	0	4	1	1	-5	-4	-2	-1	-4	-2	-3	-9	-10	10	9	6	7
18000	-2	1	9	0	2	-8	-11	-8	-8	-12	-6	-9	-19	-22	17	16	11	15
LUKE AFB																		
5000	6	6	5	3	4	0	-2	-7	-6	-5	-4	-6	-12	-13	9	9	1124	N.M.I.
10000	17	13	7	9	11	4	2	-19	-14	-7	-10	-13	-20	-22	11	10	8	10
18000	32	25	12	17	19	9	7	-37	-28	-13	-20	-23	-36	-40	17	16	9	15
LUKE AFB																		
5000	7	6	6	5	6	3	0	-9	-7	-6	-6	-7	-13	-14	9	9	1489	N.M.I.
10000	17	12	9	10	11	5	3	-19	-14	-7	-12	-14	-21	-22	10	10	8	9
18000	30	22	16	18	20	11	9	-37	-26	-17	-22	-25	-36	-39	16	15	9	14
LUKE AFB																		
5000	7	6	4	3	4	0	-1	-8	-7	-4	-3	-6	-11	-12	9	8	1505	N.M.I.
10000	20	16	5	7	11	4	3	-22	-17	-5	-9	-13	-21	-23	10	9	6	7
18000	36	29	3	18	21	10	7	-43	-31	-9	-20	-24	-38	-41	15	14	8	13

\* HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\* A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 \*\*\* PLUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FFET	EQUIVALENT HEADWINDS										STANDARD DEVIATION			
	DIRECT		WIND		WIND		WIND		WIND		JAN	APR	JUL	OCT
	JAN	APR	JUL	OCT	00A50	A75	A85	JAN	APR	JUL	OCT	00A50	A75	A85
LUKE AFB														
5000	2	7	6	6	6	2	0	-10	-8	-6	-7	-8	-13	-14
10000	21	15	10	12	14	7	6	-23	-16	-11	-13	-16	-23	-24
18000	35	24	17	21	22	14	12	-41	-29	-18	-25	-27	-39	-42
LUKE AFB														
5000	6	5	6	5	5	0	-1	-7	-6	-6	-6	-7	-12	-13
10000	15	11	9	10	11	4	3	-18	-12	-10	-11	-13	-20	-21
18000	27	20	16	17	19	10	8	-34	-25	-17	-22	-24	-35	-37
LUKE AFB														
5000	2	2	0	2	1	-3	-4	-2	-2	0	-2	-2	-7	-8
10000	-9	-4	0	-2	-4	-11	-13	7	3	0	1	2	-4	-6
18000	-19	-12	-3	-11	-11	-23	-27	11	6	0	6	4	-6	-9
LUKE AFB														
5000	3	2	1	0	1	-3	-4	-3	-2	-1	-1	-2	-7	-8
10000	-6	-2	0	-2	-3	-8	-9	4	1	0	1	1	-3	-4
18000	-12	-5	0	-7	-6	-15	-17	4	0	-2	1	0	-8	-10
MANDALAY														
5000	0	-2	-5	-4	-3	-8	-9	0	2	3	4	2	-1	-3
10000	2	1	0	-2	0	-4	-5	-2	-1	0	2	0	-5	-6
18000	3	3	-1	-2	0	-5	-6	-4	-3	1	2	-1	-7	-8
MANDALAY														
5000	-7	-6	0	0	-4	-9	-10	7	7	0	0	3	-1	-2
10000	-16	-12	-3	-3	-9	-16	-17	16	12	3	4	8	2	0
18000	-33	-21	3	-8	-14	-28	-31	31	20	-3	7	12	0	-1
MANDALAY														
5000	-1	-1	-4	-3	-3	-7	-8	1	2	2	4	2	-2	-3
10000	2	1	1	-2	0	-4	-5	-2	-1	-2	2	-1	-6	-7
18000	3	3	-1	-3	0	-5	-7	-5	-4	1	2	-1	-7	-9
MANDALAY														
5000	5	4	6	-1	3	-1	-2	-5	-4	-6	2	-4	-9	-10
10000	7	7	2	0	4	-1	-2	-10	-9	-3	0	-6	-12	-13
18000	19	13	5	8	10	3	2	-28	-18	-6	-11	-15	-25	-27
MANDALAY														
5000	7	6	5	-1	4	0	-2	-6	-6	-5	1	-4	-9	-10
10000	16	13	5	4	9	3	2	-19	-14	-5	-5	-11	-18	-19
18000	33	23	5	13	17	8	6	-39	-26	-6	-15	-21	-33	-36

HEADWINDS—COMPUTED FOR A 120-KT AIRSPEED.  
 00A—DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION			
	DIRECT						RETURN						JAN	APR	JUL	OCT
	JAN	APR	JUL	OCT	0050	075	085	JAN	APR	JUL	OCT	0050				
MANDALAY 5000	0	0	0	-4	-1	-7	1	0	-1	4	0	-3	-5	6	6	903 N.M.I.
MANDALAY 10000	5	4	4	0	3	-1	-5	-4	-5	0	-4	-9	-10	7	6	903 N.M.I.
MANDALAY 18000	8	7	-2	-3	1	-5	-10	-7	2	3	-2	-10	-12	10	9	903 N.M.I.
MANDALAY 5000	5	7	5	-2	3	-1	-5	-7	-5	2	-4	-9	-11	6	7	1468 N.M.I.
MANDALAY 10000	15	13	5	3	9	2	-17	-13	-2	-3	-10	-17	-18	6	7	1468 N.M.I.
MANDALAY 18000	33	22	2	11	16	6	-37	-25	-2	-12	-19	-31	-34	10	9	1468 N.M.I.
MANDALAY 5000	0	0	-2	-4	-2	-6	0	0	1	7	1	-2	-3	5	5	1317 N.M.I.
MANDALAY 10000	3	2	2	-1	1	-2	-3	-2	-2	2	-2	-6	-7	6	5	1317 N.M.I.
MANDALAY 18000	2	2	-2	-3	-1	-5	-3	-3	2	3	0	-5	-7	8	7	1317 N.M.I.
MANDALAY 5000	2	7	3	-1	2	-3	-2	-7	-3	3	-3	-8	-9	6	6	1410 N.M.I.
MANDALAY 10000	16	13	5	3	9	3	-16	-13	-6	-3	-10	-16	-18	7	6	1410 N.M.I.
MANDALAY 18000	33	22	-1	9	14	3	-34	-23	1	-9	-16	-29	-32	10	9	1410 N.M.I.
MANDALAY 5000	-5	-7	-2	0	-4	-9	5	7	2	0	3	0	-1	5	5	1967 N.M.I.
MANDALAY 10000	-14	-11	-2	-3	-8	-13	14	11	2	3	7	1	0	6	6	1967 N.M.I.
MANDALAY 18000	-30	-24	2	-9	-16	-30	35	22	-2	5	14	2	0	10	9	1967 N.M.I.
MCGUIRE AFB 5000	-14	-10	-6	-7	-9	-17	13	10	6	7	8	1	0	12	12	789 N.M.I.
MCGUIRE AFB 10000	-29	-21	-11	-12	-18	-28	26	19	10	11	15	7	4	13	13	789 N.M.I.
MCGUIRE AFB 18000	-48	-32	-15	-23	-29	-45	43	27	14	24	25	12	9	19	19	789 N.M.I.
MCGUIRE AFB 5000	-8	-8	-3	-2	-5	-11	7	7	3	2	4	0	-1	8	8	1766 N.M.I.
MCGUIRE AFB 10000	-16	-13	-4	-5	-9	-16	13	11	1	4	7	1	0	9	9	1766 N.M.I.
MCGUIRE AFB 18000	-33	-22	-2	-15	-18	-30	25	16	1	12	12	3	1	12	12	1766 N.M.I.
MCGUIRE AFB 5000	-14	-9	-8	-9	-10	-20	13	9	7	9	9	1	0	13	12	872 N.M.I.
MCGUIRE AFB 10000	-27	-18	-15	-16	-19	-30	25	16	15	14	17	8	6	13	14	872 N.M.I.
MCGUIRE AFB 18000	-45	-30	-23	-29	-31	-45	38	26	21	25	26	14	12	20	19	872 N.M.I.
MCGUIRE AFB 5000	-13	-9	-7	-10	-10	-17	12	7	7	9	8	1	0	11	11	1252 N.M.I.
MCGUIRE AFB 10000	-25	-16	-15	-16	-19	-26	23	14	15	15	16	8	7	12	12	1252 N.M.I.
MCGUIRE AFB 18000	-40	-27	-23	-23	-29	-41	34	23	22	24	25	15	12	17	17	1252 N.M.I.

\* HEADWINDS - COMPUTED FOR A 120-KT AIRSPEED.  
 \*\* A - DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 \*\*\* N.M.I. - NINE MILES.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN FEET	EQUIVALENT HEADWIND M.E.A.D.M.I.N.D.S.P. RETURN										STANDARD DEVIATION				
	JAN	APR	JUL	OCT	00ASO	A75	ABS	JAN	APR	JUL	OCT	JAN	APR	JUL	OCT
<b>MCGUIRE AFB</b>															
5000	-10	-8	-5	-6	-8	-13	-14	8	7	5	5	6	1	0	8
10000	-23	-16	-11	-12	-15	-22	-24	21	14	10	11	13	7	5	10
18000	-41	-29	-18	-26	-27	-39	-42	35	25	13	22	23	15	13	15
<b>MCGUIRE AFB</b>															
5000	-12	-9	-5	-5	-8	-15	-17	11	8	5	4	6	0	-1	11
10000	-23	-18	-7	-8	-14	-23	-25	20	15	7	7	11	3	2	12
18000	-42	-28	-8	-22	-24	-39	-43	34	21	7	18	18	6	4	17
<b>MCGUIRE AFB</b>															
5000	-13	-9	-7	-7	-9	-18	-20	10	8	6	6	7	-1	-3	15
10000	-25	-17	-12	-11	-16	-27	-30	19	13	11	9	12	2	0	17
18000	-40	-23	-18	-23	-27	-43	-47	25	22	16	15	19	5	1	24
<b>MCGUIRE AFB</b>															
5000	-7	-5	-3	-3	-5	-12	-13	6	4	3	2	3	-3	-4	11
10000	-13	-11	-4	-5	-8	-17	-19	7	8	4	4	5	-2	-3	13
18000	-26	-16	-6	-15	-15	-27	-31	11	6	4	10	7	-2	-5	18
<b>MCGUIRE AFB</b>															
5000	-16	-12	-8	-10	-12	-21	-23	15	11	8	9	10	1	0	15
10000	-33	-23	-16	-14	-21	-33	-36	31	22	15	13	19	8	6	17
18000	-52	-35	-22	-31	-33	-51	-55	47	31	21	27	29	15	12	24
<b>MCGUIRE AFB</b>															
5000	-12	-7	-7	-9	-9	-16	-18	11	6	6	9	7	1	0	11
10000	-24	-15	-15	-16	-18	-25	-27	22	13	14	14	15	8	6	11
18000	-38	-25	-23	-27	-28	-38	-41	32	21	21	23	23	14	12	16
<b>MCGUIRE AFB</b>															
5000	-16	-11	-7	-9	-11	-19	-21	15	10	7	9	9	2	0	13
10000	-31	-22	-14	-14	-20	-30	-33	29	20	13	13	18	8	6	14
18000	-51	-33	-19	-31	-32	-48	-53	46	29	19	27	28	15	12	26
<b>MCGUIRE AFB</b>															
5000	-15	-11	-8	-9	-11	-20	-22	14	10	3	8	9	1	0	14
10000	-30	-20	-15	-14	-20	-30	-32	27	18	14	12	17	7	4	16
18000	-48	-32	-21	-29	-31	-47	-52	40	23	20	23	26	13	9	23
<b>MCGUIRE AFB</b>															
5000	-10	-7	-4	-5	-7	-15	-17	8	5	4	4	5	-2	-4	13
10000	-20	-15	-7	-8	-13	-23	-25	14	13	7	7	9	0	-1	15
18000	-35	-24	-10	-23	-23	-34	-43	26	14	8	17	15	2	2	21

\* HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\* A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 \*\*\* PLUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN LB	EQUIVALENT HEADWIND												STANDARD DEVIATION				
	DIRECT			EAST			SOUTH			WEST							
FFET	JAN	APR	JUL	OCT	MAY	AUG	JAN	APR	JUL	OCT	MAY	AUG	JAN	APR	JUL	OCT	
MCQUEEN AFB	7	5	5	6	5	5	-10	-7	-6	-7	-8	-17	-20	16	15	11	13
5000	14	12	8	10	10	0	-21	-16	-10	-13	-15	-26	-29	18	18	12	15
10000	24	12	11	18	15	1	-40	-23	-15	-26	-25	-42	-46	24	24	14	23
18000																	
MCQUEEN AFB	14	9	7	8	7	7	12	8	7	7	8	0	-2	14	14	10	12
5000	26	18	14	14	18	31	22	15	13	12	15	5	3	16	16	11	14
10000	43	30	21	27	24	49	32	24	19	19	22	9	6	22	22	13	22
18000																	
MCQUEEN AFB	4	4	5	5	7	14	6	3	4	7	4	0	-2	9	8	7	9
5000	14	10	12	13	13	20	14	8	11	14	11	4	3	9	9	7	8
10000	27	16	19	21	21	32	19	14	16	16	16	8	6	13	12	9	12
18000																	
MEDAN	1	0	3	2	1	4	1	0	2	2	0	0	-3	4	5	5	5
5000	4	2	3	0	3	7	4	2	2	1	2	-1	-2	5	5	6	5
10000	12	7	2	0	4	11	7	6	-2	0	2	-3	-4	8	7	6	6
18000																	
MEDAN	2	2	13	1	2	4	3	-2	-13	-2	-3	-10	-12	6	6	5	8
5000	0	1	6	5	2	3	0	0	-4	-4	-3	-8	-9	7	6	8	7
10000	-2	-3	-3	-6	-4	-11	2	3	3	6	3	-1	-3	9	8	8	7
18000																	
MEDAN	0	2	5	1	2	3	0	-1	-4	-1	-2	-7	-8	7	6	6	8
5000	2	2	6	4	3	1	-1	-2	-5	-4	-4	-9	-10	8	7	8	8
10000	-7	-3	-6	-6	-5	-12	7	3	4	6	5	0	-1	10	8	9	7
18000																	
MEDAN	0	3	10	-2	2	-3	0	-3	-13	1	-3	-8	-9	5	4	5	5
5000	4	5	6	3	4	0	-4	-4	-5	-2	-4	-9	-10	6	5	7	6
10000	5	3	-1	0	1	-3	-8	-4	1	0	-3	-8	-9	7	7	6	6
18000																	
MELBOURNE	0	3	8	5	3	-2	-1	-4	-3	-6	-5	-11	-13	8	8	9	8
5000	5	3	12	11	9	2	-5	-8	-14	-12	-10	-17	-19	9	9	9	10
10000	14	15	22	21	17	9	-15	-18	-28	-26	-22	-31	-33	10	11	13	13
18000																	
MELBOURNE	-10	-13	-14	-13	-13	-20	10	13	14	12	12	6	5	7	8	9	9
5000	-15	-16	-20	-21	-19	-28	15	17	19	19	17	10	8	9	10	12	11
10000	-21	-27	-28	-39	-29	-42	19	24	24	35	24	15	12	11	14	15	15
18000																	

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DEFOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWIND RETURN												STANDARD DEVIATION							
	DIRECT			EQUVALENT			HEADWIND			RETURN			JAN	APR	JUL	OCT				
MELBOURNE	TO	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	
5000	0	1	2	1	1	-3	-4	0	-1	-2	-2	-2	-2	-6	-7	6	6	7	7	1707 N.M.I.
10000	0	1	2	2	0	-4	-5	0	-1	-4	-4	-4	-2	-8	-9	7	7	8	8	
18000	2	0	-1	0	0	-6	-8	-4	-3	-5	-5	-5	-5	-11	-13	8	9	11	10	
MELBOURNE	TO	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	
5000	9	10	9	10	9	2	0	-9	-11	-9	-11	-11	-10	-17	-19	8	10	11	11	1396 N.M.I.
10000	14	15	11	14	13	5	3	-15	-16	-12	-16	-16	-15	-23	-25	11	12	12	12	
18000	23	27	22	26	24	14	12	-25	-29	-24	-29	-29	-27	-37	-39	13	14	14	15	
MEMPHIS	TO	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	
5000	-7	-8	-4	-1	-5	-11	-13	6	7	4	4	1	4	-1	-2	9	9	6	8	1055 N.M.I.
10000	-11	-9	-2	-3	-6	-13	-14	9	7	2	2	2	4	-1	-2	9	9	7	9	
18000	-23	-15	1	-8	-10	-22	-25	16	10	-2	6	6	5	-2	-4	14	13	7	12	
MEMPHIS	TO	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	
5000	-5	-3	0	-3	-3	-11	-13	2	1	0	2	2	1	-6	-8	13	13	9	11	608 N.M.I.
10000	-9	-6	-3	-6	-6	-15	-18	3	3	2	3	3	2	-6	-8	14	14	11	13	
18000	-19	-12	-7	-14	-13	-25	-29	1	3	4	5	5	3	-8	-11	21	20	12	19	
MEMPHIS	TO	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	
5000	-9	-5	-2	-6	-6	-14	-15	7	4	2	5	5	4	-3	-4	12	12	9	11	939 N.M.I.
10000	-16	-10	-7	-11	-11	-19	-21	12	8	5	9	9	8	0	-1	12	12	9	12	
18000	-28	-19	-12	-21	-20	-31	-35	16	12	9	14	14	12	2	0	18	17	11	17	
MEMPHIS	TO	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	
5000	-6	-5	-3	-2	-4	-10	-11	5	4	3	2	2	3	-1	-3	9	9	6	8	1220 N.M.I.
10000	-19	-14	-6	-10	-12	-20	-22	17	13	6	9	9	10	4	2	11	10	8	9	
18000	-37	-29	-12	-20	-23	-36	-40	33	26	11	18	18	20	10	7	17	15	9	15	
MEMPHIS	TO	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	
5000	13	9	6	7	9	1	0	-14	-10	-6	-7	-7	-9	-17	-19	13	12	8	11	696 N.M.I.
10000	25	18	10	10	15	5	3	-28	-20	-10	-11	-11	-17	-27	-30	14	14	10	13	
18000	41	25	13	23	23	11	8	-67	-31	-14	-27	-27	-28	-45	-49	20	20	11	19	
MEMPHIS	TO	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	
5000	-5	-3	-2	0	-3	-11	-13	3	1	2	0	0	1	-6	-8	13	13	9	11	302 N.M.I.
10000	-7	-4	-2	0	-4	-12	-15	1	1	1	0	0	0	-7	-9	14	14	10	13	
18000	-15	-5	4	-3	-4	-17	-21	0	-4	-4	-2	-2	-3	-14	-17	20	20	19	11	18
MEMPHIS	TO	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	00450	A75	A85	JAN	APR	JUL	OCT	
5000	10	6	5	5	6	-1	-2	-12	-9	-5	-7	-7	-8	-16	-18	13	12	9	11	704 N.M.I.
10000	19	13	9	9	11	3	0	-24	-16	-9	-11	-11	-15	-25	-27	14	14	10	13	
18000	29	16	11	17	17	5	2	-41	-25	-13	-24	-24	-25	-40	-44	20	20	12	19	

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 004--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	F U L L Y A I R L E N T H E A D I N D S												STANDARD DEVIATION				
	DIRECT						RETURN						JAN	APR	JUL	OCT	
	JAN	APR	JUL	OCT	00ASO	A75	A85	JAN	APR	JUL	UCT	00ASO	A75	A85			
MEMPHIS TO GUNNARD AFB	-6	-5	-3	-1	-4	-9	-11	5	5	3	1	3	-1	-2	0	0	0
5000	-18	-14	-5	-9	-12	-19	-21	16	13	5	8	10	3	2	1432	6	7
10000	-36	-29	-11	-19	-22	-35	-38	32	26	10	16	19	9	7	8	7	9
MEMPHIS TO PATRICK AFB	3	4	1	3	2	-4	-5	-4	-5	-1	-3	-4	-10	-12	629	8	10
5000	12	10	2	4	6	-1	-2	-15	-12	-2	-5	-8	-17	-19	11	11	8
10000	21	20	5	11	12	2	0	-31	-26	-5	-15	-18	-32	-36	12	12	8
18000															17	17	9
MEMPHIS TO PITTSBURGH	11	8	5	7	0	-2	-2	-13	-9	-5	-7	-9	-17	-19	566	13	9
5000	23	15	9	10	13	4	2	-26	-18	-9	-11	-16	-26	-29	13	13	11
10000	30	21	11	20	20	7	5	-45	-28	-13	-25	-26	-43	-47	14	14	10
18000															21	20	11
MEMPHIS TO REGINA	-9	-5	-2	-7	-6	-13	-15	8	4	2	6	4	-2	-3	1123	11	10
5000	-17	-10	-7	-12	-12	-19	-21	13	9	6	10	9	2	0	11	11	8
10000	-28	-19	-13	-21	-20	-31	-34	18	12	10	16	13	3	1	11	11	9
18000															17	16	11
MEMPHIS TO SCOTT AFB	0	0	1	0	0	-8	-10	-2	-2	-1	0	-2	-10	-12	210	15	12
5000	0	-2	0	-1	-1	-10	-13	-6	-2	-1	-1	-3	-12	-15	15	15	11
10000	-5	-5	-2	-5	-4	-17	-21	-15	-5	0	-2	-5	-19	-22	22	22	12
18000																	21
MEMPHIS TO SELFRIDGE AFB	8	5	4	5	5	-2	-4	-10	-6	-4	-5	-6	-15	-17	562	14	11
5000	15	9	6	7	8	0	-1	-20	-13	-7	-9	-12	-22	-24	14	13	9
10000	21	12	8	12	12	0	-2	-36	-21	-10	-19	-20	-35	-39	14	14	10
18000															21	20	12
MEMPHIS TO SHAW AFB	13	10	5	6	7	0	-1	-13	-10	-5	-5	-8	-16	-18	474	13	11
5000	25	19	6	8	13	4	1	-26	-20	-6	-9	-15	-26	-29	14	14	8
10000	40	31	9	20	23	9	6	-44	-34	-9	-23	-26	-43	-47	20	19	9
18000															20	19	11
MEMPHIS TO WESTOVER AFB	13	9	6	7	8	1	0	-14	-10	-6	-8	-10	-17	-19	921	12	10
5000	25	17	11	12	15	7	5	-28	-20	-11	-13	-18	-27	-30	12	12	8
10000	40	24	15	24	24	12	9	-47	-30	-16	-28	-29	-44	-48	13	13	9
18000															19	19	11
MEMPHIS TO WUSTSMITH	4	3	3	4	3	-3	-5	-8	-5	-7	-5	-6	-14	-16	642	13	11
5000	10	6	5	6	6	-1	-4	-16	-10	-7	-8	-10	-19	-22	14	14	10
10000	14	7	6	7	8	-3	-6	-30	-17	-7	-16	-17	-31	-35	21	20	12
18000																	20

\* HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUVALENT HEADWIND												STANDARD DEVIATION					
	DIRECT			RETURN			M E A D M I N D S			JAN APR JUL OCT								
	JAN	APR	JUL	OCT	0050	A75	A85	JAN	APR	JUL	OCT	0050	A75	A85	JAN	APR	JUL	OCT
<b>MEMPHIS</b>																		
5000	-7	-5	-3	-5	-5	-10	-12	6	4	3	5	4	4	0	-1	0	0	0
10000	-19	-12	7	-12	-13	-19	-21	10	11	7	11	11	11	5	3	0	0	0
18000	-34	-23	-16	-24	-24	-34	-37	28	19	14	21	19	19	10	0	0	0	0
	1537 N.M.I.																	
<b>MEMPHIS</b>																		
5000	-7	-3	-2	-7	-5	-11	-13	5	2	1	6	3	3	-2	-3	0	0	0
10000	-14	-8	-8	-11	-11	-17	-18	11	7	7	10	8	2	1	1	0	0	0
18000	-24	-15	-12	-19	-18	-26	-28	15	10	9	13	11	3	1	1	0	0	0
	1803 N.M.I.																	
<b>MEXICO CITY</b>																		
5000	3	5	5	0	3	-2	-3	-5	-6	-5	-1	-5	-5	-10	-12	0	0	0
10000	3	3	2	0	1	-3	-5	-7	-5	-3	-2	-5	-5	-10	-12	0	0	0
18000	3	2	1	0	1	-6	-7	-15	-9	-3	-5	-8	-8	-16	-19	0	0	0
	1595 N.M.I.																	
<b>MEXICO CITY</b>																		
5000	1	3	5	0	2	-3	-4	-2	-4	-6	0	-4	-4	-9	-10	0	0	0
10000	-2	0	1	-2	-1	-6	-8	-1	-1	-2	0	-1	-1	-7	-8	0	0	0
18000	-6	-3	0	-4	-3	-11	-13	-4	-3	-2	0	-3	-3	-10	-12	0	0	0
	1733 N.M.I.																	
<b>MEXICO CITY</b>																		
5000	5	6	6	3	5	1	0	-5	-6	-5	-3	-5	-5	-9	-10	0	0	0
10000	-5	-3	3	0	-1	-7	-8	3	2	-3	-1	0	0	-5	-6	0	0	0
18000	-17	-13	4	-4	-6	-17	-20	10	8	-4	2	2	2	-5	-7	0	0	0
	1311 N.M.I.																	
<b>MEXICO CITY</b>																		
5000	7	7	3	2	4	0	-1	-8	-7	-3	-2	-5	-5	-10	-12	0	0	0
10000	13	10	3	4	6	1	0	-16	-12	-3	-5	-9	-9	-16	-18	0	0	0
18000	24	15	1	11	11	2	0	-32	-21	-2	-15	-17	-17	-29	-32	0	0	0
	1693 N.M.I.																	
<b>MEXICO CITY</b>																		
5000	4	7	2	0	3	-2	-3	-5	-7	-2	0	-4	-4	-10	-11	0	0	0
10000	8	7	0	1	3	-2	-3	-9	-7	0	-1	-4	-4	-11	-12	0	0	0
18000	17	12	-3	6	6	-2	-4	-21	-15	3	-7	-9	-9	-20	-23	0	0	0
	804 N.M.I.																	
<b>MEXICO CITY</b>																		
5000	7	6	3	2	4	0	-2	-8	-7	-3	-3	-5	-5	-11	-12	0	0	0
10000	12	9	4	4	6	1	0	-15	-11	-4	-5	-9	-9	-15	-17	0	0	0
18000	21	12	1	10	9	1	0	-30	-19	-3	-14	-16	-16	-27	-30	0	0	0
	1747 N.M.I.																	
<b>MEXICO CITY</b>																		
5000	4	5	5	3	4	0	0	-4	-6	-4	-2	-5	-5	-8	-9	0	0	0
10000	-6	-4	3	0	-1	-7	-9	5	3	-3	-1	0	0	-5	-6	0	0	0
18000	-19	-15	4	-3	-7	-18	-21	13	11	-4	2	4	4	-4	-5	0	0	0
	1365 N.M.I.																	

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MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION							
	JAN	APR	JUL	DEC	EQUINOXIAL				WINTER				SUMMER				JAN	APR	JUL	DEC
MEXICO CITY	0	3	-1	-1	PATRICK AFB				0	-3	1	1	0	-5	-6	8	8	11	6	1144 N.M.I.
5000	6	5	-1	1	0	0	0	0	-6	-6	1	-1	0	-3	-9	8	8	6	7	
10000	18	15	-3	6	2	7	7	-1	-4	-17	3	-7	-3	-20	-22	12	11	6	9	
MEXICO CITY	7	7	3	2	PITTSBURGH				-8	-7	-3	-2	-5	-11	-12	9	9	12	7	1596 N.M.I.
5000	12	9	3	4	4	6	0	0	-15	-11	-3	-5	-8	-15	-17	9	9	6	8	
10000	22	13	0	10	10	10	1	0	-30	-19	-1	-13	-15	-27	-30	13	12	7	12	
MEXICO CITY	1	3	5	0	MEXINA				-2	-4	-5	0	-3	-8	-10	8	8	10	7	1879 N.M.I.
5000	-3	-1	1	-2	2	-2	-2	-4	0	0	-1	1	0	-5	-6	8	8	6	8	
10000	-10	-5	0	-5	-1	-5	-13	-15	-1	0	-1	1	-1	-8	-9	13	12	7	11	
MEXICO CITY	6	7	4	2	SCOTT AFB				-7	-8	-4	-1	-5	-11	-13	9	9	13	7	1242 N.M.I.
5000	8	6	2	2	4	4	4	-1	-11	-8	-2	-3	-6	-13	-14	9	9	7	9	
10000	13	8	0	4	4	4	4	-3	-22	-14	0	-6	-10	-21	-24	14	13	7	12	
MEXICO CITY	7	6	4	2	SELFRIDGE AFB				-8	-7	-4	-2	-6	-11	-12	9	8	13	7	1617 N.M.I.
5000	11	8	3	4	4	6	0	-1	-14	-10	-4	-5	-8	-15	-16	9	9	7	8	
10000	18	10	0	7	7	7	0	-2	-28	-17	-2	-12	-14	-26	-28	13	13	7	12	
MEXICO CITY	5	6	2	1	SHAW AFB				-6	-7	-2	-1	-4	-9	-11	8	8	12	7	1323 N.M.I.
5000	11	9	1	2	3	5	0	0	-12	-10	-1	-3	-6	-13	-15	9	9	6	8	
10000	22	16	-1	9	10	10	0	-1	-27	-20	1	-11	-14	-26	-28	12	12	7	11	
MEXICO CITY	8	7	3	2	WESTOVER AFB				-11	-9	-3	-3	-6	-11	-13	8	8	12	7	1919 N.M.I.
5000	14	11	4	5	7	7	2	0	-17	-13	-3	-6	-10	-17	-19	9	9	6	8	
10000	26	16	2	12	12	12	3	1	-34	-22	-4	-17	-19	-31	-33	12	12	7	11	
MEXICO CITY	6	6	4	2	WURTSMITH				-9	-7	-4	-3	-6	-11	-12	9	8	13	7	1696 N.M.I.
5000	10	7	3	4	4	5	0	-1	-13	-9	-4	-5	-8	-14	-16	9	9	7	8	
10000	15	9	1	6	6	6	-1	-2	-26	-16	-3	-11	-13	-24	-27	13	13	7	12	
MEXICO CITY	5	5	5	3	YAKIMA				-5	-5	-4	-3	-5	-8	-9	6	6	13	7	1930 N.M.I.
5000	-6	-3	1	-1	4	-2	-7	-9	4	2	-1	0	0	-3	-5	8	7	12	7	
10000	-17	-12	0	-8	-9	-10	-21	-21	9	7	-1	6	3	-3	-5	13	12	7	11	

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 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION					
	JAN	APR	JUL	OCT	00ASO	A75	A05	JAN	APR	JUL	OCT	00ASO	A75	A05	JAN	APR	JUL	OCT
MIDWAY ISLAND	TO SHFWYA																	
5000	0	-1	3	-1	0	-7	-9	-4	-1	-5	-1	-3	-11	-13	13	11	9	11
10000	-3	-4	0	-7	-4	-11	-13	-3	0	-2	3	-1	-8	-10	12	11	9	10
18000	-9	-11	-9	-14	-11	-20	-23	-7	0	5	3	0	-9	-11	16	14	11	13
MIDWAY ISLAND	TO MAKE ISLAND																	
5000	-5	0	4	3	0	-5	-6	4	0	-5	-3	-2	-7	-8	9	7	6	7
10000	-2	-3	4	4	0	-5	-7	1	2	-3	-4	-1	-7	-8	11	8	6	8
18000	-24	-11	0	0	-7	-18	-21	19	9	0	0	5	-2	-4	14	11	8	10
MINN-ST PAUL	TO MINOT AFB																	
5000	-12	-6	-5	-10	-9	-18	-20	11	5	5	9	7	-1	-3	13	14	11	14
10000	-21	-12	-13	-16	-16	-25	-27	20	11	13	15	14	5	3	13	14	11	14
18000	-33	-22	-22	-28	-26	-39	-42	29	19	20	24	22	10	7	20	19	14	19
MINN-ST PAUL	TO NELLIS AFB																	
5000	-4	-4	-4	-3	-4	-13	-11	3	4	4	3	3	-1	-3	8	9	7	8
10000	-14	-8	-9	-10	-11	-17	-19	12	7	9	9	9	2	1	11	10	8	10
18000	-28	-21	-19	-20	-22	-32	-35	22	17	18	16	18	8	6	18	16	10	15
MINN-ST PAUL	TO NEW CUMBERLAND																	
5000	13	8	7	9	9	1	0	-14	-9	-7	-9	-10	-18	-20	13	12	9	11
10000	25	16	15	14	17	8	6	-27	-18	-15	-16	-19	-28	-31	14	14	10	13
18000	38	25	21	24	26	14	11	-44	-29	-22	-29	-30	-44	-48	20	20	12	19
MINN-ST PAUL	TO NEW ORLEANS																	
5000	0	0	0	1	0	-7	-8	-2	-1	0	-2	-1	-8	-10	12	11	8	10
10000	0	0	0	1	0	-7	-9	-6	-4	-1	-4	-4	-12	-14	12	12	9	12
18000	-4	0	3	2	0	-10	-12	-13	-10	-5	-10	-9	-20	-23	18	17	10	17
MINN-ST PAUL	TO NIAGARA FALLS																	
5000	13	7	8	10	9	1	0	-14	-8	-8	-10	-10	-19	-21	13	13	10	12
10000	25	15	16	17	15	9	6	-26	-16	-16	-18	-19	-29	-31	14	15	11	13
18000	38	24	24	26	27	15	11	-43	-23	-24	-30	-31	-45	-48	21	20	13	20
MINN-ST PAUL	TO ORNAFC AFB																	
5000	-4	-4	-4	-2	-4	-9	-10	3	4	4	2	3	-1	-2	8	8	6	7
10000	-13	-8	-9	-9	-10	-16	-18	11	7	9	8	8	2	1	10	10	7	9
18000	-28	-21	-18	-19	-21	-31	-34	21	17	17	15	17	8	5	17	15	10	14
MINN-ST PAUL	TO PATRICK AFB																	
5000	4	3	2	3	2	-3	-4	-6	-6	-2	-4	-4	-11	-12	11	10	7	9
10000	9	7	4	4	4	-1	-2	-14	-10	-4	-6	-9	-16	-18	11	11	8	11
18000	12	11	6	9	8	0	-2	-27	-20	-8	-16	-17	-29	-32	16	16	9	15

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EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS												STANDARD DEVIATION				
	DIRECT			RETURN			M E A D I N O S			JAN	APP	JUL	OCT	JAN	APP	JUL	OCT
MINN-ST PAUL TO PITTSBURGH																	
5000	12	8	7	8	0	-1	-14	-9	-7	-9	-10	-18	-21	13	13	10	12
10000	24	15	14	14	16	7	-26	-17	-15	-15	-18	-28	-30	14	15	11	13
18000	37	24	21	24	25	13	-43	-23	-22	-29	-30	-44	-48	21	20	13	20
MINN-ST PAUL TO REGINA																	
5000	-11	-5	-5	-10	-8	-17	10	4	4	9	6	-1	-4	13	13	11	13
10000	-21	-12	-13	-16	-16	-27	20	11	12	15	14	5	3	12	13	11	13
18000	-32	-21	-21	-25	-25	-40	28	18	13	23	21	9	7	19	18	13	18
MINN-ST PAUL TO SCOTT AFB																	
5000	5	3	1	3	2	-5	-7	-4	-1	-7	-4	-13	-15	14	14	10	12
10000	8	5	4	5	5	-3	-13	-8	-6	-5	-9	-19	-21	14	15	12	14
18000	9	4	4	10	7	-5	-25	-15	-10	-12	-17	-30	-34	22	21	13	21
MINN-ST PAUL TO SELFIDGE AFB																	
5000	13	7	7	9	8	0	-14	-4	-7	-10	-10	-19	-21	14	14	10	12
10000	24	14	15	16	17	7	-25	-16	-16	-17	-19	-29	-31	14	15	12	14
18000	37	24	23	26	26	14	-42	-28	-24	-30	-30	-45	-48	22	21	13	21
MINN-ST PAUL TO SHAW AFB																	
5000	9	6	4	5	5	-1	-10	-7	-4	-6	-7	-14	-16	12	12	8	10
10000	16	11	8	8	10	2	-20	-14	-8	-10	-13	-22	-24	13	13	10	12
18000	21	17	11	15	15	4	-35	-24	-14	-22	-23	-36	-40	19	18	11	18
MINN-ST PAUL TO THULF																	
5000	-1	0	1	1	0	-5	0	0	-2	-2	-1	-7	-8	8	8	8	8
10000	-3	0	0	0	-1	-7	1	0	0	0	0	-5	-7	8	8	8	8
18000	-2	-2	-2	-2	-3	-10	-3	-1	0	-3	-2	-10	-12	12	12	10	11
MINN-ST PAUL TO WESTCAMP AFB																	
5000	14	7	8	10	9	2	-15	-9	-9	-10	-11	-19	-20	12	12	9	11
10000	25	16	16	17	18	9	-27	-17	-16	-18	-20	-29	-31	13	14	10	12
18000	39	25	23	26	27	15	-44	-29	-26	-30	-31	-44	-48	20	19	12	19
MINN-ST PAUL TO Wurtsmith																	
5000	13	6	8	10	9	0	-14	-7	-8	-11	-10	-19	-22	14	14	11	13
10000	24	13	16	17	17	7	-25	-15	-16	-18	-19	-29	-31	14	15	12	14
18000	36	23	24	26	26	13	-41	-27	-25	-30	-30	-44	-48	22	21	14	21
MINN-ST PAUL TO YAKIMA																	
5000	-10	-5	-4	-8	-7	-13	10	5	4	7	6	0	-1	10	9	7	9
10000	-20	-11	-11	-15	-15	-22	20	10	11	14	13	6	5	10	10	8	10
18000	-32	-22	-22	-28	-26	-39	29	19	21	25	23	13	10	17	16	11	16

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MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION											
	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												JAN	APR	JUL	OCT								
DIRECTION													RETURN											
EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES													JAN	APR	JUL	OCT	00A50	A75	A85					
MINN-ST PAUL TO YELMKNIFE													5	2	2	7	3	-2	-4	10	10	1204	11	11
5000	-3	-2	-9	-5	-12	-14	-14	-14	-14	-14	-14	-14	9	9	11									
10000	-8	-10	-13	-12	-18	-20	-20	-20	-20	-20	-20	-20	8	8	9									
18000	-24	-15	-14	-20	-18	-30	-30	-30	-30	-30	-30	-30	14	13	11									
MINOT AFB TO WELLS AFB													4	3	3	2	3	-2	-3	8	8	942	8	8
5000	-3	-3	-3	-4	-9	-10	-10	-10	-10	-10	-10	-10	6	6	8									
10000	-4	-7	-6	-7	-13	-15	-15	-15	-15	-15	-15	-15	11	10	9									
18000	-10	-14	-17	-14	-16	-27	-29	-29	-29	-29	-29	-29	18	17	11									
MINOT AFB TO NEW CUMBERLAND													-13	-8	-7	-9	-10	-17	-19	11	11	1149	10	10
5000	12	7	7	8	1	0	0	0	0	0	0	0	12	12	11									
10000	22	14	14	15	8	6	6	6	6	6	6	6	18	18	11									
18000	34	22	21	24	14	11	11	11	11	11	11	11	18	17	11									
MINOT AFB TO NEW ORLEANS													-6	-3	-1	-5	-4	-11	-12	10	10	1210	10	10
5000	4	2	0	2	-4	-5	-5	-5	-5	-5	-5	-5	11	11	10									
10000	8	5	2	6	5	-1	-3	-3	-3	-3	-3	-3	11	11	11									
18000	9	8	6	10	8	-1	-3	-3	-3	-3	-3	-3	17	16	10									
MINOT AFB TO NIAGARA FALLS													-13	-7	-7	-10	-10	-17	-19	12	12	902	12	12
5000	12	6	7	8	1	0	0	0	0	0	0	0	12	12	11									
10000	22	13	15	16	8	6	6	6	6	6	6	6	12	13	10									
18000	34	22	23	25	14	12	12	12	12	12	12	12	18	17	12									
MINOT AFB TO OXNAFC AFB													5	3	3	2	3	-1	-2	8	8	1157	8	8
5000	-3	-2	-2	-3	-8	-10	-10	-10	-10	-10	-10	-10	10	10	10									
10000	-8	-5	-7	-7	-13	-15	-15	-15	-15	-15	-15	-15	10	10	10									
18000	-19	-15	-16	-15	-17	-24	-24	-24	-24	-24	-24	-24	17	16	11									
MINOT AFB TO PATRICK AFB													-8	-5	-2	-5	-5	-11	-13	10	10	1536	10	10
5000	6	4	2	5	4	-1	-3	-3	-3	-3	-3	-3	10	9	7									
10000	12	9	5	7	8	1	0	0	0	0	0	0	10	10	8									
18000	18	14	9	13	12	4	2	2	2	2	2	2	15	14	9									
MINOT AFB TO PITTSBURGH													-13	-7	-6	-9	-9	-17	-19	12	12	1012	12	12
5000	11	6	6	9	7	0	-1	-1	-1	-1	-1	-1	12	12	11									
10000	22	13	14	14	15	7	5	5	5	5	5	5	12	13	10									
18000	33	22	21	24	24	13	11	11	11	11	11	11	18	17	11									
MINOT AFB TO PRUDHOE BAY													2	7	7	5	1	-4	-5	8	7	1070	8	8
5000	-3	-1	0	-6	-3	-8	-10	-10	-10	-10	-10	-10	10	10	10									
10000	-11	-6	-7	-10	-9	-14	-15	-15	-15	-15	-15	-15	10	10	10									
18000	-20	-11	-11	-15	-15	-22	-24	-24	-24	-24	-24	-24	11	10	9									

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.

00A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.

MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUILVALENT HEADWINDS												STANDARD DEVIATION			
	JAN	APP	JUL	OCT	00450	A75	A85	JAN	APP	JUL	OCT	00450		A75	A85	
MINDT AFB																
5000	-10	-4	-3	-8	-7	-16	-18	9	3	3	7	5	-3	-6	105 No.ME.	
10000	-19	-11	-11	-15	-14	-23	-25	18	10	10	14	12	4	2	13 12 14	
18000	-29	-18	-17	-25	-22	-35	-38	25	16	14	21	18	6	3	13 11 13	
MINDT AFB																
5000	9	5	3	7	5	-2	-3	-11	-6	-3	-8	-7	-15	-18	762 No.ME.	
10000	16	10	8	11	11	2	0	-19	-12	-9	-13	-13	-22	-24	12 12 16 12	
18000	22	15	13	18	16	5	2	-31	-20	-16	-24	-22	-35	-38	13 13 10 12	
MINDT AFB																
5000	11	6	6	9	7	0	-1	-12	-7	-7	-10	-9	-17	-19	845 No.ME.	
10000	22	12	14	14	15	7	5	-23	-14	-15	-17	-18	-26	-28	12 12 10 12	
18000	33	21	22	25	24	13	10	-37	-25	-24	-28	-28	-40	-43	12 13 10 12	
MINDT AFB																
5000	10	6	4	6	6	0	-1	-11	-7	-6	-7	-8	-14	-16	1204 No.ME.	
10000	18	12	9	10	12	4	2	-21	-14	-10	-12	-15	-22	-24	11 10 8 10	
18000	24	18	14	19	17	8	5	-35	-24	-16	-24	-24	-36	-39	11 12 9 11	
MINDT AFB																
5000	-1	0	2	1	0	-5	-6	0	0	-2	-3	-1	-7	-9	1865 No.ME.	
10000	-4	0	0	-1	-2	-7	-8	2	-1	3	0	0	-6	-7	8 8 8 8	
18000	-3	-1	0	-2	-2	-9	-11	-1	-2	-2	-2	-2	-10	-12	12 11 10 11	
MINDT AFB																
5000	12	6	8	9	8	1	0	-13	-7	-8	-13	-10	-17	-19	1268 No.ME.	
10000	23	13	15	16	16	8	7	-24	-15	-16	-17	-18	-26	-28	11 11 8 10	
18000	34	22	23	25	25	15	12	-39	-26	-25	-29	-30	-41	-43	12 12 9 11	
MINDT AFB																
5000	11	5	7	10	8	0	-1	-12	-6	-7	-11	-9	-17	-19	776 No.ME.	
10000	22	12	15	16	16	7	5	-23	-13	-16	-17	-18	-26	-29	12 12 10 12	
18000	33	21	24	25	25	14	11	-37	-24	-25	-29	-29	-41	-44	12 13 11 13	
MINDT AFB																
5000	-11	-5	-3	-7	-7	-14	-15	10	5	3	7	6	0	-2	706 No.ME.	
10000	-19	-10	-10	-14	-14	-21	-23	18	10	10	14	12	5	4	10 10 8 10	
18000	-29	-19	-20	-26	-24	-35	-38	25	16	19	22	20	9	6	11 10 9 10	
MINDT AFB																
5000	-5	-2	-1	-7	-4	-11	-13	4	1	1	6	2	-4	-5	959 No.ME.	
10000	-14	-7	-8	-12	-11	-17	-19	13	6	8	11	9	2	1	11 10 9 11	
18000	-22	-12	-11	-14	-16	-26	-28	18	7	9	14	12	2	0	15 14 12 14	

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 ---NEGATIVE SYMBOLS INDICATE EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 PLUS SIGN DENOTES HEADWINDS.

MONTHLY EQUIVALENT READINGS AND STANDARD DEVIATION IN CYCLES FOR GREAT CIRCLE AIR ROUTES

MONTH IN FEET	MONTHS												STANDARD DEVIATION										
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	
WISAMA 40	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	-13	-9	-4	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10
10000	-26	-19	-7	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10
15000	-42	-31	-13	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30
WISAMA 40	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	-13	-9	-4	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10
10000	-27	-19	-8	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10
15000	-44	-30	-12	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30
WISAMA 40	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	-11	-7	-5	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7
10000	-24	-10	-7	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14
15000	-41	-30	-12	-35	-35	-35	-35	-35	-35	-35	-35	-35	-35	-35	-35	-35	-35	-35	-35	-35	-35	-35	-35
WISAMA 40	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	7	0	0	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
10000	16	11	7	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
15000	22	10	9	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
WISAMA 40	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	-9	-9	-9	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12
10000	-21	-17	-7	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12
15000	-44	-26	-10	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20
WISAMA 40	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	-4	-3	-3	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
10000	-10	-7	-5	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10
15000	-31	-12	-9	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15
WISAMA 40	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	5	0	-2	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
10000	16	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15000	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WELLS 40P	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	0	7	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
10000	20	10	10	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
15000	30	26	10	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
WELLS 40P	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
5000	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10000	15	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15000	20	20	0	15	10	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

WELLS 40P - COMPANY FOR A 170-CT AIRCRAFT.  
 10000 - 170'S ANNUAL LOW WATER READINGS FOR IMPROVED AND CITY UTILITIES.  
 15000 - 170'S YEARLY READINGS.

EQUIVALENT HEADINGS AND STANDARD DEVIATION IN AMPTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT in FEET	C. S. W. I. Y. A. S. E. N. T. M. S. A. P. M. J. N. D. S. O.												STANDARD DEVIATION						
	JAN	APR	JUL	OCT	NOV	DEC	JAN	APR	JUL	OCT	NOV	DEC	JAN	APR	JUL	OCT			
WELLS AFB 5000 10000 10000	7	6	5	5	5	5	0	0	0	0	0	-7	-12	-13	0	1702 N.M.I.			
	10	12	11	12	12	12	7	5	-20	-13	-11	-13	-14	-21	-23	10	9	7	9
	31	22	19	21	22	22	13	11	-37	-26	-20	-25	-26	-37	-40	16	15	9	14
WELLS AFB 5000 10000 10000	4	3	2	3	2	2	-2	-2	4	3	3	-3	1	-4	-5	10	9	6	8
	7	6	5	5	5	5	-6	-14	5	5	5	5	5	-3	-5	15	13	9	12
	24	21	13	13	13	13	-34	10	17	13	10	14	1	-1	-1	23	21	13	10
WELLS AFB 5000 10000 10000	3	1	1	1	1	1	-2	-3	-4	-4	-1	-2	-3	-8	-9	0	7	5	7
	16	17	7	6	1	2	0	0	-17	-13	-2	-7	-10	-17	-19	9	8	6	8
	30	25	5	15	17	7	5	5	-35	-24	-6	-17	-21	-34	-37	14	13	7	12
WELLS AFB 5000 10000 10000	7	6	5	5	5	5	3	0	-9	-7	-5	-5	-7	-12	-13	0	8	6	7
	19	13	10	11	12	6	5	5	-21	-14	-10	-12	-14	-21	-23	10	10	7	9
	33	24	17	21	22	13	11	11	-39	-27	-18	-25	-26	-38	-41	16	15	9	14
WELLS AFB 5000 10000 10000	6	3	3	3	3	3	-1	-2	-6	-3	-2	-3	-4	-9	-10	0	8	6	8
	1	2	3	3	2	-3	-4	-4	-4	-3	-6	-4	-5	-11	-12	10	9	8	9
	1	4	11	3	5	-5	-8	-8	-11	-10	-14	-9	-12	-22	-24	10	16	11	16
WELLS AFB 5000 10000 10000	5	5	4	3	4	4	-1	-2	-6	-3	-4	-3	-5	-10	-12	9	9	6	8
	17	12	8	10	11	4	3	3	-18	-13	-8	-11	-13	-20	-22	11	10	8	10
	31	24	15	19	21	11	9	9	-34	-27	-15	-22	-24	-34	-39	17	16	10	15
WELLS AFB 5000 10000 10000	6	5	5	4	4	4	3	-1	-7	-4	-5	-5	-6	-11	-12	0	8	6	7
	17	11	10	11	12	5	4	4	-19	-12	-10	-12	-14	-20	-22	10	10	8	9
	34	27	18	20	21	12	10	10	-34	-26	-19	-24	-26	-34	-39	16	15	9	14
WELLS AFB 5000 10000 10000	7	6	4	4	4	4	0	-1	-8	-7	-4	-3	-6	-11	-12	0	8	6	7
	19	15	6	9	11	5	3	3	-21	-16	-8	-10	-13	-21	-23	10	9	7	9
	34	27	11	19	21	11	9	9	-39	-30	-11	-21	-24	-37	-40	15	14	8	13
WELLS AFB 5000 10000 10000	8	6	6	6	6	6	1	0	-10	-7	-6	-6	-8	-13	-14	0	8	6	7
	20	13	11	12	13	7	6	6	-22	-14	-12	-13	-15	-22	-24	9	9	7	9
	33	23	19	22	23	15	13	13	-40	-27	-20	-26	-27	-38	-41	15	14	8	13

COMPILED—COMPUTED FOR A 120-KV AIRSPACE.  
 COORDINATE ANNUAL EQUIVALENT HEADINGS FOR INDICATED PER CENT RELIABILITIES.  
 PERCENT SIGN DRIVES HEADINGS.

STANDARD DEVIATION AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	C O S T I N G S												STANDARD DEVIATION						
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	APR	JUL	OCT			
<b>WELLS AFB</b>	<b>WYOMING</b>																		
5000	6	5	5	4	4	5	3	3	3	3	3	3	-7	-5	-5	-5	-6	-11	-12
10000	16	10	10	11	11	11	5	3	3	3	3	3	-10	-11	-11	-12	-13	-20	-22
15000	27	20	10	10	10	20	11	9	9	9	9	9	-34	-24	-20	-23	-25	-35	-36
<b>WELLS AFB</b>	<b>UTAH</b>																		
5000	2	2	0	2	2	1	1	1	1	1	1	1	-2	-2	1	-2	-1	-6	-8
10000	-8	-4	0	-2	-2	-4	-4	-11	-11	-11	-11	-11	6	2	0	0	1	-5	-7
15000	-18	-11	-3	-13	-13	-10	-23	-26	-26	-26	-26	-26	10	5	0	4	3	-7	-10
<b>WELLS AFB</b>	<b>WYOMING</b>																		
5000	3	2	1	1	1	1	1	1	1	1	1	1	-4	-2	3	-2	-2	-7	-9
10000	-5	-1	0	-1	-2	-2	-6	-9	-9	-9	-9	-9	2	3	3	0	0	-5	-6
15000	-11	-3	3	-7	-5	-16	-17	-17	-17	-17	-17	-17	2	-1	-3	0	-1	-9	-11
<b>Wb CAMPBELL AFB</b>	<b>NEW MEXICO</b>																		
5000	-12	-8	-4	-5	-5	-7	-16	-16	-16	-16	-16	-16	10	7	4	4	5	0	-2
10000	-22	-16	-7	-9	-13	-22	-24	-24	-24	-24	-24	-24	19	14	6	7	10	3	1
15000	-41	-26	-7	-21	-22	-30	-42	-42	-42	-42	-42	-42	31	18	5	16	15	4	1
<b>Wb CAMPBELL AFB</b>	<b>NEBRASKA FALLS</b>																		
5000	-9	-7	-5	-5	-7	-7	-15	-15	-15	-15	-15	-15	6	5	4	3	4	-4	-6
10000	-10	-12	-9	-7	-12	-22	-25	-25	-25	-25	-25	-25	10	8	7	4	7	-3	-5
15000	-31	-23	-13	-16	-20	-36	-40	-40	-40	-40	-40	-40	11	13	9	5	4	-4	-8
<b>Wb CAMPBELL AFB</b>	<b>ONTARIO AFB</b>																		
5000	-6	-2	-2	-2	-4	-4	-11	-12	-12	-12	-12	-12	4	2	2	1	2	-4	-6
10000	-10	-8	-3	-5	-6	-16	-17	-17	-17	-17	-17	-17	4	4	2	3	3	-4	-6
15000	-22	-12	-6	-17	-12	-26	-27	-27	-27	-27	-27	-27	5	1	3	0	3	-6	-9
<b>Wb CAMPBELL AFB</b>	<b>PLATTSBURGH</b>																		
5000	-16	-12	-8	-9	-11	-23	-23	-23	-23	-23	-23	-23	15	11	9	9	10	1	0
10000	-33	-23	-16	-16	-21	-33	-36	-36	-36	-36	-36	-36	31	21	15	13	19	8	5
15000	-52	-35	-21	-32	-34	-51	-56	-56	-56	-56	-56	-56	48	30	21	27	29	15	11
<b>Wb CAMPBELL AFB</b>	<b>OSGEO</b>																		
5000	-12	-7	-6	-6	-9	-9	-16	-16	-16	-16	-16	-16	11	6	6	6	7	0	0
10000	-23	-14	-13	-16	-17	-25	-27	-27	-27	-27	-27	-27	21	13	14	14	15	6	6
15000	-36	-25	-22	-27	-29	-39	-42	-42	-42	-42	-42	-42	31	21	21	23	23	13	11
<b>Wb CAMPBELL AFB</b>	<b>SCOTT AFB</b>																		
5000	-14	-11	-7	-9	-11	-19	-21	-21	-21	-21	-21	-21	14	13	7	9	9	2	0
10000	-30	-21	-13	-16	-19	-29	-32	-32	-32	-32	-32	-32	26	20	13	13	10	8	6
15000	-53	-36	-19	-31	-37	-46	-52	-52	-52	-52	-52	-52	46	34	14	27	27	14	11

STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

Equivalent Headwinds and Standard Deviation in Knots for Great Circle Air Routes

Region in Feet	W. S. M. I. V. A. I. F. S. T. H. E. A. R. M. I. H. D. S. O.												STANDARD DEVIATION				
	JAN	APR	JUL	SEPT	OCT	NOV	DEC	JAN	APR	JUL	OCT	NOV	DEC	JAN	APR	JUL	OCT
<b>Wb Campbellland</b>	TO SELPHUR												305 N.M.I.				
5000	-14	-7	-7	-9	-13	-19	-21	13	9	7	7	0	0	-1	15	14	12
10000	-20	-14	-13	-19	-29	-32	-32	23	17	14	11	14	6	4	16	16	14
10000	-47	-32	-31	-31	-37	-52	-52	30	27	19	22	25	11	0	23	23	22
<b>Wb Campbellland</b>	TO SWAN AFB												412 N.M.I.				
5000	-7	-2	-3	-5	-12	-14	-14	5	3	2	3	3	-4	-6	13	12	9
10000	-16	-5	-6	-10	-20	-22	-22	8	7	4	5	5	-3	-5	15	15	10
10000	-33	-10	-7	-19	-33	-36	-36	15	6	5	11	8	-3	-6	21	21	12
<b>Wb Campbellland</b>	TO WESTOVER AFB												220 N.M.I.				
5000	12	0	0	0	0	-1	-1	-10	-10	-9	-9	-10	-19	-22	15	15	10
10000	24	13	14	16	4	3	3	-20	-23	-14	-16	-19	-31	-33	17	17	12
10000	39	22	16	25	11	7	7	-47	-30	-23	-31	-31	-48	-52	24	24	14
<b>Wb Campbellland</b>	TO WATTSVILLE												305 N.M.I.				
5000	-13	-9	-7	-9	-10	-23	-23	11	6	5	6	7	-1	-3	15	14	10
10000	-24	-13	-12	-17	-27	-29	-29	20	14	12	10	13	4	1	16	16	11
10000	-41	-26	-25	-26	-43	-47	-47	28	22	17	17	20	7	3	23	22	14
<b>Wb Campbellland</b>	TO VAINA												1917 N.M.I.				
5000	-12	-7	-5	-8	-14	-15	-15	11	6	5	8	7	2	0	9	9	6
10000	-23	-14	-13	-16	-23	-25	-25	22	13	12	14	14	8	7	9	9	7
10000	-30	-21	-22	-24	-30	-31	-31	32	21	21	25	24	15	13	14	14	9
<b>Wb Campbellland</b>	TO YELLOWKNIFE												1093 N.M.I.				
5000	-4	-5	-5	-7	-13	-14	-14	6	3	4	7	4	0	-2	9	9	7
10000	-14	-10	-12	-13	-19	-21	-21	14	8	11	11	11	4	3	9	9	8
10000	-27	-18	-16	-21	-30	-32	-32	20	14	16	16	16	8	6	13	12	9
<b>Wb Delta</b>	TO PERRINS												1919 N.M.I.				
5000	1	1	2	0	0	-4	-4	-1	-1	-3	2	-1	-5	-5	4	5	5
10000	5	3	3	0	2	-1	-1	-4	-4	-3	0	-4	-8	-9	5	5	6
10000	9	6	-3	0	2	-3	-3	-13	-8	3	0	-4	-11	-13	8	8	6
<b>Wb Delta</b>	TO SAIGON												1970 N.M.I.				
5000	3	3	2	-1	1	-2	-2	-2	-3	-2	1	-2	-5	-6	5	5	5
10000	9	7	4	1	5	0	0	-10	-7	-4	-1	-4	-10	-12	6	5	6
10000	16	11	-3	1	5	-2	-2	-20	-12	3	-2	-7	-17	-19	8	8	6
<b>Wb Delta</b>	TO TENGAN												1368 N.M.I.				
5000	-2	-6	-1	3	-3	-7	-8	3	7	1	0	2	-1	-2	9	7	6
10000	-9	-8	-2	-5	-6	-11	-12	9	8	3	5	6	1	0	7	7	6
10000	-32	-26	-8	-15	-20	-30	-33	29	25	7	14	17	9	7	12	10	8

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 000--OPPOSITE DIRECTION HEADWIND MEANINGS FOR INDICATED PER CENT DELIABILITIES.  
 10000 SIG. 30-KNOTS HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WIND IN KNOTS	W E A T H E R												STANDARD DEVIATION					
	JAN	APR	JUL	OCT	COMO	A75	A85	JAN	APR	JUL	OCT	COASO	A75	A85	JAN	APR	JUL	OCT
Wb OLLANS	052 N.M.I.																	
5000	-2	-7	-3	1	2	-3	-9	-9	2	7	3	0	2	-2	-3	7	6	5
10000	-12	-10	-1	-2	-6	-13	-14	12	10	2	3	6	6	0	0	7	6	7
15000	-36	-20	0	-12	-10	-33	-36	35	27	-1	11	17	3	0	13	12	6	10
Wb OLLANS	948 N.M.I.																	
5000	0	3	4	4	5	-1	-3	-10	-4	-4	-4	-6	-13	-15	12	11	6	10
10000	14	10	5	4	0	0	-1	-10	-13	-4	-6	-12	-20	-22	12	12	9	12
15000	21	11	4	12	10	0	-2	-35	-20	-7	-19	-19	-33	-37	10	10	10	17
Wb OLLANS	1491 N.M.I.																	
5000	-4	-3	0	0	0	-2	-7	4	3	0	0	1	-3	-4	6	7	5	7
10000	-16	-12	-1	-6	-9	-16	-10	13	12	1	4	6	1	0	9	6	6	6
15000	-34	-20	-4	-16	-20	-33	-36	30	25	3	14	16	5	3	15	13	6	12
Wb OLLANS	507 N.M.I.																	
5000	1	3	1	3	2	-3	-3	-4	-3	-1	-3	-4	-10	-12	11	11	7	10
10000	13	12	1	4	7	0	-2	-16	-13	-1	-5	-8	-18	-20	12	12	6	11
15000	30	26	1	13	16	3	1	-33	-20	-1	-15	-19	-33	-37	16	16	9	14
Wb OLLANS	792 N.M.I.																	
5000	0	6	4	4	3	-1	-3	-10	-7	-4	-4	-6	-14	-15	12	11	6	10
10000	13	11	3	6	6	0	-1	-20	-14	-6	-7	-12	-21	-23	13	13	9	12
15000	25	14	4	13	12	1	0	-37	-22	-5	-10	-19	-34	-38	16	16	10	17
Wb OLLANS	1390 N.M.I.																	
5000	-7	-3	-1	-3	-4	-11	-13	5	2	0	4	2	-3	-5	10	10	6	9
10000	-14	-8	-4	-9	-9	-16	-10	10	6	3	7	4	0	-1	10	10	6	10
15000	-24	-17	-10	-10	-17	-27	-30	12	10	7	11	9	0	-1	16	15	9	14
Wb OLLANS	512 N.M.I.																	
5000	2	1	1	0	0	-8	-8	-4	-2	-1	0	-2	-10	-12	13	13	8	11
10000	6	0	1	3	3	-8	-10	-6	-3	-2	-1	-3	-12	-14	13	14	10	13
15000	-2	-5	-3	-3	-4	-15	-16	-15	-5	2	-2	-4	-17	-20	20	19	11	18
Wb OLLANS	631 N.M.I.																	
5000	0	4	3	1	3	-7	-4	-8	-5	-3	-3	-5	-12	-14	12	11	6	10
10000	16	7	4	4	6	-1	-3	-15	-10	-5	-6	-9	-18	-20	13	13	9	12
15000	14	6	2	7	6	-3	-6	-30	-17	-4	-14	-15	-29	-33	16	16	10	17
Wb OLLANS	542 N.M.I.																	
5000	11	6	4	4	6	0	-7	-11	-9	-4	-4	-7	-14	-16	12	11	6	10
10000	20	16	5	5	10	2	0	-22	-17	-4	-7	-12	-22	-25	13	13	6	12
15000	34	24	3	17	14	5	2	-43	-30	-1	-19	-22	-38	-42	16	16	10	16

DEFINITIONS: -10000 FT. A 120-KT AIRSPEED.  
 -15000 FT. A 100-KT AIRSPEED.  
 -20000 FT. A 80-KT AIRSPEED.  
 -30000 FT. A 60-KT AIRSPEED.  
 -40000 FT. A 40-KT AIRSPEED.  
 -50000 FT. A 20-KT AIRSPEED.  
 -60000 FT. A 10-KT AIRSPEED.  
 -70000 FT. A 5-KT AIRSPEED.  
 -80000 FT. A 2-KT AIRSPEED.  
 -90000 FT. A 1-KT AIRSPEED.  
 -100000 FT. A 0-KT AIRSPEED.



EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WIND IN FEET	WIND VELOCITY HEADWIND												STANDARD DEVIATION				
	JAN	APR	JUL	SEPT	NOV	DEC	JAN	APR	JUL	SEPT	NOV	DEC	JAN	APR	JUL	OCT	
NEW ORLEANS	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	11	7	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
10000	20	15	0	0	12	4	2	2	2	2	2	2	2	2	2	2	2
10000	33	19	0	10	17	6	4	4	4	4	4	4	4	4	4	4	4
NEW ORLEANS	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	9	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10000	7	5	3	3	4	3	3	3	3	3	3	3	3	3	3	3	3
10000	9	3	1	4	3	6	0	0	0	0	0	0	0	0	0	0	0
NEW ORLEANS	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	3	2	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10000	16	10	4	9	10	10	10	10	10	10	10	10	10	10	10	10	10
10000	31	22	11	21	21	31	34	34	34	34	34	34	34	34	34	34	34
NIAGARA FALLS	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10000	14	10	4	12	12	12	12	12	12	12	12	12	12	12	12	12	12
10000	30	23	19	21	23	35	30	30	30	30	30	30	30	30	30	30	30
NIAGARA FALLS	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	4	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0
10000	6	4	1	3	4	11	13	13	13	13	13	13	13	13	13	13	13
10000	16	11	7	11	12	11	11	11	11	11	11	11	11	11	11	11	11
NIAGARA FALLS	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10000	14	9	3	6	6	15	7	7	7	7	7	7	7	7	7	7	7
10000	24	17	9	17	17	15	7	7	7	7	7	7	7	7	7	7	7
NIAGARA FALLS	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	7	5	5	4	4	5	0	0	0	0	0	0	0	0	0	0	0
10000	16	11	12	11	11	11	6	4	4	4	4	4	4	4	4	4	4
10000	29	21	18	19	19	21	12	12	12	12	12	12	12	12	12	12	12
NIAGARA FALLS	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10000	6	0	0	1	1	0	6	7	7	7	7	7	7	7	7	7	7
10000	2	0	0	2	2	1	3	4	4	4	4	4	4	4	4	4	4
NIAGARA FALLS	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	3	0	1	1	1	2	6	6	6	6	6	6	6	6	6	6	6
10000	6	3	3	3	3	4	6	6	6	6	6	6	6	6	6	6	6
10000	6	0	0	0	0	0	4	4	4	4	4	4	4	4	4	4	4
NIAGARA FALLS	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	11	5	6	9	9	7	0	0	0	0	0	0	0	0	0	0	0
10000	21	12	15	16	16	16	8	8	8	8	8	8	8	8	8	8	8
10000	31	23	22	24	24	23	13	13	13	13	13	13	13	13	13	13	13
NIAGARA FALLS	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	12	7	6	6	6	6	0	0	0	0	0	0	0	0	0	0	0
10000	23	15	11	13	13	15	5	5	5	5	5	5	5	5	5	5	5
10000	36	21	17	22	22	23	10	7	7	7	7	7	7	7	7	7	7
NIAGARA FALLS	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	14	8	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1
10000	26	16	12	14	14	18	7	7	7	7	7	7	7	7	7	7	7
10000	63	27	19	32	32	32	19	19	19	19	19	19	19	19	19	19	19
NIAGARA FALLS	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	16	9	0	0	0	0	20	22	22	22	22	22	22	22	22	22	22
10000	29	19	14	17	17	20	31	34	34	34	34	34	34	34	34	34	34
10000	67	33	23	32	32	32	49	53	53	53	53	53	53	53	53	53	53

COMPUTED BY COMPUTER FOR A 120-KT AIRSPEED.  
 001-00000'S ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 4100'S 510'S HEADWINDS HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WINDY IN FEET	DIRECTION												STANDARD DEVIATION		
	JAN	APR	JUL	OCT	00450	A75	A85	00450	A75	A85	JAN	APR	JUL	OCT	
NIAGARA FALLS	TO	SWAN AFB												552 M.MI.	
5000	-3	-1	0	-2	-2	-10	-11	0	-7	-9	13	12	9	11	
10000	-8	-2	-2	-4	-3	-14	-16	0	0	-10	14	14	10	13	
10000	-21	-7	-3	-12	-10	-24	-20	-1	-3	-16	21	21	12	20	
NIAGARA FALLS	TO	WESTOVER AFB												200 M.MI.	
5000	19	9	9	10	10	1	0	-16	-10	-9	15	15	10	12	
10000	20	10	16	16	19	6	6	-30	-20	-16	17	17	12	15	
10000	42	20	23	27	20	15	11	-47	-32	-24	24	23	14	23	
NIAGARA FALLS	TO	WPTSMITH												200 M.MI.	
5000	-15	-9	-8	-9	-11	-20	-22	13	6	9	15	15	11	12	
10000	-27	-16	-16	-17	-20	-30	-33	24	16	15	17	17	12	15	
10000	-44	-29	-24	-29	-31	-47	-51	37	25	23	26	23	15	23	
NIAGARA FALLS	TO	VANINA												1761 M.MI.	
5000	-12	-6	-5	-9	-8	-14	-16	11	5	5	7	9	7	8	
10000	-22	-13	-13	-16	-16	-23	-24	21	12	13	15	9	7	9	
10000	-36	-21	-23	-28	-27	-37	-40	31	20	22	25	15	12	14	
NIAGARA FALLS	TO	YELLOWKNIFE												1697 M.MI.	
5000	-7	-6	-5	-9	-7	-13	-14	6	3	4	0	9	6	9	
10000	-16	-9	-12	-13	-13	-19	-21	14	8	12	12	9	8	9	
10000	-26	-17	-19	-21	-21	-30	-32	20	14	17	17	13	10	13	
WOLFE	TO	PAGO PAGO												1357 M.MI.	
5000	-2	0	2	0	0	-3	-6	2	0	-2	1	7	6	5	
10000	3	5	14	9	7	1	0	-3	-5	-14	-9	8	7	7	
10000	0	9	17	14	11	5	3	-8	-10	-19	-15	9	8	9	
WOLFE	TO	PORT MORESBY												1374 M.MI.	
5000	0	3	2	4	2	-1	-2	0	-3	-2	-3	7	6	5	
10000	-4	-4	-10	-5	-4	-11	-12	4	4	10	4	7	6	6	
10000	0	-6	-13	-6	-7	-13	-15	0	5	11	4	8	8	8	
WOLFE	TO	SUVA, FIJI												773 M.MI.	
5000	-2	0	4	0	0	-5	-6	2	1	-4	0	9	8	6	
10000	3	6	13	10	0	1	0	-3	-6	-16	-10	9	8	9	
10000	7	9	17	14	11	3	1	-8	-9	-19	-15	11	10	11	
WOLFE	TO	VANINGO												1900 M.MI.	
5000	0	2	3	5	2	-1	-2	0	-2	-3	-5	5	5	4	
10000	-1	-2	-5	-1	-3	-6	-7	1	2	4	1	5	5	5	
10000	1	-3	-7	-2	-3	-8	-9	-2	3	5	1	7	6	7	

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 KNOTS SIGN DENOTES HEADWINDS.  
 NEGATIVE SIGN DENOTES TAILWINDS.

FOUR-VALVE HEADLIGHTS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEIGHT IN FEET	MONTHS												STANDARD DEVIATION		
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC			
WINDS	M.F.A.M.I.N.D.S.O.														
5000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1207 N.M.I.
10000	1	1	1	1	1	1	1	1	1	1	1	1	1	1	9 11 9
15000	2	2	2	2	2	2	2	2	2	2	2	2	2	2	10 11 11 12
20000	3	3	3	3	3	3	3	3	3	3	3	3	3	3	12 13 13 15
ORANGE AFB	PATRICK AFB														
5000	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1975 N.M.I.
10000	13	12	12	12	12	12	12	12	12	12	12	12	12	12	7 7 5 6
15000	20	20	20	20	20	20	20	20	20	20	20	20	20	20	8 8 6 7
20000	30	29	29	29	29	29	29	29	29	29	29	29	29	29	13 12 7 11
ORANGE AFB	PITTSBURGH														
5000	7	7	7	7	7	7	7	7	7	7	7	7	7	7	1875 N.M.I.
10000	17	12	12	12	12	12	12	12	12	12	12	12	12	12	8 8 6 7
15000	22	23	23	23	23	23	23	23	23	23	23	23	23	23	9 9 7 8
20000	32	31	31	31	31	31	31	31	31	31	31	31	31	31	15 14 8 13
ORANGE AFB	ROCKFORD														
5000	6	6	6	6	6	6	6	6	6	6	6	6	6	6	1158 N.M.I.
10000	3	3	3	3	3	3	3	3	3	3	3	3	3	3	8 8 6 7
15000	4	4	4	4	4	4	4	4	4	4	4	4	4	4	10 9 7 9
20000	6	6	6	6	6	6	6	6	6	6	6	6	6	6	17 16 11 15
ORANGE AFB	SCOTT AFB														
5000	6	6	6	6	6	6	6	6	6	6	6	6	6	6	1423 N.M.I.
10000	15	12	12	12	12	12	12	12	12	12	12	12	12	12	8 8 6 7
15000	20	23	23	23	23	23	23	23	23	23	23	23	23	23	10 9 7 9
20000	30	29	29	29	29	29	29	29	29	29	29	29	29	29	16 15 9 14
ORANGE AFB	SELWIDGE AFB														
5000	6	6	6	6	6	6	6	6	6	6	6	6	6	6	1761 N.M.I.
10000	15	11	11	11	11	11	11	11	11	11	11	11	11	11	8 8 6 7
15000	20	21	21	21	21	21	21	21	21	21	21	21	21	21	10 9 7 9
20000	30	29	29	29	29	29	29	29	29	29	29	29	29	29	15 14 9 13
ORANGE AFB	WINDYBROOK														
5000	7	7	7	7	7	7	7	7	7	7	7	7	7	7	1906 N.M.I.
10000	18	14	14	14	14	14	14	14	14	14	14	14	14	14	8 7 5 7
15000	24	27	27	27	27	27	27	27	27	27	27	27	27	27	9 8 6 8
20000	34	33	33	33	33	33	33	33	33	33	33	33	33	33	14 13 8 12
ORANGE AFB	WINDYBROOK														
5000	6	6	6	6	6	6	6	6	6	6	6	6	6	6	1750 N.M.I.
10000	14	9	9	9	9	9	9	9	9	9	9	9	9	9	8 8 6 7
15000	20	20	20	20	20	20	20	20	20	20	20	20	20	20	9 9 7 9
20000	30	29	29	29	29	29	29	29	29	29	29	29	29	29	15 14 9 13
ORANGE AFB	WINDYBROOK														
5000	1	1	1	1	1	1	1	1	1	1	1	1	1	1	762 N.M.I.
10000	-3	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	9 8 6 7
15000	-12	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	14 12 8 11
20000	-22	-21	-21	-21	-21	-21	-21	-21	-21	-21	-21	-21	-21	-21	21 19 12 18

ORANGE AFB - COMPUTER FOR A 120-MT ALTITUDE.  
 005-001015 ANNUAL FOUR-VALVE HEADLIGHTS FOR INDICATED PER CENT RELIABILITIES.  
 OTHER STC. DENOTES HEADLIGHTS.

FACTORIAL MEASUREMENTS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

MONTH IN FEET	F U L L Y A L E R T M E A S U R E M E N T S												STANDARD DEVIATION				
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	APR	JUL	OCT	
ATLANTA	1	2	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1702 N.M.I.
SC00	-3	0	0	0	-1	-3	-4	-4	-4	-2	0	-2	-2	-7	-8	7	6
10000	-8	-2	1	-3	-3	-12	-14	-14	-14	-3	-4	-3	-12	-14	14	13	10
10000																	7
PACIFIC	0	0	-1	-2	-1	-3	-6	-6	-6	0	1	2	0	-3	-3	5	5
SC00	1	3	12	7	6	1	0	0	0	-1	-5	-7	-7	-12	-13	6	7
10000	0	4	17	6	0	2	1	1	1	-8	-7	-17	-9	-16	-10	9	6
10000																	10
PACIFIC	0	0	2	3	1	-3	-4	-4	-4	0	1	-2	-1	-6	-7	7	7
SC00	-3	-3	-11	-5	-6	-12	-13	-13	-13	3	3	11	5	0	-1	9	7
10000	-8	-8	-13	-9	-9	-16	-16	-16	-16	7	6	13	9	1	0	11	9
10000																	12
PACIFIC	0	-2	-5	-1	-2	-8	-9	-9	-9	0	2	4	0	1	-3	7	7
SC00	-3	-4	-8	-5	-5	-11	-13	-13	-13	2	3	5	3	3	-2	8	8
10000	-8	-13	-15	-11	-12	-23	-22	-22	-22	4	7	7	6	6	-1	11	11
10000																	11
PACIFIC	1	0	0	0	0	-4	-5	-5	-5	-1	0	0	0	0	-4	5	5
SC00	-2	-6	-15	-8	-8	-14	-15	-15	-15	2	7	15	8	2	1	7	6
10000	-8	-11	-22	-12	-13	-20	-22	-22	-22	8	11	21	12	6	5	8	8
10000																	9
PACIFIC	1	0	0	0	0	-5	-6	-6	-6	-3	-1	0	0	-1	-8	11	11
SC00	-1	0	0	1	0	-8	-10	-10	-10	-3	-3	0	-2	-3	-11	13	13
10000	-5	-6	0	0	-2	-13	-16	-16	-16	-13	-5	-1	-7	-6	-10	10	10
10000																	17
PACIFIC	0	-1	-3	-4	-4	-12	-13	-13	-13	6	4	2	5	4	-1	9	9
SC00	-17	-11	-7	-10	-11	-18	-20	-20	-20	13	9	6	8	8	2	10	10
10000	-20	-21	-12	-20	-20	-30	-33	-33	-33	10	14	10	14	13	5	14	14
10000																	9
PACIFIC	0	-4	-1	-3	-4	-10	-12	-12	-12	3	3	1	2	2	-4	11	11
SC00	-14	-11	-2	-5	-6	-16	-19	-19	-19	9	8	2	3	3	-2	12	12
10000	-20	-22	-6	-14	-16	-30	-33	-33	-33	14	15	5	9	9	0	18	17
10000																	16
PACIFIC	0	-1	0	0	-1	-7	-9	-9	-9	-1	0	0	0	0	-7	11	11
SC00	-3	-3	-1	0	-3	-10	-12	-12	-12	-1	0	0	-1	-1	-8	12	12
10000	-12	-11	-2	-4	-7	-18	-21	-21	-21	-6	0	0	-3	-2	-13	18	18
10000																	17

STANDARD DEVIATION COMPUTED FOR A 120-KT AIRSPEED.  
 POSITIVE SIGN INDICATES MEASUREMENTS FOR INDICATED PER CENT RELIABILITY.  
 NEGATIVE SIGN INDICATES MEASUREMENTS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUILYALENT HEADWIND IN D.S.							STANDARD DEVIATION											
	JAN	APR	JUL	OCT	0050	A75	A85	JAN	APR	JUL	OCT								
PARICR AFB																			
5000	4	2	2	0	2	-4	-6	-5	-2	-2	0	-3	-10	-11	11	11	8	11	344 N.M.I.
10000	0	0	1	1	0	-7	-9	-4	-4	-1	-1	-3	-11	-13	13	13	8	11	
10000	-4	-4	1	1	-1	-12	-14	-9	-5	-1	-5	-5	-16	-19	18	18	10	16	
PARICR AFB																			
5000	6	4	3	3	3	-2	-4	-8	-6	-3	-3	-5	-12	-14	11	11	8	10	925 N.M.I.
10000	0	0	4	5	6	-1	-3	-14	-12	-5	-6	-9	-17	-20	13	13	8	11	
10000	13	7	5	11	8	-1	-3	-20	-10	-7	-17	-17	-30	-33	17	17	10	16	
PARICR AFB																			
5000	-1	-1	0	0	-1	-7	-9	-1	0	0	0	0	-6	-8	11	11	7	10	982 N.M.I.
10000	-6	-4	-1	-1	-3	-11	-13	0	0	0	0	0	-7	-9	12	12	8	11	
10000	-11	-11	-3	-5	-5	-19	-21	-5	0	0	-3	-2	-12	-15	17	17	10	16	
PENANG																			
5000	-1	2	14	7	3	-3	-4	1	-2	-13	0	-3	-10	-12	7	6	6	8	504 N.M.I.
10000	0	1	6	5	2	-2	-3	0	0	-6	-4	-3	-8	-9	7	6	8	7	
10000	-7	-3	-3	-6	-4	-10	-11	2	3	3	6	3	-2	-3	9	8	9	7	
PENANG																			
5000	1	4	9	9	2	-1	-2	-1	-5	-9	2	-3	-8	-9	5	5	6	5	1962 N.M.I.
10000	4	5	5	2	4	0	-1	-6	-5	-5	-1	-5	-9	-10	6	5	7	6	
10000	9	4	1	2	3	-1	-2	-15	-8	-1	-3	-7	-13	-15	8	7	6	6	
PENANG																			
5000	4	1	2	-2	1	-3	-5	-3	-1	-2	2	-2	-6	-7	7	6	6	9	322 N.M.I.
10000	3	2	3	2	2	-2	-4	-2	-2	-3	-2	-3	-8	-9	8	7	8	8	
10000	-5	-2	-4	-9	-6	-10	-12	5	2	4	4	3	-2	-3	10	8	9	8	
PENANG																			
5000	1	3	10	-2	2	-2	-3	-1	-3	-10	2	-3	-8	-9	5	5	6	6	1702 N.M.I.
10000	4	5	6	3	4	0	0	-5	-5	-6	-2	-5	-9	-10	6	5	7	6	
10000	6	3	-1	0	1	-3	-4	-9	-5	1	0	-3	-9	-10	7	7	7	6	
PENANG																			
5000	14	7	3	7	7	0	0	-14	-7	-4	-7	-9	-15	-17	9	10	10	9	662 N.M.I.
10000	27	17	4	14	19	6	4	-27	-18	-4	-16	-17	-26	-29	11	11	11	11	
10000	43	31	12	27	27	15	12	-46	-33	-12	-28	-30	-43	-46	16	15	12	13	
PENANG																			
5000	-1	-3	-7	2	-7	-7	-8	1	3	7	-2	1	-2	-3	5	6	6	6	1803 N.M.I.
10000	-1	-2	-2	2	-1	-5	-7	-1	1	1	-3	-1	-5	-6	7	6	7	6	
10000	-9	-4	-4	-4	-6	-11	-12	0	0	1	1	0	-4	-6	9	8	7	7	

ONE-WINDS--COMPUTED ON A 1000 FT. ALTITUDE.  
 ONE-WINDS--COMPUTED ON A 1000 FT. ALTITUDE.  
 WINDS--COMPUTED ON A 1000 FT. ALTITUDE.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN PLY	EQUVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION						
	DIRECT				RETURN				M. E. A. D. M. I. N. D. S.				JAN	APR	JUL	OCT			
	JAN	APR	JUL	OCT	0050	A75	A85	JAN	APR	JUL	OCT	0050	A75	A85	JAN	APR	JUL	OCT	
<b>PEIPING</b>																			
5000	8	4	0	0	6	4	-1	-3	-8	-4	0	-6	-5	-12	-13	8	10	10	8
10000	17	9	2	12	10	10	1	0	-20	-11	-3	-13	-12	-21	-23	11	10	11	11
18000	20	16	2	15	12	3	0		-33	-23	-4	-18	-19	-31	-34	15	14	11	12
<b>PEIPING</b>																			
5000	3	1	-2	4	1	-4	-5		-4	-1	1	-4	-3	-8	-9	7	9	9	7
10000	11	4	0	8	5	-1	-3		-15	-7	0	-9	-8	-16	-18	10	9	10	10
18000	8	10	-1	8	5	-2	-4		-25	-18	0	-11	-13	-24	-27	13	12	10	11
<b>PEIPING</b>																			
5000	15	7	3	7	7	1	0		-15	-7	-3	-8	-9	-15	-17	8	9	8	8
10000	28	19	6	16	16	6	6		-29	-19	-7	-17	-18	-27	-29	11	10	9	10
18000	45	33	13	29	29	17	14		-47	-35	-14	-31	-32	-44	-47	15	14	11	12
<b>PITTSBURGH</b>																			
5000	-12	-7	-6	-9	-9	-16	-18		11	6	6	8	7	0	-1	11	11	9	11
10000	-23	-14	-14	-16	-17	-25	-27		21	12	14	14	15	7	5	11	12	9	11
18000	-37	-24	-22	-27	-27	-38	-41		31	20	20	23	23	12	10	17	16	11	16
<b>PITTSBURGH</b>																			
5000	-15	-10	-7	-9	-10	-19	-21		14	9	7	9	9	1	0	14	13	9	11
10000	-29	-20	-13	-14	-19	-29	-32		27	19	12	13	17	7	5	15	15	11	14
18000	-49	-31	-19	-30	-31	-47	-52		44	27	18	26	26	13	10	22	22	12	21
<b>PITTSBURGH</b>																			
5000	-11	-8	-6	-6	-8	-17	-19		9	7	6	5	6	-2	-4	15	15	10	12
10000	-23	-14	-12	-10	-15	-26	-29		18	13	10	6	12	1	0	16	17	12	15
18000	-40	-27	-17	-23	-26	-42	-46		25	20	14	14	17	3	0	24	24	14	23
<b>PITTSBURGH</b>																			
5000	-1	0	0	-1	-1	-9	-11		0	-1	0	0	-1	-8	-10	13	13	9	12
10000	-5	-3	0	-2	-3	-12	-14		-3	-1	0	1	-1	-10	-12	15	15	10	14
18000	-17	-4	-1	-9	-7	-21	-24		-5	-7	0	0	-3	-15	-19	21	21	12	20
<b>PITTSBURGH</b>																			
5000	14	9	8	10	10	1	0		-16	-11	-8	-10	-11	-20	-23	15	14	10	12
10000	28	20	15	14	18	9	6		-31	-21	-15	-16	-20	-31	-34	16	16	11	14
18000	44	26	21	28	28	14	11		-50	-32	-22	-32	-33	-49	-54	23	23	14	22
<b>PITTSBURGH</b>																			
5000	-9	-7	-5	-4	-7	-15	-17		6	5	4	3	4	-4	-6	15	14	10	12
10000	-18	-12	-10	-8	-12	-23	-25		11	9	8	6	8	-1	-3	16	16	12	15
18000	-32	-22	-15	-18	-21	-36	-40		15	14	11	9	12	-1	-4	23	23	14	23

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 0050--QUARTER ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

FOUR VALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

HEADING IN FEET	F O U R V A L E N T H E A D W I N D S												STANDARD DEVIATION	
	JAN	APR	JUL	OCT	00450	A75	AB5	JAN	APR	JUL	OCT	00450		A75
PITTSBURGH														
TO														
9000	-12	-7	-5	-8	-8	-14	-16	11	6	5	8	7	1	0
10000	-23	-13	-12	-15	-16	-23	-24	21	12	12	14	14	8	6
10000	-37	-24	-22	-28	-28	-38	-40	32	21	21	25	24	15	13
PITTSBURGH														
TO														
9000	-7	-4	-4	-9	-6	-13	-14	6	3	4	7	5	-1	-2
10000	-14	-10	-12	-13	-13	-19	-21	14	3	11	12	11	5	3
10000	-27	-18	-18	-21	-21	-30	-32	20	14	15	16	16	8	6
PITTSBURGH														
TO														
9000	-2	0	-5	-3	-3	-7	-7	2	1	6	3	3	0	-1
10000	2	2	6	2	3	3	-1	-2	-2	-7	-2	-4	-8	-9
10000	0	5	7	0	2	-2	-3	-1	-5	-7	0	-3	-8	-10
PITTSBURGH														
TO														
9000	-4	0	4	6	1	-3	-4	5	0	-4	-6	-2	-7	-8
10000	1	3	4	5	2	-1	-2	-1	0	-4	-5	-3	-7	-8
10000	4	0	3	3	2	-3	-4	-4	0	-3	-3	-3	-8	-9
PITTSBURGH														
TO														
9000	1	0	0	5	1	-4	-6	-2	0	0	-6	-2	-8	-10
10000	10	5	6	8	7	2	0	-11	-5	-7	-9	-8	-14	-15
10000	16	6	4	12	11	3	1	-19	-10	-10	-14	-13	-21	-23
PITTSBURGH														
TO														
9000	-1	-1	-6	-2	-3	-9	-11	0	1	6	1	2	-4	-6
10000	-6	-3	-7	-6	-6	-13	-15	4	2	7	5	4	-2	-4
10000	-11	-8	-8	-10	-10	-19	-22	7	5	6	6	6	-3	-6
PITTSBURGH														
TO														
9000	-2	-2	2	5	2	-6	-8	1	2	-2	1	0	-5	-6
10000	-1	1	3	1	0	-4	-6	0	-2	-4	-1	-2	-8	-9
10000	-2	2	5	3	2	-6	-8	0	-4	-7	-4	-4	-12	-14
PITTSBURGH														
TO														
9000	-3	-3	-2	-1	-3	-8	-9	3	2	2	0	1	-3	-4
10000	3	0	1	-2	0	-5	-7	-5	0	-2	1	-2	-7	-9
10000	6	0	3	2	2	-5	-7	-14	-3	-5	-6	-7	-16	-18
PITTSBURGH														
TO														
9000	0	0	-2	3	0	-7	-8	0	0	2	-4	0	-7	-9
10000	7	4	6	5	5	3	-1	-7	-4	-6	-7	-7	-12	-14
10000	14	6	10	10	10	2	0	-16	-9	-11	-11	-12	-20	-22

HEADING-3-COMPUTED FOR A 120-KT AIRSPEED.  
 000-0900'S ANNUAL FOUR VALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN OPPOSITE HEADWINDS.

MONTHLY HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN POUNDS	MONTHLY HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES												STANDARD DEVIATION						
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	APR	JUL	OCT			
PUSAN EAST																			
5000	-3	-5	-8	3	3	3	3	3	3	3	3	3	3	3	3	3	5	6	6
10000	-11	-9	-6	-3	-8	-3	2	5	2	5	2	5	0	0	0	0	7	6	7
15000	-24	-14	-4	-7	-12	-20	-22	15	9	3	5	7	1	0	0	0	9	8	7
PUSAN EAST																			
5000	-8	-6	-4	0	0	0	0	0	0	0	0	0	0	0	0	0	9	11	10
10000	-23	-16	-6	-13	-14	-23	-26	19	15	6	8	11	3	1	1	1	12	12	11
15000	-43	-29	-12	-19	-25	-38	-42	34	23	11	16	20	9	7	7	7	16	14	12
PUSAN WEST																			
5000	-3	-5	-5	3	3	3	3	3	3	3	3	3	3	3	3	3	9	10	10
10000	-14	-13	-5	-3	-10	-17	-19	8	11	5	4	7	0	-2	-2	-2	11	10	11
15000	-32	-19	-8	-9	-16	-27	-31	16	10	8	6	9	1	0	0	0	14	13	10
PUSAN SOUTH																			
5000	14	7	4	7	7	7	7	7	7	7	7	7	7	7	7	7	11	11	11
10000	31	21	8	17	16	8	6	-14	-22	-8	-18	-20	-16	-10	-10	-10	13	13	11
15000	48	37	14	32	32	18	15	-52	-39	-15	-34	-35	-44	-53	-53	-53	18	16	13
PUSAN NORTH																			
5000	9	5	3	7	5	5	5	5	5	5	5	5	5	5	5	5	11	11	9
10000	16	10	9	12	11	3	1	-19	-11	-10	-14	-14	-22	-24	-24	-24	12	12	10
15000	23	15	13	19	16	6	4	-31	-20	-16	-24	-22	-34	-37	-37	-37	18	17	11
PUSAN WESTERN																			
5000	11	4	6	9	7	0	-1	-12	-6	-6	-10	-9	-16	-18	-18	-18	12	11	9
10000	21	12	14	15	15	7	5	-22	-13	-15	-17	-17	-25	-27	-27	-27	11	12	10
15000	31	20	21	24	23	12	10	-36	-23	-23	-27	-27	-39	-42	-42	-42	18	17	12
PUSAN EASTERN																			
5000	9	6	4	6	6	0	-1	-11	-7	-4	-7	-8	-14	-16	-16	-16	10	10	8
10000	18	11	9	10	11	4	3	-21	-13	-10	-12	-14	-22	-23	-23	-23	10	11	8
15000	26	18	14	18	17	8	6	-34	-23	-16	-24	-24	-35	-38	-38	-38	16	15	10
PUSAN WESTERN (continued)																			
5000	0	0	2	2	0	-4	0	0	-1	-2	-3	-2	-7	-9	-9	-9	8	8	8
10000	-4	0	0	-1	-2	-7	-8	3	-1	0	0	0	-5	-7	-7	-7	8	8	8
15000	-3	0	0	-1	-1	-9	-11	0	-3	-2	-2	-2	-10	-12	-12	-12	12	11	10
PUSAN EASTERN (continued)																			
5000	11	5	7	9	7	1	0	-12	-6	-8	-10	-9	-16	-18	-18	-18	11	10	8
10000	21	13	15	16	16	9	7	-23	-14	-15	-17	-18	-25	-27	-27	-27	11	11	9
15000	31	21	23	24	24	14	12	-37	-24	-24	-28	-28	-39	-41	-41	-41	16	15	11

HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 POSITIVE SIGN DENOTES HEADWINDS.  
 NEGATIVE SIGN DENOTES TAILWINDS.



FORMERLY HEADQUARTERS AND STANDARD DEVIATION IN SPTS FOR GREAT CIRCLE AIR ROUTES

ROUTE IN SPTS	F O R W E S T												STANDARD DEVIATION												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
REGMA	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	11	5	6	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
10000	21	12	13	16	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
15000	31	20	22	24	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
REGMA	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	-12	-5	-2	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7
10000	-17	-9	-9	-14	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13
15000	-26	-17	-19	-23	-22	-22	-22	-22	-22	-22	-22	-22	-22	-22	-22	-22	-22	-22	-22	-22	-22	-22	-22	-22	-22
REGMA	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	-4	-1	0	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7
10000	-13	-4	-8	-12	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13
15000	-21	-10	-10	-17	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15
SALINA	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	3	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
10000	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
15000	11	5	2	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
SALINA	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	2	0	-8	-5	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
10000	2	1	-3	-4	-1	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4
15000	6	2	1	2	1	4	-1	-4	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5
SALINA	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	3	3	9	-3	2	-2	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
10000	6	7	6	1	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15000	11	6	0	3	4	-1	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
SCOTT AFB	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	11	6	0	9	7	0	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
10000	20	13	13	11	13	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15000	31	16	15	10	19	6	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
SCOTT AFB	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	11	6	5	5	5	0	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
10000	21	16	7	6	12	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15000	31	25	11	10	19	7	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
SCOTT AFB	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5000	14	9	7	9	9	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10000	26	14	13	14	17	6	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
15000	43	26	19	27	27	14	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12

STANDARD DEVIATION PER CENT RELIABILITY.  
 THESE SIGN FIGURES HEADQUARTERS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GFAT CIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GFAT CIRCLE AIR ROUTES												STANDARD DEVIATION					
	DIRECT			EQUIVALENT			RETURN			RETURN			JAN	APR	JUL	OCT		
	JAN	APR	JUL	OCT	**450	A75	A85	JAN	APR	JUL	OCT	**450	A75	A85	JAN	APR	JUL	OCT
SCOTT AFB																		
5000	8	4	5	6	5	-2	-4	-10	-5	-5	-7	-7	-15	-18	14	13	10	12
10000	14	9	7	9	9	0	-2	-19	-12	-9	-11	-13	-23	-25	15	15	11	14
18000	20	12	11	12	13	0	-2	-34	-20	-14	-20	-21	-36	-40	22	21	18	21
SCOTT AFB																		
5000	-9	-6	-4	-7	-7	-13	-14	8	6	4	6	5	0	-1	9	9	7	8
10000	-21	-12	-9	-14	-14	-21	-23	20	11	9	13	12	6	4	16	16	10	9
18000	-35	-23	-19	-27	-26	-36	-39	30	19	16	23	21	12	10	16	15	10	14
SCOTT AFB																		
5000	-7	-3	-2	-9	-5	-12	-13	5	2	2	6	3	-2	-3	9	9	7	8
10000	-15	-8	-9	-12	-11	-18	-19	13	7	6	11	9	3	2	9	9	8	9
18000	-25	-15	-13	-20	-18	-27	-30	17	11	10	15	12	4	2	13	13	9	13
SELFRIDGE AFB																		
5000	1	2	2	0	1	-6	-8	-4	-3	-2	-1	-3	-11	-12	13	12	10	11
10000	1	2	2	0	1	-7	-9	-10	-7	-3	-2	-6	-15	-17	14	14	10	11
18000	-4	3	2	-2	0	-12	-16	-18	-15	-5	-7	-11	-24	-20	21	21	18	20
SELFRIDGE AFB																		
5000	15	9	9	10	10	2	0	-16	-10	-9	-10	-12	-20	-22	14	14	10	12
10000	28	19	16	16	19	9	7	-30	-20	-16	-17	-21	-31	-34	16	16	11	14
18000	44	28	23	28	29	15	12	-48	-32	-24	-32	-33	-49	-53	23	23	16	22
SELFRIDGE AFB																		
5000	-11	-6	-5	-8	-8	-14	-15	11	6	5	8	7	1	0	9	9	7	8
10000	-22	-13	-13	-16	-16	-23	-25	21	12	12	15	14	8	6	10	10	8	9
18000	-35	-23	-23	-28	-27	-37	-39	31	20	21	25	23	14	12	15	14	10	14
SELFRIDGE AFB																		
5000	-7	-3	-4	-9	-6	-12	-14	6	3	3	8	4	-1	-2	9	9	7	8
10000	-16	-9	-12	-14	-13	-19	-21	14	8	11	12	11	5	3	9	9	8	9
18000	-26	-17	-18	-21	-21	-29	-32	20	14	15	17	16	8	6	13	13	10	14
SHANGHAI																		
5000	-1	-2	-5	3	-1	-8	-10	1	2	2	-3	0	-6	-7	9	10	11	12
10000	0	-3	-3	1	-1	-9	-11	-5	0	2	-2	-1	-9	-11	11	10	12	11
18000	-9	0	-6	0	-4	-13	-15	-9	-8	5	-2	-3	-13	-16	14	13	11	12
SHANGHAI																		
5000	10	6	4	3	5	0	-2	-11	-7	-4	-3	-7	-13	-15	9	10	11	12
10000	27	19	7	13	16	7	5	-29	-20	-7	-14	-10	-27	-29	11	11	10	14
18000	44	33	13	24	27	16	13	-50	-36	-13	-27	-31	-45	-48	13	13	11	14

\*HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT RIRCLE AIR ROUTES

FLIGHT IN FEET	EQUIVALENT M.F.A.D. IN D.S. RETURN												STANDARD DEVIATION						
	JAN	APR	JUL	OCT	MAY	AUG	NOV	DEC	JAN	APR	MAY	AUG	NOV	DEC	JAN	APR	MAY	AUG	NOV
SHAW AFB																			
5000	8	5	4	4	WESTOVER AFB	5	-2	-4	-10	-7	-4	-5	-7	-15	-17	13	17	11	11
10000	14	12	7	8	9	1	-1	-21	-21	-16	-3	-9	-13	-23	-26	15	15	10	11
18000	26	13	9	17	15	3	0	-60	-24	-24	-12	-23	-23	-30	-33	20	20	11	10
SHAW AFB																			
5000	-4	-4	-2	-1	MURKSMITH	-3	-11	-13	1	2	2	0	1	-6	-8	13	12	9	11
10000	-10	-7	-3	-2	-6	-15	-17	2	2	2	0	1	1	-7	-9	16	16	10	11
18000	-18	-15	-6	-8	-11	-24	-28	-3	3	2	-1	0	0	-12	-15	20	20	12	10
SHAW AFB																			
5000	-10	-7	-4	-	YAKIMA	-7	-12	-14	9	6	4	6	6	1	0	0	0	7	7
10000	-22	-14	-9	-12	-14	-21	-23	20	14	8	11	12	12	6	9	16	16	10	11
18000	-36	-25	-17	-26	-25	-36	-38	30	21	16	22	21	13	11	11	16	16	11	10
SHAW AFB																			
5000	-11	-10	-7	-13	TOKYO	-11	-17	-19	9	8	6	11	8	1	0	11	10	10	10
10000	-21	-15	-9	-20	-14	-24	-26	17	12	8	18	13	6	6	6	11	11	10	10
18000	-33	-26	-12	-32	-26	-37	-40	23	19	9	25	18	0	0	0	15	16	11	10
SINGAPORE																			
5000	1	1	9	0	TAIPEI	2	-1	-2	-1	-1	-8	0	-3	-7	-8	5	5	5	5
10000	2	4	6	2	3	0	-1	-3	-3	-4	-6	-2	-4	-8	-9	9	9	7	6
18000	5	2	-1	0	1	-3	-4	-7	-3	0	0	0	-3	-8	-9	7	7	6	6
SUVA, FIJI																			
5000	0	-1	-3	0	MELBURN	-1	-7	-8	0	1	2	0	0	-5	-6	0	0	0	0
10000	-1	-2	-4	-2	-3	-9	-11	0	1	0	0	0	0	-6	-7	9	9	10	10
18000	-4	-5	-9	-7	-7	-15	-17	1	0	0	0	0	0	-7	-9	11	11	12	11
TAIPEI																			
5000	6	6	5	0	TOKYO	4	-1	-3	-7	-7	-5	0	-5	-11	-13	11	11	12	11
10000	20	18	6	10	13	5	4	-24	-19	-7	-11	-11	-15	-24	-26	16	16	10	10
18000	36	25	10	16	20	10	8	-46	-31	-11	-20	-20	-26	-40	-43	13	12	10	11
TEHRAN																			
5000	4	6	5	2	ZAHEDAN	4	-1	-2	-4	-6	-5	-1	-4	-10	-11	0	0	0	0
10000	9	8	4	4	6	0	-1	-10	-9	-9	-6	-6	-8	-14	-16	0	0	0	0
18000	25	22	11	12	16	7	5	-31	-26	-12	-14	-14	-20	-31	-34	16	16	10	11
THULE																			
5000	1	0	-1	-1	MURKSMITH	-1	-6	-8	-2	0	0	0	0	-5	-7	0	0	0	0
10000	0	0	0	-1	-1	-7	-8	-1	0	0	0	0	-1	-7	-8	0	0	0	0
18000	-6	-2	0	-4	-1	-11	-11	0	0	0	0	0	-1	-9	-11	14	12	10	11

\* HEADWINDS--COMPUTED FOR A 170-KT AIRSPEED.  
 \*\*A--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITY.  
 \*\*\* THIS SIGN DENOTES HEADWIND.

EQUIVALENT HEADWINDS AND STANDARD DEVIATION IN KNOTS FOR GREAT CIRCLE AIR ROUTES

WEIGHT IN FEET	EQUIVALENT HEADWIND RETURN												STANDARD DEVIATION						
	DIRECT						RETURN						JAN	APR	JUL	OCT	A75	A75	A85
	JAN	APR	JUL	OCT	A75	A85	JAN	APR	JUL	OCT	A75	A85							
THULE																			
5000	0	-1	-2	-4	-2	-8	-10	0	1	2	3	1	-5	-6	1228 (lb./mi.)				
10000	2	-2	0	-1	-1	-6	-8	-3	2	0	0	0	-6	-8	9 9 9 9 9				
18000	1	-4	-2	-3	-2	-10	-12	-4	2	0	0	0	-8	-10	13 12 11 11 11				
TOKYO																			
5000	3	-1	-3	-3	-2	-7	-8	-5	0	2	2	0	-5	-7	1728 (lb./mi.)				
10000	17	8	0	1	5	0	-2	-21	-11	0	-3	-8	-17	-19	9 9 9 9 9				
18000	25	24	3	9	14	4	2	-42	-30	-5	-15	-22	-37	-40	12 11 8 8 8				
VANING																			
5000	-9	-7	-4	-1	-6	-10	-11	8	6	4	1	4	1	0	1978 (lb./mi.)				
10000	-5	-4	-4	-6	-5	-8	-9	5	4	4	6	4	1	0	9 9 9 9 9				
18000	-8	-4	-5	-5	-6	-10	-11	6	4	5	5	4	1	0	7 9 9 9 9				
WESTOVER AFB																			
5000	-16	-9	-9	-9	-11	-20	-22	14	8	9	9	9	1	0	982 (lb./mi.)				
10000	-28	-19	-16	-18	-20	-30	-33	26	17	16	16	18	0	6	14 14 11 11 11				
18000	-45	-31	-24	-31	-32	-47	-51	39	26	23	26	27	14	11	22 22 16 16 16				
WESTOVER AFB																			
5000	-8	-4	-5	-9	-7	-13	-14	7	3	5	8	5	0	-1	1000 (lb./mi.)				
10000	-16	-9	-13	-14	-14	-20	-21	14	8	12	12	11	5	4	9 9 9 9 9				
18000	-26	-18	-19	-21	-21	-29	-31	19	14	17	16	16	0	6	13 12 9 12				
WURTSMITH																			
5000	-11	-6	-5	-9	-8	-14	-16	11	5	5	8	7	1	0	1928 (lb./mi.)				
10000	-21	-12	-13	-16	-16	-23	-24	20	11	13	15	14	0	6	9 9 9 9 9				
18000	-34	-22	-23	-28	-27	-36	-39	30	19	22	24	23	14	12	10 10 10 10 10				
WURTSMITH																			
5000	-7	-3	-4	-9	-6	-13	-14	6	3	3	8	4	-1	-3	1821 (lb./mi.)				
10000	-16	-9	-12	-14	-13	-19	-21	14	8	11	13	11	5	3	9 9 9 9 9				
18000	-26	-17	-18	-21	-21	-29	-32	21	14	16	17	16	0	6	13 13 10 10 10				
YAKIMA																			
5000	5	3	1	3	2	-3	-4	-5	-4	-1	-4	-4	-10	-11	976 (lb./mi.)				
10000	-1	1	0	2	0	-6	-7	-1	-2	0	-4	-2	-9	-10	9 9 9 9 9				
18000	-5	0	0	0	-1	-11	-14	-2	-4	-3	-5	-4	-14	-16	11 15 12 12 15				

\* HEADWINDS--COMPUTED FOR A 120-KT AIRSPEED.  
 \*\*\*--DENOTES ANNUAL EQUIVALENT HEADWINDS FOR INDICATED PER CENT RELIABILITIES.  
 MINUS SIGN DENOTES HEADWINDS.

	LATITUDE DEG MIN	LONGITUDE DEG MIN	ELEVATION FT
ABADAN	30 22N	48 15E	10
ADAK NS	51 53N	176 39W	17
ADELAIDE	34 57S	138 32E	12
ADEN	12 50N	45 2E	10
ALAMEDA NAS	37 47N	122 3W	29
ALERT	83 29N	62 17W	190
ANDERSON AFB	13 35N	144 55E	580
ANDREWS AFB	38 49N	76 51W	353
ATTU	52 50N	173 11E	40
BAGHDAD	33 19N	44 22E	110
BANGKOK	13 55N	100 37E	10
BOISE	43 34N	116 14W	2858
BOMBAY	19 5N	72 52E	30
BRISBANE	27 38S	152 43E	86
CALCUTTA	22 39N	88 27E	10
CANNON AFB	34 23N	103 19W	4301
CARSWELL AFB	32 46N	97 27W	617
CHERRY PT MCAS	34 54N	76 53W	29
CHICAGO	41 59N	87 54W	667
CHITOSE AB	42 48N	141 39E	92
CHURCHILL	58 45N	94 4W	96
CLARK AFB	15 11N	120 33E	475
COLOMBO	6 54N	79 52E	24
COOKTOWN	15 28S	145 14E	10
CORPUS CHRISTI	27 42N	97 17W	20
DA NANG	16 2N	108 12E	30
DARWIN	12 28S	130 55E	20
DAVAO	7 4N	125 36E	19
DHAHRAN	26 17N	50 10E	78
DIEGO GARCIA	7 21S	72 29E	4
DJAKARTA	6 9S	106 51E	10
DOVER AFB	39 8N	75 28W	27
DUTCH HARBOR	53 54N	166 32W	12
EDMONTON	53 34N	113 31W	2214
EGLIN AFB	30 29N	86 31W	5
EIELSON AFB	64 39N	147 4W	544
ELLINGTON AFB	29 36N	95 10W	3
ELLSWORTH AFB	44 49N	103 6W	3276
ELMENDORF AFB	61 15N	149 48W	258
EL TORO MCAS	33 40N	117 44W	380
ENGLAND AFB	31 19N	92 33W	89
ENIWETOK ATOLL	11 21N	162 15E	21
FORT BENNING	32 32N	84 54W	252
FORT BLISS	31 48N	106 23W	1205
FORT BRAGG/POPE	35 8N	78 56W	242
FORT CAMPBELL	36 40N	87 30W	559

THE BOEING VERTOL COMPANY

0210-10600-1

	LATITUDE DEG MIN	LONGITUDE DEG MIN	ELEVATION FT
FORT CARSON	38 41N	104 46W	5835
FORT EUSTIS	38 8N	76 37W	10
FORT HOOD	31 8N	97 34W	33
FORT HUACHUCA	31 35N	110 20W	1422
FORT KNOX	37 54N	85 58W	764
FORT LEAVENWORTH	39 22N	94 55W	786
FORT LEWIS	47 5N	122 35W	301
FORT ORD	36 41N	121 46W	134
FORT RUCKER	31 14N	85 26W	325
FORT SILL	34 39N	98 24W	119
FORT WOLTERS	32 47N	98 4W	964
FRUBISHER	63 45N	68 38W	96
GEN MITCHELL	42 47N	87 54W	698
HANOI	21 1N	105 51E	53
HICKAM AFB	21 20N	157 55W	14
HILL AFB	41 7N	111 58W	4788
HOMESTEAD AFB	25 28N	80 24W	17
HONG KONG	22 20N	114 12E	13
HUNTER AAF	32 1N	81 8W	70
HUNTSVILLE	34 39N	86 47W	629
IWAKUNI	34 9N	132 14E	10
IWO JIMA AB	24 47N	141 19E	350
JACKSONVILLE	30 25N	81 39W	24
JOHNSTON ISLAND	16 44N	169 31W	7
JUNEAU	58 27N	134 34W	1676
KADENA AB	26 21N	127 46E	142
KAKACHI	24 54N	67 9E	80
KEY WEST	24 33N	81 48W	9
KIMPO AB	37 33N	126 48E	60
KODIAK	57 45N	152 31W	77
KWAJALEIN NS	8 44N	167 43E	24
LAHORE	31 27N	74 26E	702
LARSON AFB	47 12N	119 19W	1186
LITTLE ROCK	34 55N	92 9W	311
LOCKBOURNE	39 39N	82 56W	744
LUKING AFB	46 57N	67 53W	746
LUKE AFB	33 30N	112 22W	1093
MANDALAY	21 56N	96 5E	2541
MAURITIUS ISLAND	20 26S	57 41E	165
MCGUIRE AFB	40 2N	74 36W	127
MEDAN	3 34N	98 40E	102
MELBOURNE	37 52S	144 45E	46
MEMPHIS	35 3N	89 59W	284
MEXICO CITY	19 26N	99 8W	7382

	LATITUDE DEG MIN	LONGITUDE DEG MIN	ELEVATION FT
MIDWAY ISLAND	28 12N	177 23W	10
MINN-ST PAUL	44 53N	93 13W	838
MINOT AFB	48 16N	101 17W	1723
MISAWA AB	40 42N	141 23E	110
NELLIS AFB	36 15N	115 2W	1881
NEW CUMBERLAND	40 13N	76 51W	106
NEW DELHI	28 34N	77 7E	750
NEW ORLEANS	30 1N	90 4W	13
NIAGARA FALLS	43 6N	78 57W	48
NOUMEA	22 16S	166 57E	0
OXNARD AFB	34 15N	119 5W	96
PAGO PAGO	14 20S	170 42W	9
PAPEETE	17 33S	149 37W	7
PATRICK AFB	28 15N	80 36W	9
PENANG	5 18N	100 16E	16
PEIPING	39 36N	116 24E	0
PERTH	31 56S	115 58E	51
PITTSBURGH	40 30N	80 13W	1151
PORT MORESBY	9 30S	147 7E	148
PRUDHOE BAY	70 15N	148 20W	46
PUSAN EAST	35 10N	129 8E	6
REGINA	50 26N	104 40W	1900
SAIGON	10 49N	106 40E	30
SCOTT AFB	38 33N	89 59W	444
SELFRIDGE AFB	42 36N	82 50W	610
SHANGHAI	31 15N	121 29E	0
SHAW AFB	33 59N	80 29W	250
SHEMYA	52 43N	174 7E	90
SINGAPORE	1 21N	103 54E	33
SUVA, FIJI	16 48S	179 20E	10
TAIPEI	25 2N	121 31E	26
TEHRAN	35 11N	51 20E	3960
THULE	76 32N	68 45W	251
TOKYO	35 33N	139 46E	10
VANIMO	2 41S	141 18E	3
WAKE ISLAND	19 17N	166 39E	11
WELLINGTON	41 17S	174 46E	415
WESTOVER AFB	42 12N	72 32W	244
WUKTSMITH	44 28N	83 22W	618
YAKIMA	46 34N	120 32W	1061
YELLOWKNIFE	62 28N	114 27W	676

THE BOEING VERVOL COMPANY

D210-10600-1

LATITUDE DEG MIN	LONGITUDE DEG MIN	ELEVATION FT
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ZAHEDAN

29 27N

60 54E

4716



<b>ABAKAN</b>		<b>ALAMEDA NAS (CONT.)</b>		<b>ANDERSON AFB</b>		<b>ANDREWS AFB (CONT.)</b>	
ADEN - - - - -	17	ELLINGTON AFB - - - - -	22	CHITOSE AB - - - - -	27	KEY WEST - - - - -	33
BAGHDAD - - - - -	17	ELLSWORTH AFB - - - - -	22	CLARK AFB - - - - -	27	LARSON AFB - - - - -	33
BOMBAY - - - - -	17	FLMENDORF AFB - - - - -	22	COOKTOWN - - - - -	27	LITTLE ROCK - - - - -	33
DHAHRAN - - - - -	17	EL TORO MCAS - - - - -	22	DARWIN - - - - -	28	LOCKHOURNE - - - - -	33
KARACHI - - - - -	17	ENGLAND AFB - - - - -	22	DAVAO - - - - -	28	LORING AFB - - - - -	33
LAHORE - - - - -	17	FORT BENNING - - - - -	22	ENIWETOK ATOLL - - - - -	28	LUKE AFB - - - - -	34
NEW DELHI - - - - -	17	FORT BLISS - - - - -	22	HONG KONG - - - - -	28	MEMPHIS - - - - -	34
TEHRAN - - - - -	17	FORT CAMPBELL - - - - -	22	INAKUNI - - - - -	28	MEXICO CITY - - - - -	34
ZAHEDAN - - - - -	17	FORT CARSON - - - - -	22	JMO JIMA AB - - - - -	28	MINDT AFB - - - - -	34
		FORT HOOB - - - - -	23	KADENA AB - - - - -	28	MINN-ST PAUL - - - - -	34
<b>ADAK NS</b>		FORT HUACHUCA - - - - -	23	KIMPO AB - - - - -	28	NELLIS AFB - - - - -	34
ATTU - - - - -	18	FORT KNOX - - - - -	23	KWAJALEIN NS - - - - -	28	NEW ORLEANS - - - - -	34
CHITOSE AB - - - - -	18	FORT LEAVENWORTH - - - - -	23	MISAWA AB - - - - -	29	NIAGARA FALLS - - - - -	34
DUTCH HARBOR - - - - -	18	FORT LEWIS - - - - -	23	PURT MORGENTHAU - - - - -	29	PATRICK AFB - - - - -	34
EIELSON AFB - - - - -	18	FORT RUCKER - - - - -	23	PUSAN EAST - - - - -	29	PITTSBURGH - - - - -	35
FLMENDORF AFB - - - - -	18	FORT SILL - - - - -	23	SHANGHAI - - - - -	29	REGINA - - - - -	35
JUNEAU - - - - -	18	FORT WALTERS - - - - -	23	TAIPEI - - - - -	29	SCOTT AFB - - - - -	35
KODIAK - - - - -	18	GEN MITCHELL - - - - -	23	TOKYO - - - - -	29	SELFRIDGE AFB - - - - -	35
MIDWAY ISLAND - - - - -	18	HILL AFB - - - - -	24	VANINA - - - - -	29	SHAW AFB - - - - -	35
MISAWA AB - - - - -	19	HUNTSVILLE - - - - -	24	WAKE ISLAND - - - - -	29	WESTOVER AFB - - - - -	35
PRUDHOE BAY - - - - -	19	JUNEAU - - - - -	24			WURTSMITH - - - - -	35
SHEMYA - - - - -	19	KODIAK - - - - -	24	<b>ANDREWS AFB</b>		YAKIMA - - - - -	35
		LARSON AFB - - - - -	24	BISE - - - - -	29	YELLOWKNIFE - - - - -	35
<b>ADELAIDE</b>		LITTLE ROCK - - - - -	24	CANNON AFB - - - - -	30		
BRISBANE - - - - -	19	LOCKHOURNE - - - - -	24	CARSWELL AFB - - - - -	30	<b>ATTU</b>	
COOKTOWN - - - - -	19	LUKE AFB - - - - -	24	CHERRY PT MCAS - - - - -	30	ADAK NS - - - - -	18
DARWIN - - - - -	19	MEMPHIS - - - - -	24	CHICAGO - - - - -	30	CHITOSE AB - - - - -	36
MELBOURNE - - - - -	19	MEXICO CITY - - - - -	25	CHUNCHILL - - - - -	30	DUTCH HARBOR - - - - -	36
NOUMEA - - - - -	19	MINDT AFB - - - - -	25	COMBUS CHRISTI - - - - -	30	EIELSON AFB - - - - -	36
PERTH - - - - -	19	MINN-ST PAUL - - - - -	25	EDMONTON - - - - -	30	FLMENDORF AFB - - - - -	36
PURT MORGENTHAU - - - - -	19	NELLIS AFB - - - - -	25	EGLEN AFB - - - - -	30	JUNEAU - - - - -	36
VANINA - - - - -	20	NEW ORLEANS - - - - -	25	ELLINGTON AFB - - - - -	30	KODIAK - - - - -	36
WELLINGTON - - - - -	20	NIAGARA FALLS - - - - -	25	ELLSWORTH AFB - - - - -	31	MIDWAY ISLAND - - - - -	36
		OXNARD AFB - - - - -	25	EL TORO MCAS - - - - -	31	MISAWA AB - - - - -	36
<b>ADEN</b>		PITTSBURGH - - - - -	25	ENGLAND AFB - - - - -	31	PRUDHOE BAY - - - - -	36
ABADAN - - - - -	17	REGINA - - - - -	25	FORT BENNING - - - - -	31	TOKYO - - - - -	37
BAGHDAD - - - - -	20	SCOTT AFB - - - - -	26	FORT BLISS - - - - -	31		
BOMBAY - - - - -	20	SELFRIDGE AFB - - - - -	26	FORT BRAGG/POPE - - - - -	31	<b>BAGHDAD</b>	
DHAHRAN - - - - -	20	WURTSMITH - - - - -	26	FORT CAMPBELL - - - - -	31	ABADAN - - - - -	17
KARACHI - - - - -	20	YAKIMA - - - - -	26	FORT CARSON - - - - -	31	ADEN - - - - -	20
LAHORE - - - - -	20	YELLOWKNIFE - - - - -	26	FORT HOOB - - - - -	31	BOMBAY - - - - -	37
TEHRAN - - - - -	20			FORT HUACHUCA - - - - -	32	DHAHRAN - - - - -	37
ZAHEDAN - - - - -	20	<b>ALERT</b>		FORT KNOX - - - - -	32	KARACHI - - - - -	37
		CHURCHILL - - - - -	26	FORT LEAVENWORTH - - - - -	32	LAHORE - - - - -	37
<b>ALAMEDA NAS</b>		EDMONTON - - - - -	26	FORT RUCKER - - - - -	32	NEW DELHI - - - - -	37
BISE - - - - -	21	EIELSON AFB - - - - -	26	FORT SILL - - - - -	32	TEHRAN - - - - -	37
CANNON AFB - - - - -	21	FLMENDORF AFB - - - - -	26	FORT WALTERS - - - - -	32	ZAHEDAN - - - - -	37
CARSWELL AFB - - - - -	21	FROBISHER - - - - -	27	FROBISHER - - - - -	32		
CHICAGO - - - - -	21	JUNEAU - - - - -	27	GEN MITCHELL - - - - -	32	<b>BANGKOK</b>	
CHURCHILL - - - - -	21	KODIAK - - - - -	27	HILL AFB - - - - -	32	BOMBAY - - - - -	37
COMBUS CHRISTI - - - - -	21	PRUDHOE BAY - - - - -	27	HUNTER AFB - - - - -	33	CALCUTTA - - - - -	38
EDMONTON - - - - -	21	THULE - - - - -	27	HUNTSVILLE - - - - -	33	CLARK AFB - - - - -	38
EGLEN AFB - - - - -	21	YELLOWKNIFE - - - - -	27	JACKSONVILLE - - - - -	33	COLIMBO - - - - -	38
EIELSON AFB - - - - -	21					DA NANG - - - - -	38

**BANGKOK (CONT.)**

DAVAO - - - - -	30
DJAKARTA - - - - -	30
HANOI - - - - -	30
HONG KONG - - - - -	30
KADENA AB - - - - -	30
KARACHI - - - - -	39
KIMPO AB - - - - -	39
LAHORE - - - - -	39
MANDALAY - - - - -	39
MEDAN - - - - -	39
NEW DELHI - - - - -	39
PEIPING - - - - -	39
PENANG - - - - -	39
PUSAN EAST - - - - -	39
SATGON - - - - -	40
SHANGHAI - - - - -	40
SINGAPORE - - - - -	40
TAIPEI - - - - -	40

**BOISE**

ALAMEDA NAS - - - - -	21
ANDREWS AFB - - - - -	29
CANNON AFB - - - - -	40
CARSWELL AFB - - - - -	40
CHERRY PT MCAS - - - - -	40
CHICAGO - - - - -	40
CHURCHILL - - - - -	40
CORPUS CHRISTI - - - - -	41
DOVER AFB - - - - -	41
EDMONTON - - - - -	41
EGLIN AFB - - - - -	41
EIELSON AFB - - - - -	41
ELLINGTON AFB - - - - -	41
ELLSWORTH AFB - - - - -	41
ELMENDORF AFB - - - - -	41
EL TORO MCAS - - - - -	41
ENGLAND AFB - - - - -	42
FORT BENNING - - - - -	42
FORT BLISS - - - - -	42
FORT BRAGG/POPE - - - - -	42
FORT CAMPBELL - - - - -	42
FORT CARSON - - - - -	42
FORT EUSTIS - - - - -	42
FORT HOND - - - - -	42
FORT HUACHUCA - - - - -	42
FORT KNOX - - - - -	43
FORT LEAVENWORTH - - - - -	43
FORT LEWIS - - - - -	43
FORT ORD - - - - -	43
FORT RUCKER - - - - -	43
FORT SILL - - - - -	43
FORT WOLTERS - - - - -	43
GEN MITCHELL - - - - -	43
HILL AFB - - - - -	43

**BOISE (CONT.)**

HUNTER AAF - - - - -	44
HUNTSVILLE - - - - -	44
JACKSONVILLE - - - - -	44
JUNEAU - - - - -	44
KODIAK - - - - -	44
LARSON AFB - - - - -	44
LITTLE ROCK - - - - -	44
LOCKBOURNE - - - - -	44
LUKE AFB - - - - -	44
MCGUIRE AFB - - - - -	45
MEMPHIS - - - - -	45
MEXICO CITY - - - - -	45
MINOT AFB - - - - -	45
MINN-ST PAUL - - - - -	45
NELLIS AFB - - - - -	45
NEW CUMBERLAND - - - - -	45
NEW ORLEANS - - - - -	45
NIAGARA FALLS - - - - -	45
OXNARD AFB - - - - -	46
PATRICK AFB - - - - -	46
PITTSBURGH - - - - -	46
PRUDHOE BAY - - - - -	46
REGINA - - - - -	46
SCOTT AFB - - - - -	46
SELFRIDGE AFB - - - - -	46
SHAW AFB - - - - -	46
WESTOVER AFB - - - - -	46
WURTSMITH - - - - -	47
YAKIMA - - - - -	47
YELLOWKNIFE - - - - -	47

**BOMBAY**

AHADAN - - - - -	17
ADEN - - - - -	20
BAGHDAD - - - - -	37
BANGKOK - - - - -	37
CALCUTTA - - - - -	47
COLOMBO - - - - -	47
DHARRAN - - - - -	47
DIEGO GARCIA - - - - -	47
HANOI - - - - -	47
KARACHI - - - - -	47
LAHORE - - - - -	48
MANDALAY - - - - -	48
MEDAN - - - - -	48
NEW DELHI - - - - -	48
PENANG - - - - -	48
TEHRAN - - - - -	48
ZAHEDAN - - - - -	48

**BRISBANE**

ADELAIDE - - - - -	19
COOKTOWN - - - - -	48
DARWIN - - - - -	48

**BRISBANE (CONT.)**

MELBOURNE - - - - -	49
NOUMFA - - - - -	49
PERTH - - - - -	49
PORT MORESBY - - - - -	49
SUVA, FIJI - - - - -	49
VANIMO - - - - -	49
WELLINGTON - - - - -	49

**CALCUTTA**

BANGKOK - - - - -	30
BOMBAY - - - - -	47
CLARK AFB - - - - -	49
COLOMBO - - - - -	49
DA NANG - - - - -	50
HANOI - - - - -	50
HONG KONG - - - - -	50
KARACHI - - - - -	50
LAHORE - - - - -	50
MANDALAY - - - - -	50
MEDAN - - - - -	50
NEW DELHI - - - - -	50
PEIPING - - - - -	50
PENANG - - - - -	51
SATGON - - - - -	51
SHANGHAI - - - - -	51
SINGAPORE - - - - -	51
TAIPEI - - - - -	51
ZAHEDAN - - - - -	51

**CANNON AFB**

ALAMEDA NAS - - - - -	21
ANDREWS AFB - - - - -	30
BOISE - - - - -	40
CARSWELL AFB - - - - -	51
CHERRY PT MCAS - - - - -	51
CHICAGO - - - - -	51
CHURCHILL - - - - -	52
CORPUS CHRISTI - - - - -	52
DOVER AFB - - - - -	52
EDMONTON - - - - -	52
EGLIN AFB - - - - -	52
ELLINGTON AFB - - - - -	52
ELLSWORTH AFB - - - - -	52
EL TORO MCAS - - - - -	52
ENGLAND AFB - - - - -	52
FORT BENNING - - - - -	53
FORT BLISS - - - - -	53
FORT BRAGG/POPE - - - - -	53
FORT CAMPBELL - - - - -	53
FORT CARSON - - - - -	53
FORT EUSTIS - - - - -	53
FORT HOND - - - - -	53
FORT HUACHUCA - - - - -	53
FORT KNOX - - - - -	53

**CANNON AFB (CONT.)**

FORT LEAVENWORTH - - - - -	54
FORT LEWIS - - - - -	54
FORT ORD - - - - -	54
FORT RUCKER - - - - -	54
FORT SILL - - - - -	54
FORT WOLTERS - - - - -	54
GEN MITCHELL - - - - -	54
HILL AFB - - - - -	54
HOMESTEAD AFB - - - - -	54
HUNTER AAF - - - - -	55
HUNTSVILLE - - - - -	55
JACKSONVILLE - - - - -	55
JUNEAU - - - - -	55
KEY WEST - - - - -	55
LARSON AFB - - - - -	55
LITTLE ROCK - - - - -	55
LOCKBOURNE - - - - -	55
LORING AFB - - - - -	55
LUKE AFB - - - - -	56
MCGUIRE AFB - - - - -	56
MEMPHIS - - - - -	56
MEXICO CITY - - - - -	56
MINOT AFB - - - - -	56
MINN-ST PAUL - - - - -	56
NELLIS AFB - - - - -	56
NEW CUMBERLAND - - - - -	56
NEW ORLEANS - - - - -	56
NIAGARA FALLS - - - - -	57
OXNARD AFB - - - - -	57
PATRICK AFB - - - - -	57
PITTSBURGH - - - - -	57
REGINA - - - - -	57
SCOTT AFB - - - - -	57
SELFRIDGE AFB - - - - -	57
SHAW AFB - - - - -	57
WESTOVER AFB - - - - -	57
WURTSMITH - - - - -	58
YAKIMA - - - - -	58
YELLOWKNIFE - - - - -	58

**CARSWELL AFB**

ALAMEDA NAS - - - - -	21
ANDREWS AFB - - - - -	30
BOISE - - - - -	40
CANNON AFB - - - - -	51
CHERRY PT MCAS - - - - -	50
CHICAGO - - - - -	50
CHURCHILL - - - - -	50
CORPUS CHRISTI - - - - -	50
DOVER AFB - - - - -	50
EDMONTON - - - - -	50
EGLIN AFB - - - - -	50
ELLINGTON AFB - - - - -	50
ELLSWORTH AFB - - - - -	50

<b>CARSWELL AFB (CONT.)</b>	<b>CHERRY PT MCAS (CONT.)</b>	<b>CHICAGO (CONT.)</b>	<b>CHICAGO (CONT.)</b>
EL TORO MCAS - - - - 59	CORPUS CHRISTI - - - - 64	CARSWELL AFB - - - - 58	SHAW AFB - - - - 75
ENGLAND AFB - - - - 59	DOVER AFB - - - - 64	CHERRY PT MCAS - - - - 64	WESTOVER AFB - - - - 75
FORT BENNING - - - - 59	EDMONTON - - - - 64	CHURCHILL - - - - 70	WURTSMITH - - - - 76
FORT BLISS - - - - 59	EGLIN AFB - - - - 65	CORPUS CHRISTI - - - - 70	YAKIMA - - - - 76
FORT BRAGG/POPE - - - - 59	ELLINGTON AFB - - - - 65	DOVER AFB - - - - 70	YELLOWKNIFE - - - - 76
FORT CAMPBELL - - - - 59	ELLSWORTH AFB - - - - 65	EDMONTON - - - - 70	
FORT CARSON - - - - 60	ENGLAND AFB - - - - 65	EGLIN AFB - - - - 70	<b>CHITOSE AB</b>
FORT EUSTIS - - - - 60	FORT BENNING - - - - 65	ELLINGTON AFB - - - - 70	ADAK NS - - - - 18
FORT HUACHUCA - - - - 60	FORT BLISS - - - - 65	ELLSWORTH AFB - - - - 70	ANDERSON AFB - - - - 27
FORT KNOX - - - - 60	FORT CAMPBELL - - - - 65	EL TORO MCAS - - - - 70	ATTU - - - - 36
FORT LEAVENWORTH - - - - 60	FORT CARSON - - - - 65	ENGLAND AFB - - - - 70	CLARK AFB - - - - 76
FORT LEWIS - - - - 60	FORT EUSTIS - - - - 65	FORT BENNING - - - - 71	HONG KONG - - - - 76
FORT ORD - - - - 60	FORT HOOD - - - - 66	FORT BLISS - - - - 71	IWAKUNI - - - - 76
FORT RUCKER - - - - 60	FORT HUACHUCA - - - - 66	FORT BRAGG/POPE - - - - 71	IWO JIMA AB - - - - 76
GEN MITCHELL - - - - 60	FORT KNOX - - - - 66	FORT CAMPBELL - - - - 71	KADENA AB - - - - 76
HILL AFB - - - - 61	FORT LEAVENWORTH - - - - 66	FORT CARSON - - - - 71	KIMPO AB - - - - 76
HOMESTEAD AFB - - - - 61	FORT RUCKER - - - - 66	FORT EUSTIS - - - - 71	PEIPING - - - - 77
HUNTER AAF - - - - 61	FORT SILL - - - - 66	FORT HOOD - - - - 71	PUSAN EAST - - - - 77
HUNTSVILLE - - - - 61	FORT WALTERS - - - - 66	FORT HUACHUCA - - - - 71	SHANGHAI - - - - 77
JACKSONVILLE - - - - 61	FROBISHER - - - - 66	FORT KNOX - - - - 71	SHENYA - - - - 77
KEY WEST - - - - 61	GEN MITCHELL - - - - 66	FORT LEAVENWORTH - - - - 72	TAIPEI - - - - 77
LARSON AFB - - - - 61	HILL AFB - - - - 67	FORT LEWIS - - - - 72	TOKYO - - - - 77
LITTLE ROCK - - - - 61	HOMESTEAD AFB - - - - 67	FORT ORD - - - - 72	WAKE ISLAND - - - - 77
LOCKBOURNE - - - - 61	HUNTER AAF - - - - 67	FORT RUCKER - - - - 72	
LORING AFB - - - - 62	HUNTSVILLE - - - - 67	FORT SILL - - - - 72	<b>CHURCHILL</b>
LUKE AFB - - - - 62	JACKSONVILLE - - - - 67	FORT WALTERS - - - - 72	ALAMEDA NAS - - - - 21
MCGUIRE AFB - - - - 62	KEY WEST - - - - 67	FROBISHER - - - - 72	ALERT - - - - 26
MEMPHIS - - - - 62	LITTLE ROCK - - - - 67	HILL AFB - - - - 72	ANDREWS AFB - - - - 30
MEXICO CITY - - - - 62	LOCKBOURNE - - - - 67	HOMESTEAD AFB - - - - 72	BOISE - - - - 40
MINOT AFB - - - - 62	LORING AFB - - - - 67	HUNTER AAF - - - - 73	CANNON AFB - - - - 52
MINN-ST PAUL - - - - 62	LUKE AFB - - - - 68	HUNTSVILLE - - - - 73	CARSWELL AFB - - - - 58
NELLIS AFB - - - - 62	MCGUIRE AFB - - - - 68	JACKSONVILLE - - - - 73	CHERRY PT MCAS - - - - 64
NEW CUMBERLAND - - - - 62	MEMPHIS - - - - 68	JUNEAU - - - - 73	CHICAGO - - - - 70
NEW ORLEANS - - - - 63	MEXICO CITY - - - - 68	KEY WEST - - - - 73	CORPUS CHRISTI - - - - 77
NIAGARA FALLS - - - - 63	MINOT AFB - - - - 68	LARSON AFB - - - - 73	DOVER AFB - - - - 77
OXNARD AFB - - - - 63	MINN-ST PAUL - - - - 68	LITTLE ROCK - - - - 73	EDMONTON - - - - 78
PATRICK AFB - - - - 63	NELLIS AFB - - - - 68	LOCKBOURNE - - - - 73	EGLIN AFB - - - - 78
PITTSBURGH - - - - 63	NEW CUMBERLAND - - - - 68	LORING AFB - - - - 73	EIELSON AFB - - - - 78
REGINA - - - - 63	NEW ORLEANS - - - - 68	LUKE AFB - - - - 74	ELLINGTON AFB - - - - 78
SCOTT AFB - - - - 63	NIAGARA FALLS - - - - 69	MCGUIRE AFB - - - - 74	ELLSWORTH AFB - - - - 78
SELFRIDGE AFB - - - - 63	PATRICK AFB - - - - 69	MEMPHIS - - - - 74	ELMENDORF AFB - - - - 78
SHAW AFB - - - - 63	PITTSBURGH - - - - 69	MEXICO CITY - - - - 74	EL TORO MCAS - - - - 78
WESTOVER AFB - - - - 64	REGINA - - - - 69	MINOT AFB - - - - 74	ENGLAND AFB - - - - 78
WURTSMITH - - - - 64	SCOTT AFB - - - - 69	MINN-ST PAUL - - - - 74	FORT BENNING - - - - 78
YAKIMA - - - - 64	SELFRIDGE AFB - - - - 69	NELLIS AFB - - - - 74	FORT BLISS - - - - 79
YELLOWKNIFE - - - - 64	SHAW AFB - - - - 69	NEW CUMBERLAND - - - - 74	FORT BRAGG/POPE - - - - 79
	WESTOVER AFB - - - - 69	NEW ORLEANS - - - - 74	FORT CAMPBELL - - - - 79
	WURTSMITH - - - - 69	NIAGARA FALLS - - - - 75	FORT CARSON - - - - 79
<b>CHERRY PT MCAS</b>		OXNARD AFB - - - - 75	FORT EUSTIS - - - - 79
ANDREWS AFB - - - - 30	<b>CHICAGO</b>	PATRICK AFB - - - - 75	FORT HOOD - - - - 79
BOISE - - - - 40	ALAMEDA NAS - - - - 21	PITTSBURGH - - - - 75	FORT HUACHUCA - - - - 79
CANNON AFB - - - - 51	ANDREWS AFB - - - - 30	REGINA - - - - 75	FORT KNOX - - - - 79
CARSWELL AFB - - - - 58	BOISE - - - - 40	SCOTT AFB - - - - 75	FORT LEAVENWORTH - - - - 79
CHICAGO - - - - 64	CANNON AFB - - - - 51	SELFRIDGE AFB - - - - 75	FORT LEWIS - - - - 80
CHURCHILL - - - - 64			

<b>CHURCHILL (CONT.)</b>	<b>CLARK AFB (CONT.)</b>	<b>CORPUS CHRISTI (CONT.)</b>	<b>DA NANG</b>
FORT ORD - - - - - 80	MANDALAY - - - - - 85	CHURCHILL - - - - - 77	BANGKOK - - - - - 38
FORT RUCKER - - - - - 80	MEDAN - - - - - 85	DOVER AFB - - - - - 89	CALCUTTA - - - - - 80
FORT SILL - - - - - 80	MISAWA AB - - - - - 85	EDMONTON - - - - - 89	CLARK AFB - - - - - 84
FORT WALTERS - - - - - 80	PEIPING - - - - - 85	EGLIN AFB - - - - - 89	COLOMBO - - - - - 86
FROBISHER - - - - - 80	PENANG - - - - - 85	ELLINGTON AFB - - - - - 89	DAVAO - - - - - 95
GEN MITCHELL - - - - - 80	PUSAN EAST - - - - - 86	ELLSWORTH AFB - - - - - 89	DJAKARTA - - - - - 95
HILL AFB - - - - - 80	SAIGON - - - - - 86	FL TORO MCAS - - - - - 89	HANOI - - - - - 95
HUNTER AAF - - - - - 80	SHANGHAI - - - - - 86	ENGLAND AFB - - - - - 90	HONG KONG - - - - - 95
HUNTSVILLE - - - - - 81	SINGAPORE - - - - - 86	FORT BENNING - - - - - 90	IMAKUNI - - - - - 95
JACKSONVILLE - - - - - 81	TAIPEI - - - - - 86	FORT BLISS - - - - - 90	IWO JIMA AB - - - - - 95
JUNEAU - - - - - 81	TOKYO - - - - - 86	FORT BRAGG/POPE - - - - - 90	KADENA AB - - - - - 95
KODIAK - - - - - 81	VANIMO - - - - - 86	FORT CAMPBELL - - - - - 90	KINPO AB - - - - - 96
LARSON AFB - - - - - 81		FORT CARSON - - - - - 90	MANDALAY - - - - - 96
LITTLE ROCK - - - - - 81	<b>COLOMBO</b>	FORT EUSTIS - - - - - 90	MEDAN - - - - - 96
LOCKBOURNE - - - - - 81	BANGKOK - - - - - 38	FORT HNOO - - - - - 90	NEW DELHI - - - - - 96
LORING AFB - - - - - 81	BOMBAY - - - - - 47	FORT HUACHUCA - - - - - 90	PEIPING - - - - - 96
LUKE AFB - - - - - 81	CALCUTTA - - - - - 49	FORT KNOX - - - - - 91	PENANG - - - - - 96
MCGUIRE AFB - - - - - 82	DA NANG - - - - - 86	FORT LEAVENWORTH - - - - - 91	PUSAN EAST - - - - - 96
MEMPHIS - - - - - 82	DIEGO GARCIA - - - - - 86	FORT LEWIS - - - - - 91	SAIGON - - - - - 96
MINOT AFB - - - - - 82	DJAKARTA - - - - - 87	FORT ORD - - - - - 91	SHANGHAI - - - - - 96
MINN-ST PAUL - - - - - 82	HANOI - - - - - 87	FORT RUCKER - - - - - 91	SINGAPORE - - - - - 97
NELLIS AFB - - - - - 82	KARACHI - - - - - 87	FORT SILL - - - - - 91	TAIPEI - - - - - 97
NFW CUMBERLAND - - - - - 82	LAHORE - - - - - 87	FORT WALTERS - - - - - 91	
NEW ORLEANS - - - - - 82	MANDALAY - - - - - 87	GEN MITCHELL - - - - - 91	<b>DARWIN</b>
NIAGARA FALLS - - - - - 82	MEDAN - - - - - 87	HILL AFB - - - - - 91	ADELAIDE - - - - - 19
OXNARD AFB - - - - - 82	NEW DELHI - - - - - 87	HOMESTAD AFB - - - - - 92	ANDERSON AFB - - - - - 28
PATRICK AFB - - - - - 83	PENANG - - - - - 87	HUNTER AAF - - - - - 92	BRISBANE - - - - - 48
PITTSBURGH - - - - - 83	SAIGON - - - - - 87	HUNTSVILLE - - - - - 92	CLARK AFB - - - - - 84
PRINCE OF WALES - - - - - 83	SINGAPORE - - - - - 88	JACKSONVILLE - - - - - 92	COOKTOWN - - - - - 88
REGINA - - - - - 83	ZAHEDAN - - - - - 88	KEY WEST - - - - - 92	DAVAO - - - - - 97
SCOTT AFB - - - - - 83		LARSON AFB - - - - - 92	DJAKARTA - - - - - 97
SELFRIDGE AFB - - - - - 83	<b>COOKTOWN</b>	LITTLE ROCK - - - - - 92	MELBOURNE - - - - - 97
SHAW AFB - - - - - 83	ADELAIDE - - - - - 19	LOCKBOURNE - - - - - 92	PERTH - - - - - 97
THULE - - - - - 83	ANDERSON AFB - - - - - 27	LORING AFB - - - - - 92	PORT MORESBY - - - - - 97
WESTOVER AFB - - - - - 83	BRISBANE - - - - - 48	LUKE AFB - - - - - 93	SINGAPORE - - - - - 97
WURTSMITH - - - - - 84	DARWIN - - - - - 88	MCGUIRE AFB - - - - - 93	VANIMO - - - - - 97
YAKIMA - - - - - 84	DAVAO - - - - - 88	MEMPHIS - - - - - 93	
YELLOWKNIFE - - - - - 84	ENIWETOK ATOLL - - - - - 88	MEXICO CITY - - - - - 93	<b>DAVAO</b>
	KWAJALEIN NS - - - - - 88	MINOT AFB - - - - - 93	ANDERSON AFB - - - - - 28
	MELBOURNE - - - - - 88	MINN-ST PAUL - - - - - 93	BANGKOK - - - - - 38
	NOUMEA - - - - - 88	NELLIS AFB - - - - - 93	CLARK AFB - - - - - 84
	PERTH - - - - - 88	NEW CUMBERLAND - - - - - 93	COOKTOWN - - - - - 88
	PORT MORESBY - - - - - 89	NEW ORLEANS - - - - - 93	DA NANG - - - - - 95
	SUVA, FIJI - - - - - 89	NIAGARA FALLS - - - - - 94	DARWIN - - - - - 97
	VANIMO - - - - - 89	OXNARD AFB - - - - - 94	DJAKARTA - - - - - 98
		PATRICK AFB - - - - - 94	HANOI - - - - - 98
	<b>CORPUS CHRISTI</b>	PITTSBURGH - - - - - 94	HONG KONG - - - - - 98
	ALAMEDA NAS - - - - - 21	REGINA - - - - - 94	IMAKUNI - - - - - 98
	ANDREWS AFB - - - - - 30	SCOTT AFB - - - - - 94	IWO JIMA AB - - - - - 98
	BOISE - - - - - 41	SELFRIDGE AFB - - - - - 94	KADENA AB - - - - - 98
	CANNON AFB - - - - - 52	SHAW AFB - - - - - 94	KINPO AB - - - - - 98
	CARSWELL AFB - - - - - 58	WESTOVER AFB - - - - - 94	MANDALAY - - - - - 98
	CHERRY PT MCAS - - - - - 64	WURTSMITH - - - - - 95	MEDAN - - - - - 98
	CHICAGO - - - - - 70		PENANG - - - - - 98

<b>DAVAO (CONT.)</b>	<b>DOVER AFB (CONT.)</b>	<b>DUTCH HARBOR (CONT.)</b>	<b>EDMONTON (CONT.)</b>
PORT MORESBY - - - - - 99	EGLIN AFB - - - - - 102	JUNEAU - - - - - 107	LOCKBOURNE - - - - - 112
PUSAN EAST - - - - - 99	ELLINGTON AFB - - - - - 102	KODIAK - - - - - 107	LORING AFB - - - - - 112
SAIGON - - - - - 99	ELLSWORTH AFB - - - - - 102	LARSON AFB - - - - - 107	LUKE AFB - - - - - 112
SHANGHAI - - - - - 99	ENGLAND AFB - - - - - 102	MIDWAY ISLAND - - - - - 108	MCGUIRE AFB - - - - - 112
SINGAPORE - - - - - 99	FORT BENNING - - - - - 102	PRUDHOM BAY - - - - - 108	MEMPHIS - - - - - 112
TAIPEI - - - - - 99	FORT BLISS - - - - - 102	SHEMYA - - - - - 108	MINOT AFB - - - - - 112
TOKYO - - - - - 99	FORT BRAGG/POPE - - - - - 102	YAKIMA - - - - - 108	MINN-ST PAUL - - - - - 112
VANINO - - - - - 99	FORT CAMPBELL - - - - - 102	YELLOWKNIFE - - - - - 108	NELLIS AFB - - - - - 112
<b>DHAMRAN</b>	FORT CARSON - - - - - 103	<b>EDMONTON</b>	NEW CUMBERLAND - - - - - 113
ABADAN - - - - - 17	FORT HOOD - - - - - 103	ALAMEDA NAS - - - - - 21	NEW ORLEANS - - - - - 113
ADEN - - - - - 20	FORT HUACHUCA - - - - - 103	ALERT - - - - - 26	NIAGARA FALLS - - - - - 113
BAGHDAD - - - - - 37	FORT KNOX - - - - - 103	ANDREWS AFB - - - - - 30	OXNARD AFB - - - - - 113
BOMBAY - - - - - 47	FORT LEAVENWORTH - - - - - 103	BOISE - - - - - 41	PITTSBURGH - - - - - 113
KARACHI - - - - - 100	FORT RUCKER - - - - - 103	CANNON AFB - - - - - 52	PRUDHOM BAY - - - - - 113
LAHORE - - - - - 100	FORT SILL - - - - - 103	CARSWELL AFB - - - - - 59	REGINA - - - - - 113
NEW DELHI - - - - - 100	FORT WOLTERS - - - - - 103	CHEMRY PT MCAS - - - - - 64	SCOTT AFB - - - - - 113
TEHRAN - - - - - 100	FROBISHER - - - - - 103	CHICAGO - - - - - 70	SELFRIDGE AFB - - - - - 113
ZAMEDAN - - - - - 100	GEN MITCHELL - - - - - 104	CHURCHILL - - - - - 78	SHAW AFB - - - - - 114
<b>DIEGO GARCIA</b>	HILL AFB - - - - - 104	CORPUS CHRISTI - - - - - 89	THULE - - - - - 114
BOMBAY - - - - - 47	HOMESTEAD AFB - - - - - 104	DOVER AFB - - - - - 102	WESTOVER AFB - - - - - 114
COLONIA - - - - - 86	HUNTER AAF - - - - - 104	DUTCH HARBOR - - - - - 107	Wurtsmith - - - - - 114
KARACHI - - - - - 100	HUNTSVILLE - - - - - 104	EGLIN AFB - - - - - 108	YAKIMA - - - - - 114
MAURITIUS ISLAND - - - - - 100	JACKSONVILLE - - - - - 104	FIELSON AFB - - - - - 108	YELLOWKNIFE - - - - - 114
MEDAN - - - - - 100	KEY WEST - - - - - 104	ELLINGTON AFB - - - - - 108	<b>EGLIN AFB</b>
PENANG - - - - - 100	LARSON AFB - - - - - 104	ELLSWORTH AFB - - - - - 108	ALAMEDA NAS - - - - - 21
SINGAPORE - - - - - 101	LITTLE ROCK - - - - - 104	ELMENDORF AFB - - - - - 109	ANDREWS AFB - - - - - 30
<b>DJAKARTA</b>	LUKE AFB - - - - - 105	EL TONO MCAS - - - - - 109	BOISE - - - - - 41
BANGKOK - - - - - 38	MEMPHIS - - - - - 105	ENGLAND AFB - - - - - 109	CANNON AFB - - - - - 52
CLARK AFB - - - - - 84	MEXICO CITY - - - - - 105	FORT BENNING - - - - - 109	CARSWELL AFB - - - - - 59
COLONBO - - - - - 87	MINOT AFB - - - - - 105	FORT BLISS - - - - - 109	CHEMRY PT MCAS - - - - - 64
DA NANG - - - - - 95	MINN-ST PAUL - - - - - 105	FORT BRAGG/POPE - - - - - 109	CHICAGO - - - - - 70
DARWIN - - - - - 97	NELLIS AFB - - - - - 105	FORT CAMPBELL - - - - - 109	CHURCHILL - - - - - 78
DAVAO - - - - - 98	NEW ORLEANS - - - - - 105	FORT CARSON - - - - - 109	CORPUS CHRISTI - - - - - 89
HANOI - - - - - 101	NIAGARA FALLS - - - - - 106	FORT EUSTIS - - - - - 109	DOVER AFB - - - - - 102
HONG KONG - - - - - 101	PATRICK AFB - - - - - 106	FORT HOOD - - - - - 110	EDMONTON - - - - - 108
MANDALAY - - - - - 101	PITTSBURGH - - - - - 106	FORT HUACHUCA - - - - - 110	ELLINGTON AFB - - - - - 114
MEDAN - - - - - 101	REGINA - - - - - 106	FORT KNOX - - - - - 110	ELLSWORTH AFB - - - - - 114
PENANG - - - - - 101	SCOTT AFB - - - - - 106	FORT LEAVENWORTH - - - - - 110	EL TONO MCAS - - - - - 114
PERTH - - - - - 101	SELFRIDGE AFB - - - - - 106	FORT LEWIS - - - - - 110	ENGLAND AFB - - - - - 115
SAIGON - - - - - 101	SHAW AFB - - - - - 106	FORT ORD - - - - - 110	FORT BLISS - - - - - 115
SINGAPORE - - - - - 101	WESTOVER AFB - - - - - 106	FORT RUCKER - - - - - 110	FORT BRAGG/POPE - - - - - 115
<b>DOVER AFB</b>	Wurtsmith - - - - - 106	FORT SILL - - - - - 110	FORT CARSON - - - - - 115
BOISE - - - - - 41	YELLOWKNIFE - - - - - 107	FORT WOLTERS - - - - - 110	FORT EUSTIS - - - - - 115
CANNON AFB - - - - - 52	<b>DUTCH HARBOR</b>	FROBISHER - - - - - 111	FORT HOOD - - - - - 115
CARSWELL AFB - - - - - 58	ADAK NS - - - - - 18	GEN MITCHELL - - - - - 111	FORT HUACHUCA - - - - - 115
CHEMRY PT MCAS - - - - - 64	ATTU - - - - - 36	HILL AFB - - - - - 111	FORT HUACHUCA - - - - - 115
CHICAGO - - - - - 70	EDMONTON - - - - - 107	HUNTER AAF - - - - - 111	FORT LEAVENWORTH - - - - - 116
CHURCHILL - - - - - 77	EIELSON AFB - - - - - 107	HUNTSVILLE - - - - - 111	FORT LEWIS - - - - - 116
CORPUS CHRISTI - - - - - 89	ELMENDORF AFB - - - - - 107	JACKSONVILLE - - - - - 111	FORT ORD - - - - - 116
EDMONTON - - - - - 102	FORT LEWIS - - - - - 107	KODIAK - - - - - 111	FORT SILL - - - - - 116
	HICKAM AFB - - - - - 107	LARSON AFB - - - - - 111	FORT WOLTERS - - - - - 116
		LITTLE ROCK - - - - - 112	GEN MITCHELL - - - - - 116

FGLIN AFB (CONT.)

HILL AFB	-116
HINVESTAD AFB	-116
HUNTER AFB	-116
HUNTSVILLE	-117
JACKSONVILLE	-117
KEY WEST	-117
LANSON AFB	-117
LITTLE ROCK	-117
LICKING AFB	-117
LORING AFB	-117
LUKE AFB	-117
MCGUIRE AFB	-117
MEMPHIS	-118
MEXICO CITY	-118
MINOT AFB	-118
MINN-ST PAUL	-118
NELLS AFB	-118
NEW CUMBERLAND	-118
NEW ORLEANS	-118
NIAGARA FALLS	-118
ONHARD AFB	-118
PATRICK AFB	-119
PITTSBURGH	-119
REGINA	-119
SCOTT AFB	-119
SELFRIDGE AFB	-119
SHAW AFB	-119
WESTOVER AFB	-119
Wurtsmith	-119
YAKIMA	-119

FIELSON AFB

ADAK NS	-119
ALAMEDA NAS	-121
ALFRT	-121
ATTU	-121
BOISE	-121
CHURCHILL	-121
DUTCH HARBOR	-121
EDMONTON	-121
FELLSWORTH AFB	-121
ELMENDORF AFB	-121
FORT LEWIS	-121
FORT ORD	-121
FORT RUCKER	-121
HILL AFB	-121
JAMEAU	-121
KODIAK	-121
LANSON AFB	-121
MINOT AFB	-121
PRUDHOMME BAY	-121
REGINA	-121
SHENVA	-121
THULE	-121

FIELSON AFB (CONT.)

YAKIMA	-121
YELLOWKNIFE	-121
ELLINGTON AFB	
ALAMEDA NAS	-122
ANDREWS AFB	-122
BOISE	-122
CANNON AFB	-122
CANSMILL AFB	-122
CHERRY PT MCAS	-122
CHICAGO	-122
CHURCHILL	-122
CIMPUS CHRISTI	-122
DJVER AFB	-122
EDMONTON	-122
EGLIN AFB	-122
FELLSWORTH AFB	-122
FL TONU MCAS	-122
FRANKLIN AFB	-122
FORT BENNING	-122
FORT BLISS	-122
FORT BRAGG/POPE	-122
FORT CAMPBELL	-122
FORT CASSIN	-122
FORT CUSTIS	-122
FORT HANCOCK	-122
FORT HUACHUCA	-122
FORT KNOX	-122
FORT LEAVENWORTH	-122
FORT MADON	-122
FORT MCKER	-122
FORT SILL	-122
FORT WALTERS	-122
GEN MITCHELL	-122
HILL AFB	-122
HINVESTAD AFB	-122
HUNTSVILLE	-122
JACKSONVILLE	-122
KEY WEST	-122
LANSON AFB	-122
LITTLE ROCK	-122
LOCKBOURNE	-122
LORING AFB	-122
LUKE AFB	-122
MCGUIRE AFB	-122
MEMPHIS	-122
MEXICO CITY	-122
MINOT AFB	-122
MINN-ST PAUL	-122
NELLS AFB	-122
NEW CUMBERLAND	-122
NEW ORLEANS	-122

ELLINGTON AFB (CONT.)

NIAGARA FALLS	-120
ONHARD AFB	-120
PATRICK AFB	-120
PITTSBURGH	-120
REGINA	-120
SCOTT AFB	-120
SELFRIDGE AFB	-120
SHAW AFB	-120
WESTOVER AFB	-120
Wurtsmith	-120
YAKIMA	-120
FELLSWORTH AFB	
ALAMEDA NAS	-122
ANDREWS AFB	-122
BOISE	-122
CANNON AFB	-122
CANSMILL AFB	-122
CHERRY PT MCAS	-122
CHICAGO	-122
CHURCHILL	-122
CIMPUS CHRISTI	-122
DJVER AFB	-122
EDMONTON	-122
EGLIN AFB	-122
FELLSWORTH AFB	-122
FL TONU MCAS	-122
FRANKLIN AFB	-122
FORT BENNING	-122
FORT BLISS	-122
FORT BRAGG/POPE	-122
FORT CAMPBELL	-122
FORT CASSIN	-122
FORT CUSTIS	-122
FORT HANCOCK	-122
FORT HUACHUCA	-122
FORT KNOX	-122
FORT LEAVENWORTH	-122
FORT MADON	-122
FORT MCKER	-122
FORT SILL	-122
FORT WALTERS	-122
GEN MITCHELL	-122
HILL AFB	-122
HINVESTAD AFB	-122
HUNTSVILLE	-122
JACKSONVILLE	-122
KEY WEST	-122
LANSON AFB	-122
LITTLE ROCK	-122
LOCKBOURNE	-122
LORING AFB	-122
LUKE AFB	-122
MCGUIRE AFB	-122
MEMPHIS	-122
MEXICO CITY	-122
MINOT AFB	-122
MINN-ST PAUL	-122
NELLS AFB	-122
NEW CUMBERLAND	-122
NEW ORLEANS	-122

FELLSWORTH AFB (CONT.)

KODIAK	-130
LANSON AFB	-130
LITTLE ROCK	-130
LOCKBOURNE	-130
LORING AFB	-130
LUKE AFB	-130
MCGUIRE AFB	-130
MEMPHIS	-131
MEXICO CITY	-131
MINOT AFB	-131
MINN-ST PAUL	-131
NELLS AFB	-131
NEW CUMBERLAND	-131
NEW ORLEANS	-131
NIAGARA FALLS	-131
ONHARD AFB	-131
PATRICK AFB	-132
PITTSBURGH	-132
REGINA	-132
SCOTT AFB	-132
SELFRIDGE AFB	-132
SHAW AFB	-132
WESTOVER AFB	-132
Wurtsmith	-132
YAKIMA	-132
YELLOWKNIFE	-133
ELMENDORF AFB	
ADAK NS	-119
ALAMEDA NAS	-121
ALFRT	-121
ATTU	-121
BOISE	-121
CHURCHILL	-121
DUTCH HARBOR	-121
EDMONTON	-121
FELLSWORTH AFB	-121
FORT LEWIS	-121
FORT ORD	-121
HILL AFB	-121
JAMEAU	-121
KODIAK	-121
LANSON AFB	-121
MINOT AFB	-121
NELLS AFB	-121
PRUDHOMME BAY	-121
REGINA	-121
SHENVA	-121
THULE	-121
YAKIMA	-121
YELLOWKNIFE	-121

## EL TORO NCAS

ALAMEDA NAS	- 22
ANDREWS AFB	- 31
BOISE	- 42
CANNON AFB	- 53
CARSWELL AFB	- 59
CHICAGO	- 71
CHURCHILL	- 79
CORPUS CHRISTI	- 89
EDMONTON	- 109
EGLIN AFB	- 115
ELLINGTON AFB	- 122
ELLSWORTH AFB	- 127
ENGLAND AFB	- 139
FORT BENNING	- 145
FORT BLISS	- 146
FORT BRAGG/POPE	- 150
FORT CAMPBELL	- 146
FORT CARSON	- 146
FORT EUSTIS	- 146
FORT HOOD	- 146
FORT HUACHUCA	- 146
FORT KNOX	- 146
FORT LEAVENWORTH	- 146
FORT LEWIS	- 146
FORT ORD	- 146
FORT RUCKER	- 146
FORT SILL	- 146
FORT WALTERS	- 146
GEN MITCHELL	- 146
HILL AFB	- 146
HOMESTEAD AFB	- 146
HUNTER AAF	- 146
HUNTSVILLE	- 146
JACKSONVILLE	- 146
JUNEAU	- 146
KEY WEST	- 146
LARSON AFB	- 146
LITTLE ROCK	- 146
LOCKBOURNE	- 146
LUKE AFB	- 146
MEMPHIS	- 146
MEXICO CITY	- 146
MINOT AFB	- 146
MINN-ST PAUL	- 146
NELLIS AFB	- 146
NEW CUMBERLAND	- 146
NEW ORLEANS	- 146
NIAGARA FALLS	- 146
PATRICK AFB	- 146
PITTSBURGH	- 146
REGINA	- 146
SCOTT AFB	- 146
SELFRIDGE AFB	- 146
SHAW AFB	- 146

## EL TORO NCAS (CONT.)

HUNTSVILLE	- 139
YAKIMA	- 139
YELLOWKNIFE	- 139
ENGLAND AFB	
ALAMEDA NAS	- 22
ANDREWS AFB	- 31
BOISE	- 42
CANNON AFB	- 53
CARSWELL AFB	- 59
CHERRY PT NCAS	- 65
CHICAGO	- 71
CHURCHILL	- 79
CORPUS CHRISTI	- 89
DOVER AFB	- 102
EDMONTON	- 109
EGLIN AFB	- 115
ELLINGTON AFB	- 122
ELLSWORTH AFB	- 127
EL TORO NCAS	- 134
FORT BENNING	- 139
FORT BLISS	- 139
FORT BRAGG/POPE	- 139
FORT CAMPBELL	- 146
FORT CARSON	- 146
FORT EUSTIS	- 146
FORT HOOD	- 146
FORT HUACHUCA	- 146
FORT KNOX	- 146
FORT LEAVENWORTH	- 146
FORT LEWIS	- 146
FORT ORD	- 146
FORT RUCKER	- 146
FORT SILL	- 146
FORT WALTERS	- 146
GEN MITCHELL	- 146
HILL AFB	- 146
HOMESTEAD AFB	- 146
HUNTER AAF	- 146
HUNTSVILLE	- 146
JACKSONVILLE	- 146
KEY WEST	- 146
LARSON AFB	- 146
LITTLE ROCK	- 146
LOCKBOURNE	- 146
LORING AFB	- 146
LUKE AFB	- 146
MCGUIRE AFB	- 146
MEMPHIS	- 146
MEXICO CITY	- 146
MINOT AFB	- 146
MINN-ST PAUL	- 146
NELLIS AFB	- 146
NEW CUMBERLAND	- 146

## ENGLAND AFB (CONT.)

NEW ORLEANS	- 146
NIAGARA FALLS	- 146
OSWEGO AFB	- 146
PATRICK AFB	- 146
PITTSBURGH	- 146
REGINA	- 146
SCOTT AFB	- 146
SELFRIDGE AFB	- 146
SHAW AFB	- 146
WRESTOVER AFB	- 146
HUNTSVILLE	- 146
YAKIMA	- 146
FINMETIK ATOLL	
ANDERSON AFB	- 20
CUMTOWN	- 80
THE JINA AN	- 146
JOHNSTON ISLAND	- 146
KWAJALEIN IS	- 146
MIDWAY ISLAND	- 146
PURT MUMFSAV	- 146
SUVA, FIJI	- 146
TIKVI	- 146
YANING	- 146
WAKE ISLAND	- 146

## FORT BENNING

ALAMEDA NAS	- 22
ANDREWS AFB	- 31
BOISE	- 42
CANNON AFB	- 53
CARSWELL AFB	- 59
CHERRY PT NCAS	- 65
CHICAGO	- 71
CHURCHILL	- 79
CORPUS CHRISTI	- 89
DOVER AFB	- 102
EDMONTON	- 109
ELLINGTON AFB	- 122
ELLSWORTH AFB	- 127
EL TORO NCAS	- 134
ENGLAND AFB	- 139
FORT BLISS	- 145
FORT BRAGG/POPE	- 145
FORT CAMPBELL	- 146
FORT CARSON	- 146
FORT EUSTIS	- 146
FORT HOOD	- 146
FORT HUACHUCA	- 146
FORT KNOX	- 146
FORT LEAVENWORTH	- 146
FORT LEWIS	- 146
FORT ORD	- 146
FORT SILL	- 146

## FORT BENNING (CONT.)

FORT WALTERS	- 147
FROBISHER	- 147
GEN MITCHELL	- 147
HILL AFB	- 147
HOMESTEAD AFB	- 147
HUNTER AAF	- 147
HUNTSVILLE	- 147
JACKSONVILLE	- 147
KEY WEST	- 146
LARSON AFB	- 146
LITTLE ROCK	- 146
LOCKBOURNE	- 146
LORING AFB	- 146
LUKE AFB	- 146
MCGUIRE AFB	- 146
MEMPHIS	- 146
MEXICO CITY	- 146
MINOT AFB	- 146
MINN-ST PAUL	- 146
NELLIS AFB	- 146
NEW CUMBERLAND	- 146
NEW ORLEANS	- 146
NIAGARA FALLS	- 146
OSWEGO AFB	- 146
PATRICK AFB	- 146
PITTSBURGH	- 146
REGINA	- 150
SCOTT AFB	- 150
SELFRIDGE AFB	- 150
SHAW AFB	- 150
WRESTOVER AFB	- 150
HUNTSVILLE	- 150
YAKIMA	- 150

## FORT BLISS

ALAMEDA NAS	- 22
ANDREWS AFB	- 31
BOISE	- 42
CANNON AFB	- 53
CARSWELL AFB	- 59
CHERRY PT NCAS	- 65
CHICAGO	- 71
CHURCHILL	- 79
CORPUS CHRISTI	- 89
DOVER AFB	- 102
EDMONTON	- 109
EGLIN AFB	- 115
ELLINGTON AFB	- 122
ELLSWORTH AFB	- 127
EL TORO NCAS	- 134
ENGLAND AFB	- 139
FORT BENNING	- 145
FORT BRAGG/POPE	- 150
FORT CAMPBELL	- 150

**FORT BLISS (CONT.)**

FORT CARSON	-191
FORT EUSTIS	-191
FORT HOOD	-191
FORT HUACHUCA	-191
FORT KNOX	-191
FORT LEAVENWORTH	-191
FORT LEWIS	-191
FORT ORD	-191
FORT QUICKEN	-191
FORT SILL	-192
FORT WALTERS	-192
GEN MITCHELL	-192
HILL AFB	-192
HOMESTEAD AFB	-192
HUNTER AAF	-192
HUNTSVILLE	-192
JACKSONVILLE	-192
JUNEAU	-192
KEY WEST	-193
LARSON AFB	-193
LITTLE ROCK	-193
LOCKBOURNE	-193
LORING AFB	-193
LUKE AFB	-193
MCGUIRE AFB	-193
MEMPHIS	-193
MEXICO CITY	-193
MINOT AFB	-194
MINN-ST PAUL	-194
NELLIS AFB	-194
NEW CUMBERLAND	-194
NEW ORLEANS	-194
NIAGARA FALLS	-194
OXNARD AFB	-194
PATRICK AFB	-194
PITTSBURGH	-194
REGINA	-195
SCOTT AFB	-195
SELFRIDGE AFB	-195
SHAW AFB	-195
WESTOVER AFB	-195
Wurtsmith	-195
YAKIMA	-195
YELLOWKNIFE	-195

**FORT BRAGG/POPE**

ANDREWS AFB	31
ROISE	42
CANNON AFB	59
CARSWELL AFB	59
CHICAGO	71
CHURCHILL	79
CORPUS CHRISTI	90
DOVER AFB	102

**FORT BRAGG/POPE (CONT.)**

EDMONTON	-109
EGLIN AFB	-119
ELLINGTON AFB	-122
ELLSWORTH AFB	-127
EL TORO MCAS	-135
ENGLAND AFB	-139
FORT BENNING	-145
FORT BLISS	-150
FORT CAMPBELL	-155
FORT CARSON	-156
FORT EUSTIS	-156
FORT HOOD	-156
FORT HUACHUCA	-156
FORT KNOX	-156
FORT LEAVENWORTH	-156
FORT RUCKER	-156
FORT SILL	-156
FORT WALTERS	-156
FROBISHER	-157
GEN MITCHELL	-157
HILL AFB	-157
HOMESTEAD AFB	-157
HUNTER AAF	-157
HUNTSVILLE	-157
JACKSONVILLE	-157
KEY WEST	-157
LARSON AFB	-157
LITTLE ROCK	-158
LOCKBOURNE	-158
LORING AFB	-158
LUKE AFB	-158
MCGUIRE AFB	-158
MEMPHIS	-158
MEXICO CITY	-158
MINOT AFB	-158
MINN-ST PAUL	-158
NELLIS AFB	-159
NEW CUMBERLAND	-159
NEW ORLEANS	-159
NIAGARA FALLS	-159
OXNARD AFB	-159
PATRICK AFB	-159
PITTSBURGH	-159
REGINA	-159
SCOTT AFB	-159
SELFRIDGE AFB	-160
WESTOVER AFB	-160
Wurtsmith	-160
YAKIMA	-160

**FORT CAMPBELL**

ALAMEDA NAS	22
ANDREWS AFB	31
ROISE	42

**FORT CAMPBELL (CONT.)**

CANNON AFB	59
CARSWELL AFB	59
CHERRY PT MCAS	65
CHICAGO	71
CHURCHILL	79
CORPUS CHRISTI	90
DOVER AFB	102
EDMONTON	109
EGLIN AFB	119
ELLINGTON AFB	122
ELLSWORTH AFB	127
EL TORO MCAS	135
ENGLAND AFB	139
FORT BENNING	145
FORT BLISS	150
FORT BRAGG/POPE	155
FORT CARSON	156
FORT EUSTIS	156
FORT HOOD	156
FORT HUACHUCA	156
FORT LEAVENWORTH	156
FORT LEWIS	156
FORT ORD	156
FORT QUICKEN	156
FORT SILL	156
FORT WALTERS	156
FROBISHER	157
GEN MITCHELL	157
HILL AFB	157
HOMESTEAD AFB	157
HUNTER AAF	157
HUNTSVILLE	157
JACKSONVILLE	157
KEY WEST	157
LARSON AFB	157
LITTLE ROCK	158
LOCKBOURNE	158
LORING AFB	158
LUKE AFB	158
MCGUIRE AFB	158
MEMPHIS	158
MEXICO CITY	158
MINOT AFB	158
MINN-ST PAUL	158
NELLIS AFB	159
NEW CUMBERLAND	159
NEW ORLEANS	159
NIAGARA FALLS	159
OXNARD AFB	159
PATRICK AFB	159
PITTSBURGH	159
REGINA	159
SCOTT AFB	159
SELFRIDGE AFB	160
WESTOVER AFB	160
Wurtsmith	160
YAKIMA	160

**FORT CAMPBELL (CONT.)**

WESTOVER AFB	-166
Wurtsmith	-166
YAKIMA	-166
YELLOWKNIFE	-166

<b>FORT CARSON</b>	
ALAMEDA NAS	22
ANDREWS AFB	31
ROISE	42
CANNON AFB	59
CARSWELL AFB	59
CHERRY PT MCAS	65
CHICAGO	71
CHURCHILL	79
CORPUS CHRISTI	90
DOVER AFB	102
EDMONTON	109
EGLIN AFB	119
ELLINGTON AFB	122
ELLSWORTH AFB	127
EL TORO MCAS	135
ENGLAND AFB	139
FORT BENNING	145
FORT BLISS	150
FORT BRAGG/POPE	155
FORT CARSON	156
FORT EUSTIS	156
FORT HOOD	156
FORT HUACHUCA	156
FORT LEAVENWORTH	156
FORT LEWIS	156
FORT ORD	156
FORT QUICKEN	156
FORT SILL	156
FORT WALTERS	156
FROBISHER	157
GEN MITCHELL	157
HILL AFB	157
HOMESTEAD AFB	157
HUNTER AAF	157
HUNTSVILLE	157
JACKSONVILLE	157
KEY WEST	157
LARSON AFB	157
LITTLE ROCK	158
LOCKBOURNE	158
LORING AFB	158
LUKE AFB	158
MCGUIRE AFB	158
MEMPHIS	158
MEXICO CITY	158
MINOT AFB	158
MINN-ST PAUL	158
NELLIS AFB	159
NEW CUMBERLAND	159
NEW ORLEANS	159
NIAGARA FALLS	159
OXNARD AFB	159
PATRICK AFB	159
PITTSBURGH	159
REGINA	159
SCOTT AFB	159
SELFRIDGE AFB	160
WESTOVER AFB	160
Wurtsmith	160
YAKIMA	160



**FORT CARSON (CONT.)**

MINN-ST PAUL	-168
NELLIS AFB	-168
NEW CUMBERLAND	-168
NEW ORLEANS	-168
NIAGARA FALLS	-168
OXNARD AFB	-168
PATRICK AFB	-168
PITTSBURGH	-169
REGINA	-169
SCOTT AFB	-169
SELFRIDGE AFB	-169
SHAW AFB	-169
WESTOVER AFB	-169
WURTSMITH	-169
YAKIMA	-169
YELLOWKNIFE	-169

**FORT EUSTIS**

NOISE	42
CANNON AFB	53
CARSWELL AFB	60
CHERRY PT MCAS	66
CHICAGO	71
CHURCHILL	79
CORPUS CHRISTI	90
EDMONTON	103
EGLIN AFB	115
ELLINGTON AFB	122
ELLSWORTH AFB	128
EL TORO MCAS	135
ENGLAND AFB	140
FORT BENNING	146
FORT BLISS	151
FORT BRAGG/POPE	156
FORT CAMPBELL	160
FORT CARSON	165
FORT HOOD	174
FORT HUACHUCA	174
FORT KNOX	178
FORT LEAVENWORTH	174
FORT RUCKER	174
FORT SILL	174
FORT WALTERS	179
FRONTSHER	170
GEN MITCHELL	170
HILL AFB	171
HOMESTEAD AFB	171
HUNTER AAF	171
HUNTSVILLE	171
JACKSONVILLE	171
KEY WEST	171
LARSON AFB	171
LITTLE ROCK	171
LOCKBOURNE	171

**FORT EUSTIS (CONT.)**

LOMING AFB	-172
LURE AFB	-172
MEMPHIS	-172
MEXICO CITY	-172
MINUT AFB	-172
MINN-ST PAUL	-172
NELLIS AFB	-172
NEW ORLEANS	-172
NIAGARA FALLS	-172
PATRICK AFB	-173
PITTSBURGH	-173
REGINA	-173
SCOTT AFB	-173
SELFRIDGE AFB	-173
SHAW AFB	-173
WESTOVER AFB	-173
WURTSMITH	-173
YAKIMA	-173

**FORT HOOD**

ALAMEDA NAS	21
ANDREWS AFB	31
NOISE	42
CANNON AFB	53
CHERRY PT MCAS	66
CHICAGO	71
CHURCHILL	79
CORPUS CHRISTI	90
DOVER AFB	103
EDMONTON	110
EGLIN AFB	115
ELLINGTON AFB	122
ELLSWORTH AFB	128
EL TORO MCAS	135
ENGLAND AFB	140
FORT BENNING	146
FORT BLISS	151
FORT BRAGG/POPE	156
FORT CAMPBELL	160
FORT CARSON	165
FORT EUSTIS	170
FORT HUACHUCA	174
FORT KNOX	174
FORT LEAVENWORTH	174
FORT LEWIS	174
FORT ORD	174
FORT RUCKER	174
FORT SILL	174
FORT LEWIS	174
GEN MITCHELL	174
HILL AFB	174
HOMESTEAD AFB	175
HUNTER AAF	175
HUNTSVILLE	175
JACKSONVILLE	175

**FORT HOOD (CONT.)**

KEY WEST	-175
LARSON AFB	-175
LITTLE ROCK	-175
LOCKBOURNE	-175
LOMING AFB	-175
LURE AFB	-176
MCGUIRE AFB	-176
MEMPHIS	-176
MEXICO CITY	-176
MINUT AFB	-176
MINN-ST PAUL	-176
NELLIS AFB	-176
NEW CUMBERLAND	-176
NEW ORLEANS	-176
NIAGARA FALLS	-177
OXNARD AFB	-177
PATRICK AFB	-177
PITTSBURGH	-177
REGINA	-177
SCOTT AFB	-177
SELFRIDGE AFB	-177
SHAW AFB	-177
WESTOVER AFB	-177
WURTSMITH	-178
YAKIMA	-178
YELLOWKNIFE	-178

**FORT HUACHUCA**

ALAMEDA NAS	21
ANDREWS AFB	31
NOISE	42
CANNON AFB	53
CARSWELL AFB	60
CHERRY PT MCAS	66
CHICAGO	71
CHURCHILL	79
CORPUS CHRISTI	90
DOVER AFB	103
EDMONTON	110
EGLIN AFB	115
ELLINGTON AFB	122
ELLSWORTH AFB	128
EL TORO MCAS	135
ENGLAND AFB	140
FORT BENNING	146
FORT BLISS	151
FORT BRAGG/POPE	156
FORT CAMPBELL	160
FORT CARSON	165
FORT EUSTIS	170
FORT HOOD	174
FORT KNOX	178
FORT LEAVENWORTH	174
FORT LEWIS	178

**FORT HUACHUCA (CONT.)**

FORT HOOD	-178
FORT RUCKER	-178
FORT SILL	-178
FORT WALTERS	-179
GEN MITCHELL	-179
HILL AFB	-179
HOMESTEAD AFB	-179
HUNTER AAF	-179
HUNTSVILLE	-179
JACKSONVILLE	-179
JUNEAU	-179
KEY WEST	-179
LARSON AFB	-180
LITTLE ROCK	-180
LOCKBOURNE	-180
LURE AFB	-180
MCGUIRE AFB	-180
MEMPHIS	-180
MEXICO CITY	-180
MINUT AFB	-180
MINN-ST PAUL	-180
NELLIS AFB	-181
NEW CUMBERLAND	-181
NEW ORLEANS	-181
NIAGARA FALLS	-181
OXNARD AFB	-181
PATRICK AFB	-181
PITTSBURGH	-181
REGINA	-181
SCOTT AFB	-181
SELFRIDGE AFB	-182
SHAW AFB	-182
WESTOVER AFB	-182
WURTSMITH	-182
YAKIMA	-182
YELLOWKNIFE	-182

**FORT KNOX**

ALAMEDA NAS	21
ANDREWS AFB	31
NOISE	42
CANNON AFB	53
CARSWELL AFB	60
CHERRY PT MCAS	66
CHICAGO	71
CHURCHILL	79
CORPUS CHRISTI	91
DOVER AFB	103
EDMONTON	110
EGLIN AFB	115
ELLINGTON AFB	123
ELLSWORTH AFB	128
EL TORO MCAS	135
ENGLAND AFB	140

FORT KNOX (CONT.)

FORT BENNING-	-146
FORT BLISS-	-151
FORT BRAGG/PIPE-	-156
FORT CARSON-	-168
FORT EUSTIS-	-170
FORT HOOD-	-174
FORT HUACHUCA-	-178
FORT LEAVENWORTH-	-182
FORT LEWIS-	-182
FORT ORD-	-182
FORT RUCKER-	-183
FORT SILL-	-183
FORT WALTERS-	-183
FROBISHER-	-183
GEN MITCHELL-	-183
HILL AFB-	-183
HONESTEAD AFB-	-183
HUNTER AAF-	-183
HUNTSVILLE-	-183
JACKSONVILLE-	-184
KEY WEST-	-184
LARSON AFB-	-184
LITTLE ROCK-	-184
LOCKBOURNE-	-184
LORING AFB-	-184
LUKE AFB-	-184
MCGUIRE AFB-	-184
MEMPHIS-	-184
MEXICO CITY-	-185
MINOT AFB-	-185
MINN-ST PAUL-	-185
NELLIS AFB-	-185
NEW CUMBERLAND-	-185
NEW ORLEANS-	-185
NIAGARA FALLS-	-185
OXNARD AFB-	-185
PATRICK AFB-	-185
PITTSBURGH-	-186
REGINA-	-186
SCOTT AFB-	-186
SELFRIDGE AFB-	-186
SHAW AFB-	-186
WESTOVER AFB-	-186
WURTSMITH-	-186
YAKIMA-	-186
YELLOWKNIFE-	-186

FORT LEAVENWORTH

ALAMEDA NAS-	-23
ANDREWS AFB-	-32
BOISE-	-43
CANNON AFB-	-56
CARSWELL AFB-	-60
CHERRY PT MCAS-	-66

FORT LEAVENWORTH (CONT.)

CHICAGO-	-72
CHURCHILL-	-79
CORPUS CHRISTI-	-91
DOVER AFB-	-103
EDMONTON-	-110
EGLIN AFB-	-116
FLLINGTON AFB-	-123
ELLSWORTH AFB-	-128
EL TORN MCAS-	-135
ENGLAND AFB-	-140
FORT BENNING-	-146
FORT BLISS-	-151
FORT BRAGG/PIPE-	-156
FORT CAMPBELL-	-160
FORT CARSON-	-165
FORT EUSTIS-	-170
FORT HOOD-	-174
FORT HUACHUCA-	-178
FORT KNOX-	-182
FORT LEWIS-	-187
FORT ORD-	-187
FORT RUCKER-	-187
FORT SILL-	-187
FORT WALTERS-	-187
FROBISHER-	-187
GEN MITCHELL-	-187
HILL AFB-	-187
HONESTEAD AFB-	-187
HUNTER AAF-	-188
HUNTSVILLE-	-188
JACKSONVILLE-	-188
JUNEAU-	-188
KEY WEST-	-188
LARSON AFB-	-188
LITTLE ROCK-	-188
LOCKBOURNE-	-188
LORING AFB-	-188
LUKE AFB-	-189
MCGUIRE AFB-	-189
MEMPHIS-	-189
MEXICO CITY-	-189
MINOT AFB-	-189
MINN-ST PAUL-	-189
NELLIS AFB-	-189
NEW CUMBERLAND-	-189
NEW ORLEANS-	-189
NIAGARA FALLS-	-190
OXNARD AFB-	-190
PATRICK AFB-	-190
PITTSBURGH-	-190
REGINA-	-190
SCOTT AFB-	-190
SELFRIDGE AFB-	-190
SHAW AFB-	-190

FORT LEAVENWORTH (CONT.)

WESTOVER AFB-	-190
WURTSMITH-	-191
YAKIMA-	-191
YELLOWKNIFE-	-191

FORT LEWIS

ALAMEDA NAS-	-23
BOISE-	-43
CANNON AFB-	-56
CARSWELL AFB-	-60
CHICAGO-	-72
CHURCHILL-	-79
CORPUS CHRISTI-	-91
DUTCH HARBOR-	-107
EDMONTON-	-110
EGLIN AFB-	-116
EIELSON AFB-	-120
FLLINGTON AFB-	-123
ELLSWORTH AFB-	-128
EL TORN MCAS-	-135
ENGLAND AFB-	-140
FORT BENNING-	-146
FORT BLISS-	-151
FORT CAMPBELL-	-161
FORT CARSON-	-165
FORT HOOD-	-174
FORT HUACHUCA-	-178
FORT KNOX-	-182
FORT LEAVENWORTH-	-187
FORT ORD-	-191
FORT RUCKER-	-191
FORT SILL-	-191
FORT WALTERS-	-191
GEN MITCHELL-	-191
HILL AFB-	-191
HUNTSVILLE-	-192
JUNEAU-	-192
KODIAK-	-192
LITTLE ROCK-	-192
LOCKBOURNE-	-192
LUKE AFB-	-192
MEMPHIS-	-192
MINOT AFB-	-192
MINN-ST PAUL-	-192
NELLIS AFB-	-193
NEW CUMBERLAND-	-193
NEW ORLEANS-	-193
NIAGARA FALLS-	-193
OXNARD AFB-	-193
PITTSBURGH-	-193
PRUDHOMME HAY-	-193
REGINA-	-193
SCOTT AFB-	-193

FORT LEWIS (CONT.)

SELFRIDGE AFB-	-194
WURTSMITH-	-194
YELLOWKNIFE-	-194

FORT ORD

BOISE-	-43
CANNON AFB-	-56
CARSWELL AFB-	-60
CHICAGO-	-72
CHURCHILL-	-79
CORPUS CHRISTI-	-91
EDMONTON-	-110
EGLIN AFB-	-116
EIELSON AFB-	-120
FLLINGTON AFB-	-123
ELLSWORTH AFB-	-128
EL TORN MCAS-	-135
ENGLAND AFB-	-140
FORT BENNING-	-146
FORT BLISS-	-151
FORT CAMPBELL-	-161
FORT CARSON-	-165
FORT HOOD-	-174
FORT HUACHUCA-	-178
FORT KNOX-	-182
FORT LEAVENWORTH-	-187
FORT LEWIS-	-191
FORT RUCKER-	-194
FORT SILL-	-194
FORT WALTERS-	-194
GEN MITCHELL-	-194
HILL AFB-	-194
HUNTSVILLE-	-194
JUNEAU-	-195
KODIAK-	-195
LARSON AFB-	-195
LITTLE ROCK-	-195
LOCKBOURNE-	-195
LUKE AFB-	-195
MEMPHIS-	-195
MEXICO CITY-	-195
MINOT AFB-	-195
MINN-ST PAUL-	-196
NELLIS AFB-	-196
NEW ORLEANS-	-196
NIAGARA FALLS-	-196
OXNARD AFB-	-196
PITTSBURGH-	-196
REGINA-	-196
SCOTT AFB-	-196
SELFRIDGE AFB-	-196
WURTSMITH-	-197
YAKIMA-	-197

**FORT ORD (CONT.)**  
 YELLOWKNIFE - - - - -197

**FORT RUCKER**  
 ALAMEDA NAS - - - - - 23  
 ANDREWS AFB - - - - - 32  
 BOISE - - - - - 43  
 CANNON AFB - - - - - 94  
 CARSWELL AFB - - - - - 60  
 CHERRY PT MCAS - - - - - 66  
 CHICAGO - - - - - 72  
 CHURCHILL - - - - - 80  
 CORPUS CHRISTI - - - - - 91  
 DOVER AFB - - - - -103  
 EDMONTON - - - - -110  
 ELLINGTON AFB - - - - -123  
 ELLSWORTH AFB - - - - -129  
 EL TORNADO MCAS - - - - -136  
 ENGLAND AFB - - - - -141  
 FORT BLISS - - - - -151  
 FORT BRAGG/POPE - - - - -156  
 FORT CAMPBELL - - - - -161  
 FORT CARSON - - - - -166  
 FORT EUSTIS - - - - -170  
 FORT HOOD - - - - -174  
 FORT HUACHUCA - - - - -179  
 FORT KNOX - - - - -183  
 FORT LEAVENWORTH - - - - -187  
 FORT LEWIS - - - - -191  
 FORT ORD - - - - -194  
 FORT SILL - - - - -197  
 FORT WALTERS - - - - -197  
 GEN MITCHELL - - - - -197  
 HILL AFB - - - - -197  
 HOMESTEAD AFB - - - - -197  
 HUNTER AAF - - - - -197  
 HUNTSVILLE - - - - -198  
 JACKSONVILLE - - - - -198  
 KEY WEST - - - - -198  
 LARSON AFB - - - - -198  
 LITTLE ROCK - - - - -198  
 LOCKBOURNE - - - - -198  
 LORING AFB - - - - -198  
 LUKE AFB - - - - -198  
 MCGUIRE AFB - - - - -198  
 MEMPHIS - - - - -199  
 MEXICO CITY - - - - -199  
 MINOT AFB - - - - -199  
 MINN-ST PAUL - - - - -199  
 NELLIS AFB - - - - -199  
 NEW CUMBERLAND - - - - -199  
 NEW ORLEANS - - - - -199  
 NIAGARA FALLS - - - - -199  
 OXNARD AFB - - - - -199  
 PATRICK AFB - - - - -200

**FORT RUCKER (CONT.)**  
 PITTSBURGH - - - - -200  
 REGINA - - - - -200  
 SCOTT AFB - - - - -200  
 SELFRIDGE AFB - - - - -200  
 SHAW AFB - - - - -200  
 WESTOVER AFB - - - - -200  
 Wurtsmith - - - - -200  
 YAKIMA - - - - -200

**FORT SILL**  
 ALAMEDA NAS - - - - - 23  
 ANDREWS AFB - - - - - 32  
 BOISE - - - - - 43  
 CANNON AFB - - - - - 94  
 CHERRY PT MCAS - - - - - 66  
 CHICAGO - - - - - 72  
 CHURCHILL - - - - - 80  
 CORPUS CHRISTI - - - - - 91  
 DOVER AFB - - - - -103  
 EDMONTON - - - - -110  
 EGLIN AFB - - - - -116  
 ELLINGTON AFB - - - - -123  
 ELLSWORTH AFB - - - - -129  
 EL TORNADO MCAS - - - - -136  
 ENGLAND AFB - - - - -141  
 FORT BENNING - - - - -147  
 FORT BLISS - - - - -152  
 FORT BRAGG/POPE - - - - -156  
 FORT CAMPBELL - - - - -161  
 FORT CARSON - - - - -166  
 FORT EUSTIS - - - - -170  
 FORT HOOD - - - - -174  
 FORT HUACHUCA - - - - -179  
 FORT KNOX - - - - -183  
 FORT LEAVENWORTH - - - - -187  
 FORT LEWIS - - - - -191  
 FORT ORD - - - - -194  
 FORT RUCKER - - - - -197  
 GEN MITCHELL - - - - -201  
 HILL AFB - - - - -201  
 HOMESTEAD AFB - - - - -201  
 HUNTER AAF - - - - -201  
 HUNTSVILLE - - - - -201  
 JACKSONVILLE - - - - -201  
 KEY WEST - - - - -201  
 LARSON AFB - - - - -201  
 LITTLE ROCK - - - - -201  
 LOCKBOURNE - - - - -202  
 LORING AFB - - - - -202  
 LUKE AFB - - - - -202  
 MCGUIRE AFB - - - - -202  
 MEMPHIS - - - - -202  
 MEXICO CITY - - - - -202  
 MINOT AFB - - - - -202

**FORT SILL (CONT.)**  
 MINN-ST PAUL - - - - -202  
 NELLIS AFB - - - - -202  
 NEW CUMBERLAND - - - - -203  
 NEW ORLEANS - - - - -203  
 NIAGARA FALLS - - - - -203  
 OXNARD AFB - - - - -203  
 PATRICK AFB - - - - -203  
 PITTSBURGH - - - - -203  
 REGINA - - - - -203  
 SCOTT AFB - - - - -203  
 SELFRIDGE AFB - - - - -203  
 SHAW AFB - - - - -204  
 WESTOVER AFB - - - - -204  
 Wurtsmith - - - - -204  
 YAKIMA - - - - -204  
 YELLOWKNIFE - - - - -204

**FORT WALTERS**  
 ALAMEDA NAS - - - - - 23  
 ANDREWS AFB - - - - - 32  
 BOISE - - - - - 43  
 CANNON AFB - - - - - 94  
 CHERRY PT MCAS - - - - - 66  
 CHICAGO - - - - - 72  
 CHURCHILL - - - - - 80  
 CORPUS CHRISTI - - - - - 91  
 DOVER AFB - - - - -103  
 EDMONTON - - - - -110  
 EGLIN AFB - - - - -116  
 ELLINGTON AFB - - - - -123  
 ELLSWORTH AFB - - - - -129  
 EL TORNADO MCAS - - - - -136  
 ENGLAND AFB - - - - -141  
 FORT BENNING - - - - -147  
 FORT BLISS - - - - -152  
 FORT BRAGG/POPE - - - - -156  
 FORT CAMPBELL - - - - -161  
 FORT CARSON - - - - -166  
 FORT EUSTIS - - - - -170  
 FORT HUACHUCA - - - - -179  
 FORT KNOX - - - - -183  
 FORT LEAVENWORTH - - - - -187  
 FORT LEWIS - - - - -191  
 FORT ORD - - - - -194  
 FORT RUCKER - - - - -197  
 GEN MITCHELL - - - - -204  
 HILL AFB - - - - -204  
 HOMESTEAD AFB - - - - -204  
 HUNTER AAF - - - - -204  
 HUNTSVILLE - - - - -205  
 JACKSONVILLE - - - - -205  
 KEY WEST - - - - -205  
 LARSON AFB - - - - -205  
 LITTLE ROCK - - - - -205

**FORT WALTERS (CONT.)**  
 LOCKBOURNE - - - - -205  
 LORING AFB - - - - -205  
 LUKE AFB - - - - -205  
 MCGUIRE AFB - - - - -205  
 MEMPHIS - - - - -206  
 MEXICO CITY - - - - -206  
 MINOT AFB - - - - -206  
 MINN-ST PAUL - - - - -206  
 NELLIS AFB - - - - -206  
 NEW CUMBERLAND - - - - -206  
 NEW ORLEANS - - - - -206  
 NIAGARA FALLS - - - - -206  
 OXNARD AFB - - - - -206  
 PATRICK AFB - - - - -207  
 PITTSBURGH - - - - -207  
 REGINA - - - - -207  
 SCOTT AFB - - - - -207  
 SELFRIDGE AFB - - - - -207  
 SHAW AFB - - - - -207  
 WESTOVER AFB - - - - -207  
 Wurtsmith - - - - -207  
 YAKIMA - - - - -207  
 YELLOWKNIFE - - - - -208

**FROBISHER**  
 ALERT - - - - - 27  
 ANDREWS AFB - - - - - 32  
 CHERRY PT MCAS - - - - - 66  
 CHICAGO - - - - - 72  
 CHURCHILL - - - - - 80  
 DOVER AFB - - - - -103  
 EDMONTON - - - - -111  
 EGLIN AFB - - - - -120  
 ELLSWORTH AFB - - - - -129  
 FORT BENNING - - - - -147  
 FORT BRAGG/POPE - - - - -157  
 FORT CAMPBELL - - - - -161  
 FORT CARSON - - - - -166  
 FORT EUSTIS - - - - -170  
 FORT KNOX - - - - -183  
 FORT LEAVENWORTH - - - - -187  
 GEN MITCHELL - - - - -208  
 HUNTER AAF - - - - -208  
 HUNTSVILLE - - - - -208  
 JUNEAU - - - - -208  
 LARSON AFB - - - - -208  
 LITTLE ROCK - - - - -208  
 LOCKBOURNE - - - - -208  
 LORING AFB - - - - -208  
 MCGUIRE AFB - - - - -209  
 MEMPHIS - - - - -209  
 MINOT AFB - - - - -209  
 MINN-ST PAUL - - - - -209  
 NEW CUMBERLAND - - - - -209

<b>FRONISHER (CONT.)</b>	<b>GEN MITCHELL (CONT.)</b>	<b>HICKAM AFB (CONT.)</b>	<b>HILL AFB (CONT.)</b>
NIAGARA FALLS - - - -209	LOCKBOURNE - - - -211	MIDWAY ISLAND - - - -216	MINN-ST PAUL - - - -218
PITTSBURGH - - - -209	LORING AFB - - - -212	WAKE ISLAND - - - -216	NELLIS AFB - - - -218
PRUDHOM RAY - - - -209	LUKE AFB - - - -212		NEW CUMBERLAND - - - -218
REGINA - - - -209	MCGUIRE AFB - - - -212	<b>HILL AFB</b>	NEW ORLEANS - - - -218
SCOTT AFB - - - -210	MEMPHIS - - - -212	ALAMEJA NAS - - - -24	NIAGARA FALLS - - - -218
SELFRIDGE AFB - - - -210	MEXICO CITY - - - -212	ANDREWS AFB - - - -32	OXNARD AFB - - - -219
SHAW AFB - - - -210	MINOT AFB - - - -212	BOISE - - - -43	PATRICK AFB - - - -219
THULE - - - -210	MINN-ST PAUL - - - -212	CANNON AFB - - - -54	PITTSBURGH - - - -219
WESTOVER AFB - - - -210	NELLIS AFB - - - -212	CARSWELL AFB - - - -61	REGINA - - - -219
HUNTSVILLE - - - -210	NEW CUMBERLAND - - - -212	CHERRY PT MCAS - - - -67	SCOTT AFB - - - -219
YAKIMA - - - -210	NEW ORLEANS - - - -213	CHICAGO - - - -72	SELFRIDGE AFB - - - -219
YELLOWKNIFE - - - -210	NIAGARA FALLS - - - -213	CHURCHILL - - - -80	SHAW AFB - - - -219
	OXNARD AFB - - - -213	CORPUS CHRISTI - - - -91	WESTOVER AFB - - - -219
<b>GEN MITCHELL</b>	PATRICK AFB - - - -213	DOVER AFB - - - -104	HUNTSVILLE - - - -219
ALAMEJA NAS - - - -23	PITTSBURGH - - - -213	EDMONTON - - - -111	YAKIMA - - - -220
ANDREWS AFB - - - -32	REGINA - - - -213	EGLIN AFB - - - -116	YELLOWKNIFE - - - -220
BOISE - - - -43	SCOTT AFB - - - -213	EIELSON AFB - - - -120	
CANNON AFB - - - -54	SELFRIDGE AFB - - - -213	ELLINGTON AFB - - - -123	<b>HOMESTEAD AFB</b>
CARSWELL AFB - - - -60	SHAW AFB - - - -213	ELLSWORTH AFB - - - -129	ANDREWS AFB - - - -33
CHERRY PT MCAS - - - -66	WESTOVER AFB - - - -214	ELMENDORF AFB - - - -133	CANNON AFB - - - -54
CHURCHILL - - - -80	HUNTSVILLE - - - -214	EL TORO MCAS - - - -136	CARSWELL AFB - - - -61
CORPUS CHRISTI - - - -91	YAKIMA - - - -214	ENGLAND AFB - - - -141	CHERRY PT MCAS - - - -67
DOVER AFB - - - -104	YELLOWKNIFE - - - -214	FORT BENNING - - - -147	CHICAGO - - - -72
EDMONTON - - - -111		FORT BLISS - - - -152	CORPUS CHRISTI - - - -92
EGLIN AFB - - - -116	<b>HANDI</b>	FORT BRAGG/POPE - - - -157	DOVER AFB - - - -104
ELLINGTON AFB - - - -123	BANGKOK - - - -38	FORT CAMPBELL - - - -161	EGLIN AFB - - - -116
ELLSWORTH AFB - - - -129	BOMBAY - - - -47	FORT CARSON - - - -166	ELLINGTON AFB - - - -124
EL TORO MCAS - - - -136	CALCUTTA - - - -90	FORT EUSTIS - - - -171	ELLSWORTH AFB - - - -129
ENGLAND AFB - - - -141	CLARK AFB - - - -84	FORT HOOD - - - -174	EL TORO MCAS - - - -136
FORT BENNING - - - -147	COLUMBO - - - -87	FORT HUACHUCA - - - -179	ENGLAND AFB - - - -141
FORT BLISS - - - -152	DA NANG - - - -95	FORT KNOX - - - -183	FORT BENNING - - - -147
FORT BRAGG/POPE - - - -157	DAVAO - - - -98	FORT LEAVENWORTH - - - -187	FORT BLISS - - - -152
FORT CAMPBELL - - - -161	DJAKARTA - - - -101	FORT LEWIS - - - -191	FORT BRAGG/POPE - - - -157
FORT CARSON - - - -166	HONG KONG - - - -214	FORT ORD - - - -194	FORT CAMPBELL - - - -161
FORT EUSTIS - - - -170	JAKARTA - - - -214	FORT RUCKER - - - -197	FORT CARSON - - - -166
FORT HOOD - - - -174	KADENA AB - - - -214	FORT SILL - - - -201	FORT EUSTIS - - - -171
FORT HUACHUCA - - - -179	KIMPO AH - - - -214	FORT WOLTERS - - - -204	FORT HOOD - - - -175
FORT KNOX - - - -183	LAHORE - - - -215	GEN MITCHELL - - - -210	FORT HUACHUCA - - - -179
FORT LEAVENWORTH - - - -187	MANDALAY - - - -215	HOMESTEAD AFB - - - -216	FORT KNOX - - - -183
FORT LEWIS - - - -191	MEDAN - - - -215	HUNTER AAF - - - -216	FORT LEAVENWORTH - - - -187
FORT ORD - - - -194	NEW DELHI - - - -215	HUNTSVILLE - - - -216	FORT RUCKER - - - -197
FORT RUCKER - - - -197	PEIPING - - - -215	JACKSONVILLE - - - -217	FORT SILL - - - -201
FORT SILL - - - -201	PNANG - - - -215	JUNEAU - - - -217	FORT WOLTERS - - - -204
FORT WOLTERS - - - -204	PUSAN EAST - - - -215	KEY WEST - - - -217	GEN MITCHELL - - - -211
FRONISHER - - - -208	SAIGON - - - -215	KODIAK - - - -217	HILL AFB - - - -216
HILL AFB - - - -210	SHANGHAI - - - -215	LARSON AFB - - - -217	HUNTER AAF - - - -220
HOMESTEAD AFB - - - -211	SINGAPORE - - - -216	LITTLE ROCK - - - -217	HUNTSVILLE - - - -220
HUNTER AAF - - - -211	TAIPEI - - - -216	LOCKBOURNE - - - -217	JACKSONVILLE - - - -220
HUNTSVILLE - - - -211	TOKYO - - - -216	LORING AFB - - - -217	LITTLE ROCK - - - -220
JACKSONVILLE - - - -211		LUKE AFB - - - -217	LOCKBOURNE - - - -220
JUNEAU - - - -211	<b>HICKAM AFB</b>	MCGUIRE AFB - - - -218	LORING AFB - - - -220
KEY WEST - - - -211	DUTCH HARBOR - - - -107	MEMPHIS - - - -218	LUKE AFB - - - -220
LARSON AFB - - - -211	JOHNSTON ISLAND - - - -216	MEXICO CITY - - - -218	MCGUIRE AFB - - - -221
LITTLE ROCK - - - -211		MINOT AFB - - - -218	MEMPHIS - - - -221

HOMESTEAD AFB (CONT.)

MEXICO CITY	-221
MINOT AFB	-221
MINN-ST PAUL	-221
NELLIS AFB	-221
NEW CUMBERLAND	-221
NEW ORLEANS	-221
NIAGARA FALLS	-221
PATRICK AFB	-222
PITTSBURGH	-222
REGINA	-222
SCOTT AFB	-222
SELFRIDGE AFB	-222
SHAW AFB	-222
WESTOVER AFB	-222
WURTSMITH	-222

HUNG KONG

ANDERSON AFB	28
BANGKOK	38
CALCUTTA	50
CHITOSE AB	76
CLARK AFB	84
DA NANG	95
DAVAO	98
DJAKARTA	101
HANOI	214
IWAKUNI	222
IWO JIMA AB	223
KADENA AB	223
KIMPO AB	223
MANDALAY	223
MEDAN	223
MISAWA AB	223
PEIPING	223
PFNANG	223
PUSAN EAST	223
SAIGON	224
SHANGHAI	224
SINGAPORE	224
TAIPEI	224
TOKYO	224

HUNTER AAF

ANDREWS AFB	33
BOISE	44
CANNON AFB	55
CARSWELL AFB	61
CHERRY PT MCAS	67
CHICAGO	73
CHURCHILL	80
CORPUS CHRISTI	92
DOVER AFB	104
EDMONTON	111
EGLIN AFB	116

HUNTER AAF (CONT.)

ELLINGTON AFB	-124
ELLSWORTH AFB	-129
EL TORO MCAS	-136
ENGLAND AFB	-141
FORT BENNING	-147
FORT BLISS	-152
FORT BRAGG/PDPE	-157
FORT CAMPBELL	-162
FORT CARSON	-166
FORT EUSTIS	-171
FORT HOOD	-175
FORT HUACHUCA	-179
FORT KNOX	-183
FORT LEAVENWORTH	-188
FORT RUCKER	-197
FORT SILL	-201
FORT WALTERS	-204
FROBISHER	-208
GEN MITCHELL	-211
HILL AFB	-216
HOMESTEAD AFB	-220
HUNTSVILLE	-224
KEY WFST	-224
LARSON AFB	-224
LITTLE ROCK	-224
LOCKBOURNE	-225
LORING AFB	-225
LUKE AFB	-225
MCGUIRE AFB	-225
MEMPHIS	-225
MEXICO CITY	-225
MINOT AFB	-225
MINN-ST PAUL	-225
NELLIS AFB	-225
NEW CUMBERLAND	-226
NEW ORLEANS	-226
NIAGARA FALLS	-226
OXNARD AFB	-226
PATRICK AFB	-226
PITTSBURGH	-226
REGINA	-226
SCOTT AFB	-226
SELFRIDGE AFB	-226
WESTOVER AFB	-227
WURTSMITH	-227

HUNTSVILLE

ALAMEDA NAS	24
ANDREWS AFB	33
BOISE	44
CANNON AFB	55
CARSWELL AFB	61
CHERRY PT MCAS	67
CHICAGO	73

HUNTSVILLE (CONT.)

CHURCHILL	81
CORPUS CHRISTI	92
DOVER AFB	104
EDMONTON	111
EGLIN AFB	117
ELLINGTON AFB	124
ELLSWORTH AFB	129
EL TORO MCAS	136
ENGLAND AFB	141
FORT BENNING	147
FORT BLISS	152
FORT BRAGG/PDPE	157
FORT CARSON	166
FORT EUSTIS	171
FORT HOOD	175
FORT HUACHUCA	179
FORT KNOX	183
FORT LEAVENWORTH	188
FORT LEWIS	192
FORT ORD	194
FORT RUCKER	198
FORT SILL	201
FORT WALTERS	205
FROBISHER	208
GEN MITCHELL	211
HILL AFB	216
HOMESTEAD AFB	220
HUNTER AAF	224
JACKSONVILLE	227
KEY WFST	227
LARSON AFB	227
LITTLE ROCK	227
LOCKBOURNE	227
LORING AFB	227
LUKE AFB	227
MCGUIRE AFB	228
MEMPHIS	228
MEXICO CITY	228
MINOT AFB	228
MINN-ST PAUL	228
NELLIS AFB	228
NEW CUMBERLAND	228
NEW ORLEANS	228
NIAGARA FALLS	228
OXNARD AFB	229
PATRICK AFB	229
PITTSBURGH	229
REGINA	229
SCOTT AFB	229
SELFRIDGE AFB	229
SHAW AFB	229
WESTOVER AFB	229
WURTSMITH	229
YAKIMA	230

HUNTSVILLE (CONT.)

YELLOWKNIFE	-230
IWAKUNI	
ANDERSON AFB	28
CHITOSE AB	76
CLARK AFB	85
DA NANG	95
DAVAO	98
HANOI	214
HONG KONG	222
IWO JIMA AB	230
KADENA AB	230
KIMPO AB	230
MISAWA AB	230
PEIPING	230
PUSAN EAST	230
SAIGON	230
SHANGHAI	231
TAIPEI	231
TOKYO	231
IWO JIMA AB	
ANDERSON AFB	28
CHITOSE AB	76
CLARK AFB	85
DA NANG	95
DAVAO	98
ENIWETOK ATOLL	144
HANOI	214
HONG KONG	223
IWAKUNI	230
KADENA AB	231
KIMPO AB	231
KWAJALEIN NS	231
MISAWA AB	231
PEIPING	231
PUSAN EAST	231
SHANGHAI	232
TAIPEI	232
TOKYO	232
VANINO	232
WAKE ISLAND	232
JACKSONVILLE	
ANDREWS AFB	33
BOISE	44
CANNON AFB	55
CARSWELL AFB	61
CHERRY PT MCAS	67
CHICAGO	73
CHURCHILL	81
CORPUS CHRISTI	92
DOVER AFB	104
EDMONTON	111

JACKSONVILLE (CONT.)

EGLIN AFB	- - - - -117
ELLINGTON AFB	- - - - -124
ELLSWORTH AFB	- - - - -129
EL TORO MCAS	- - - - -137
ENGLAND AFB	- - - - -141
FORT BENNING	- - - - -147
FORT BLISS	- - - - -152
FORT BRAGG/POPE	- - - - -157
FORT CAMPBELL	- - - - -162
FORT CARSON	- - - - -166
FORT CUSTIS	- - - - -171
FORT HOOD	- - - - -175
FORT HUACHUCA	- - - - -179
FORT KNOX	- - - - -184
FORT LEAVENWORTH	- - - - -188
FORT RUCKER	- - - - -198
FORT SILL	- - - - -201
FORT WOLTERS	- - - - -205
GEN MITCHELL	- - - - -211
HILL AFB	- - - - -217
HOMESTEAD AFB	- - - - -220
HUNTSVILLE	- - - - -227
KEY WEST	- - - - -232
LITTLE ROCK	- - - - -232
LOCKBOURNE	- - - - -232
LORING AFB	- - - - -232
LUKE AFB	- - - - -233
MCGUIRE AFB	- - - - -233
MEMPHIS	- - - - -233
MEXICO CITY	- - - - -233
MINOT AFB	- - - - -233
MINN-ST PAUL	- - - - -233
NELLIS AFB	- - - - -233
NEW CUMBERLAND	- - - - -233
NEW ORLEANS	- - - - -233
NIAGARA FALLS	- - - - -234
OXNARD AFB	- - - - -234
PITTSBURGH	- - - - -234
REGINA	- - - - -234
SCOTT AFB	- - - - -234
SELFRIDGE AFB	- - - - -234
SHAW AFB	- - - - -234
WESTOVER AFB	- - - - -234
WURTSMITH	- - - - -234

JOHNSTON ISLAND

ENIWEATOK ATOLL	- - - - -144
HICKAM AFB	- - - - -216
KWAJALEIN IS.	- - - - -235
MIDWAY ISLAND	- - - - -235
PAGO PAGO	- - - - -235
WAKE ISLAND	- - - - -235

JUNEAU

ADAK NS	- - - - -18
ALAMEDA NAS	- - - - -24
ALERT	- - - - -27
ATTU	- - - - -36
BOISE	- - - - -44
CANNON AFB	- - - - -55
CHICAGO	- - - - -73
CHURCHILL	- - - - -81
DUTCH HARBOR	- - - - -107
EDMONTON	- - - - -111
EIELSON AFB	- - - - -120
ELLSWORTH AFB	- - - - -130
ELMENDORF AFB	- - - - -133
EL TORO MCAS	- - - - -137
FORT BLISS	- - - - -152
FORT CARSON	- - - - -167
FORT HUACHUCA	- - - - -179
FORT LEAVENWORTH	- - - - -188
FORT LEWIS	- - - - -192
FORT ORD	- - - - -195
FROBISHER	- - - - -200
GEN MITCHELL	- - - - -211
HILL AFB	- - - - -217
KODIAK	- - - - -235
LARSON AFB	- - - - -235
LUKE AFB	- - - - -235
MINOT AFB	- - - - -235
MINN-ST PAUL	- - - - -235
NELLIS AFB	- - - - -236
OXNARD AFB	- - - - -236
PRUDHOM RAY	- - - - -236
REGINA	- - - - -236
SHEMYA	- - - - -236
THULE	- - - - -236
YAKIMA	- - - - -236
YELLOWKNIFE	- - - - -236

KADENA AB

ANDERSON AFB	- - - - -28
BANGKOK	- - - - -38
CHITOSE AB	- - - - -76
CLARK AFB	- - - - -85
DA NANG	- - - - -95
DAVAN	- - - - -98
HANOI	- - - - -214
HONG KONG	- - - - -223
IWAKUNI	- - - - -230
IWO JIMA AB	- - - - -231
KIMPO AB	- - - - -236
MANDALAY	- - - - -237
MISAWA AB	- - - - -237
PEIPING	- - - - -237
PUSAN EAST	- - - - -237
SAIGON	- - - - -237

KADENA AB (CONT.)

SHANGHAI	- - - - -237
TAIPEI	- - - - -237
TOKYO	- - - - -237
VANIMO	- - - - -237

KARACHI

ABADAN	- - - - -17
ADEN	- - - - -20
BAGHDAD	- - - - -37
BANGKOK	- - - - -39
BOMBAY	- - - - -47
CALCUTTA	- - - - -50
CULMANN	- - - - -87
DHAHRAN	- - - - -100
DIEGO GARCIA	- - - - -100
LAMORE	- - - - -238
MANDALAY	- - - - -238
NEW DELHI	- - - - -238
TEHRAN	- - - - -238
ZAHEDAN	- - - - -238

KEY WEST

ANDREWS AFB	- - - - -33
CANNON AFB	- - - - -55
CARSWELL AFB	- - - - -61
CHERRY PT MCAS	- - - - -67
CHICAGO	- - - - -73
CORPUS CHRISTI	- - - - -92
DOVER AFB	- - - - -104
EGLIN AFB	- - - - -117
ELLINGTON AFB	- - - - -124
ELLSWORTH AFB	- - - - -130
EL TORO MCAS	- - - - -137
ENGLAND AFB	- - - - -142
FORT BENNING	- - - - -148
FORT BLISS	- - - - -153
FORT BRAGG/POPE	- - - - -157
FORT CAMPBELL	- - - - -162
FORT CARSON	- - - - -167
FORT CUSTIS	- - - - -171
FORT HOOD	- - - - -175
FORT HUACHUCA	- - - - -179
FORT KNOX	- - - - -184
FORT LEAVENWORTH	- - - - -188
FORT RUCKER	- - - - -198
FORT SILL	- - - - -201
FORT WOLTERS	- - - - -205
GEN MITCHELL	- - - - -211
HILL AFB	- - - - -217
HUNTER AAF	- - - - -224
HUNTSVILLE	- - - - -227
JACKSONVILLE	- - - - -232
LITTLE ROCK	- - - - -238
LOCKBOURNE	- - - - -238

KEY WEST (CONT.)

LORING AFB	- - - - -238
LUKE AFB	- - - - -238
MCGUIRE AFB	- - - - -239
MEMPHIS	- - - - -239
MEXICO CITY	- - - - -239
MINOT AFB	- - - - -239
MINN-ST PAUL	- - - - -239
NELLIS AFB	- - - - -239
NEW CUMBERLAND	- - - - -239
NEW ORLEANS	- - - - -239
NIAGARA FALLS	- - - - -239
PATRICK AFB	- - - - -240
PITTSBURGH	- - - - -240
REGINA	- - - - -240
SCOTT AFB	- - - - -240
SELFRIDGE AFB	- - - - -240
SHAW AFB	- - - - -240
WESTOVER AFB	- - - - -240
WURTSMITH	- - - - -240

KIMPO AB

ANDERSON AFB	- - - - -28
BANGKOK	- - - - -39
CHITOSE AB	- - - - -76
CLARK AFB	- - - - -85
DA NANG	- - - - -96
DAVAN	- - - - -98
HANOI	- - - - -214
HONG KONG	- - - - -223
IWAKUNI	- - - - -230
IWO JIMA AB	- - - - -231
KADENA AB	- - - - -236
MANDALAY	- - - - -240
MISAWA AB	- - - - -241
PEIPING	- - - - -241
PUSAN EAST	- - - - -241
SAIGON	- - - - -241
SHANGHAI	- - - - -241
TAIPEI	- - - - -241
TOKYO	- - - - -241

KODIAK

ADAK NS	- - - - -18
ALAMEDA NAS	- - - - -24
ALERT	- - - - -27
ATTU	- - - - -36
BOISE	- - - - -44
CHURCHILL	- - - - -81
DUTCH HARBOR	- - - - -107
EDMONTON	- - - - -111
EIELSON AFB	- - - - -120
ELLSWORTH AFB	- - - - -130
ELMENDORF AFB	- - - - -133
FORT LEWIS	- - - - -192

KODIAK (CONT.)

FORT ORD	-195
HILL AFB	-217
JUNEAU	-235
LARSON AFB	-241
MINOT AFB	-241
NELLIS AFB	-242
OXNARD AFB	-242
PRUDHOE HAY	-242
REGINA	-242
SHEMYA	-242
THULE	-242
YAKIMA	-242
YELLOWKNIFE	-242

KWAJALEIN IS

ANDERSON AFB	28
CONKTON	88
ENIWETOK ATOLL	-145
IWO JIMA AR	-231
JOHNSTON ISLAND	-235
MIDWAY ISLAND	-242
NOUMEA	-243
PAGO PAGO	-243
PORT MORESBY	-243
SUVA, FIJI	-243
VANIMO	-243
WAKE ISLAND	-243

LAHORE

ABADAN	17
ADEN	20
BAGHDAD	37
HANGKOK	39
BOMBAY	48
CALCUTTA	55
COLUMBO	87
QAHHRAN	100
HANOI	215
KARACHI	238
MANDALAY	243
NEW DELHI	243
TEHRAN	243
ZAHEDAN	244

LARSON AFB

ALAMEDA NAS	24
ANDREWS AFB	33
ROISE	44
CANNON AFB	55
CARSWELL AFB	61
CHICAGO	73
CHURCHILL	81
CORPUS CHRISTI	92
DOVER AFB	104

LARSON AFB (CONT.)

DUTCH HARBOR	-107
EDMONTON	-111
EGLIN AFB	-117
EIELSON AFB	-120
ELLINGTON AFB	-124
ELLSWORTH AFB	-130
ELMENDORF AFB	-133
EL TORO MCAS	-137
ENGLAND AFB	-142
FORT BENNING	-148
FORT BLISS	-153
FORT BRAGG/POPE	-157
FORT CAMPBELL	-162
FORT CARSON	-167
FORT EUSTIS	-171
FORT HOOD	-175
FORT HUACHUCA	-180
FORT KNOX	-184
FORT LEAVENWORTH	-188
FORT ORD	-195
FORT RUCKER	-198
FORT SILL	-201
FORT WOLTERS	-205
FROBISHER	-208
GEN MITCHELL	-211
HILL AFB	-217
HUNTER AAF	-224
HUNTSVILLE	-227
JUNEAU	-235
KODIAK	-241
LITTLE ROCK	-244
LOCKBOURNE	-244
LUKE AFB	-244
MCGUIRE AFB	-244
MEMPHIS	-244
MEXICO CITY	-244
MINOT AFB	-244
MINN-ST PAUL	-244
NELLIS AFB	-245
NEW CUMBERLAND	-245
NEW ORLEANS	-245
NIAGARA FALLS	-245
OXNARD AFB	-245
PITTSBURGH	-245
PRUDHOE HAY	-245
REGINA	-245
SCOTT AFB	-245
SELFRIDGE AFB	246
SHAW AFB	-246
WESTOVER AFB	-246
WURTSMITH	-246
YELLOWKNIFE	-246

LITTLE ROCK

ALAMEDA NAS	24
ANDREWS AFB	33
ROISE	44
CANNON AFB	55
CARSWELL AFB	61
CHERRY PT MCAS	67
CHICAGO	73
CHURCHILL	81
CORPUS CHRISTI	92
DOVER AFB	104
EDMONTON	112
EGLIN AFB	117
ELLINGTON AFB	124
ELLSWORTH AFB	130
EL TORO MCAS	137
ENGLAND AFB	142
FORT BENNING	148
FORT BLISS	153
FORT BRAGG/POPE	158
FORT CAMPBELL	162
FORT CARSON	167
FORT EUSTIS	171
FORT HOOD	175
FORT HUACHUCA	180
FORT KNOX	184
FORT LEAVENWORTH	188
FORT LEWIS	192
FORT ORD	195
FORT RUCKER	198
FORT SILL	201
FORT WOLTERS	205
FROBISHER	208
GEN MITCHELL	211
HILL AFB	217
HOMESTEAD AFB	220
HUNTER AAF	224
HUNTSVILLE	227
JACKSONVILLE	232
KEY WEST	238
LARSON AFB	244
LOCKBOURNE	244
LORING AFB	246
LUKE AFB	246
MCGUIRE AFB	246
MEXICO CITY	247
MINOT AFB	247
MINN-ST PAUL	247
NELLIS AFB	247
NEW CUMBERLAND	247
NEW ORLEANS	247
NIAGARA FALLS	247
OXNARD AFB	247
PATRICK AFB	247
PITTSBURGH	248

LITTLE ROCK (CONT.)

REGINA	-248
SCOTT AFB	-248
SELFRIDGE AFB	-248
SHAW AFB	-248
WESTOVER AFB	-248
WURTSMITH	-248
YAKIMA	-248
YELLOWKNIFE	-248

LOCKBOURNE

ALAMEDA NAS	24
ANDREWS AFB	33
ROISE	44
CANNON AFB	55
CARSWELL AFB	61
CHERRY PT MCAS	67
CHICAGO	73
CHURCHILL	81
CORPUS CHRISTI	92
DOVER AFB	105
EDMONTON	112
EGLIN AFB	117
ELLINGTON AFB	124
ELLSWORTH AFB	130
EL TORO MCAS	137
ENGLAND AFB	142
FORT BENNING	148
FORT BLISS	153
FORT BRAGG/POPE	158
FORT CAMPBELL	162
FORT CARSON	167
FORT EUSTIS	171
FORT HOOD	175
FORT HUACHUCA	180
FORT KNOX	184
FORT LEAVENWORTH	188
FORT LEWIS	192
FORT ORD	195
FORT RUCKER	198
FORT SILL	202
FORT WOLTERS	205
FROBISHER	208
GEN MITCHELL	211
HILL AFB	217
HOMESTEAD AFB	220
HUNTER AAF	225
HUNTSVILLE	227
JACKSONVILLE	232
KEY WEST	238
LARSON AFB	244
LITTLE ROCK	246
LORING AFB	249
LUKE AFB	249
MCGUIRE AFB	249

## LOCKBOURNE (CONT.)

MEMPHIS - - - - -249  
 MEXICO CITY - - - - -249  
 MINOT AFB - - - - -249  
 MINN-ST PAUL - - - - -249  
 NELLIS AFB - - - - -249  
 NEW CUMBERLAND - - - - -249  
 NEW ORLEANS - - - - -250  
 NIAGARA FALLS - - - - -250  
 OXNARD AFB - - - - -250  
 PATRICK AFB - - - - -250  
 REGINA - - - - -250  
 SCOTT AFB - - - - -250  
 SELFRIDGE AFB - - - - -250  
 SHAW AFB - - - - -250  
 WESTOVER AFB - - - - -250  
 WURTSMITH - - - - -251  
 YAKIMA - - - - -251  
 YELLOWKNIFE - - - - -251

## LORING AFB

ANDREWS AFB - - - - - 33  
 CANNON AFB - - - - - 55  
 CARSWELL AFB - - - - - 62  
 CHERRY PT MCAS - - - - - 67  
 CHICAGO - - - - - 73  
 CHURCHILL - - - - - 81  
 CORPUS CHRISTI - - - - - 92  
 DOVER AFB - - - - -105  
 EDMONTON - - - - -112  
 EGLIN AFB - - - - -117  
 ELLINGTON AFB - - - - -124  
 ELLSWORTH AFB - - - - -130  
 ENGLAND AFB - - - - -142  
 FORT BENNING - - - - -148  
 FORT BLISS - - - - -153  
 FORT BRAGG/POPE - - - - -158  
 FORT CAMPBELL - - - - -162  
 FORT CARSON - - - - -167  
 FORT EUSTIS - - - - -172  
 FORT HOOD - - - - -175  
 FORT KNOX - - - - -184  
 FORT LEAVENWORTH - - - - -188  
 FORT RUCKER - - - - -198  
 FORT SILL - - - - -202  
 FORT WOLTERS - - - - -205  
 FROBISHER - - - - -208  
 GEN MITCHELL - - - - -212  
 HILL AFB - - - - -217  
 HOMESTEAD AFB - - - - -220  
 HUNTER AAF - - - - -225  
 HUNTSVILLE - - - - -227  
 JACKSONVILLE - - - - -232  
 KEY WEST - - - - -238  
 LITTLE ROCK - - - - -246

## LORING AFB (CONT.)

LOCKBOURNE - - - - -249  
 MCGUIRE AFB - - - - -251  
 MEMPHIS - - - - -251  
 MINOT AFB - - - - -251  
 MINN-ST PAUL - - - - -251  
 NEW CUMBERLAND - - - - -251  
 NEW ORLEANS - - - - -251  
 NIAGARA FALLS - - - - -252  
 PATRICK AFB - - - - -252  
 PITTSBURGH - - - - -252  
 REGINA - - - - -252  
 SCOTT AFB - - - - -252  
 SELFRIDGE AFB - - - - -252  
 SHAW AFB - - - - -252  
 THULE - - - - -252  
 WESTOVER AFB - - - - -252  
 WURTSMITH - - - - -253  
 YELLOWKNIFE - - - - -253

## LUKE AFB

ALAMEDA NAS - - - - - 24  
 ANDREWS AFB - - - - - 34  
 BOISE - - - - - 44  
 CANNON AFB - - - - - 56  
 CARSWELL AFB - - - - - 62  
 CHERRY PT MCAS - - - - - 68  
 CHICAGO - - - - - 74  
 CHURCHILL - - - - - 81  
 CORPUS CHRISTI - - - - - 93  
 DOVER AFB - - - - -105  
 EDMONTON - - - - -112  
 EGLIN AFB - - - - -117  
 ELLINGTON AFB - - - - -125  
 ELLSWORTH AFB - - - - -130  
 EL TORN MCAS - - - - -137  
 ENGLAND AFB - - - - -142  
 FORT BENNING - - - - -148  
 FORT BLISS - - - - -153  
 FORT BRAGG/POPE - - - - -158  
 FORT CAMPBELL - - - - -162  
 FORT CARSON - - - - -167  
 FORT EUSTIS - - - - -172  
 FORT HOOD - - - - -176  
 FORT HUACHUCA - - - - -180  
 FORT KNOX - - - - -184  
 FORT LEAVENWORTH - - - - -189  
 FORT LEWIS - - - - -192  
 FORT ORD - - - - -195  
 FORT RUCKER - - - - -198  
 FORT SILL - - - - -202  
 FORT WOLTERS - - - - -205  
 GEN MITCHELL - - - - -212  
 HILL AFB - - - - -217  
 HOMESTEAD AFB - - - - -220

## LUKE AFB (CONT.)

HUNTER AAF - - - - -225  
 HUNTSVILLE - - - - -227  
 JACKSONVILLE - - - - -233  
 JUNEAU - - - - -235  
 KEY WEST - - - - -238  
 LARSON AFB - - - - -244  
 LITTLE ROCK - - - - -246  
 LOCKBOURNE - - - - -249  
 MCGUIRE AFB - - - - -253  
 MEMPHIS - - - - -253  
 MEXICO CITY - - - - -253  
 MINOT AFB - - - - -253  
 MINN-ST PAUL - - - - -253  
 NELLIS AFB - - - - -253  
 NEW CUMBERLAND - - - - -253  
 NEW ORLEANS - - - - -254  
 NIAGARA FALLS - - - - -254  
 OXNARD AFB - - - - -254  
 PATRICK AFB - - - - -254  
 PITTSBURGH - - - - -254  
 REGINA - - - - -254  
 SCOTT AFB - - - - -254  
 SELFRIDGE AFB - - - - -254  
 SHAW AFB - - - - -254  
 WESTOVER AFB - - - - -255  
 WURTSMITH - - - - -255  
 YAKIMA - - - - -255  
 YELLOWKNIFE - - - - -255

## MANDALAY

BANGKOK - - - - - 39  
 BOMBAY - - - - - 48  
 CALCUTTA - - - - - 50  
 CLARK AFB - - - - - 85  
 CULOMBON - - - - - 87  
 DA NANG - - - - - 96  
 DAVAO - - - - - 98  
 DJAKARTA - - - - -101  
 HANOI - - - - -215  
 HONG KONG - - - - -223  
 KADENA AB - - - - -237  
 KARACHI - - - - -238  
 KIMPI AB - - - - -240  
 LAHORE - - - - -243  
 MEDAN - - - - -255  
 NEW DELHI - - - - -255  
 PEIPING - - - - -255  
 PENANG - - - - -255  
 PUSAN EAST - - - - -255  
 SAIGON - - - - -256  
 SHANGHAI - - - - -256  
 SINGAPORE - - - - -256  
 TAIPEI - - - - -256

## MAURITIUS ISLAND

DIEGO GARCIA - - - - -100

## MCGUIRE AFB

BOISE - - - - - 45  
 CANNON AFB - - - - - 56  
 CARSWELL AFB - - - - - 62  
 CHERRY PT MCAS - - - - - 68  
 CHICAGO - - - - - 74  
 CHURCHILL - - - - - 82  
 CORPUS CHRISTI - - - - - 93  
 EDMONTON - - - - -112  
 EGLIN AFB - - - - -117  
 ELLINGTON AFB - - - - -125  
 ELLSWORTH AFB - - - - -130  
 ENGLAND AFB - - - - -142  
 FORT BENNING - - - - -148  
 FORT BLISS - - - - -153  
 FORT BRAGG/POPE - - - - -158  
 FORT CAMPBELL - - - - -162  
 FORT CARSON - - - - -167  
 FORT HOOD - - - - -176  
 FORT HUACHUCA - - - - -180  
 FORT KNOX - - - - -184  
 FORT LEAVENWORTH - - - - -189  
 FORT RUCKER - - - - -198  
 FORT SILL - - - - -202  
 FORT WOLTERS - - - - -205  
 FROBISHER - - - - -209  
 GEN MITCHELL - - - - -212  
 HILL AFB - - - - -218  
 HOMESTEAD AFB - - - - -221  
 HUNTER AAF - - - - -225  
 HUNTSVILLE - - - - -228  
 JACKSONVILLE - - - - -233  
 KEY WEST - - - - -239  
 LARSON AFB - - - - -244  
 LITTLE ROCK - - - - -246  
 LOCKBOURNE - - - - -249  
 LORING AFB - - - - -251  
 LUKE AFB - - - - -253  
 MEMPHIS - - - - -256  
 MEXICO CITY - - - - -256  
 MINOT AFB - - - - -256  
 MINN-ST PAUL - - - - -256  
 NELLIS AFB - - - - -257  
 NEW ORLEANS - - - - -257  
 NIAGARA FALLS - - - - -257  
 PATRICK AFB - - - - -257  
 PITTSBURGH - - - - -257  
 REGINA - - - - -257  
 SCOTT AFB - - - - -257  
 SELFRIDGE AFB - - - - -257  
 SHAW AFB - - - - -257  
 WESTOVER AFB - - - - -258



MCGUIRE AFB (CONT.)	MEMPHIS (CONT.)	MEXICO CITY (CONT.)	MIDWAY ISLAND (CONT.)
WURTSMITH - - - - -258	FORT HOOD - - - - -176	EL TORO MCAS - - - - -137	SHEMYA - - - - -263
YELLOWKNIFE - - - - -258	FORT HUACHUCA - - - - -180	ENGLAND AFB - - - - -142	WAKE ISLAND - - - - -263
MEDAN	FORT KNOX - - - - -184	FORT RENNING - - - - -148	MINOT AFB
HANGKOK - - - - -39	FORT LEAVENWORTH - - - - -189	FORT BLISS - - - - -153	ALAMEDA NAS - - - - -25
BONRAY - - - - -48	FORT LEWIS - - - - -192	FORT BRAGG/POPE - - - - -158	ANDREWS AFB - - - - -34
CALCUTTA - - - - -50	FORT ORD - - - - -195	FORT CAMPBELL - - - - -163	BOISE - - - - -45
CLARK AFB - - - - -85	FORT RUCKER - - - - -199	FORT CARSON - - - - -168	CANNON AFB - - - - -56
CULOMBO - - - - -87	FORT SILL - - - - -202	FORT EUSTIS - - - - -172	CARSWELL AFB - - - - -62
DA NANG - - - - -96	FORT WOLTERS - - - - -206	FORT HOOD - - - - -176	CHERRY PT MCAS - - - - -68
DAVAO - - - - -99	FROBISHER - - - - -209	FORT HUACHUCA - - - - -180	CHICAGO - - - - -74
DIEGO GARCIA - - - - -100	GEN MITCHELL - - - - -212	FORT KNOX - - - - -185	CHURCHILL - - - - -82
DJAKARTA - - - - -101	HILL AFB - - - - -218	FORT LEAVENWORTH - - - - -189	CORPUS CHRISTI - - - - -93
HANOI - - - - -215	HOMESTEAD AFB - - - - -221	FORT ORD - - - - -195	DOVER AFB - - - - -105
HONG KONG - - - - -273	HUNTER AAF - - - - -225	FORT RUCKER - - - - -199	EDMONTON - - - - -112
MANDALAY - - - - -255	HUNTSVILLE - - - - -228	FORT SILL - - - - -202	EGLIN AFB - - - - -118
NEW DELHI - - - - -258	JACKSONVILLE - - - - -233	FORT WOLTERS - - - - -206	ELLINGTON AFB - - - - -125
SAIGON - - - - -258	KEY WEST - - - - -239	GEN MITCHELL - - - - -212	ELLSWORTH AFB - - - - -131
SINGAPORE - - - - -258	LARSON AFB - - - - -244	HILL AFB - - - - -218	ELMENDORF AFB - - - - -133
TAIPEI - - - - -258	LOCKBOURNE - - - - -249	HOMESTEAD AFB - - - - -221	EL TORO MCAS - - - - -138
MELBOURNE	LORING AFB - - - - -251	HUNTER AAF - - - - -225	ENGLAND AFB - - - - -143
ADFLAIDE - - - - -19	LUKE AFB - - - - -253	HUNTSVILLE - - - - -228	FORT BENNING - - - - -149
BRISBANE - - - - -49	MCGUIRE AFB - - - - -256	JACKSONVILLE - - - - -233	FORT BLISS - - - - -154
COOKTOWN - - - - -48	MEXICO CITY - - - - -259	KEY WEST - - - - -239	FORT BRAGG/POPE - - - - -158
DARWIN - - - - -97	MINOT AFB - - - - -259	LARSON AFB - - - - -244	FORT CAMPBELL - - - - -163
NOUMEA - - - - -258	MINN-ST PAUL - - - - -259	LITTLE ROCK - - - - -247	FORT CARSON - - - - -168
PERTH - - - - -258	NELLIS AFB - - - - -259	LOCKBOURNE - - - - -249	FORT EUSTIS - - - - -172
PORT MORFESBY - - - - -259	NEW CUMBERLAND - - - - -259	LUKE AFB - - - - -253	FORT HOOD - - - - -176
WELLINGTON - - - - -259	NEW ORLEANS - - - - -259	MCGUIRE AFB - - - - -256	FORT HUACHUCA - - - - -180
MEMPHIS	NIAGARA FALLS - - - - -259	MEMPHIS - - - - -259	FORT KNOX - - - - -185
ALAMEDA NAS - - - - -34	OXNARD AFB - - - - -260	MINOT AFB - - - - -261	FORT LEAVENWORTH - - - - -189
ANDREWS AFB - - - - -34	PATRICK AFB - - - - -260	MINN-ST PAUL - - - - -261	FORT LEWIS - - - - -192
BOISE - - - - -45	PITTSBURGH - - - - -260	NELLIS AFB - - - - -261	FORT ORD - - - - -195
CANNON AFB - - - - -56	REGINA - - - - -260	NEW CUMBERLAND - - - - -261	FORT RUCKER - - - - -199
CARSWELL AFB - - - - -62	SCOTT AFB - - - - -260	NEW ORLEANS - - - - -261	FORT SILL - - - - -202
CHERRY PT MCAS - - - - -68	SELFRIDGE AFB - - - - -260	NIAGARA FALLS - - - - -261	FORT WOLTERS - - - - -206
CHICAGO - - - - -74	SHAW AFB - - - - -260	OXNARD AFB - - - - -261	FROBISHER - - - - -209
CHURCHILL - - - - -82	WESTOVER AFB - - - - -260	PATRICK AFB - - - - -262	GEN MITCHELL - - - - -212
CORPUS CHRISTI - - - - -93	WURTSMITH - - - - -260	PITTSBURGH - - - - -262	HILL AFB - - - - -218
DOVER AFB - - - - -105	YAKIMA - - - - -261	REGINA - - - - -262	HOMESTEAD AFB - - - - -221
EDMONTON - - - - -112	YELLOWKNIFE - - - - -261	SCOTT AFB - - - - -262	HUNTER AAF - - - - -225
EGLIN AFB - - - - -118	MEXICO CITY	SELFRIDGE AFB - - - - -262	HUNTSVILLE - - - - -228
ELLINGTON AFB - - - - -125	ALAMEDA NAS - - - - -25	SHAW AFB - - - - -262	JACKSONVILLE - - - - -233
ELLSWORTH AFB - - - - -131	ANDREWS AFB - - - - -34	WESTOVER AFB - - - - -262	JUNEAU - - - - -235
EL TORO MCAS - - - - -137	BOISE - - - - -45	WURTSMITH - - - - -262	KEY WEST - - - - -239
ENGLAND AFB - - - - -142	CANNON AFB - - - - -56	YAKIMA - - - - -262	KODIAK - - - - -241
FORT BENNING - - - - -148	CARSWELL AFB - - - - -62	MIDWAY ISLAND	LARSON AFB - - - - -244
FORT BLISS - - - - -153	CHERRY PT MCAS - - - - -68	ADAK NS - - - - -18	LITTLE ROCK - - - - -247
FORT BRAGG/POPE - - - - -158	CHICAGO - - - - -74	ATTU - - - - -36	LOCKBOURNE - - - - -249
FORT CAMPBELL - - - - -163	CORPUS CHRISTI - - - - -93	DUTCH HARBOR - - - - -108	LORING AFB - - - - -251
FORT CARSON - - - - -167	DOVER AFB - - - - -105	ENIWETOK ATOLL - - - - -149	LUKE AFB - - - - -253
FORT EUSTIS - - - - -172	EGLIN AFB - - - - -118	HICKAM AFB - - - - -216	MCGUIRE AFB - - - - -256
	ELLINGTON AFB - - - - -125	JOHNSTON ISLAND - - - - -235	MEMPHIS - - - - -259
	ELLSWORTH AFB - - - - -131	KWAJALEIN NS - - - - -242	

MINOT AFB (CONT.)

MEXICO CITY	-261
MINN-ST PAUL	-263
NELLIS AFB	-263
NEW CUMBERLAND	-263
NEW ORLEANS	-263
NIAGARA FALLS	-263
ONNARD AFB	-263
PATRICK AFB	-263
PITTSBURGH	-264
PRUDHOE BAY	-264
REGINA	-264
SCOTT AFB	-264
SELFRIDGE AFB	-264
SHAW AFB	-264
THULE	-264
WESTOVER AFB	-264
WURTSMITH	-264
YAKIMA	-265
YELLOWKNIFE	-265

MINN-ST PAUL

ALAMEDA NAS	-25
ANDREWS AFB	-34
BOISE	-45
CANNON AFB	-56
CANSWELL AFB	-62
CHERRY PT MCAS	-68
CHICAGO	-74
CHURCHILL	-92
CORPUS CHRISTI	-93
DIYVER AFB	-105
EDMONTON	-112
EGLIN AFB	-118
ELLINGTON AFB	-125
FLLSWORTH AFB	-131
EL TORO MCAS	-138
ENGLAND AFB	-143
FORT BENNING	-149
FORT BLISS	-154
FORT BRAGG/POPE	-158
FORT CAMPBELL	-163
FORT CARSON	-168
FORT EUSTIS	-172
FORT HOOD	-176
FORT HUACHUCA	-180
FORT KNOX	-185
FORT LEAVENWORTH	-189
FORT LEWIS	-192
FORT ORD	-196
FORT RUCKER	-199
FORT SILL	-202
FORT WALTERS	-206
FORT WORTH	-209
GEN MITCHELL	-212

MINN-ST PAUL (CONT.)

HILL AFB	-210
HOMESTEAD AFB	-221
HUNTER AFB	-225
HUNTSVILLE	-228
JACKSONVILLE	-233
JUNEAU	-235
KEY WEST	-239
LANSON AFB	-244
LITTLE ROCK	-247
LUCKBOURNE	-249
LORING AFB	-251
LUKE AFB	-253
MCGUIRE AFB	-256
MEMPHIS	-259
MEXICO CITY	-261
MINOT AFB	-263
NELLIS AFB	-265
NEW CUMBERLAND	-265
NEW ORLEANS	-265
NIAGARA FALLS	-265
ONNARD AFB	-265
PATRICK AFB	-265
PITTSBURGH	-265
REGINA	-266
SCOTT AFB	-266
SELFRIDGE AFB	-266
SHAW AFB	-266
THULE	-266
WESTOVER AFB	-266
WURTSMITH	-266
YAKIMA	-266
YELLOWKNIFE	-266

MISAWA AB

ADAK NS	-18
ANDERSON AFB	-29
ATTU	-36
CLARK AFB	-85
WONG KING	-223
IWAKUNI	-230
IWO JIMA AB	-231
KADENA AB	-237
KIMPO AB	-241
PEIPING	-267
PUSAN EAST	-267
SHANGHAI	-267
SHEMVA	-267
TAIPEI	-267
TOKYO	-267
WAKE ISLAND	-267

NELLIS AFB

ALAMEDA NAS	-25
ANDREWS AFB	-34

NELLIS AFB (CONT.)

BOISE	-45
CANNON AFB	-56
CANSWELL AFB	-62
CHERRY PT MCAS	-68
CHICAGO	-74
CHURCHILL	-82
CORPUS CHRISTI	-93
DIYVER AFB	-105
EDMONTON	-112
EGLIN AFB	-118
ELLINGTON AFB	-125
FLLSWORTH AFB	-131
ELMENDORF AFB	-133
EL TORO MCAS	-138
ENGLAND AFB	-143
FORT BENNING	-149
FORT BLISS	-154
FORT BRAGG/POPE	-158
FORT CAMPBELL	-163
FORT CARSON	-168
FORT EUSTIS	-172
FORT HOOD	-176
FORT HUACHUCA	-180
FORT KNOX	-185
FORT LEAVENWORTH	-189
FORT LEWIS	-192
FORT ORD	-196
FORT RUCKER	-199
FORT SILL	-202
FORT WALTERS	-206
GEN MITCHELL	-212
HILL AFB	-210
HOMESTEAD AFB	-221
HUNTER AFB	-225
HUNTSVILLE	-228
JACKSONVILLE	-233
JUNEAU	-235
KEY WEST	-239
KODIAK	-242
LANSON AFB	-244
LITTLE ROCK	-247
LUCKBOURNE	-249
LUKE AFB	-253
MCGUIRE AFB	-256
MEMPHIS	-259
MEXICO CITY	-261
MINOT AFB	-263
MINN-ST PAUL	-265
NEW CUMBERLAND	-265
NEW ORLEANS	-265
NIAGARA FALLS	-265
ONNARD AFB	-265
PATRICK AFB	-265
PITTSBURGH	-266

NELLIS AFB (CONT.)

REGINA	-264
SCOTT AFB	-264
SELFRIDGE AFB	-264
SHAW AFB	-264
WESTOVER AFB	-264
WURTSMITH	-264
YAKIMA	-264
YELLOWKNIFE	-264

NEW CUMBERLAND

BOISE	-45
CANNON AFB	-56
CANSWELL AFB	-62
CHERRY PT MCAS	-68
CHICAGO	-74
CHURCHILL	-82
CORPUS CHRISTI	-93
EDMONTON	-112
EGLIN AFB	-118
ELLINGTON AFB	-125
FLLSWORTH AFB	-131
EL TORO MCAS	-138
ENGLAND AFB	-143
FORT BENNING	-149
FORT BLISS	-154
FORT BRAGG/POPE	-158
FORT CAMPBELL	-163
FORT CARSON	-168
FORT EUSTIS	-172
FORT HUACHUCA	-180
FORT KNOX	-185
FORT LEAVENWORTH	-189
FORT LEWIS	-192
FORT ORD	-196
FORT RUCKER	-199
FORT SILL	-202
FORT WALTERS	-206
GEN MITCHELL	-212
HILL AFB	-210
HOMESTEAD AFB	-221
HUNTER AFB	-225
HUNTSVILLE	-228
JACKSONVILLE	-233
JUNEAU	-235
KEY WEST	-239
KODIAK	-242
LANSON AFB	-244
LITTLE ROCK	-247
LUCKBOURNE	-249
LUKE AFB	-253
MCGUIRE AFB	-256
MEMPHIS	-259
MEXICO CITY	-261
MINOT AFB	-263
MINN-ST PAUL	-265
NEW CUMBERLAND	-265
NEW ORLEANS	-265
NIAGARA FALLS	-265
ONNARD AFB	-265
PATRICK AFB	-265
PITTSBURGH	-266

NEW CUMBERLAND (CONT.)

NEW ORLEANS - - - -	-269
NIAGARA FALLS - - - -	-269
PATRICK AFB - - - -	-269
PITTSBURGH - - - -	-269
REGINA - - - -	-269
SCOTT AFB - - - -	-269
SELFRIDGE AFB - - - -	-270
SHAW AFB - - - -	-270
WESTOVER AFB - - - -	-270
WRIGHTSMITH - - - -	-270
YAKIMA - - - -	-270
YLLINGHAM - - - -	-270

NEW DELHI

ANDAMAN - - - -	17
BANGALOR - - - -	37
BANGKOK - - - -	39
BOMBAY - - - -	48
CALCUTTA - - - -	90
CEYLON - - - -	87
DA NANG - - - -	96
DMANRAN - - - -	-100
HANOI - - - -	-215
KARACHI - - - -	-218
LANING - - - -	-243
MADAGASCAR - - - -	-255
MEAN - - - -	-259
PHNANG - - - -	-270
SAGINA - - - -	-270
TENHAN - - - -	-270
ZANEDAN - - - -	-271

NEW ORLEANS

ALAMEDA NAS - - - -	25
ANDREWS AFB - - - -	34
BOISE - - - -	45
CANNON AFB - - - -	56
CARSWELL AFB - - - -	63
CHERRY PT MCAS - - - -	69
CHICAGO - - - -	74
CHURCHILL - - - -	82
CORPUS CHRISTI - - - -	93
DWYER AFB - - - -	-105
EDMONTON - - - -	-113
EGLIN AFB - - - -	-118
ELLINGTON AFB - - - -	-125
ELLSWORTH AFB - - - -	-131
FL TOWN MCAS - - - -	-138
ENGLAND AFB - - - -	-143
FORT RENNING - - - -	-149
FORT ALISS - - - -	-154
FORT BRAGG/POPE - - - -	-159
FORT CAMPBELL - - - -	-163
FORT CARSON - - - -	-168

NEW ORLEANS (CONT.)

FORT EUSTIS - - - -	-172
FORT HOOD - - - -	-176
FORT HUACHUCA - - - -	-181
FORT KNOX - - - -	-189
FORT LEAVENWORTH - - - -	-189
FORT LEWIS - - - -	-193
FORT ORD - - - -	-196
FORT RUCKER - - - -	-199
FORT SILL - - - -	-203
FORT WALTERS - - - -	-206
GEN MITCHELL - - - -	-213
HILL AFB - - - -	-219
HUMPHREYS AFB - - - -	-221
HUNTER AFB - - - -	-226
HUNTSVILLE - - - -	-228
JACKSONVILLE - - - -	-233
KFY WEST - - - -	-239
LARSON AFB - - - -	-245
LITTLE ROCK - - - -	-247
LOCKBOURNE - - - -	-250
LUKE AFB - - - -	-254
MCGUIRE AFB - - - -	-257
MEMPHIS - - - -	-259
MEXICO CITY - - - -	-261
MINOT AFB - - - -	-263
MINN-ST PAUL - - - -	-265
NELLIS AFB - - - -	-267
NEW CUMBERLAND - - - -	-269
NIAGARA FALLS - - - -	-271
OKNARD AFB - - - -	-271
PATRICK AFB - - - -	-271
PITTSBURGH - - - -	-271
REGINA - - - -	-271
SCOTT AFB - - - -	-271
SELFRIDGE AFB - - - -	-271
SHAW AFB - - - -	-271
WESTOVER AFB - - - -	-272
WRIGHTSMITH - - - -	-272
YAKIMA - - - -	-272

NIAGARA FALLS

ALAMEDA NAS - - - -	25
ANDREWS AFB - - - -	34
BOISE - - - -	45
CANNON AFB - - - -	57
CARSWELL AFB - - - -	63
CHERRY PT MCAS - - - -	69
CHICAGO - - - -	74
CHURCHILL - - - -	82
CORPUS CHRISTI - - - -	93
DWYER AFB - - - -	-106
EDMONTON - - - -	-113
EGLIN AFB - - - -	-118

NIAGARA FALLS (CONT.)

ELLINGTON AFB - - - -	-126
ELLSWORTH AFB - - - -	-131
FL TOWN MCAS - - - -	-138
ENGLAND AFB - - - -	-143
FORT RENNING - - - -	-149
FORT ALISS - - - -	-154
FORT BRAGG/POPE - - - -	-159
FORT CAMPBELL - - - -	-163
FORT CARSON - - - -	-168
FORT EUSTIS - - - -	-172
FORT HOOD - - - -	-177
FORT HUACHUCA - - - -	-181
FORT KNOX - - - -	-189
FORT LEAVENWORTH - - - -	-189
FORT LEWIS - - - -	-193
FORT ORD - - - -	-196
FORT RUCKER - - - -	-199
FORT SILL - - - -	-203
FORT WALTERS - - - -	-206
FRANKFURT - - - -	-209
GEN MITCHELL - - - -	-213
HILL AFB - - - -	-219
HUMPHREYS AFB - - - -	-221
HUNTER AFB - - - -	-226
HUNTSVILLE - - - -	-228
JACKSONVILLE - - - -	-233
KFY WEST - - - -	-239
LARSON AFB - - - -	-245
LITTLE ROCK - - - -	-247
LOCKBOURNE - - - -	-250
LUKE AFB - - - -	-254
MCGUIRE AFB - - - -	-257
MEMPHIS - - - -	-259
MEXICO CITY - - - -	-261
MINOT AFB - - - -	-263
MINN-ST PAUL - - - -	-265
NELLIS AFB - - - -	-267
NEW CUMBERLAND - - - -	-269
NEW ORLEANS - - - -	-271
OKNARD AFB - - - -	-271
PATRICK AFB - - - -	-271
PITTSBURGH - - - -	-271
REGINA - - - -	-271
SCOTT AFB - - - -	-271
SELFRIDGE AFB - - - -	-271
SHAW AFB - - - -	-271
WESTOVER AFB - - - -	-272
WRIGHTSMITH - - - -	-272
YAKIMA - - - -	-272
YLLINGHAM - - - -	-272

NUMA

ADLAIDE - - - -	19
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NUMA (CONT.)

BRISBANE - - - -	49
COOKTOWN - - - -	88
KWAJALEIN NS - - - -	-243
MELBOURNE - - - -	-258
PAGO PAGO - - - -	-273
FORT MORESBY - - - -	-273
SUVA, FIJI - - - -	-273
VANINO - - - -	-273
WELLINGTON - - - -	-274

OKNARD AFB

ALAMEDA NAS - - - -	25
BOISE - - - -	46
CANNON AFB - - - -	57
CARSWELL AFB - - - -	63
CHICAGO - - - -	75
CHURCHILL - - - -	82
CORPUS CHRISTI - - - -	94
EDMONTON - - - -	-113
EGLIN AFB - - - -	-118
ELLINGTON AFB - - - -	-126
ELLSWORTH AFB - - - -	-131
ENGLAND AFB - - - -	-143
FORT RENNING - - - -	-149
FORT ALISS - - - -	-154
FORT BRAGG/POPE - - - -	-159
FORT CAMPBELL - - - -	-163
FORT CARSON - - - -	-168
FORT HOOD - - - -	-177
FORT HUACHUCA - - - -	-181
FORT KNOX - - - -	-189
FORT LEAVENWORTH - - - -	-190
FORT LEWIS - - - -	-193
FORT ORD - - - -	-196
FORT RUCKER - - - -	-199
FORT SILL - - - -	-203
FORT WALTERS - - - -	-206
GEN MITCHELL - - - -	-213
HILL AFB - - - -	-219
HUNTER AFB - - - -	-226
HUNTSVILLE - - - -	-229
JACKSONVILLE - - - -	-234
JUNEAU - - - -	-236
KNOX - - - -	-242
LARSON AFB - - - -	-245
LITTLE ROCK - - - -	-247
LOCKBOURNE - - - -	-250
LUKE AFB - - - -	-254
MEMPHIS - - - -	-260
MEXICO CITY - - - -	-261
MINOT AFB - - - -	-263
MINN-ST PAUL - - - -	-265
NELLIS AFB - - - -	-268
NEW ORLEANS - - - -	-271

<b>ONARD AFB (CONT.)</b>	<b>PATRICK AFB (CONT.)</b>	<b>PFNANG (CONT.)</b>	<b>PITTSBURGH (CONT.)</b>
NIAGARA FALLS - - - -272	HUNTER AAF - - - -226	DJAKARTA - - - -101	HUNTER AAF - - - -226
PATRICK AFB - - - -274	HUNTSVILLE - - - -229	HANOI - - - -215	HUNTSVILLE - - - -229
PITTSBURGH - - - -274	KEY WEST - - - -240	HONG KONG - - - -223	JACKSONVILLE - - - -214
REGINA - - - -274	LITTLE ROCK - - - -247	MANDALAY - - - -255	KEY WEST - - - -240
SCOTT AFB - - - -274	LOCKBOURNE - - - -250	NEW DELHI - - - -270	LARSON AFB - - - -245
SELFRIDGE AFB - - -274	LORING AFB - - - -252	SAIGON - - - -276	LITTLE ROCK - - - -248
SHAW AFB - - - -274	LUKE AFB - - - -254	SHANGHAI - - - -277	LORING AFB - - - -252
WURTSMITH - - - -274	MCGUIRE AFB - - -257	SINGAPORE - - - -277	LUKE AFB - - - -254
YAKIMA - - - -274	MEMPHIS - - - -260	TAIPEI - - - -277	MCGUIRE AFB - - - -257
YELLOWKNIFE - - - -275	MEXICO CITY - - - -262		MEMPHIS - - - -260
	MINOT AFB - - - -263	<b>PERTH</b>	MEXICO CITY - - - -262
<b>PAGO PAGO</b>	MINN-ST PAUL - - - -265	ADELAIDE - - - -19	MINOT AFB - - - -264
JOHNSTON ISLAND - - -235	NELLIS AFB - - - -268	BRISBANE - - - -49	MINN-ST PAUL - - - -265
KWAJALEIN NS - - - -243	NEW CUMBERLAND - - -269	COCKTOWN - - - -88	NELLIS AFB - - - -268
NUMEA - - - -273	NEW ORLEANS - - - -271	DARWIN - - - -97	NEW CUMBERLAND - - -269
PAPEETE - - - -275	NIAGARA FALLS - - -272	DJAKARTA - - - -101	NEW ORLEANS - - - -271
SUVA, FIJI - - - -275	ONWARD AFB - - - -274	MELBOURNE - - - -258	NIAGARA FALLS - - -272
WELLINGTON - - - -275	PITTSBURGH - - - -275		ONWARD AFB - - - -274
	REGINA - - - -275	<b>PITTSBURGH</b>	PATRICK AFB - - - -275
<b>PAPETE</b>	SCOTT AFB - - - -275	ALAMEDA NAS - - - -25	REGINA - - - -277
PAGO PAGO - - - -275	SELFRIDGE AFB - - -275	ANDREWS AFB - - - -35	SCOTT AFB - - - -277
SUVA, FIJI - - - -275	SHAW AFB - - - -276	NOISE - - - -46	SELFRIDGE AFB - - -277
	WESTOVER AFB - - -276	CANNON AFB - - - -57	SHAW AFB - - - -277
<b>PATRICK AFB</b>	WURTSMITH - - - -276	CARSWELL AFB - - - -63	WESTOVER AFB - - -277
ANDREWS AFB - - - -34		CHERRY PT MCAS - - - -69	WURTSMITH - - - -277
NOISE - - - -46	<b>PEIPING</b>	CHICAGO - - - -75	YAKIMA - - - -278
CANNON AFB - - - -57	HANGKOK - - - -39	CHURCHILL - - - -83	YELLOWKNIFE - - - -278
CARSWELL AFB - - - -63	CALCUTTA - - - -90	CORPUS CHRISTI - - - -94	
CHERRY PT MCAS - - - -69	CHITOSE AB - - - -77	DAVEN AFB - - - -106	<b>PORT MORESBY</b>
CHICAGO - - - -75	CLARK AFB - - - -85	EDMONTON - - - -113	ADELAIDE - - - -19
CHURCHILL - - - -83	DA NANG - - - -96	EGLIN AFB - - - -119	ANDERSON AFB - - - -29
CORPUS CHRISTI - - - -94	HANOI - - - -215	ELLINGTON AFB - - - -126	BRISBANE - - - -49
DIVIS AFB - - - -106	HONG KONG - - - -223	ELLSWORTH AFB - - - -132	COCKTOWN - - - -89
EGLIN AFB - - - -119	IMAKUNI - - - -230	EL TORO MCAS - - - -138	DARWIN - - - -97
ELLINGTON AFB - - - -126	IMU JIMA AB - - - -231	ENGLAND AFB - - - -143	DAVAO - - - -99
ELLSWORTH AFB - - - -132	KADENA AB - - - -237	FORT BENNING - - - -149	ENIWETOK ATOLL - - - -145
EL TORO MCAS - - - -138	KINNO AB - - - -241	FORT BLISS - - - -154	KWAJALEIN NS - - - -243
ENGLAND AFB - - - -143	MANDALAY - - - -255	FORT BRAGG/POPE - - - -159	MELBOURNE - - - -259
FORT BENNING - - - -149	MISAWA AB - - - -267	FORT CAMPBELL - - - -164	NUMEA - - - -273
FORT BLISS - - - -154	PUSAN EAST - - - -276	FORT CARSON - - - -169	SUVA, FIJI - - - -278
FORT BRAGG/POPE - - -159	SAIGON - - - -276	FORT EUSTIS - - - -173	VANIMO - - - -278
FORT CAMPBELL - - - -164	SHANGHAI - - - -276	FORT HOOD - - - -177	
FORT CARSON - - - -169	TAIPEI - - - -276	FORT HUACHUCA - - - -181	<b>PRUDHOF HAY</b>
FORT EUSTIS - - - -173	TOKYO - - - -276	FORT KNOX - - - -186	ADAK NS - - - -19
FORT HOND - - - -177		FORT LEAVENWORTH - - - -190	ALERT - - - -27
FORT HUACHUCA - - - -181	<b>PENANG</b>	FORT LEWIS - - - -193	ATTU - - - -36
FORT KNOX - - - -186	HANGKOK - - - -39	FORT ORD - - - -196	NOISE - - - -46
FORT LEAVENWORTH - - -190	IMMRAY - - - -48	FORT RUCKER - - - -200	CHURCHILL - - - -83
FORT RUCKER - - - -200	CALCUTTA - - - -51	FORT SILL - - - -203	DUTCH HARBOR - - - -108
FORT SILL - - - -203	CLARK AFB - - - -85	FORT WALTERS - - - -207	EDMONTON - - - -113
FORT WALTERS - - - -207	COLIMBO - - - -87	FROBISHER - - - -209	EIELSON AFB - - - -121
GEN MITCHELL - - - -213	DA NANG - - - -96	GEN MITCHELL - - - -213	ELMENDORF AFB - - - -134
HILL AFB - - - -219	DAVAO - - - -99	HILL AFB - - - -219	FORT LEWIS - - - -193
HOMESTEAD AFB - - - -222	JIFON GARCIA - - - -100	HOMESTEAD AFB - - - -222	FROBISHER - - - -209

PRUDHIE BAY (CONT.)

JUNFAU	-236
KODIAK	-242
LARSON AFB	-245
MINOT AFB	-264
REGINA	-278
SHEMYA	-278
THULE	-278
YAKIMA	-278
YELLOWKNIFE	-278

PUSAN EAST

ANDERSUM AFB	29
BANGKOK	39
CHITOSE AB	77
CLARK AFB	86
DA NANG	96
DAVAO	99
HANOI	-215
HONG KONG	-223
IWAKUNI	-230
IWO JIMA AB	-231
KADENA AB	-237
KIMPO AB	-241
MANDALAY	-255
MISAWA AB	-267
PEIPING	-276
SAIGON	-279
SHANGHAI	-279
TAIPEI	-279
TOKYO	-279

REGINA

ALAMEDA NAS	25
ANDREWS AFB	35
BOISE	46
CANNON AFB	57
CARSWELL AFB	63
CHERRY PT MCAS	69
CHICAGO	75
CHURCHILL	83
CORPUS CHRISTI	94
DOVER AFB	-106
EDMONTON	-113
EGLIN AFB	-119
FIELSON AFB	-121
ELLINGTON AFB	-126
ELLSWORTH AFB	-132
ELMENDORF AFB	-134
EL TORO MCAS	-138
ENGLAND AFB	-144
FORT BENNING	-150
FORT BLISS	-155
FORT BRAGG/POPE	-159
FORT CAMPBELL	-164

REGINA (CONT.)

FORT CARSON	-169
FORT EUSTIS	-173
FORT HOOD	-177
FORT HUACHUCA	-181
FORT KNOX	-186
FORT LEAVENWORTH	-190
FORT LEWIS	-193
FORT ORD	-196
FORT RUCKER	-200
FORT SILL	-203
FORT WALTERS	-207
FRUISHER	-209
GEN MITCHELL	-213
HILL AFB	-219
HOMESTEAD AFB	-222
HUNTER AAF	-226
HUNTSVILLE	-229
JACKSONVILLE	-234
JUNFAU	-236
KEY WEST	-240
KODIAK	-242
LARSON AFB	-245
LITTLE ROCK	-248
LOCKBOURNE	-250
LORING AFB	-252
LUKE AFB	-254
MCGUIRE AFB	-257
MEMPHIS	-260
MEXICO CITY	-262
MINOT AFB	-264
MINN-ST PAUL	-266
NELLIS AFB	-268
NEW CUMBERLAND	-269
NEW ORLEANS	-271
NIAGARA FALLS	-272
ONNARD AFB	-274
PATRICK AFB	-275
PITTSBURGH	-277
PRUDHIE BAY	-278
SCOTT AFB	-279
SELFRIDGE AFB	-279
SHAW AFB	-279
THULE	-279
WESTOVER AFB	-279
WURTSMITH	-280
YAKIMA	-280
YELLOWKNIFE	-280

SAIGON

HANGKOK	40
CALCUTTA	51
CLARK AFB	86
COLMBO	87
DA NANG	96

SAIGON (CONT.)

DAVAO	99
DJAKARTA	-101
HANOI	-215
HONG KONG	-224
IWAKUNI	-230
KADENA AB	-237
KIMPO AB	-241
MANDALAY	-256
MEDAN	-258
NEW DELHI	-270
PEIPING	-276
PENANG	-276
PUSAN EAST	-279
SHANGHAI	-280
SINGAPORE	-280
TAIPEI	-280

SCOTT AFB

ALAMEDA NAS	26
ANDREWS AFB	35
BOISE	46
CANNON AFB	57
CARSWELL AFB	63
CHERRY PT MCAS	69
CHICAGO	75
CHURCHILL	83
CORPUS CHRISTI	94
DOVER AFB	-106
EDMONTON	-113
EGLIN AFB	-119
ELLINGTON AFB	-126
ELLSWORTH AFB	-132
EL TORO MCAS	-139
ENGLAND AFB	-144
FORT BENNING	-150
FORT BLISS	-155
FORT BRAGG/POPE	-159
FORT CAMPBELL	-164
FORT CARSON	-169
FORT EUSTIS	-173
FORT HOOD	-177
FORT HUACHUCA	-181
FORT KNOX	-186
FORT LEAVENWORTH	-190
FORT LEWIS	-193
FORT ORD	-196
FORT RUCKER	-200
FORT SILL	-203
FORT WALTERS	-207
FRUISHER	-210
GEN MITCHELL	-213
HILL AFB	-219
HOMESTEAD AFB	-222
HUNTER AAF	-226

SCOTT AFB (CONT.)

HUNTSVILLE	-229
JACKSONVILLE	-234
KEY WEST	-240
LARSON AFB	-245
LITTLE ROCK	-248
LOCKBOURNE	-250
LORING AFB	-252
LUKE AFB	-254
MCGUIRE AFB	-257
MEMPHIS	-260
MEXICO CITY	-262
MINOT AFB	-264
MINN-ST PAUL	-266
NELLIS AFB	-268
NEW CUMBERLAND	-269
NEW ORLEANS	-271
NIAGARA FALLS	-272
ONNARD AFB	-274
PATRICK AFB	-275
PITTSBURGH	-277
REGINA	-279
SELFRIDGE AFB	-280
SHAW AFB	-280
WESTOVER AFB	-280
WURTSMITH	-281
YAKIMA	-281
YELLOWKNIFE	-281

SELFRIDGE AFB

ALAMEDA NAS	26
ANDREWS AFB	35
BOISE	46
CANNON AFB	57
CARSWELL AFB	63
CHERRY PT MCAS	69
CHICAGO	75
CHURCHILL	83
CORPUS CHRISTI	94
DOVER AFB	-106
EDMONTON	-113
EGLIN AFB	-119
ELLINGTON AFB	-126
ELLSWORTH AFB	-132
EL TORO MCAS	-139
ENGLAND AFB	-144
FORT BENNING	-150
FORT BLISS	-155
FORT BRAGG/POPE	-160
FORT CAMPBELL	-164
FORT CARSON	-169
FORT EUSTIS	-173
FORT HOOD	-177
FORT HUACHUCA	-182
FORT KNOX	-186

**SELFRIDGE AFB (CONT.)**

FORT LEAVENWORTH-	-190
FORT LEWIS-	-194
FORT ORD-	-196
FORT RUCKER-	-200
FORT SILL-	-203
FORT WOLTERS-	-207
FROBISHER-	-210
GEN MITCHELL-	-213
HILL AFB-	-219
HOMESTEAD AFB-	-222
HUNTER AAF-	-226
HUNTSVILLE-	-229
JACKSONVILLE-	-234
KEY WEST-	-240
LARSON AFB-	-246
LITTLE ROCK-	-248
LOCKBOURNE-	-250
LORING AFB-	-252
LUKE AFB-	-254
MCGUIRE AFB-	-257
MEMPHIS-	-260
MEXICO CITY-	-262
MINOT AFB-	-264
MINN-ST PAUL-	-266
NELLIS AFB-	-268
NEW CUMBERLAND-	-270
NEW ORLEANS-	-271
NIAGARA FALLS-	-272
OXNARD AFB-	-274
PATRICK AFB-	-275
PITTSBURGH-	-277
REGINA-	-279
SCOTT AFB-	-280
SHAW AFB-	-281
WESTOVER AFB-	-281
YAKIMA-	-281
YELLOWKNIFE-	-281

**SHANGHAI**

ANDERSON AFB-	- 29
BANGKOK -	- 40
CALCUTTA-	- 51
CHITOSE AB-	- 77
CLARK AFB-	- 86
DA NANG -	- 96
DAVAO -	- 99
HANOI -	-215
HONG KONG -	-224
IWAKUNI -	-231
IWO JIMA AB -	-232
KADENA AB -	-237
KIMPO AB-	-241
MANDALAY-	-256
MISAWA AB -	-267

**SHANGHAI (CONT.)**

PEIPING -	-276
PENANG -	-277
PUSAN EAST-	-279
SAIGON-	-280
TAIPEI-	-281
TOKYO -	-281

**SHAW AFB**

ANDREWS AFB -	- 35
BOISE -	- 46
CANNON AFB-	- 57
CANSWELL AFB-	- 63
CHERRY PT MCAS-	- 69
CHICAGO -	- 75
CHURCHILL -	- 83
CORPUS CHRISTI-	- 94
DOVER AFB -	-106
EDMONTON-	-114
EGLIN AFB -	-119
ELLINGTON AFB-	-126
ELLSWORTH AFB-	-132
EL TORO MCAS -	-139
ENGLAND AFB -	-144
FORT HENNING-	-150
FORT BLISS -	-155
FORT CAMPBELL -	-164
FORT CARSON -	-169
FORT EUSTIS -	-173
FORT HOND -	-177
FORT HUACHUCA -	-182
FORT KNIX -	-186
FORT LEAVENWORTH-	-190
FORT RUCKER -	-200
FORT SILL -	-204
FORT WOLTERS-	-207
FROBISHER -	-210
GEN MITCHELL-	-213
HILL AFB -	-219
HOMESTEAD AFB-	-222
HUNTSVILLE-	-229
JACKSONVILLE-	-234
KEY WEST -	-240
LARSON AFB -	-246
LITTLE ROCK -	-248
LOCKBOURNE-	-250
LORING AFB-	-252
LUKE AFB -	-254
MCGUIRE AFB -	-257
MEMPHIS -	-260
MEXICO CITY -	-262
MINOT AFB -	-264
MINN-ST PAUL-	-266
NELLIS AFB-	-268
NEW CUMBERLAND-	-270

**SHAW AFB (CONT.)**

NEW ORLEANS -	-271
NIAGARA FALLS -	-273
OXNARD AFB-	-274
PATRICK AFB -	-276
PITTSBURGH-	-277
REGINA-	-279
SCOTT AFB -	-280
SELFRIDGE AFB-	-281
WESTOVER AFB-	-282
WURTSMITH -	-282
YAKIMA -	-282

**SHEMYA**

ADAK NS -	- 19
CHITOSE AB-	- 77
DUTCH HARBOR-	-108
EGLIN AFB -	-121
ELMENDORF AFB-	-134
JUNEAU -	-236
KODIAK -	-242
MIDWAY ISLAND -	-263
MISAWA AB -	-267
PRUDHOE BAY -	-278
TOKYO -	-282

**SINGAPORE**

BANGKOK -	- 40
CALCUTTA -	- 51
CLARK AFB -	- 86
COLOMBO -	- 88
DA NANG -	- 97
DARWIN -	- 97
DAVAO -	- 99
DIEGO GARCIA-	-101
DJAKARTA -	-101
HANOI -	-216
HONG KONG -	-224
MANDALAY -	-256
MEDAN -	-258
PENANG -	-277
SAIGON -	-280
TAIPEI -	-282

**SUVA, FIJI**

BRISBANE-	- 49
COOKTOWN -	- 89
ENIWTOK ATOLL -	-145
KWAJALEIN NS -	-243
NOUMEA -	-273
PAGO PAGO -	-275
PAPEETE -	-275
PORT MORESBY-	-278
WELLINGTON-	-282

**TAIPEI**

ANDERSON AFB-	- 29
BANGKOK -	- 40
CALCUTTA-	- 51
CHITOSE AB-	- 77
CLARK AFB-	- 86
DA NANG -	- 97
DAVAO -	- 99
HANOI -	-216
HONG KONG -	-224
IWAKUNI -	-231
IWO JIMA AB -	-232
KADENA AB -	-237
KIMPO AB-	-241
MANDALAY-	-256
MEDAN -	-258
MISAWA AB -	-267
PEIPING -	-276
PENANG -	-277
PUSAN EAST-	-279
SAIGON-	-280
SHANGHAI-	-281
SINGAPORE -	-282
TOKYO -	-282

**TEHRAN**

ABADAN -	- 17
ADEN -	- 20
BAGHDAD -	- 37
BOMBAY -	- 40
DHAHRAN -	-100
KARACHI -	-238
LAHORE -	-243
NEW DELHI -	-270
ZAHEDAN -	-282

**THULE**

ALERT -	- 27
CHURCHILL -	- 83
EDMONTON-	-114
EIELSON AFB -	-121
ELMENDORF AFB-	-134
FROBISHER -	-210
JUNEAU -	-236
KODIAK -	-242
LORING AFB-	-252
MINOT AFB -	-264
MINN-ST PAUL -	-266
PRUDHOE BAY -	-278
REGINA -	-279
WURTSMITH -	-282
YELLOWKNIFE -	-283

**TOKYO**

ANDERSON AFB-	- 29
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<b>TOKYO (CONT.)</b>	<b>WELLINGTON (CONT.)</b>	<b>WESTOVER AFB (CONT.)</b>	<b>WURTSMITH (CONT.)</b>
ATTU - - - - - 37	SUVA, FIJI - - - - -282	REGINA - - - - -279	MEXICO CITY - - - - -262
CHITOSE AB - - - - - 77		SCOTT AFB - - - - -280	MINOT AFB - - - - -264
CLARK AFB - - - - - 86	<b>WESTOVER AFB</b>	SELFRIDGE AFB - - - - -281	MINN-ST PAUL - - - - -266
DAVAO - - - - - 99	ANDREWS AFB - - - - - 35	SHAW AFB - - - - -282	NELLIS AFB - - - - -269
ENIWETOK ATOLL - - - - -145	ROISE - - - - - 46	WURTSMITH - - - - -283	NEW CUMBERLAND - - - - -270
HANOI - - - - -216	CANNON AFB - - - - - 57	YELLOWKNIFE - - - - -283	NEW ORLEANS - - - - -272
HONG KONG - - - - -224	CARSWELL AFB - - - - - 64		NIAGARA FALLS - - - - -273
IWAKUNI - - - - -231	CHERRY PT MCAS - - - - - 69	<b>WURTSMITH</b>	OXNARD AFB - - - - -274
IWO JIMA AB - - - - -232	CHICAGO - - - - - 75	ALAMEDA NAS - - - - - 26	PATRICK AFB - - - - -276
KADENA AB - - - - -237	CHURCHILL - - - - - 83	ANDREWS AFB - - - - - 35	PITTSBURGH - - - - -277
KIMP AB - - - - -241	CORPUS CHRISTI - - - - - 94	ROISE - - - - - 47	REGINA - - - - -280
MISAWA AB - - - - -267	DOVER AFB - - - - -106	CANNON AFB - - - - - 58	SCOTT AFB - - - - -281
PEIPING - - - - -276	EDMONTON - - - - -114	CARSWELL AFB - - - - - 64	SHAW AFB - - - - -282
PUSAN EAST - - - - -279	EGLIN AFB - - - - -119	CHERRY PT MCAS - - - - - 69	THULE - - - - -282
SHANGHAI - - - - -281	ELLINGTON AFB - - - - -126	CHICAGO - - - - - 76	WESTOVER AFB - - - - -283
SHYMYA - - - - -282	ELLSWORTH AFB - - - - -132	CHURCHILL - - - - - 84	YAKIMA - - - - -283
TAIPEI - - - - -282	ENGLAND AFB - - - - -144	CORPUS CHRISTI - - - - - 95	YELLOWKNIFE - - - - -283
WAKE ISLAND - - - - -283	FORT BENNING - - - - -150	DOVER AFB - - - - -106	
	FORT BLISS - - - - -155	EDMONTON - - - - -114	<b>YAKIMA</b>
<b>VANIMO</b>	FORT BRAGG/POPE - - - - -160	EGLIN AFB - - - - -119	ALAMEDA NAS - - - - - 26
ADFLAIDE - - - - - 20	FORT CAMPBELL - - - - -164	ELLINGTON AFB - - - - -127	ANDREWS AFB - - - - - 35
ANDERSON AFB - - - - - 29	FORT CARSON - - - - -169	ELLSWORTH AFB - - - - -132	ROISE - - - - - 47
BRISBANE - - - - - 49	FORT EUSTIS - - - - -173	EL TORO MCAS - - - - -139	CANNON AFB - - - - - 58
CLARK AFB - - - - - 86	FORT HOOD - - - - -177	ENGLAND AFB - - - - -144	CARSWELL AFB - - - - - 64
COMPTON - - - - - 89	FORT HUACHUCA - - - - -182	FORT BENNING - - - - -150	CHICAGO - - - - - 76
DAWIN - - - - - 97	FORT KNOX - - - - -186	FORT BLISS - - - - -155	CHURCHILL - - - - - 84
DAVAO - - - - - 99	FORT LEAVENWORTH - - - - -190	FORT BRAGG/POPE - - - - -160	CORPUS CHRISTI - - - - - 95
ENIWETOK ATOLL - - - - -145	FORT RUCKER - - - - -200	FORT CAMPBELL - - - - -164	DUTCH HARBOR - - - - -108
IWO JIMA AB - - - - -232	FORT SILL - - - - -204	FORT CARSON - - - - -169	EDMONTON - - - - -114
KADENA AB - - - - -237	FORT WOLTERS - - - - -207	FORT EUSTIS - - - - -173	EGLIN AFB - - - - -119
KWAJALEIN NS - - - - -243	FROBISHER - - - - -210	FORT HOOD - - - - -178	EIELSON AFB - - - - -121
NOUMFA - - - - -273	GEN MITCHELL - - - - -214	FORT HUACHUCA - - - - -182	ELLINGTON AFB - - - - -127
POINT MORSBY - - - - -278	HILL AFB - - - - -219	FORT KNOX - - - - -186	ELLSWORTH AFB - - - - -132
WAKE ISLAND - - - - -283	HOMESTEAD AFB - - - - -222	FORT LEAVENWORTH - - - - -191	ELMENDORF AFB - - - - -134
	HUNTER AAF - - - - -227	FORT LEWIS - - - - -194	EL TORO MCAS - - - - -139
<b>WAKE ISLAND</b>	HUNTSVILLE - - - - -229	FORT ORD - - - - -197	ENGLAND AFB - - - - -144
ANDERSON AFB - - - - - 29	JACKSONVILLE - - - - -234	FORT RUCKER - - - - -200	FORT BENNING - - - - -150
CHITOSE AB - - - - - 77	KEY WEST - - - - -240	FORT SILL - - - - -204	FORT BLISS - - - - -155
ENIWETOK ATOLL - - - - -145	LARSON AFB - - - - -246	FORT WOLTERS - - - - -207	FORT BRAGG/POPE - - - - -160
HICKAM AFB - - - - -216	LITTLE ROCK - - - - -248	FROBISHER - - - - -210	FORT CAMPBELL - - - - -164
IWO JIMA AB - - - - -232	LOCKBOURNE - - - - -250	GEN MITCHELL - - - - -214	FORT CARSON - - - - -169
JOHNSTON ISLAND - - - - -235	LORING AFB - - - - -252	HILL AFB - - - - -219	FORT EUSTIS - - - - -173
KWAJALEIN NS - - - - -243	LUKE AFB - - - - -255	HOMESTEAD AFB - - - - -222	FORT HOOD - - - - -178
MIDWAY ISLAND - - - - -263	MCGUIRE AFB - - - - -258	HUNTER AAF - - - - -227	FORT HUACHUCA - - - - -182
MISAWA AB - - - - -267	MEMPHIS - - - - -260	HUNTSVILLE - - - - -229	FORT KNOX - - - - -186
TOKYO - - - - -283	MEXICO CITY - - - - -262	JACKSONVILLE - - - - -234	FORT LEAVENWORTH - - - - -191
VANIMO - - - - -283	MINOT AFB - - - - -264	KEY WEST - - - - -240	FORT ORD - - - - -197
	MINN-ST PAUL - - - - -266	LARSON AFB - - - - -246	FORT RUCKER - - - - -200
<b>WELLINGTON</b>	NELLIS AFB - - - - -268	LITTLE ROCK - - - - -248	FORT SILL - - - - -204
ADFLAIDE - - - - - 20	NEW CUMBERLAND - - - - -270	LOCKBOURNE - - - - -251	FORT WOLTERS - - - - -207
BRISBANE - - - - - 49	NEW ORLEANS - - - - -272	LORING AFB - - - - -253	FROBISHER - - - - -210
MELBOURNE - - - - -259	NIAGARA FALLS - - - - -273	LUKE AFB - - - - -255	GEN MITCHELL - - - - -214
NOUMFA - - - - -274	PATRICK AFB - - - - -276	MCGUIRE AFB - - - - -258	HILL AFB - - - - -220
PAGO PAGO - - - - -275	PITTSBURGH - - - - -277	MEMPHIS - - - - -260	HUNTSVILLE - - - - -230

YAKIMA (CONT.)

JUNEAU- - - - -	-236
KODIAK- - - - -	-242
LITTLE ROCK - - - -	-248
LOCKBOURNE- - - - -	-251
LUKE AFB- - - - -	-255
MEMPHIS - - - - -	-261
MEXICO CITY - - - - -	-262
MINOT AFB - - - - -	-265
MINN-ST PAUL- - - - -	-266
NELLIS AFB- - - - -	-269
NEW CUMBERLAND- - - -	-270
NEW ORLEANS - - - - -	-272
NIAGARA FALLS - - - -	-273
OXNARD AFB- - - - -	-274
PITTSBURGH- - - - -	-278
PRUDHOE BAY - - - - -	-278
REGINA- - - - -	-280
SCOTT AFB - - - - -	-281
SELFRIDGE AFB - - - -	-281
SHAW AFB- - - - -	-282
WURTSMITH - - - - -	-283
YELLOWKNIFE - - - - -	-283

YELLOWKNIFE (CONT.)

JUNEAU- - - - -	-236
KODIAK- - - - -	-242
LARSON AFB- - - - -	-246
LITTLE ROCK - - - - -	-248
LOCKBOURNE- - - - -	-251
LORING AFB- - - - -	-253
LUKE AFB- - - - -	-255
MCGUIRE AFB - - - - -	-258
MEMPHIS - - - - -	-261
MINOT AFB - - - - -	-265
MINN-ST PAUL- - - - -	-266
NELLIS AFB- - - - -	-269
NEW CUMBERLAND- - - -	-270
NIAGARA FALLS - - - -	-273
OXNARD AFB- - - - -	-275
PITTSBURGH- - - - -	-278
PRUDHOE BAY - - - - -	-278
REGINA- - - - -	-280
SCOTT AFB - - - - -	-281
SELFRIDGE AFB - - - -	-281
THULE - - - - -	-283
WESTOVER AFB- - - - -	-283
WURTSMITH - - - - -	-283
YAKIMA- - - - -	-283

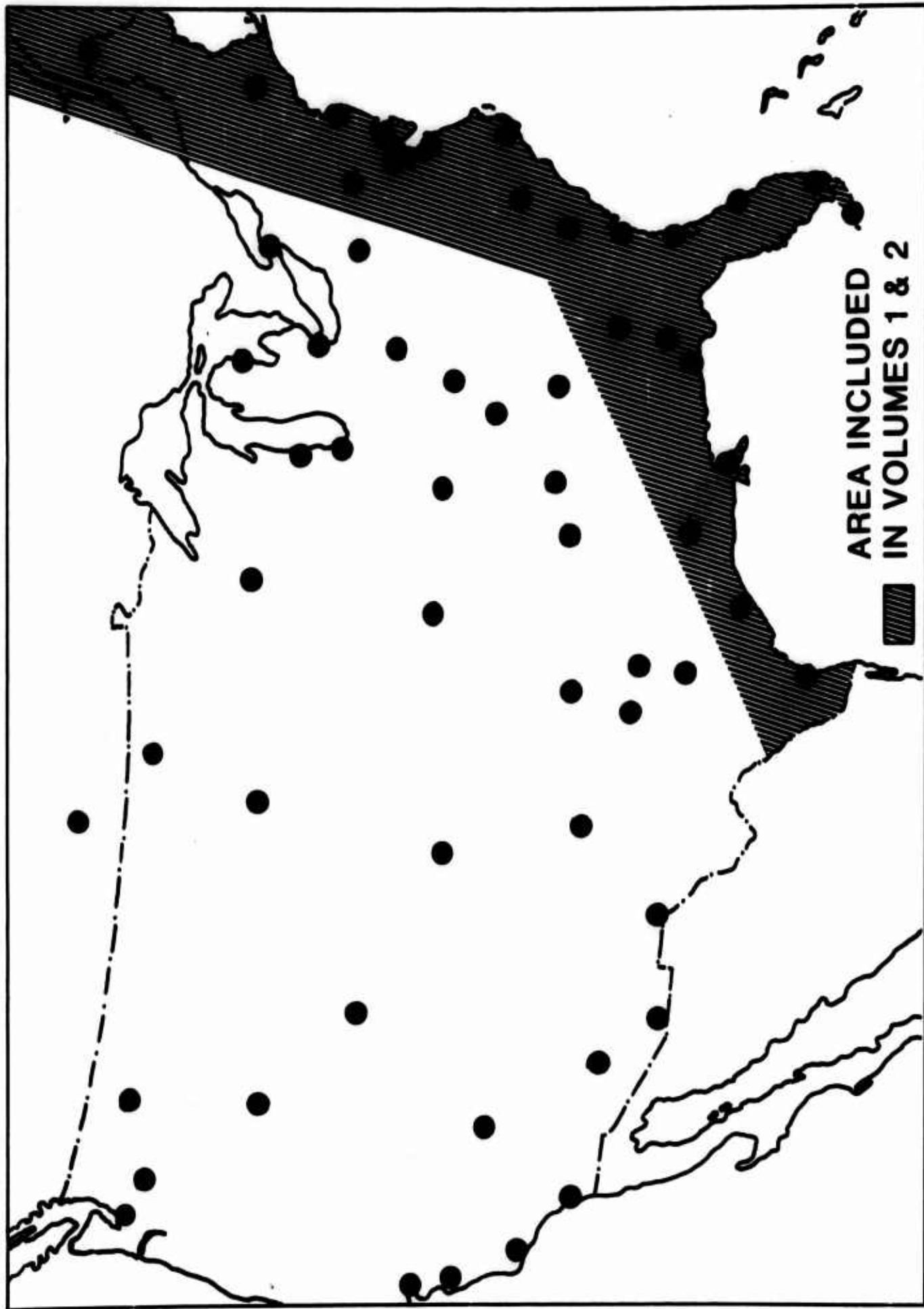
YELLOWKNIFE

ALAMEDA NAS - - - - -	26
ALERT - - - - -	27
ANDREWS AFB - - - - -	35
BOISE - - - - -	47
CANNON AFB- - - - -	50
CARSWELL AFB- - - - -	64
CHICAGO - - - - -	76
CHURCHILL - - - - -	84
DOVER AFB - - - - -	-107
DUTCH HARBOR- - - - -	-108
EDMONTON- - - - -	-114
EIELSON AFB - - - - -	-121
ELLSWORTH AFB - - - -	-133
ELYNDORF AFB - - - - -	-134
EL TORO MCAS - - - - -	-139
FORT BLISS- - - - -	-155
FORT CAMPBELL - - - - -	-165
FORT CARSON - - - - -	-169
FORT HOOD - - - - -	-178
FORT HUACHUCA - - - - -	-182
FORT KNOX - - - - -	-186
FORT LEAVENWORTH- - - -	-191
FORT LEWIS- - - - -	-196
FORT ORD- - - - -	-197
FORT SILL - - - - -	-204
FORT WALTERS- - - - -	-208
FROBISHER - - - - -	-210
GEN MITCHELL- - - - -	-214
HILL AFB- - - - -	-220
HUNTSVILLE- - - - -	-230

ZAHEDAN

AHADAN- - - - -	17
ADEN- - - - -	20
BAGHDAD - - - - -	37
BOMBAY- - - - -	48
CALCUTTA- - - - -	51
COLIMBRO - - - - -	88
DHAHRAN - - - - -	-100
KARACHI - - - - -	-238
LAHORE- - - - -	-244
MANDALAY- - - - -	-256
NEW DELHI - - - - -	-271
TEHRAN- - - - -	-282





AREA INCLUDED  
IN VOLUMES 1 & 2

***BOEING VERTOL COMPANY***

A DIVISION OF THE BOEING COMPANY

P.O. BOX 16858

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