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**THE NASA DIGITAL VGH PROGRAM -
EXPLORATION OF METHODS AND FINAL RESULTS**

Volume III - B 727 Data 1978-1980: 1765 HOURS

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FOREWORD

This report was prepared by Eagle Engineering, Inc., Hampton Division, under contract NASW 4430, sponsored by NASA Langley Research Center and the Federal Aviation Administration Technical Center under the FAA-NASA Interagency Agreement No. DTFA03-890-A-00019 of 13 June 1989. This report fulfills the requirement of the Program Plan for the National Aging Aircraft Research Program, DOT/FAA/CT-88/32, August 1989, Paragraph 2.3.2.1, Flight Loads.

The Eagle Engineering, Inc. effort was performed by Norman L. Crabill and administered under the direction of Joseph W. Stickle (NASA Langley Research Center) and Thomas DeFiore (FAA Technical Center).

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VOLUME III: B 727 Data 1978-1980: 1765 HOURS

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SUMMARY

Data obtained from the Digital Flight Data Recorder System of B 727 aircraft in 985 flights and 1765 hours of airline revenue operations are presented as an extension of the work documented in Volume I of this report. Data on conditions with flap deployment and autopilot use are given. In addition, acceleration statistics are presented from about 26 hours on nonrevenue flights. No discussion of the data is presented.

INTRODUCTION

This document presents the results of the NASA DVGH Program obtained during 1978-1980 operations of Boeing 727 aircraft. This Volume is an extension of the work and methods documented in Volume I. The data reduction analysis and methods and data presentation are essentially the same as those reported in Volume I. However, this report does contain additional data on autopilot usage and some limited acceleration-derived exceedance data obtained from nonrevenue flights.

AIRCRAFT AND INSTRUMENTATION

Aircraft

The aircraft type was the Boeing 727-200 with three Pratt and Whitney JT8D-15 turbofan engines. Characteristics of the aircraft used in the data reduction process are given in Table I; the configuration is shown in figure 1.

Instrumentation

The data were obtained from the Digital Flight Data Recorder system described in Volume I. Measurements were:

<u>Parameter</u>	<u>Range and Units</u>	<u>Samples per Second</u>
$a_n + 1$	-3g to +6g	4
a_y	-1g to +1g	4
CAS	100 to 450 kts	1
HP	-1,000 to 50,000 ft	1
FLP	-5° to 60°	1
Autopilot Status	Off or Not-Off	Discrete
Cabin Pressure	0 to ~ 15 psia	1

Note that Spoiler data are not reported here, although they were in Volume I. Flap deflection (FLP) is for the inboard right trailing-edge flap as shown in figure 1. The cabin pressure data type is new, and was not available in the tests reported in Volumes I and II.

SCOPE OF DATA

Data were collected from up to 20 aircraft operating in regular airline service over the service area, shown in figure 2, during 1978 through 1980: Almost all of the data (985 flights and 1765 hours) were obtained during passenger-carrying revenue service; a small amount (64 flights and 25.9 hours) was obtained during nonrevenue service (ferry flights mainly, although some training and maintenance flights may have been included). Due to operational difficulties, it was not practical to obtain continuous data from one aircraft as in Volumes I and II; it was therefore decided to obtain the data from any of the twenty 727-200 aircraft being operated by the airline over the service route during the 22 months of the test.

DATA REDUCTION PROCESS

The Data Reduction Process is basically the same as described in Volume I. The filter used to separate maneuver and gust accelerations was similar to that described in Volume I except that the high limit of the band pass was set at 1.5 Hz based on an inspection of representative spectra. Although the results of reference 13 in Volume I indicate that the operation of the autopilot can cause up to a 20 percent reduction in the normal acceleration peak response to continuous turbulence, it was decided, after consultation with the industry, not to account for this in deriving U_{de} , in order to maintain comparability with the earlier VGH results, even though the autopilot status was being monitored.

RESULTS

Flight and Acceleration Derived Statistics

Presentation of Flight Profile Statistics results is as described in Volume II. Flight Profile Statistics are given in Percent of Time, and as Maximum Values on a Percent of Flight basis for Entire Flights (flaps up or down) and for Flaps Deflected. For operations reported in this volume, the conditions existing at flap retraction after lift-off, and the conditions existing at flap deflection before landing are given.

Acceleration Derived Statistics are also presented as in Volume I, except that with Flaps Deflected, the maximum a_n per flight and the Equivalent Airspeed occurring are presented for the various flap detents in take off and landing. Also new are level crossing counts for the Acceleration Derived quantities for non-revenue flights. All other results are for revenue flights. The Acceleration Derived quantities are subject to the same limitations discussed in Volume I, which indicates that the exceedances derived from the DFDR system at 4 samples per second may be significantly less than if actual peak values were counted.

The detailed Flight Profile and Acceleration Derived Statistics are given in figures 3 through 24, as shown in Table II. No discussion of the data is presented.

Autopilot Usage and Effects

Autopilot status was monitored as off, or on, without regard to the exact on-mode for 223 hours of operations. The autopilot was on about 56 percent of the time; 23.7 percent of the time that

the autopilot was on, the low amplitude limit cycle in normal acceleration noted in Volumes I and II appeared. Its characteristics are summarized in figure 25. This phenomenon is believed to be due to off-nominal autopilot operation in the altitude-hold mode and is more fully discussed in Volumes I and II.

Cabin Pressure

Absolute cabin pressure was measured and used to compute the quantity "Maximum Differential Cabin Pressure per Flight" by using the measured absolute cabin pressure and the standard atmosphere based on the indicated pressure altitude. The distribution of this quantity as a function of the percent of flights is shown in figure 26.

CONCLUDING REMARKS

Data obtained from the Digital Flight Data Recorder system of B 727-200 aircraft in 985 flights and 1765 hours of airline revenue operations are presented as an extension of the work documented in Volume I of this report. Some new data on conditions with flap deployment and autopilot usage are given. In addition, acceleration statistics are presented from about 26 hours on nonrevenue flights. No general discussion of the data is presented.

TABLE I
BOEING B 727 CHARACTERISTICS USED IN THE ANALYSIS

o Geometrical Characteristics

- o Wing Area = 1560 ft²
- o Wing Mean Chord = 15.06 ft

o Lift Curve Slope $C_{L\alpha}$ per degree

- o Flaps up = $f(M, HP)$
- o Flaps down

<u>M</u>	<u>HP = 0</u>	<u>20 kft</u>	<u>40 kft</u>	<u>FLP, deg</u>	<u>HP ≈ 0</u>
.2	.0980	.0980	.0980	0	.0980
.4	.0920	.0975	.1010	5	.1110
.5	.0890	.0965	.1025	10	.1150
.6	.0870	.0978	.1050	25 (TO)	.1167
.7	.0845	.0990	.1100	40 (LD)	.1056
.8	-	.1040	.1185		
.9	-	.1150	.1325		

- o Weight was computed linearly with time from takeoff to landing as described in Appendix C in Volume I.

TABLE II
INDEX OF FLIGHT PROFILE AND ACCELERATION STATISTICS

FLIGHT PROFILE STATISTICS

o ENTIRE FLIGHTS

Figure Number	Subject	Page Numbers
3	Weight vs. Flight Duration	12-17
4	Altitudes and Gross Weights	18
5	Altitudes and Airspeeds	19-22
6	Altitude Summary	23
7	Maximum Altitudes	24-25

o FLAPS DEFLECTED

8	Flap Detent Use	26
9	Weights, Altitudes and Airspeeds	27-36
10	Flap Deflection Times	37-39
11	Equivalent Airspeeds and Detents	40
12	Flap Use above 10,000 ft	41

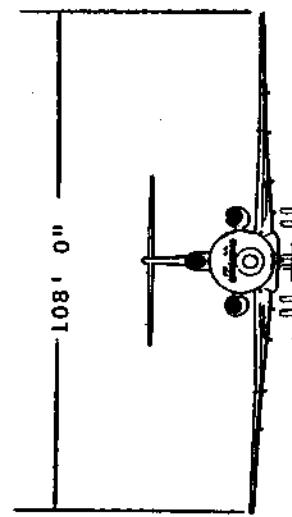
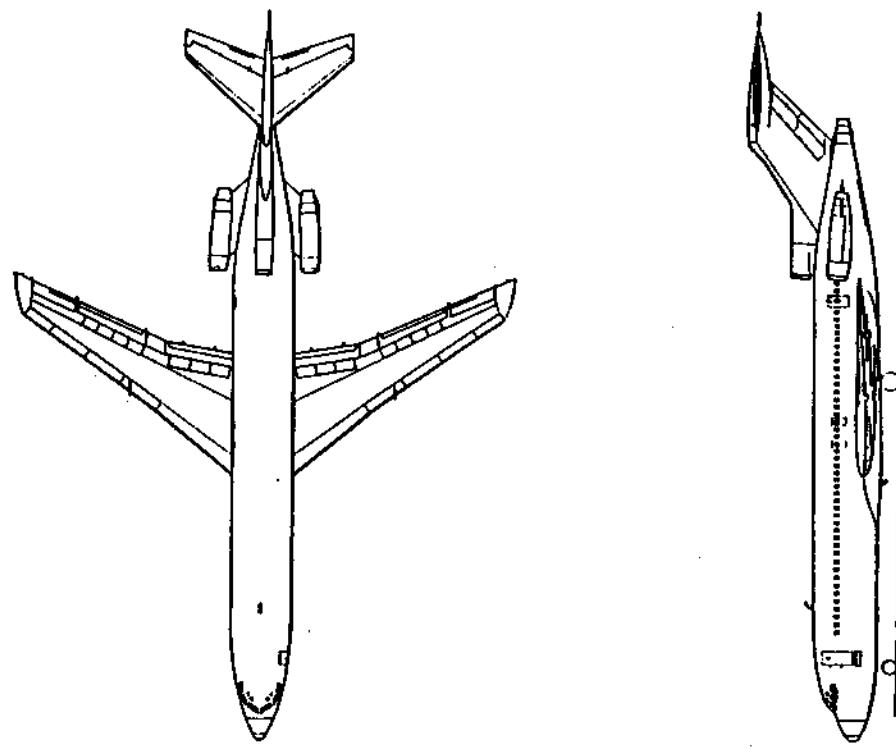
TABLE II (continued)
ACCELERATION DERIVED STATISTICS

o ENTIRE FLIGHTS

Figure Number	Subject	Page Numbers
13 Normal Acceleration Exceedances		
(a)	a_n matrix	42
(b)	a_{nM} matrix	43
(c)	a_{nG} matrix	44
(d)-(m)	a_n , a_{nM} , a_{nG} plots	45-54
14 Lateral Acceleration Exceedances		
(a)	a_y matrix	55
(b)-(k)	a_y plots	56-65
15 U_{de} Exceedances		
(a)	U_{de} matrix	66
(b)-(k)	U_{de} plots	67-76
16 Peak Positive and Negative a_n vs. Altitude		
(a)	a_n matrix	77
(b)-(k)	a_n plots	78-87
17 Peak Positive and Negative a_{nM} vs. Altitude		
(a)	a_{nM} matrix	88
(b)-(k)	a_{nM} plots	89-98
18 Peak Positive and Negative a_{nG} vs. Altitude		
(a)	a_{nG} matrix	99
(b)-(k)	a_{nG} plots	100-109

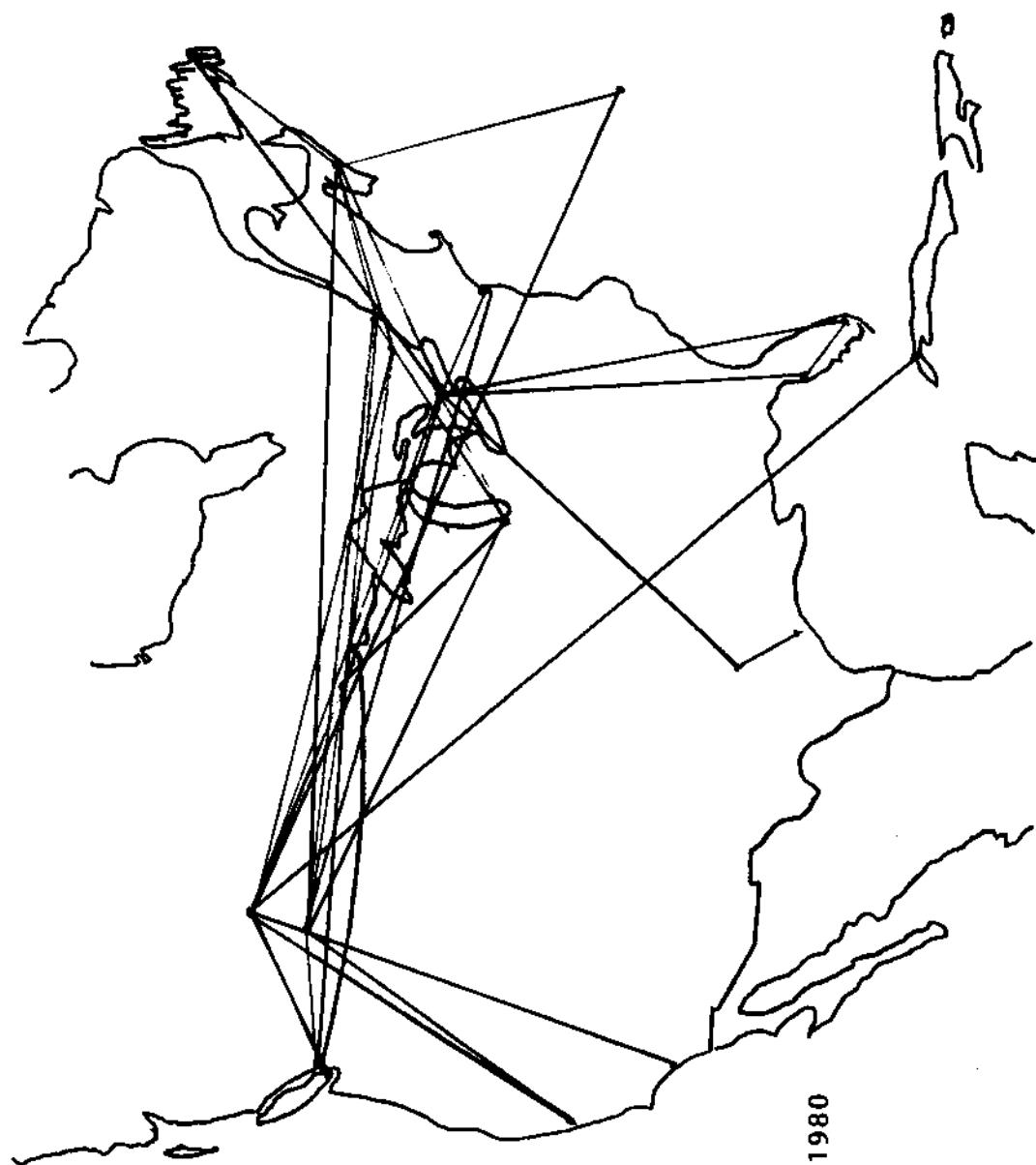
TABLE II (concluded)

19	Peak Positive and Negative U_{de} vs. Altitude		
(a)	U_{de} matrix	110	
(b)-(k)	U_{de} plots	111-120	
o FLAPS DEFLECTED			
Figure Number		Subject	Page Numbers
20 a_n Exceedances with Flaps Deflected			
(a)	Take Off Detents matrix	121	
(b)	Take Off Detents plot	122	
(c)	Landing Detents matrix	123	
(d)	Landing Detents plot	124	
21 Peak Positive and Negative a_n per flight and EAS bands			
(a)-(d)	Take Off Detents	125-128	
(e)-(j)	Landing Detents	129-134	
o NON-REVENUE FLIGHTS			
Figure Number		Subject	Page Numbers
22 Normal Acceleration Exceedances			
(a)	a_n matrix	135	
(b)	a_{nM} matrix	136	
(c)	a_{nG} matrix	137	
(d)-(m)	a_n , a_{nM} , a_{nG} plots	138-147	
23 Lateral Acceleration Exceedances			
(a)	a_y matrix	148	
(b)-(k)	a_y plots	149-158	
24 U_{de} Exceedances			
(a)	U_{de} matrix	159	
(b)-(k)	U_{de} plots	160-169	



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Figure 1.- Three view drawing of aircraft.



June 1978 - April 1980
985 Flights
1765 Hours
723,033 N.Miles

Figure 2. - Location of service area and scope of data.

DURATION OF FLIGHT, HOURS	PERCENT OF FLIGHTS								
	110 KILO	120 KILO	130 KILO	140 KILO	150 KILO	160 KILO	170 KILO	180 KILO	190 KILO
6.5-7.0	0	0	0	0	0	0	0	0	0
6.0-6.5	0	0	0	0	0	0	0	0	0
5.5-6.0	0	0	0	0	0	0	0	0	0
5.0-5.5	0	0	0	0	0	0	0	0	0
4.5-5.0	0	0	0	0	0	0	0.1	0.3	0.3
4.0-4.5	0	0	0	0	0.1	0	0.1	0.5	0.5
3.5-4.0	0	0	0	0	0	0.3	0.3	1.0	0
3.0-3.5	0	0	0	0	0.1	0.4	2.7	2.0	0.4
2.5-3.0	0	0	0	0.1	1.1	4.6	5.1	4.2	0.3
2.0-2.5	0	0	0.2	1.9	4.7	5.4	1.6	0	0
1.5-2.0	0	0.1	1.0	4.3	4.4	4.3	0.3	0	0
1.0-1.5	0	0.6	4.0	7.0	6.1	1.7	0.1	0.1	0.1
.8-.1.0	0	0.1	2.9	6.2	2.9	0.2	0	0	0
.6-.8	0	1.4	4.1	1.7	0.8	0	0	0	0
.5-.6	0	0.8	1.4	0.4	0	0	0	0	0
.4-.5	0	0.3	0.5	0.1	0	0	0	0	0
.3-.4	0	0.1	1.1	0.1	0.1	0	0	0	0
.0-.3	0	0	1.0	0	0	0	0	0	0
TOTAL PERCENT	0	3.5	16.3	23.0	24.3	19.9	10.2	2.3	0.5
ALL FLIGHTS	0	3.5	16.3	23.0	24.3	19.9	10.2	2.3	0.5

(a) Gross weight at take off

Figure 3.- Percent of flights; weights vs durations.

DURATION OF FLIGHT, HOURS	PERCENT OF FLIGHTS									
	110 KILOMETERS	120 KILOMETERS	130 KILOMETERS	140 KILOMETERS	150 KILOMETERS	160 KILOMETERS	170 KILOMETERS	180 KILOMETERS	190 KILOMETERS	200 KILOMETERS
6.5-7.0	0	0	0	0	0	0	0	0	0	0
6.0-6.5	0	0	0	0	0	0	0	0	0	0
5.5-6.0	0	0	0	0	0	0	0	0	0	0
5.0-5.5	0	0	0.1	0	0	0	0	0	0	0
4.5-5.0	0	0.2	0.5	0	0	0	0	0	0	0
4.0-4.5	0.1	0.1	0.4	0.4	0.9	0.9	0.2	0	0	0
3.5-4.0	0	0.4	0.7	1.1	1.1	0.1	0	0	0	0
3.0-3.5	0.1	0.1	2.9	2.3	0.2	0	0	0	0	0
2.5-3.0	0.1	2.5	5.6	6.2	0.9	0	0	0	0	0
2.0-2.5	0.1	2.1	5.5	5.3	0.8	0	0	0	0	0
1.5-2.0	0.3	2.4	5.5	4.7	1.4	0	0	0	0	0
1.0-1.5	0.6	4.4	8.2	5.2	1.0	0.1	0.1	0	0	0
.8-1.0	0.1	2.3	5.6	4.2	0.2	0	0	0	0	0
.6-.8	0.7	3.7	2.1	1.5	0	0	0	0	0	0
.5-.6	0.6	1.2	0.7	0.1	0	0	0	0	0	0
.4-.5	0	0.8	0	0.1	0	0	0	0	0	0
.3-.4	0	0.6	0.7	0.1	0	0	0	0	0	0
.0-.3	0	0.2	0.8	0	0	0	0	0	0	0
TOTAL PERCENT ALL FLIGHTS	2.7	21.2	39.3	31.7	4.9	0.1	0	0.1	0	0

(b) Gross weight at landing

Figure 3.-Continued.

DURATION OF FLIGHT, HOURS	PERCENT OF FLIGHTS									
	0 TO 10 KIWS	10 TO 20 KIWS	20 TO 30 KIWS	30 TO 40 KIWS	40 TO 50 KIWS	50 TO 60 KIWS	60 TO 70 KIWS	70 TO 80 KIWS	80 TO 90 KIWS	90 TO 100 KIWS
6.5-7.0	0	0	0	0	0	0	0	0	0	0
6.0-6.5	0	0	0	0	0	0	0	0	0	0
5.5-6.0	0	0	0	0	0	0	0	0	0	0
5.0-5.5	0	0	0	0	0	0	0	0	0	0
4.5-5.0	0	0	0	0	0	0	0.1	0.4	0.2	0.4
4.0-4.5	0	0	0	0	0	0	0.3	1.0	0.4	0.4
3.5-4.0	0	0	0	0	0	0.1	1.5	0.6	0.1	0.1
3.0-3.5	0	0	0	0	0	0.8	4.7	0.2	0	0
2.5-3.0	0	0	0	0	0.4	8.4	5.6	0.7	0.2	0
2.0-2.5	0	0	0	0	2.9	9.5	1.8	0.5	0.5	0
1.5-2.0	0	0	0	0.1	8.3	4.6	1.2	0.1	0	0
1.0-1.5	0	0	0	4.7	11.5	3.5	0	0	0	0
.8-1.0	0	0	0	5.3	6.6	0.5	0	0	0	0
.6-.8	0	0	0	4.0	3.9	0.2	0	0	0	0
.5-.6	0	0	0	1.6	1.0	0	0	0	0	0
.4-.5	0	0	0	0.8	0.1	0	0	0	0	0
.3-.4	0	0	0	1.0	0.3	0.1	0	0	0	0
.0-.3	0	0	0	0.9	0.1	0	0	0	0	0
TOTAL PERCENT ALL FLIGHTS	0	18.4	34.1	27.7	15.2	3.6	1.0	0	0	0

(c) Fuel weight at take off

Figure 3.- Continued.

DURATION OF FLIGHT, HOURS	PERCENT OF FLIGHTS									
	0 TO 10 KIAMS	10 TO 20 KIAMS	20 TO 30 KIAMS	30 TO 40 KIAMS	40 TO 50 KIAMS	50 TO 60 KIAMS	60 TO 70 KIAMS	70 TO 80 KIAMS	80 TO 90 KIAMS	90 TO 100 KIAMS
6.5-7.0	0	0	0	0	0	0	0	0	0	0
6.0-6.5	0	0	0	0	0	0	0	0	0	0
5.5-6.0	0	0	0	0	0	0	0	0	0	0
5.0-5.5	0	0.1	0	0	0	0	0	0	0	0
4.5-5.0	0.3	0.4	0	0	0	0	0	0	0	0
4.0-4.5	0.3	1.3	0.1	0	0	0	0	0	0	0
3.5-4.0	0.7	1.4	0.2	0	0	0	0	0	0	0
3.0-3.5	0.6	5.1	0	0	0	0	0	0	0	0
2.5-3.0	2.8	10.9	1.3	0.3	0	0	0	0	0	0
2.0-2.5	2.5	9.5	1.4	0.3	0	0	0	0	0	0
1.5-2.0	2.8	9.8	1.4	0.2	0	0	0	0	0	0
1.0-1.5	6.0	11.7	1.9	0	0	0	0	0	0	0
.8-1.0	4.2	7.6	0.6	0	0	0	0	0	0	0
.6-.8	1.4	6.2	0.4	0	0	0	0	0	0	0
.5-.6	1.0	1.6	0	0	0	0	0	0	0	0
.4-.5	0.3	0.5	0.1	0	0	0	0	0	0	0
.3-.4	0.1	1.2	0.1	0	0	0	0	0	0	0
.0-.3	0.3	0.7	0	0	0	0	0	0	0	0
TOTAL PERCENT ALL FLIGHTS	23.5	68.1	7.6	0.8	0	0	0	0	0	0

(d) Fuel weight at landing

Figure 3.- Continued.

DURATION OF FLIGHT, HOURS	PERCENT OF FLIGHTS									
	5 KIWS	10 KIWS	15 KIWS	20 KIWS	25 KIWS	30 KIWS	35 KIWS	40 KIWS	45 KIWS	50 KIWS
6.5-7.0	0	0	0	0	0	0	0	0	0	0
6.0-6.5	0	0	0	0	0	0	0	0	0	0
5.5-6.0	0	0	0	0	0	0	0	0	0.1	0.3
5.0-5.5	0	0	0	0	0	0	0	0	0.1	0.1
4.5-5.0	0	0	0	0	0	0	0	0	0.2	0
4.0-4.5	0	0	0	0	0	0	0	0	0.2	0
3.5-4.0	0	0	0	0	0	0	0	0	0	0
3.0-3.5	0	0	0	0	0	0	0	0	0	0
2.5-3.0	0	0	0	0	0	0	0	0	0	0
2.0-2.5	0	0	0	0	0	0	0	0	0	0
1.5-2.0	0	0	0	0	0	0	0	0	0	0
1.0-1.5	0	0	0	0	0	0	0	0	0	0
.8-.1.0	0	0	0	0	0	0	0	0	0	0
.6-.8	0	0	0	0	0	0	0	0	0	0
.5-.6	0	0	0	0	0	0	0	0	0	0
.4-.5	0.7	0.7	0.2	0	0	0	0	0	0	0
.3-.4	1.4	0	0	0	0	0	0	0	0	0
.0-.3	1.0	0	0	0	0	0	0	0	0	0
TOTAL PERCENT ALL FLIGHTS	3.1	27.8	19.6	19.9	17.3	12.1	3.4	1.4	1.9	0.5

(e) Fuel burn vs flight duration

Figure 3.-Continued.

DURATION OF FLIGHT, HOURS	PERCENT OF FLIGHTS									
	0 TO 5 KIWS	5 TO 10 KIWS	10 TO 15 KIWS	15 TO 20 KIWS	20 TO 25 KIWS	25 TO 30 KIWS	30 TO 35 KIWS	35 TO 40 KIWS	40 TO 45 KIWS	45 TO 50 KIWS
6.5-7.0	0	0	0	0	0	0	0	0	0	0
6.0-6.5	0	0	0	0	0	0	0	0	0	0
5.5-6.0	0	0	0	0	0	0	0	0	0	0
5.0-5.5	0	0	0	0.1	0	0	0	0	0	0
4.5-5.0	0	0.2	0.1	0.1	0.2	0.2	0.2	0	0	0
4.0-4.5	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.6	0	0
3.5-4.0	0	0.3	0.2	0.2	0.4	0.6	0.6	0	0	0
3.0-3.5	0.1	0.1	0.1	1.0	1.2	1.6	1.4	0.2	0	0
2.5-3.0	0.1	1.4	3.5	3.7	2.9	2.9	0.8	0	0	0
2.0-2.5	0.4	1.1	2.0	3.7	3.2	3.0	0.3	0	0	0
1.5-2.0	0.4	1.3	3.2	2.9	2.5	3.5	0.4	0	0	0
1.0-1.5	0.5	1.9	4.0	4.7	4.3	3.9	0.2	0	0	0
.8-.1.0	0.2	1.1	2.2	2.8	2.8	3.0	0.1	0	0	0
.6-.8	1.5	2.4	1.8	0.6	0.7	0.8	0.1	0	0	0
.5-.6	0.4	1.1	0.4	0.5	0.2	0	0	0	0	0
.4-.5	0	0.4	0.5	0	0	0	0	0	0	0
.3-.4	0.1	0.3	0.8	0.2	0	0	0	0	0	0
.0-.3	0	0.1	0.5	0.2	0.2	0	0	0	0	0
TOTAL PERCENT ALL FLIGHTS	3.9	12.0	20.5	21.2	19.9	20.2	2.1	0	0	0.2

(f) Payload weight vs flight duration

Figure 3.-Continued.

		PRESSURE ALTITUDE BANDS							
GROSS WEIGHT TOL.		\$500 TO 14500 FT2	14500 TO 19500 FT2	19500 TO 24500 FT2	24500 TO 29500 FT2	29500 TO 34500 FT2	34500 TO 39500 FT2	39500 TO 44500 FT2	-500 TO 44500 FT2
GROSS WEIGHT TOL.	4500 FT2	0	0	0	0	0	0	0	0
PERCENT TOTAL TIME		0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
110-120	0	0.0577	0.0577	0.0577	0.0577	0.0577	0.0577	0.0577	0.0577
120-130	0.0465	0.0465	0.0465	0.0465	0.0465	0.0465	0.0465	0.0465	0.0465
130-140	0.2202	0.2202	0.2202	0.2202	0.2202	0.2202	0.2202	0.2202	0.2202
140-150	0.3102	0.3102	0.3102	0.3102	0.3102	0.3102	0.3102	0.3102	0.3102
150-160	0.3400	0.3400	0.3400	0.3400	0.3400	0.3400	0.3400	0.3400	0.3400
160-170	0.3963	0.3963	0.3963	0.3963	0.3963	0.3963	0.3963	0.3963	0.3963
170-180	0.1457	0.1457	0.1457	0.1457	0.1457	0.1457	0.1457	0.1457	0.1457
180-190	0.0367	0.0367	0.0367	0.0367	0.0367	0.0367	0.0367	0.0367	0.0367
190-200	0.0094	0.0094	0.0094	0.0094	0.0094	0.0094	0.0094	0.0094	0.0094
200-210	0	0	0	0	0	0	0	0	0
PERCENT TOTAL TIME	1.4051	1.8306	2.4289	2.2467	2.7464	2.8397	3.4416	1.2188	0.0027
AVE GROSS WEIGHT IN ALTITUDE BAND	135.90	154.42	154.12	154.14	153.93	154.04	154.91	146.81	115.00
PERCENT TOTAL TIME		0.0016	0.0144	0.0206	0.0019	0.0036	0.0420	0.1376	0.0155
110-120	0.0595	0.0594	0.1365	0.0200	0.0760	0.2034	1.4387	0.0001	2.3328
120-130	0.1620	0.1620	0.1488	0.2217	0.0198	0.1466	1.3935	0.0001	10.6926
130-140	0.2213	0.2213	0.2213	0.2217	0.0590	0.1249	4.8461	13.7972	0
140-150	0.2294	0.2294	0.2294	0.2294	0.0578	0.0274	0.0763	8.4692	0
150-160	0.0359	0.0359	0.0268	0.0268	0	0	0.6851	9.6020	0
160-170	0	0	0.0013	0.0013	0	0	0.0031	5.6321	0
170-180	0	0	0.0040	0.0019	0	0	0.0737	2.1843	0
180-190	0	0	0	0	0	0	0.0469	0.0716	0
190-200	0	0	0	0	0	0	0.0274	0.0263	0
200-210	0	0	0	0	0	0	0.0020	0	0
PERCENT TOTAL TIME	0.3884	0.3870	0.6225	0.1282	0.4287	2.9570	22.9868	35.7745	0.0156
AVE GROSS WEIGHT IN ALTITUDE BAND	138.57	138.50	136.95	142.03	139.74	147.35	155.96	146.14	115.00
PERCENT TOTAL TIME		0.0843	0.0843	0.0432	0.0217	0.0160	0.0095	0.0050	0.0005
110-120	0.4287	0.4287	0.4520	0.2731	0.2468	0.1649	0.1188	0.0583	0
120-130	1.5349	1.5349	1.6286	1.8561	0.5845	0.6110	0.5587	0.4932	0.1905
130-140	1.3454	1.3454	1.3249	1.0466	0.7116	0.7032	0.6933	0.4934	0.2270
140-150	0.2115	0.2115	0.2618	0.1874	0.1990	0.2446	0.3061	0.1632	0.6875
150-160	0.0057	0.0057	0.0041	0.0032	0.0025	0.0027	0.0118	0.0353	0.1766
160-170	0	0	0	0	0	0	0.0012	0.0013	0.0713
170-180	0	0	0	0	0	0	0.0012	0	0.0023
180-190	0.0024	0.0024	0.0028	0.0016	0.0010	0.0017	0.0015	0.0007	0.0167
190-200	0	0	0	0	0	0	0	0	0
200-210	0	0	0	0	0	0	0	0	0
PERCENT TOTAL TIME	4.0239	3.7593	2.9529	1.9525	2.7786	1.4945	1.5991	0.5987	0.0003
AVE GROSS WEIGHT IN ALTITUDE BAND	136.94	137.97	139.61	139.24	139.73	141.35	142.67	141.47	115.00
PERCENT TIME		TOTAL TIME & COLUMNS (PERCENT, DECIMAL) & GROSS WEIGHT BANDS						SUM TOTAL TIME	365.60
								TOTAL ATTENDS	1765.59
								TOTAL TIME	72303.26

Figure 4.- Percent time in altitude and gross weight bands.

CAS INTERVAL, KTS	PRESSURE ALTITUDE BANDS									TOTAL FLIGHTS 985 TOTAL HOURS 1765	
	-500 TO 4500 FT			4500 TO 9500 FT			9500 TO 14500 FT				
	14500 TO 19500 FT	19500 TO 24500 FT	24500 TO 29500 FT	29500 TO 34500 FT	34500 TO 39500 FT	39500 TO 44500 FT	44500 TO 49500 FT				
-500 TO 4500 FT	0.0002	0	0	0	0	0	0	0	0	0.0002	
120-130	0.0004	0	0	0	0	0	0	0	0	0.0004	
130-140	0.0004	0	0	0	0	0	0	0	0	0.0004	
140-150	0.0005	0.0005	0	0	0	0	0	0	0	0.0060	
150-160	0.0051	0.0034	0	0	0	0	0	0	0	0.0484	
160-170	0.1278	0.0120	0	0	0	0	0	0	0	0.1397	
170-180	0.1696	0.0205	0	0	0	0	0	0	0	0.1900	
180-190	0.1774	0.0347	0	0	0	0	0	0	0	0.2121	
190-200	0.1824	0.0472	0.0005	0	0	0	0	0	0	0.2301	
200-210	0.1780	0.0659	0.0022	0	0	0	0	0	0	0.2471	
210-220	0.1646	0.1005	0.0070	0.0003	0	0	0	0	0	0.2741	
220-230	0.1372	0.1626	0.0203	0.0023	0	0	0	0.0265	0.0011	0.3502	
230-240	0.1195	0.4429	0.0993	0.0083	0.0014	0.0012	0.0048	0.1594	0	0.3368	
240-250	0.0779	0.6892	0.2615	0.0086	0.0034	0.0045	0.0957	0.4635	0	1.6043	
250-260	0.0175	0.2002	0.2411	0.0179	0.0159	0.0108	0.6481	0.3955	0	1.5469	
260-270	0.0014	0.0363	0.2479	0.0760	0.0695	0.1077	1.1295	0.1665	0	1.8349	
270-280	0.0006	0.0099	0.2646	0.1257	0.1251	0.2039	1.0736	0.0075	0	1.8108	
280-290	0	0.0026	0.2559	0.1344	0.1736	0.6561	0.4087	0	0	1.6712	
290-300	0	0.0009	0.2987	0.2662	0.3410	0.8821	0.0736	0	0	1.8626	
300-310	0	0.0002	0.4607	1.0466	1.4497	0.7980	0.0076	0	0	3.7527	
310-320	0	0	0.2223	0.4877	0.5031	0.1225	0.0001	0	0	1.3358	
320-330	0	0	0.0302	0.0526	0.0489	0.0196	0	0	0	0.1513	
330-340	0	0	0.0096	0.0133	0.0140	0.0028	0	0	0	0.0398	
340-350	0	0	0.0044	0.0032	0.0006	0.0005	0	0	0	0.0067	
350-360	0	0	0.0011	0.0019	0.0002	0	0	0	0	0.0031	
360-370	0	0	0.0008	0.0015	0	0	0	0	0	0.0024	
370-380	0	0	0.0009	0.0001	0	0	0	0	0	0.0010	
380-390	0	0	0	0	0	0	0	0	0	0	
390-400	0	0	0	0	0	0	0	0	0	0	
AV CAS	200.6517	235.5087	280.4137	301.5625	302.0673	293.6124	268.7446	249.4190	219.0588		
TOTAL HOURS IN ALT & CLIMB	24.8090	32.3214	42.8851	39.6678	48.4908	50.1376	60.7642	21.5194	0.0472	320.6426	
PERCENT TIME IN ALT & CLIMB	1.4051	1.0306	2.4289	2.2467	2.7464	2.8397	3.4416	1.2188	0.0027	18.1607	

(a) Climb

Figure 5.- Percent time in altitude and airspeed bands.

CAS INTERVAL, KTS	PRESSURE ALTITUDE BANDS									
	4500 TO 4500 FT	9500 TO 9500 FT	14500 TO 14500 FT	19500 TO 19500 FT	24500 TO 24500 FT	29500 TO 29500 FT	34500 TO 34500 FT	39500 TO 39500 FT	44500 TO 44500 FT	-500 TO 44500 FT
-500 TO 4500 FT	0.0013	0	0	0	0	0	0	0	0	0.0013
120-130	0.0061	0.0008	0	0	0	0	0	0	0	0.0069
130-140	0.0061	0.0008	0	0	0	0	0	0	0	0.0069
140-150	0.0241	0.0062	0	0	0	0	0	0	0	0.0303
150-160	0.0879	0.0299	0	0	0	0	0	0	0	0.1178
160-170	0.0774	0.0299	0	0	0	0	0	0	0	0.1073
170-180	0.0647	0.0185	0	0	0	0	0	0	0	0.0832
180-190	0.0411	0.0179	0	0	0	0	0	0	0	0.0590
190-200	0.0200	0.0178	0.0097	0	0.0004	0	0	0	0	0.0480
200-210	0.0241	0.0408	0.0547	0.0005	0.0091	0.0039	0.0003	0	0	0.1334
210-220	0.0120	0.0254	0.0321	0.0023	0.0031	0.0092	0.0082	0	0.0002	0.0926
220-230	0.0112	0.0288	0.0245	0.0012	0.0061	0.0098	0.0257	0.0276	0.0089	0.1439
230-240	0.0067	0.0684	0.0721	0.0019	0.0085	0.0180	0.0552	0.5740	0.0064	0.8111
240-250	0.0069	0.0714	0.1110	0.0139	0.0139	0.0135	0.0549	4.3486	0.0001	4.6288
250-260	0.0015	0.0222	0.0449	0.0065	0.0049	0.0097	0.0571	11.3550	0	11.5025
260-270	0.0034	0.0034	0.0320	0.0030	0.0062	0.0556	1.6382	18.5794	0	20.3212
270-280	0	0.0020	0.0306	0.0030	0.0079	0.0770	13.3971	0.9930	0	14.4106
280-290	0	0.0022	0.0377	0.0104	0.0177	0.1146	6.1669	0.0020	0	6.3514
290-300	0	0.0003	0.0408	0.0144	0.0277	0.6715	1.5629	0	0	2.3176
300-310	0	0.0002	0.0297	0.0134	0.0183	0.9765	0.0303	0	0	1.0685
310-320	0	0.0001	0.0207	0.0273	0.0391	0.6106	0	0	0	0.6978
320-330	0	0.0001	0.0230	0.0076	0.0951	0.3585	0	0	0	0.4844
330-340	0	0.0001	0.0265	0.0060	0.1459	0.0280	0	0	0	0.2095
340-350	0	-0.0001	0.0139	0.0072	0.0205	0.0006	0	0	0	0.0423
350-360	0	0.0001	0.0077	0.0012	0.0038	0	0	0	0	0.0129
360-370	0	0.0002	0.0009	0.0040	0	0	0	0	0	0.0031
370-380	0	0	0	0.0023	0	0	0	0	0	0.0023
380-390	0	0	0	0	0	0	0	0	0	0
390-400	0	0	0	0	0	0	0	0	0	0
AV CAS TOTAL HOURS	175.8187	213.5582	262.1649	298.7830	312.3425	303.6620	278.0729	259.1361	229.1230	
AIR. & LEVEL	6.8567	6.8322	10.8145	2.2631	7.5682	52.2079	406.0278	631.6297	0.2756	1124.4756
PERCENT TIME IN AIR & LEVEL	0.3884	0.3870	0.6125	0.1282	0.4287	2.9570	22.9968	35.7745	0.0156	63.6965
TOTAL FLIGERS	985									
TOTAL HOURS	1765									

(b) Level

Figure 5.-Continued.

PRESSURE ALTITUDE BANDS									
CAS INTERVAL, KTS	4500 TO 4500 FT	9500 TO 9500 FT	14500 TO 14500 FT	19500 TO 19500 FT	24500 TO 24500 FT	29500 TO 29500 FT	34500 TO 34500 FT	39500 TO 39500 FT	-500 TO 44500 FT
120-130	0.1953	0.0089	0	0	0	0	0	0	0
130-140	0.8450	0.0482	0	0	0	0	0	0	0.2042
140-150	0.6169	0.0593	0	0	0	0	0	0	0.8931
150-160	0.5573	0.1088	0.0003	0	0	0	0	0	0.6762
160-170	0.4565	0.1384	0.0006	0	0	0	0	0	0.5664
170-180	0.3527	0.1741	0.0031	0	0	0	0	0	0.5955
180-190	0.2277	0.1439	0.0048	0	0	0	0	0	0.5300
190-200	0.1869	0.1699	0.0134	0	0	0	0	0	0.3763
200-210	0.1724	0.3059	0.0609	0.0073	0.0008	0	0	0	0.3702
210-220	0.1291	0.2309	0.0244	0.0080	0.0037	0	0	0	0.5473
220-230	0.1115	0.3110	0.0120	0.0072	0.0074	0.0062	0.0006	0	0.3960
230-240	0.0988	0.7438	0.1566	0.0253	0.0073	0.0103	0.0046	0	0.4821
240-250	0.0605	1.0369	0.2569	0.0457	0.0181	0.0108	0.0067	0.0001	1.0535
250-260	0.0103	0.2111	0.2427	0.0226	0.0146	0.0129	0.0111	0.0084	1.5917
260-270	0.0013	0.0316	0.2185	0.0322	0.0173	0.0185	0.0118	0.0107	0.7467
270-280	0.0016	0.0115	0.2673	0.0931	0.0764	0.0596	0.0344	0.0320	0.8740
280-290	0.0002	0.0102	0.5889	0.4616	0.4140	0.4444	0.0218	0	1.1501
290-300	0	0.0038	0.4628	0.6526	0.7040	0.7109	0.1876	0	2.3681
300-310	0	0.0024	0.1636	0.2200	0.2136	0.2552	0.0224	0	2.7217
310-320	0	0.0020	0.0674	0.0754	0.0888	0.1106	0.0036	0	0.8773
320-330	0	0.0011	0.0788	0.0757	0.1049	0.0429	0	0	0.3479
330-340	0	0.0014	0.0665	0.0702	0.0653	0.0119	0	0	0.3034
340-350	0	0.0001	0.0247	0.0233	0.0261	0.0023	0	0	0.2154
350-360	0	0	0.0136	0.0114	0.0098	0	0	0	0.0764
360-370	0	0.0001	0.0173	0.0112	0.0052	0	0	0	0.0349
370-380	0	0	0.0076	0.0084	0.0013	0	0	0	0.0337
380-390	0	0	0.0002	0.0005	0	0	0	0	0.0183
390-400	0	0	0	0	0	0	0	0	0.0007
AV CAS	163.9242	220.7603	275.7677	294.0602	296.7056	294.0248	278.4078	260.1140	243.3333
TOTAL HOURS IN ALT BAND	71.0449	66.3527	50.3701	32.7079	31.4031	29.9538	28.2339	10.3947	0.0083
TOTAL HOURS IN ALT BAND	4.0239	3.7581	2.8529	1.8525	1.7786	1.6965	1.5991	0.5887	0.0005
TOTAL FLIGHTS	985								
TOTAL HOURS	1765								

(c) Descent

Figure 5.- Continued.

		PRESSURE ALTITUDE BANDS																		
		-500 TO 4500 FT		4500 TO 9500 FT		9500 TO 14500 FT		14500 TO 19500 FT		19500 TO 24500 FT		24500 TO 29500 FT		29500 TO 34500 FT		34500 TO 39500 FT		39500 TO 44500 FT		
CMS INTERVAL, FT:5		120-130	0.1968	0.0089	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
130-140		0.8515	0.0490	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2057	
140-150		0.6465	0.0659	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.9005	
150-160		0.6902	0.1422	0.0003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7125	
160-170		0.6616	0.1802	0.0006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8327	
170-180		0.5870	0.2131	0.0031	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8425	
180-190		0.4462	0.1965	0.0048	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8032	
190-200		0.3893	0.2350	0.0236	0	0.0004	0	0	0	0	0	0	0	0	0	0	0	0	0.6474	
200-210		0.3745	0.4136	0.1177	0.0079	0.0099	0	0.0039	0	0.0003	0	0	0	0	0	0	0	0	0.6483	
210-220		0.3057	0.3568	0.0536	0.0106	0.0068	0	0.0092	0	0.0082	0	0	0	0	0	0	0	0	0.9278	
220-230		0.2599	0.5026	0.0767	0.0107	0.0136	0	0.0159	0	0.0319	0	0.0550	0	0.0100	0	0	0	0	0.7627	
230-240		0.2251	1.2550	0.3280	0.0355	0.0172	0	0.0295	0	0.0645	0	0.7400	0	0.0065	0	0	0	0	0.9762	
240-250		0.1453	1.8003	0.7294	0.0612	0.0352	0	0.0289	0	0.1617	0	4.8512	0	0.0050	0	0	0	0	2.7014	
250-260		0.0293	0.4336	0.5267	0.0470	0.0362	0	0.0333	0	0.7470	0	11.9412	0	0	0	0	0	0	7.8247	
260-270		0.0560	0.0714	0.4985	0.1112	0.0930	0	0.1818	0	3.0021	0	19.0660	0	0	0	0	0	0	13.7962	
270-280		0.0022	0.0234	0.5824	0.2219	0.2093	0	0.3404	0	15.0696	0	0.9233	0	0	0	0	0	0	23.0301	
280-290		0.0002	0.0150	0.8425	0.6053	0.6053	0	1.2551	0	7.0640	0	0.0023	0	0	0	0	0	0	17.3715	
290-300		0	0	0.0050	0.0023	0.9332	0	1.0726	0	2.2645	0	1.8241	0	0	0	0	0	0	6.9010	
300-310		0	0	0	0.0028	0.6540	1.2881	0	1.6816	0	0.0197	0	0.0603	0	0	0	0	0	5.6984	
310-320		0	0	0	0.0022	0.3104	0.5904	0	0.6310	0	0.8438	0	0.0037	0	0	0	0	0	2.3815	
320-330		0	0	0	0.0012	0.1320	0.1359	0	0.2489	0	0.4210	0	0	0	0	0	0	0	0.9391	
330-340		0	0	0	0.0015	0.1027	0.0935	0	0.2252	0	0.0428	0	0	0	0	0	0	0	0.4636	
340-350		0	0	0	0.0002	0.0430	0.0336	0	0.0472	0	0.0034	0	0	0	0	0	0	0	0.1275	
350-360		0	0	0	0.0002	0.0224	0.0145	0	0.0138	0	0	0	0	0	0	0	0	0	0.0508	
360-370		0	0	0	0.0003	0.0190	0.0167	0	0.0052	0	0	0	0	0	0	0	0	0	0.0412	
370-380		0	0	0	0	0.0085	0.0118	0	0.0013	0	0	0	0	0	0	0	0	0	0.0216	
380-390		0	0	0	0	0.0002	0.0005	0	0	0	0	0	0	0	0	0	0	0	0.0007	
390-400		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AV CMS		173.5895	224.8120	276.2687	298.1906	301.0313	287.6715	276.9469	258.8363	228.0453										
TOTAL FLIGHTS IN ALTITUDE BAND		102.7106	105.5062	104.6997	74.6389	97.4622	132.2994	495.0259	663.5437	0.3311	1765.5876									
PERCENT TIME IN ALTITUDE BAND		5.8174	5.9757	5.8943	4.2274	4.9537	7.4932	28.0375	37.5820	0.0198	100.0000									
TOTAL FLIGHTS												985								
TOTAL HOURS												1765								

(d) All flight modes

Figure 5.- Continued.

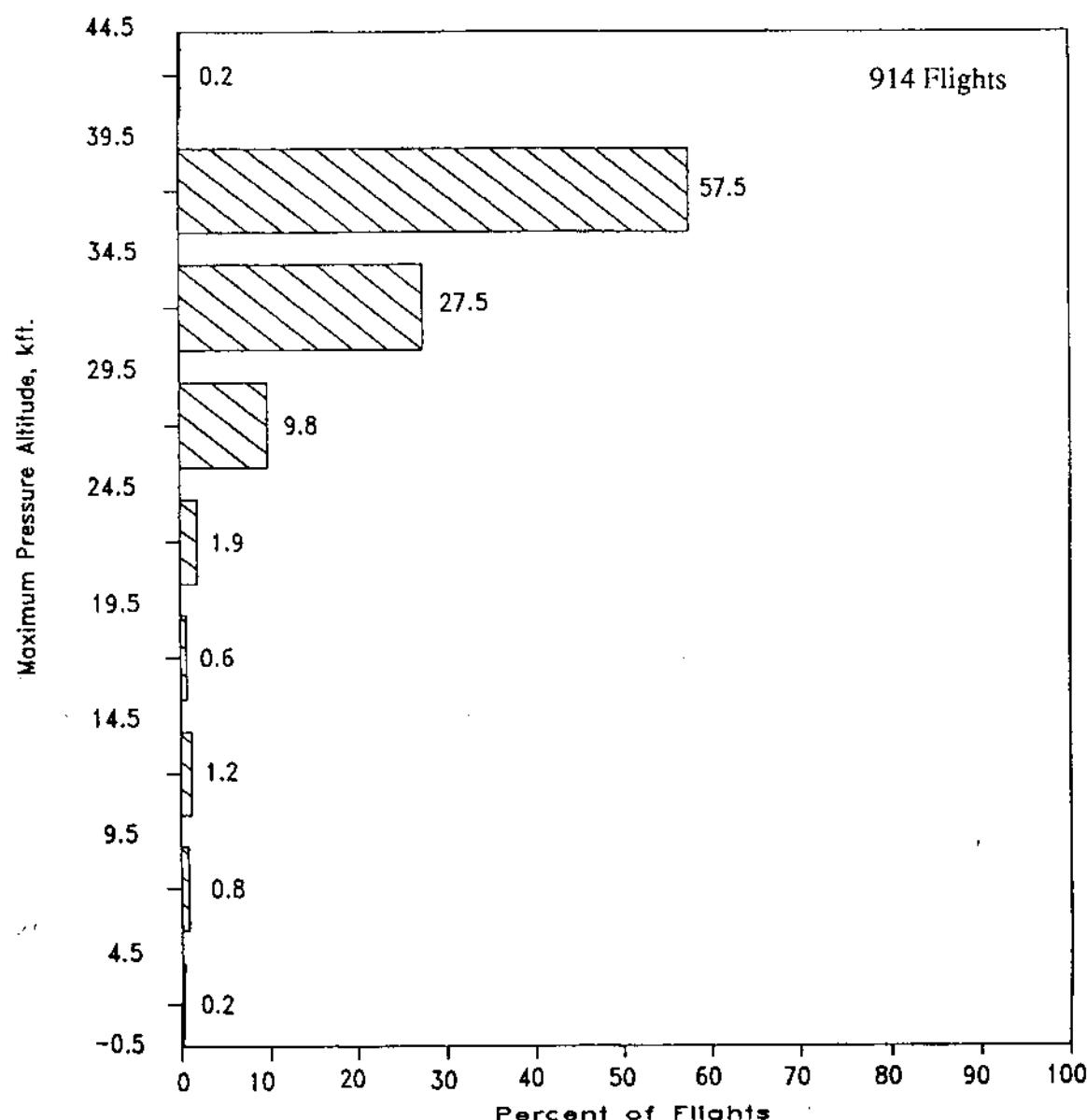
		PRESSURE ALTITUDE BANDS															
		-500 TO 4500 FT		4500 TO 9500 FT		9500 TO 14500 FT		14500 TO 19500 FT		19500 TO 24500 FT		24500 TO 29500 FT		29500 TO 34500 FT		34500 TO 39500 FT	
TIME INTERVAL, HRS IN ALTITUDE BAND																	
6.50-7.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.00-6.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.50-6.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.00-5.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.50-5.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.00-4.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.102	0	0
3.50-4.00	0	0	0	0	0	0	0	0	0	0	0	0	0.711	0.406	0	0	0
3.00-3.50	0	0	0	0	0	0	0	0	0	0	0	0	1.320	0	0	0	0
2.50-3.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.00-2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.50-2.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.00-1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.90-1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.80-.90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.70-.80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.60-.70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.50-.60	0	0	0	0	0	0.102	0	0	0	0	0	0	0	0	0	0	0
.45-.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.40-.45	0.102	0	0	0	0.102	0	0.102	0	0.203	0	0.203	0	0	0	0	0	0
.35-.40	0	0	0.102	0	0	0	0.102	0	0.203	0	0.203	0	0	0	0	0	0
.30-.35	0	0	0	0	0.102	0	0	0	0.203	1.929	2.338	0	0	0	2.234	0	0
.25-.30	0	0.305	0	0.203	0	0.406	0	0.305	0	0.203	1.827	2.543	0	0	3.756	0	0
.20-.25	1.015	0	0.012	0	1.218	0	0.406	1.920	0	2.132	3.756	0	0	0	2.234	0	0
.15-.20	7.817	9.543	7.716	0.711	3.046	7.614	0	14.518	16.548	15.635	0	0	0	0	1.117	0	0
.10-.15	46.294	41.827	36.447	6.497	52.693	87.107	76.650	60.508	22.944	0	0	0	0	0	0	0	0
.05-.10	35.939	47.005	0	0.305	0	2.538	0	0	0.711	0	0.203	0	0	0	0	0	0
.00-.05	0.528	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL FLIGHTS		102.7106		105.5062		104.0697		74.6388		87.4622		132.2994		495.0259		663.5437	
TOTAL PERCENT		5.8174		5.9757		5.8943		4.2274		4.9537		7.4932		28.0375		37.5520	
TIME IN ALT BAND		0.0189															

Figure 6.- Percent of flights vs time in altitude bands.

		PERCENT OF FLIGHTS								
		-500 TO 4500 FT	4500 TO 9500 FT	9500 TO 14500 FT	14500 TO 19500 FT	19500 TO 24500 FT	24500 TO 29500 FT	29500 TO 34500 FT	34500 TO 39500 FT	39500 TO 44500 FT
DURATION OF FLIGHT, HOURS										
6.5-7.0	0	0	0	0	0	0	0	0	0	0
6.0-6.5	0	0	0	0	0	0	0	0	0	0
5.5-6.0	0	0	0	0	0	0	0	0	0	0
5.0-5.5	0	0	0	0	0	0	0	0	0	0
4.5-5.0	0	0	0	0	0	0	0	0	0	0
4.0-4.5	0	0	0	0	0	0	0	0	0	0
3.5-4.0	0	0	0	0	0	0	0	0	0	0
3.0-3.5	0	0	0	0	0	0	0	0	0	0
2.5-3.0	0	0	0	0	0	0	0	0	0	0
2.0-2.5	0	0	0	0	0	0	0	0	0	0
1.5-2.0	0	0	0	0	0	0	0	0	0	0
1.0-1.5	0	0	0	0	0	0	0	0	0	0
.8-.1.0	0	0	0	0	0	0	0	0	0	0
.6-.8	0	0	0	0	0	0	0	0	0	0
.5-.6	0	0	0	0	0	0	0	0	0	0
.4-.5	0	0	0	0	0	0	0	0	0	0
.3-.4	0	0	0	0	0	0	0	0	0	0
.0-.3	0.2	0.8	0	0	0	0	0	0	0	0
TOTAL PERCENT										
ALL FLIGHTS	0.2	0.8	1.2	0.6	1.9	0.8	27.5	57.7	0.2	

(a) Maximum altitude vs flight duration matrix

Figure 7.- Percent of flights to maximum altitude.



(b) Percent of flights to maximum pressure altitude per flight : Plot.

Figure 7.- Concluded.

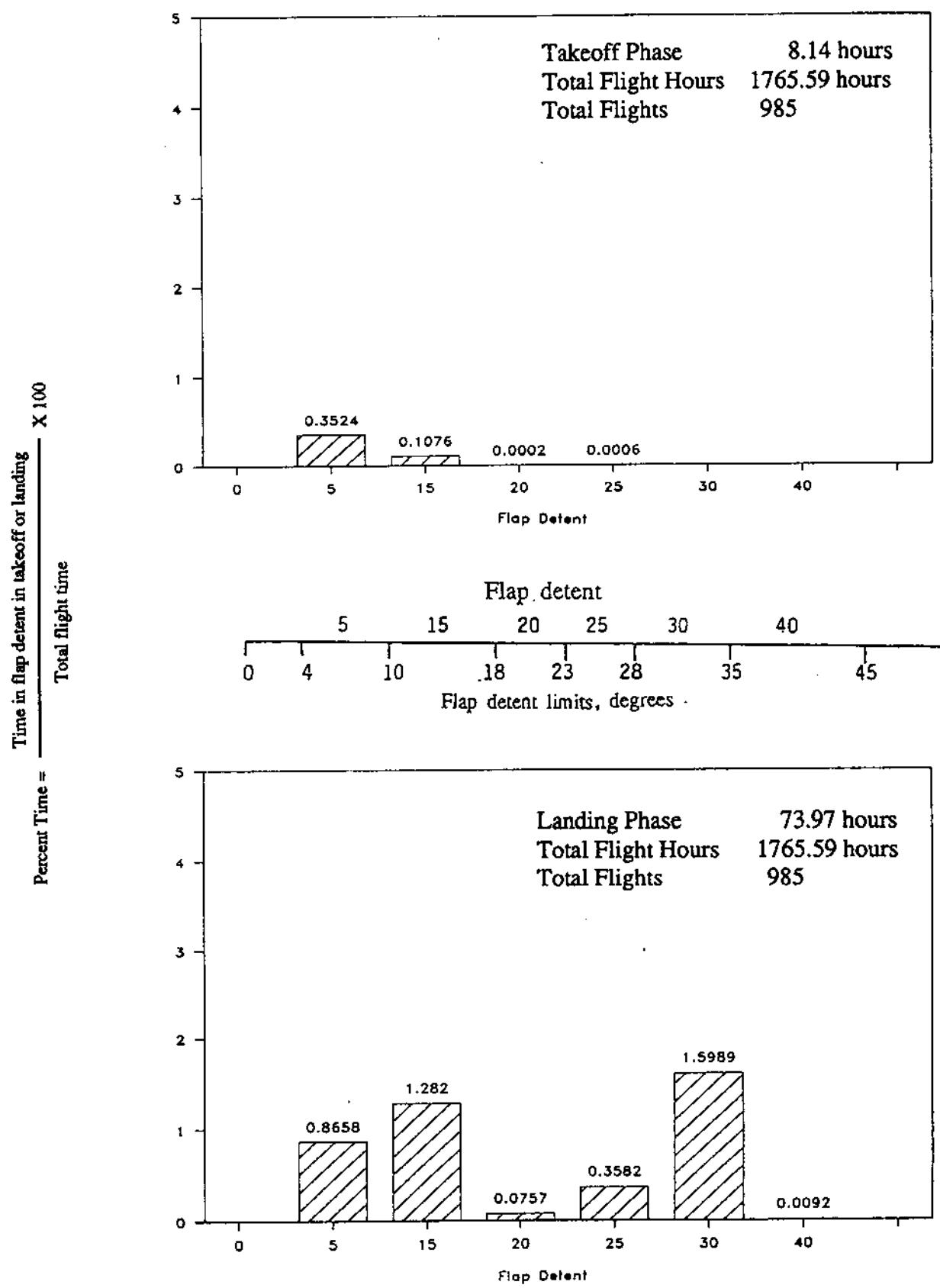
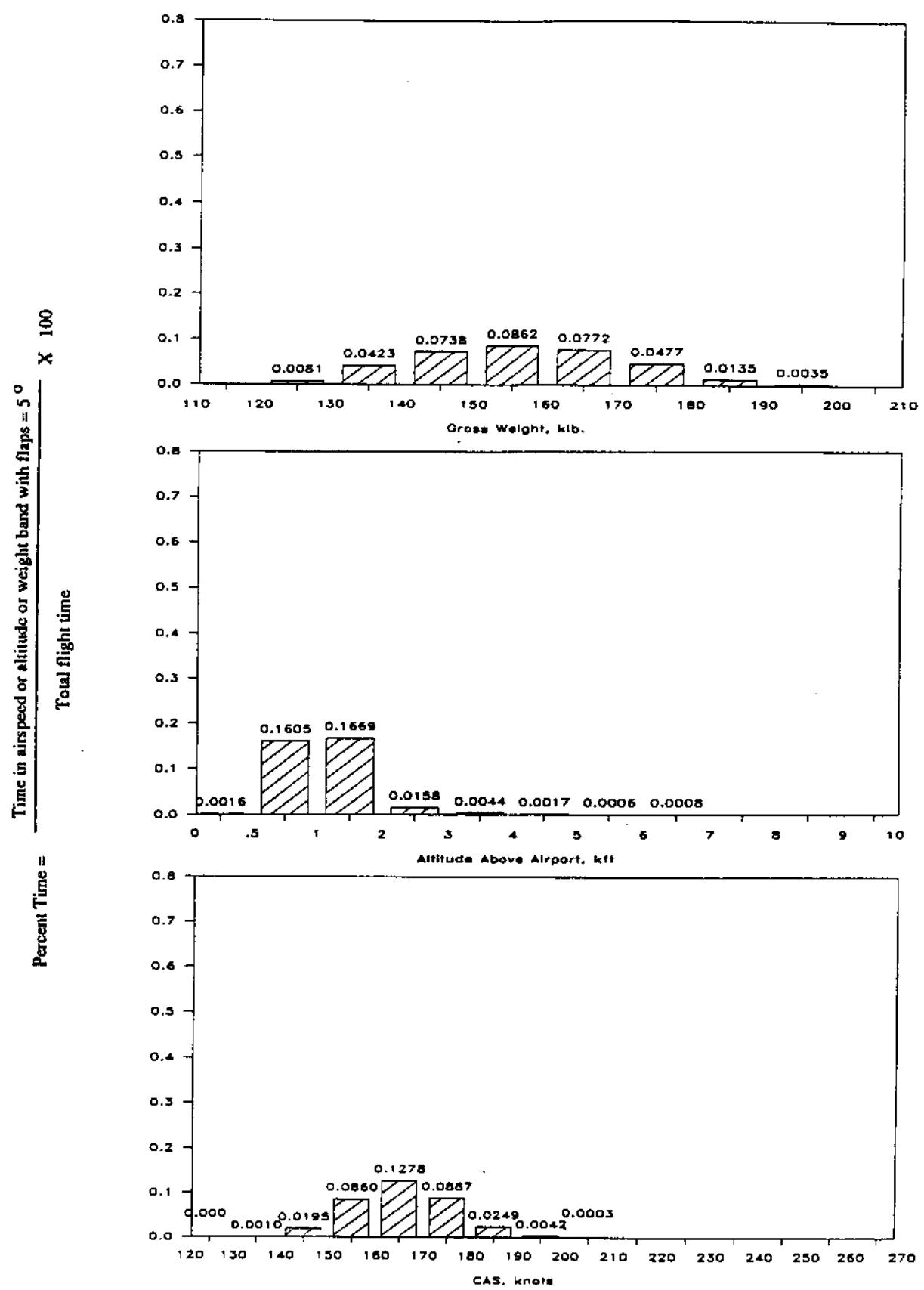
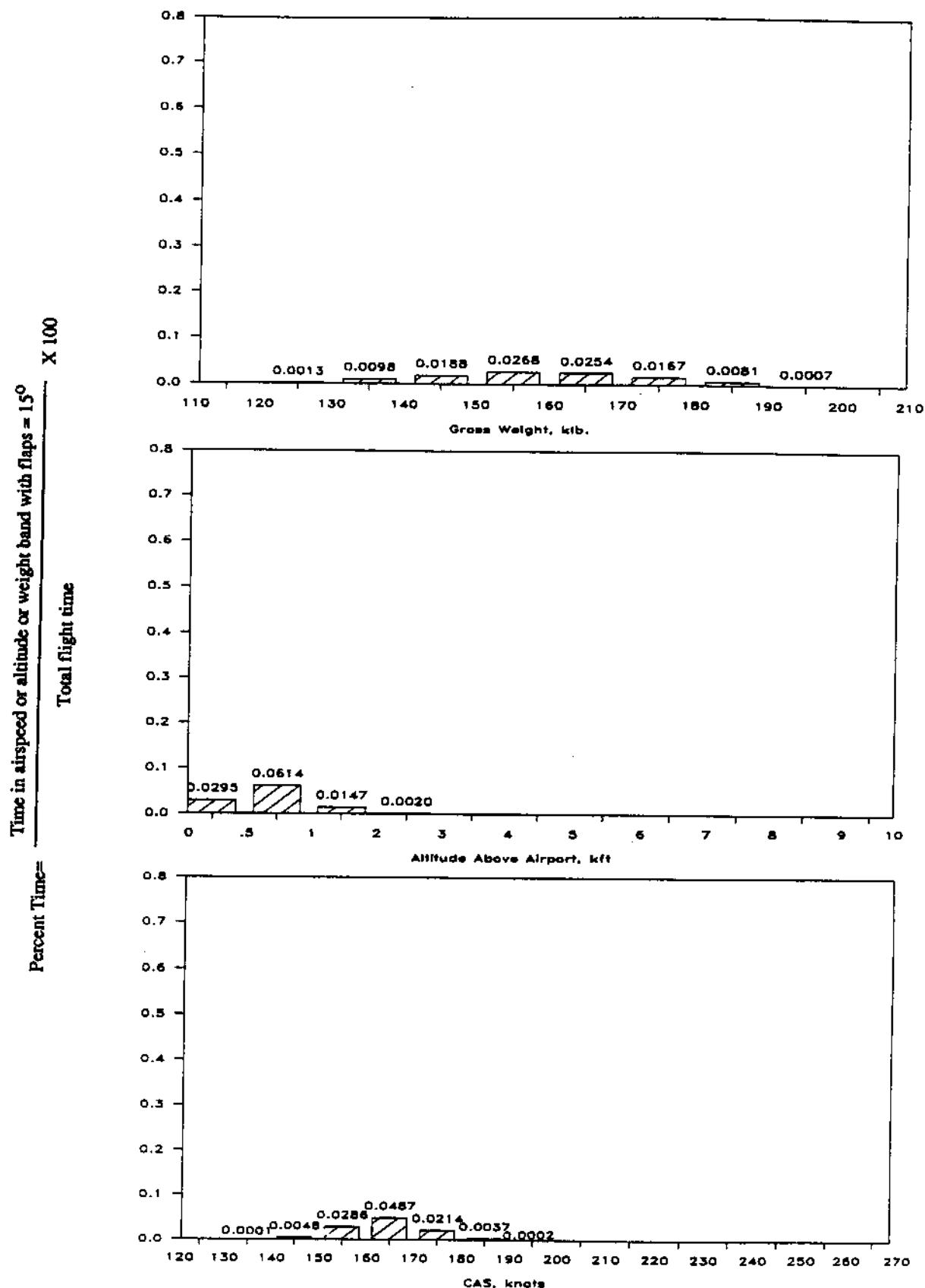


Figure 8.- Percent of total flight time at each flap detent.



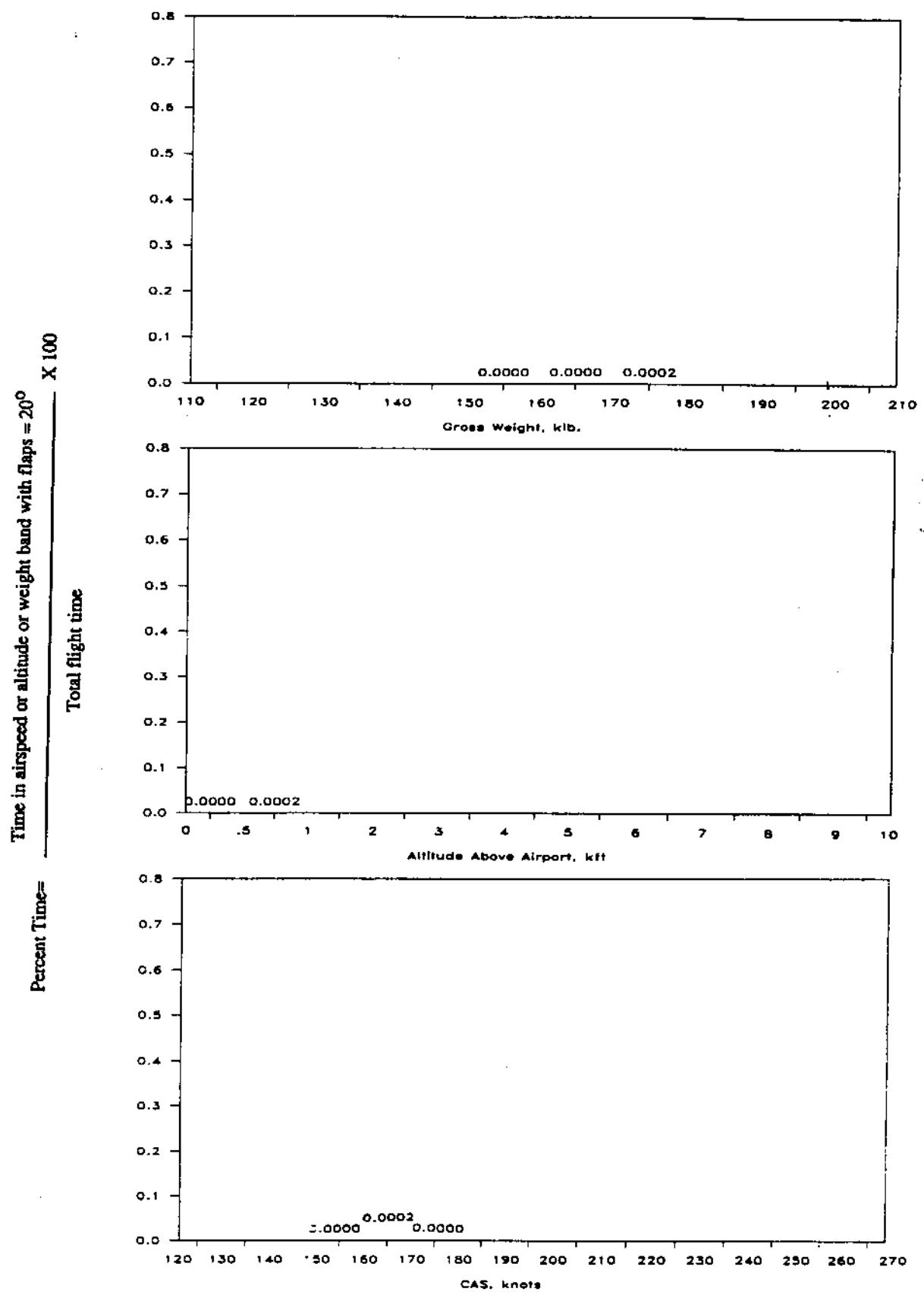
(a) Takeoff, flaps=5°; 6.2223 hours

Figure 9.- Gross weight, altitude above airport, and airspeed time distributions.



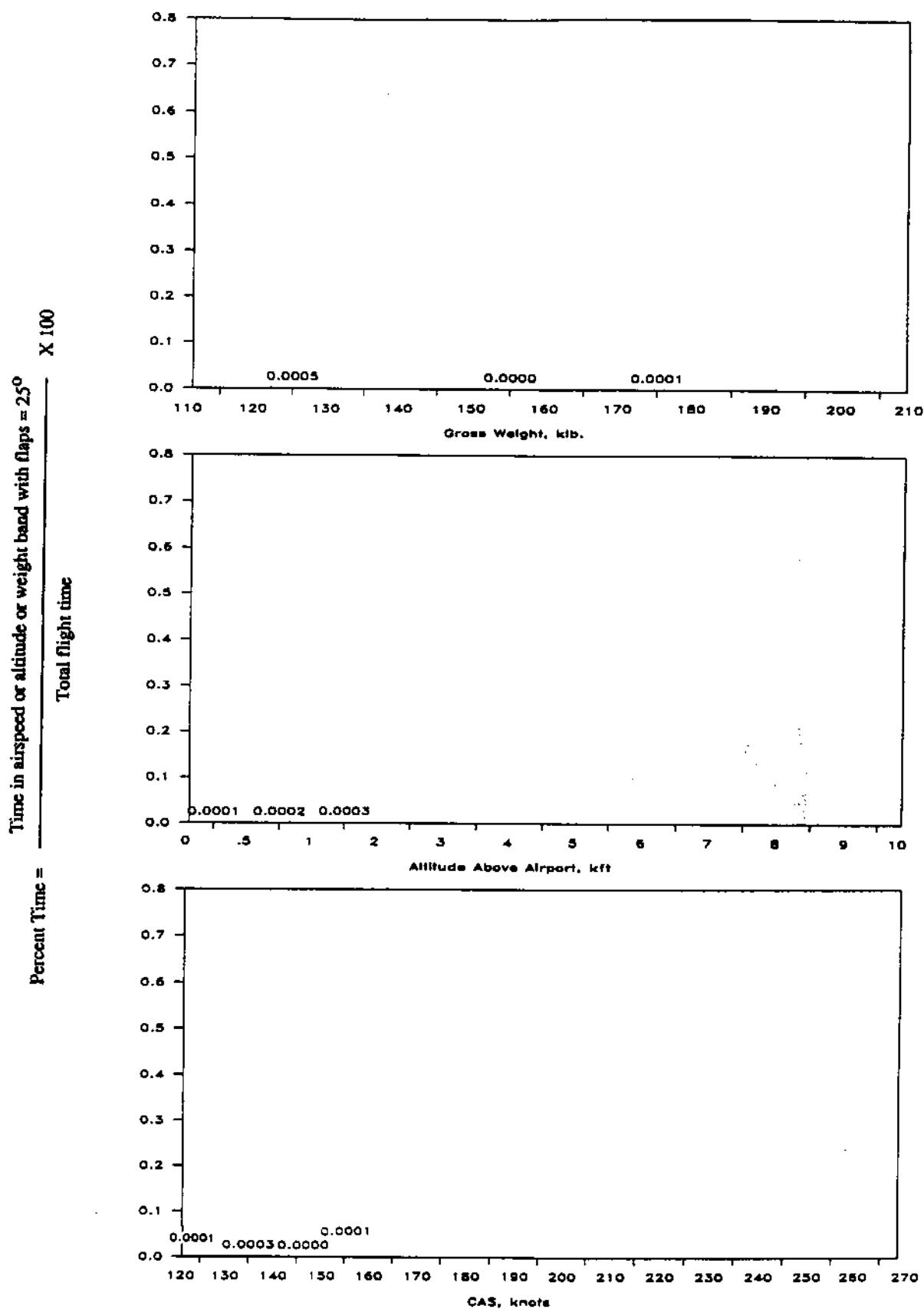
(b) Takeoff, flaps=15°; 1.8993 hours

Figure 9.- Continued.



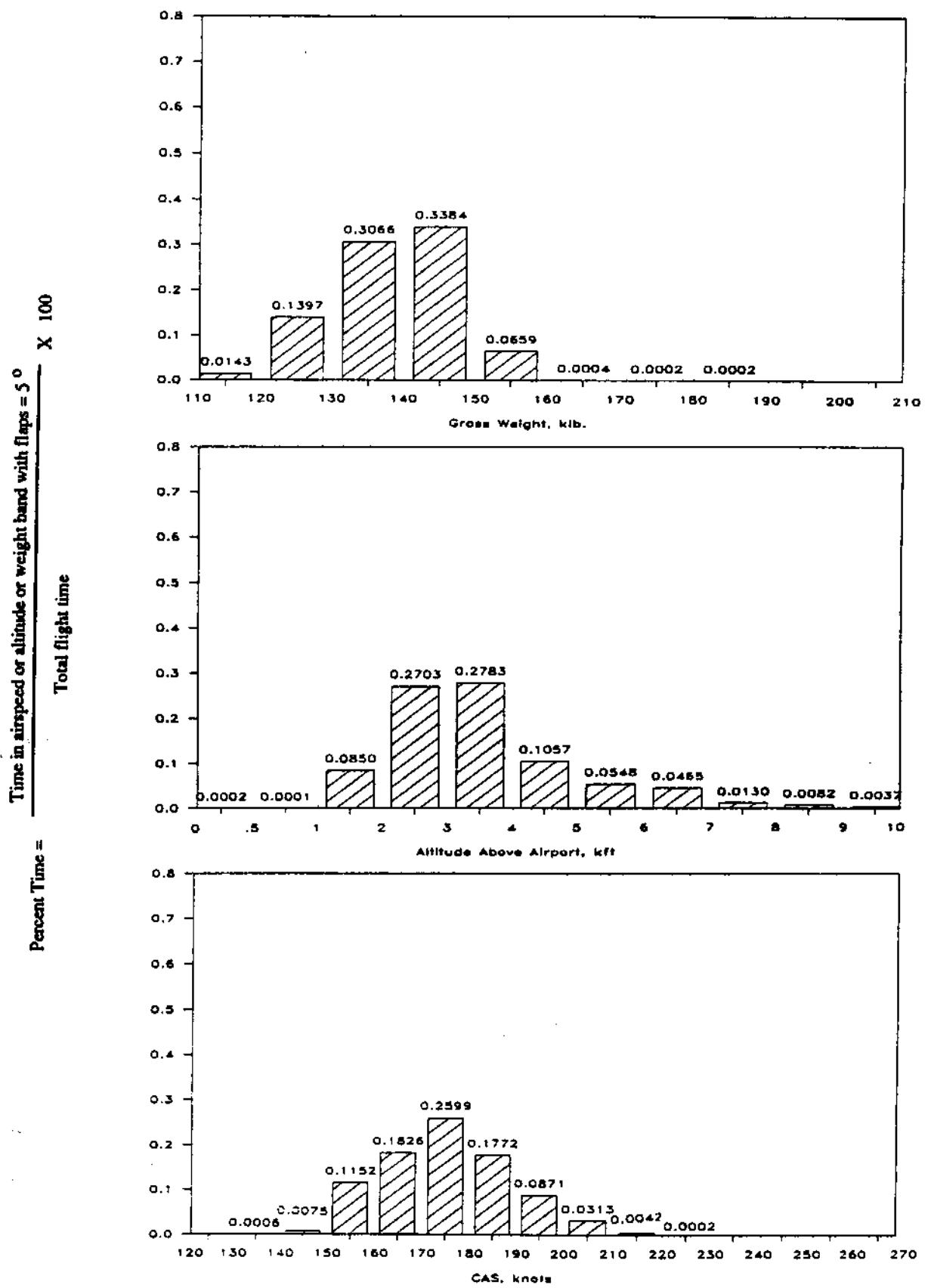
(c) Takeoff, flaps=20°; 0.0033 hours

Figure 9.- Continued.



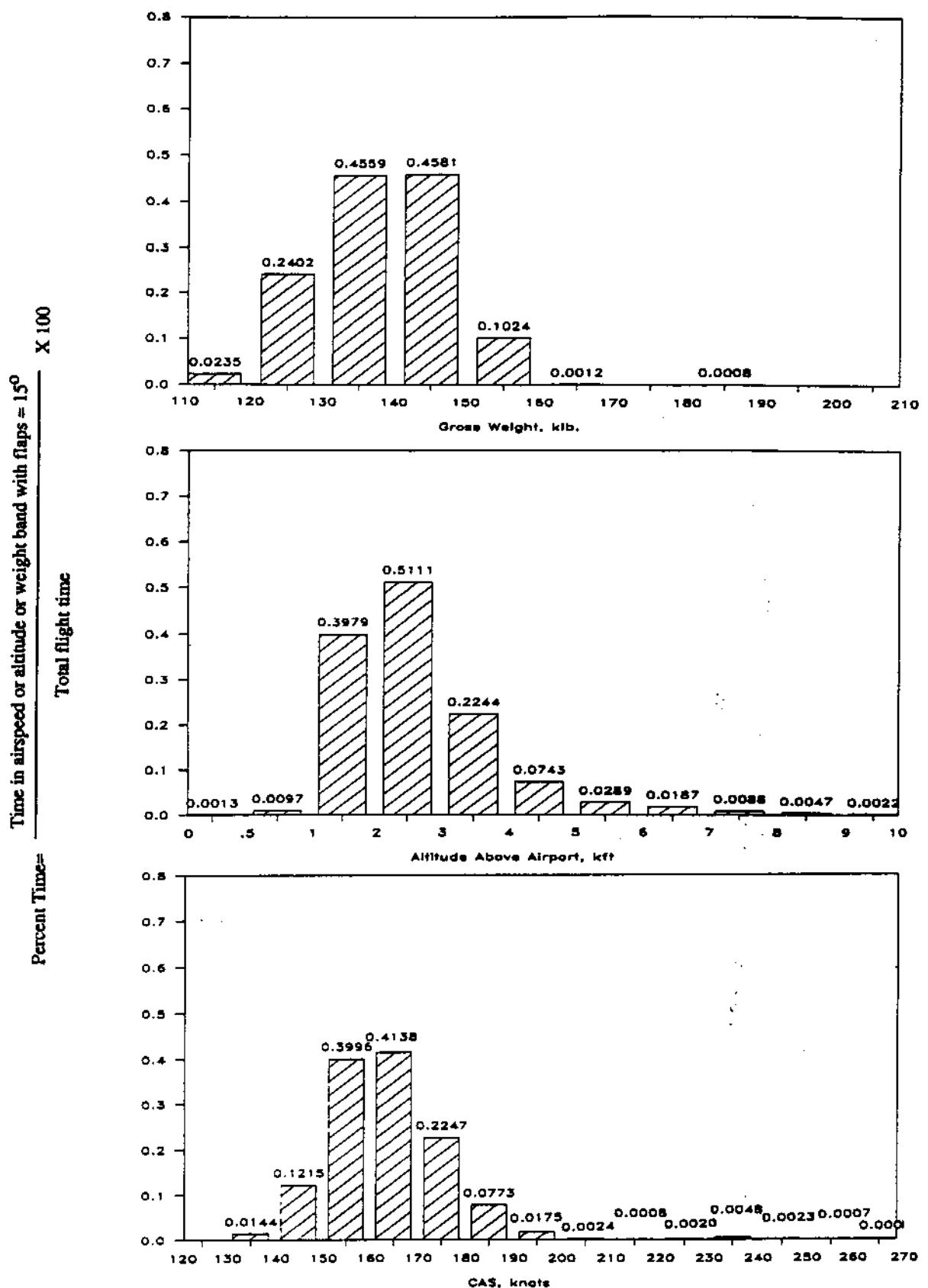
(d) Takeoff, flaps=25°; .0108 hours

Figure 9.- Continued.



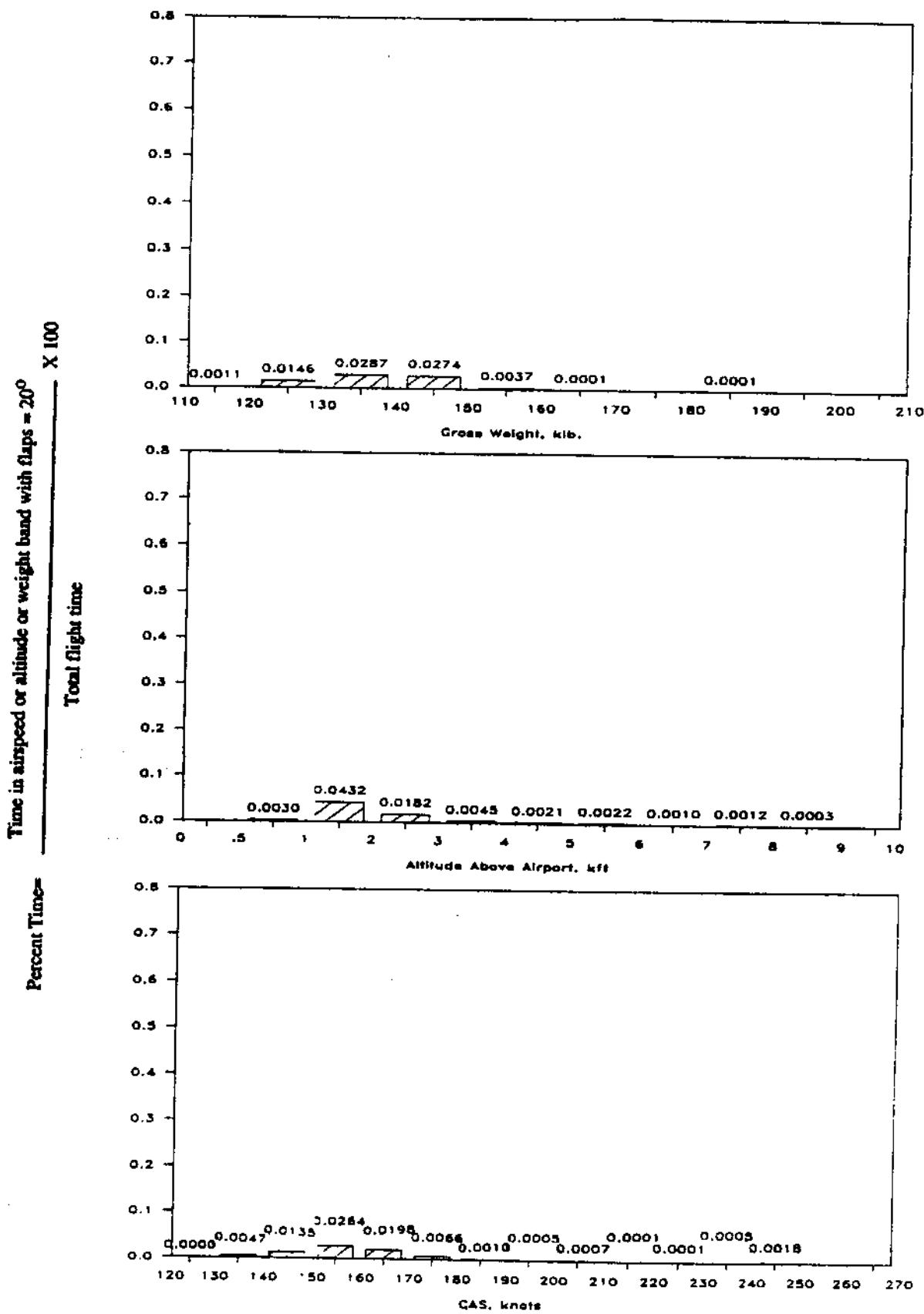
(e) Landing, flaps=5°; 15.2862 hours

Figure 9.- Continued.



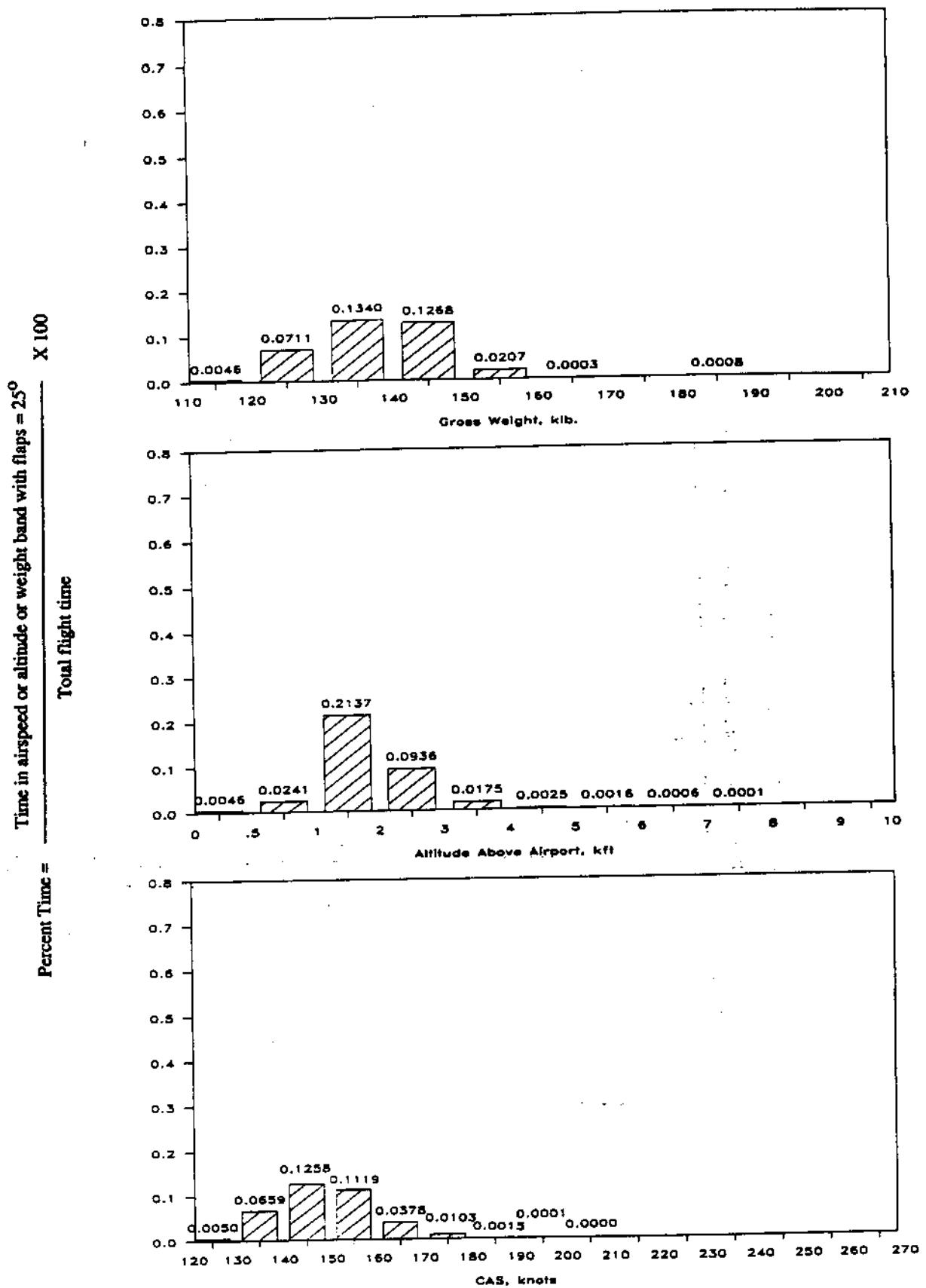
(f) Landing, flaps=15°; 22.635 hours

Figure 9.- Continued.



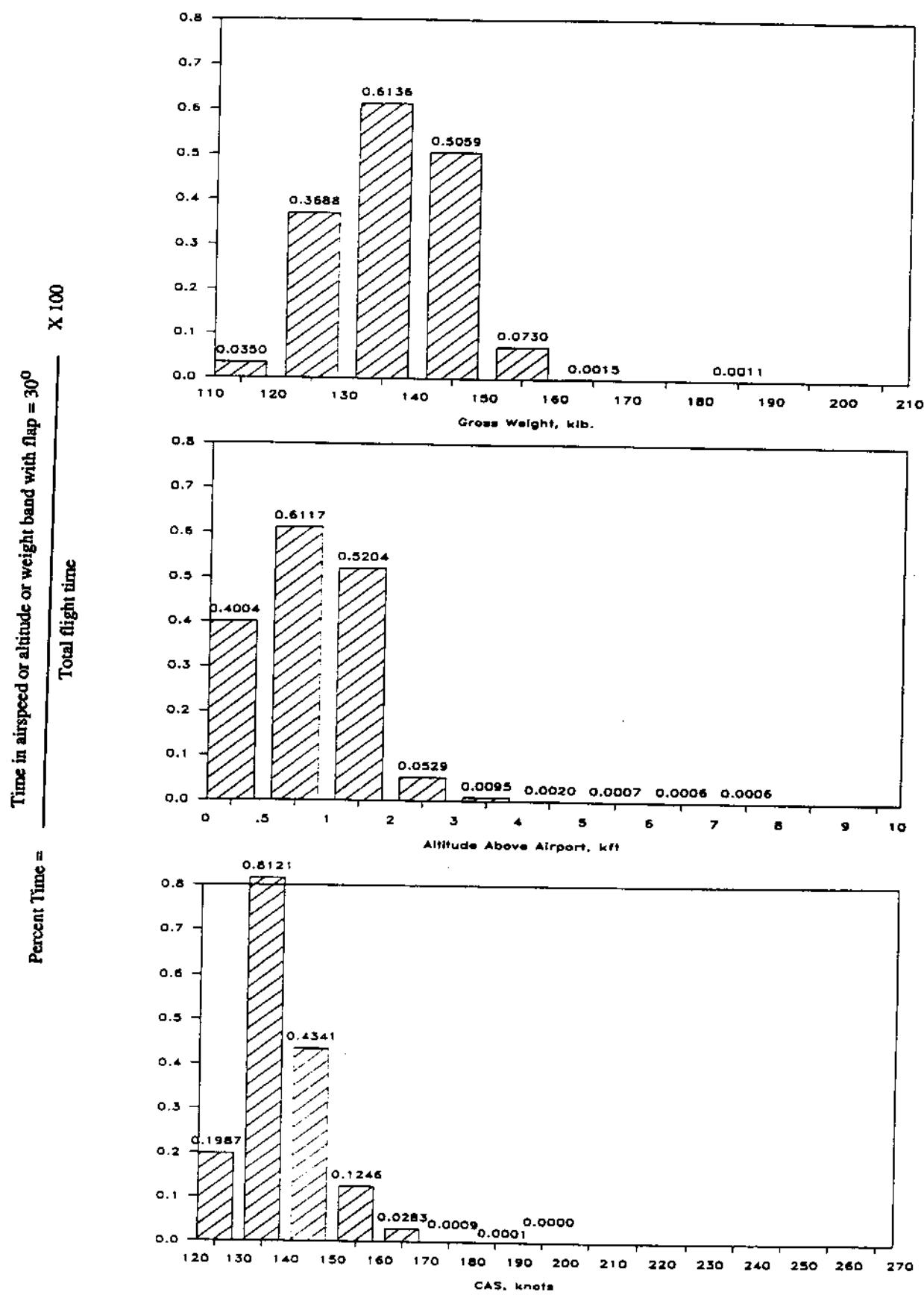
(g) Landing, flaps=20°; 1.3367 hours

Figure 9.- Continued.



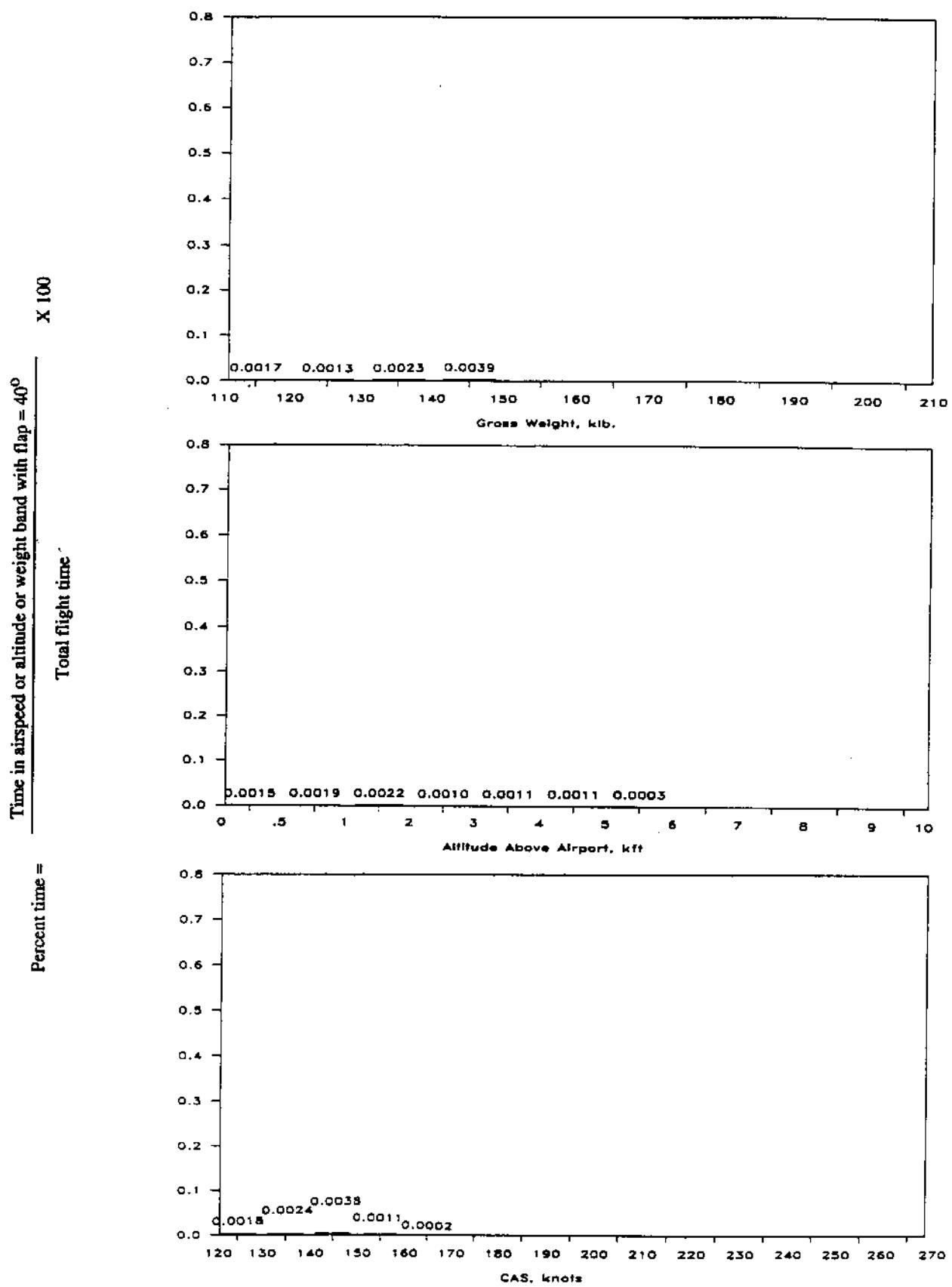
(h) Landing, flaps=25°; 6.3246 hours

Figure 9.- Continued.



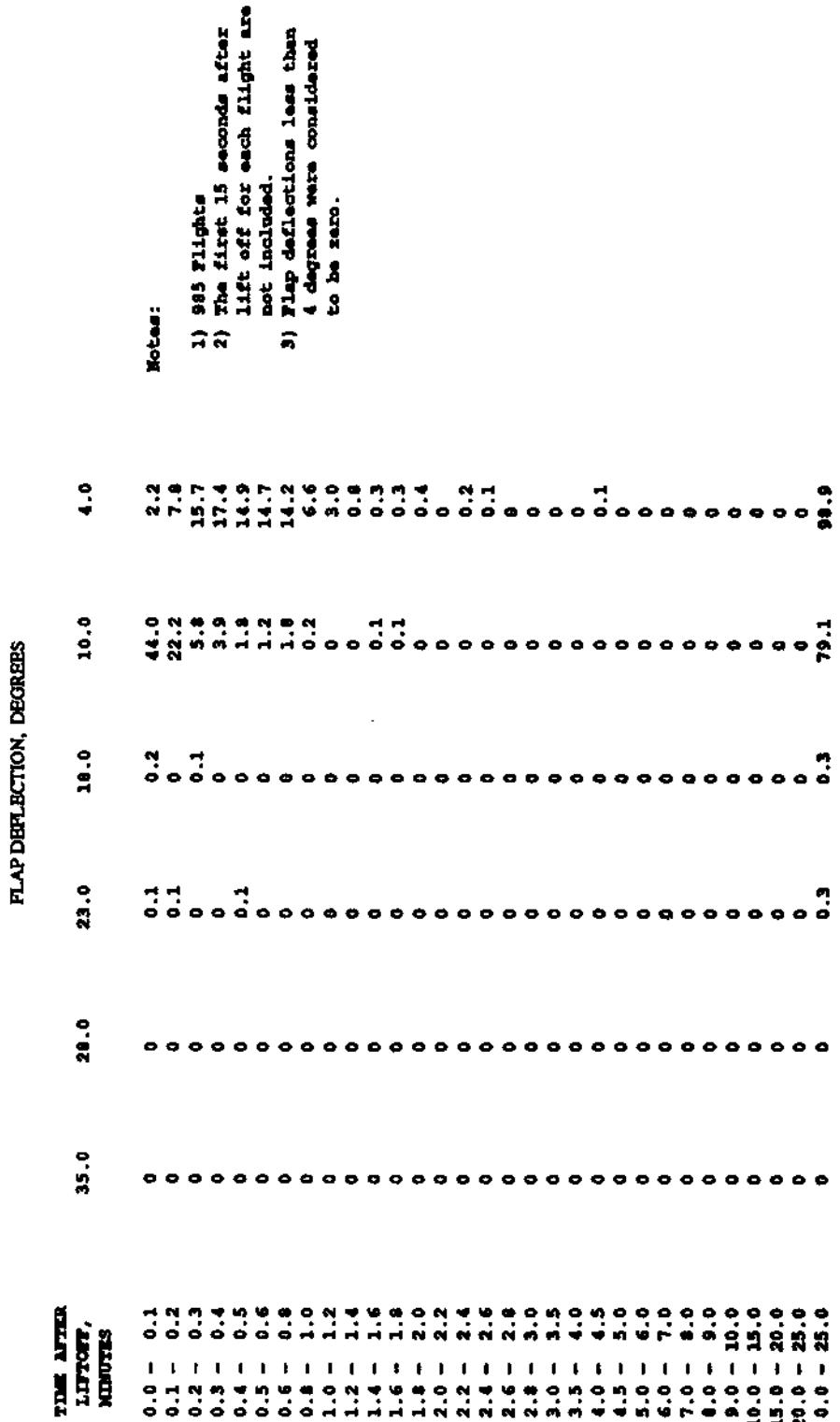
(i) Landing, flaps=30°; 28.2303 hours

Figure 9.- Continued.



(j) Landing, flaps=40°; 0.1619 hours

Figure 9.- Concluded.



(a) Take off: Percent of flights vs times when take off flap deflection is reduced to less than indicated values

Figure 10.- Flap deflection times.

FLAP DEFLECTION, DEGREES

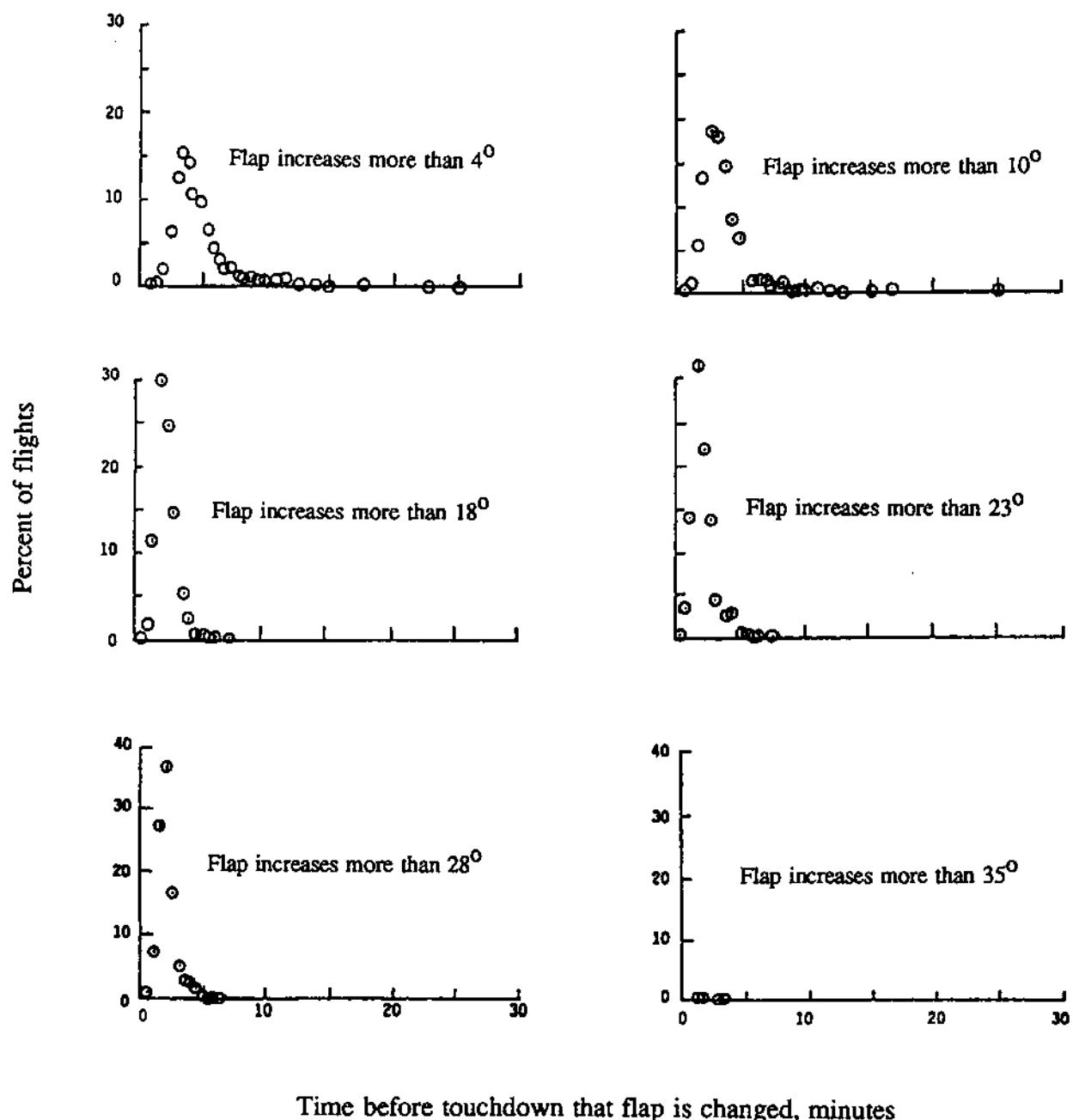
TIME BEFORE TOUCHDOWN, MINUTES	4.0	10.0	16.0	23.0	28.0	35.0
0.0 - 0.5	0	0	0	0	0	0
0.5 - 1.0	0.2	0.2	0.4	0.4	0.6	0
1.0 - 1.5	0.8	0.8	1.7	1.7	2.2	3.4
1.5 - 2.0	2.5	2.5	5.8	5.8	11.6	16.2
2.0 - 2.5	6.5	6.5	13.2	13.2	29.9	32.9
2.5 - 3.0	12.4	12.4	18.9	18.9	24.4	22.8
3.0 - 3.5	15.3	15.3	18.2	18.2	14.8	14.2
3.5 - 4.0	13.6	13.6	14.9	14.9	5.4	4.8
4.0 - 4.5	10.4	10.4	8.3	8.3	2.6	2.2
4.5 - 5.0	9.8	9.8	6.6	6.6	2.4	2.4
5.0 - 5.5	6.8	6.8	3.2	3.2	0.7	0.6
5.5 - 6.0	4.7	4.7	1.9	1.9	0.4	0.3
6.0 - 6.5	3.2	3.2	1.7	1.7	0.2	0.2
6.5 - 7.0	2.2	2.2	1.1	1.1	0	0.1
7.0 - 7.5	2.4	2.4	0.7	0.7	0	0.2
7.5 - 8.0	1.3	1.3	0.4	0.4	0	0
8.0 - 8.5	1.0	1.0	0.3	0.3	0	0
8.5 - 9.0	1.5	1.5	0.2	0.2	0	0
9.0 - 9.5	0.8	0.8	0.3	0.3	0	0
9.5 - 10.0	0.6	0.6	0.4	0.4	0	0
10.0 - 11.0	0.8	0.8	0.3	0.3	0	0
11.0 - 12.0	0.9	0.9	0.2	0.2	0	0
12.0 - 13.0	0.3	0.3	0.1	0.1	0	0
13.0 - 14.0	0.3	0.3	0	0	0	0
14.0 - 15.0	0.1	0.1	0.1	0.1	0	0
15.0 - 17.0	0.3	0.3	0.2	0.2	0	0
17.0 - 19.0	0	0	0	0	0	0
19.0 - 21.0	0	0	0	0	0	0
21.0 - 23.0	0.1	0.1	0	0	0	0
23.0 - 25.0	0.1	0.1	0	0	0	0
25.0 - 30.0	0	0	0	0	0	0
30.0 - 35.0	0	0	0	0	0	0
35.0 - 40.0	0	0	0	0	0	0
40.0 - 60.0	0.1	0	0	0	0	0
0.0 - 60.0	99.3	99.9	95.6	98.9	99.0	0.7

Notes:

- 1) 985 flights
- 2) The last 15 seconds before touchdown on each flight are not included.
- 3) Flap deflections less than 4 degrees were considered to be zero.

(b) Landing: Percent of flights vs times when take off flap deflection is reduced to greater than indicated values

Figure 10.-Continued.



(c) Landing : Plots of data from Figure 10(b)

Figure 10.- Concluded.

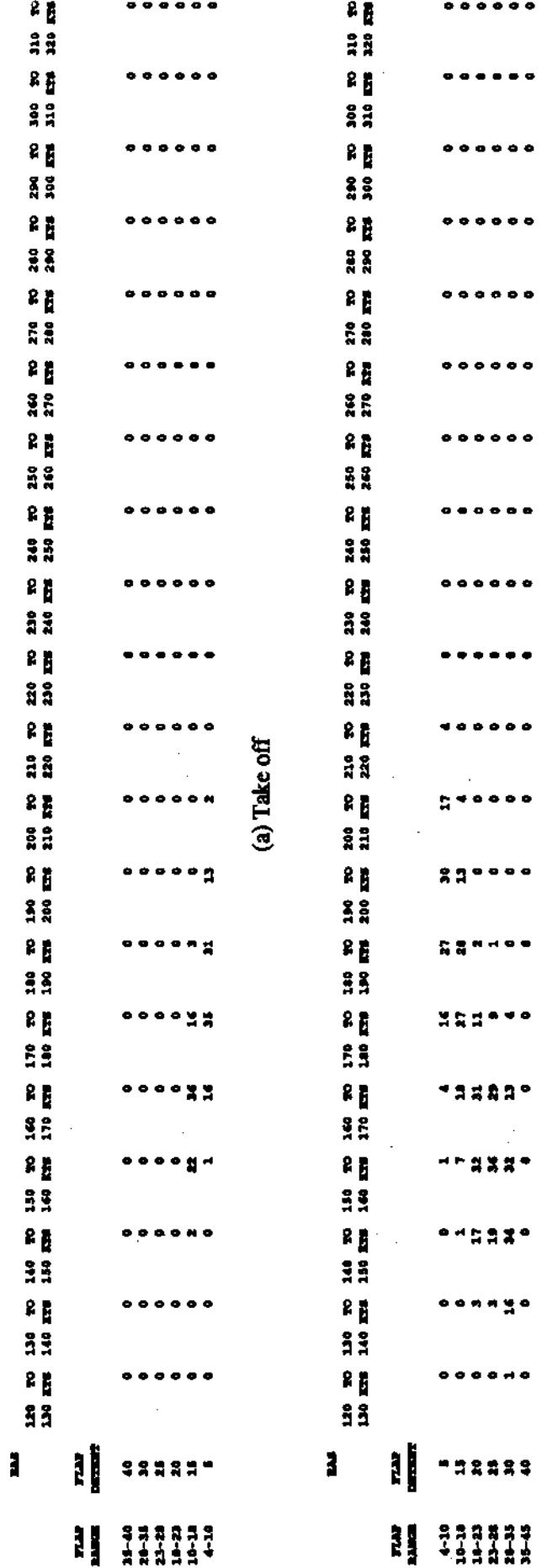


Figure 11.- Percent of lights vs equivalent airspeed at flap detent change.

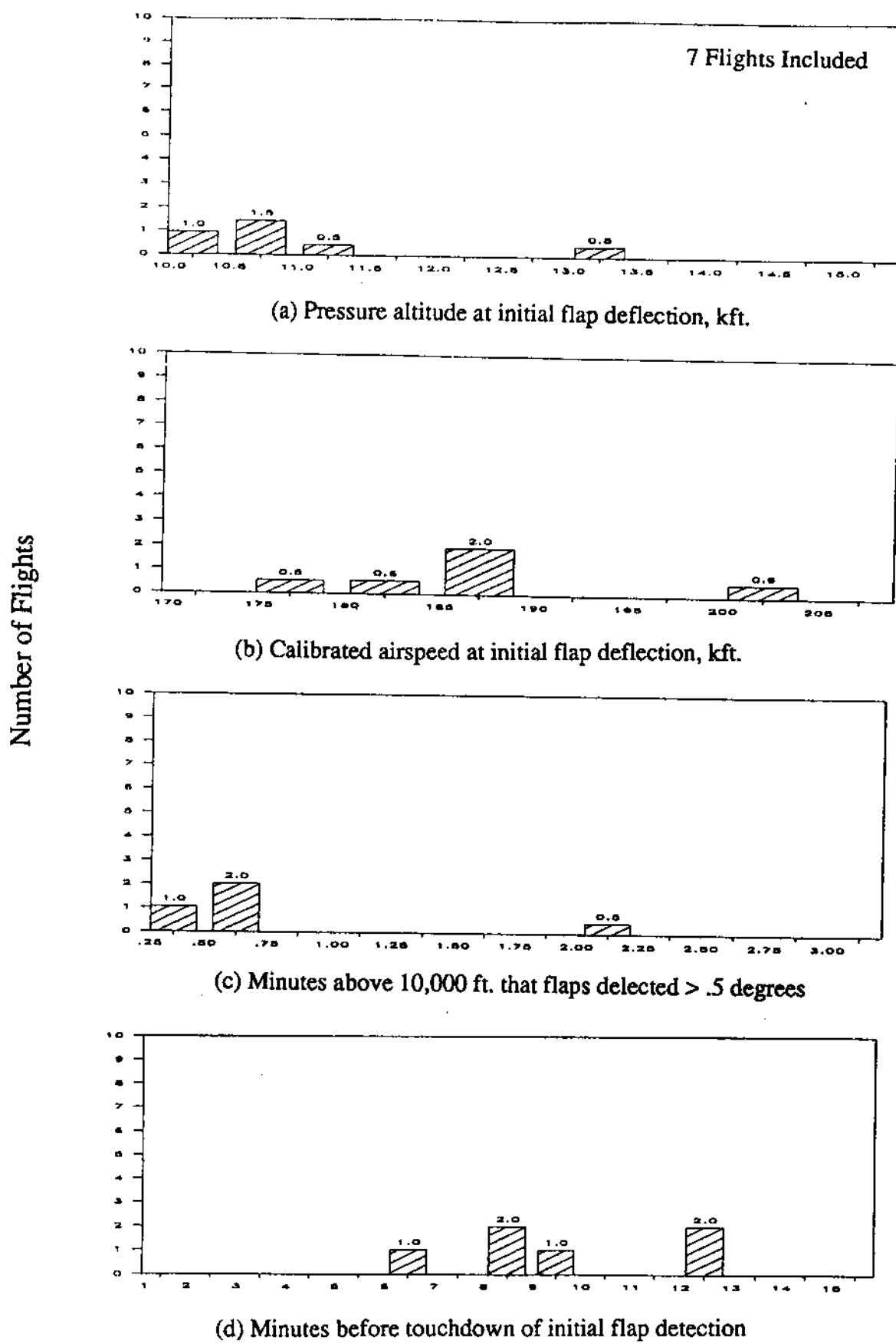


Figure 12.- Flap use above 10,000 feet altitude.

(a) a_1 Level crossing counts per hour within pressure altitude bands

Figure 13.- Normal acceleration exceedances.

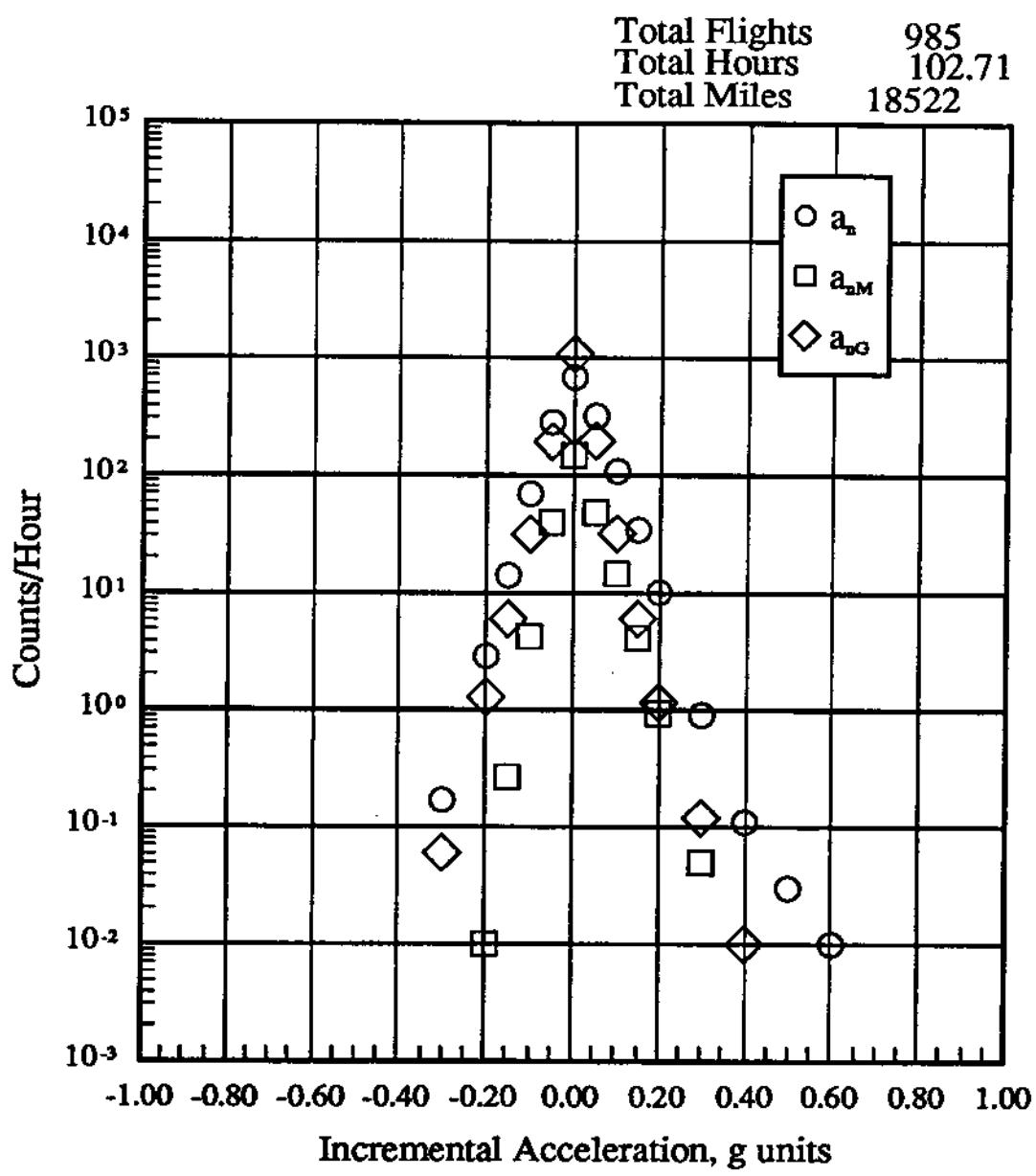
LEVEL α_{BL}	PRESSURE ALTITUDE BANDS						TOTAL FLIGHTS FLIGHT MILES FLIGHT MILES	985 1765.59 723033.21
	-500 TO 4500 FT	4500 TO 9500 FT	9500 TO 14500 FT	14500 TO 19500 FT	19500 TO 24500 FT	24500 TO 29500 FT		
g's	0	0	0	0	0	0	0	0
1.60	0	0	0	0	0	0	0	0
1.40	0	0	0	0	0	0	0	0
1.20	0	0	0	0	0	0	0	0
1.00	0	0	0	0	0	0	0	0
.80	0	0	0	0	0	0	0	0
.70	0	0	0	0	0	0	0	0
.60	0	0	0	0	0	0	0	0
.50	0	0	0	0	0	0	0	0
.40	0	0	0	0	0	0	0	0
.30	0.05	0.04	0	0	0	0.01	0	0.01
.20	0.94	0.80	0.35	0.15	0.13	0.06	0.03	0.15
.15	4.16	2.98	1.98	0.55	0.55	0.39	0.14	0.67
.10	14.75	12.59	7.85	3.04	2.23	1.73	0.56	2.71
.05	48.62	45.16	35.01	19.01	14.20	11.93	4.77	12.58
0	149.23	118.70	114.90	96.59	98.10	119.21	151.36	142.39
-.05	39.92	29.88	27.81	17.20	15.54	11.07	5.55	11.10
-.10	4.25	3.87	3.97	1.58	1.36	1.16	0.50	1.24
-.15	0.27	0.47	0.34	0.15	0.18	0.16	0.03	0.12
-.20	0.01	0.05	0.02	0.01	0.06	0.03	0.01	0.01
-.30	0	0	0.01	0	0	0.01	0	0
-.40	0	0	0	0	0	0	0	0
-.50	0	0	0	0	0	0	0	0
-.60	0	0	0	0	0	0	0	0
-.70	0	0	0	0	0	0	0	0
-.80	0	0	0	0	0	0	0	0
-.90	0	0	0	0	0	0	0	0
-1.00	0	0	0	0	0	0	0	0
-1.20	0	0	0	0	0	0	0	0
-1.40	0	0	0	0	0	0	0	0
-1.60	0	0	0	0	0	0	0	0
FLIGHT HOURS & MILE	102.71	105.51	104.07	74.64	97.46	132.30	495.03	663.54
FLIGHT MILES & MILE	18522.12	26173.93	33995.36	28461.45	36365.13	58863.40	223579.31	296925.11
TOTAL FLIGHTS							146.91	1765.59
TOTAL FLIGHT MILES							723033.21	1765.59

(b) a_{IM} Level crossing counts per hour within pressure altitude bands

Figure 13.- Continued.

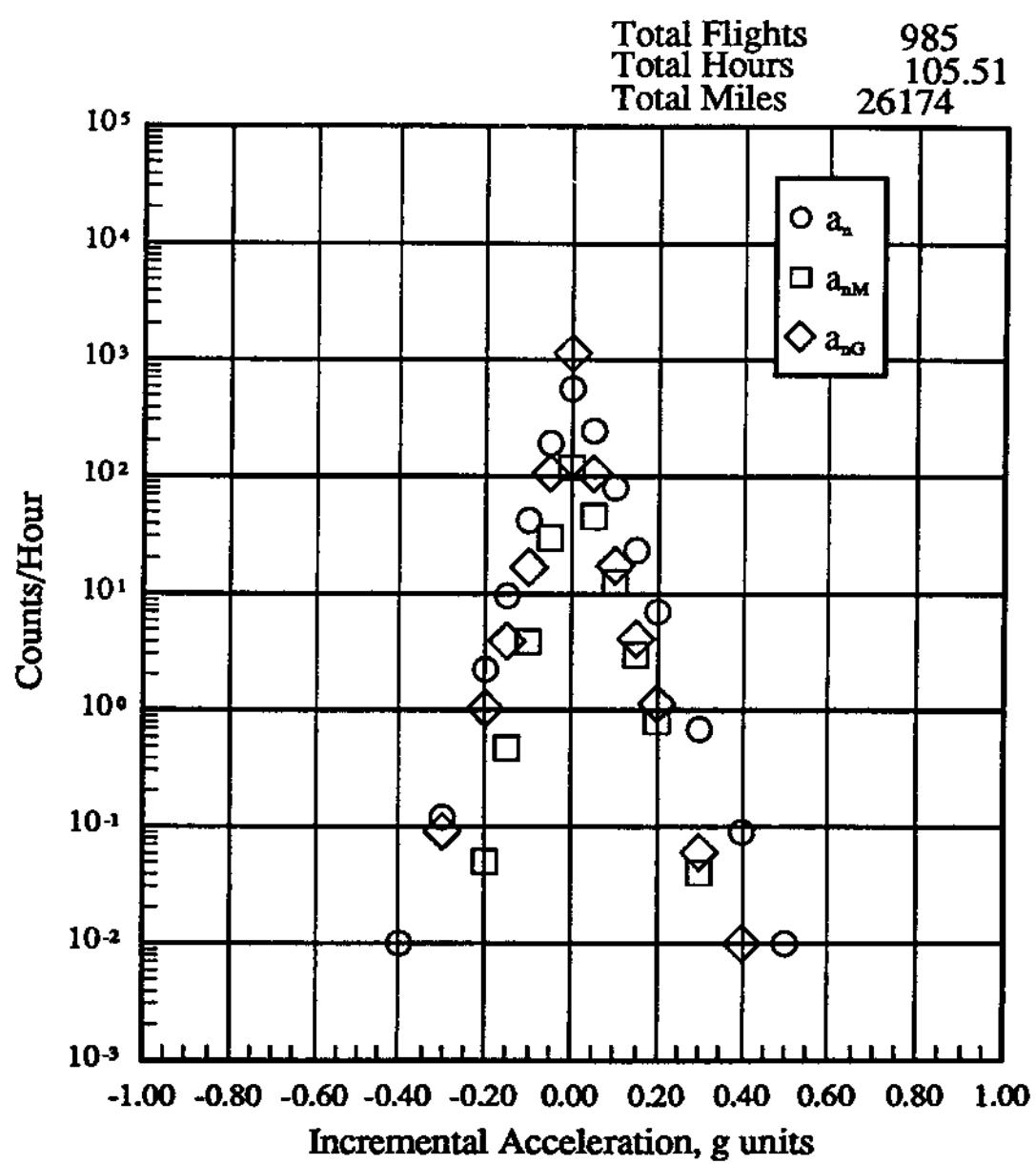
(c) α_{NG} Level crossing counts per hour within pressure altitude bands

Figure 13.- Continued.



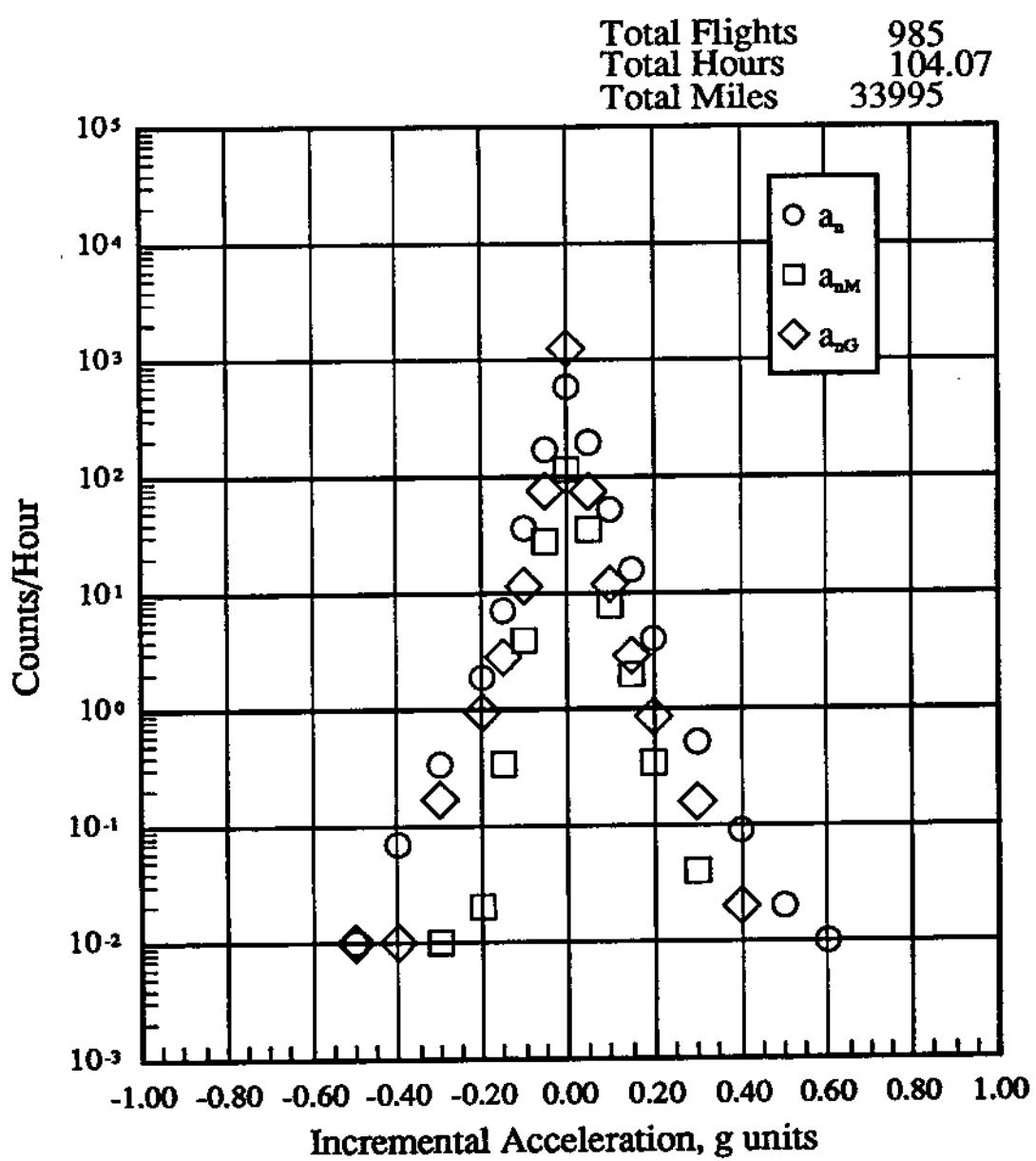
(d) a_n , a_{nM} , a_{nG} , -500 to 4500 feet altitude

Figure 13.- Continued.



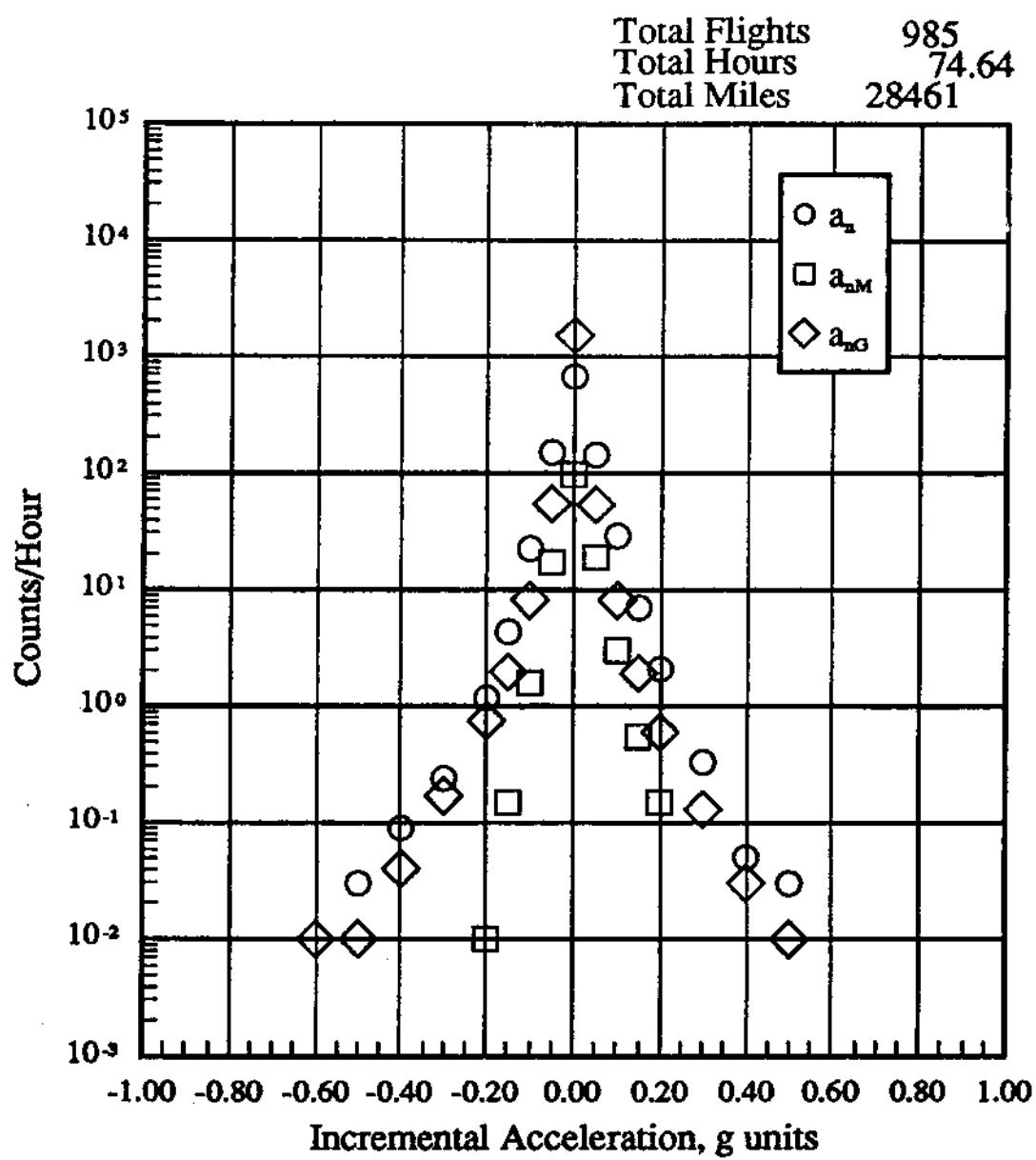
(e) a_n , a_{nM} , a_{nG} , 9500 to 14500 feet altitude

Figure 13.- Continued.



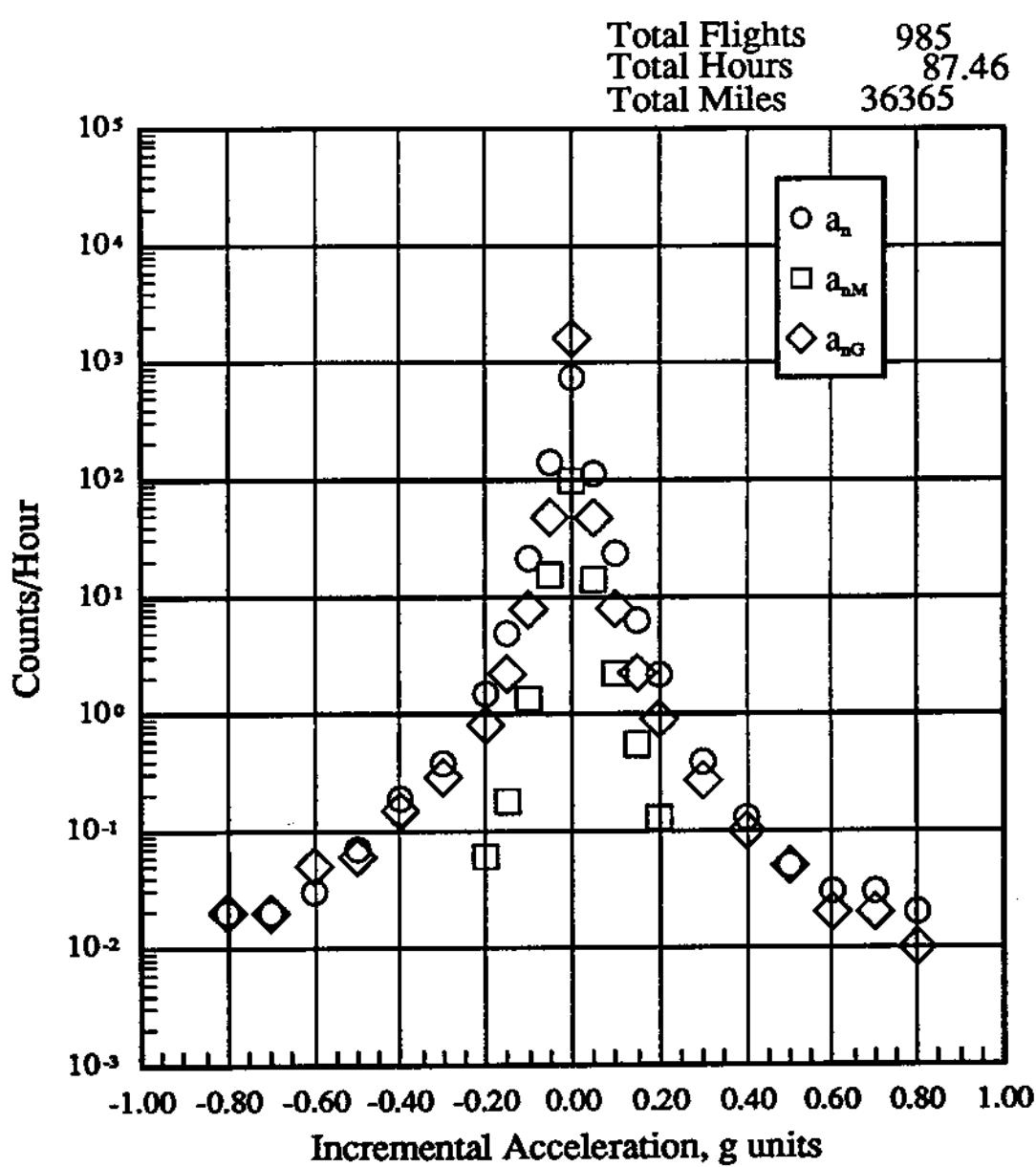
(f) a_n , a_{nM} , a_{nG} , 9500 to 14500 feet altitude

Figure 13.- Continued.



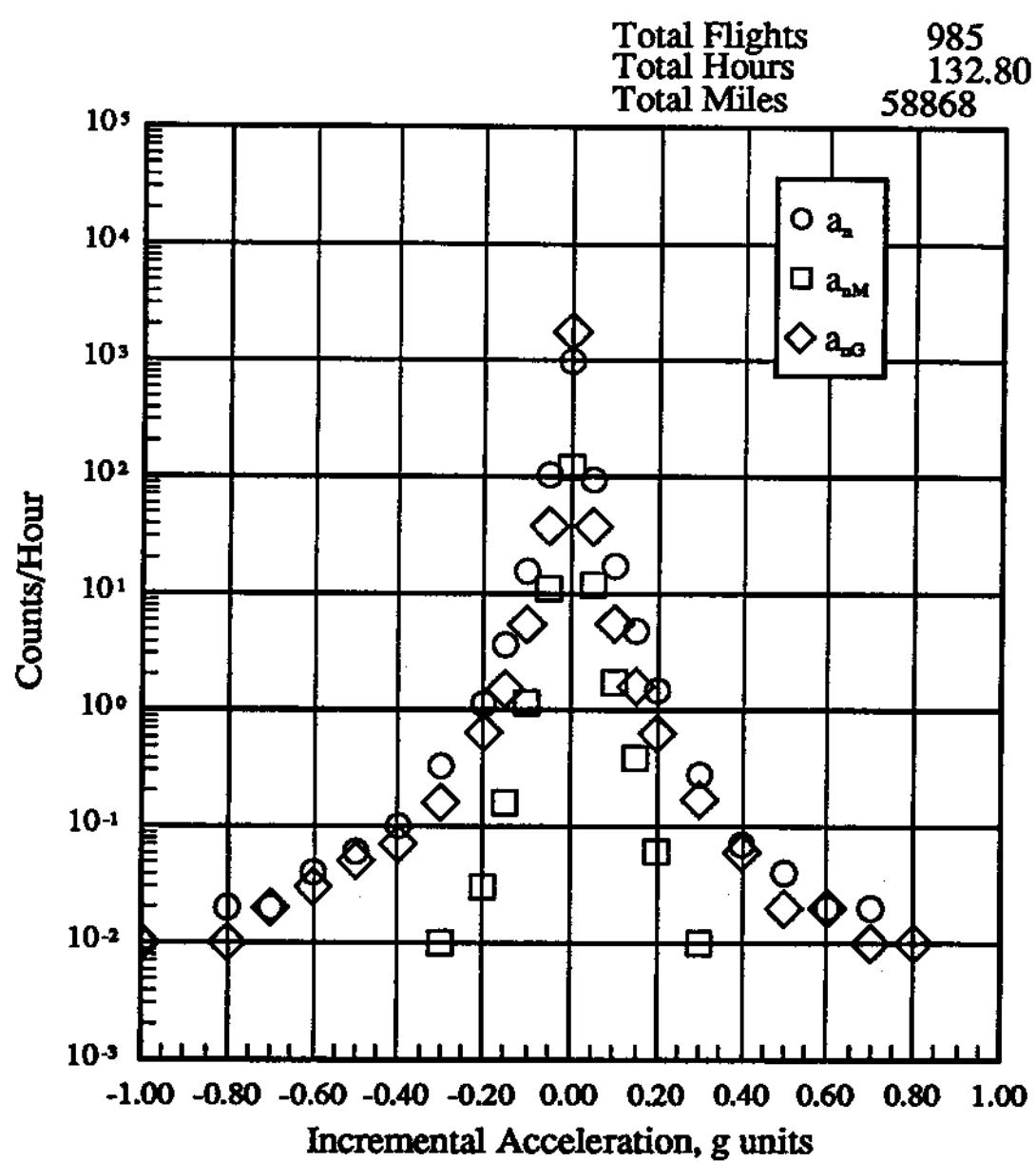
(g) a_n , a_{nM} , a_{nG} , 14500 to 19500 feet altitude

Figure 13.- Continued.



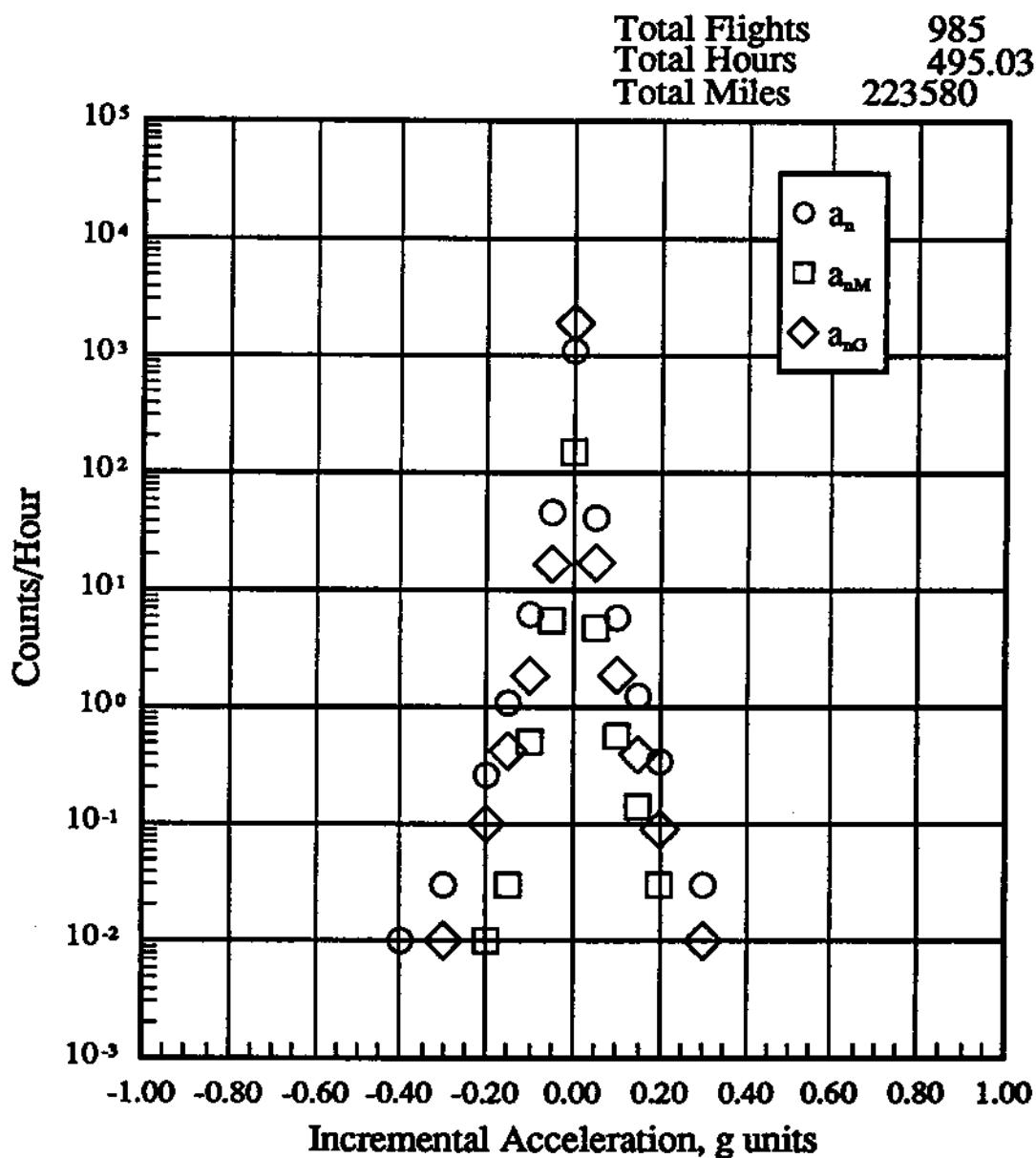
(h) a_n , a_{nM} , a_{nG} , 19500 to 24500 feet altitude

Figure 13.- Continued.



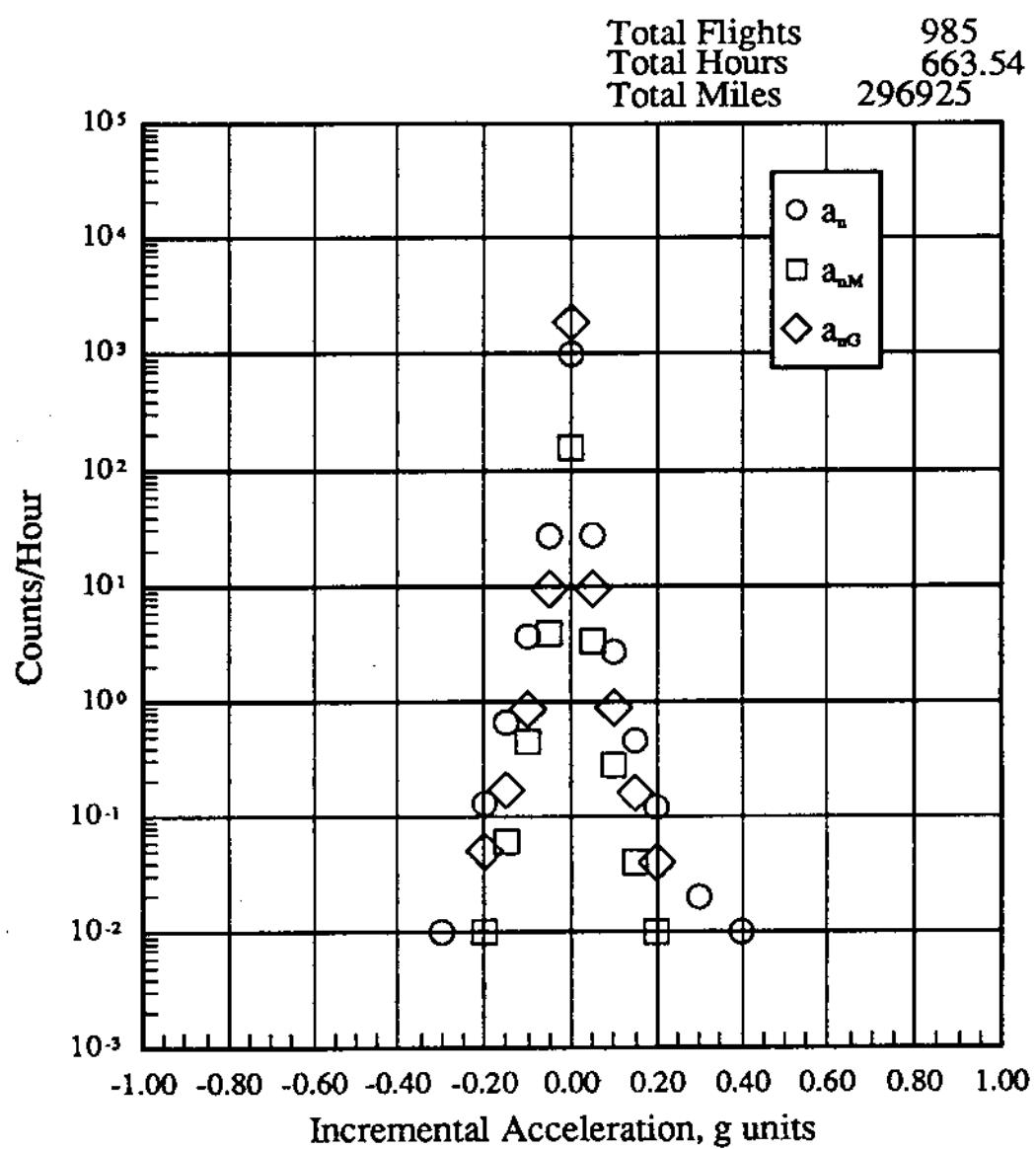
(i) a_x , a_M , a_G , 24500 to 29500 feet altitude

Figure 13.- Continued.



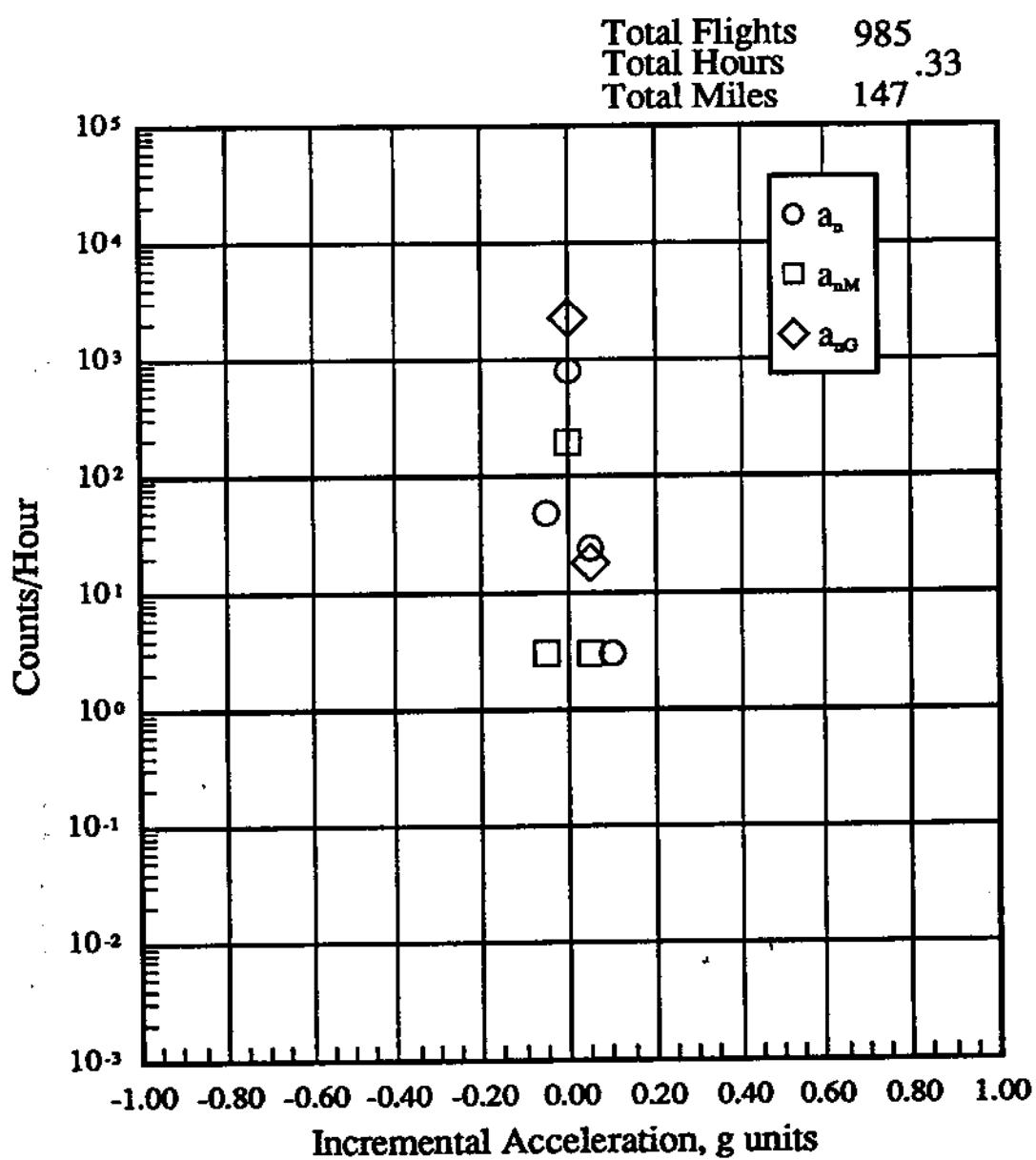
(j) a_n , a_{nM} , a_{nG} , 29500 to 34500 feet altitude

Figure 13.- Continued.



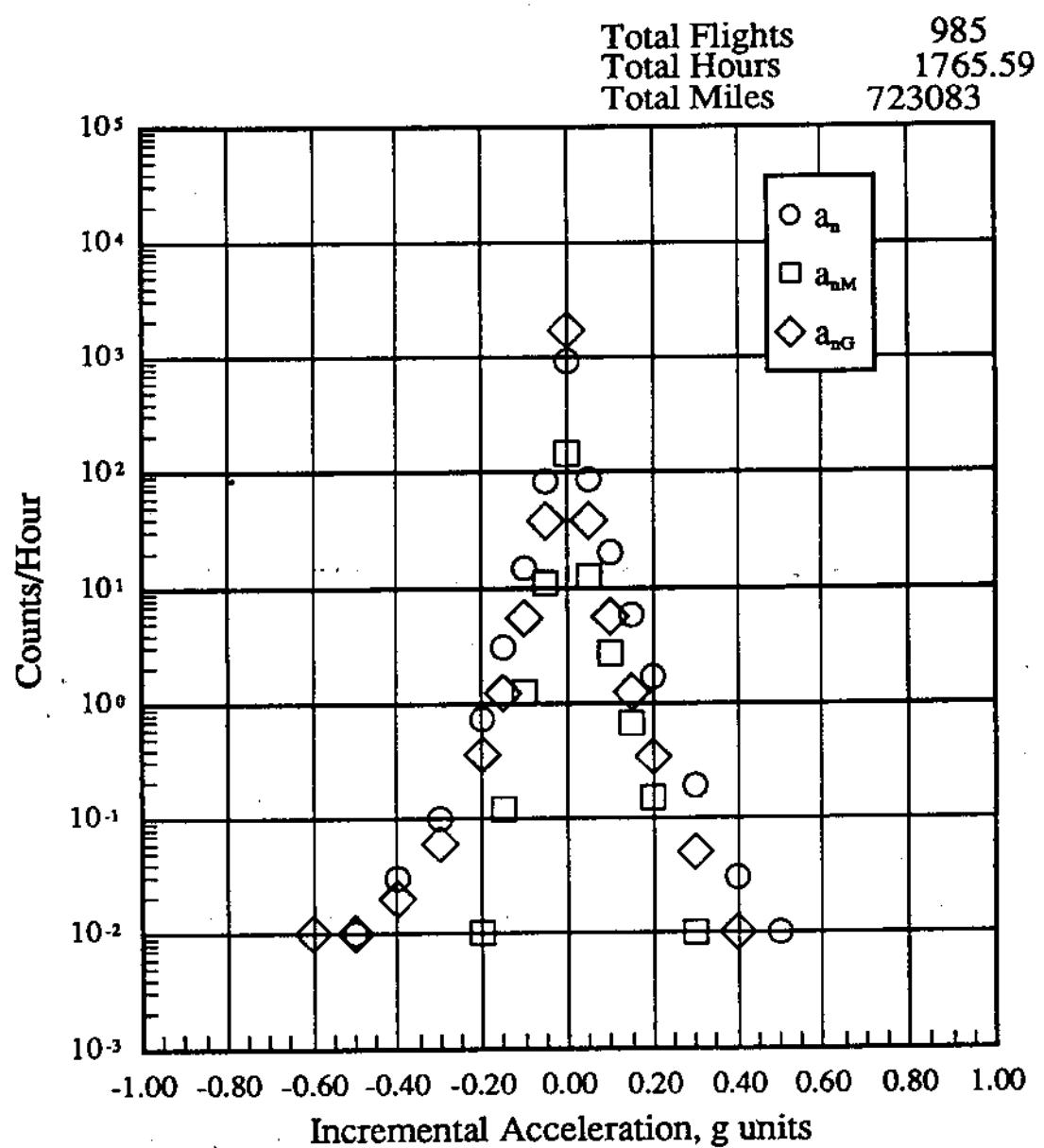
(k) a_n , a_{nm} , a_{ng} , 34500 to 39500 feet altitude

Figure 13.- Continued.



(I) a_n , a_{nm} , a_{ng} , 39500 to 44500 feet altitude

Figure 13.- Continued.



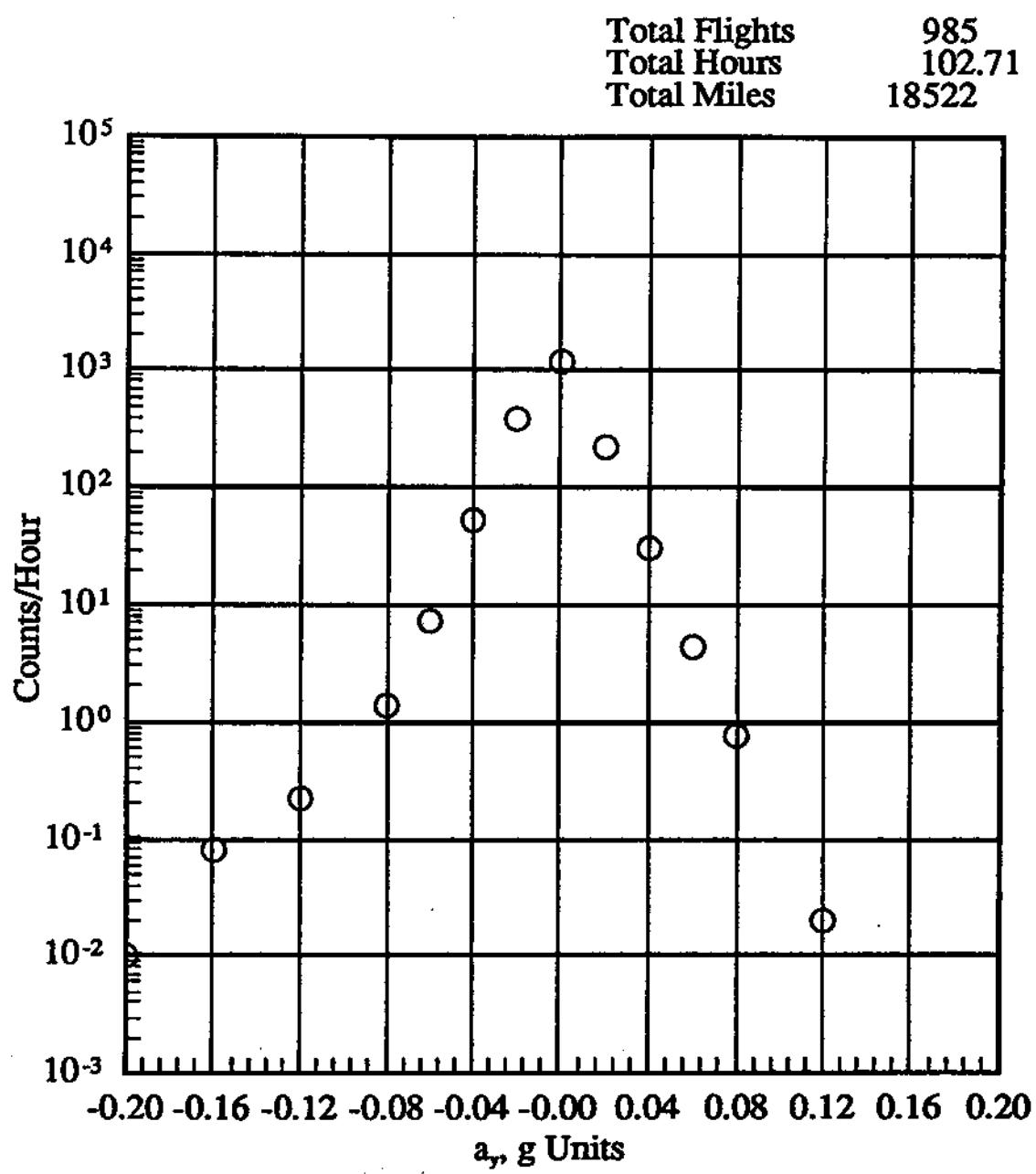
(m) a_n , a_{nM} , a_{nG} , -500 to 44500 feet altitude

Figure 13.- Concluded.

a_y LEVEL ft's	PRESSURE ALTITUDE BANDS										-500 TO -4500 FT			
	-500 TO 4500 FT	4500 TO 9500 FT	9500 TO 14500 FT	14500 TO 19500 FT	19500 TO 24500 FT	24500 TO 29500 FT	29500 TO 34500 FT	34500 TO 39500 FT	39500 TO 44500 FT	44500 TO 49500 FT	-500 TO -4500 FT			
.48	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.44	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.36	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.32	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.28	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.24	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.16	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01
.12	0.02	0	0.02	0	0.03	0.02	0.03	0.02	0.02	0	0	0	0	0.02
.08	0.76	0.22	0.20	0.21	0.31	0.33	0.27	0.27	0.05	0.02	0	0	0	0.13
.06	4.35	1.35	0.73	0.74	1.03	0.74	0.74	0.28	0.09	0	0	0	0	0.63
.04	30.91	9.62	4.26	3.18	4.07	3.10	1.45	0.73	0	0	0	0	0	3.89
.02	222.65	87.94	42.08	31.31	30.20	26.18	14.49	9.33	6.04	33.04	0	0	0	0
0	1205.53	900.69	839.85	900.22	970.23	1111.53	1245.60	1121.27	1522.15	1113.78	0	0	0	0
-.02	387.15	171.07	68.58	65.09	47.43	32.89	14.62	10.20	0	53.46	0	0	0	0
-.04	53.20	15.85	7.10	5.23	5.00	3.61	1.32	0.57	0	5.79	0	0	0	0
-.06	7.29	1.79	1.06	0.99	1.28	0.87	0.23	0.08	0	0.86	0	0	0	0
-.08	1.38	0.27	0.19	0.32	0.53	0.36	0.04	0.01	0	0.19	0	0	0	0
-.12	0.22	0	0.03	0	0.18	0.11	0	0	0	0.03	0	0	0	0
-.16	0.08	0	0.01	0	0.08	0.06	0.06	0	0	0.01	0	0	0	0.01
-.20	0.01	0	0	0	0.03	0.04	0.04	0	0	0.01	0	0	0	0.01
-.24	0.01	0	0	0	0.01	0.02	0.02	0	0	0	0	0	0	0
-.28	0.01	0	0	0	0	0.01	0.01	0	0	0	0	0	0	0
-.32	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-.36	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-.44	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-.48	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FLIGHT DOTS & ALT	102.71	105.51	104.07	74.64	87.46	132.30	495.03	663.54	0.33	1765.59	0	0	0	0
FLIGHT MILES & ALT	18522.12	26173.93	33995.36	28461.45	36365.13	53863.40	223579.81	296925.11	146.91	723033.21	0	0	0	0
TOTAL FLIGHTS	985	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL FLIGHT HOURS FLAPS UP AND DOWN	1765.59	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL FLIGHT MILES FLAPS UP AND DOWN	723033.21	0	0	0	0	0	0	0	0	0	0	0	0	0

(a) a_y Level crossing counts per hour within pressure altitude bands

Figure 14.- Lateral acceleration exceedances.



(b) -500 to 4500 feet altitude

Figure 14.- Continued.

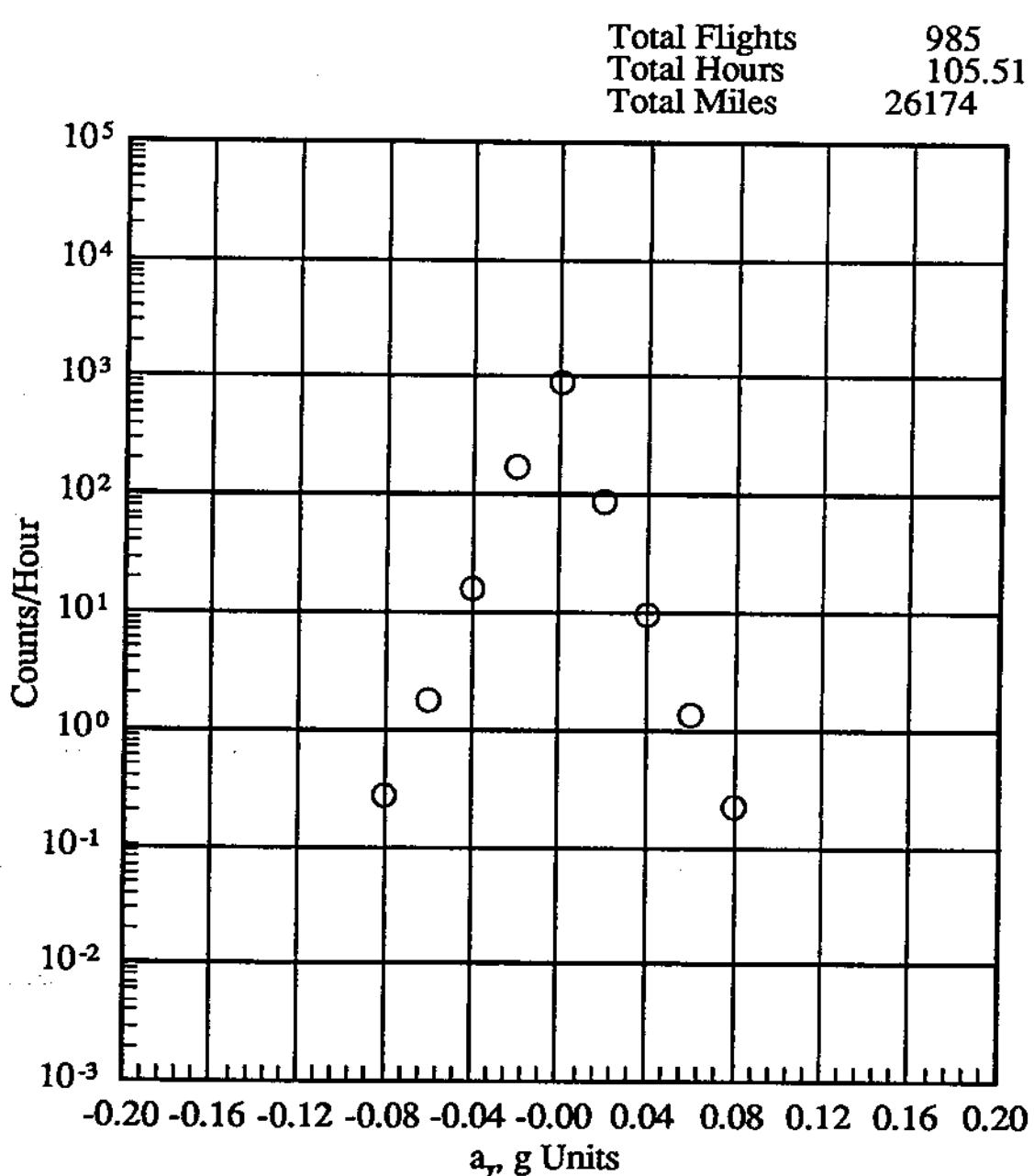
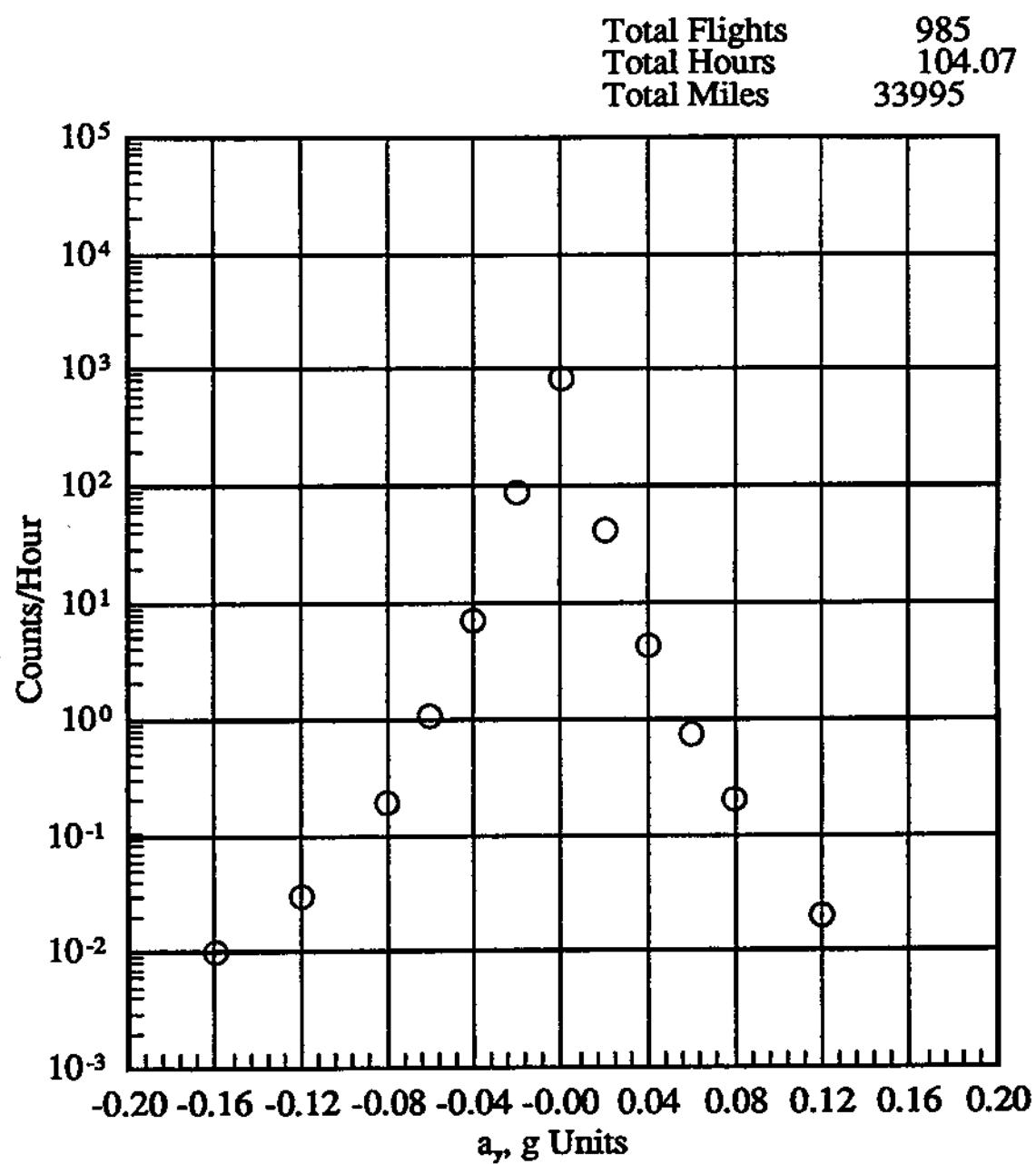
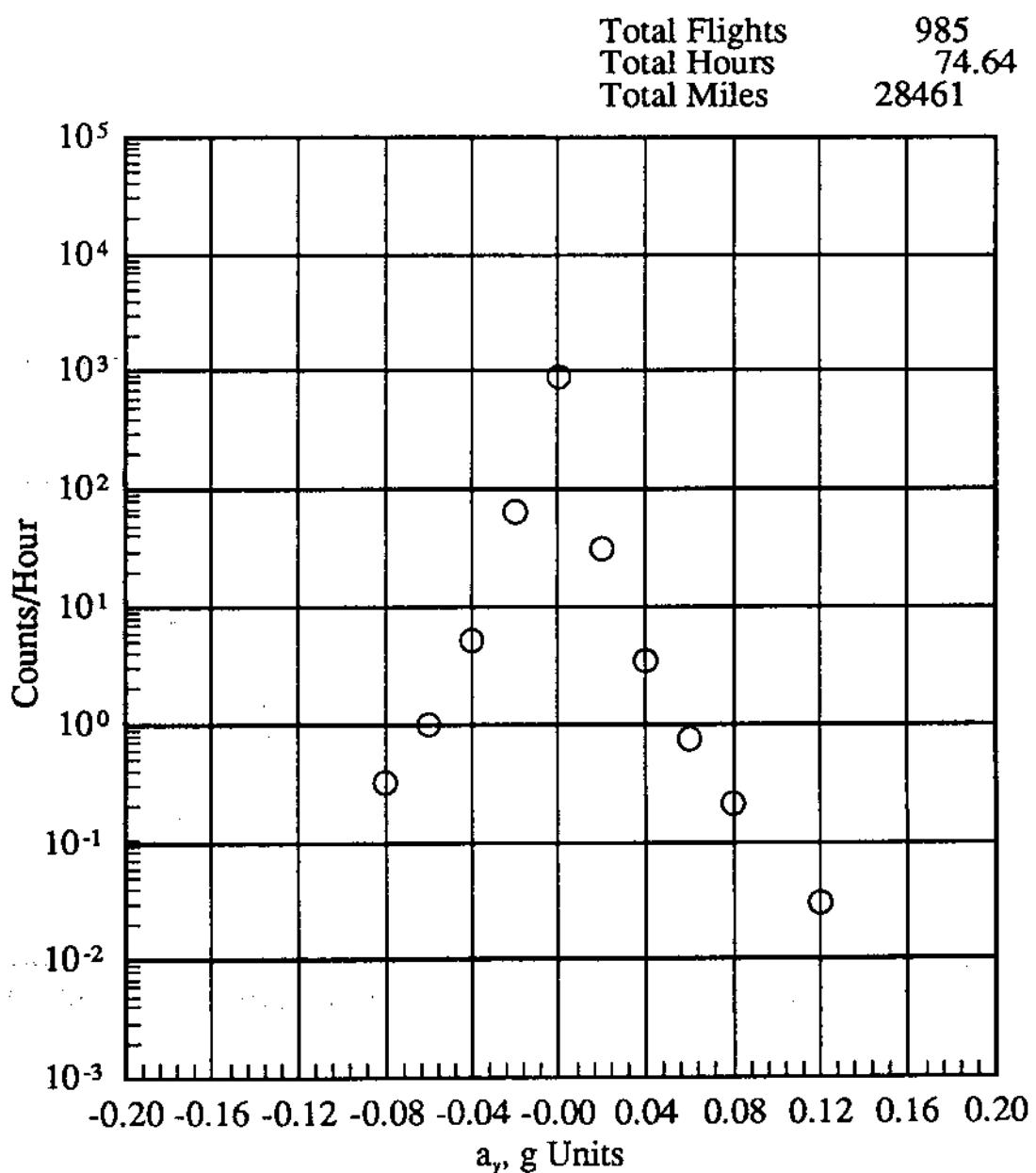


Figure 14.- Continued.



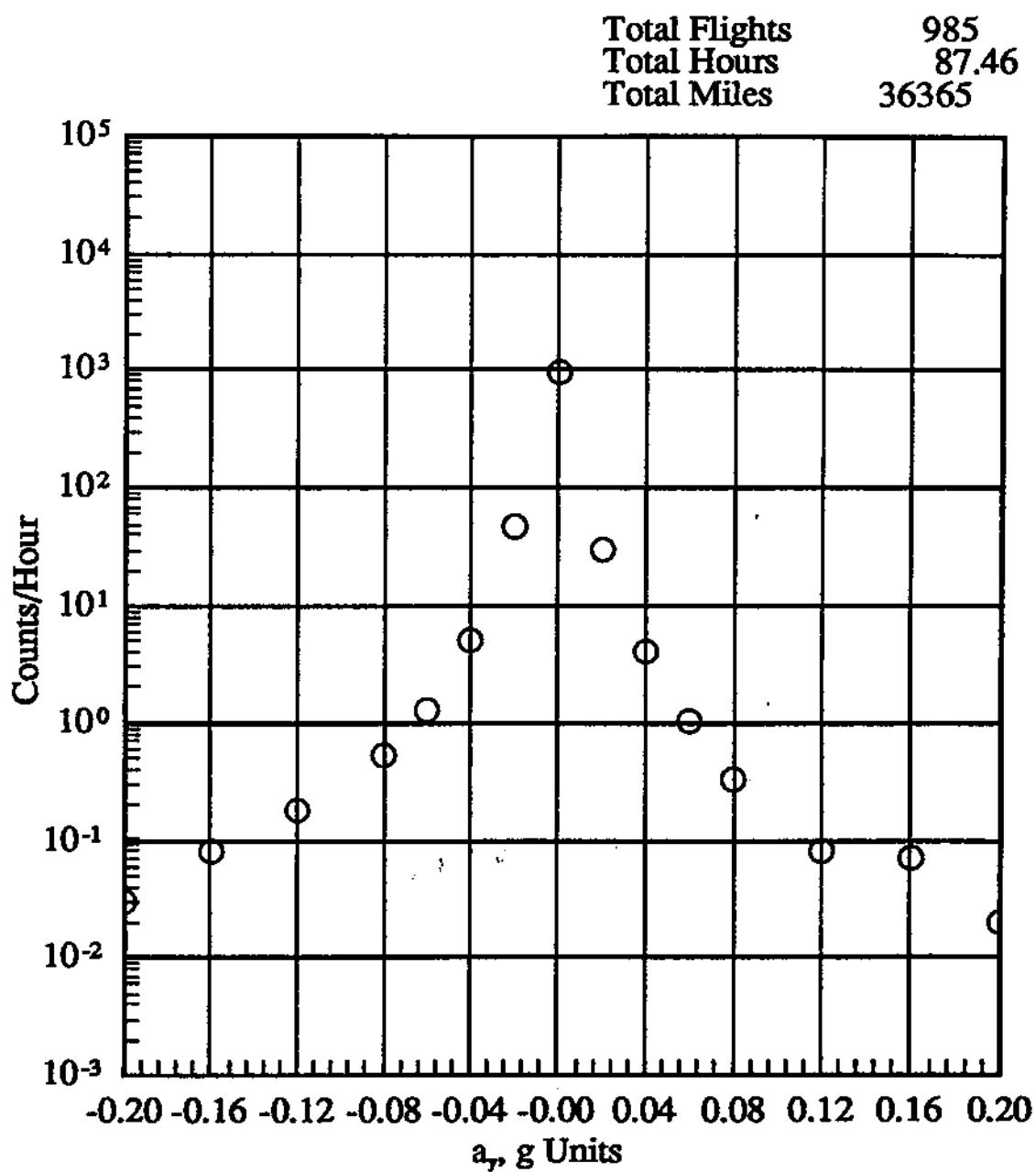
(d) 9500 to 14500 feet altitude

Figure 14.- Continued.



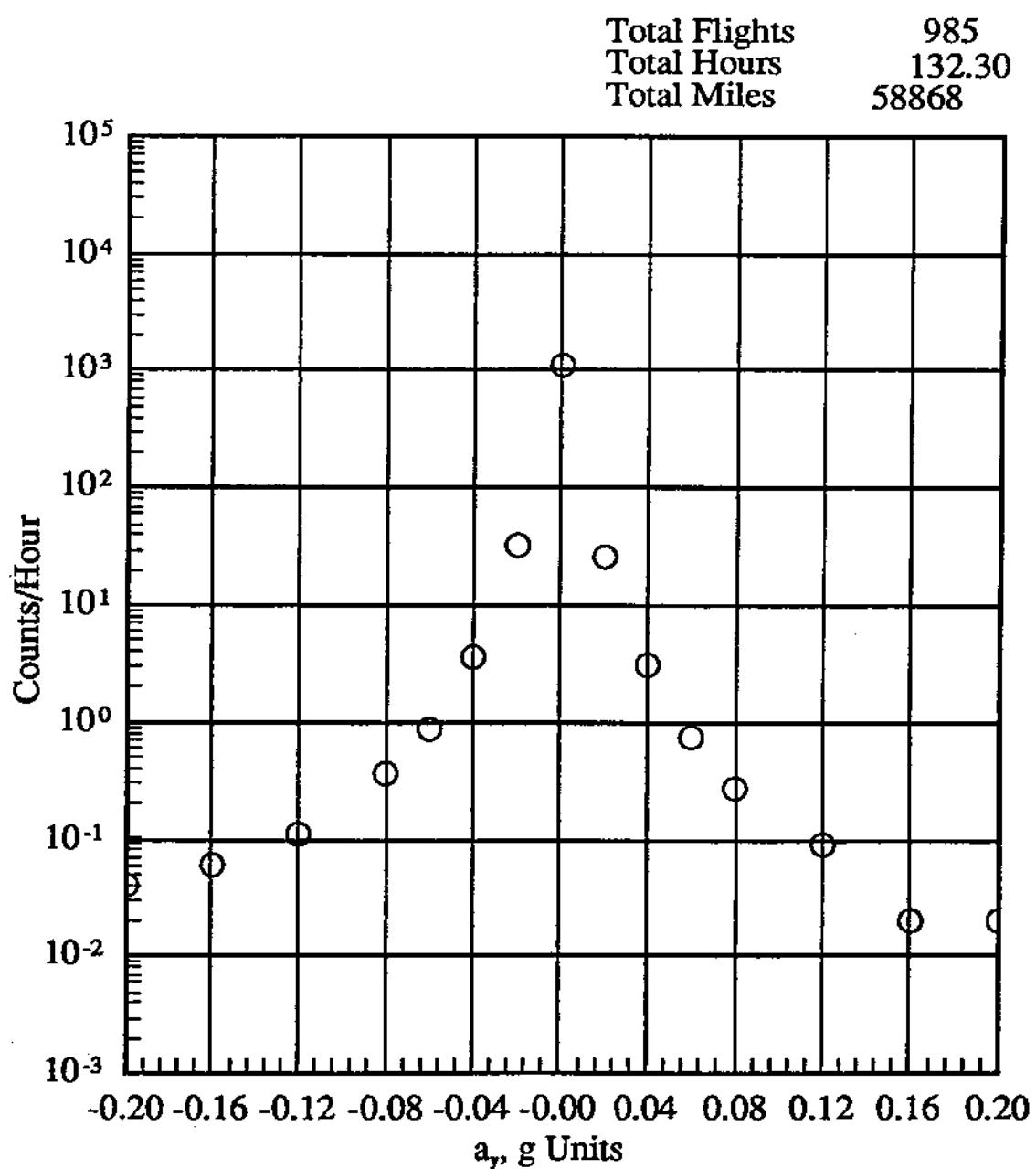
(e) 14500 to 19500 feet altitude

Figure 14.- Continued.



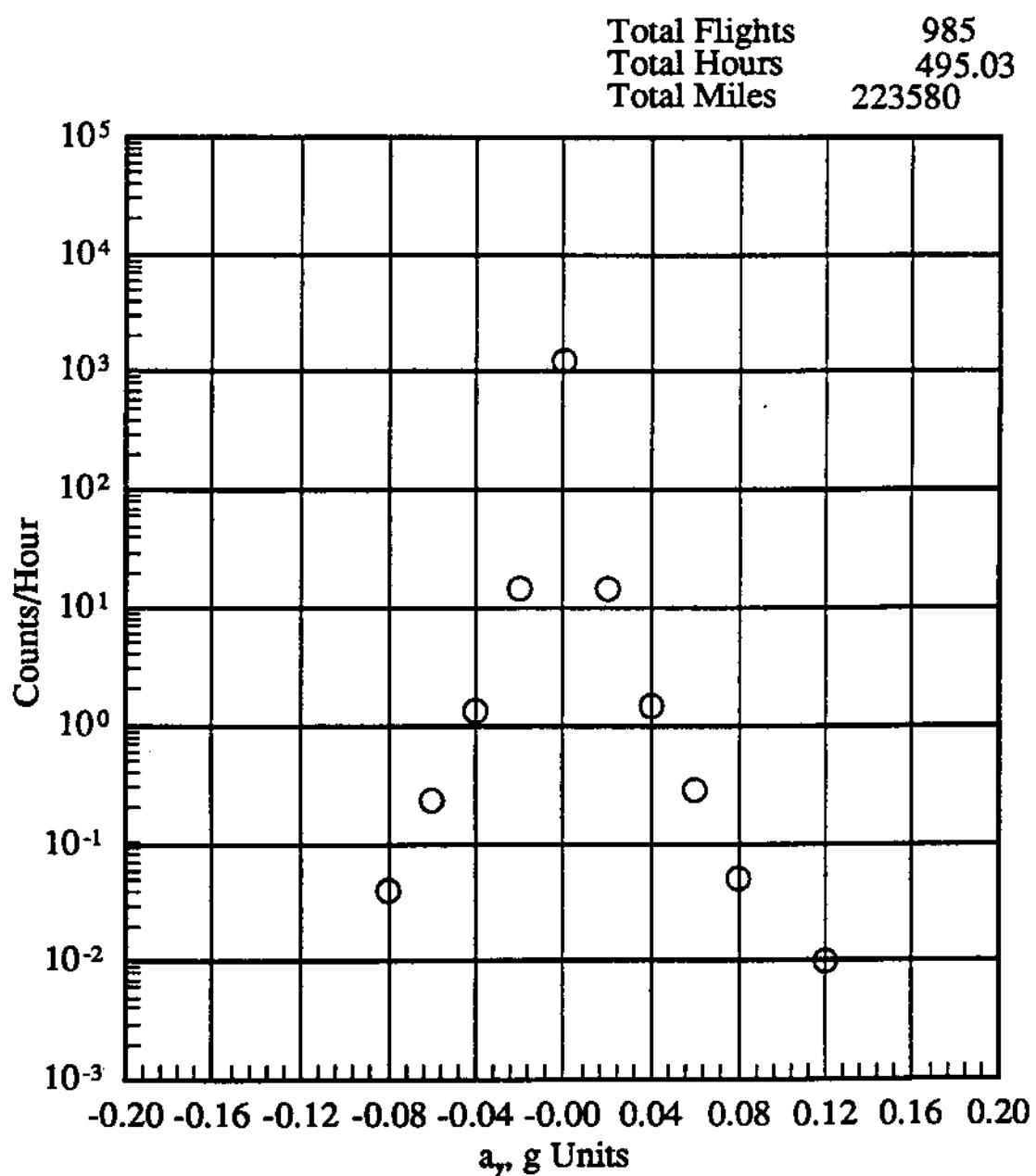
(f) 19500 to 24500 feet altitude

Figure 14.- Continued.



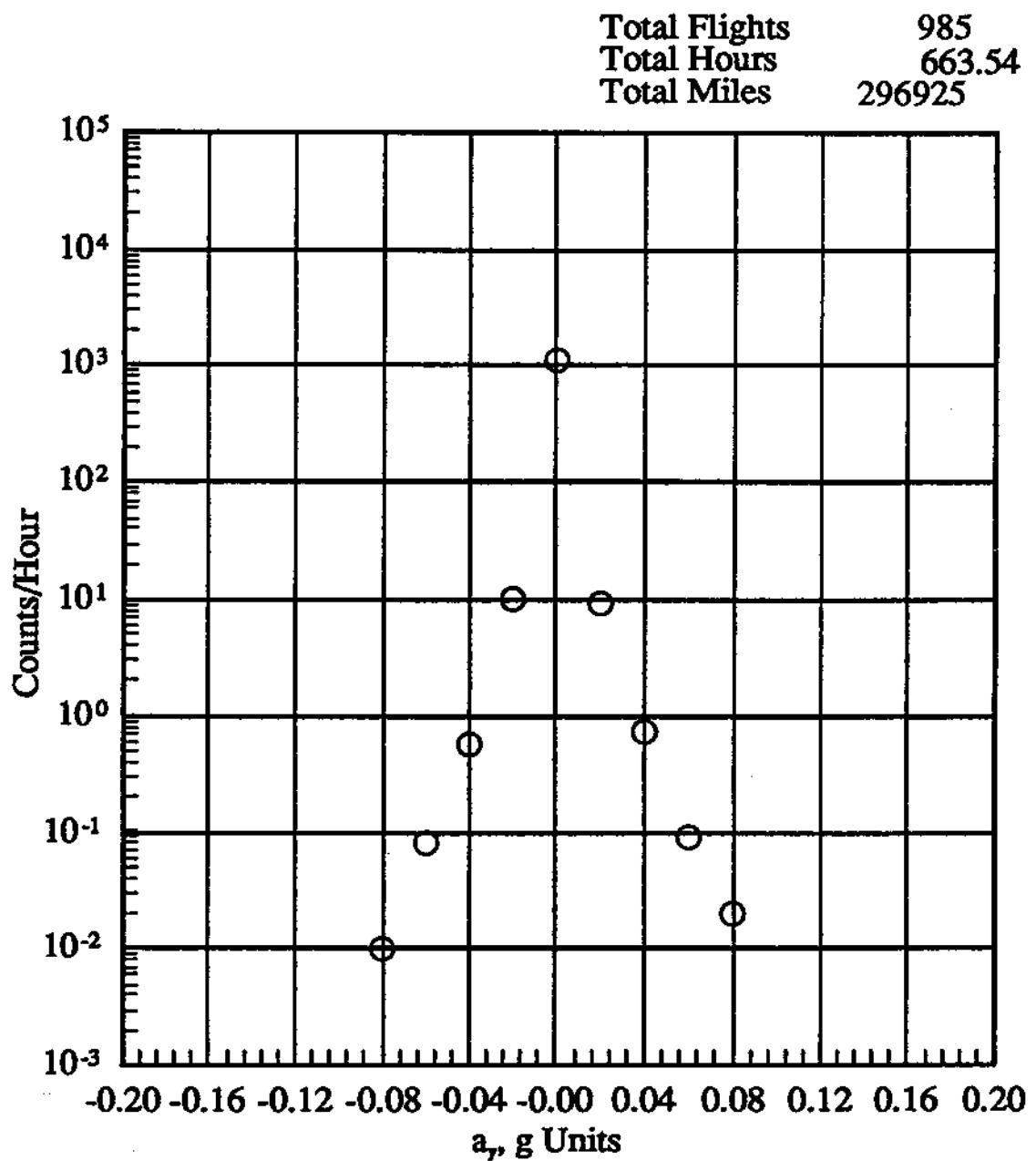
(g) 24500 to 29500 feet altitude

Figure 14.- Continued.



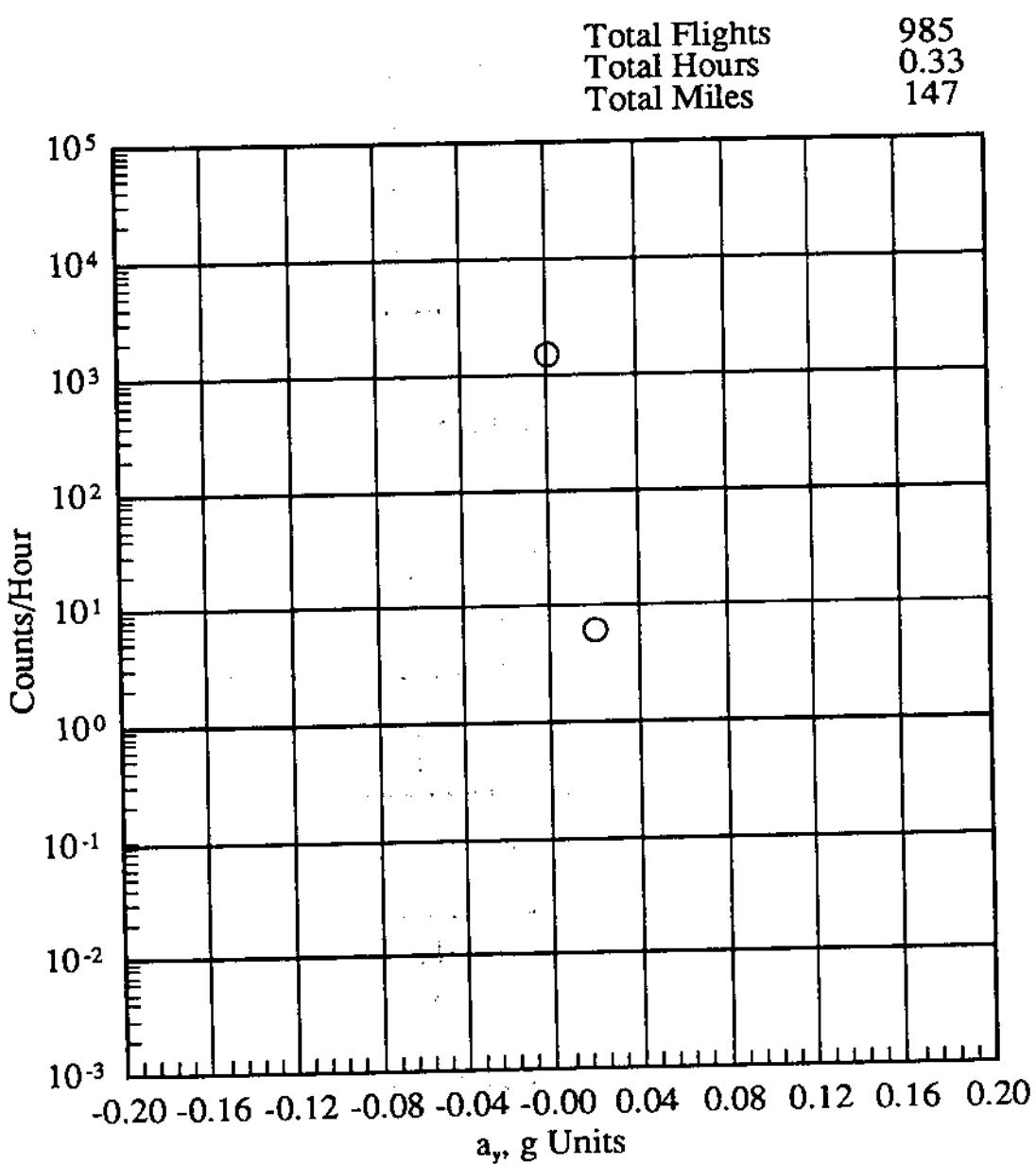
(h) 29500 to 34500 feet altitude

Figure 14.- Continued.



(i) 34500 to 39500 feet altitude

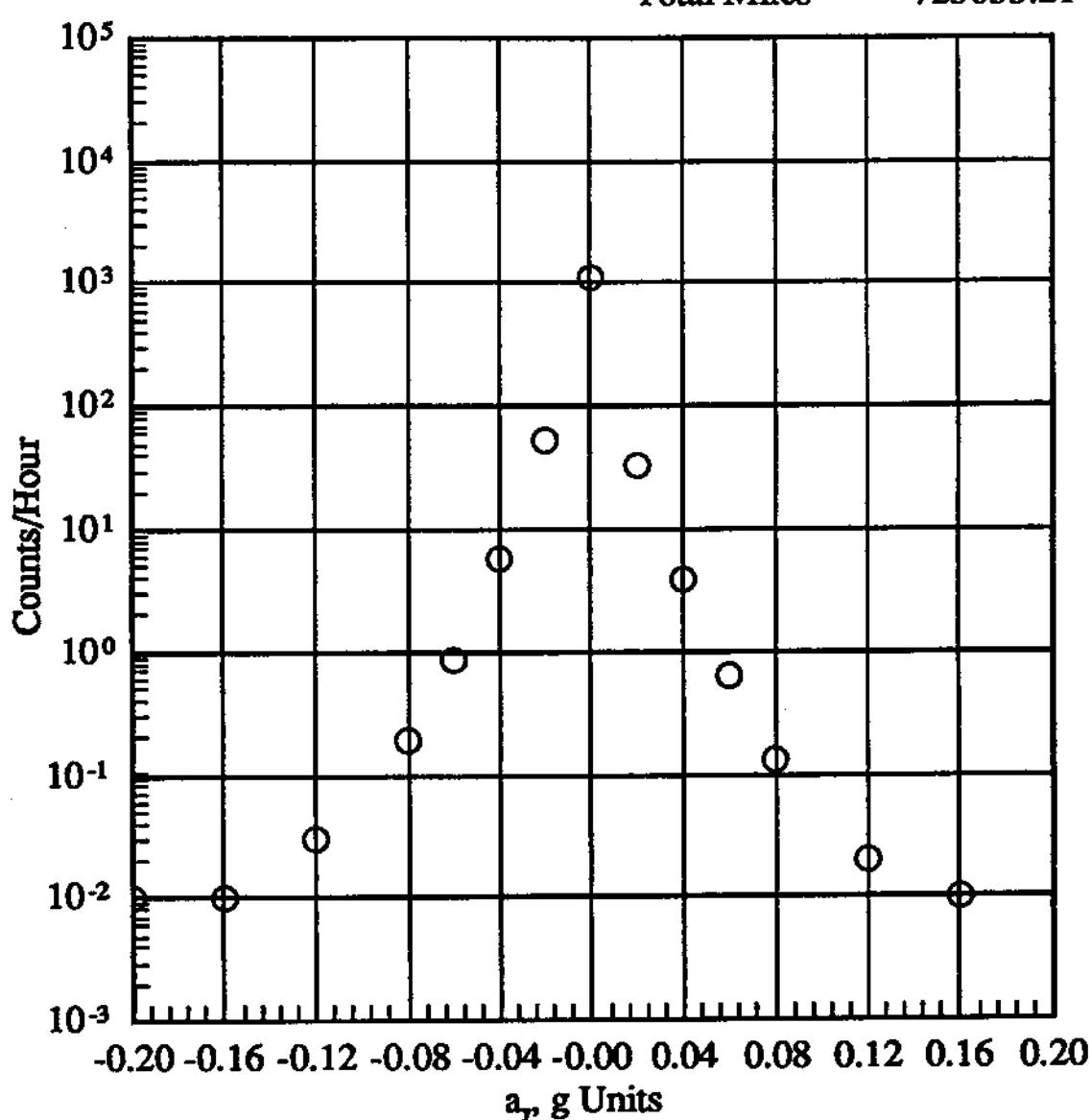
Figure 14.- Continued.



(j) 39500 to 44500 feet altitude

Figure 14.- Continued.

Total Flights 985
Total Hours 1765.59
Total Miles 723033.21



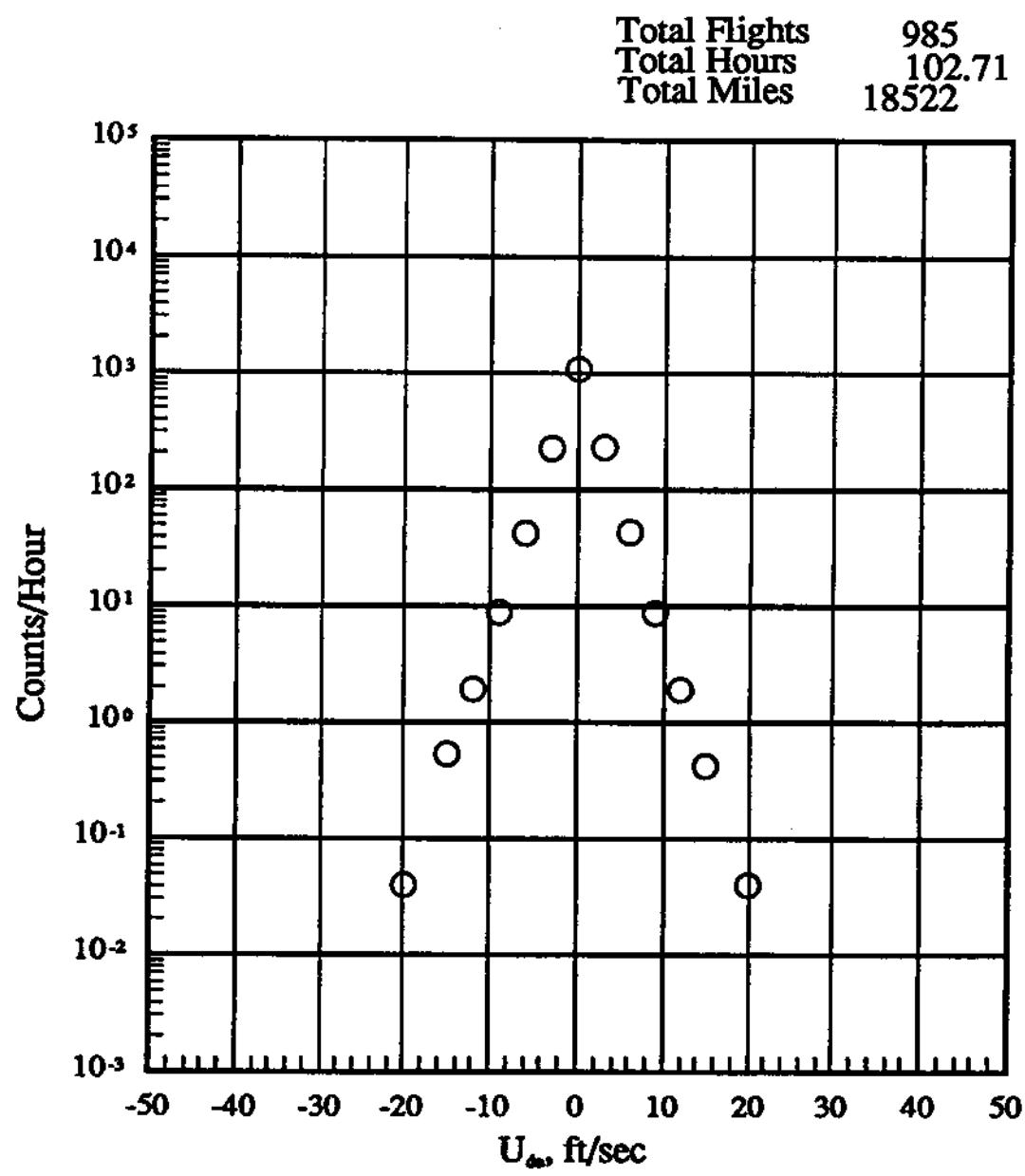
(k) -500 to 44500 feet altitude

Figure 14.- Concluded.

U_{de} DERIVED GUST VELOCITY LEVEL FT/SEC	PRESSURE ALTITUDE BANDS										TOTAL FLIGHTS 985	TOTAL FLIGHTS HOURS FLAPS UP AND DOWN 1765.59	TOTAL FLIGHT MILES FLAPS UP AND DOWN 723033.21	
	-500 TO 4500 FT	4500 TO 2500 FT	2500 TO 14500 FT	14500 TO 19500 FT	19500 TO 24500 FT	24500 TO 29500 FT	29500 TO 34500 FT	34500 TO 39500 FT	39500 TO 44500 FT					
100	0	0	0	0	0	0	0	0	0	0	0	0	0	
90	0	0	0	0	0	0	0	0	0	0	0	0	0	
80	0	0	0	0	0	0	0	0	0	0	0	0	0	
70	0	0	0	0	0	0	0	0	0	0	0	0	0	
60	0	0	0	0	0	0	0	0	0	0	0	0	0	
50	0	0	0	0	0	0	0	0	0	0	0	0	0	
40	0	0	0	0	0	0	0	0	0	0	0	0	0	
30	0	0	0	0	0	0	0	0	0	0	0	0	0	
20	0	0.04	0.01	0	0	0.01	0	0	0	0	0	0	0.01	
15	0.42	0.08	0.07	0.03	0.06	0.05	0.02	0	0	0	0	0	0.04	
12	1.92	0.26	0.22	0.08	0.18	0.11	0.05	0	0	0	0	0	0.17	
9	8.75	2.00	0.75	0.24	0.36	0.28	0.03	0	0	0	0	0	0.74	
6	43.58	10.39	3.58	1.63	1.88	1.16	0.22	0.10	0	0	0	0	3.72	
3	228.43	73.75	30.02	16.55	13.17	8.59	3.64	1.70	0	0	0	0	23.12	
0	1083.63	1139.33	1258.02	1521.30	1615.16	1749.36	1896.69	1846.57	2068.12	1707.62	1707.62	1707.62	1707.62	
-3	223.92	74.65	30.31	16.53	13.55	8.53	3.50	1.67	0	0	0	0	22.88	
-6	42.44	10.08	3.65	1.76	1.73	1.06	0.25	0.11	0	0	0	0	3.64	
-9	8.84	2.03	0.80	0.42	0.59	0.29	0.03	0.01	0	0	0	0	0.76	
-12	1.94	0.40	0.27	0.15	0.25	0.12	0.01	0	0	0	0	0	0.19	
-15	0.53	0.09	0.05	0.04	0.13	0.07	0	0	0	0	0	0	0.05	
-20	0.04	0.01	0.01	0.01	0.06	0.04	0	0	0	0	0	0	0.01	
-30	0	0	0	0	0	0.01	0.01	0	0	0	0	0	0	
-40	0	0	0	0	0	0	0.01	0	0	0	0	0	0	
-50	0	0	0	0	0	0	0	0	0	0	0	0	0	
-60	0	0	0	0	0	0	0	0	0	0	0	0	0	
-70	0	0	0	0	0	0	0	0	0	0	0	0	0	
-80	0	0	0	0	0	0	0	0	0	0	0	0	0	
-90	0	0	0	0	0	0	0	0	0	0	0	0	0	
-100	0	0	0	0	0	0	0	0	0	0	0	0	0	
FLIGHT HOURS @ ALLT	102.71	105.51	104.07	76.64	87.46	132.30	495.03	663.54	633.54	633.54	633.54	633.54	1765.59	
FLIGHT MILES @ ALLT	18522.12	26273.93	33395.36	28451.45	36365.13	50363.40	223579.81	296925.11	146.91	146.91	146.91	146.91	146.91	723033.21

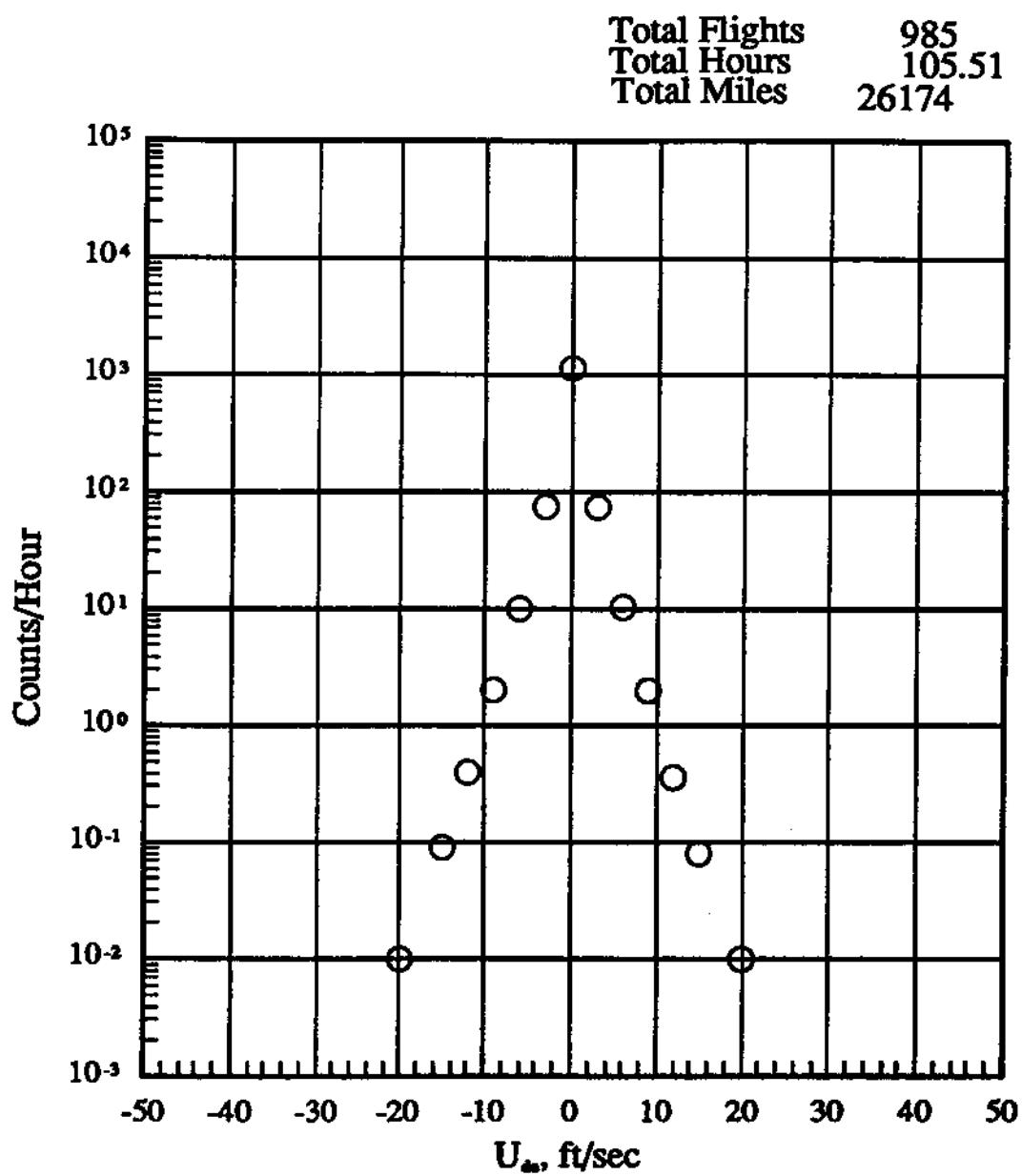
(a) U_{de} Level crossing counts per hour withing pressure altitude bands

Figure 15.- U_{de} exceedances.



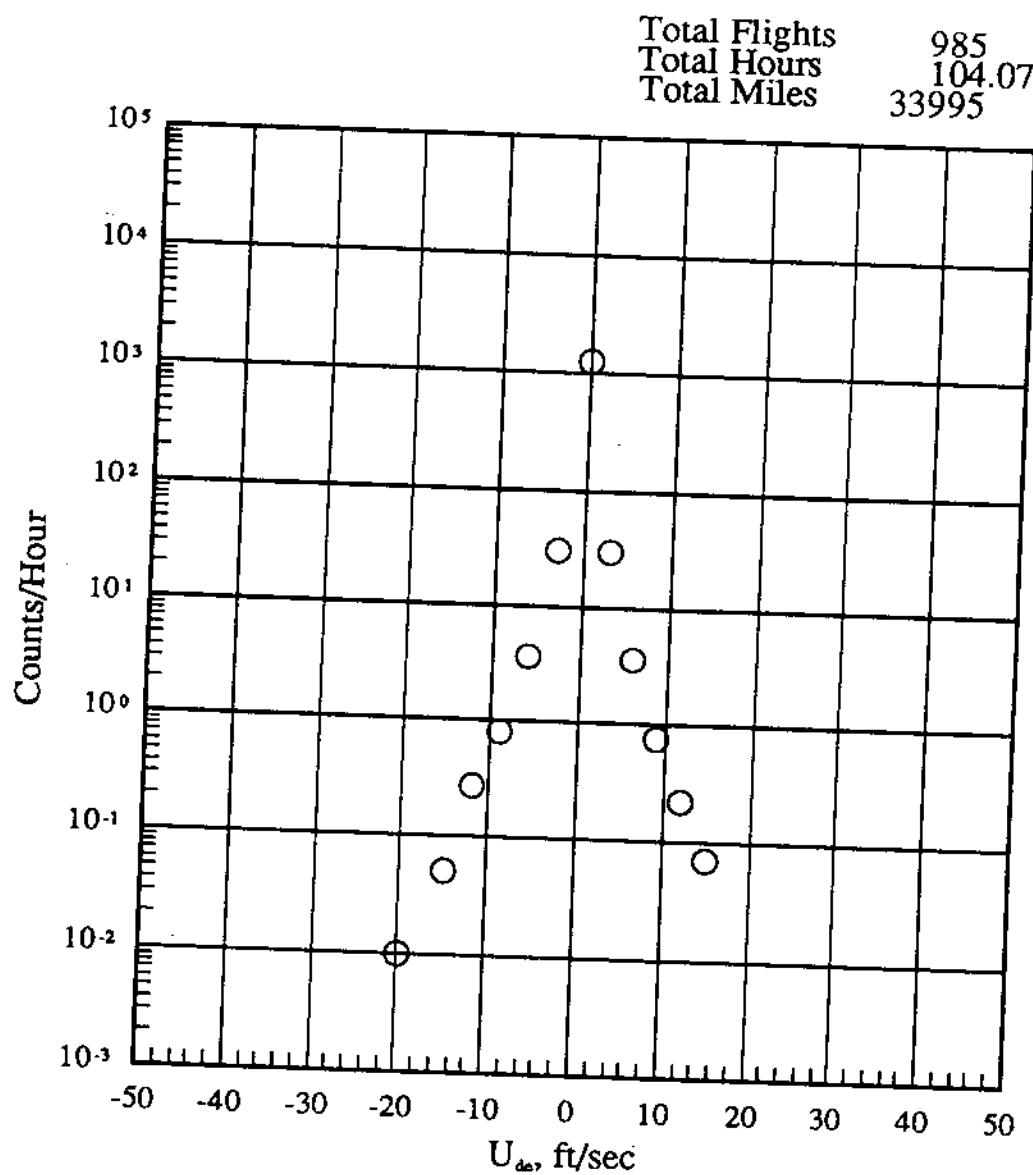
(b) -500 to 4500 feet altitude

Figure 15.- Continued.



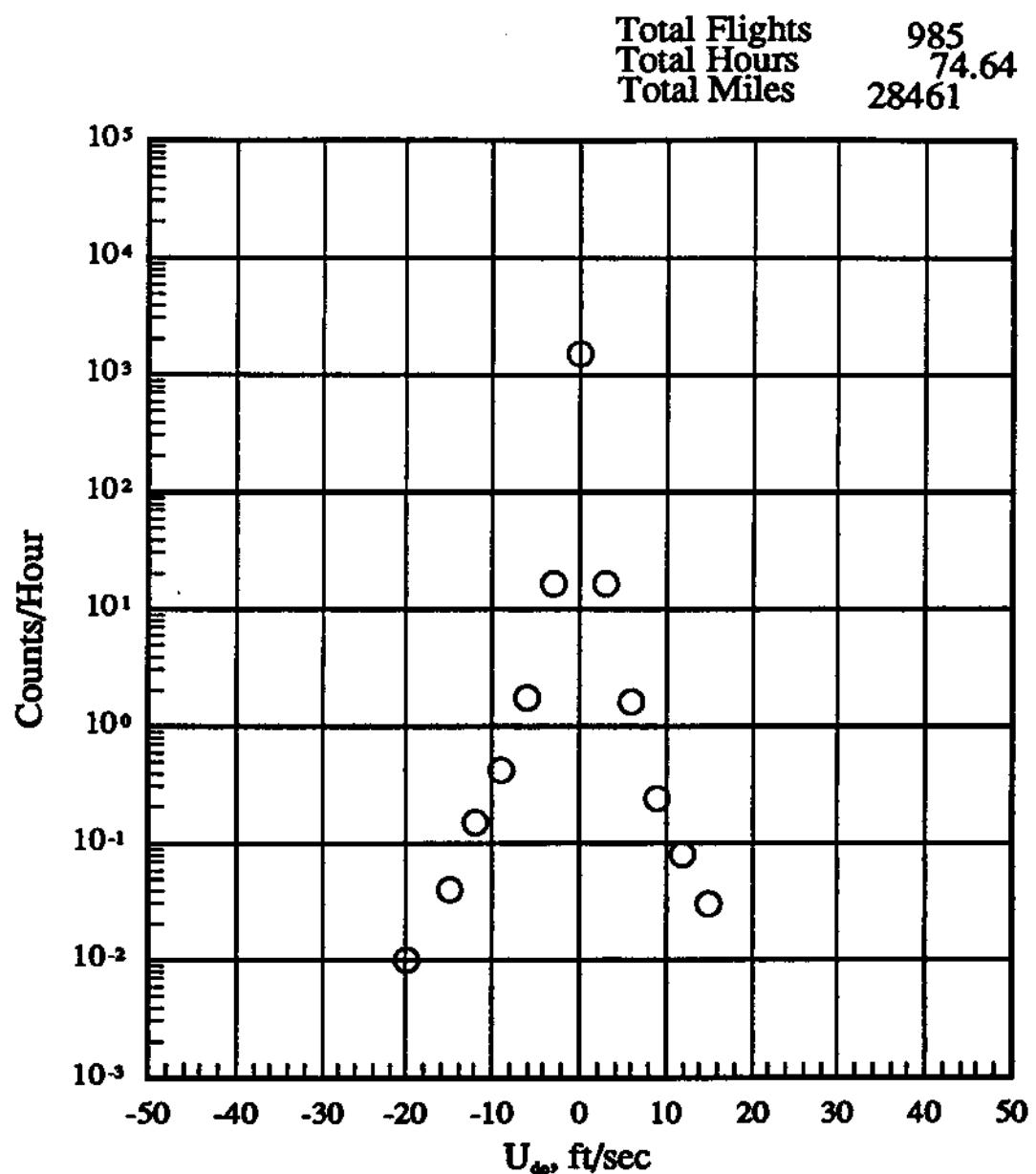
(c) 4500 to 9500 feet altitude

Figure 15.- Continued.



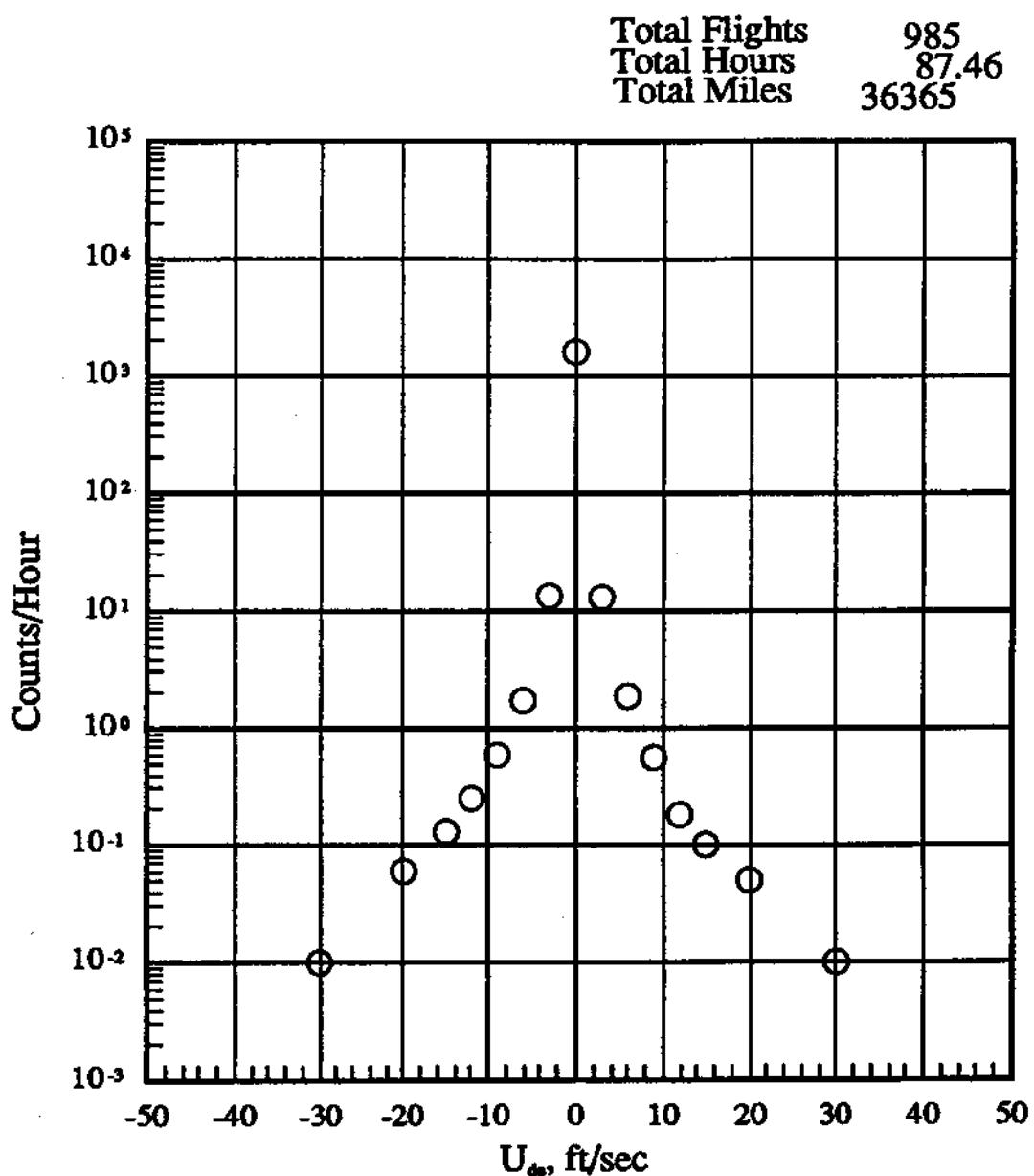
(d) 9500 to 14500 feet altitude

Figure 15.- Continued.



(e) 14500 to 19500 feet altitude

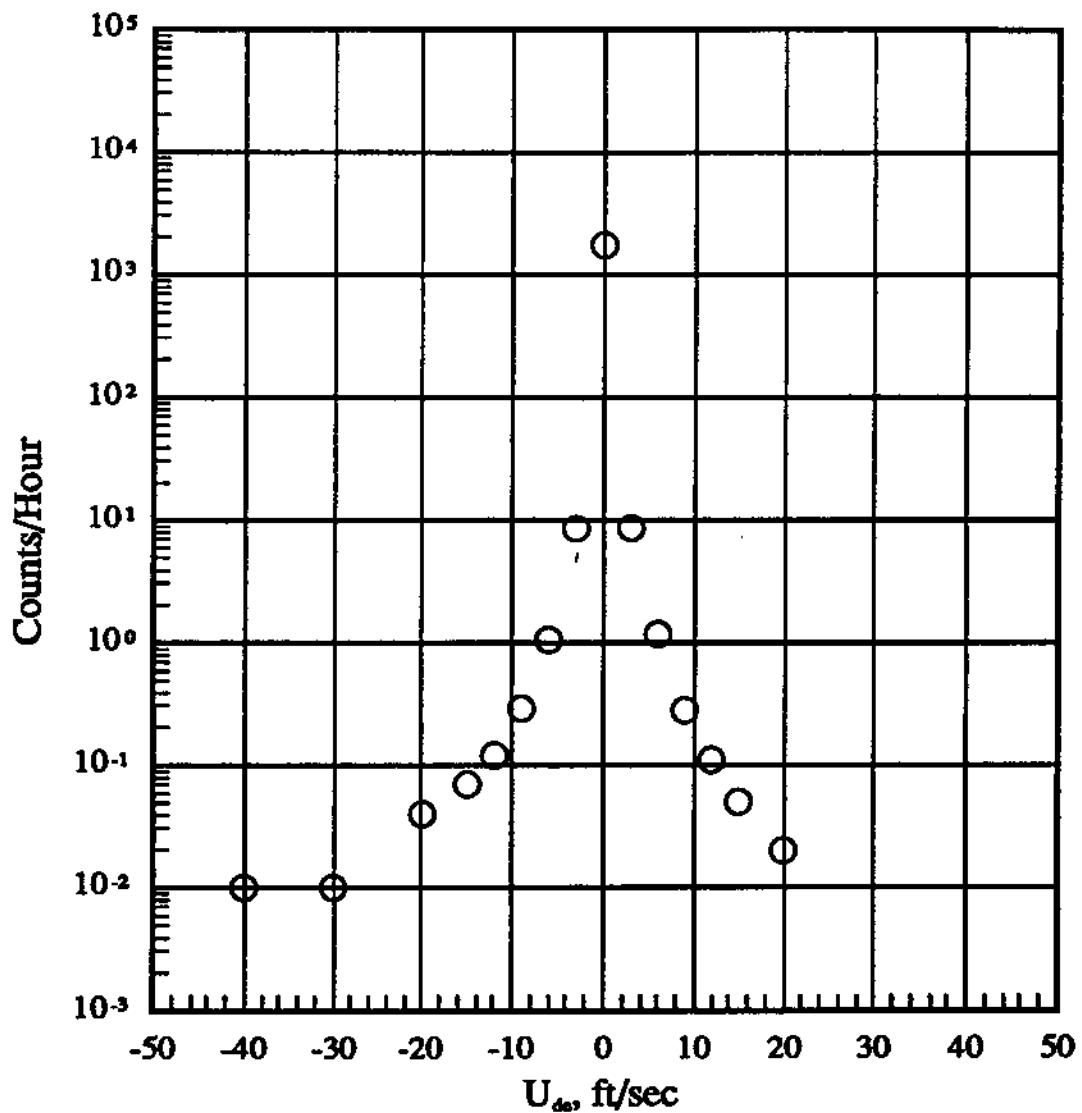
Figure 15.- Continued.



(f) 19500 to 24500 feet altitude

Figure 15.- Continued.

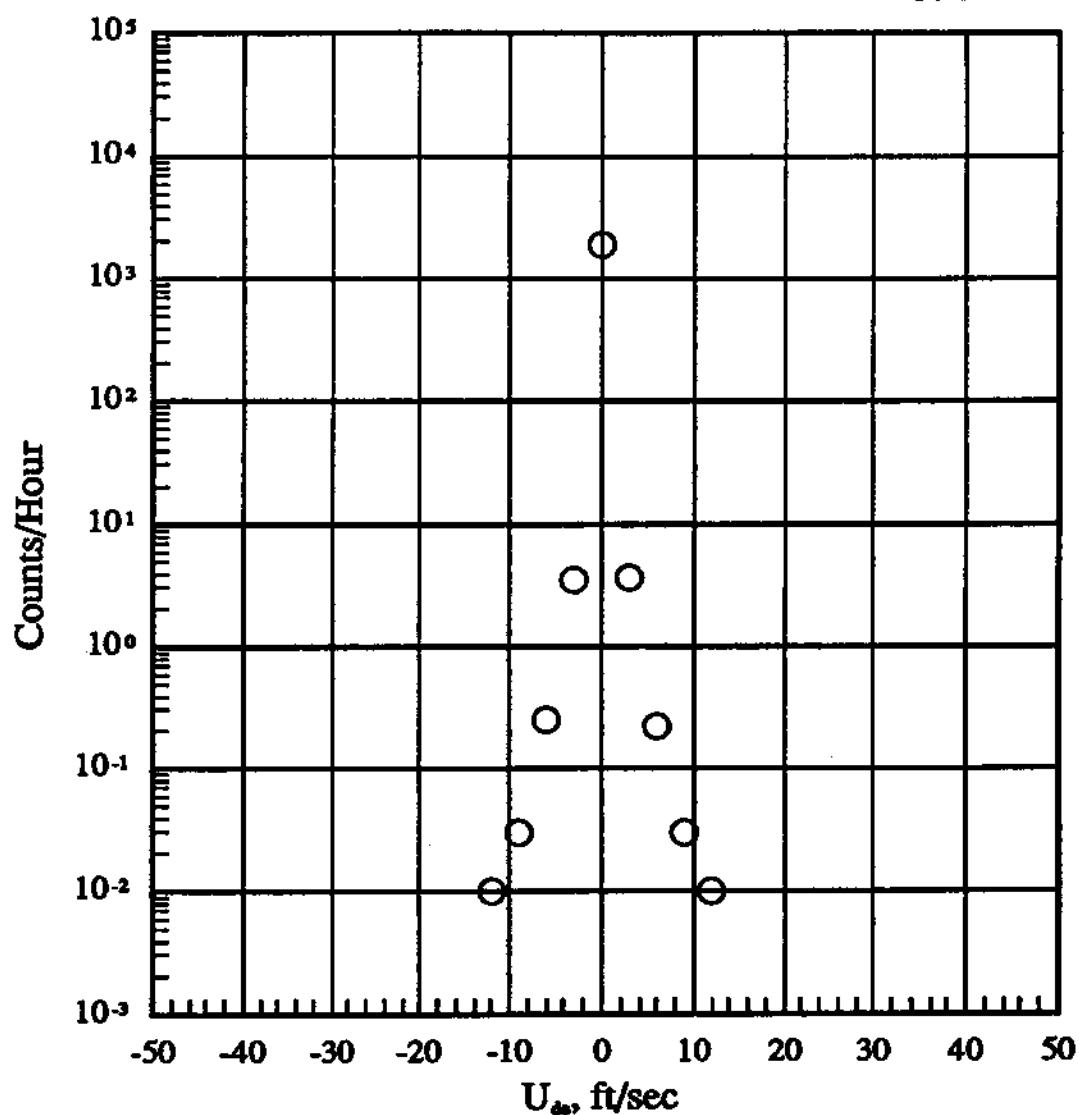
Total Flights 985
Total Hours 132.80
Total Miles 58868



(g) 24500 to 29500 feet altitude

Figure 15.- Continued.

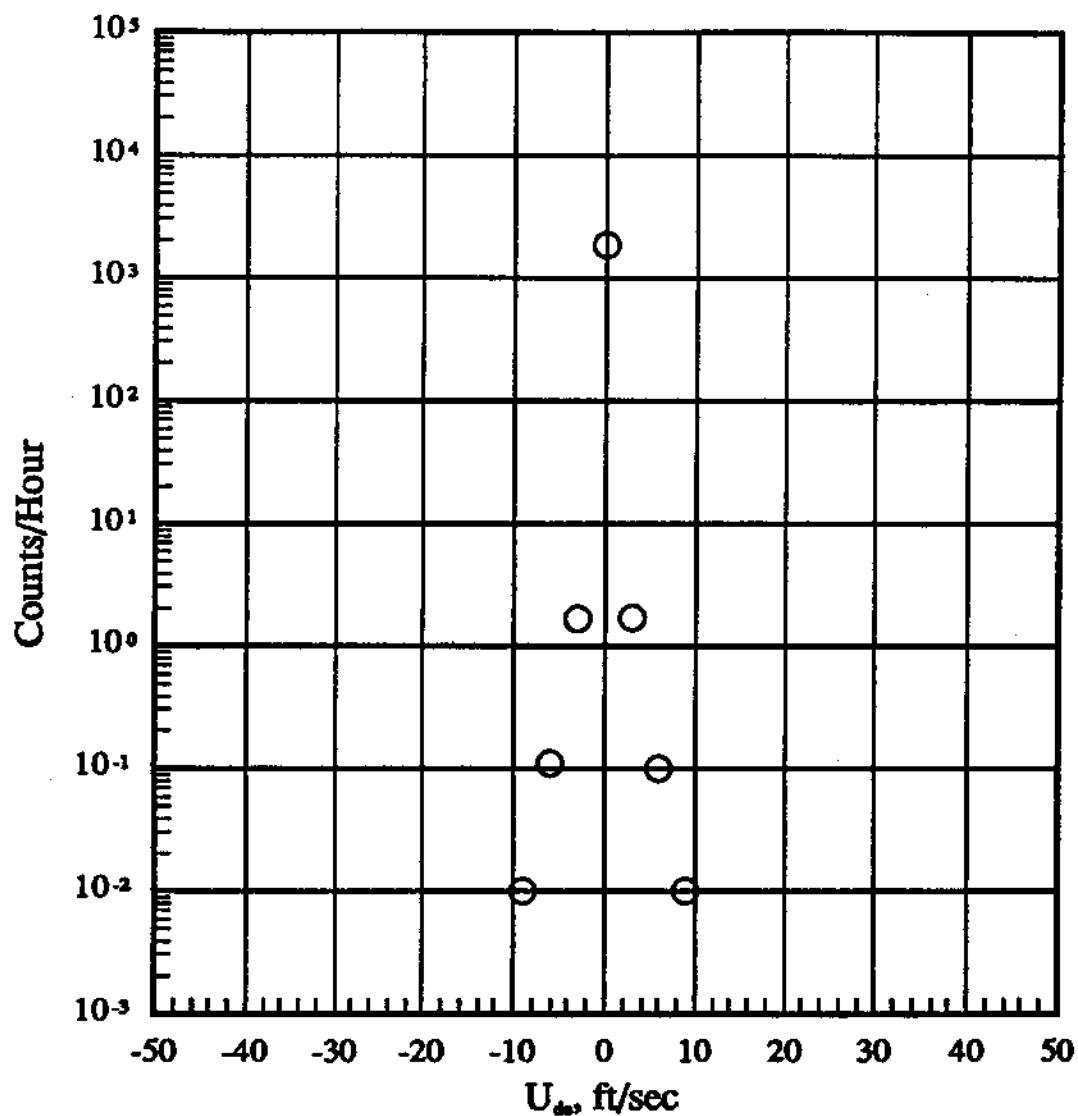
Total Flights 985
Total Hours 465.03
Total Miles 223580



(h) 29500 to 34500 feet altitude

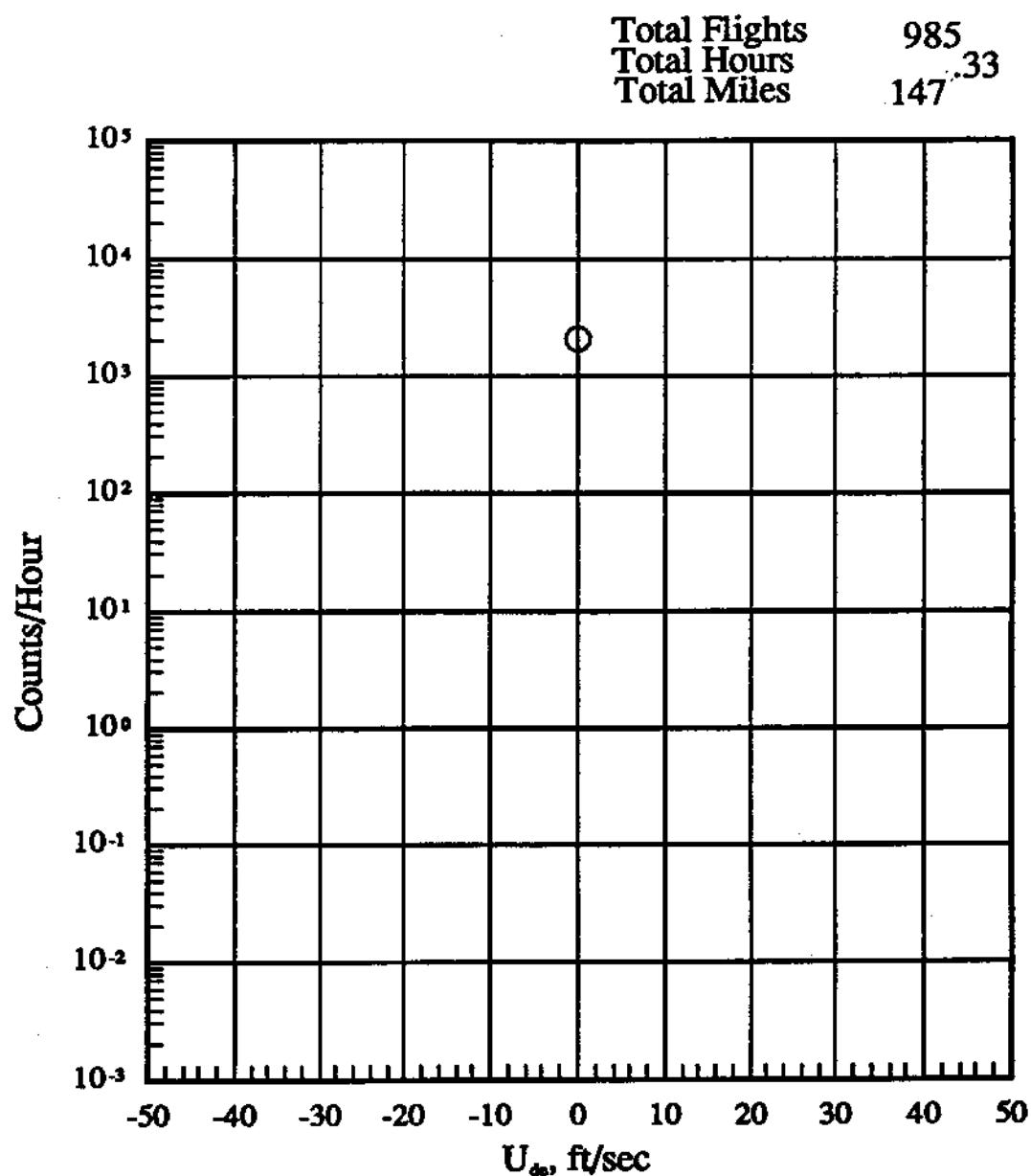
Figure 15.- Continued.

Total Flights 985
Total Hours 663.54
Total Miles 296925



(i) 34500 to 39500 feet altitude

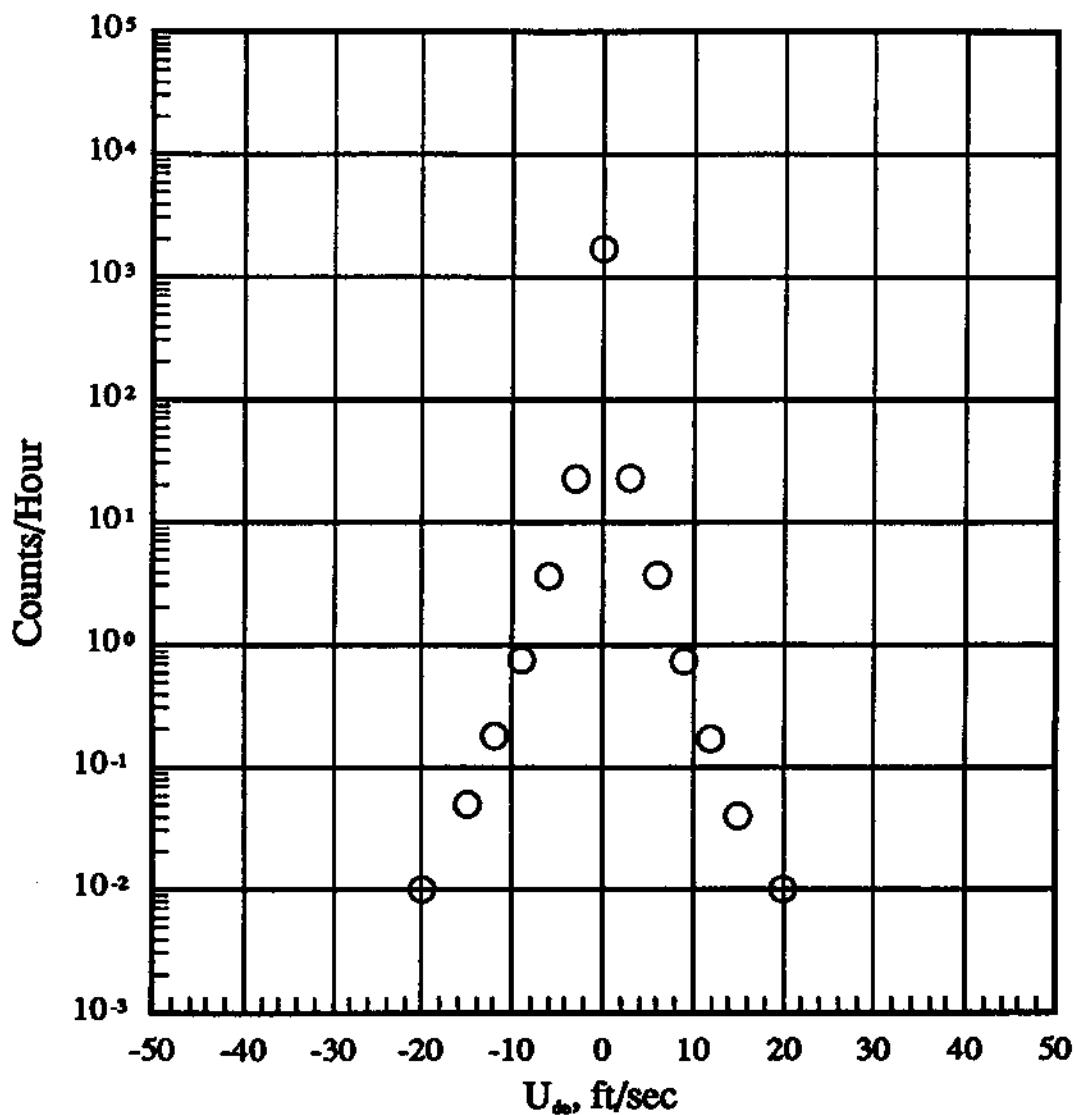
Figure 15.- Continued.



(j) 39500 to 44500 feet altitude

Figure 15.- Continued.

Total Flights 985
Total Hours 1765.59
Total Miles 723083



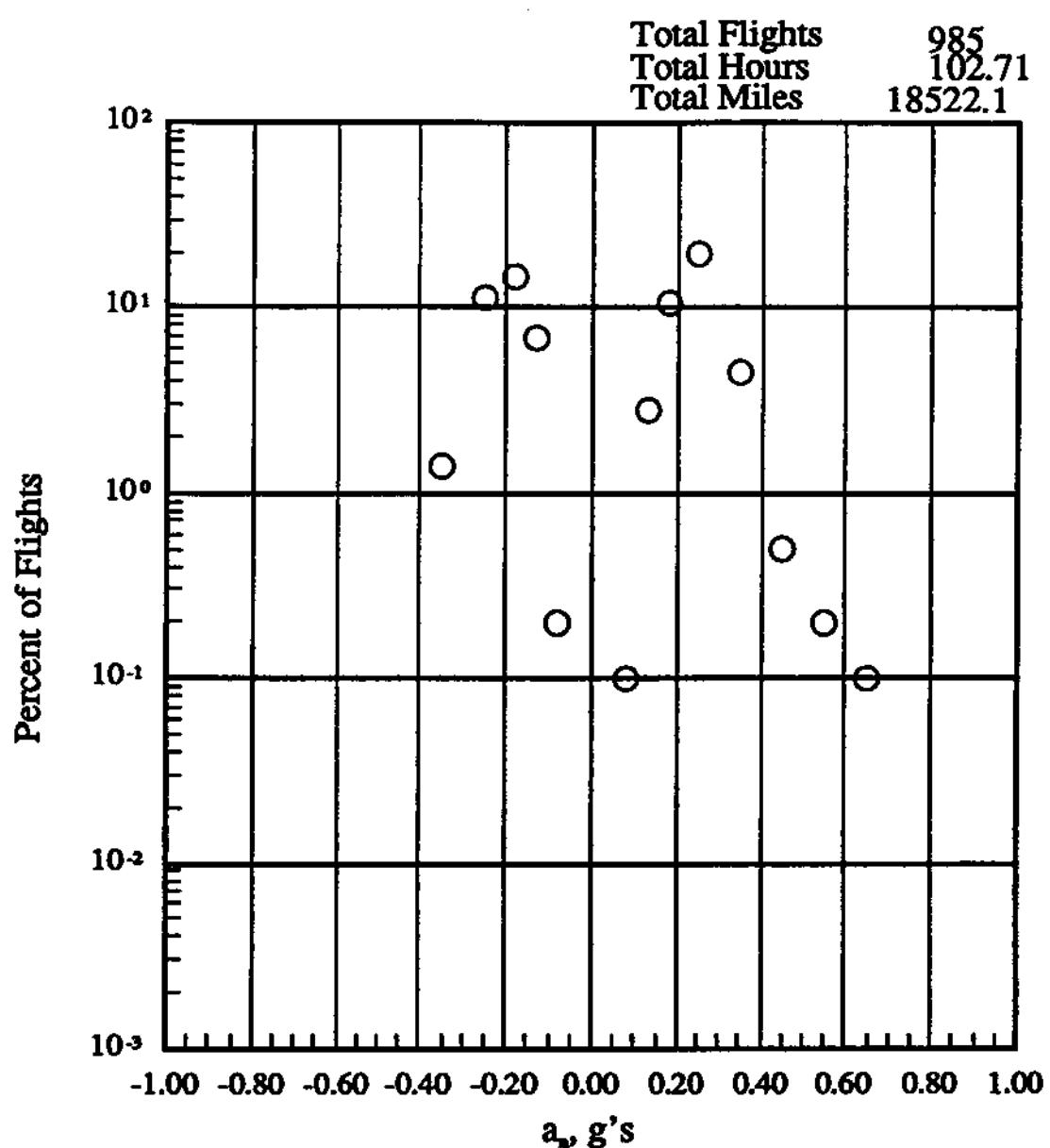
(k) -500 to 44500 feet altitude

Figure 15.- Concluded.

		PRESSURE ALTITUDE BANDS											
		-500 TO 4500 FT		9500 TO 14500 FT		14500 TO 19500 FT		19500 TO 24500 FT		24500 TO 29500 FT		29500 TO 34500 FT	
a_n MAX		g's FROM TO		LEVEL FOR EACH FLIGHT		g's FROM TO		LEVEL FOR EACH FLIGHT		g's FROM TO		LEVEL FOR EACH FLIGHT	
g's	FROM	TO											
1.60	1.60	0	0	0	0	0	0	0	0	0	0	0	0
1.40	1.60	0	0	0	0	0	0	0	0	0	0	0	0
1.20	1.40	0	0	0	0	0	0	0	0	0	0	0	0
1.00	1.20	0	0	0	0	0	0	0	0	0	0	0	0
.80	1.00	0	0	0	0	0	0	0	0	0	0	0	0
.70	.80	0	0	0	0	0	0	0	0	0	0	0	0
.60	.70	0.10	0	0.10	0	0	0	0	0	0	0	0	0.20
.50	.60	0.20	0.10	0.10	0.20	0	0	0	0	0	0	0	0.80
.40	.50	0.50	0.60	0.30	0.10	0.10	0.20	0.10	0.10	0.10	0.10	0	1.90
.30	.40	4.50	3.00	1.20	0.50	0.50	0.50	0.70	0.50	0.50	0.50	0	31.50
.20	.30	19.70	12.60	6.70	2.10	2.20	2.00	2.60	1.10	0	0	0	49.10
.15	.20	10.70	6.60	3.90	1.20	0.40	1.00	2.60	1.10	0	0	0	27.70
.10	.15	2.80	2.40	1.10	0.10	0.10	0.20	0.80	0.60	0	0	0	8.20
.05	.10	0.10	0.10	0.10	0	0	0	0	0.10	0	0	0	0.40
-0.05	-0.10	0.20	0.10	0	0	0	0	0	0	0	0	0	0.60
-0.10	-0.15	6.90	3.20	3.60	0.40	0.80	0.70	2.20	2.40	0	0	0	20.30
-0.15	-0.20	14.80	6.00	5.60	2.60	1.50	1.30	3.00	3.00	0	0	0	38.00
-0.20	-0.30	11.40	6.00	4.40	1.80	1.70	2.00	2.90	2.20	0	0	0	33.90
-0.30	-0.40	1.40	1.10	1.10	0.20	0.20	0.40	0.60	0.30	0	0	0	5.40
-0.40	-0.50	0	0.10	0.20	0.20	0.20	0.10	0.20	0.10	0	0	0	1.10
-0.50	-0.60	0	0	0	0.10	0.10	0.10	0.10	0.10	0	0	0	0.40
-0.60	-0.70	0	0	0	0	0	0.10	0	0	0	0	0	0.10
-0.70	-0.80	0	0	0	0	0	0	0	0	0	0	0	0
-0.80	-1.00	0	0	0	0	0.10	0	0	0	0	0	0	0.10
-1.00	-1.20	0	0	0	0	0	0	0	0	0	0	0	0
-1.20	-1.40	0	0	0	0	0	0	0	0	0	0	0	0.10
-1.40	-1.60	0	0	0	0	0	0	0	0	0	0	0	0
-1.60	-1.80	0	0	0	0	0	0	0	0	0	0	0	0
FLIGHT HOURS @ ALT		102.71	105.51	104.07	74.64	87.46	132.30	495.03	663.54	0.33	1765.59		
FLIGHT MILES @ ALT		18522.12	26173.93	33995.36	24461.45	36365.13	58863.40	223579.81	296925.11	146.91	723033.21		
TOTAL FLIGHTS										965			

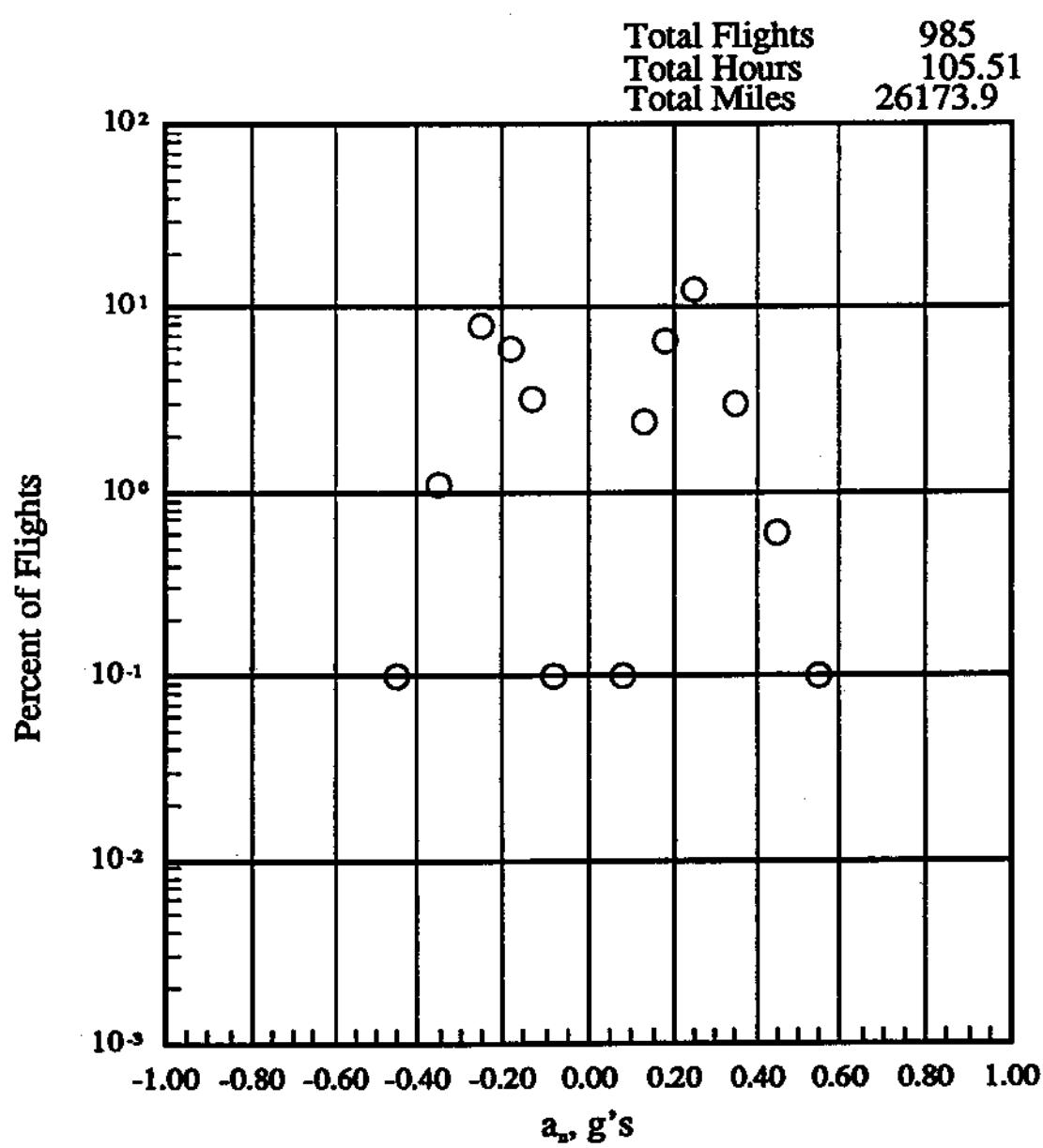
(a) Percent of flights where peak positive and negative a_n per flight occurs within pressure altitude bands, any flap

Figure 16.- Peak positive and negative a_n vs altitude.



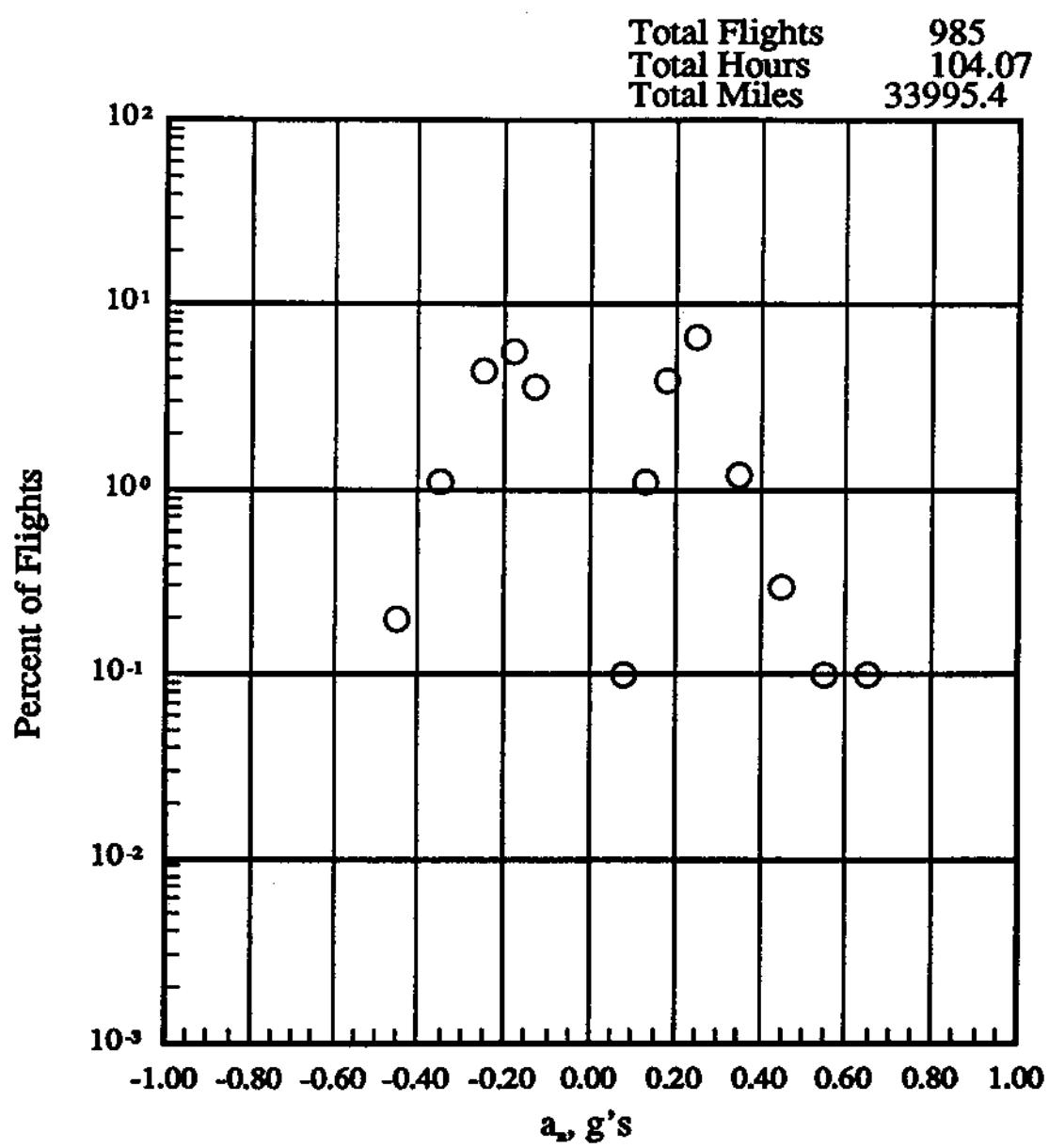
(b) -500 to 4500 feet altitude

Figure 16.- Continued.



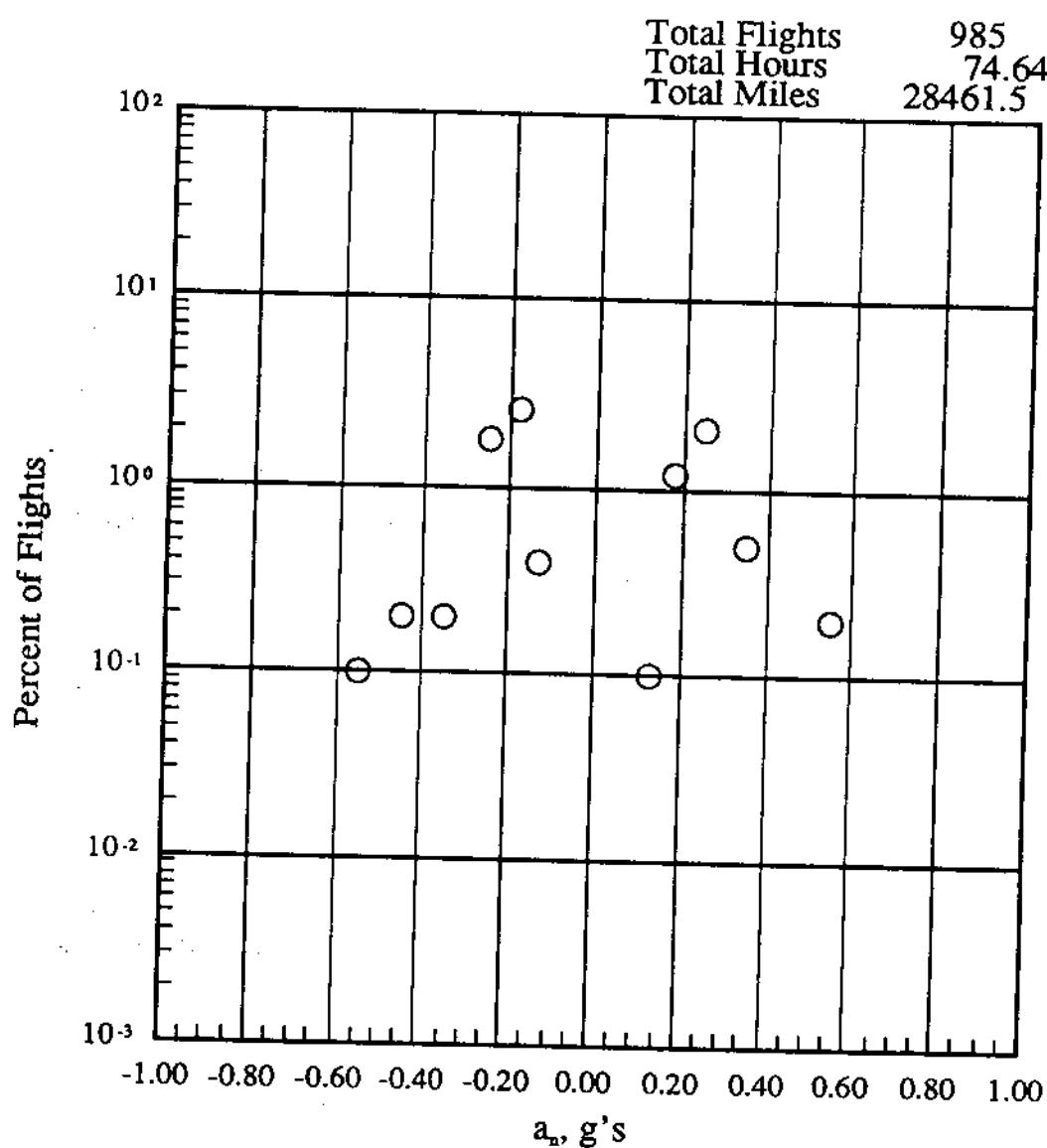
(c) 4500 to 9500 feet altitude

Figure 16.- Continued.



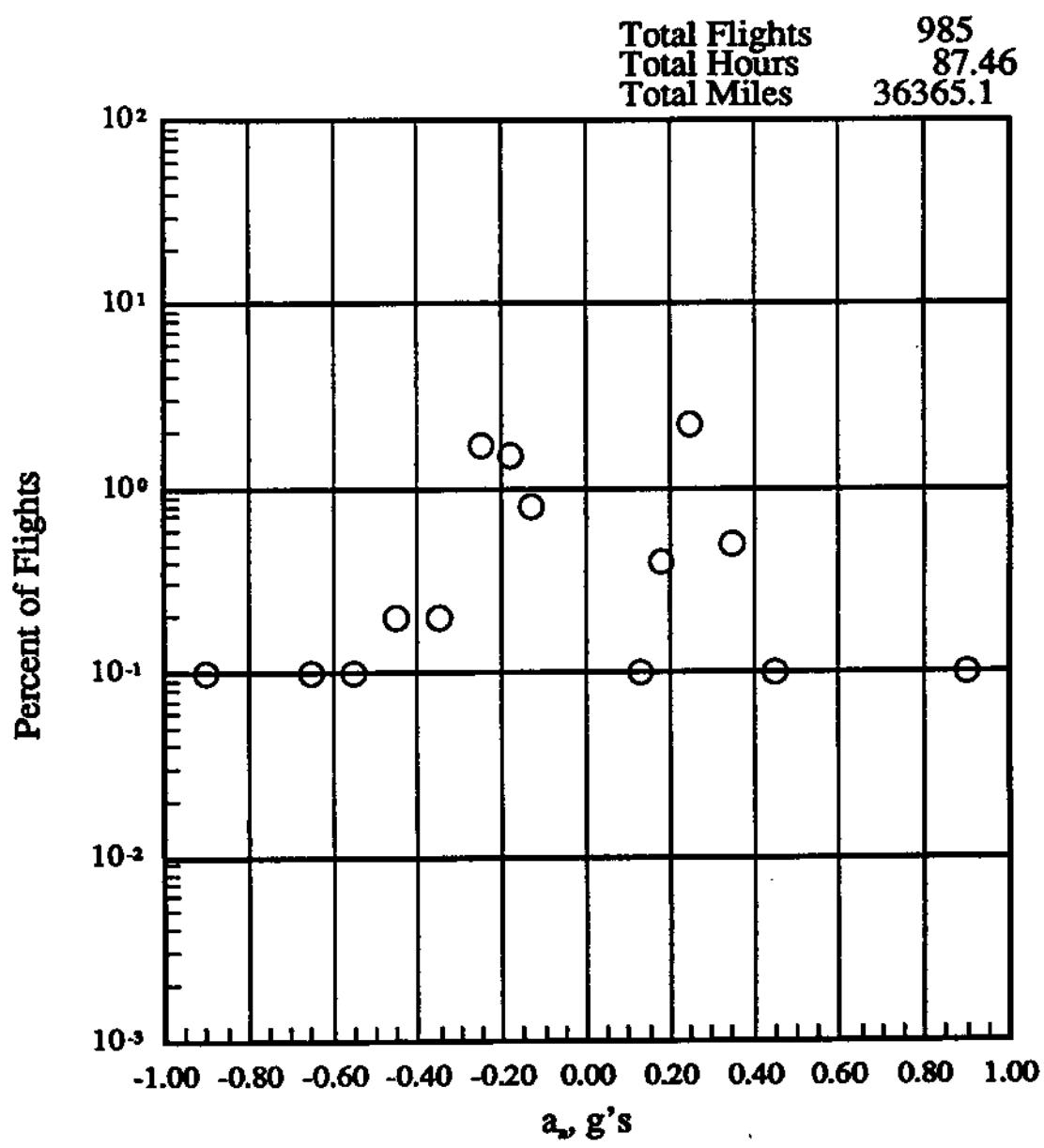
(d) 9500 to 14500 feet altitude

Figure 16.- Continued.



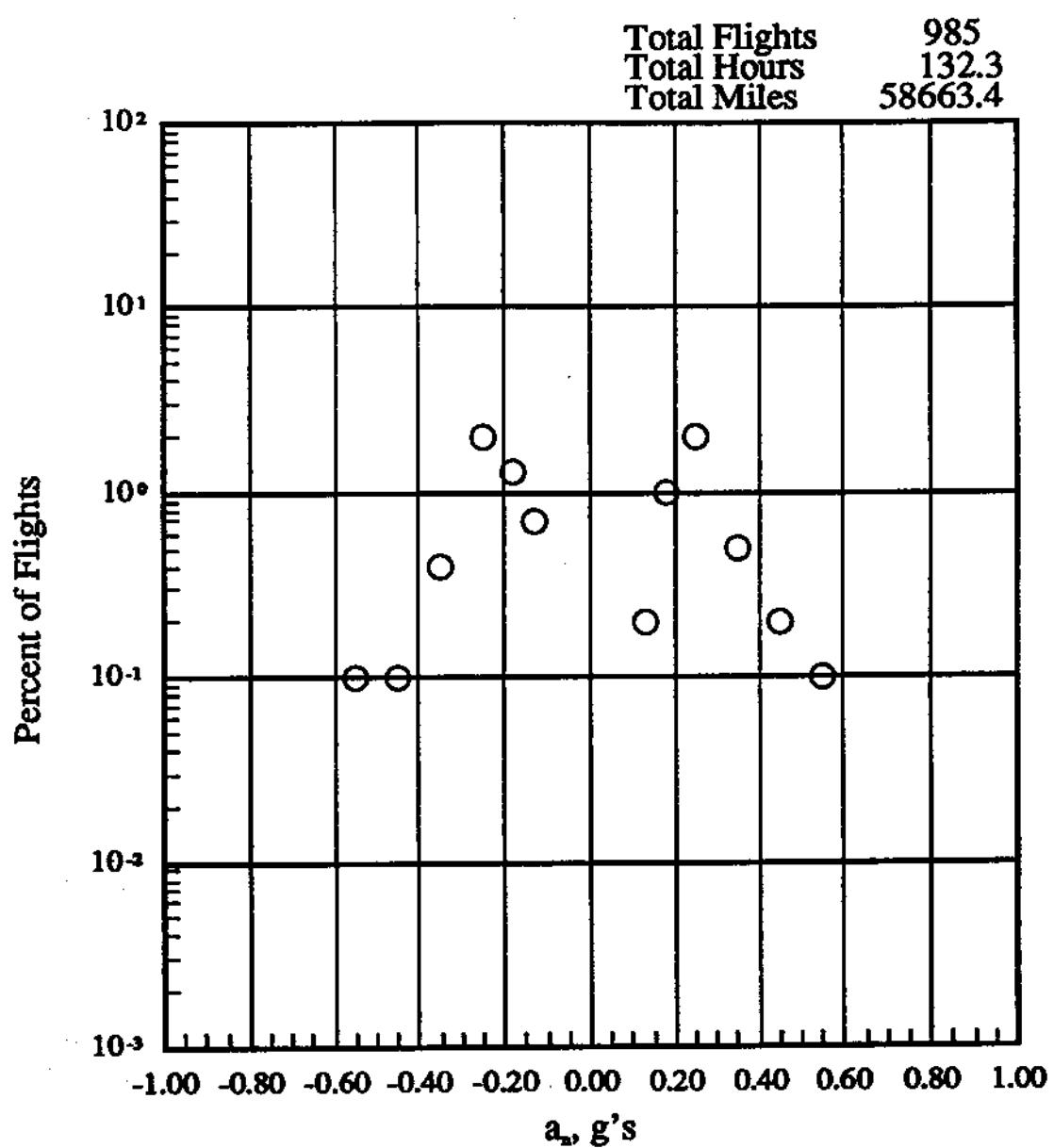
(e) 14500 to 19500 feet altitude

Figure 16.- Continued.



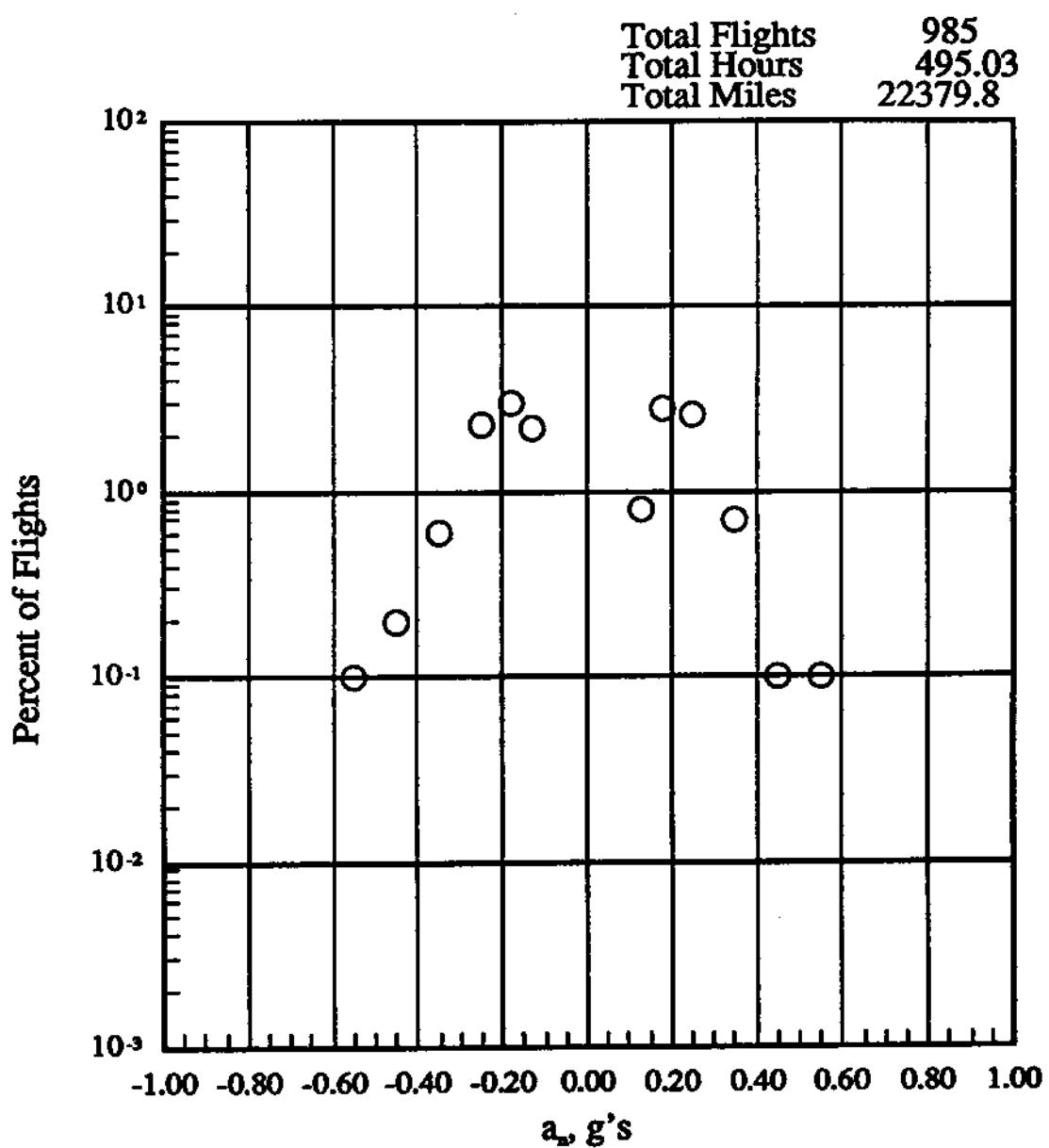
(f) 19500 to 24500 feet altitude

Figure 16.- Continued.



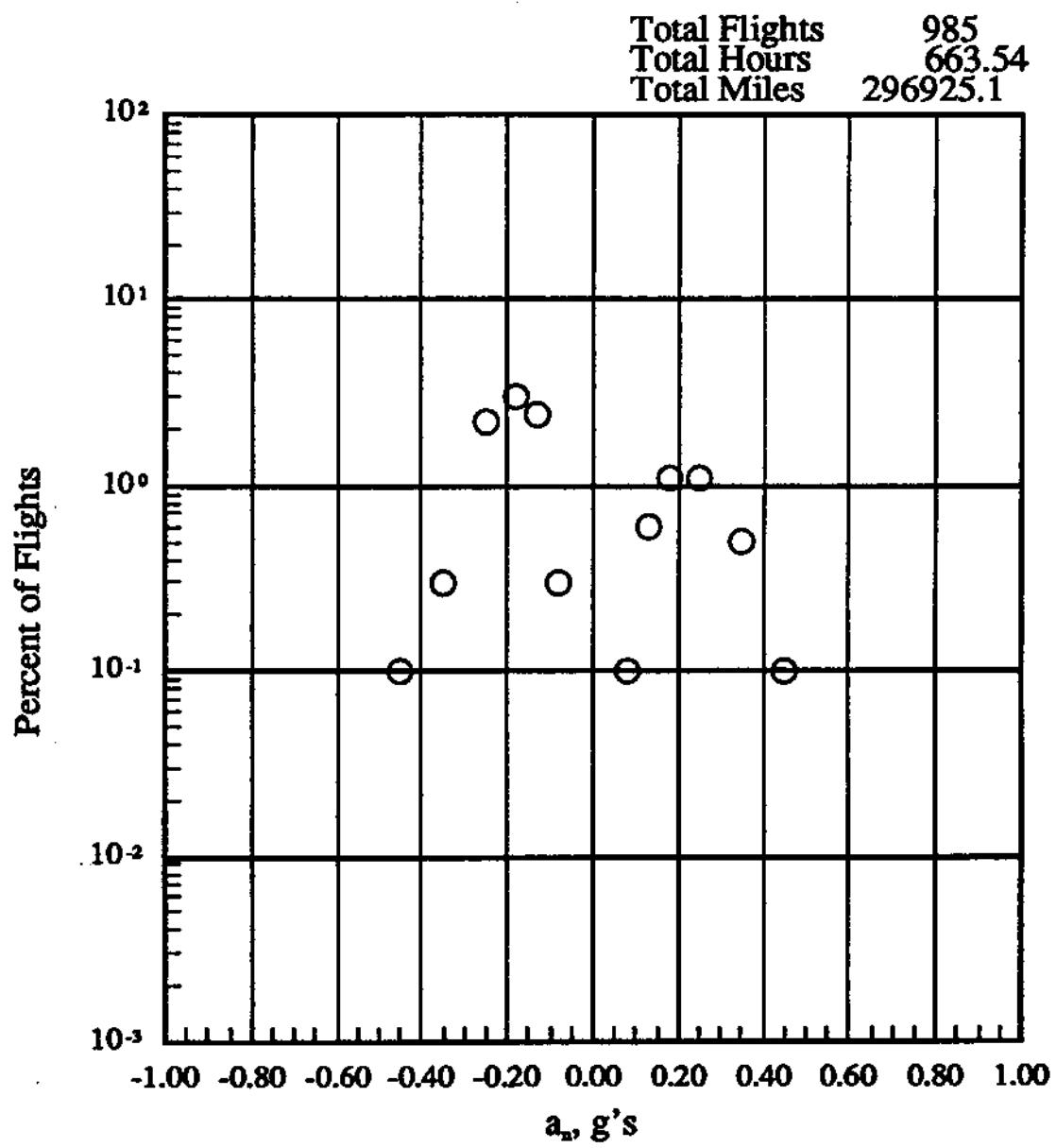
(g) 24500 to 29500 feet altitude

Figure 16.- Continued.



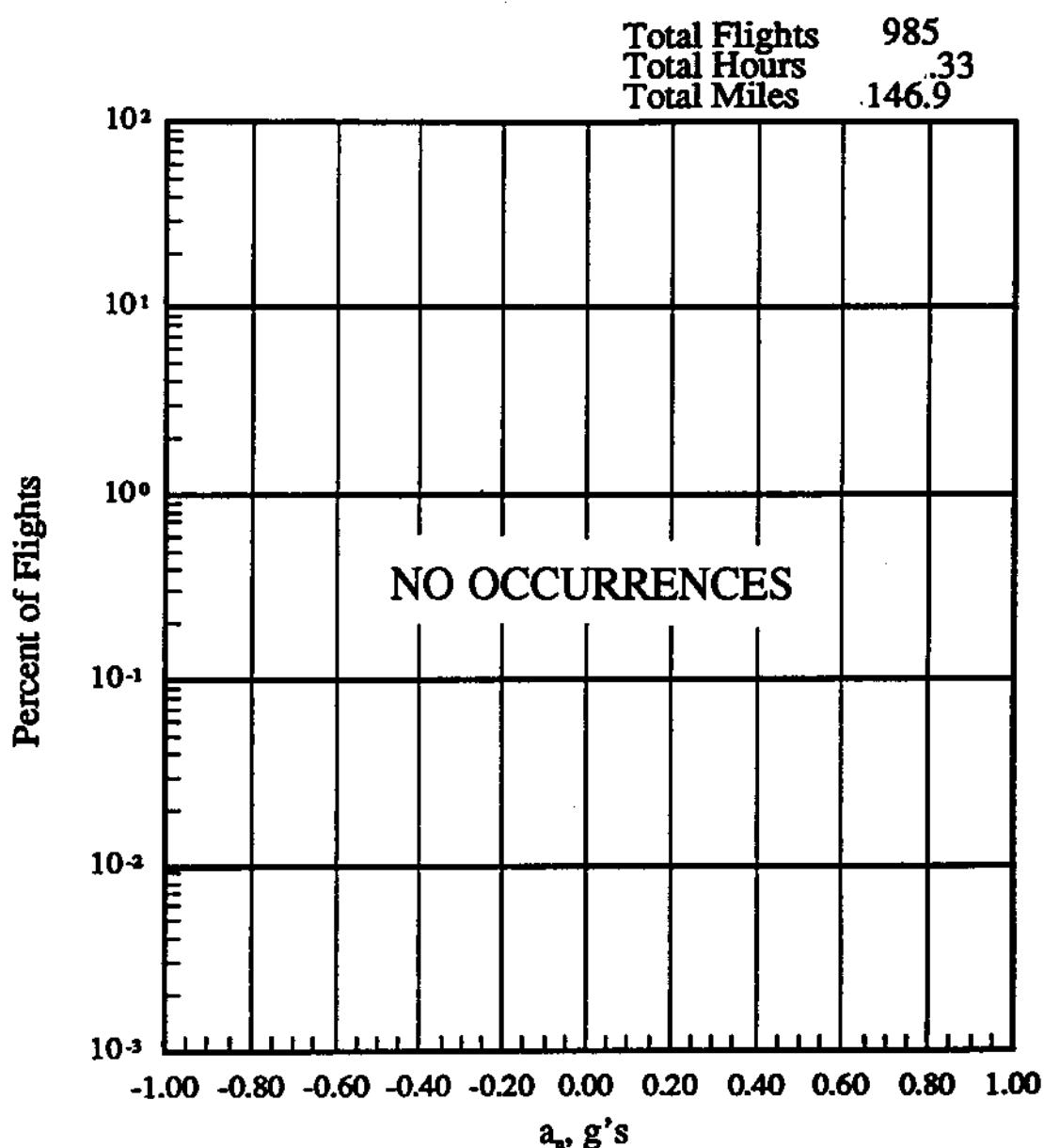
(h) 29500 to 34500 feet altitude

Figure 16.- Continued.



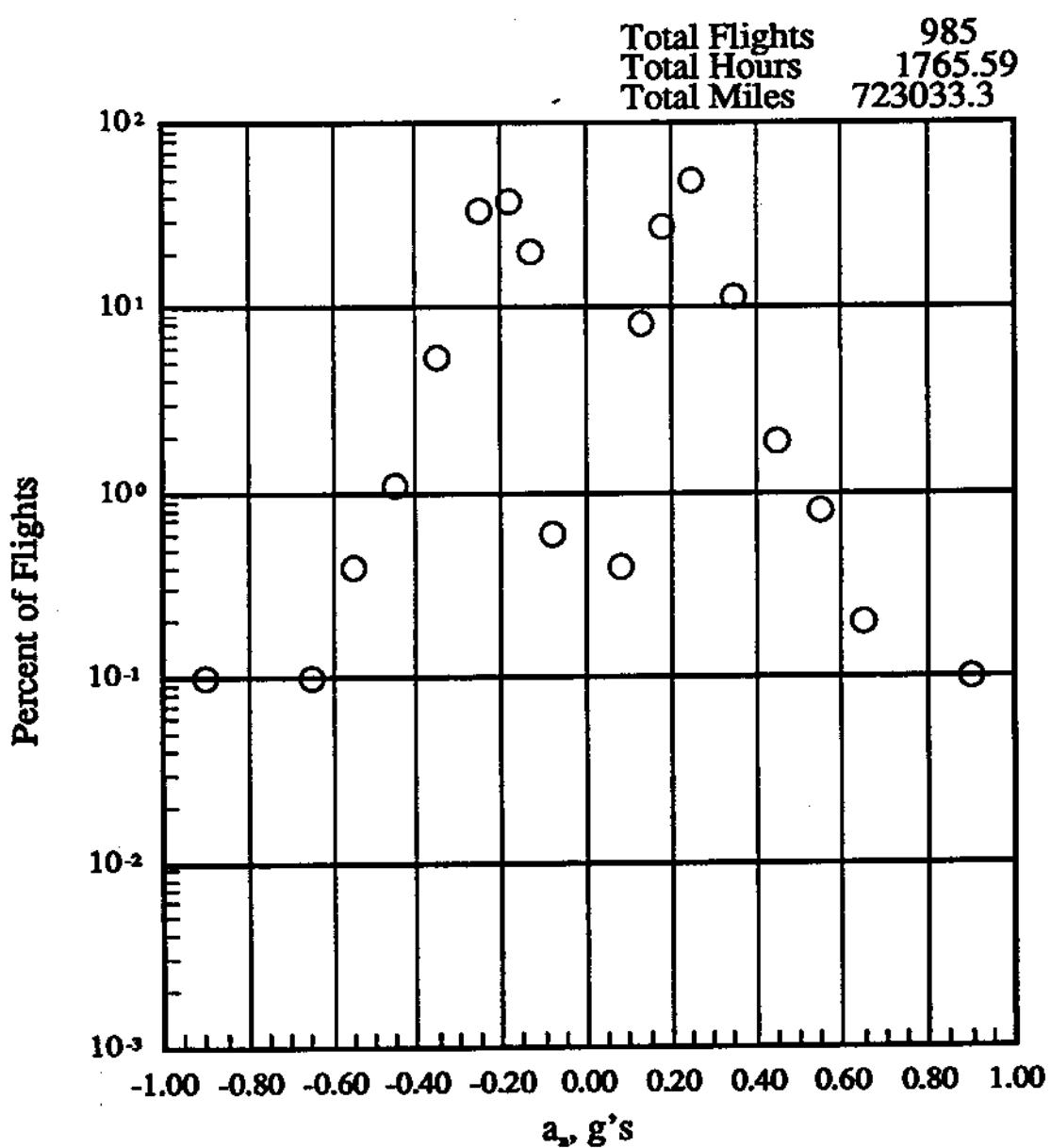
(i) 34500 to 39500 feet altitude

Figure 16.- Continued.



(j) 39500 to 44500 feet altitude

Figure 16.- Continued.



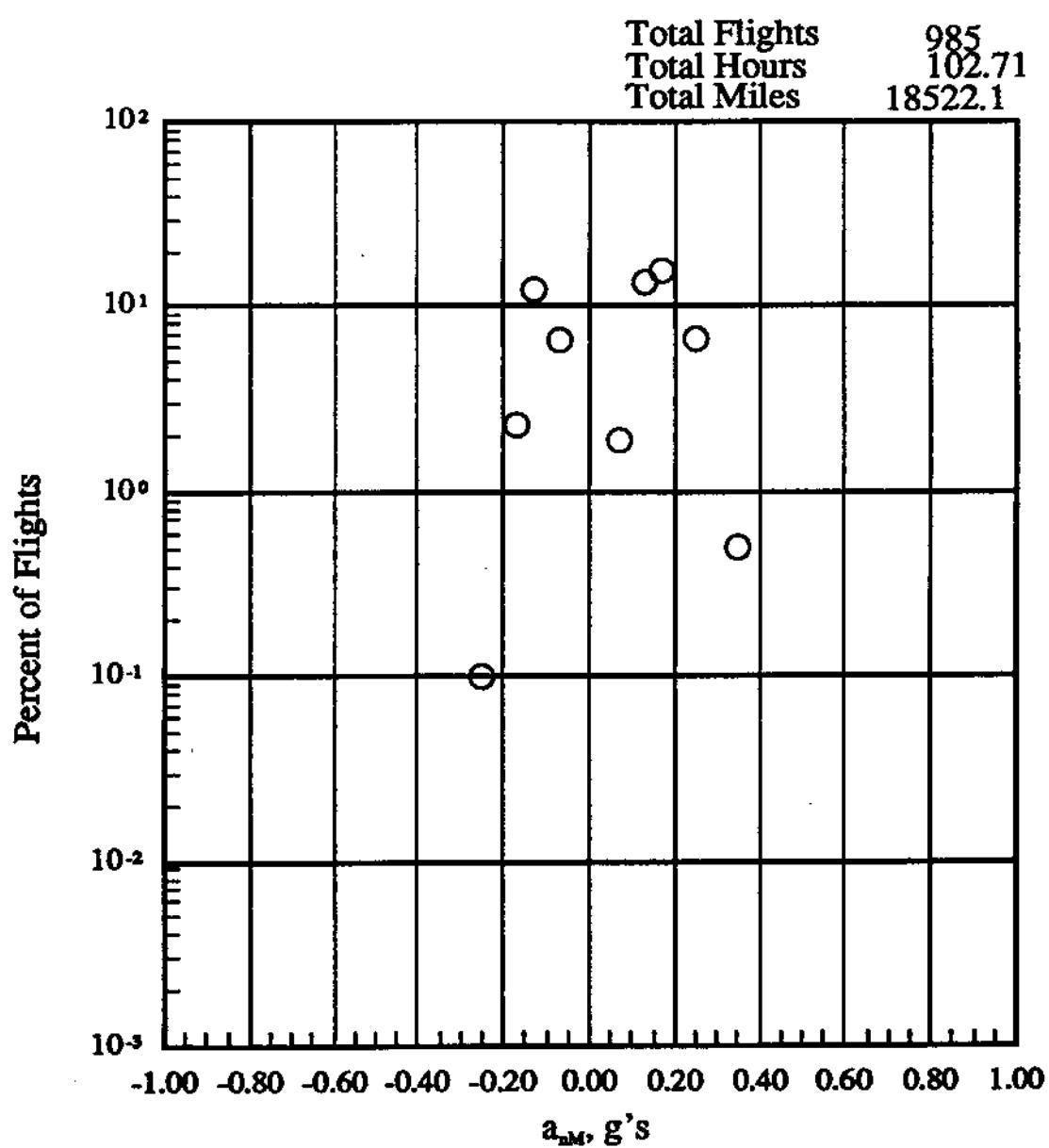
(k) -500 to 44500 feet altitude

Figure 16.- Concluded.

q's FROM FLIGHT	TO	PRESSURE ALTITUDE BANDS												TOTAL FLIGHTS
		9500 TO 14500 FT	14500 TO 19500 FT	19500 TO 24500 FT	19500 TO 24500 FT	24500 TO 29500 FT	24500 TO 29500 FT	29500 TO 34500 FT	29500 TO 34500 FT	34500 TO 39500 FT	34500 TO 39500 FT	39500 TO 44500 FT	-500 TO 44500 FT	
LEVEL FOR EACH		q's FROM FLIGHT												
.80	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0
.70	0.80	0	0	0	0	0	0	0	0	0	0	0	0	0
.60	0.70	0	0	0	0	0	0	0	0	0	0	0	0	0
.50	0.60	0	0	0	0	0	0	0	0	0	0	0	0	0
.40	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0
.30	0.40	0.50	0.40	0.30	0.20	0.10	0.10	0.10	0	0	0	0	0	1.30
.20	0.30	6.70	6.20	2.40	0.90	0.70	0.40	0.80	0.40	0	0	0	0	18.60
.15	0.20	15.70	9.00	5.50	1.40	1.40	1.40	1.60	1.60	0.30	0	0	0	36.40
.10	0.15	13.60	10.50	5.60	1.80	1.00	1.70	2.20	1.20	0	0	0	0	37.70
.05	0.10	1.90	1.30	1.50	0.10	0.10	0.40	0.30	0.30	0	0	0	0	6.00
-.05	-.10	6.60	3.40	3.40	0.60	0.80	0.80	2.70	3.60	0	0	0	0	21.80
-.10	-.15	12.40	10.40	13.20	2.10	2.50	4.20	7.80	9.20	0	0	0	0	61.80
-.15	-.20	2.30	3.60	2.40	0.70	0.70	1.30	0.90	2.10	0	0	0	0	14.10
-.20	-.30	0.10	0.50	0.10	0.10	0.30	0.30	0.20	0.30	0	0	0	0	1.90
-.30	-.40	0	0	0	0.10	0	0	0.10	0.10	0	0	0	0	0.30
-.40	-.50	0	0	0	0	0	0	0	0	0	0	0	0	0
-.50	-.60	0	0	0	0	0	0	0	0	0	0	0	0	0
-.60	-.70	0	0	0	0	0	0	0	0	0	0	0	0	0
-.70	-.80	0	0	0	0	0	0	0	0	0	0	0	0	0
-.80	-.90	0	0	0	0	0	0	0	0	0	0	0	0	0
-.90	-1.00	0	0	0	0	0	0	0	0	0	0	0	0	0
-1.00	-1.20	0	0	0	0	0	0	0	0	0	0	0	0	0
-1.20	-1.40	0	0	0	0	0	0	0	0	0	0	0	0	0
-1.40	-1.60	0	0	0	0	0	0	0	0	0	0	0	0	0
-1.60	-1.80	0	0	0	0	0	0	0	0	0	0	0	0	0
FLIGHT HOURS @ ALT	102.71	105.51	104.07	74.64	87.46	132.30	495.03	663.54	0.33	1765.59				
FLIGHT MILES @ ALT	18522.12	26173.93	33395.36	28461.45	36365.13	58663.40	223579.81	296925.11	146.91	723033.21				

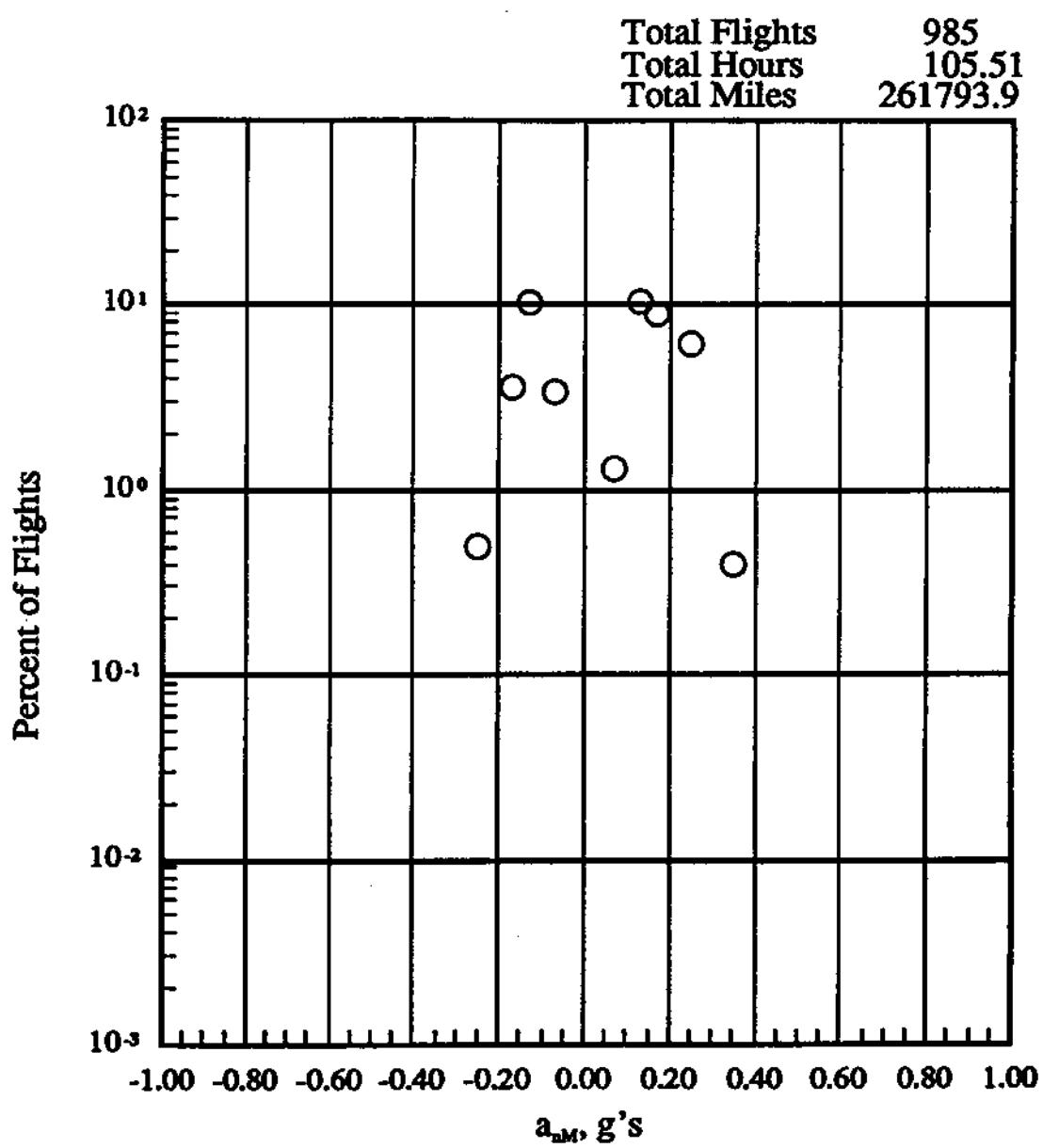
(a) Percent of flights where peak positive and negative Δu_M per flight occurs within pressure altitude bands, any flap

Figure 17.- Peak positive and negative Δ_{hM} vs altitude.



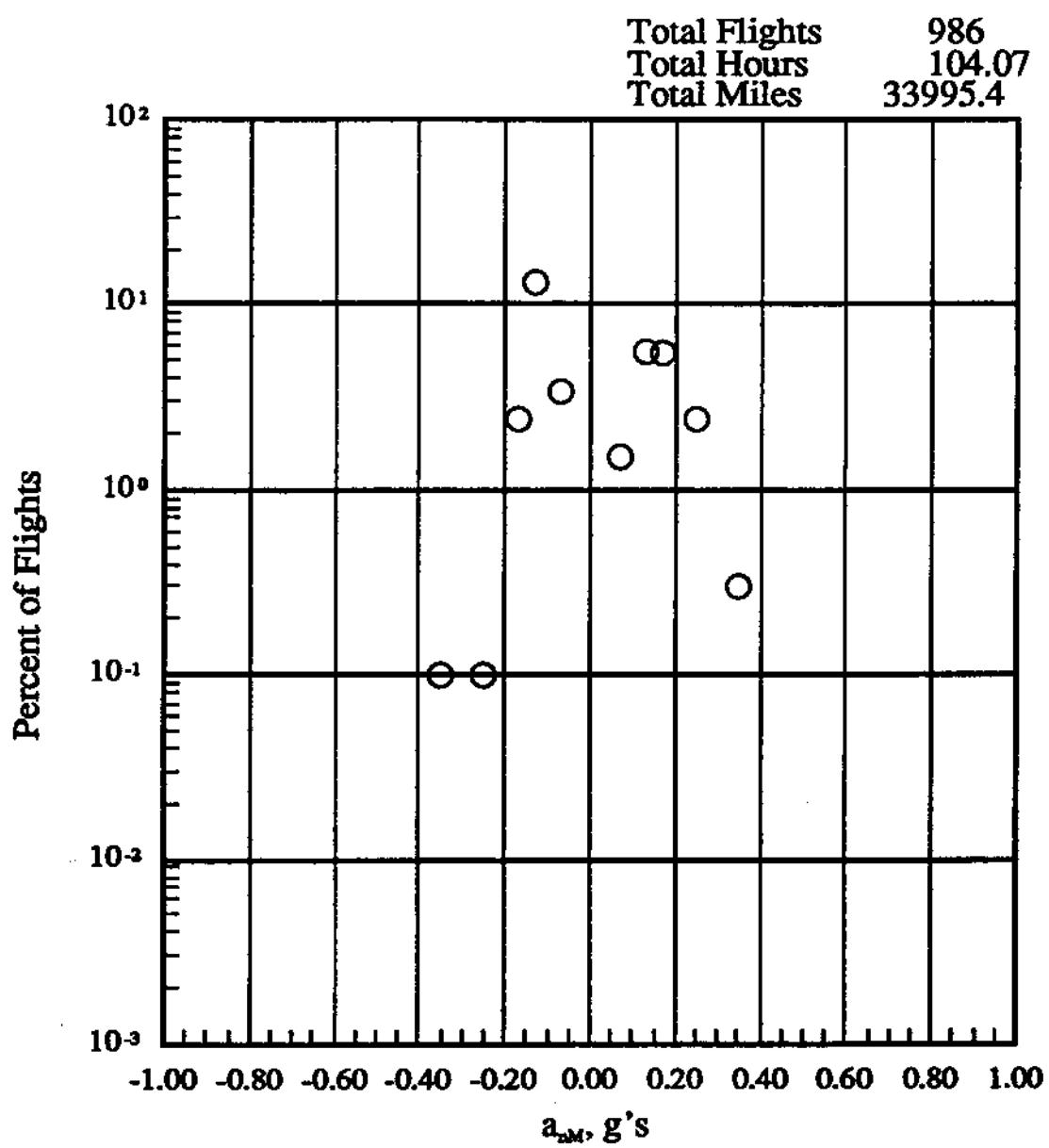
(b) -500 to 4500 feet altitude

Figure 17.- Continued.



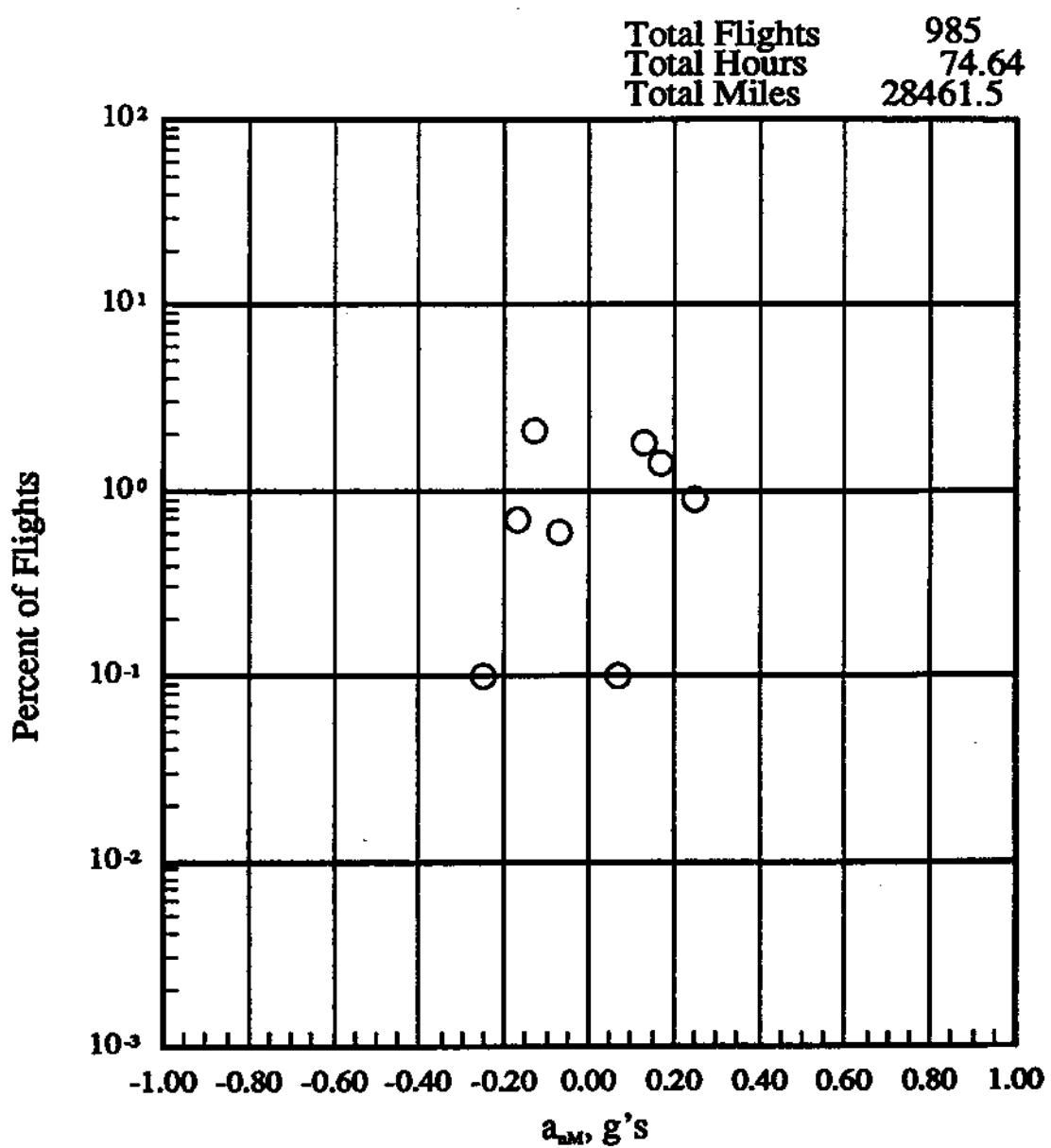
(c) 4500 to 9500 feet altitude

Figure 17.- Continued.



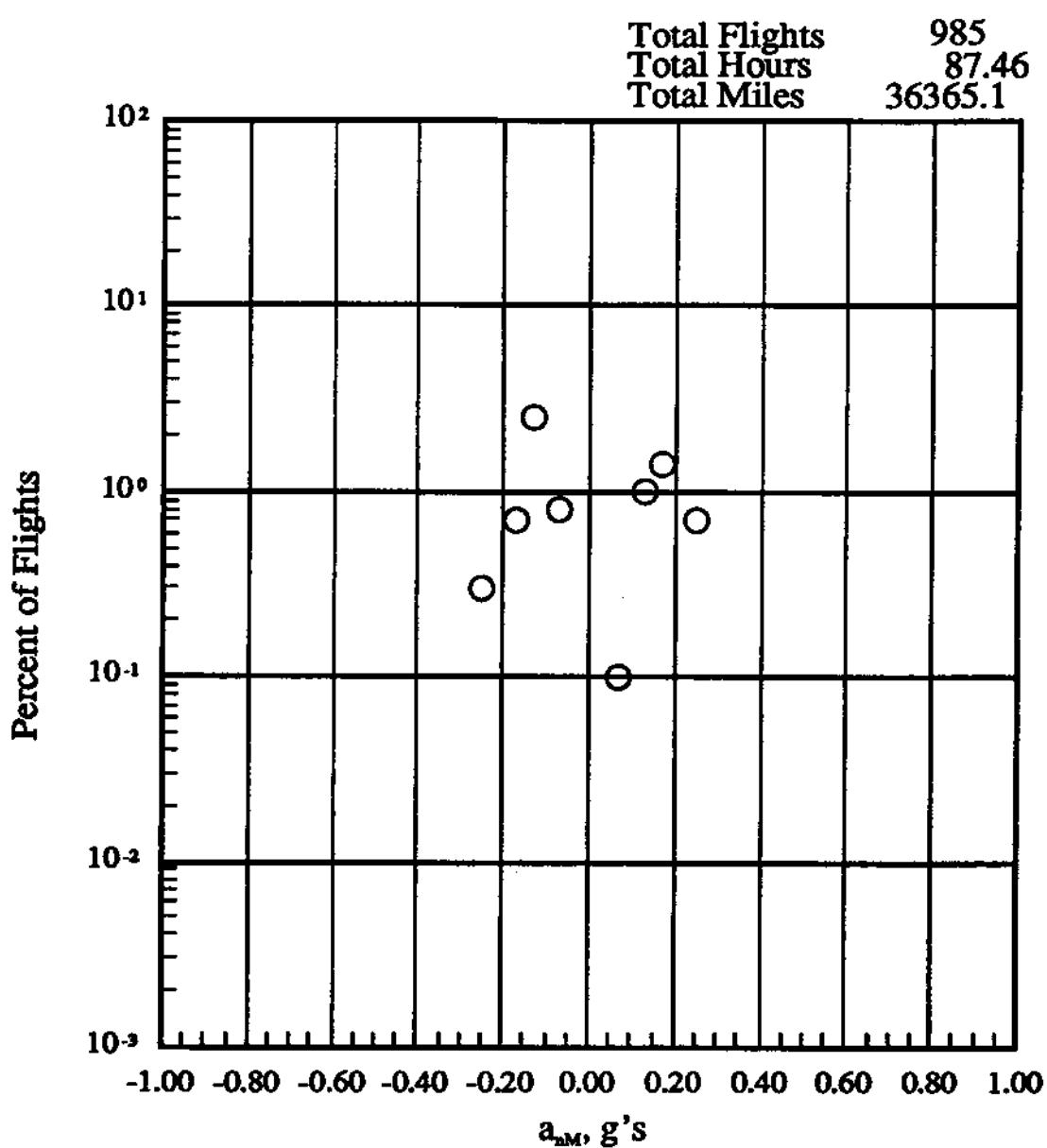
(d) 9500 to 14500 feet altitude

Figure 17.- Continued.



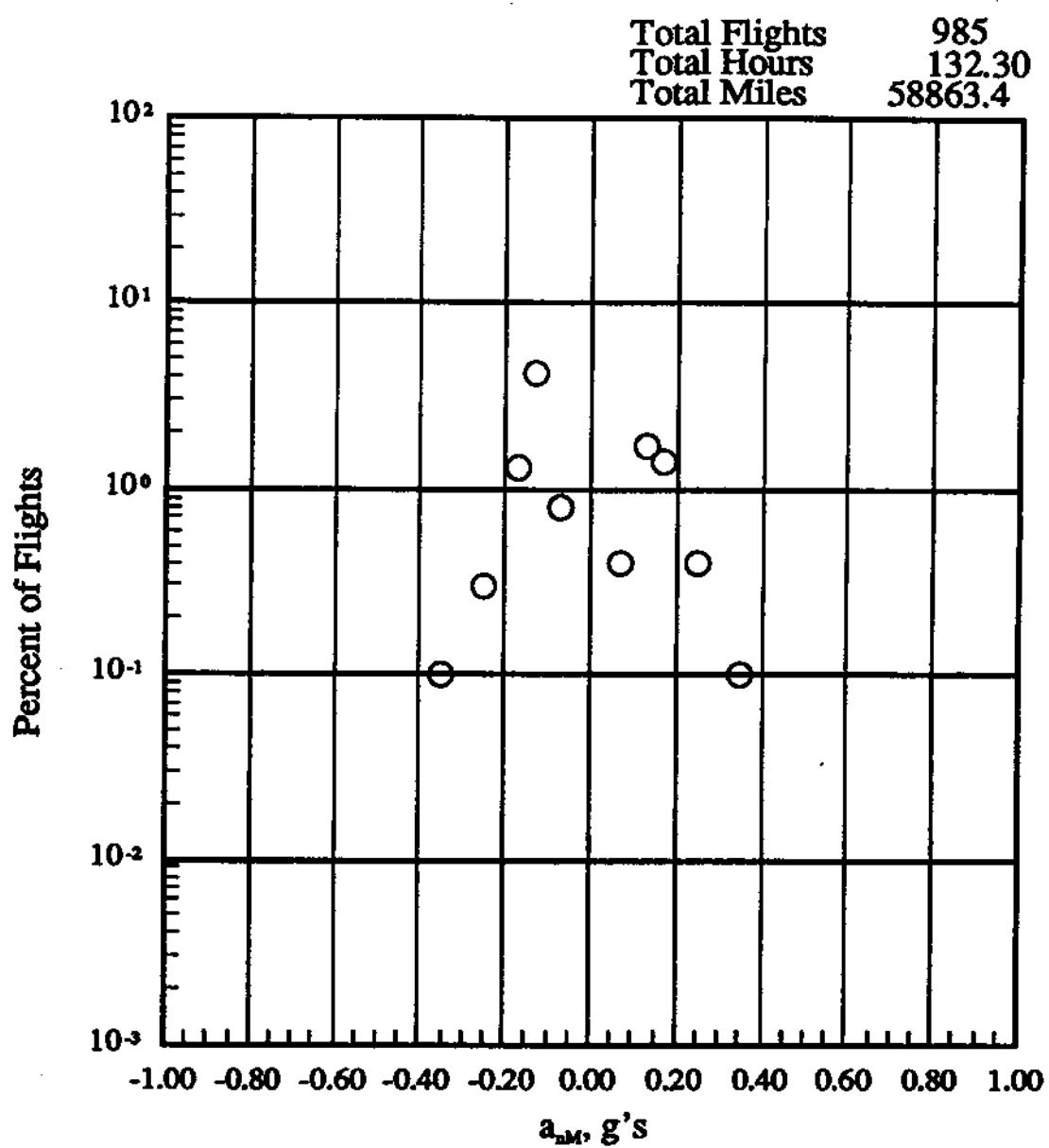
(e) 14500 to 19500 feet altitude

Figure 17.- Continued.



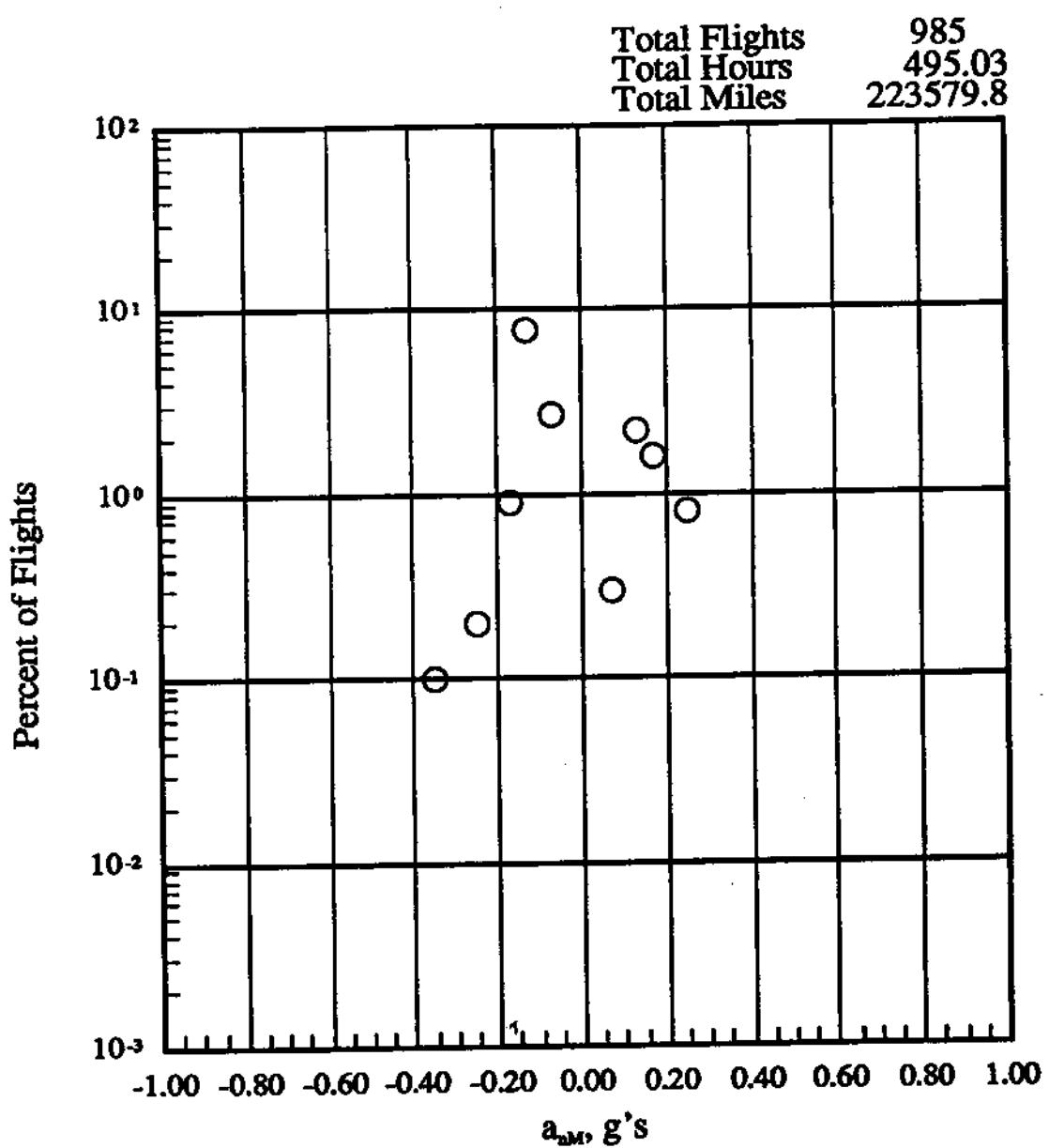
(f) 19500 to 24500 feet altitude

Figure 17.- Continued.



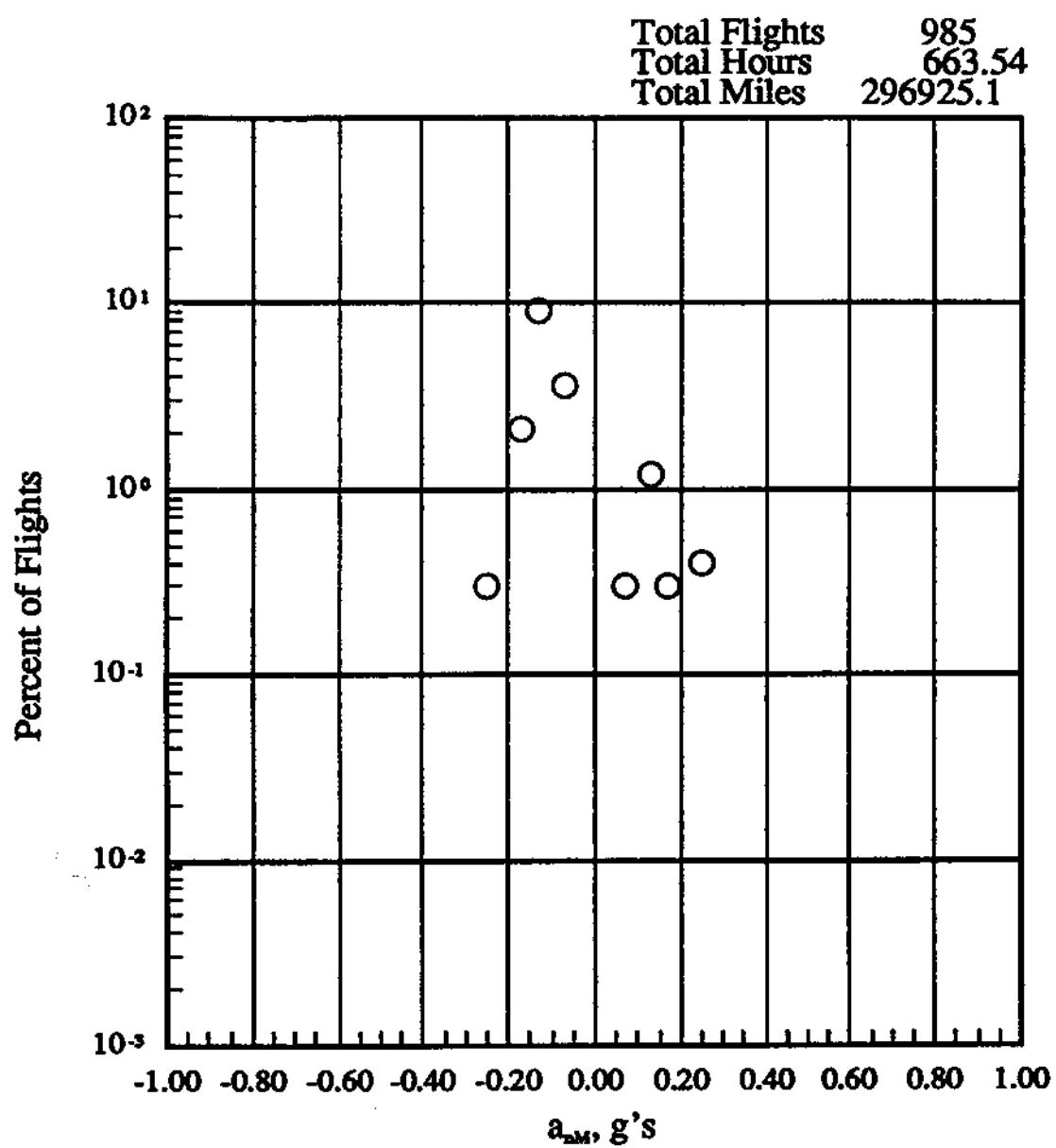
(g) 24500 to 29500 feet altitude

Figure 17.- Continued.



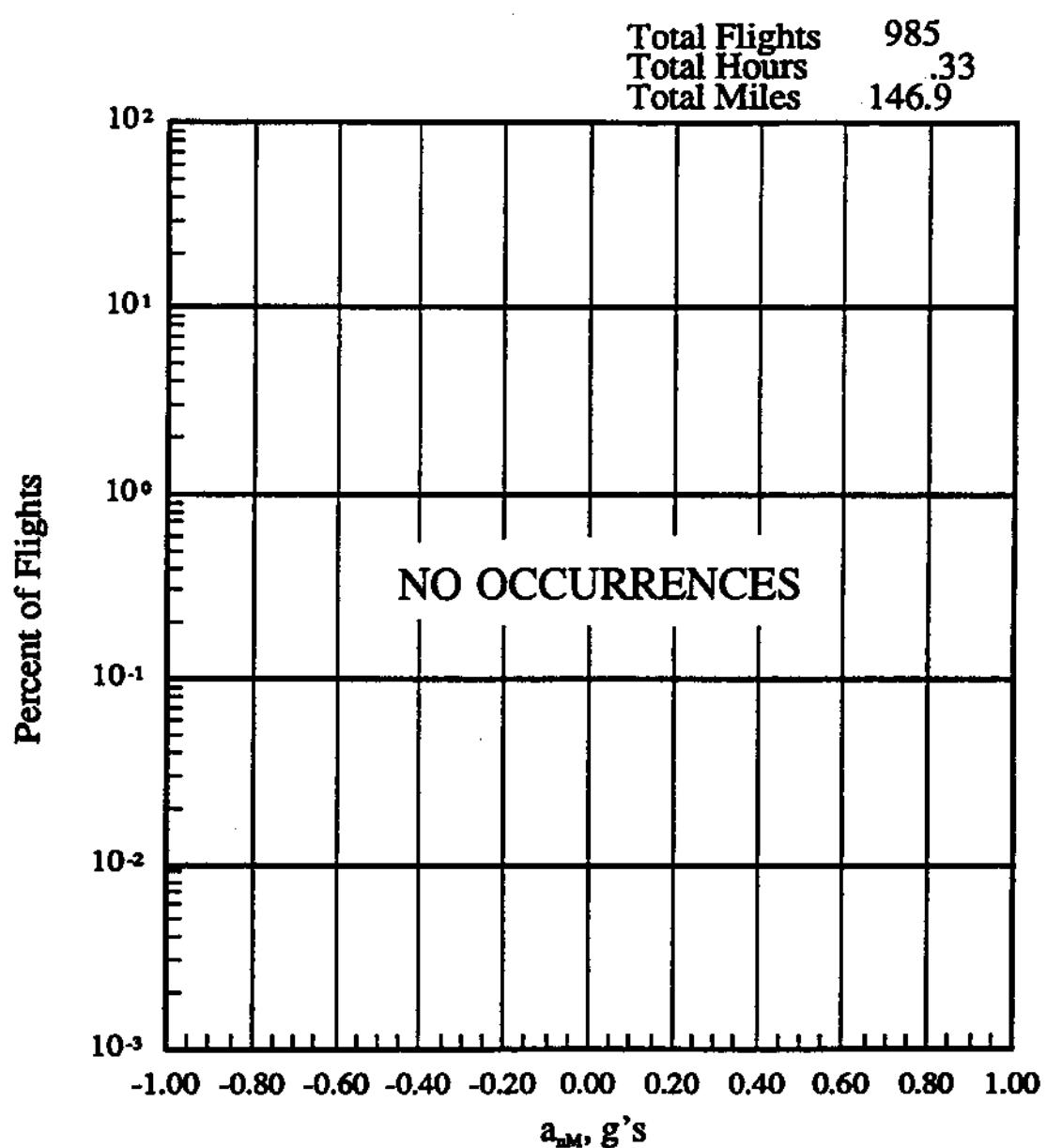
(h) 29500 to 34500 feet altitude

Figure 17.- Continued.



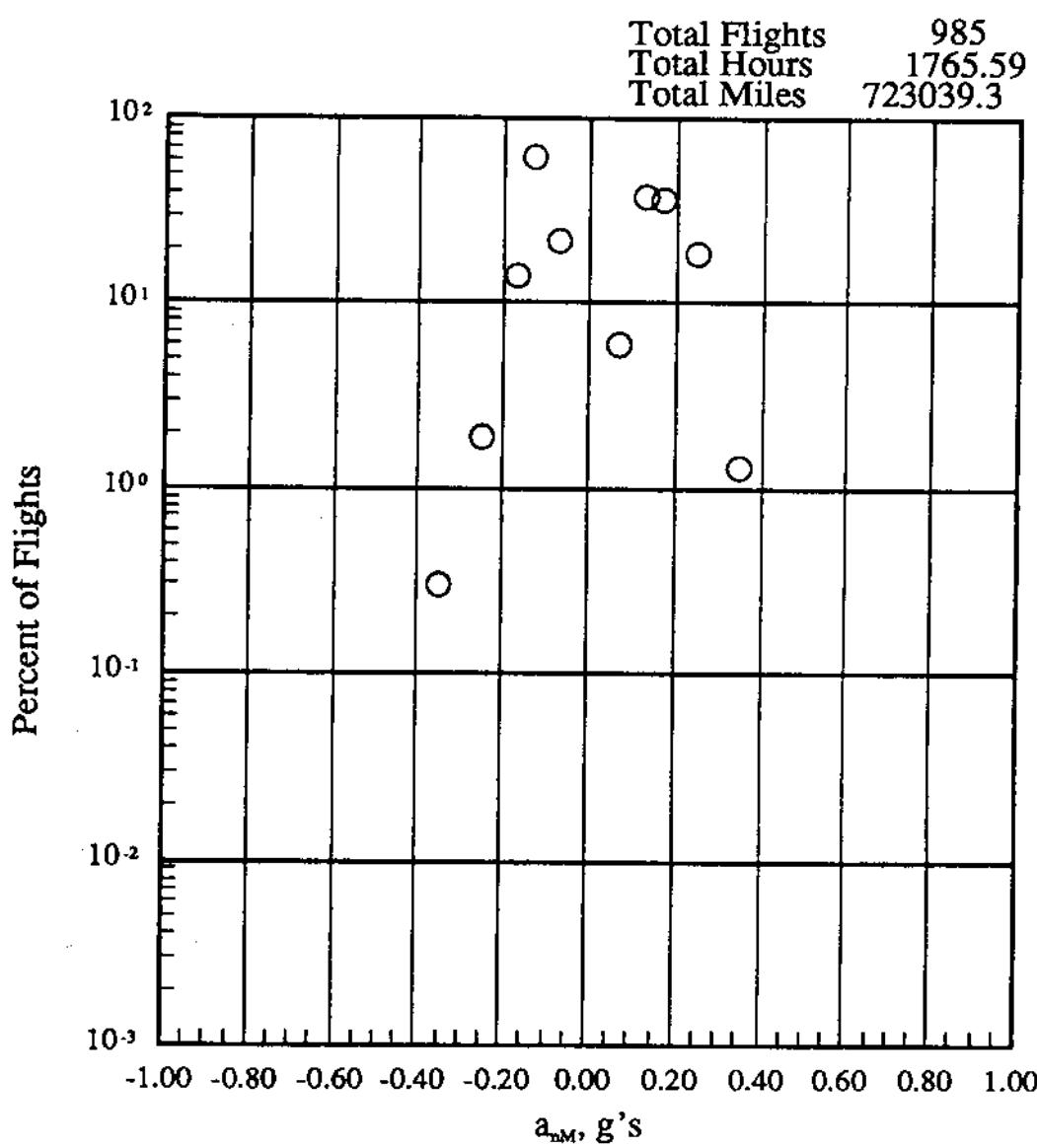
(i) 34500 to 39500 feet altitude

Figure 17.- Continued.



(j) 39500 to 44500 feet altitude

Figure 17.- Continued.



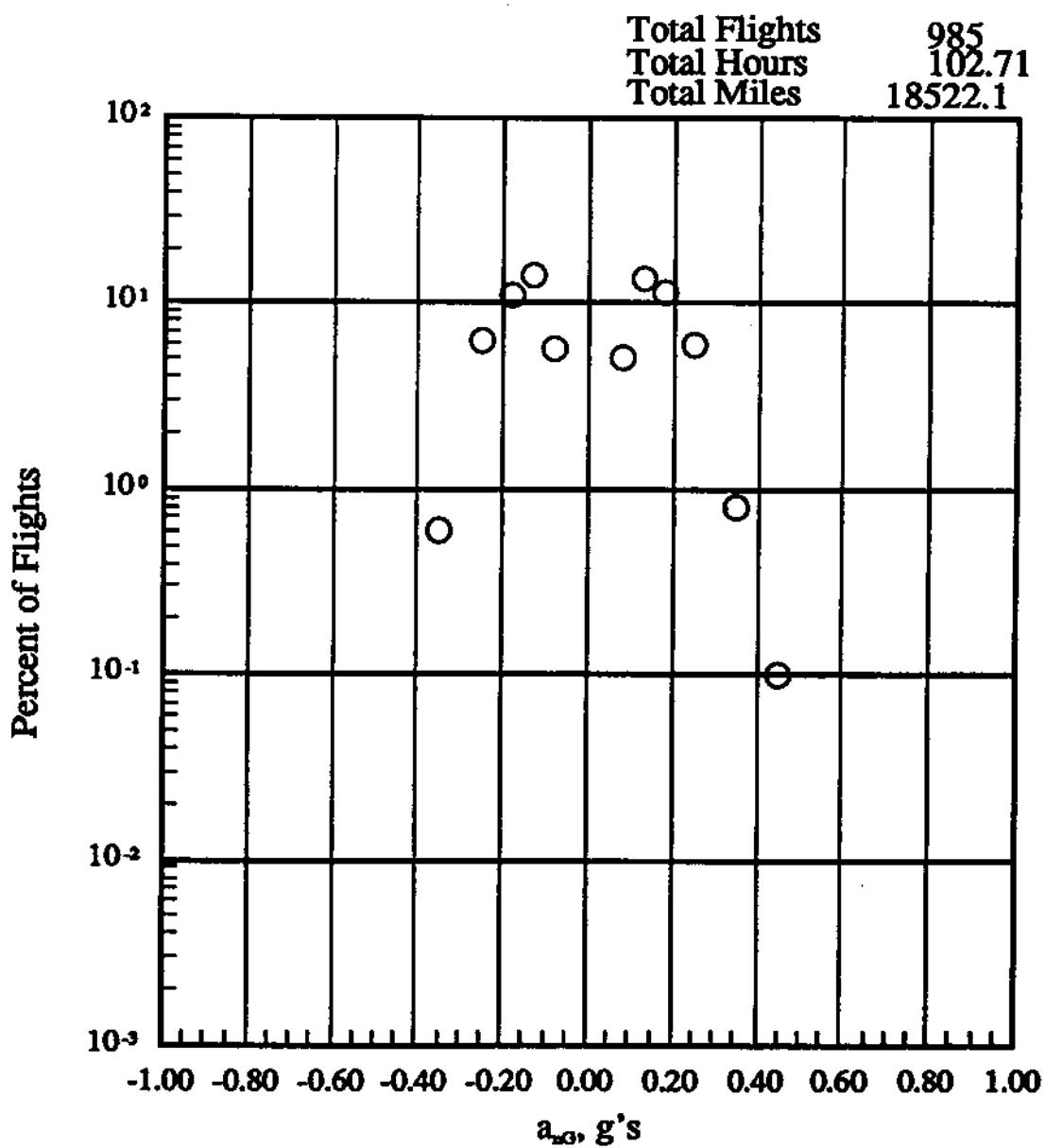
(k) -500 to 44500 feet altitude

Figure 17.- Concluded.

LEVEL FOR EACH FLIGHT	PRESSURE ALTITUDE BANDS										TOTAL FLIGHTS 985	
	-500 TO 4500 FT		4500 TO 9500 FT		9500 TO 14500 FT		14500 TO 19500 FT		19500 TO 24500 FT			
	a_{nG} MAX	a_{nG} MIN	a_{nG} MAX	a_{nG} MIN	a_{nG} MAX	a_{nG} MIN	a_{nG} MAX	a_{nG} MIN	a_{nG} MAX	a_{nG} MIN		
a_{nG} 's FROM TO												
1.60	1.80	0	0	0	0	0	0	0	0	0	0	
1.40	1.60	0	0	0	0	0	0	0	0	0	0	
1.20	1.40	0	0	0	0	0	0	0	0	0	0	
1.00	1.20	0	0	0	0	0	0	0	0	0	0	
.80	1.00	0	0	0	0	0	0	0	0	0	0.10	
.70	.80	0	0	0	0	0	0	0	0	0	0	
.60	.70	0	0	0	0	0	0	0	0	0	0	
.50	.60	0	0	0	0	0.10	0	0.10	0	0	0.20	
.40	.50	0.10	0.10	0.10	0.10	0.10	0	0	0.10	0	0.60	
.30	.40	0.40	0.50	0.50	0.70	0.70	0.20	0.30	0.20	0.10	2.80	
.20	.30	0.60	0.70	0.70	1.30	1.40	1.10	1.40	1.10	0	18.80	
.15	.20	11.50	4.80	3.50	1.70	1.60	1.20	2.50	1.20	0	28.00	
.10	.15	13.70	5.80	5.10	2.00	1.60	1.00	2.80	2.40	0	34.50	
.05	.10	5.10	2.30	1.70	0.80	0.30	1.20	1.60	1.30	0	14.40	
-0.05	-0.10	5.70	2.80	1.80	0.90	0.50	1.00	1.40	1.30	0	16.00	
-0.10	-0.15	14.30	5.50	4.40	2.10	1.60	1.40	2.30	1.30	0	33.00	
-0.15	-0.20	11.10	4.70	3.60	1.70	1.60	0.70	2.30	1.40	0	27.10	
-0.20	-0.30	6.30	3.90	2.70	1.20	0.50	1.40	1.30	1.50	0	18.90	
-0.30	-0.40	0.60	1.00	0.70	0.30	0.30	0.20	0.30	0.20	0	3.70	
-0.40	-0.50	0	0	0	0.10	0.10	0.10	0	0	0	0.20	
-0.50	-0.60	0	0	0	0	0.10	0	0.10	0	0	0.40	
-0.60	-0.70	0	0	0	0	0.10	0	0	0	0	0.10	
-0.70	-0.80	0	0	0	0	0	0	0	0	0	0	
-0.80	-1.00	0	0	0	0	0	0.10	0	0	0	0.10	
-1.00	-1.20	0	0	0	0	0	0.10	0	0	0	0.10	
-1.20	-1.40	0	0	0	0	0	0	0	0	0	0	
-1.40	-1.60	0	0	0	0	0	0	0	0	0	0	
-1.60	-1.80	0	0	0	0	0	0	0	0	0	0	
FLIGHT HOURS @ ALL		102.71	105.51	104.07	74.64	87.46	132.30	495.03	663.54	0.33	1765.59	
FLIGHT MILES @ ALL		18522.12	26173.93	33995.36	20461.45	36355.13	58863.40	223579.81	296925.11	146.91	723033.21	

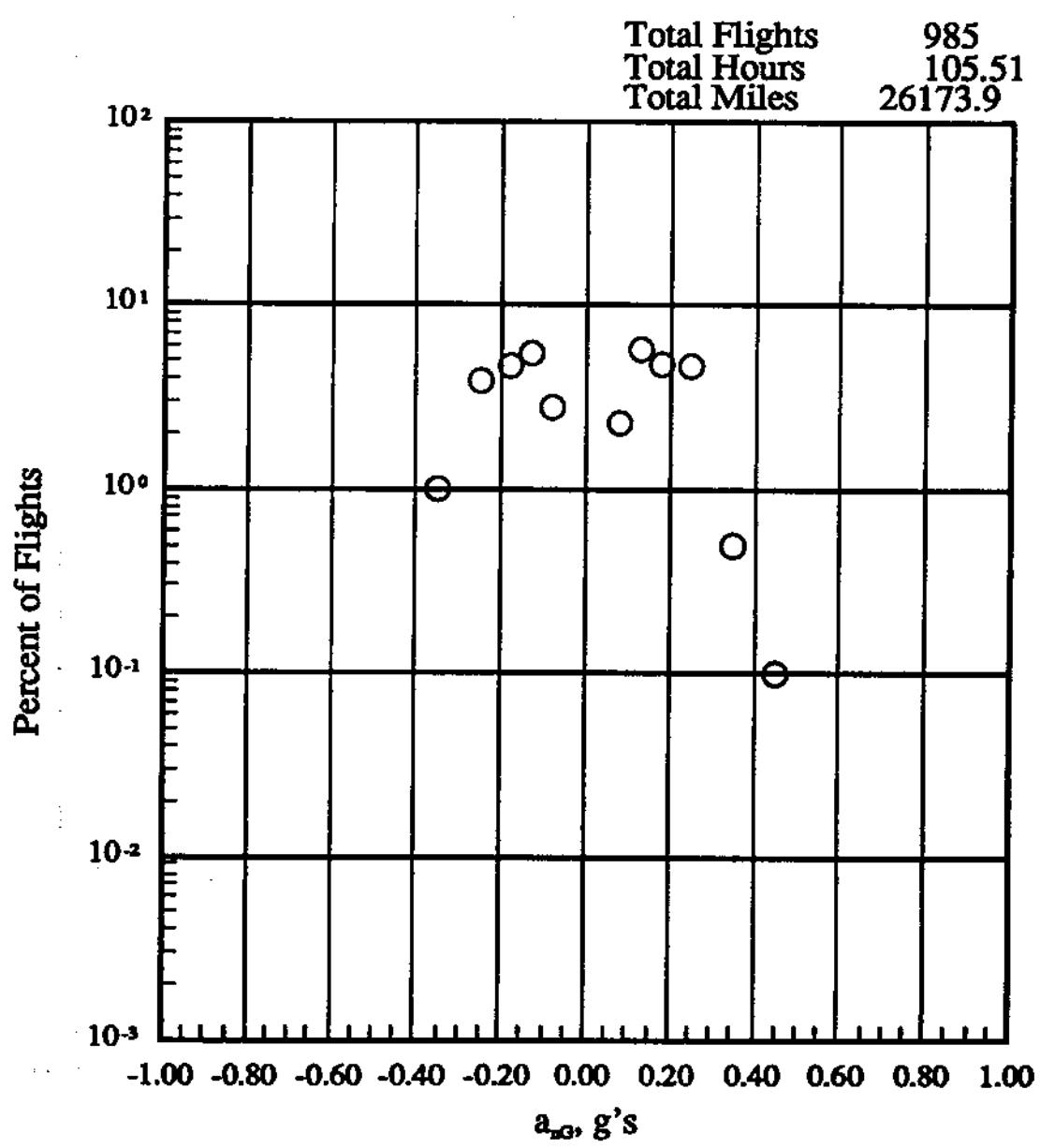
(a) Percent of flights where peak positive and negative a_{nG} per flight occurs within pressure altitude bands, any flap

Figure 18.- Peak positive and negative a_{nG} vs altitude.



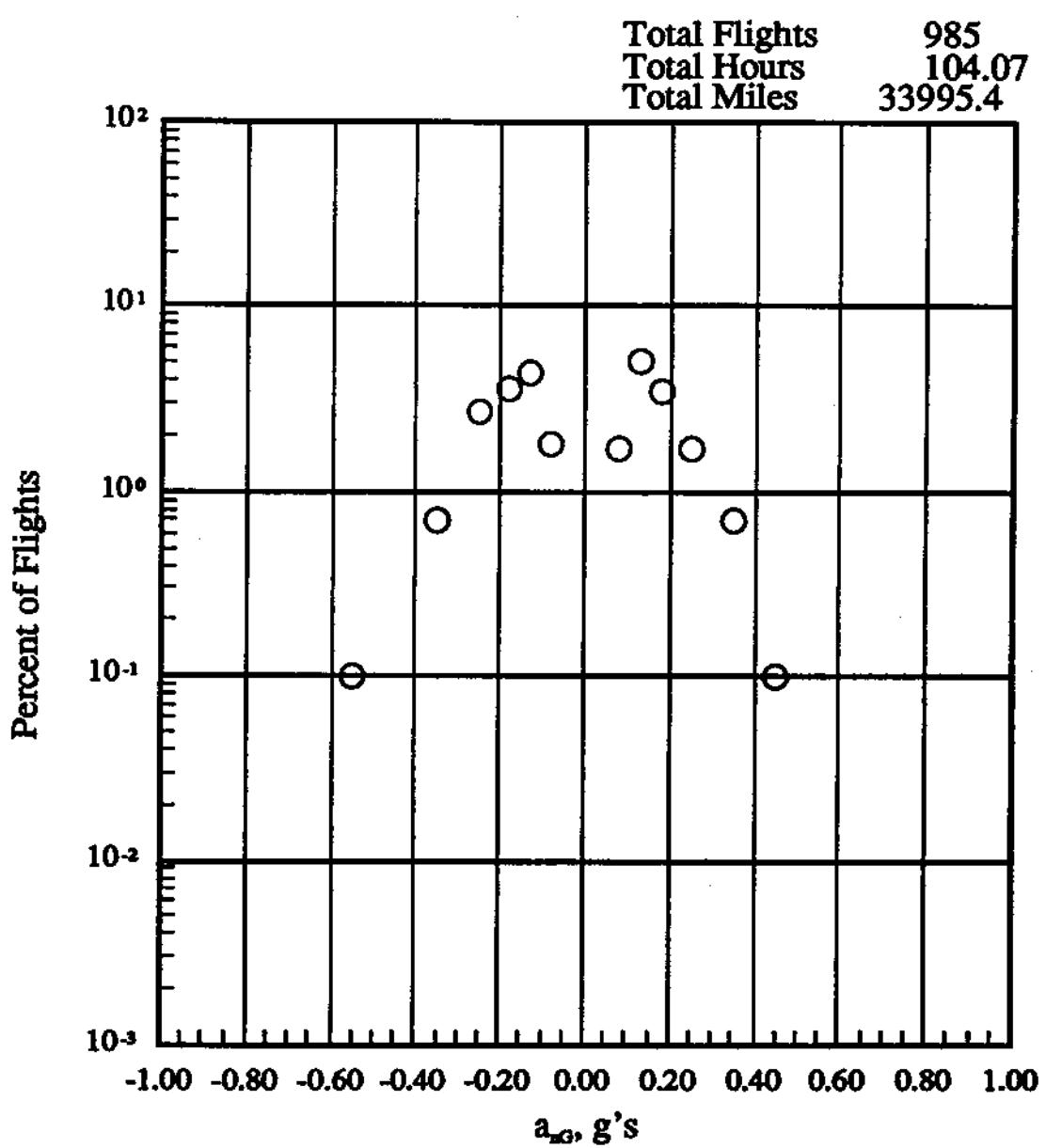
(b) -500 to 4500 feet altitude

Figure 18.- Continued.



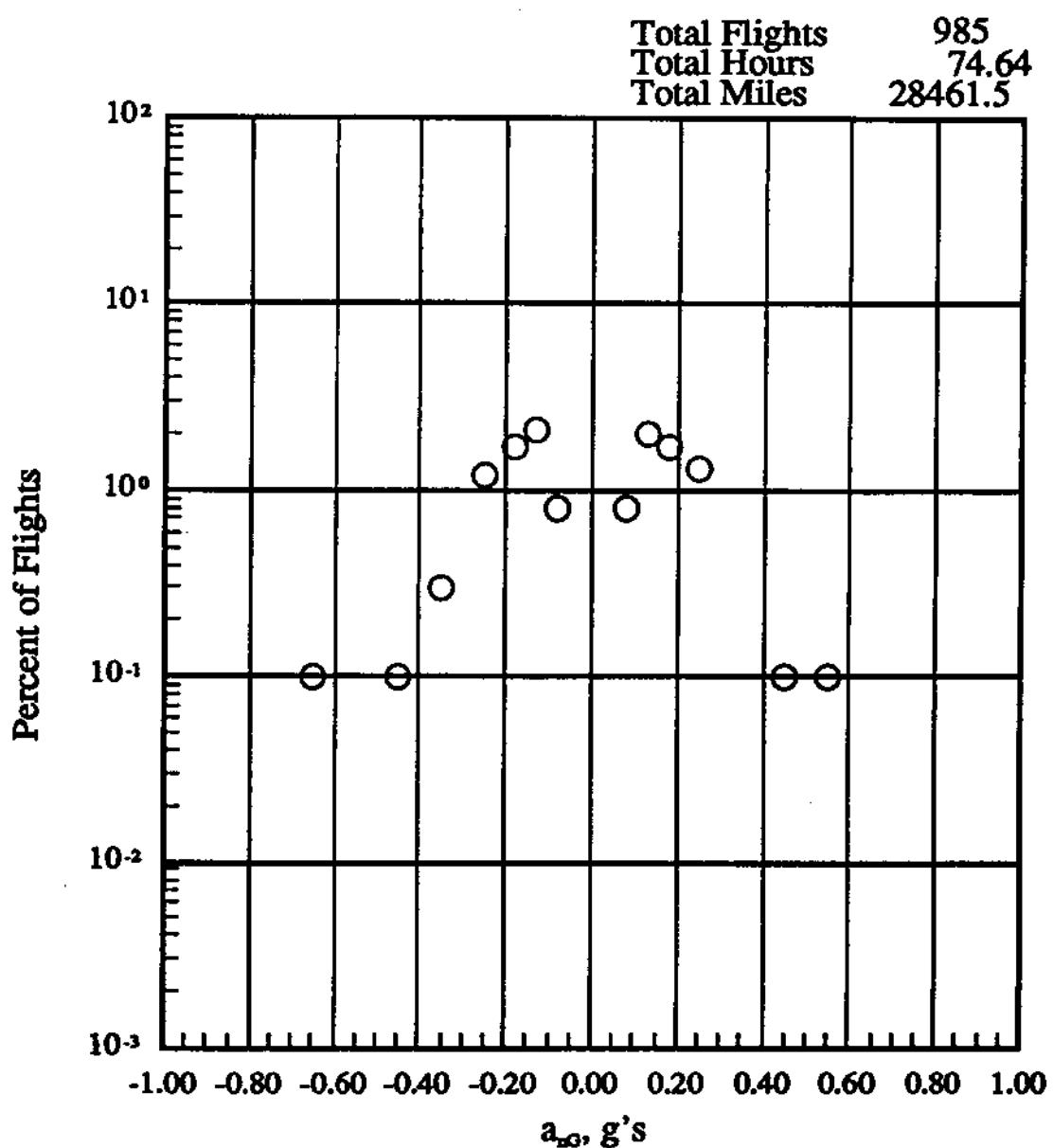
(c) 4500 to 9500 feet altitude

Figure 18.- Continued.



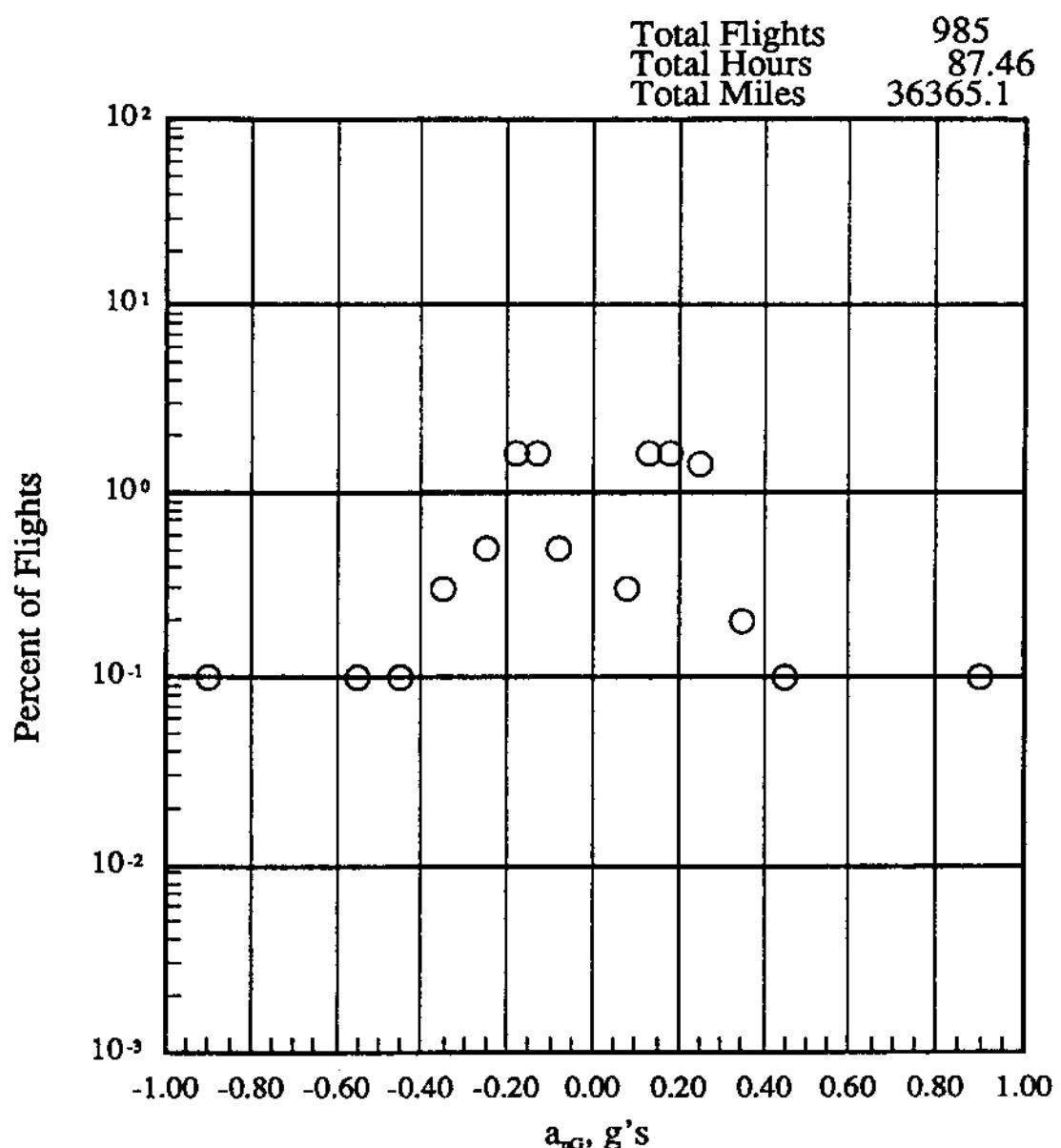
(d) 9500 to 14500 feet altitude

Figure 18.- Continued.



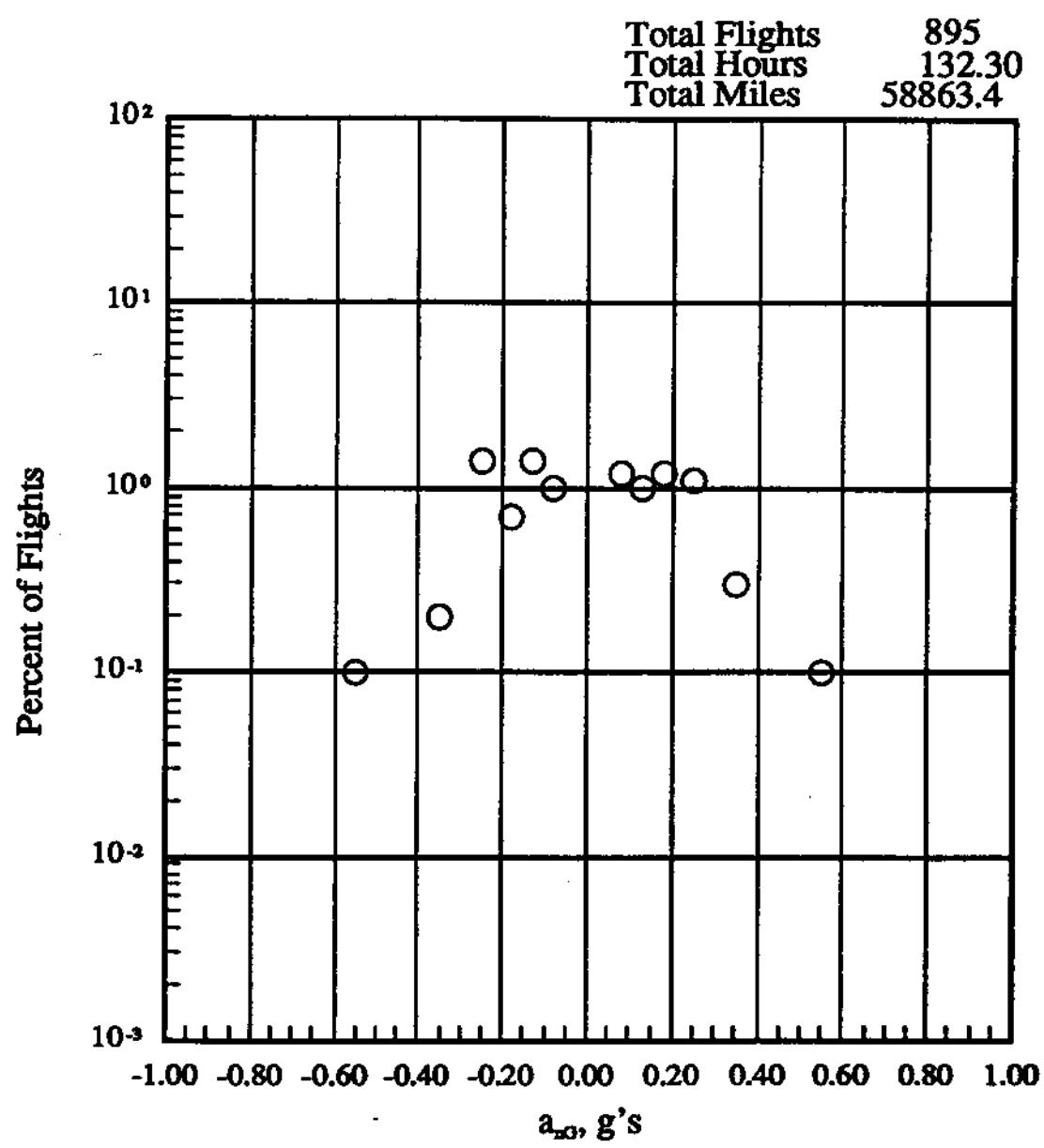
(e) 14500 to 19500 feet altitude

Figure 18.- Continued.



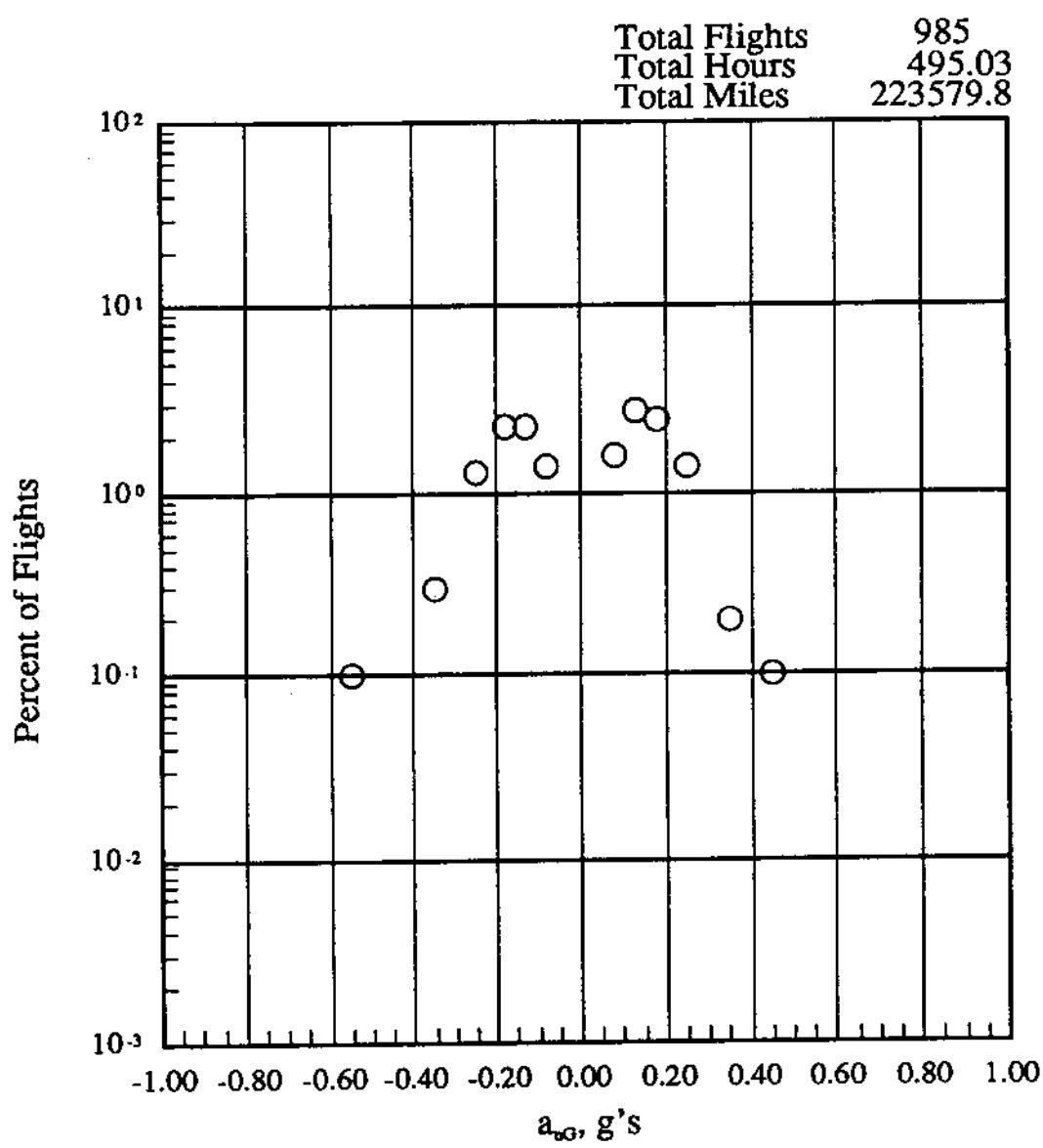
(f) 19500 to 24500 feet altitude

Figure 18.- Continued.



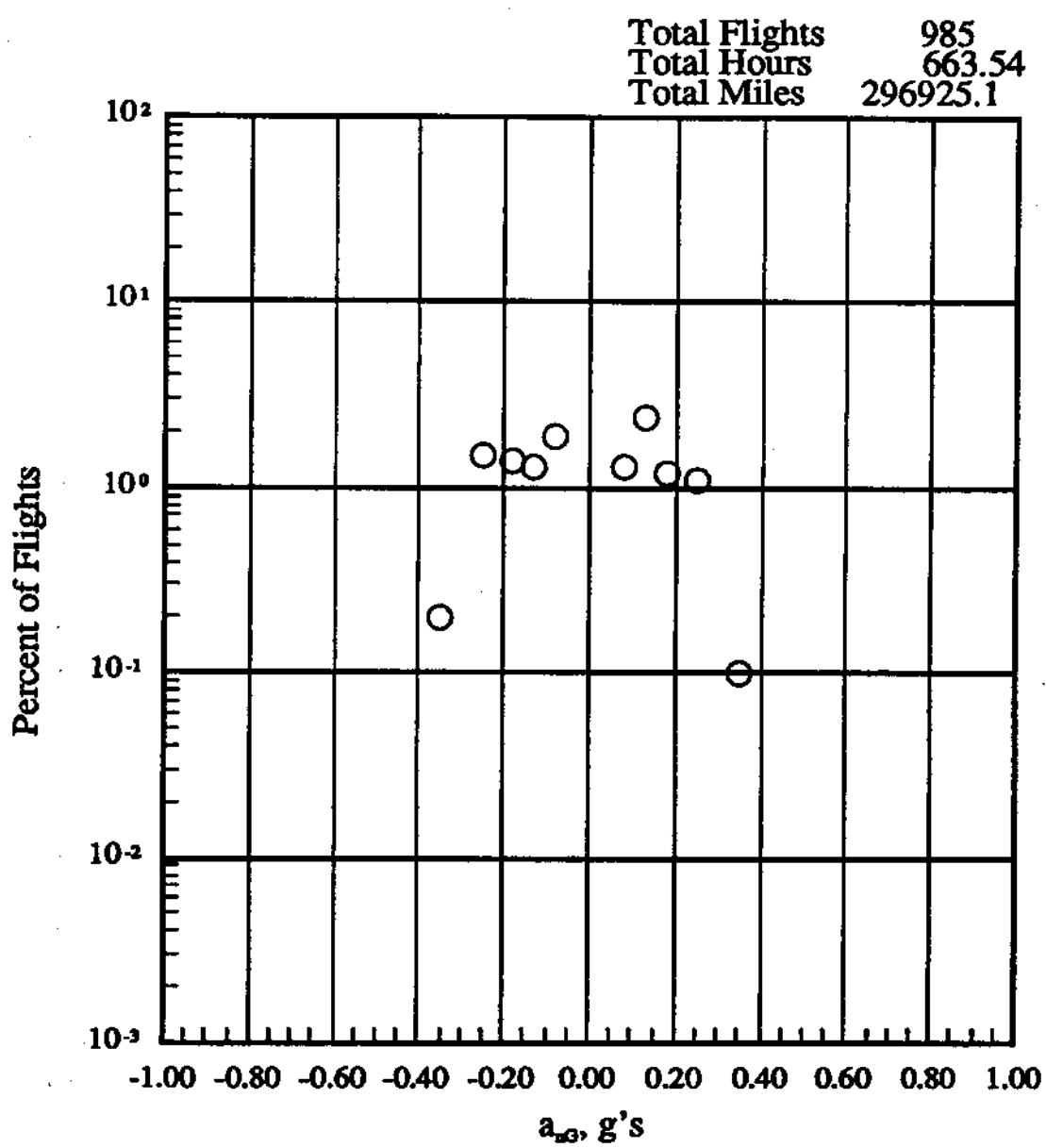
(g) 24500 to 29500 feet altitude

Figure 18.- Continued.



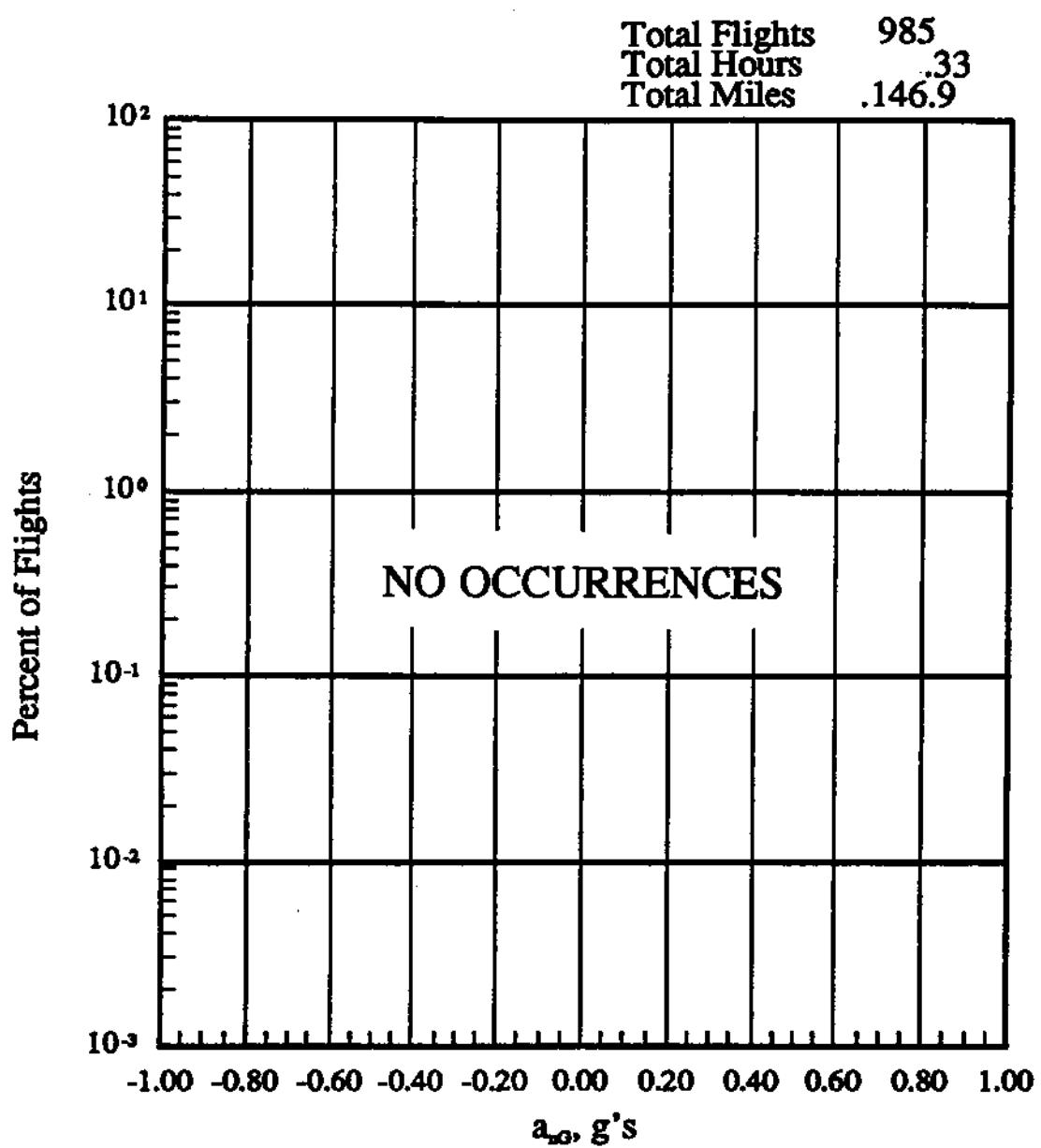
(h) 29500 to 34500 feet altitude

Figure 18.- Continued.



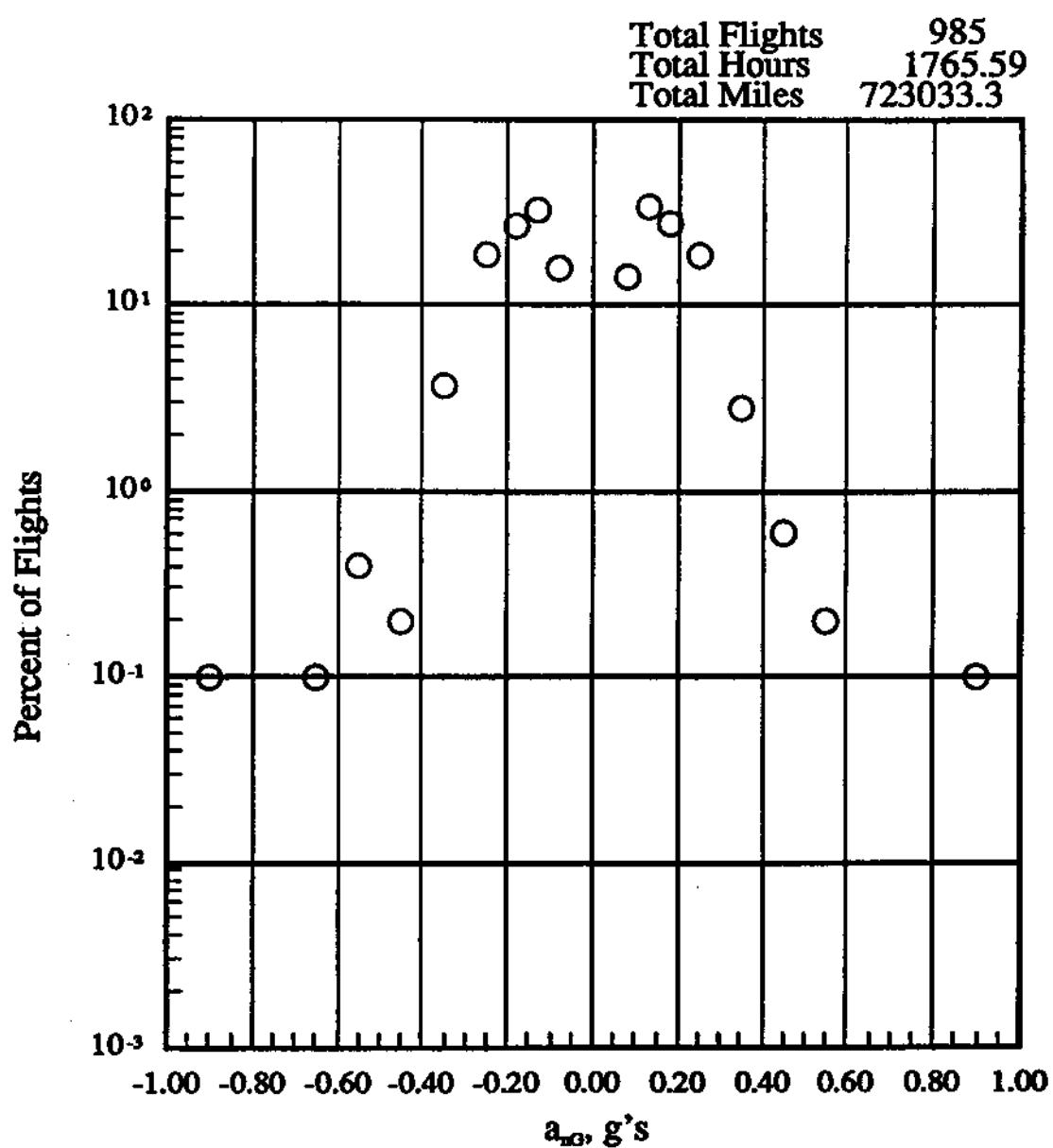
(i) 34500 to 39500 feet altitude

Figure 18.- Continued.



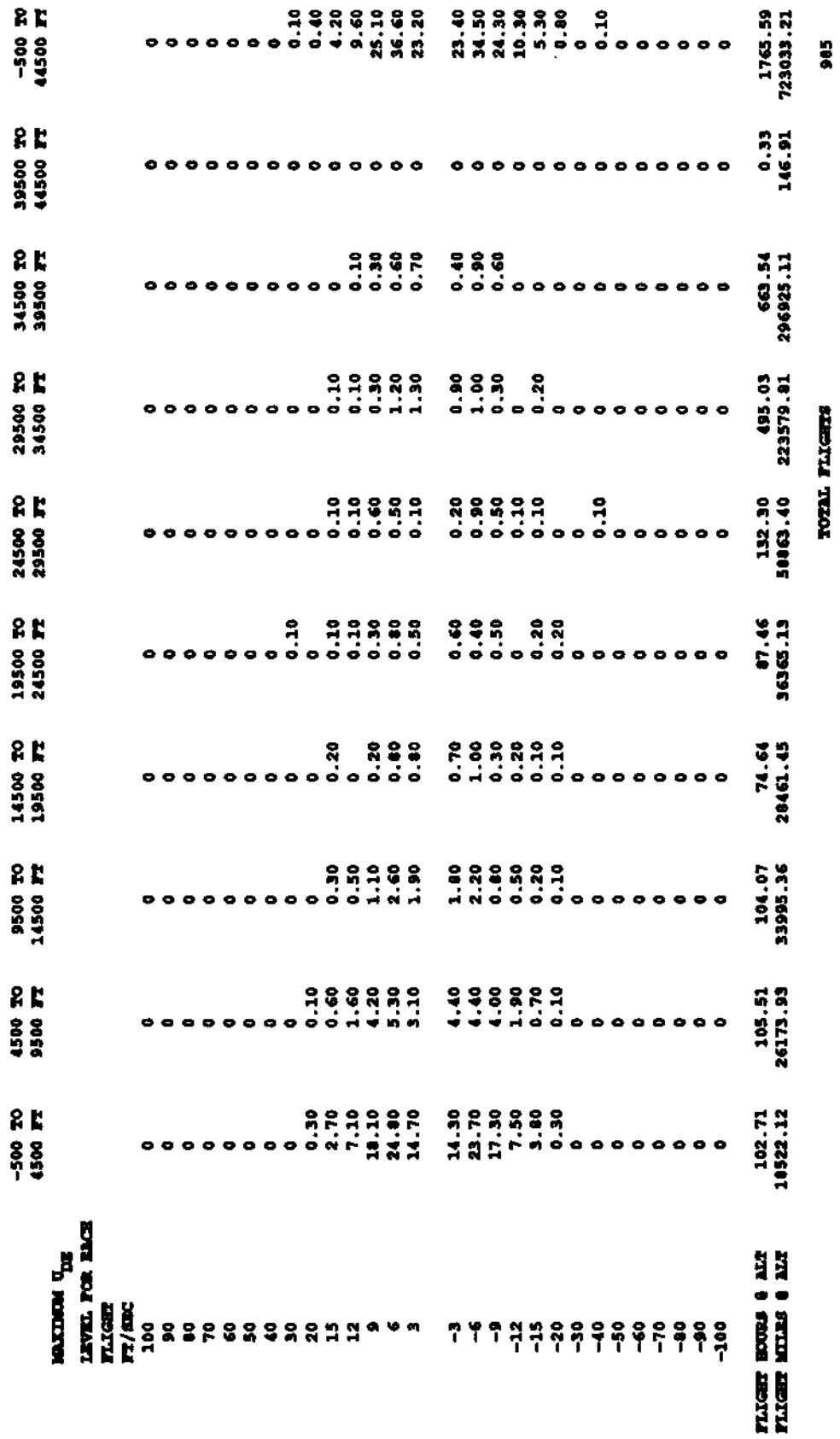
(j) 39500 to 44500 feet altitude

Figure 18.- Continued.



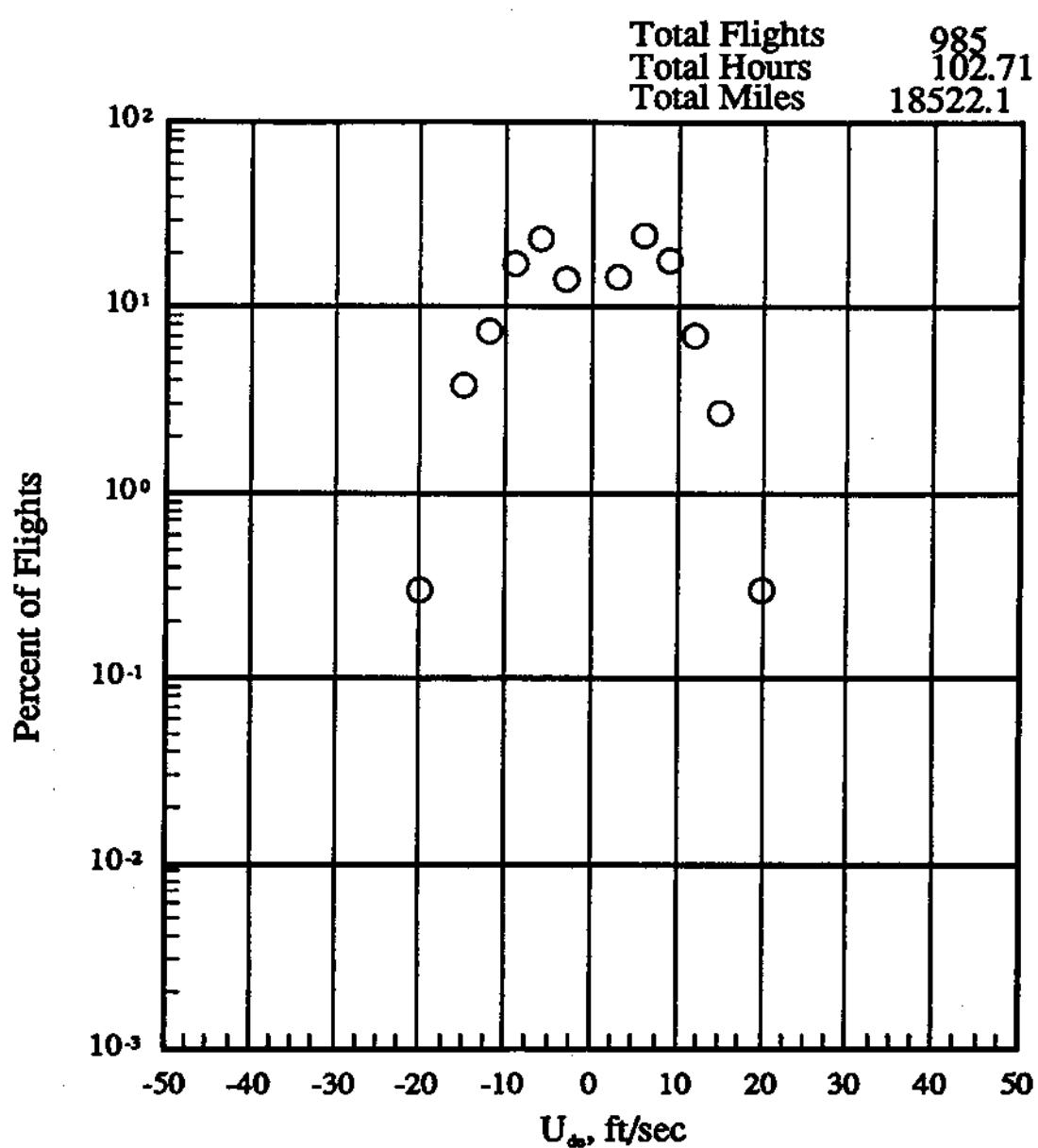
(k) -500 to 44500 feet altitude

Figure 18.- Concluded.



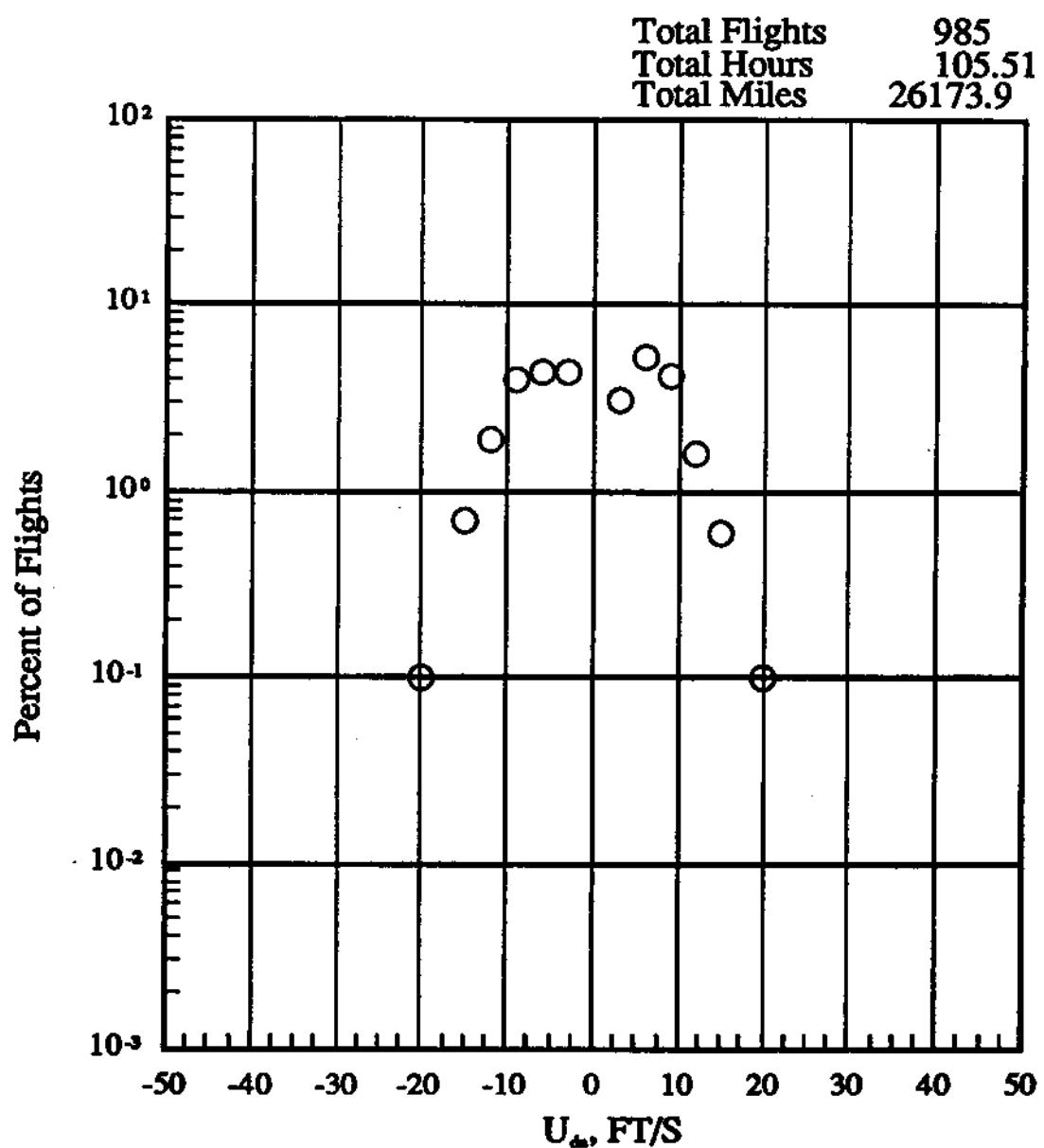
of flights where peak positive and negative U_{de} per flight occurs within pressure altitude bands, any flap

Figure 19.- Peak positive and negative U_{de} vs altitude.



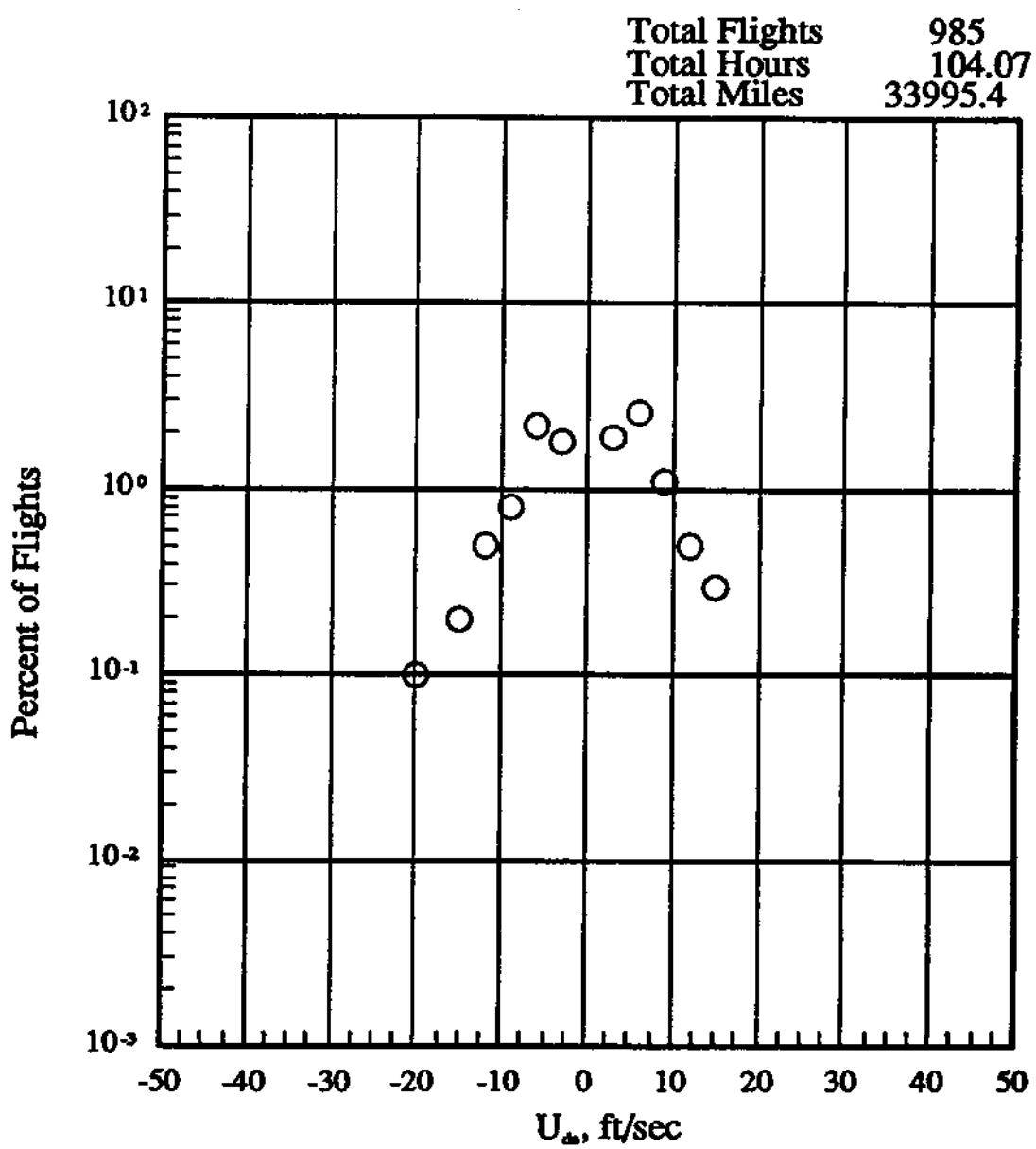
(b) -500 to 4500 feet altitude

Figure 19.- Continued.



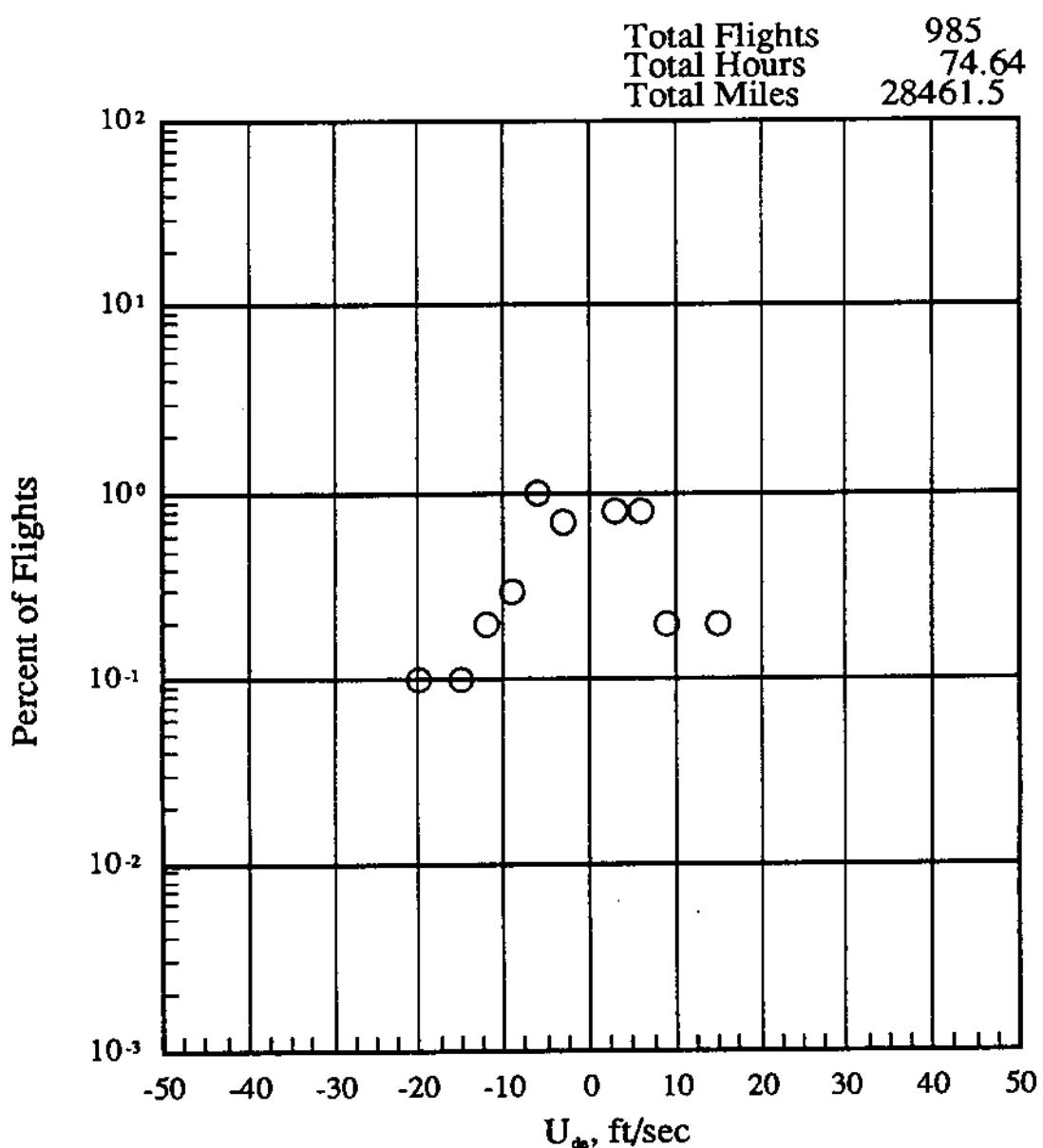
(c) 4500 to 9500 feet altitude

Figure 19.- Continued.



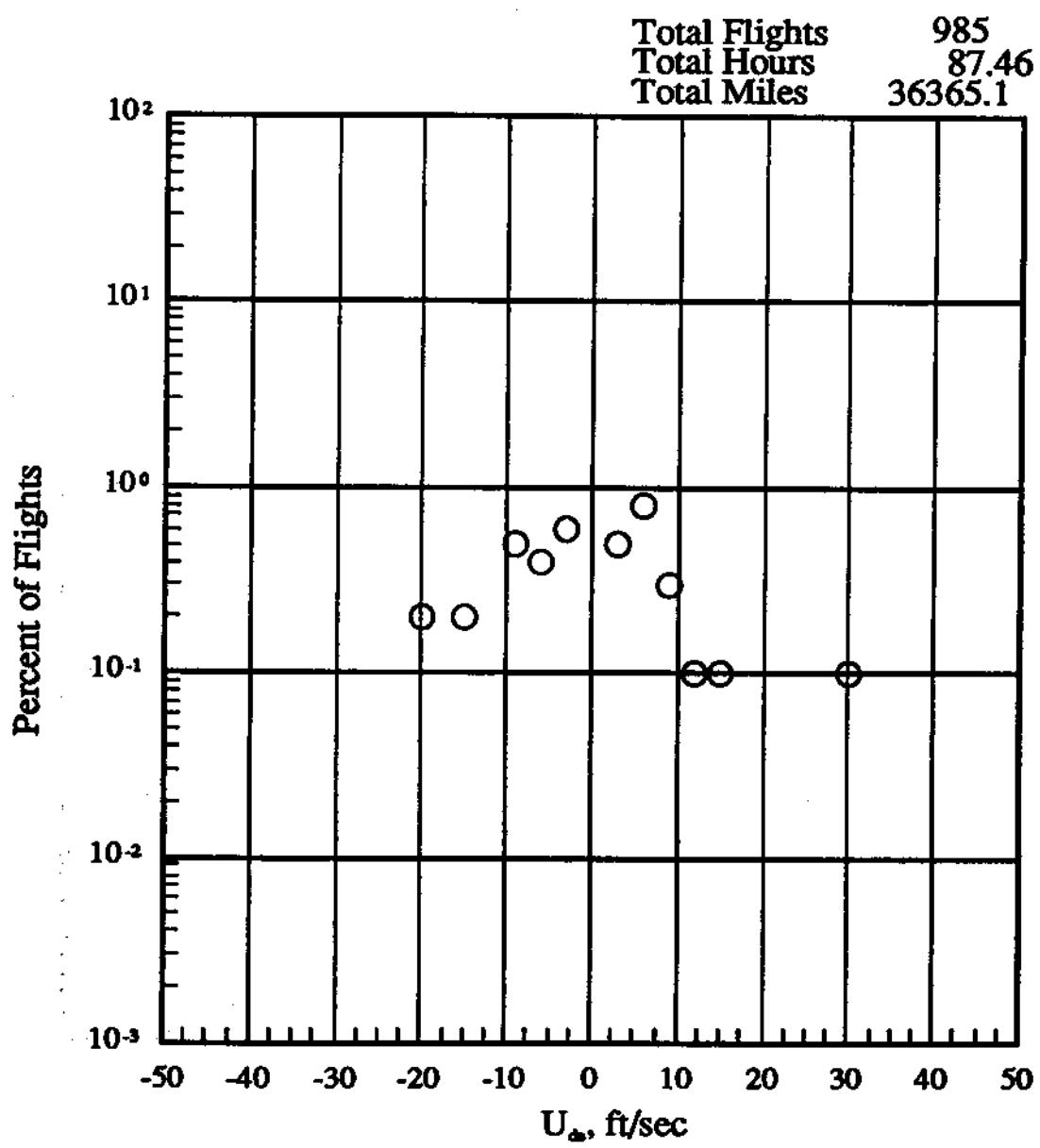
(d) 9500 to 14500 feet altitude

Figure 19.- Continued.



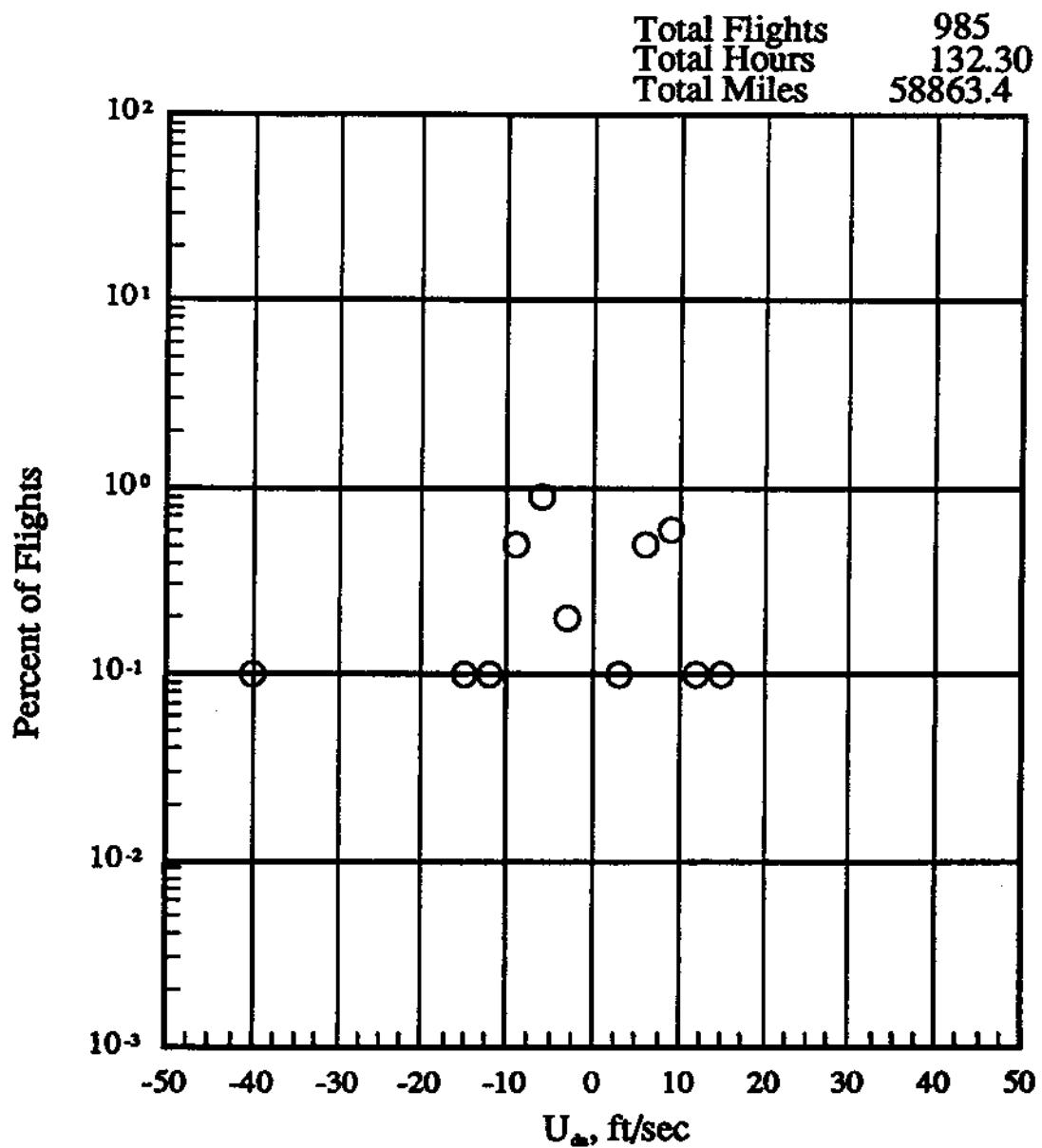
(e) 14500 to 19500 feet altitude

Figure 19.- Continued.



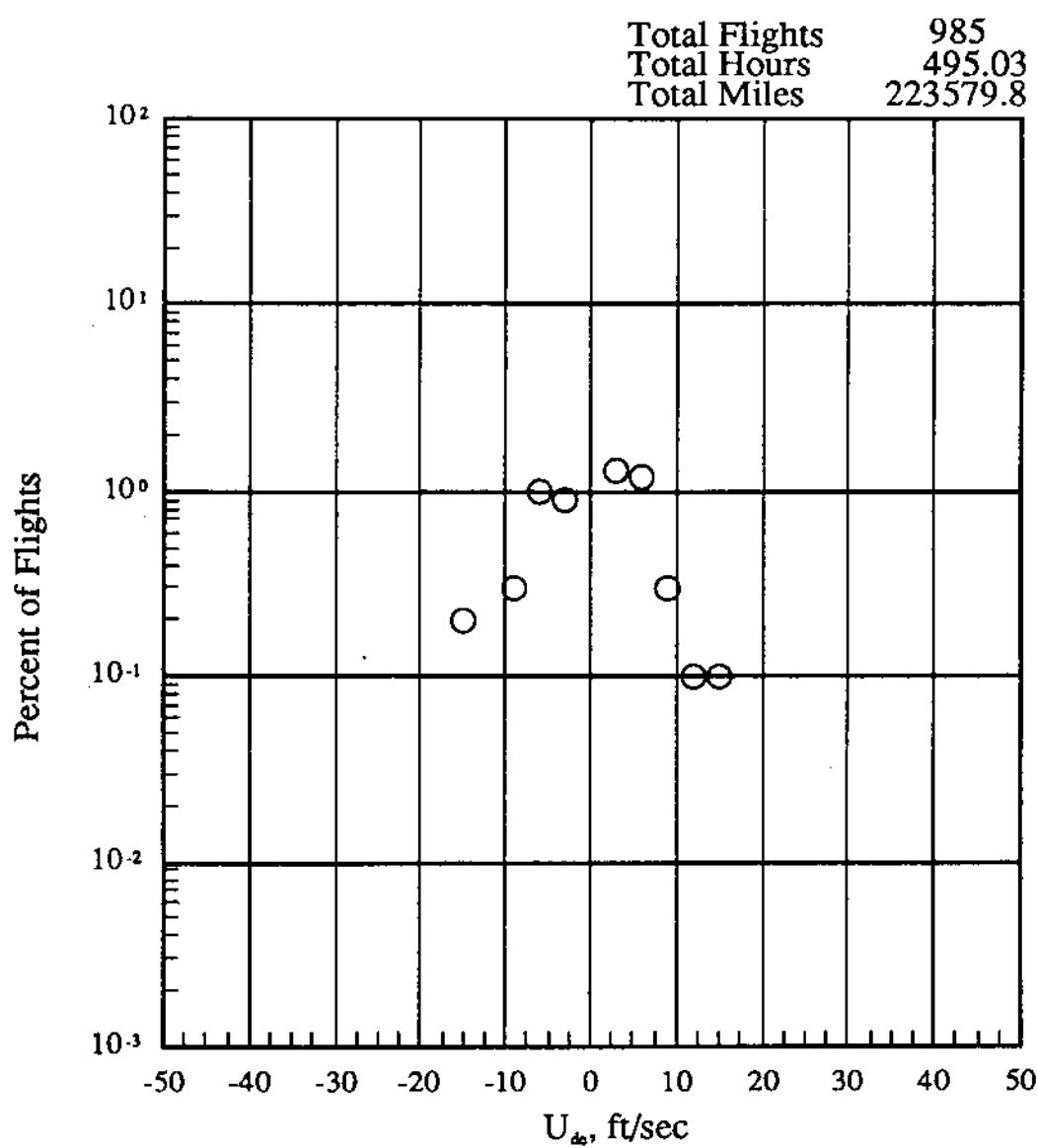
(f) 19500 to 24500 feet altitude

Figure 19.- Continued.



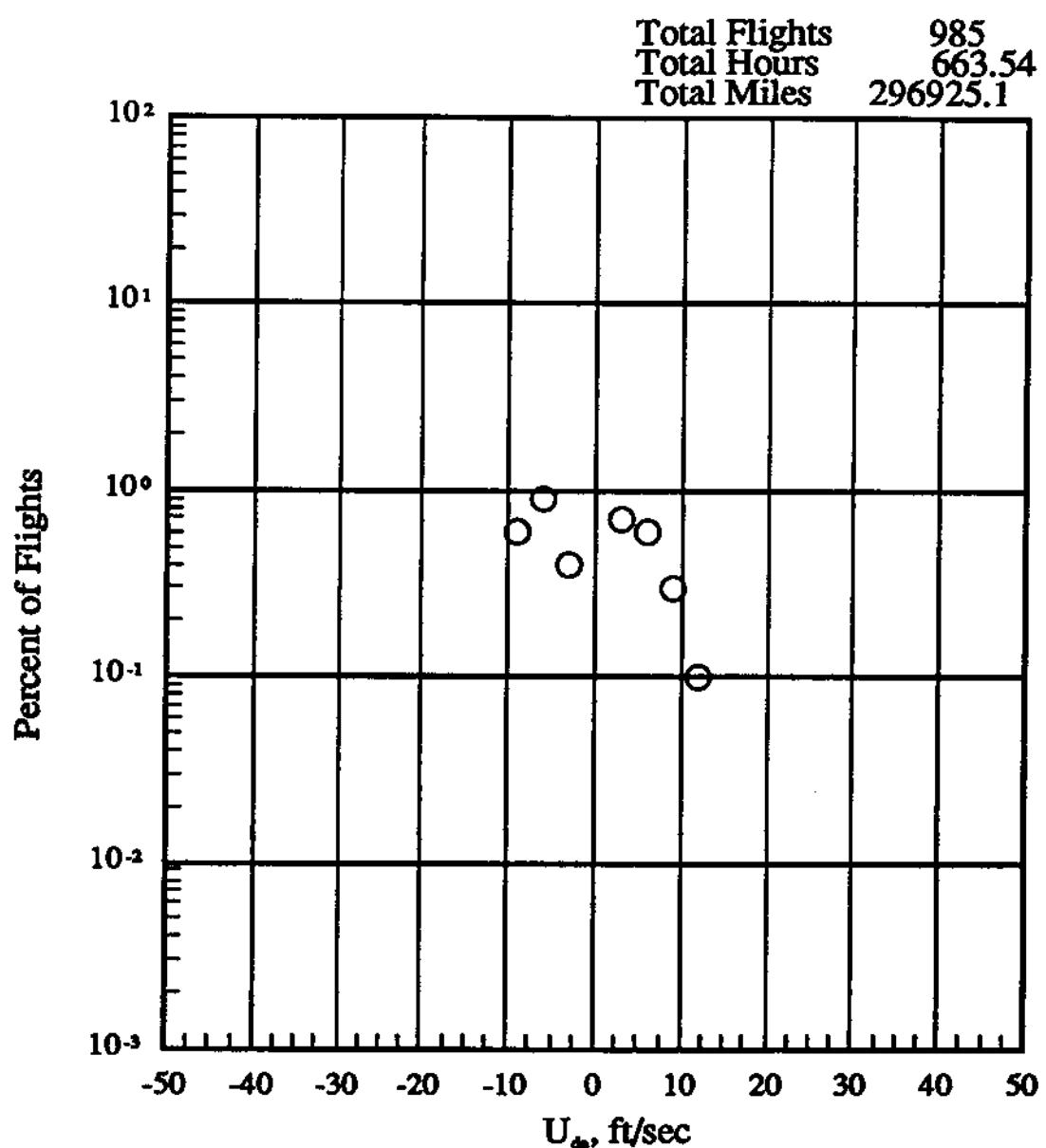
(g) 24500 to 29500 feet altitude

Figure 19.- Continued.



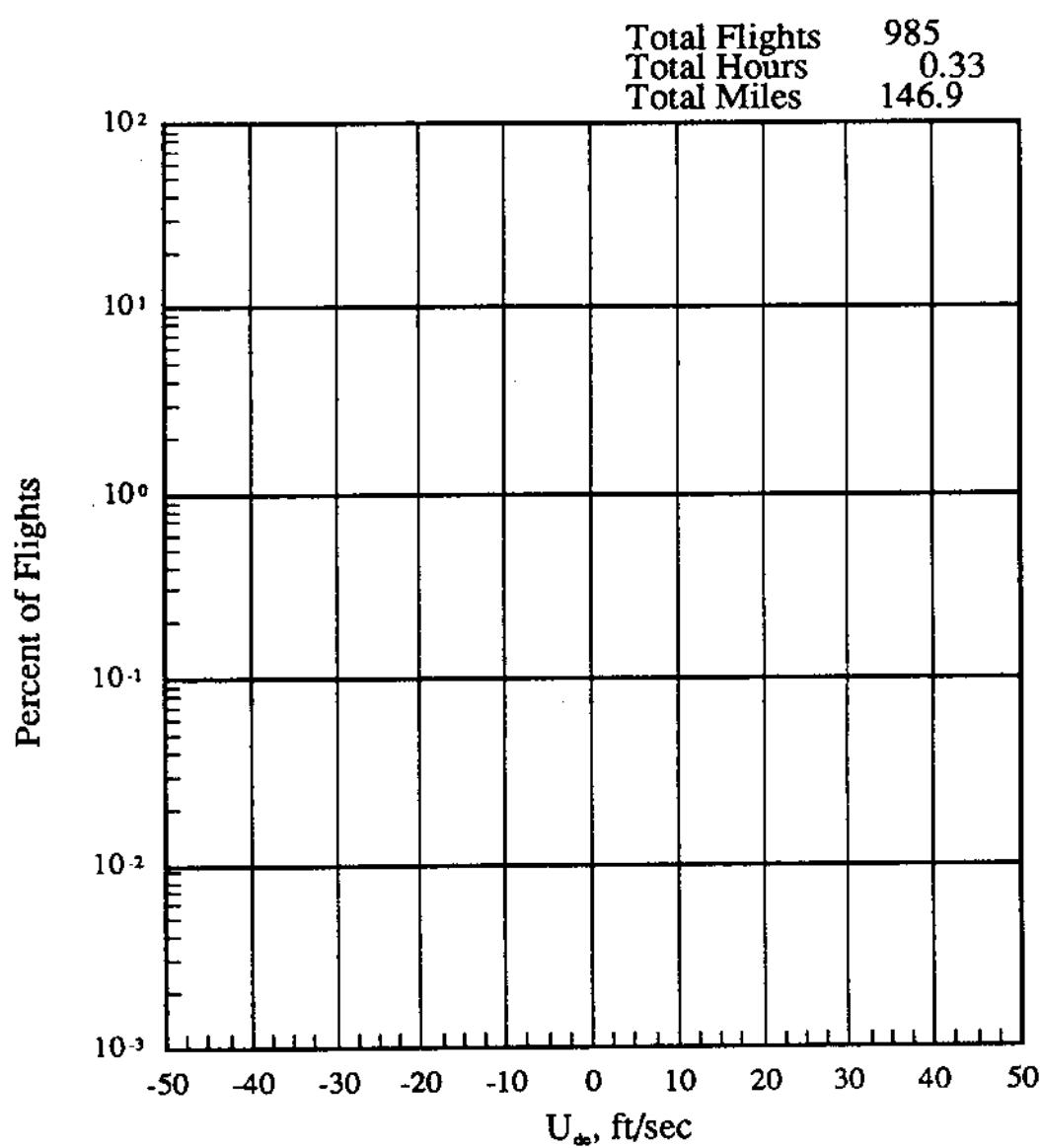
(h) 29500 to 34500 feet altitude

Figure 19.- Continued.



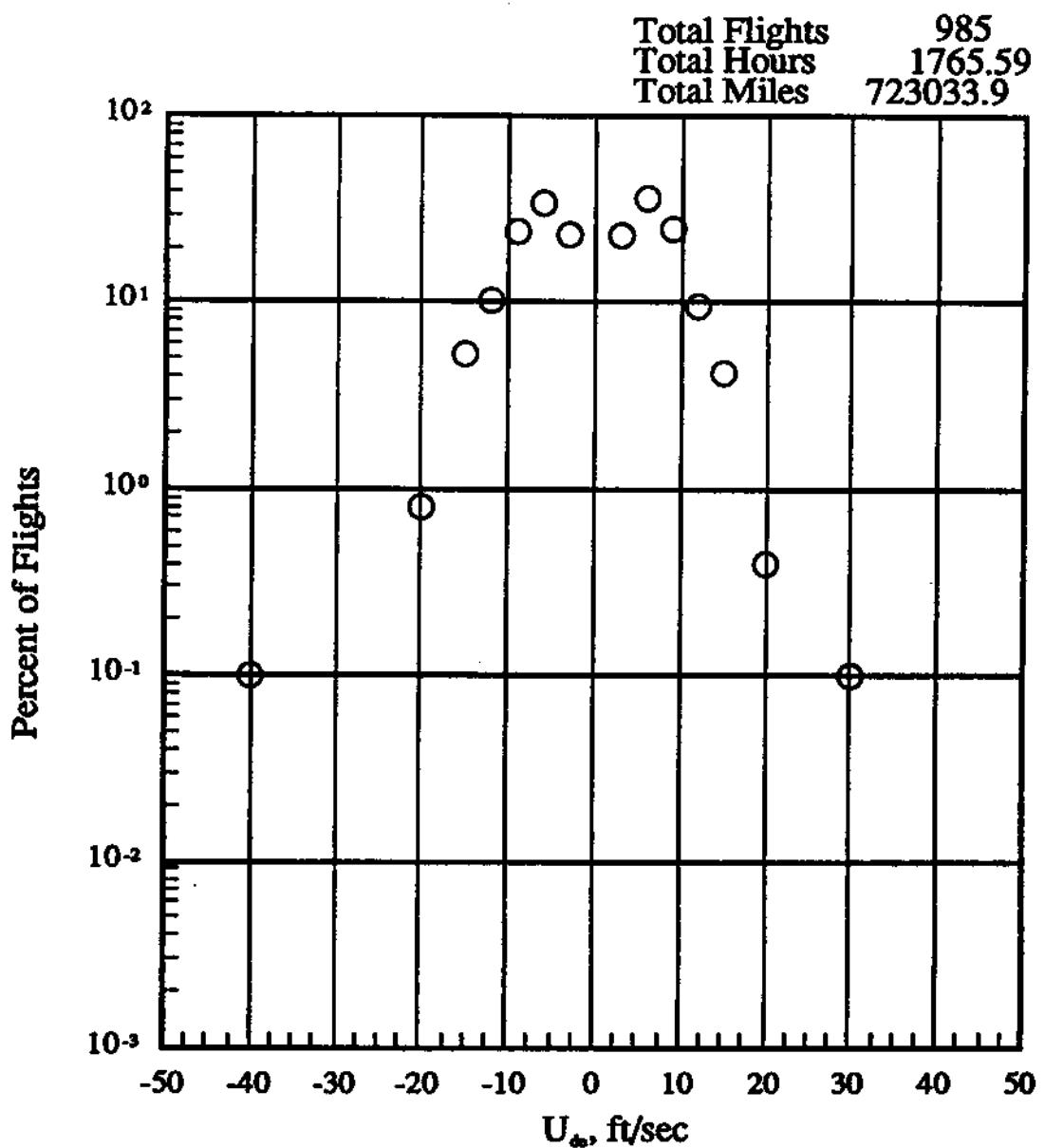
(i) 34500 to 39500 feet altitude

Figure 19.- Continued.



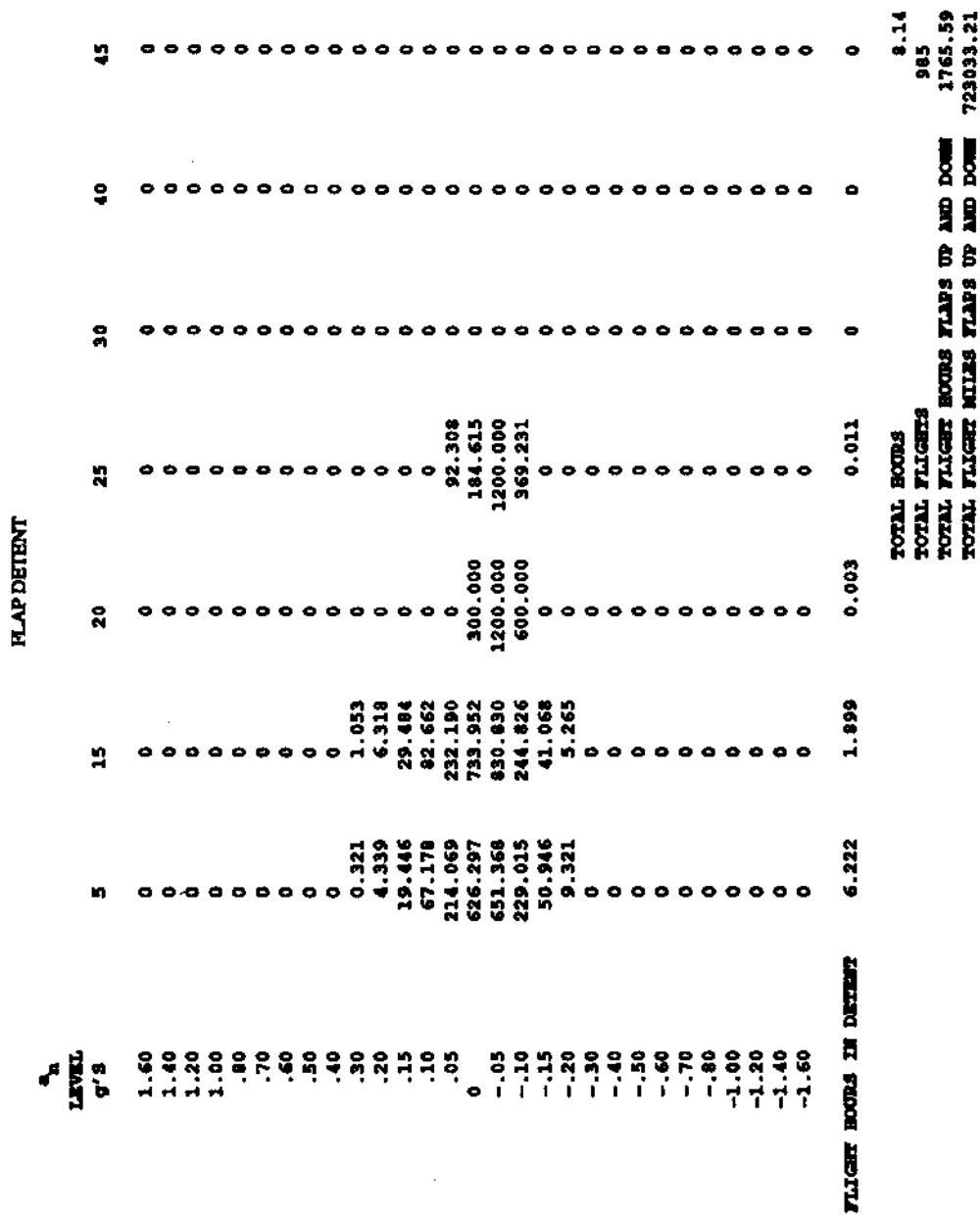
(j) 39500 to 44500 feet altitude

Figure 19.- Continued.



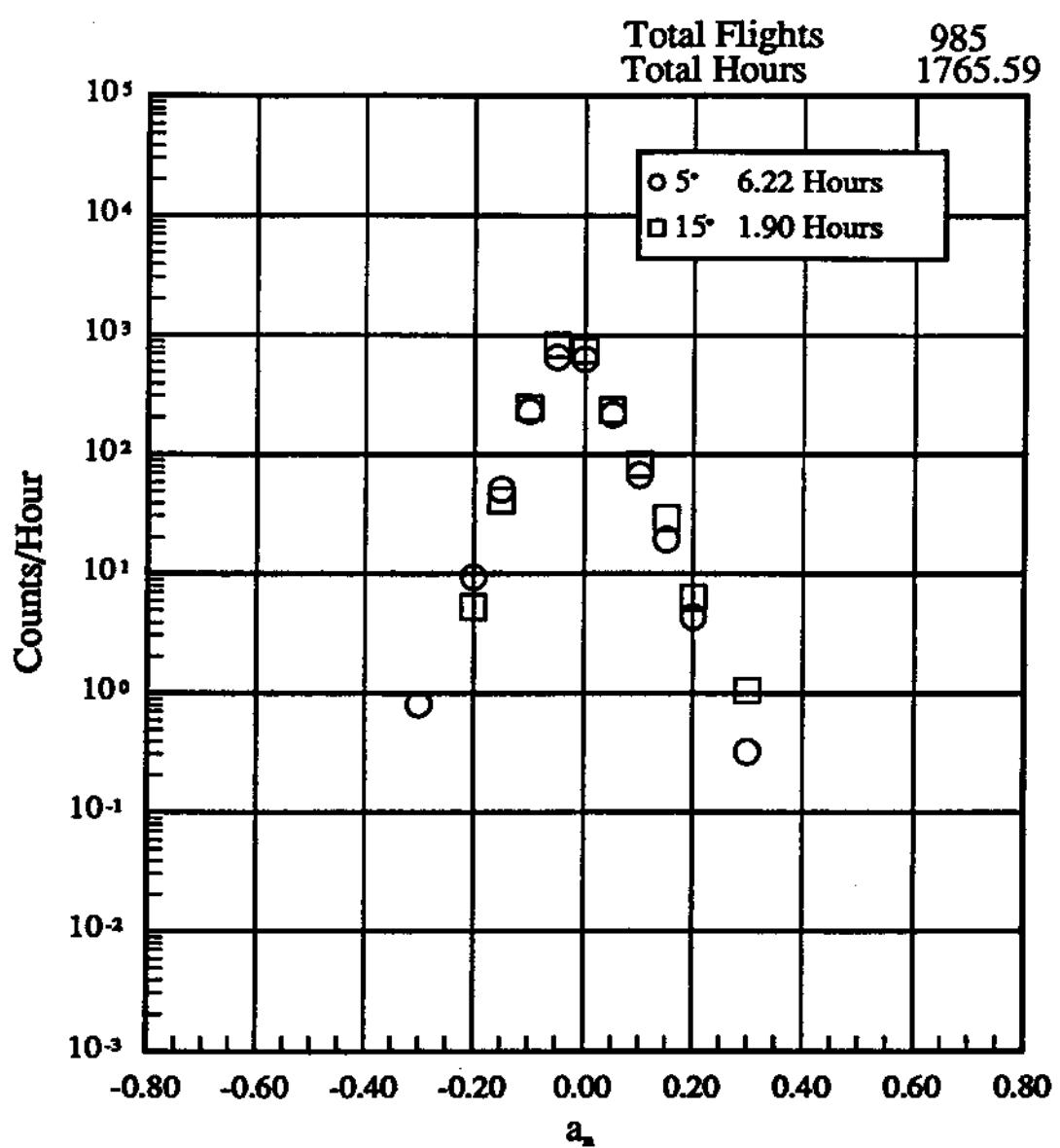
(k) -500 to 44500 feet altitude

Figure 19.- Concluded.



(a) Take off

Figure 20.- a_h exceedances with flaps deflected.



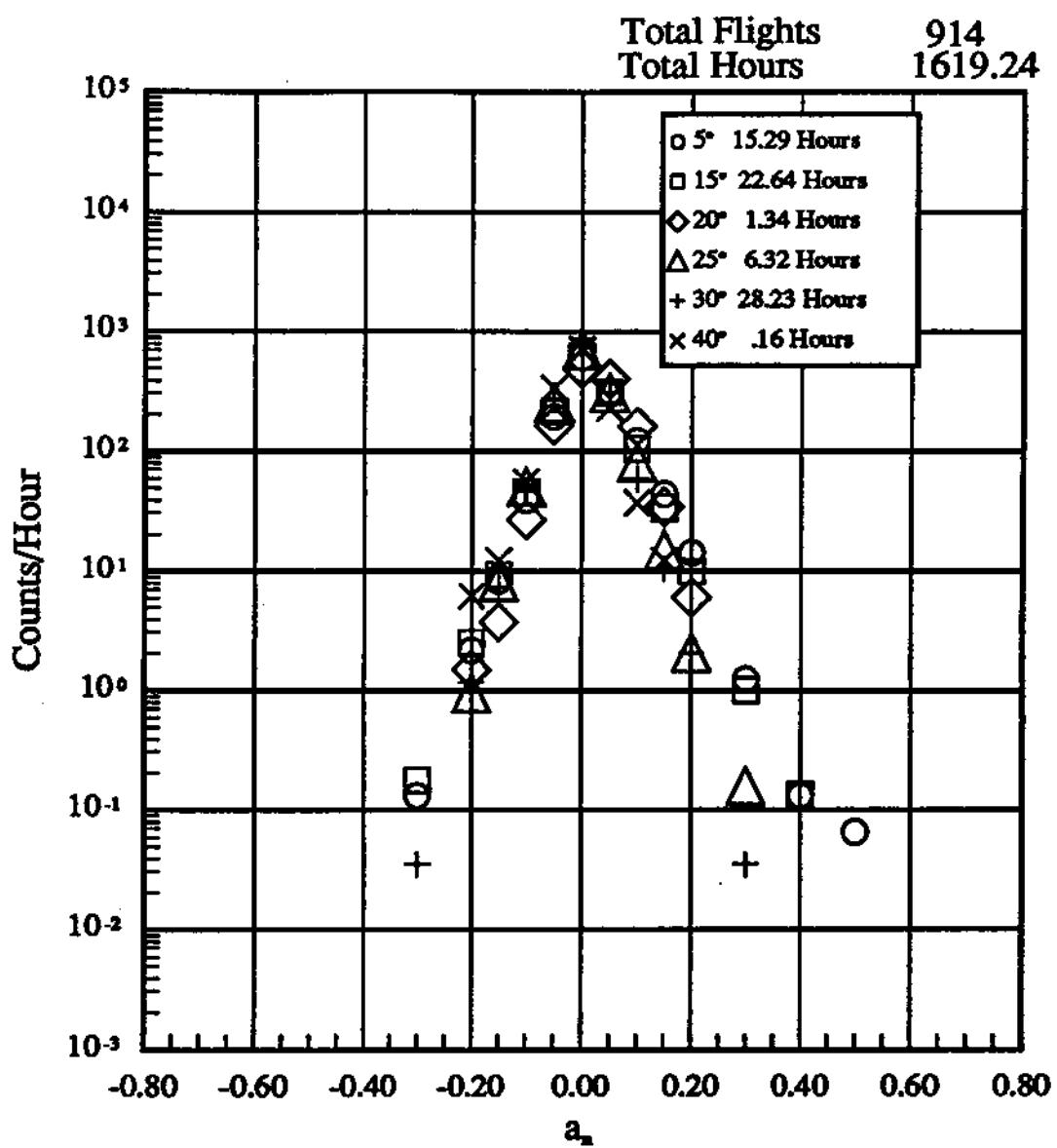
(b) Take off

Figure 20.- Continued.

FLAP DEFENT LEVEL $\frac{g}{g^{\prime} g}$	FLAP DEFENT					TOTAL FLIGHTS 985	TOTAL FLIGHT HOURS 73.97	TOTAL FLIGHT HOURS FLAPS UP AND DOWN 1765.59	TOTAL FLIGHT MILES FLAPS UP AND DOWN 723033.21
	5	15	20	25	30				
1.60	0	0	0	0	0	0	0	0	0
1.40	0	0	0	0	0	0	0	0	0
1.20	0	0	0	0	0	0	0	0	0
1.00	0	0	0	0	0	0	0	0	0
.80	0	0	0	0	0	0	0	0	0
.70	0	0	0	0	0	0	0	0	0
.60	0	0	0	0	0	0	0	0	0
.50	0	0	0	0	0	0	0	0	0
.40	0.131	0.133	0	0	0	0	0	0	0
.30	1.243	1.016	0	0.158	0	0.035	0	0	0
.20	14.261	9.896	5.985	2.055	2.055	0	0	0	0
.15	43.700	33.620	24.414	15.021	10.485	12.350	0	0	0
.10	121.413	104.440	160.100	80.698	58.412	37.050	0	0	0
.05	317.869	314.557	401.746	308.795	310.021	228.473	0	0	0
0	606.430	622.341	492.269	698.070	871.013	716.293	0	0	0
-.05	193.574	215.242	164.589	256.143	266.087	339.623	0	0	0
-.10	39.382	45.593	26.933	50.280	46.581	55.575	0	0	0
-.15	8.243	9.366	3.741	8.064	7.226	12.350	0	0	0
-.20	2.159	2.518	1.496	0.949	1.169	6.175	0	0	0
-.30	0.191	0.177	0	0	0	0.035	0	0	0
-.40	0	0	0	0	0	0	0	0	0
-.50	0	0	0	0	0	0	0	0	0
-.60	0	0	0	0	0	0	0	0	0
-.70	0	0	0	0	0	0	0	0	0
-.80	0	0	0	0	0	0	0	0	0
-.90	0	0	0	0	0	0	0	0	0
-1.00	0	0	0	0	0	0	0	0	0
-1.20	0	0	0	0	0	0	0	0	0
-1.40	0	0	0	0	0	0	0	0	0
-1.60	0	0	0	0	0	0	0	0	0
FLIGHT HOURS IN DEFENT		15.286	22.635	1.397	6.325	28.290	0.162	0	0

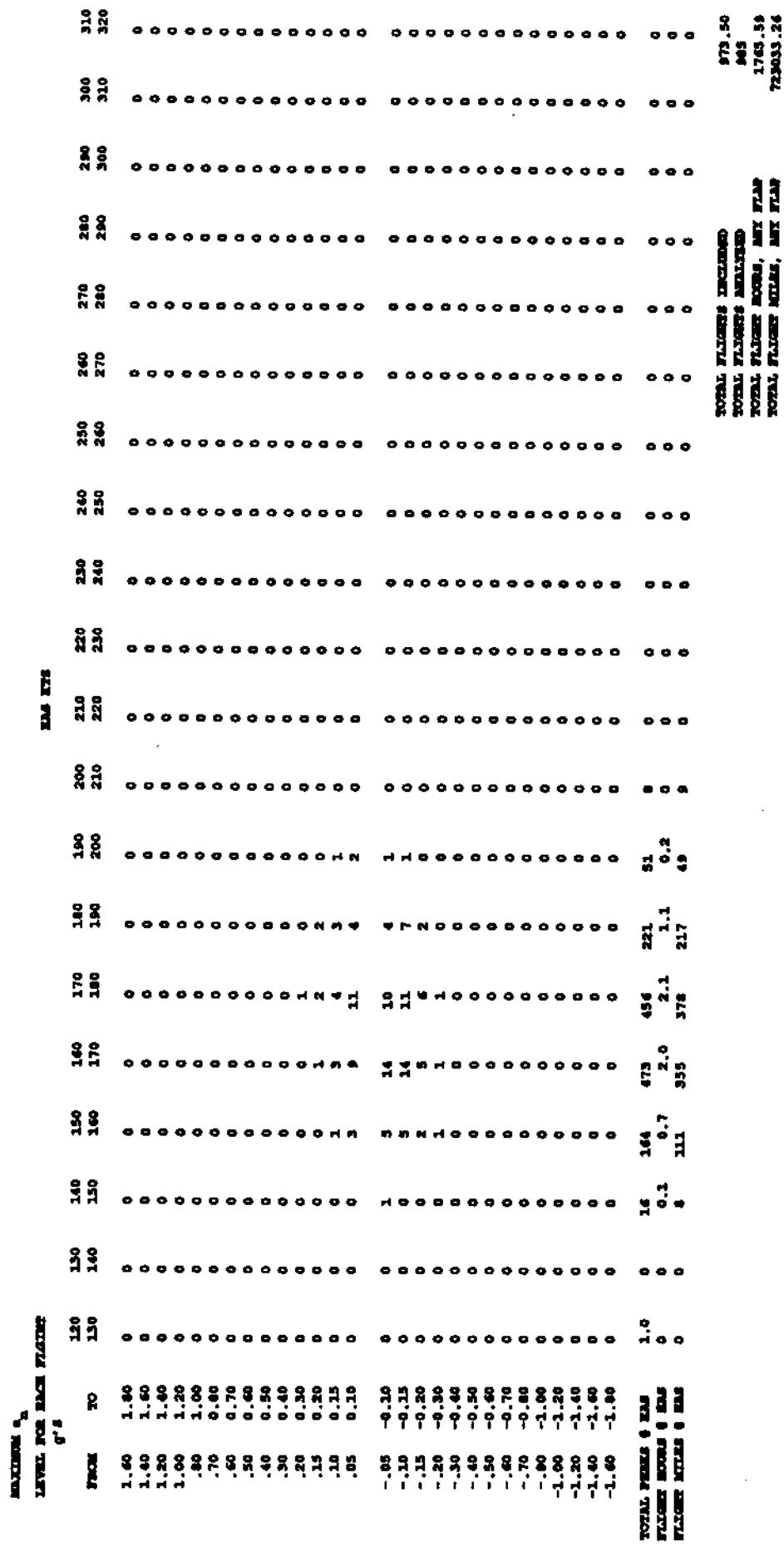
(c) Landing

Figure 20.- Continued.



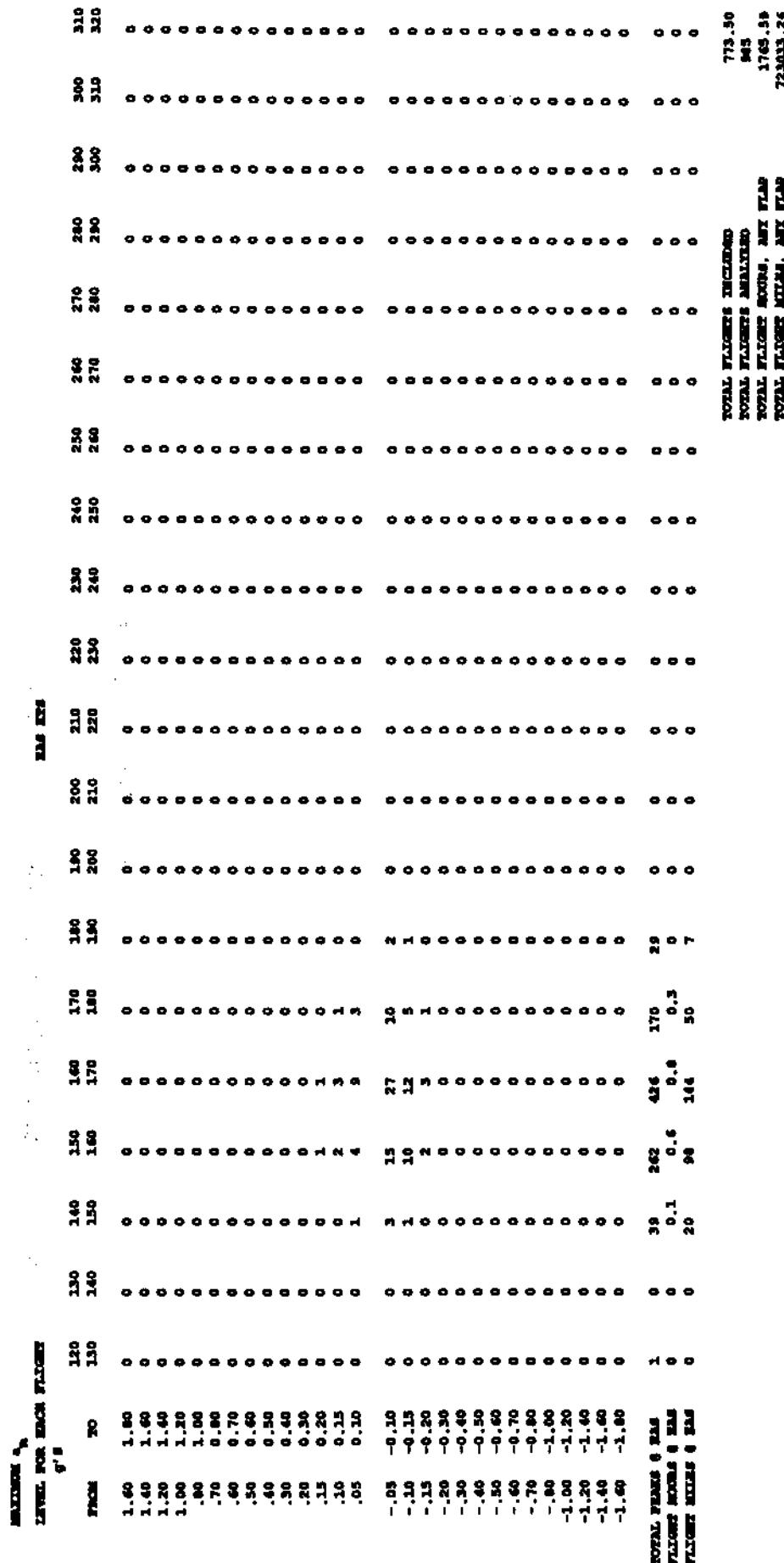
(d) Landing.

Figure 20.- Concluded.



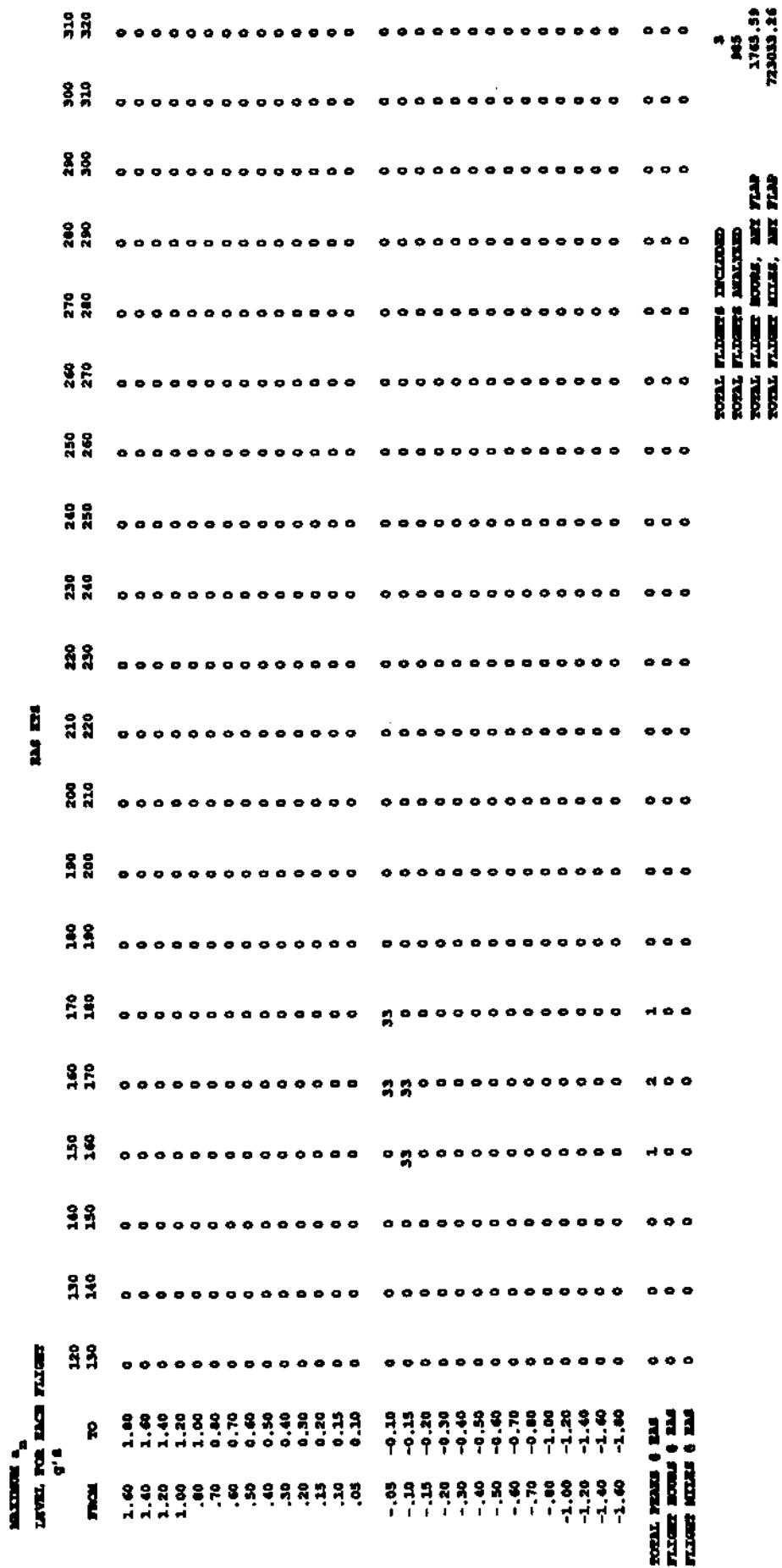
(a) Take off; flaps 5 degree detent

Figure 21.- Peak positive and negative a_n per flight vs EAS bands; percent of flights.



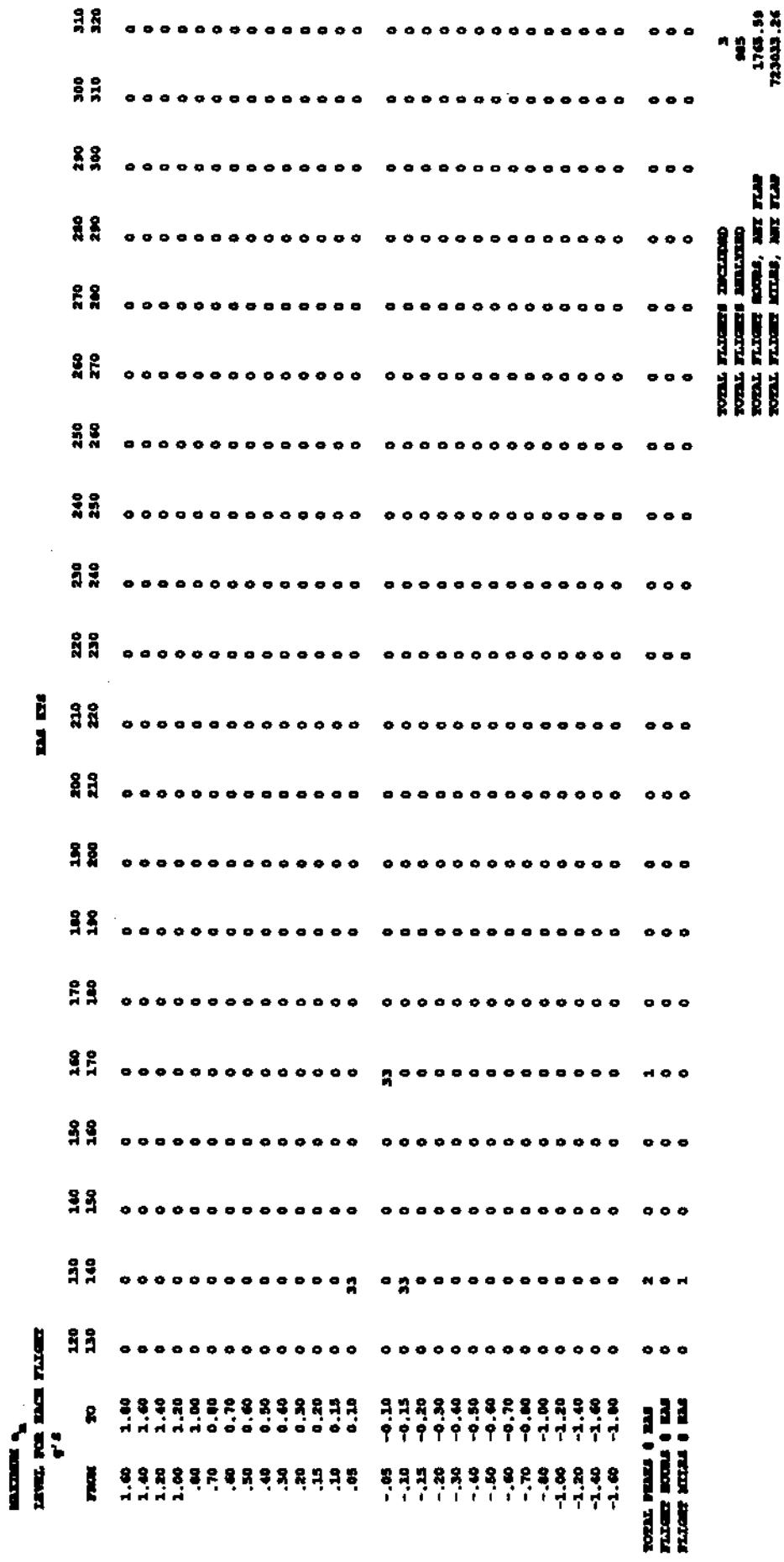
(b) Take off, flaps 15 degree detent

Figure 21.- Continued.



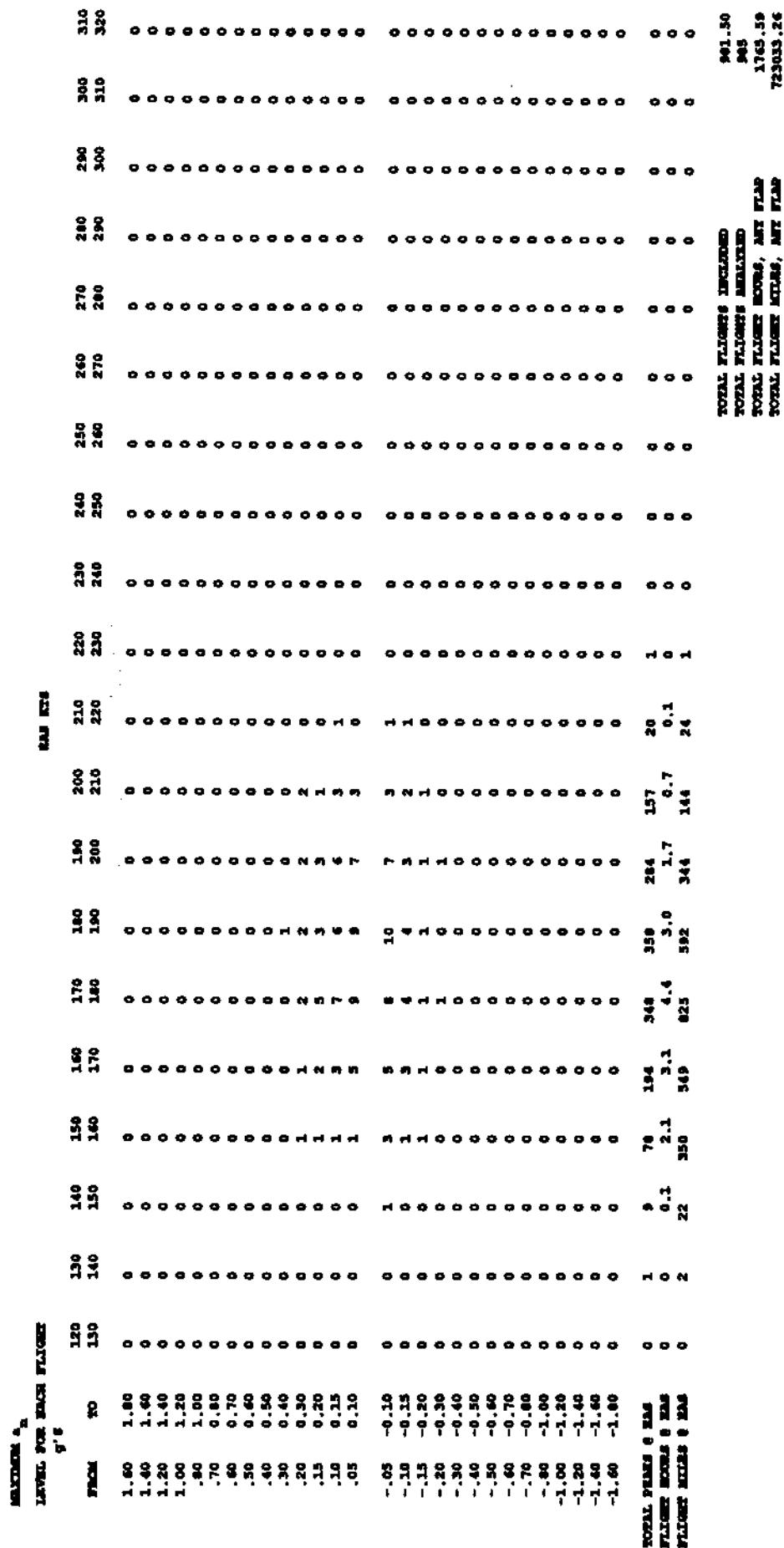
(c) Take off; flaps 20 degree detent

Figure 21.- Continued.



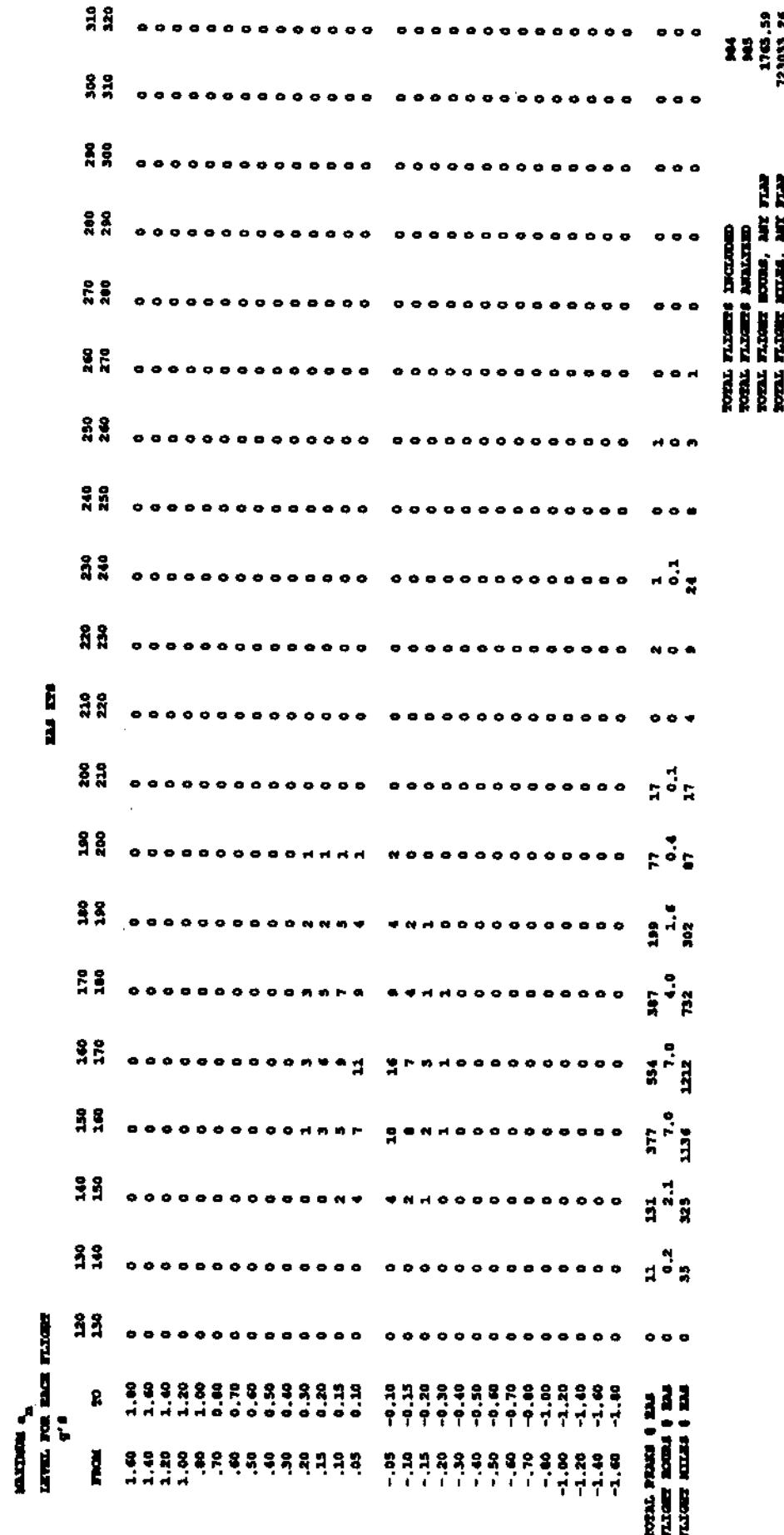
(d) Take off; flaps 22 degree detent

Figure 21.- Continued.



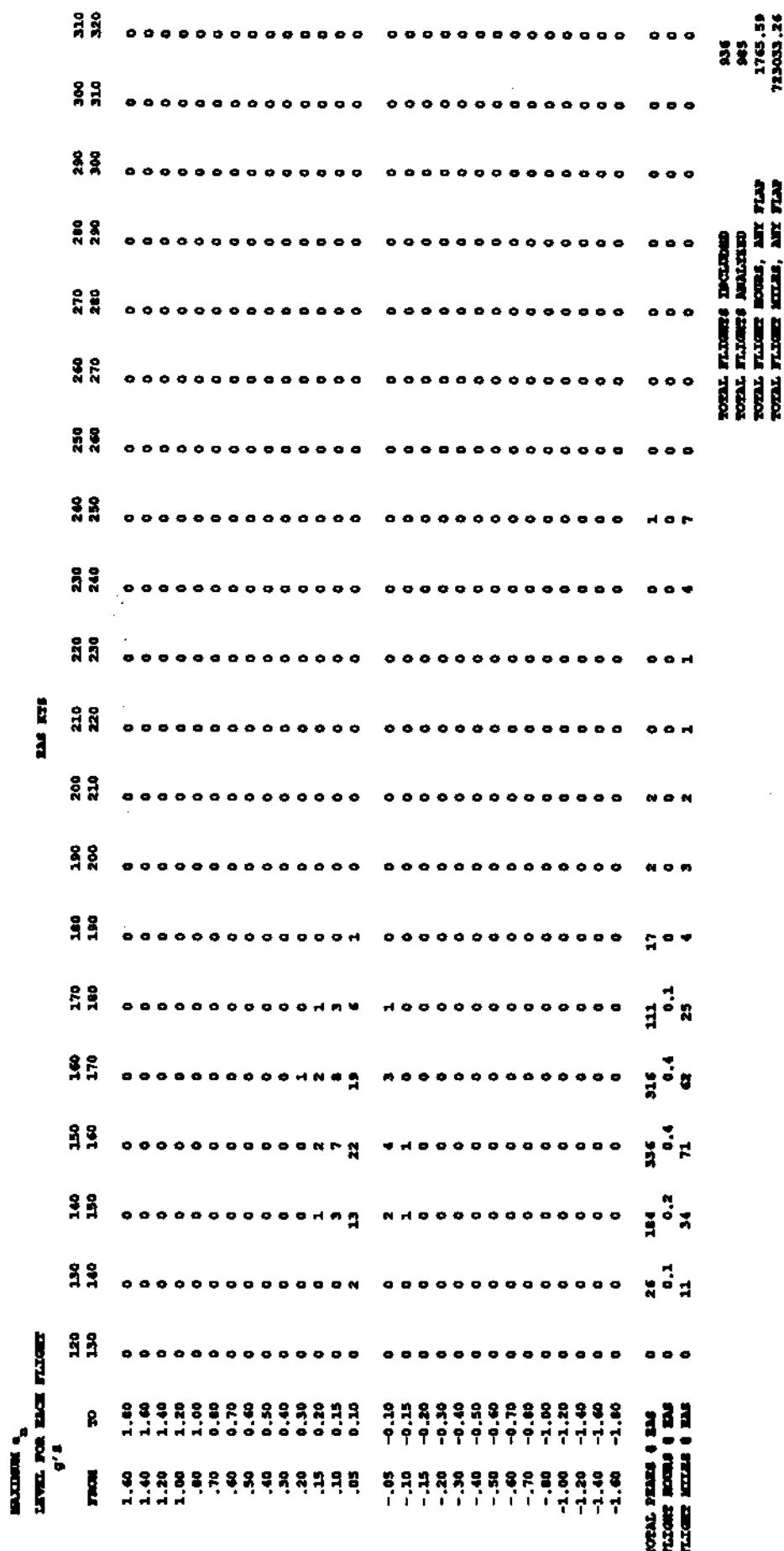
(e) Landing; flaps 5 degree detent

Figure 21.- Continued.



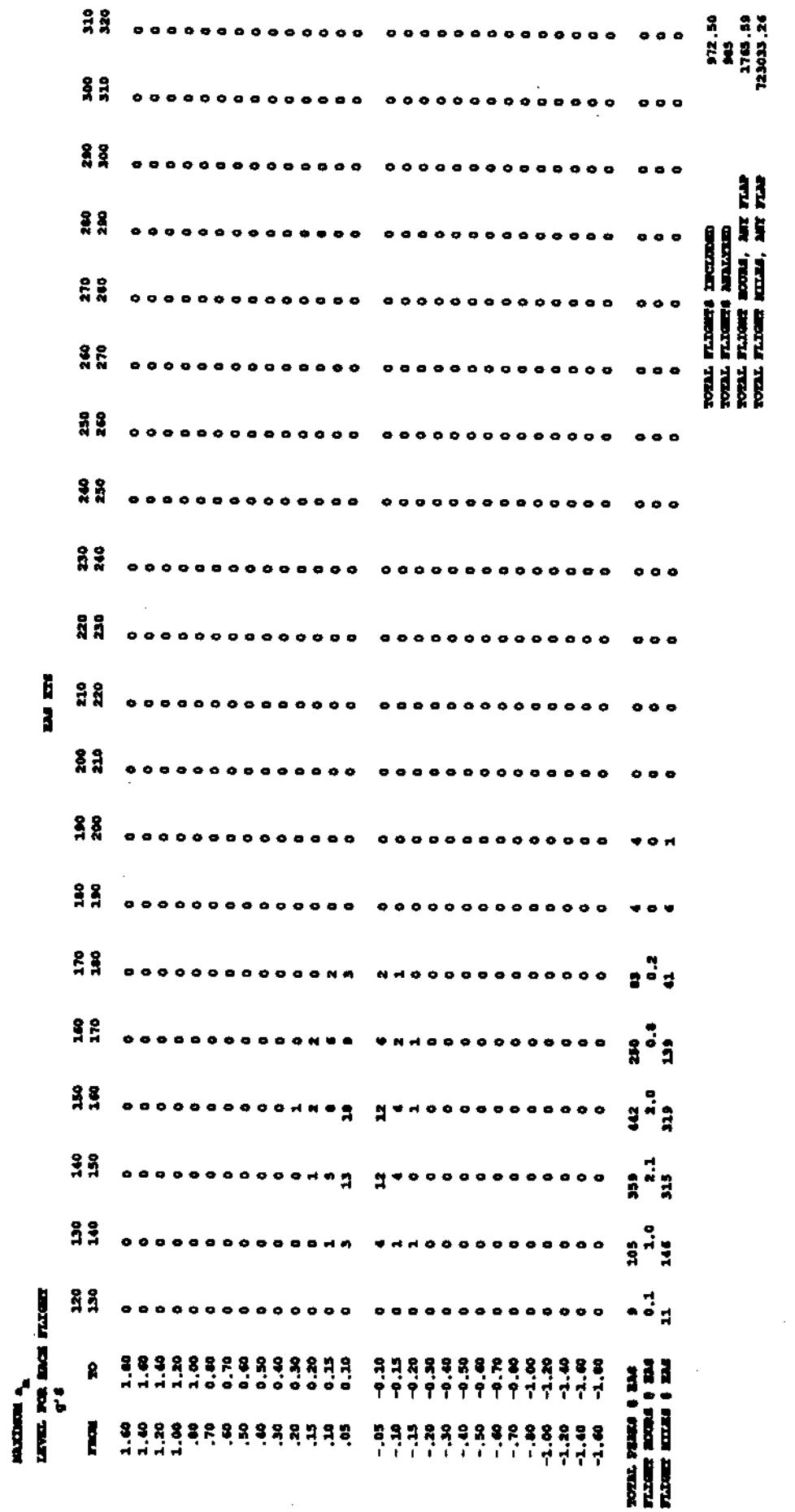
(f) Landing; flaps 15 degree detent

Figure 21.- Continued.



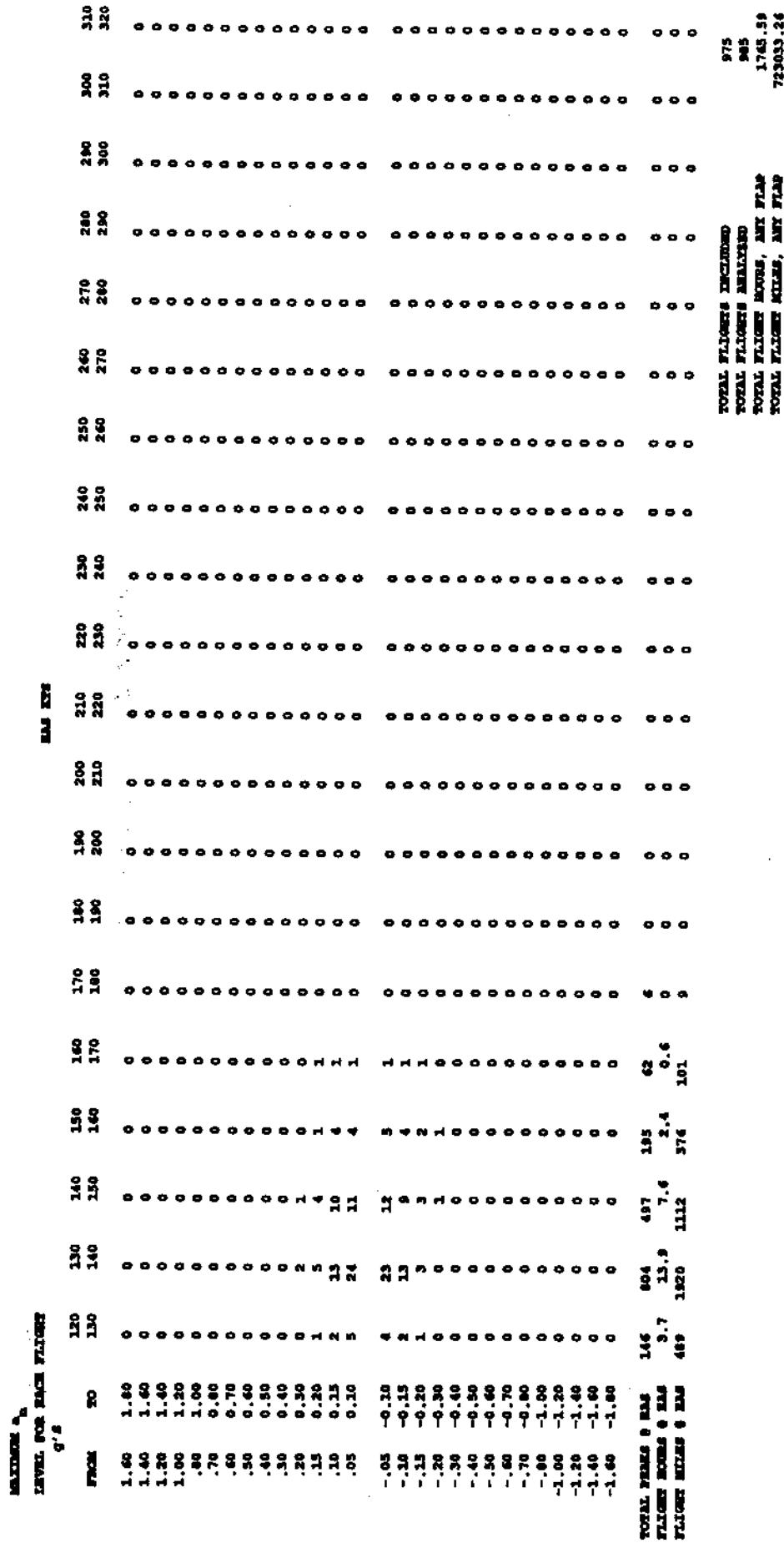
(g) Landing; flaps 20 degree detent

Figure 21.- Continued.



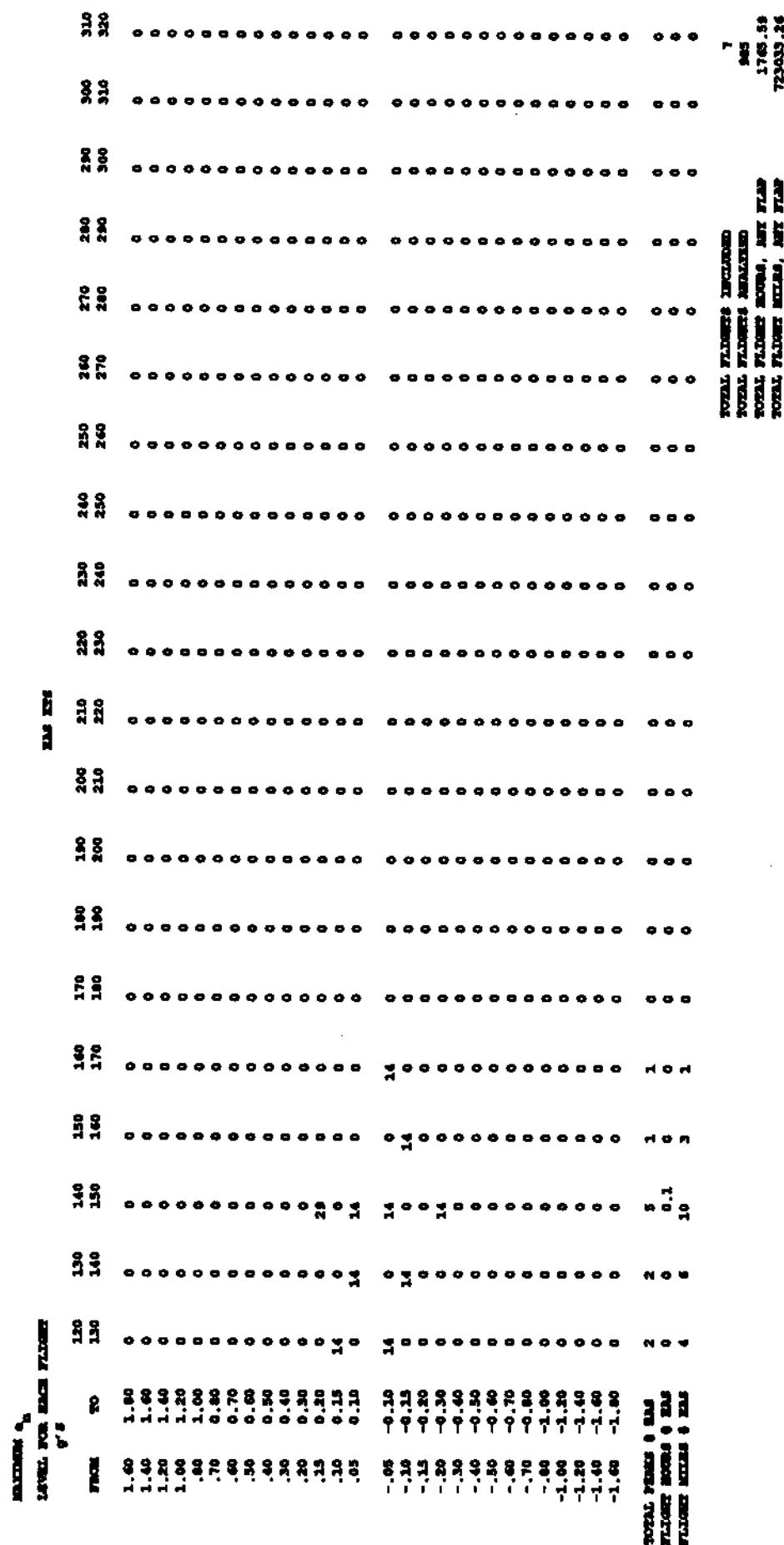
(h) Landing; flaps 25 degree detent

Figure 21.-Continued.



(i) Landing; flaps 30 degree detent

Figure 21.- Continued.



(j) Landing; flaps 40 degree detent

Figure 21.- Continued.

LEVEL	PRESSURE ALTITUDE BANDS											
	-500 TO 4500 FT	4500 TO 9500 FT	9500 TO 14500 FT	14500 TO 19500 FT	19500 TO 24500 FT	24500 TO 29500 FT	29500 TO 34500 FT	34500 TO 39500 FT	39500 TO 44500 FT	-500 TO 44500 FT		
G/S	0	0	0	0	0	0	0	0	0	0	0	0
1.60	0	0	0	0	0	0	0	0	0	0	0	0
1.40	0	0	0	0	0	0	0	0	0	0	0	0
1.20	0	0	0	0	0	0	0	0	0	0	0	0
1.00	0	0	0	0	0	0	0	0	0	0	0	0
.80	0	0	0	0	0	0	0	0	0	0	0	0
.70	0	0	0	0	0	0	0	0	0	0	0	0
.60	0	0	0	0	0	0	0	0	0	0	0	0
.50	0	0	0	0	0.90	0.52	0	0	0	0	0	0.08
.40	0.61	0	0.65	3.61	0.52	0	0	0	0	0	0	0.42
.30	6.42	1.02	3.23	5.42	2.07	0	0.52	0	0	0	0	2.74
.20	40.59	6.14	12.94	8.13	5.69	1.75	4.12	0.41	0	0	0	15.42
.15	91.71	20.47	27.17	7.22	28.97	3.50	7.73	0.69	0	0	0	35.75
.10	198.69	75.25	53.69	55.98	24.83	15.74	10.31	1.38	10.05	78.51		
.05	397.14	204.75	137.14	170.65	68.81	139.03	66.48	12.54	25.11	177.81		
0	681.57	552.82	562.16	504.74	844.38	1078.16	926.02	1005.27	626.58	784.47		
-.05	2666.90	198.21	128.73	139.95	89.51	132.04	73.69	17.77	18.84	132.58		
-.10	79.36	39.14	43.34	18.96	13.45	36.73	14.43	3.31	5.02	36.40		
-.15	24.47	7.17	8.41	6.32	2.59	11.37	11.85	0.69	1.26	10.91		
-.20	6.18	1.02	5.18	6.32	0.52	2.62	2.06	0.28	0	3.01		
-.30	0.48	0	1.29	0.90	0.52	1.75	3.09	0	0	0.62		
-.40	0	0	0	0	0.52	0	1.03	0	0	0.12		
-.50	0	0	0	0	0.52	0	0	0	0	0.08		
-.60	0	0	0	0	0.52	0	0	0	0	0.08		
-.70	0	0	0	0	0	0	0	0	0	0		
-.80	0	0	0	0	0	0	0	0	0	0		
-.90	0	0	0	0	0	0	0	0	0	0		
-.100	0	0	0	0	0	0	0	0	0	0		
-.120	0	0	0	0	0	0	0	0	0	0		
-.140	0	0	0	0	0	0	0	0	0	0		
-.160	0	0	0	0	0	0	0	0	0	0		
FLIGHT HOURS @ ALT	6.25	1.95	1.55	1.11	1.93	1.14	1.94	7.26	0.80	25.93		
FLIGHT MILES @ ALT	1509.73	468.11	479.05	419.35	770.93	460.15	869.28	3264.04	358.21	8618.85		
TOTAL FLIGHTS									64			
TOTAL FLIGHT HOURS FLAPS UP AND DOWN									25.93			
TOTAL FLIGHT MILES FLAPS UP AND DOWN									8618.85			

(a) a_n Level crossing counts per hour within pressure altitude bands

Figure 22.- Normal acceleration exceedances; Non-revenue flights.

LEVEL	PRESSURE ALTITUDE BANDS										TOTAL FLIGHTS	TOTAL FLIGHT MILES FLAPS UP AND DOWN	TOTAL FLIGHT MILES FLAPS UP AND DOWN
	4500 TO 4500 FT	9500 TO 14500 FT	14500 TO 19500 FT	19500 TO 24500 FT	24500 TO 29500 FT	29500 TO 34500 FT	34500 TO 39500 FT	39500 TO 44500 FT	44500 TO 44500 FT				
g's	0	0	0	0	0	0	0	0	0	0	0	0	0
1.50	0	0	0	0	0	0	0	0	0	0	0	0	0
1.40	0	0	0	0	0	0	0	0	0	0	0	0	0
1.20	0	0	0	0	0	0	0	0	0	0	0	0	0
1.00	0	0	0	0	0	0	0	0	0	0	0	0	0
.90	0	0	0	0	0	0	0	0	0	0	0	0	0
.70	0	0	0	0	0	0	0	0	0	0	0	0	0
.60	0	0	0	0	0	0	0	0	0	0	0	0	0
.50	0	0	0	0	0	0	0	0	0	0	0	0	0
.40	0	0	0	0	0	0	0	0	0	0	0	0	0
.30	0.36	0	0.65	0	0.91	0	0.52	0	0	0	0	0	0.27
.20	5.57	1.02	2.59	3.61	2.07	0	0.52	0	0	0	0	0	2.43
.15	15.87	5.12	5.18	3.61	5.69	0.87	1.55	0.41	0	0	0	0	6.59
.10	36.47	15.87	16.11	9.03	8.80	2.62	2.06	0.41	1.26	0	0	0	15.55
.05	72.69	47.69	40.75	37.02	20.70	20.11	14.43	3.44	10.05	0	0	0	35.48
0	156.41	111.59	95.09	106.55	104.00	118.92	133.98	157.62	148.17	0	0	0	140.10
-.05	37.92	29.69	28.46	29.80	18.11	20.11	14.43	3.44	7.53	0	0	0	21.79
-.10	7.63	6.65	6.47	5.61	3.62	6.12	4.64	0.69	2.51	0	0	0	4.63
-.15	2.18	0	2.29	2.71	0.52	1.75	2.58	0.28	1.26	0	0	0	1.31
-.20	0	0	0.65	1.81	0.52	0.87	1.03	0	0	0	0	0	0.27
-.30	0	0	0	0	0	0.52	0	0.52	0	0	0	0	0.08
-.40	0	0	0	0	0	0.32	0	0	0	0	0	0	0.04
-.50	0	0	0	0	0	0.52	0	0	0	0	0	0	0.04
-.60	0	0	0	0	0	0	0	0	0	0	0	0	0
-.70	0	0	0	0	0	0	0	0	0	0	0	0	0
-.80	0	0	0	0	0	0	0	0	0	0	0	0	0
-.90	0	0	0	0	0	0	0	0	0	0	0	0	0
-1.00	0	0	0	0	0	0	0	0	0	0	0	0	0
-1.20	0	0	0	0	0	0	0	0	0	0	0	0	0
-1.40	0	0	0	0	0	0	0	0	0	0	0	0	0
-1.60	0	0	0	0	0	0	0	0	0	0	0	0	0
FLIGHT HOURS & ALT	8.25	1.95	1.11	1.93	1.14	1.94	7.26	0.80	25.39	0	0	0	
FLIGHT MILES & ALT	1509.73	468.11	479.05	419.35	770.93	480.15	369.28	3264.04	8618.05	0	0	0	
TOTAL FLIGHTS										64			
TOTAL FLIGHT MILES FLAPS UP AND DOWN										25.33			
TOTAL FLIGHT MILES FLAPS UP AND DOWN										8618.05			

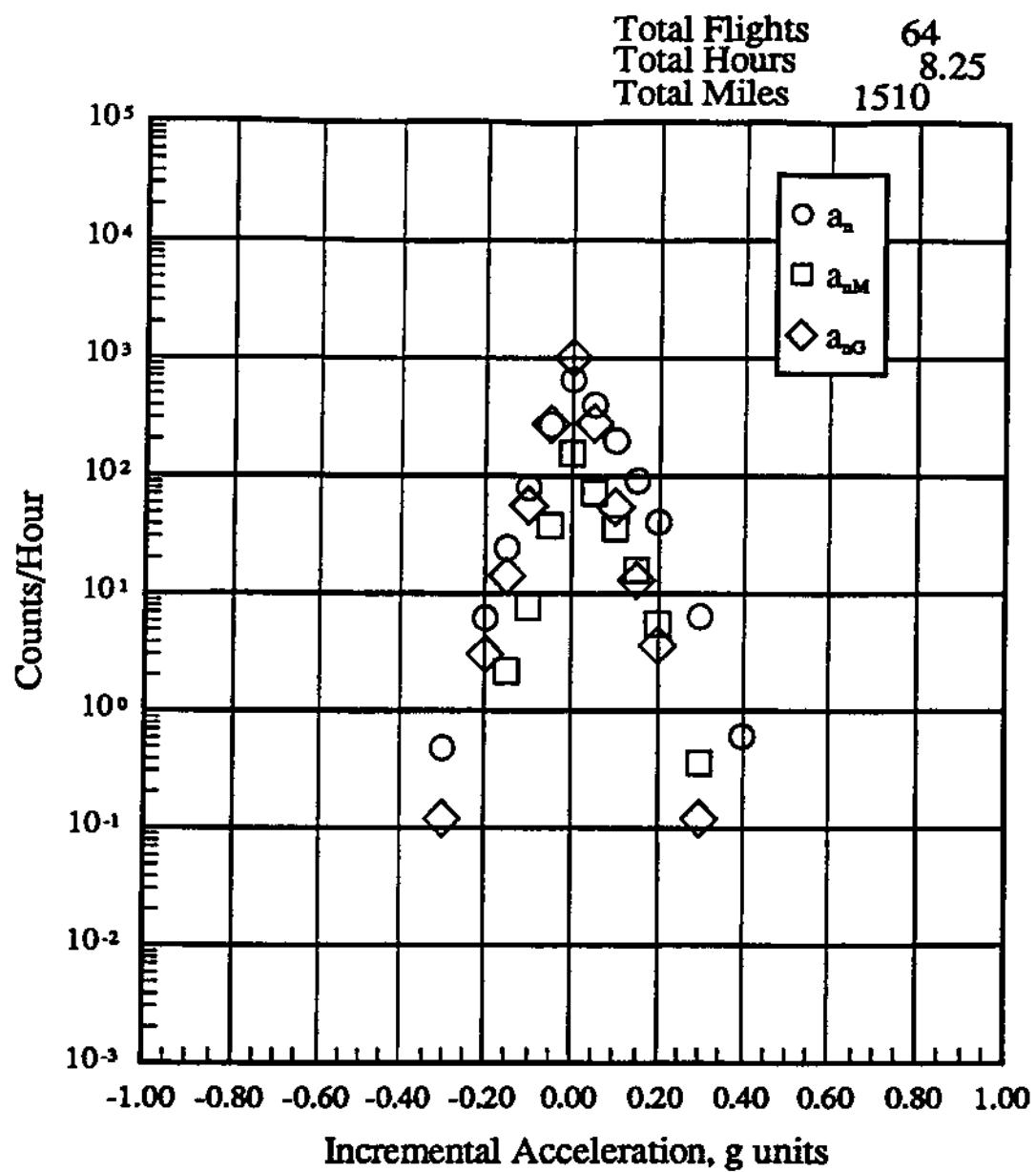
(b) a_{HM} Level crossing counts per hour within pressure altitude bands

Figure 22.- Continued.

LEVEL	PRESSURE ALTITUDE BANDS										TOTAL FLIGHTS	TOTAL FLIGHT HOURS	FLYING UP AND DOWN	TOTAL FLIGHT MILES	FLYING UP AND DOWN
	-500 TO 4500 FT	500 TO 9500 FT	950 TO 14500 FT	14500 TO 19500 FT	19500 TO 24500 FT	24500 TO 29500 FT	29500 TO 34500 FT	34500 TO 39500 FT	39500 TO 44500 FT	44500 TO 49500 FT					
g' s															
1.60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.30	0.12	0	0	0	0	0	0	0	0	0	0	0	0	0	0.04
.20	3.63	0.51	0.65	0.90	0	0	0	0	0.52	0	0	0	0	0	1.31
.15	12.96	1.02	2.59	0.90	1.03	0	0	2.58	0	0	0	0	0	0	4.67
.10	55.00	11.26	12.94	5.42	3.62	3.50	7.21	0.41	0	0	0	0	0	0	20.44
.05	278.05	92.65	72.45	55.98	27.42	72.58	30.92	5.51	11.30	0	0	0	0	0	111.64
0	1005.46	1486.99	1538.98	1278.56	1713.08	1645.66	1762.90	1543.03	1598.47	0	0	0	0	0	1391.52
-.05	272.95	91.63	67.28	58.69	28.97	72.58	28.86	6.34	8.79	0	0	0	0	0	109.67
-.10	56.22	10.24	12.94	6.32	3.10	5.25	5.15	0.41	0	0	0	0	0	0	20.67
-.15	14.18	1.54	1.94	0.90	0	0	0	1.03	0	0	0	0	0	0	4.86
-.20	3.03	0	0	1.81	0	0	0	0.32	0	0	0	0	0	0	1.00
-.30	0.12	0	0	0	0	0	0	0	0	0	0	0	0	0	0.04
-.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-.60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-.70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-.80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-.90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-1.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-1.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-1.60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FLIGHT HOURS @ ALT	8.25	1.95	1.55	1.11	1.93	1.14	1.94	7.26	0.80	0	0	0	0	0	25.93
FLIGHT MILES @ ALT	1509.73	468.11	479.05	419.35	770.93	480.15	869.28	3264.04	358.21	0	0	0	0	0	3618.85

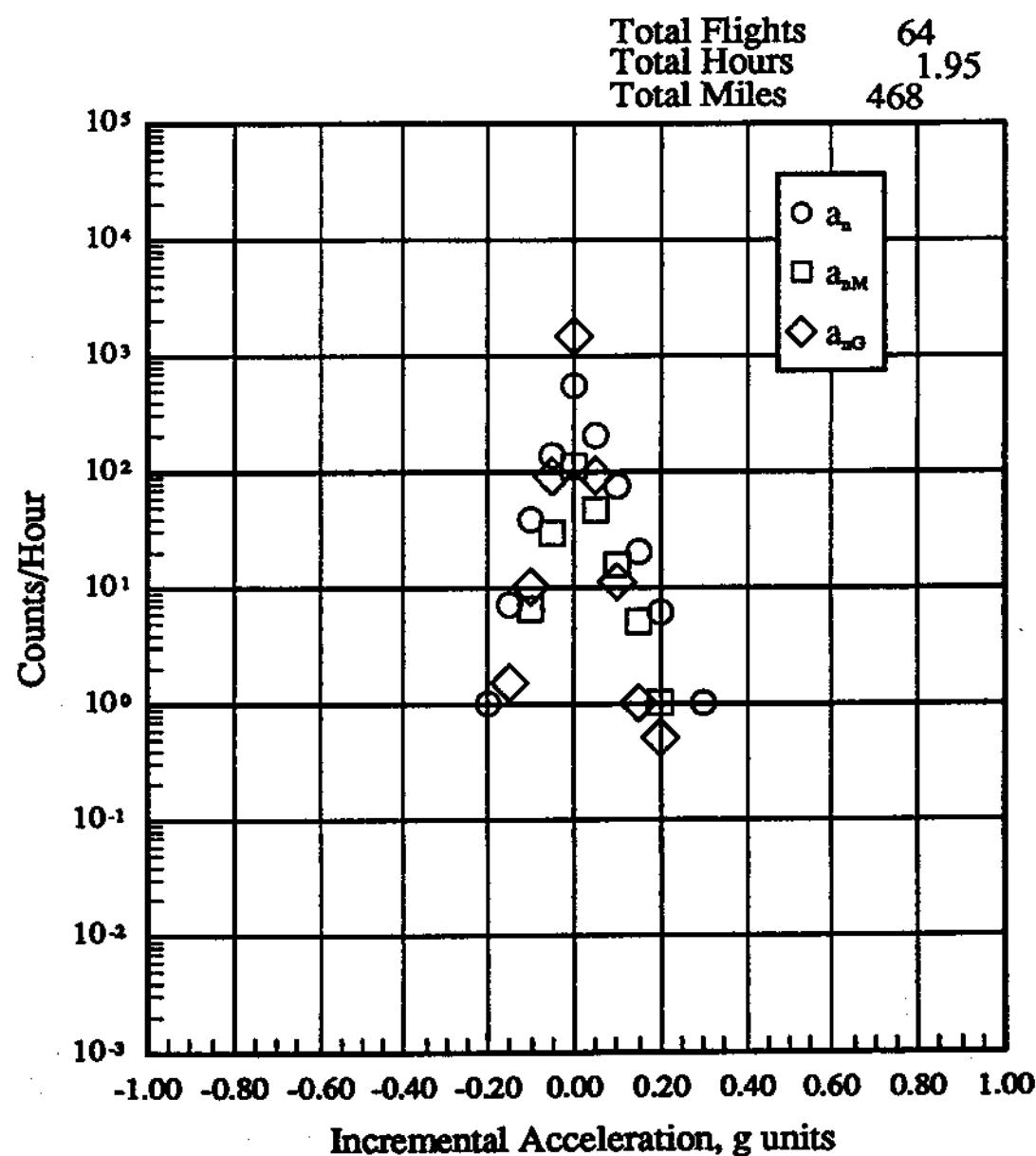
(c) aIG Level crossing counts per hour within pressure altitude bands

Figure 22.- Continued.



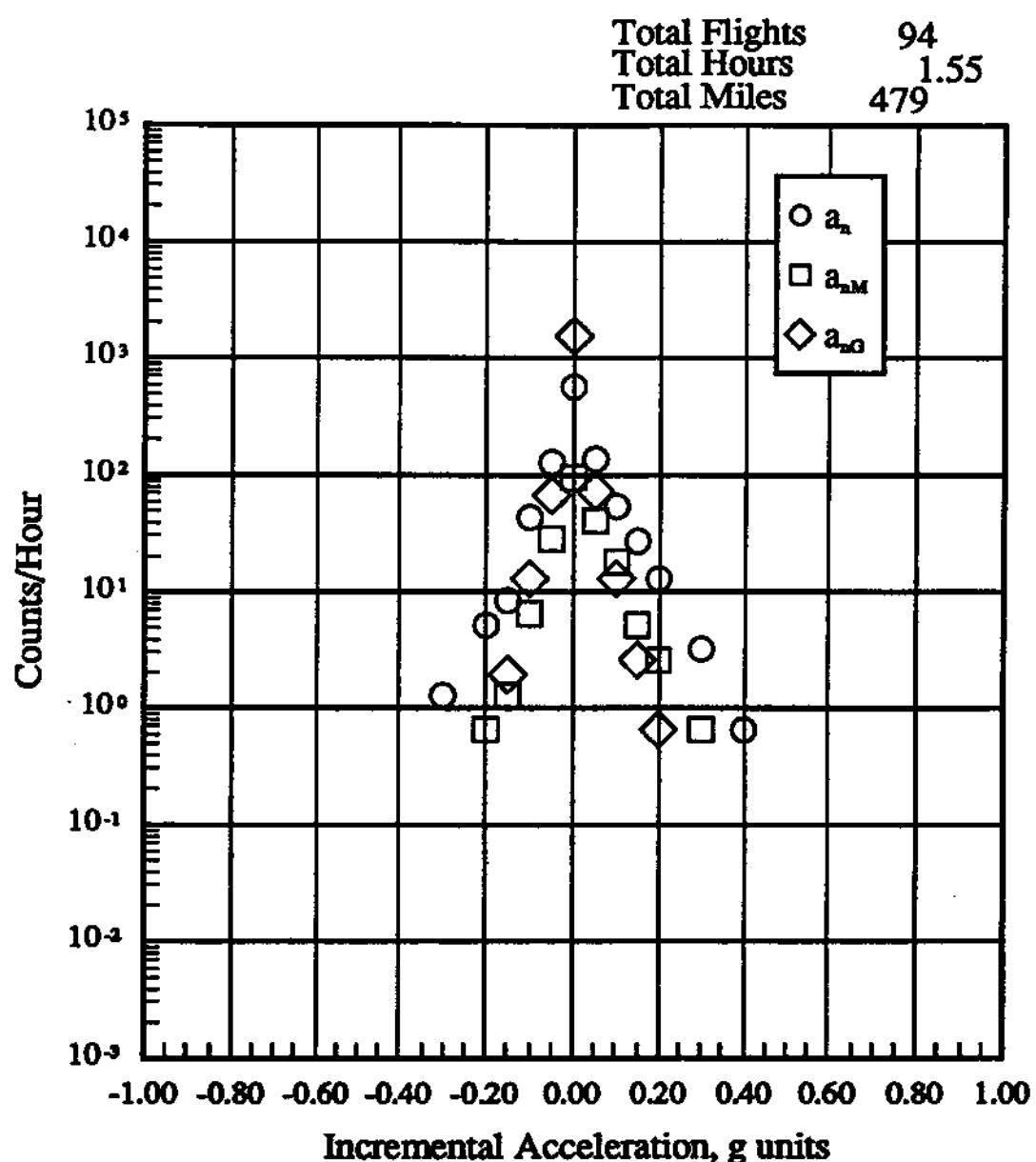
(d) a_n , a_M , a_G , -500 to 4500 feet altitude

Figure 22.- Continued.



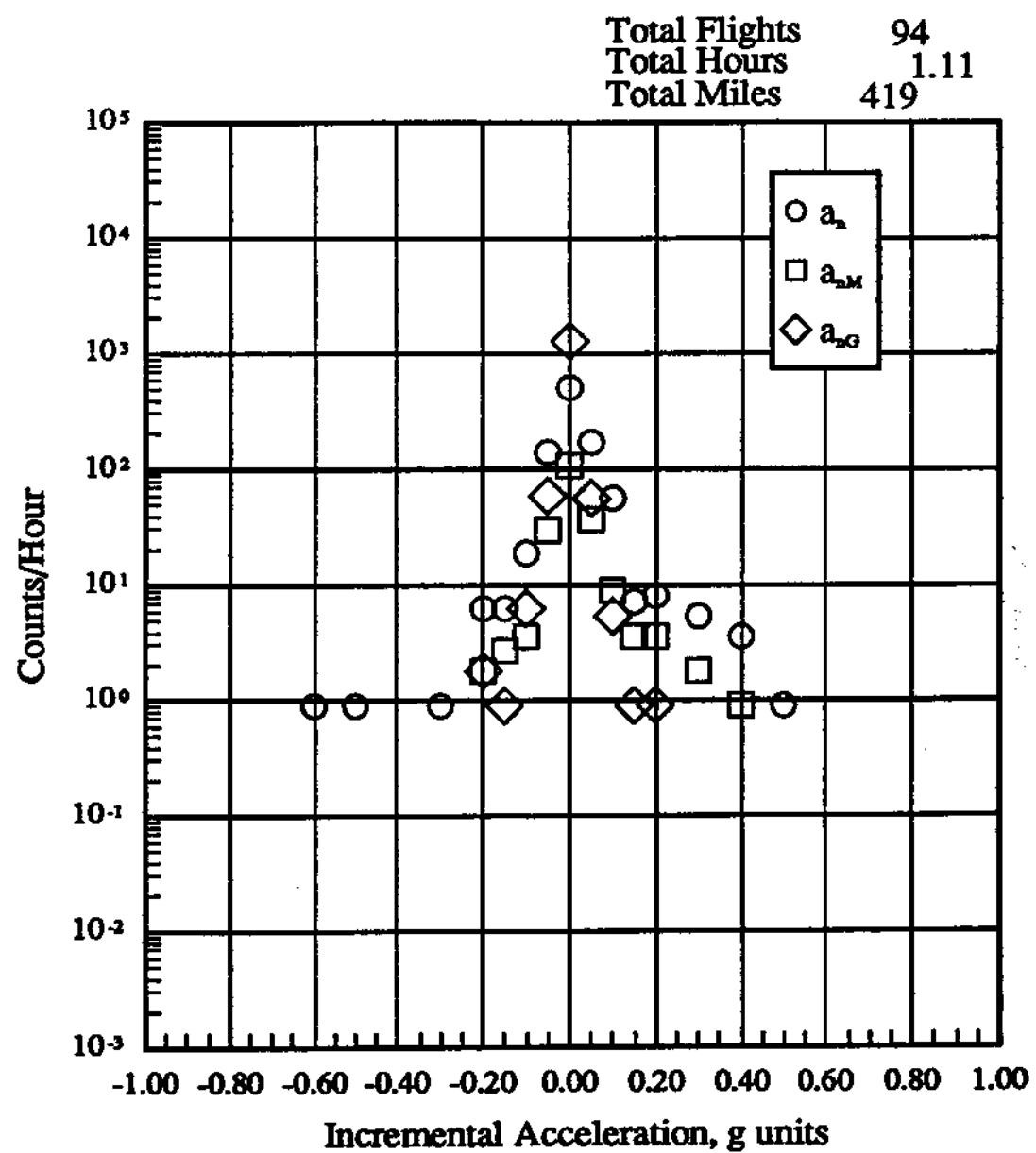
(e) a_n , a_{nM} , a_{nG} , 4500 to 9500 feet altitude

Figure 22.- Continued.



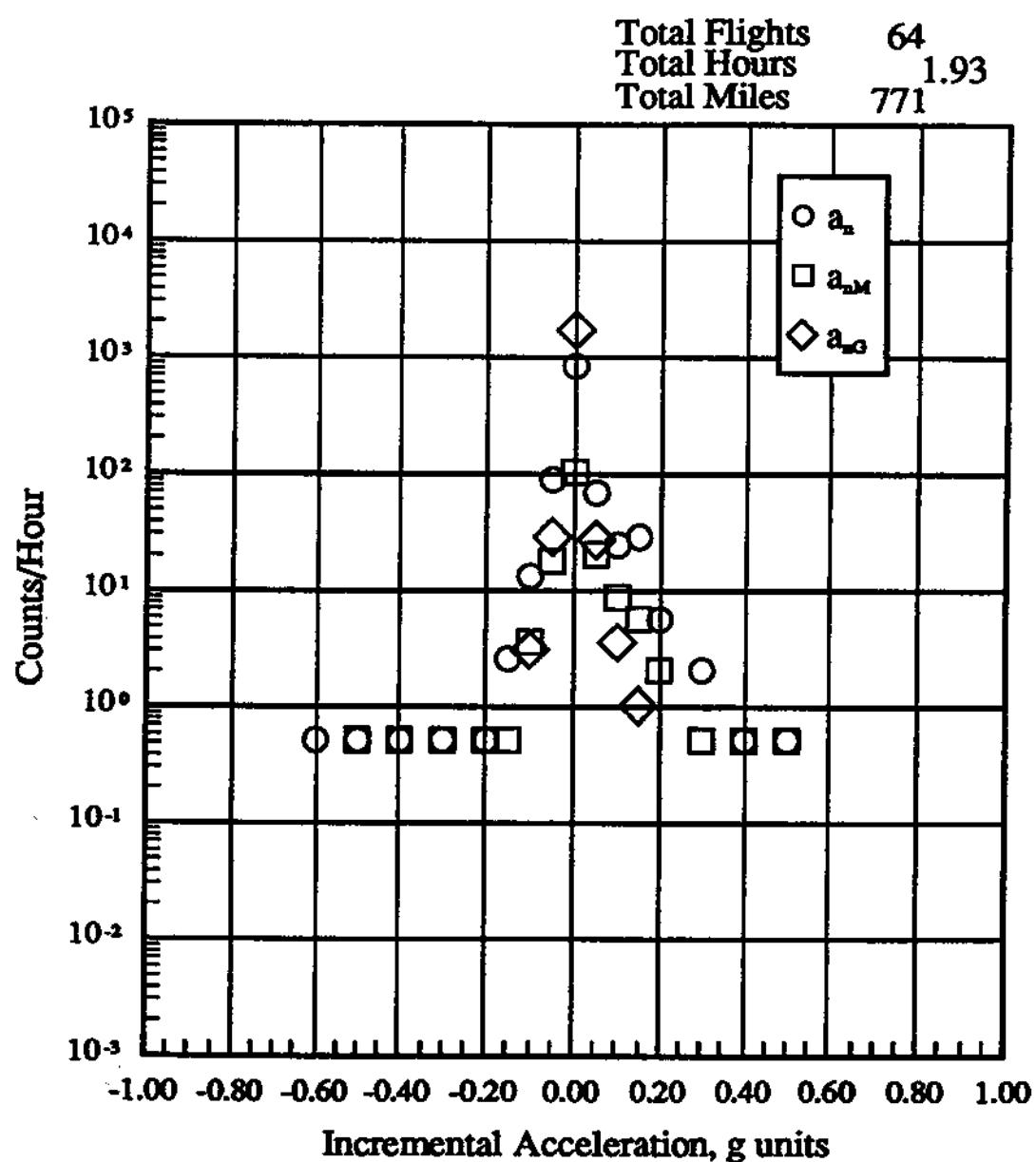
(f) a_n , a_{nM} , a_{no} , 9500 to 14500 feet altitude

Figure 22.- Continued.



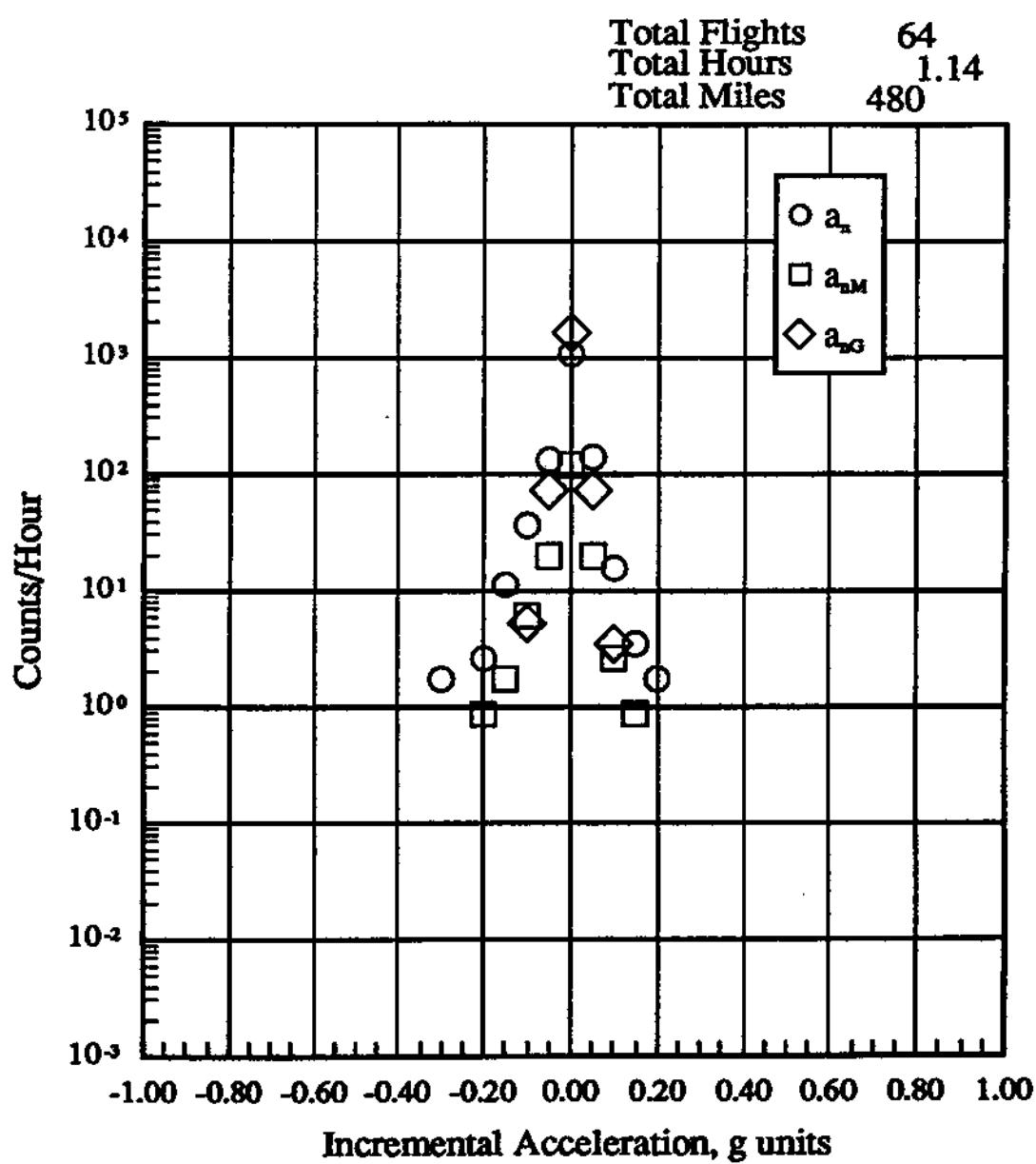
(g) a_x , a_{xM} , a_{xG} , 14500 to 19500 feet altitude

Figure 22.- Continued.



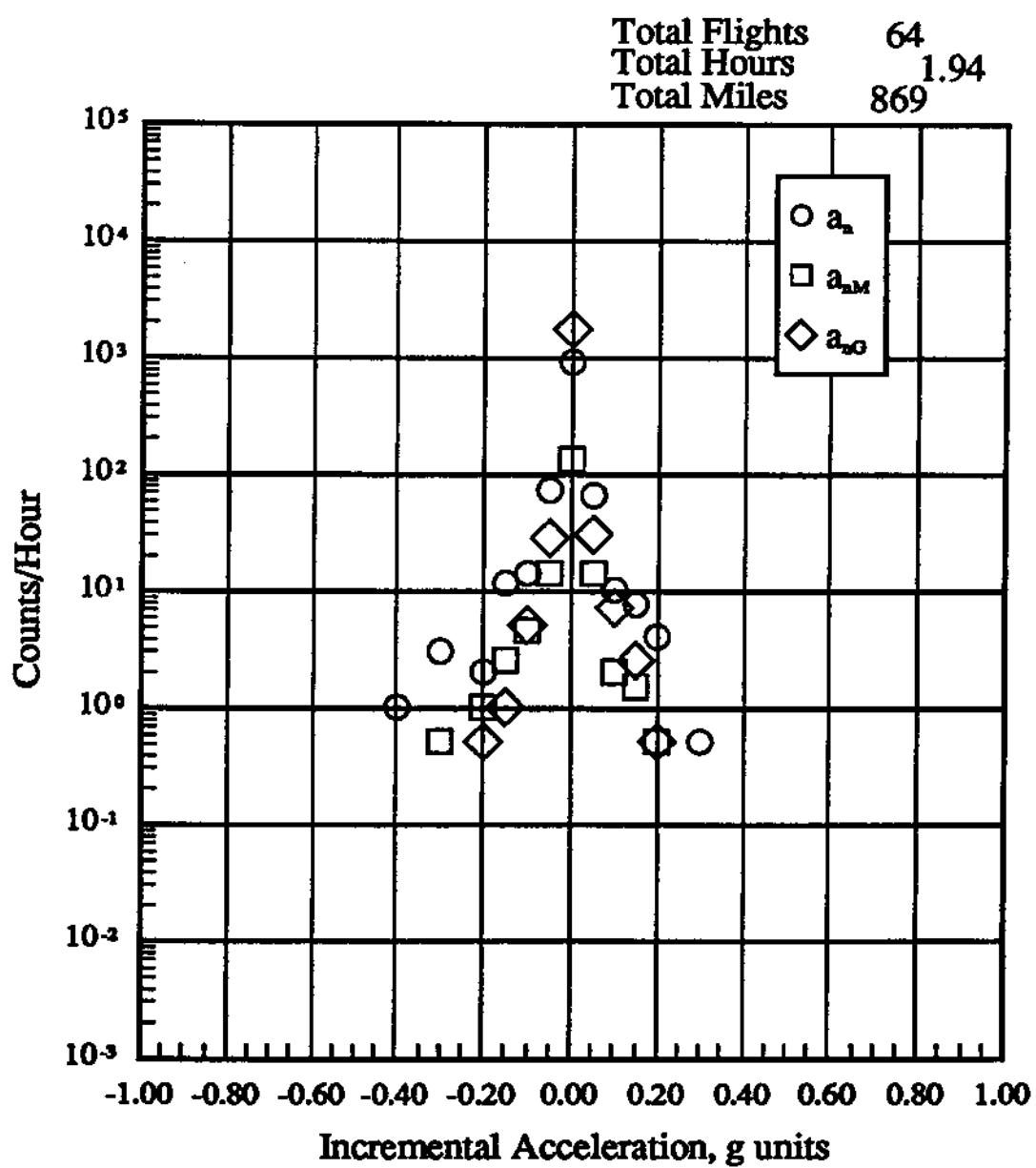
(h) a_n , a_{nM} , a_{nG} , 19500 to 24500 feet altitude

Figure 22.- Continued.



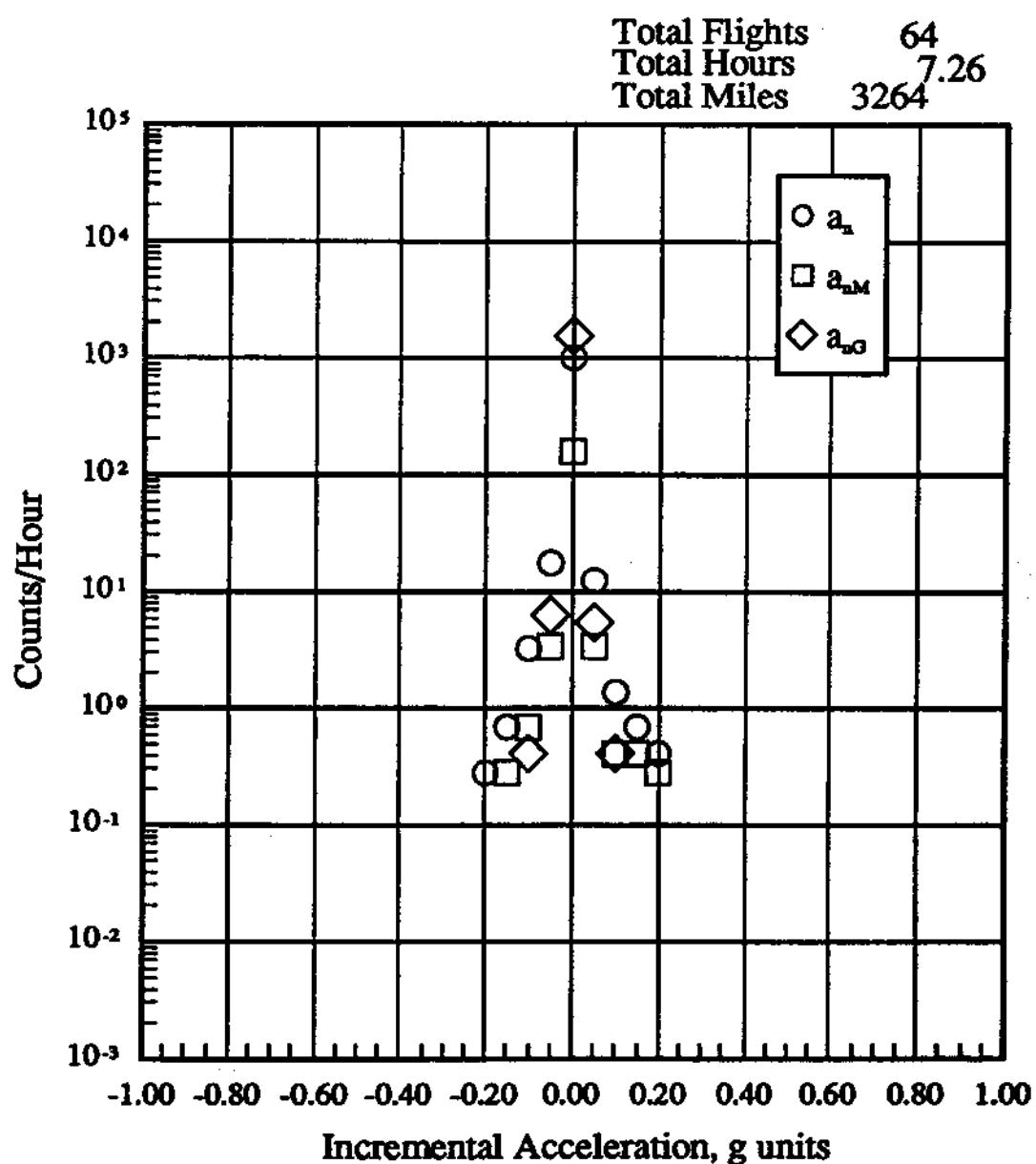
(i) a_x , a_{xM} , a_{xG} , 24500 to 29500 feet altitude

Figure 22.- Continued.



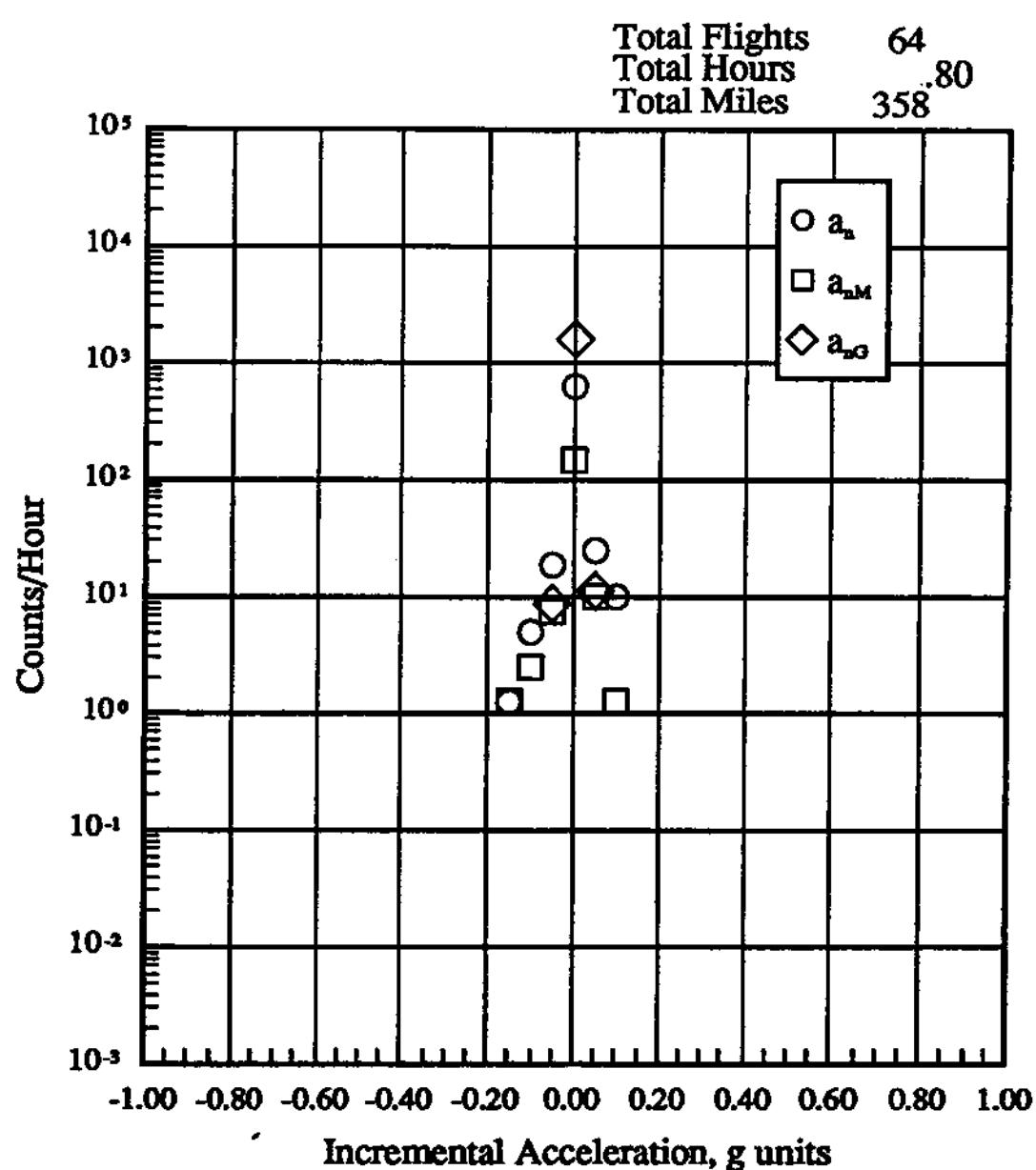
(j) a_s , a_M , a_o , 29500 to 34500 feet altitude

Figure 22.- Continued.



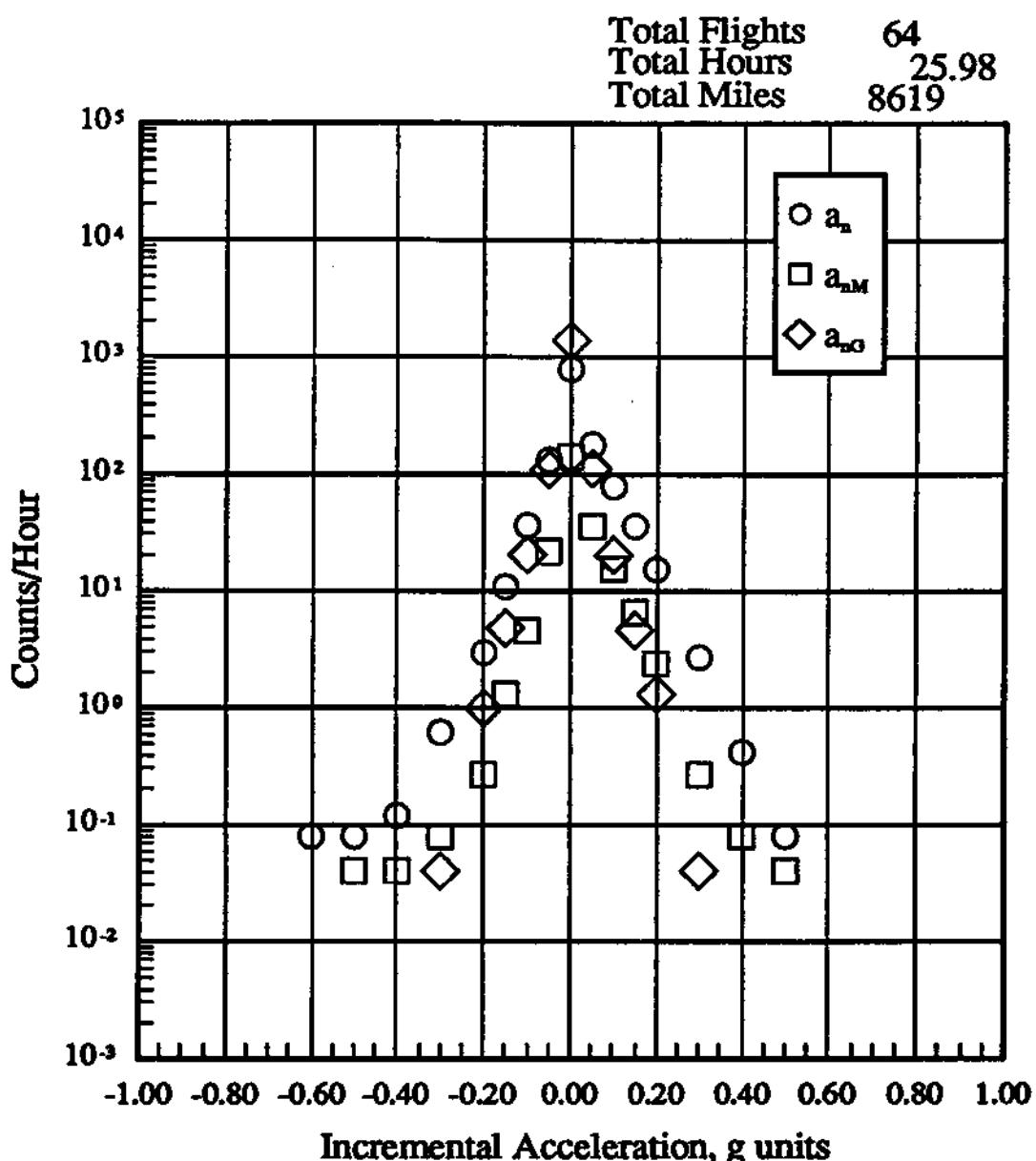
(k) a_x, a_{xM}, a_{xG} , 34500 to 39500 feet altitude

Figure 22.- Continued.



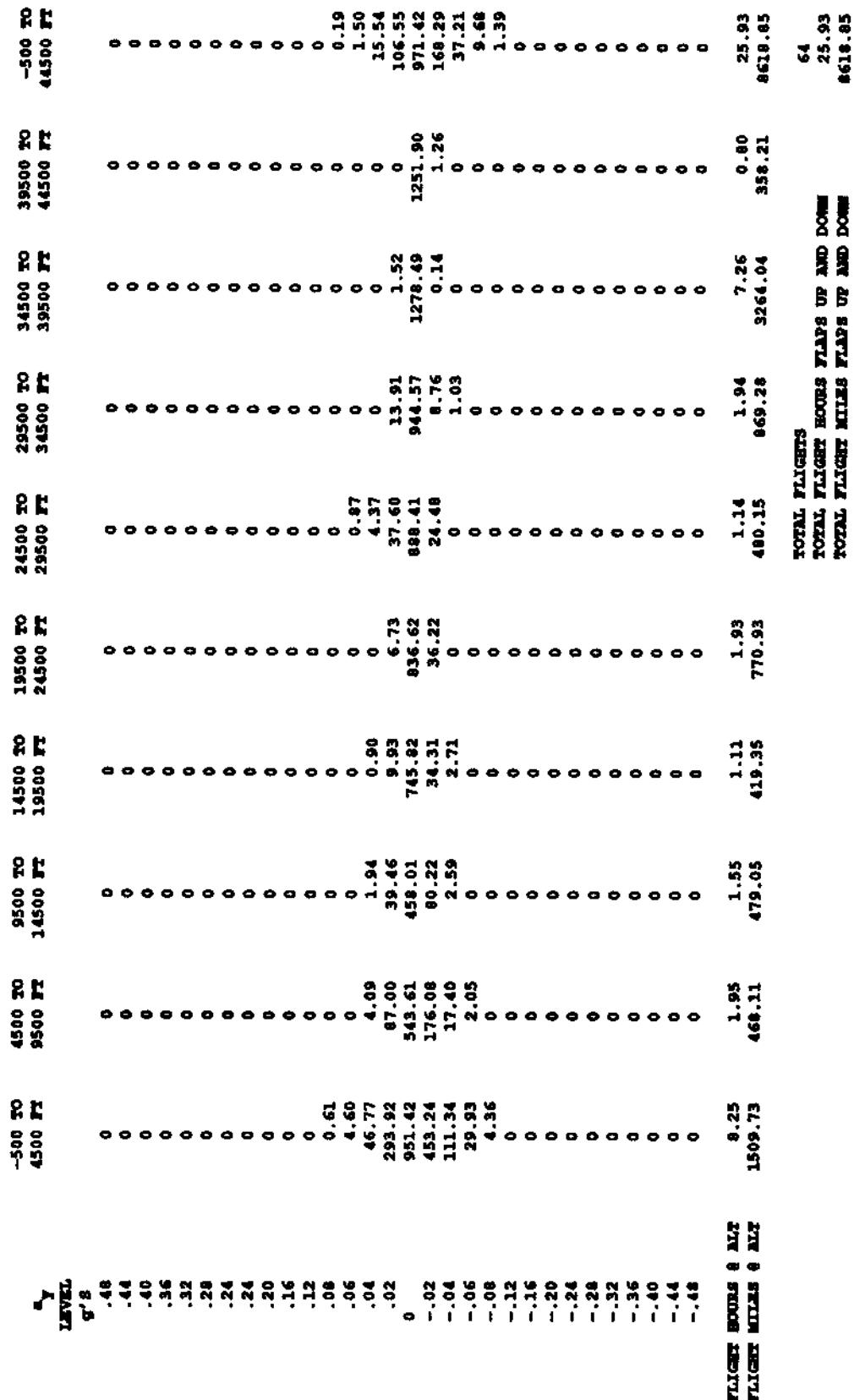
(I) a_n , a_{nM} , a_{nG} , 39500 to 44500 feet altitude

Figure 22.- Continued.



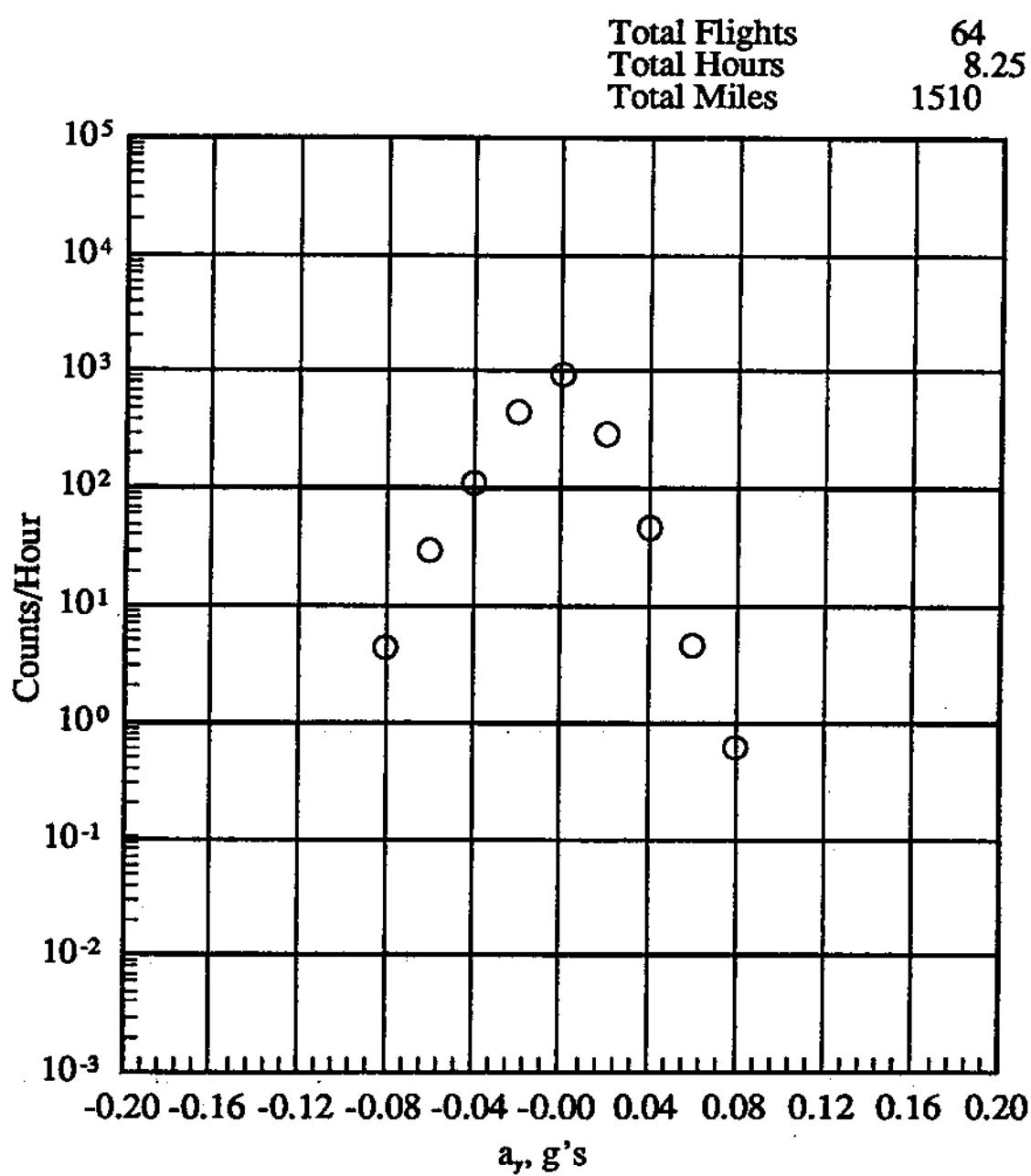
(m) a_n , a_{nm} , a_{no} , -500 to 44500 feet altitude

Figure 22.- Continued.



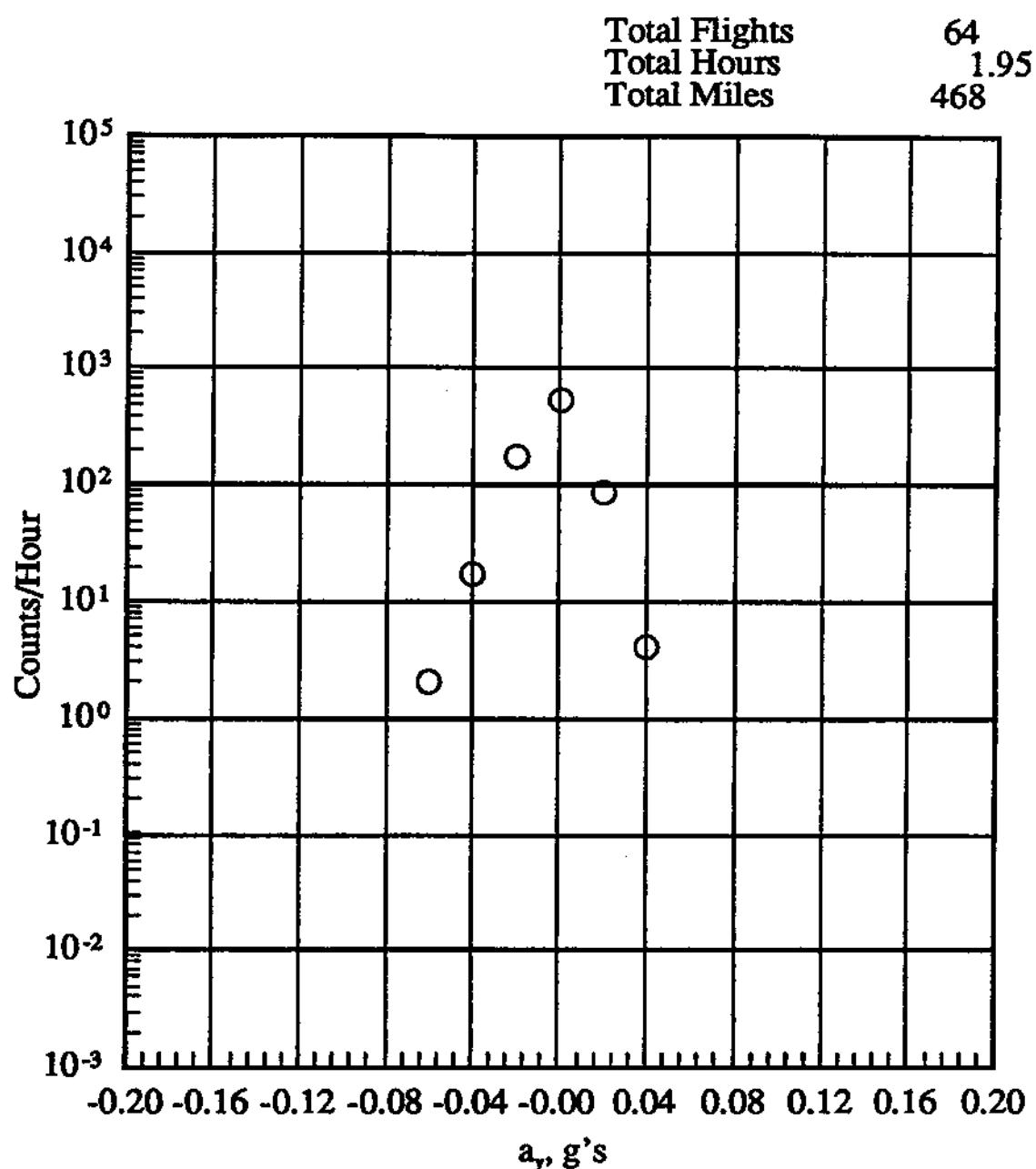
(a) a_y Level crossing counts per hour within pressure altitude bands

Figure 23.: Lateral acceleration exceedances: Non-revenue flights.



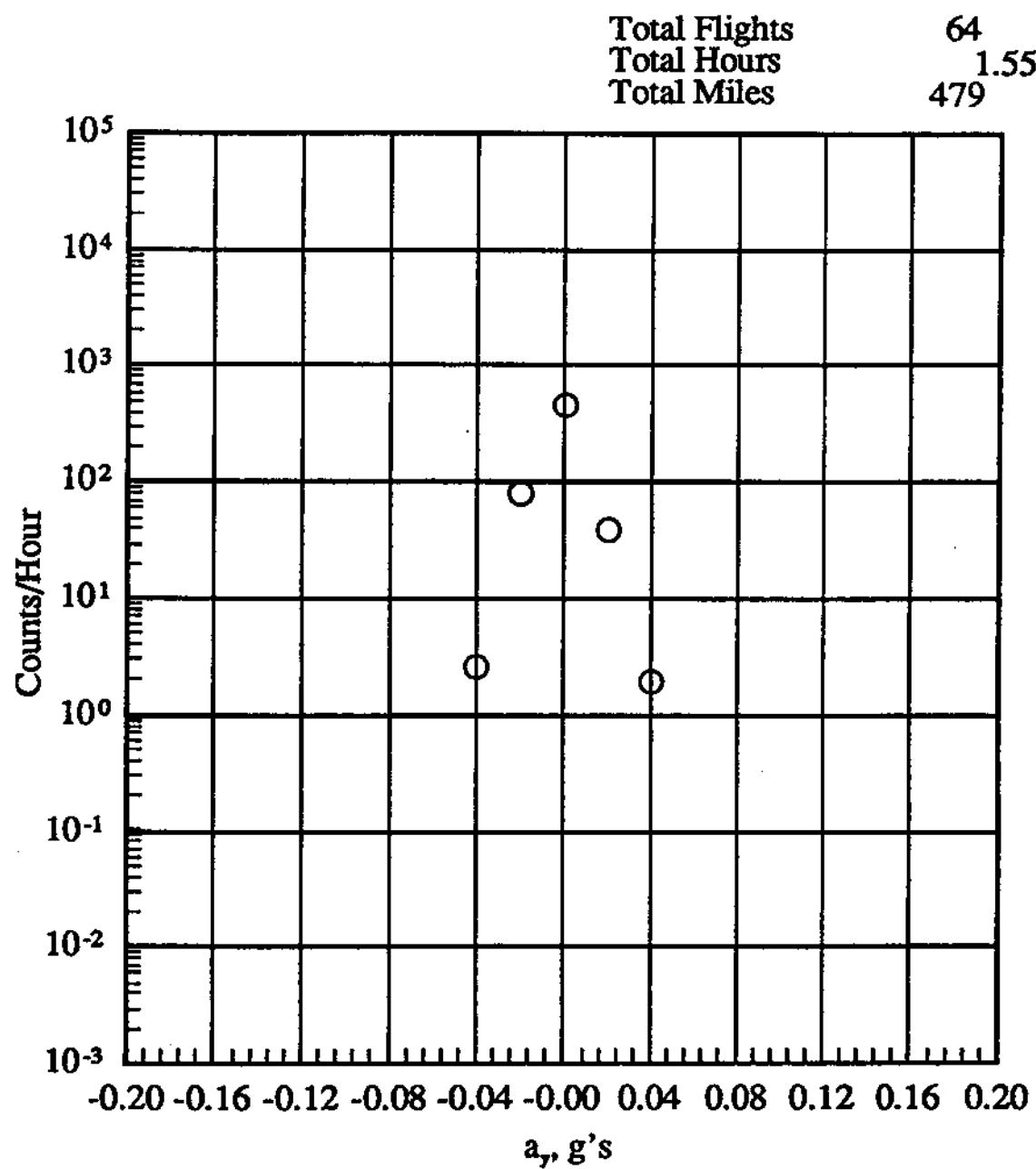
(b) -500 to 4500 feet altitude

Figure 23.- Continued.



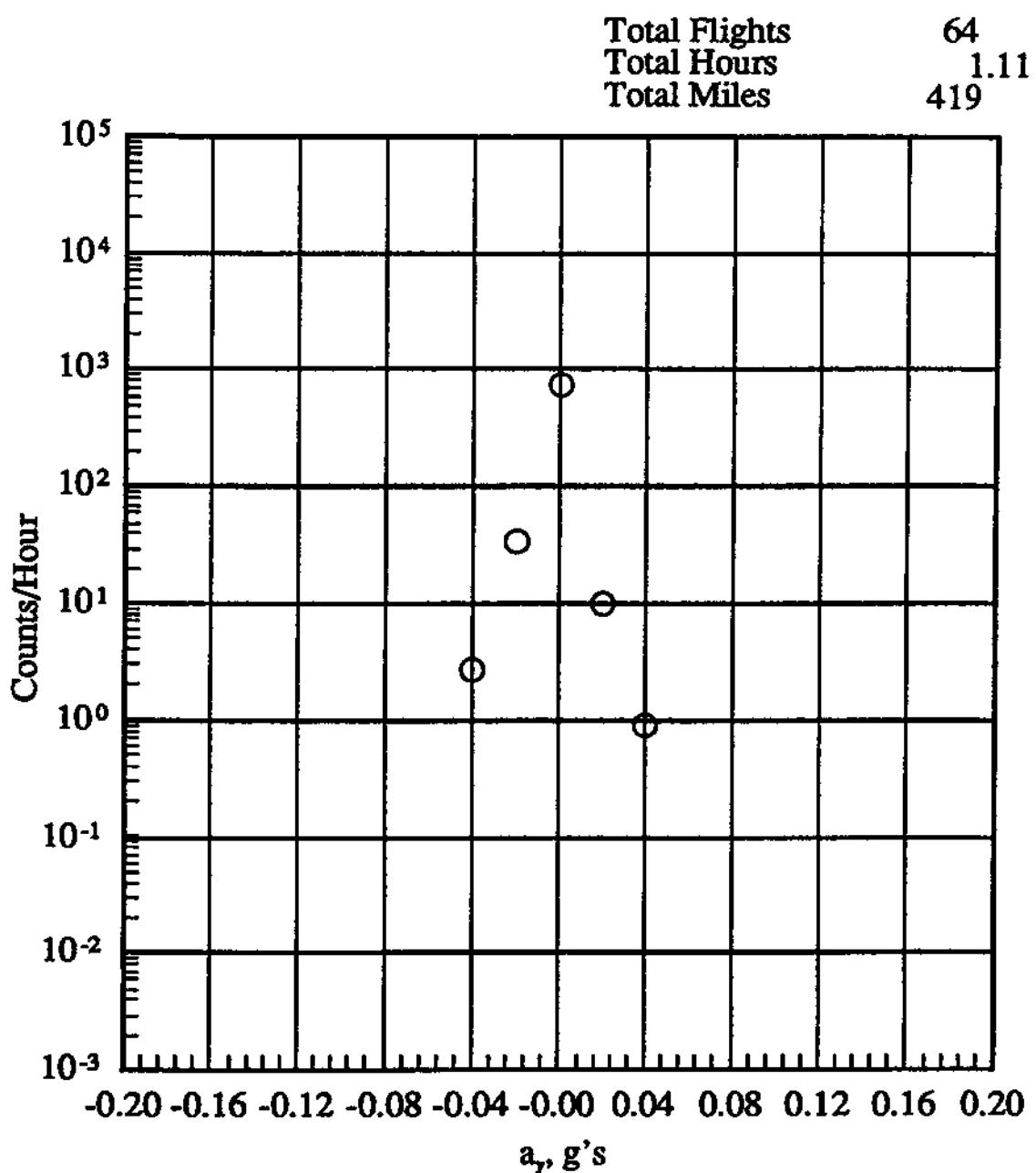
(c) 4500 to 9500 feet altitude

Figure 23.- Continued.



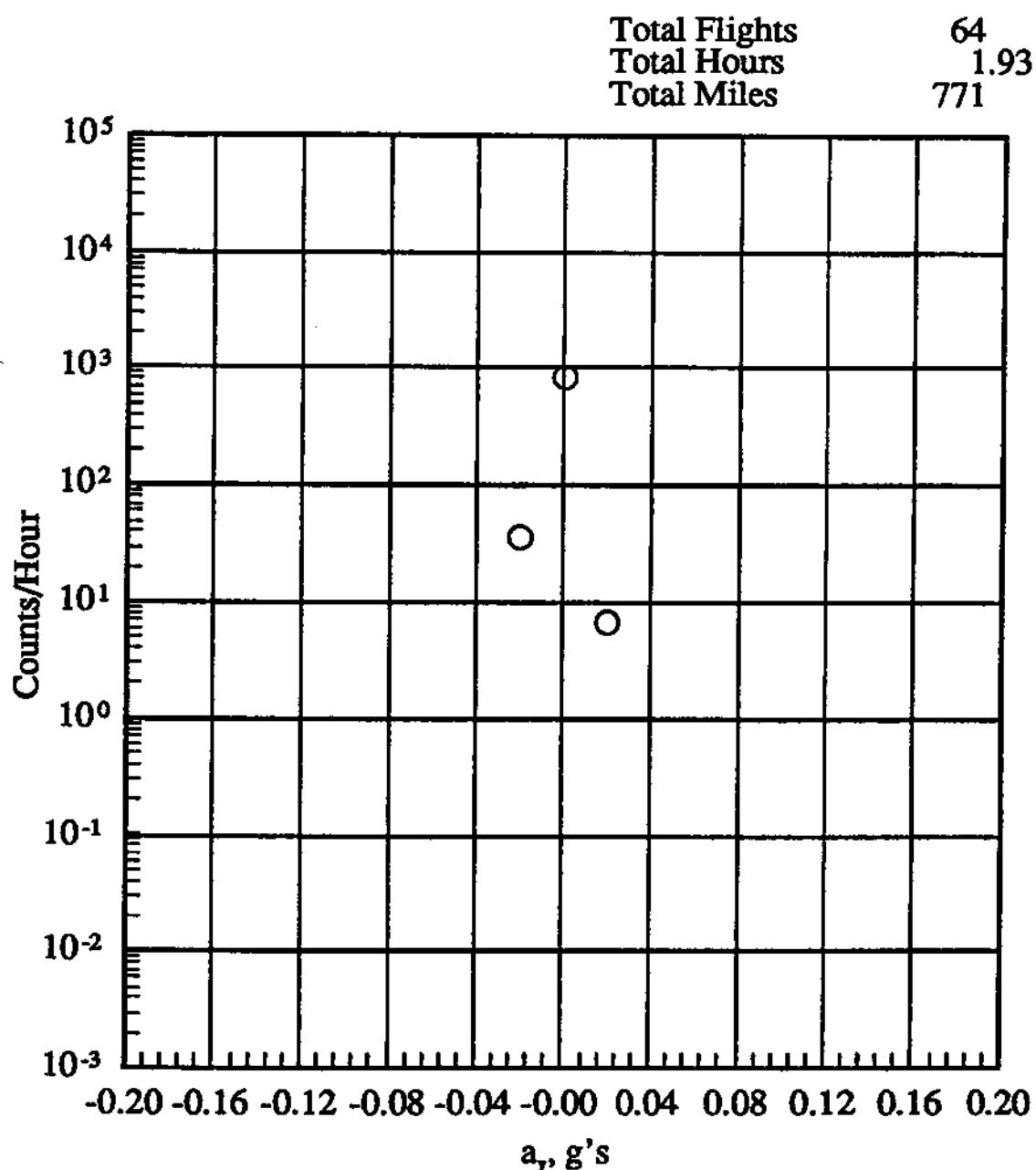
(d) 9500 to 14500 altitude

Figure 23.- Continued.



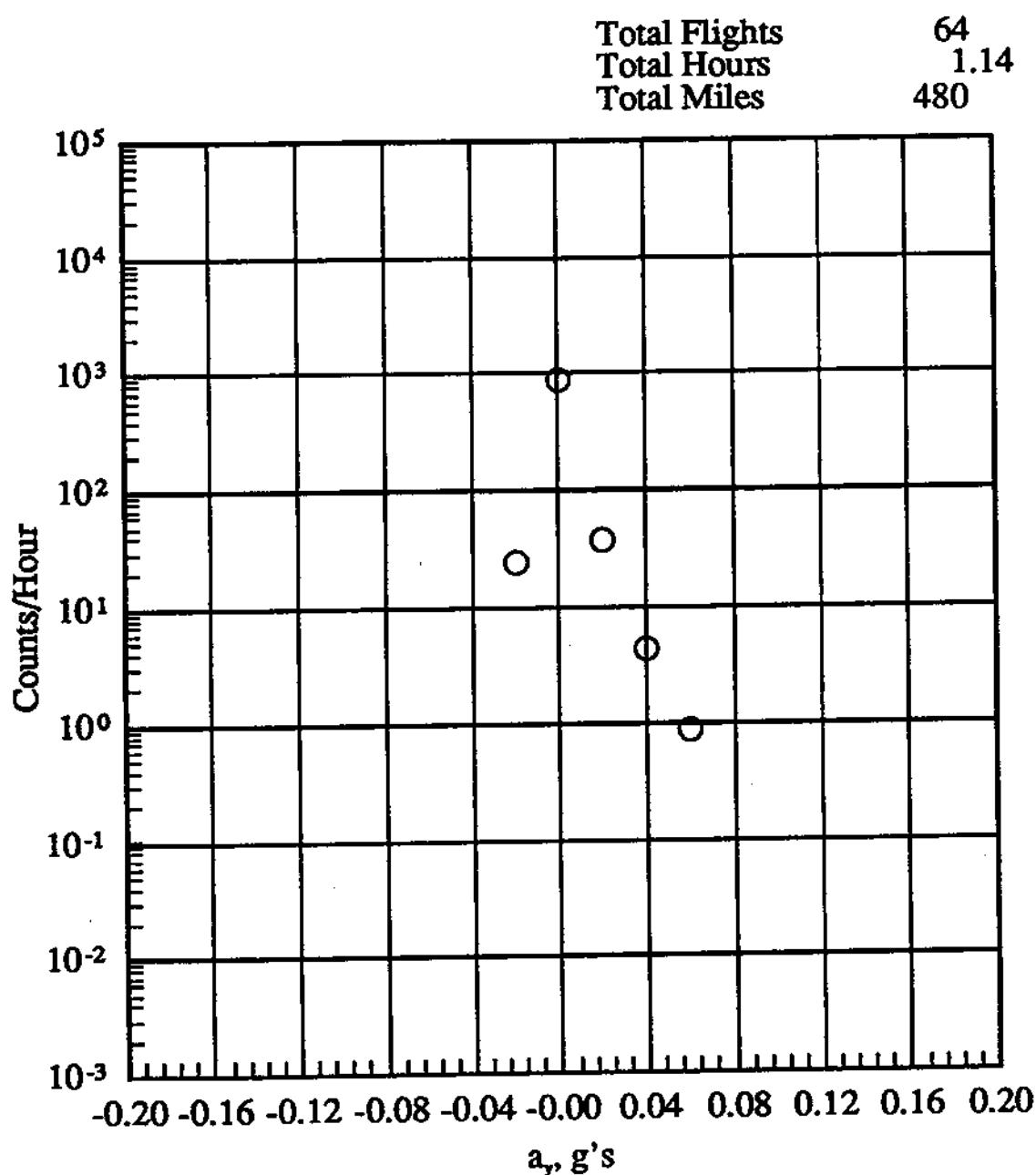
(e) 14500 to 19500 feet altitude

Figure 23.- Continued.



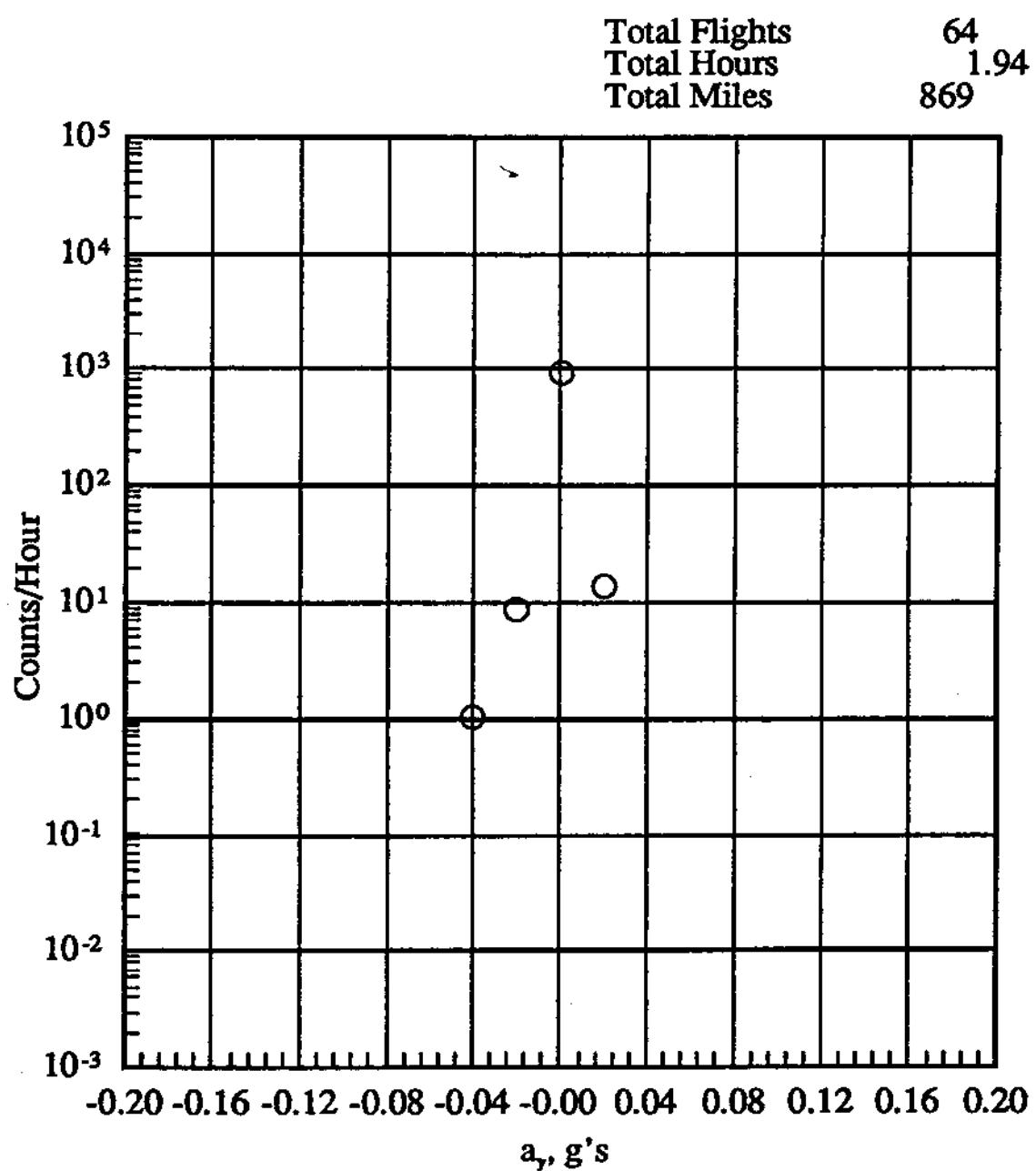
(f) 19500 to 24500 feet altitude

Figure 23.- Continued.



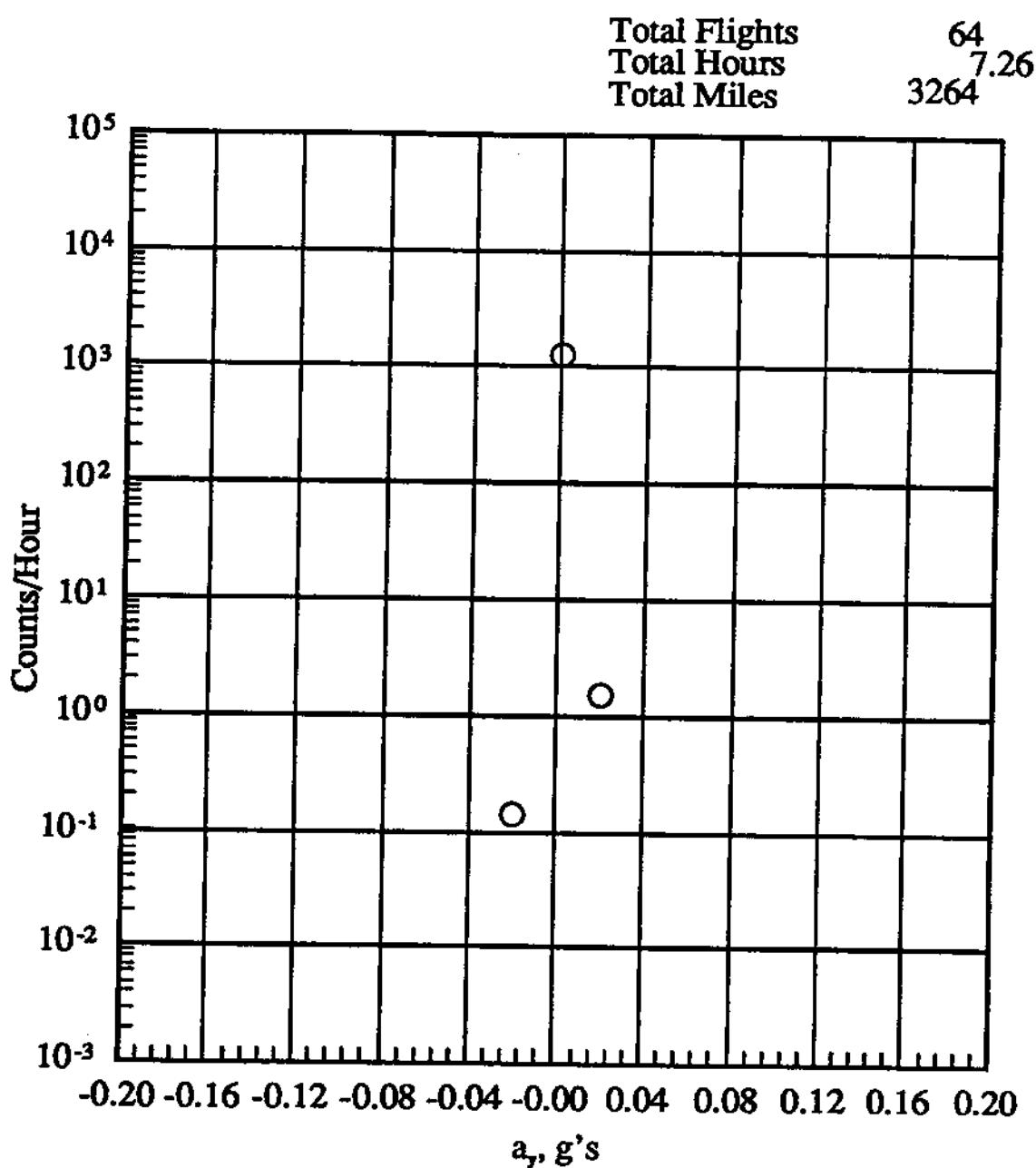
(g) 24500 to 29500 feet altitude

Figure 23.- Continued.



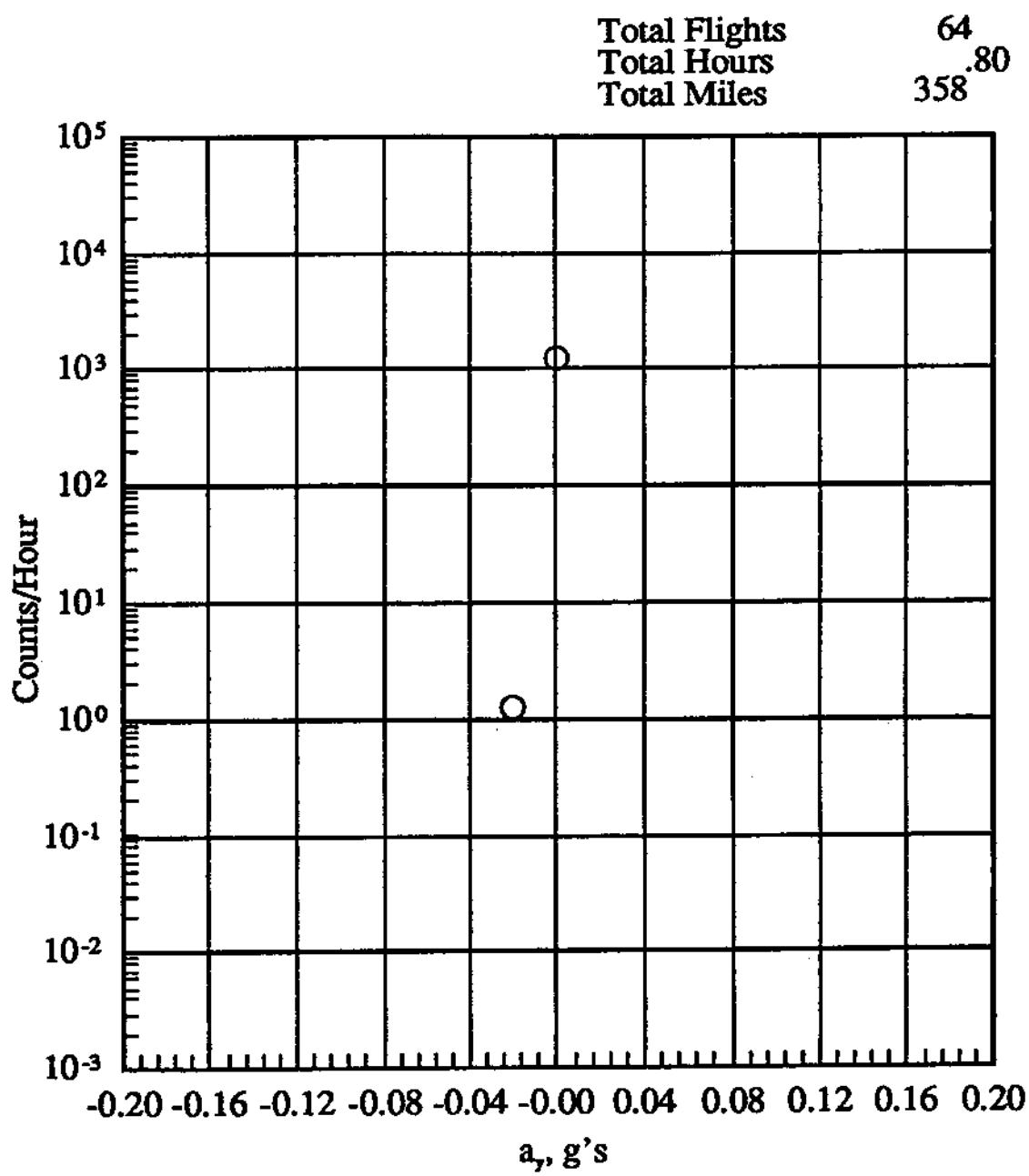
(h) 29500 to 34500 feet altitude

Figure 23.- Continued.



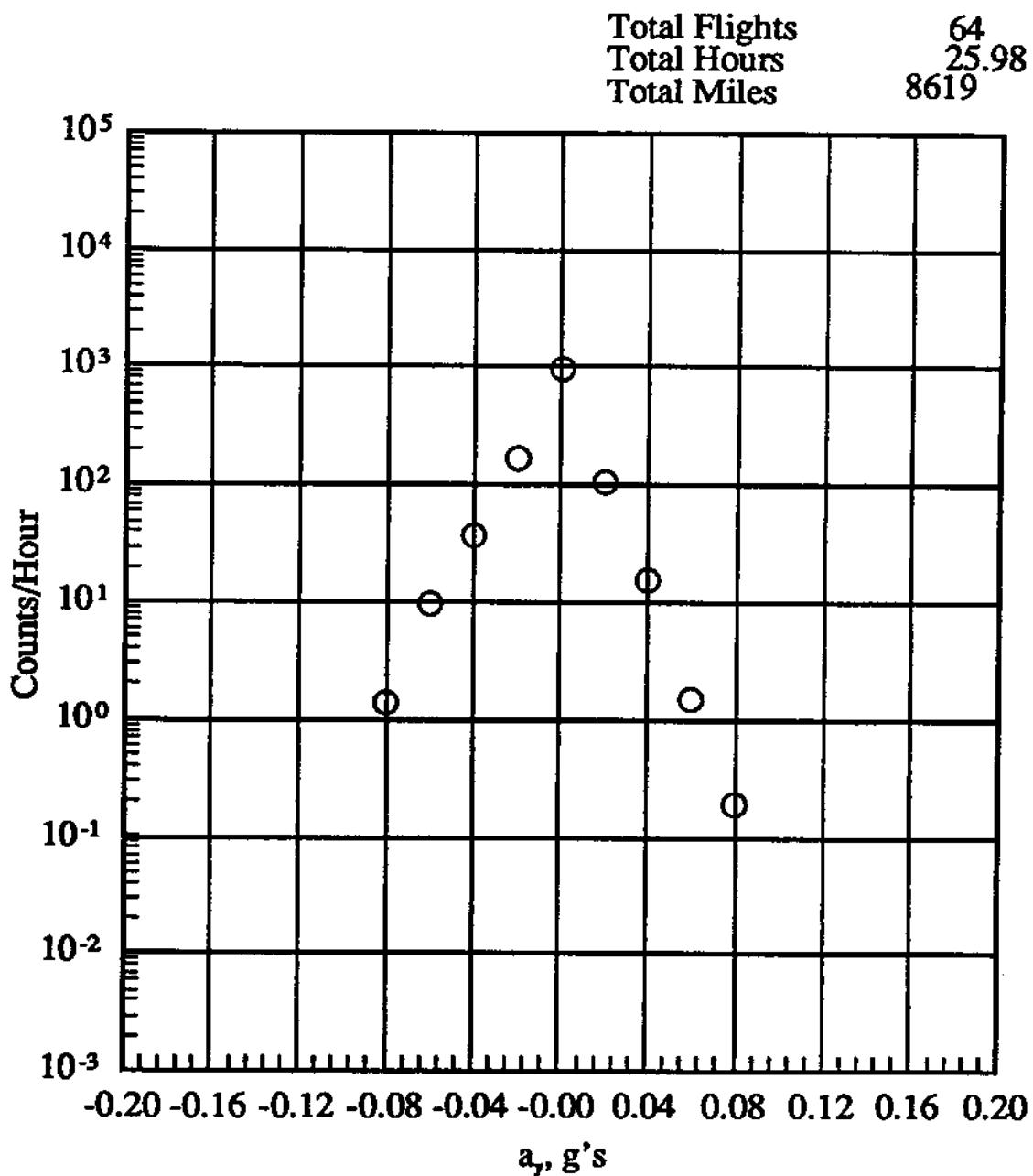
(i) 34500 to 39500 feet altitude

Figure 23.- Continued.



(j) 39500 to 44500 feet altitude

Figure 23.- Continued.

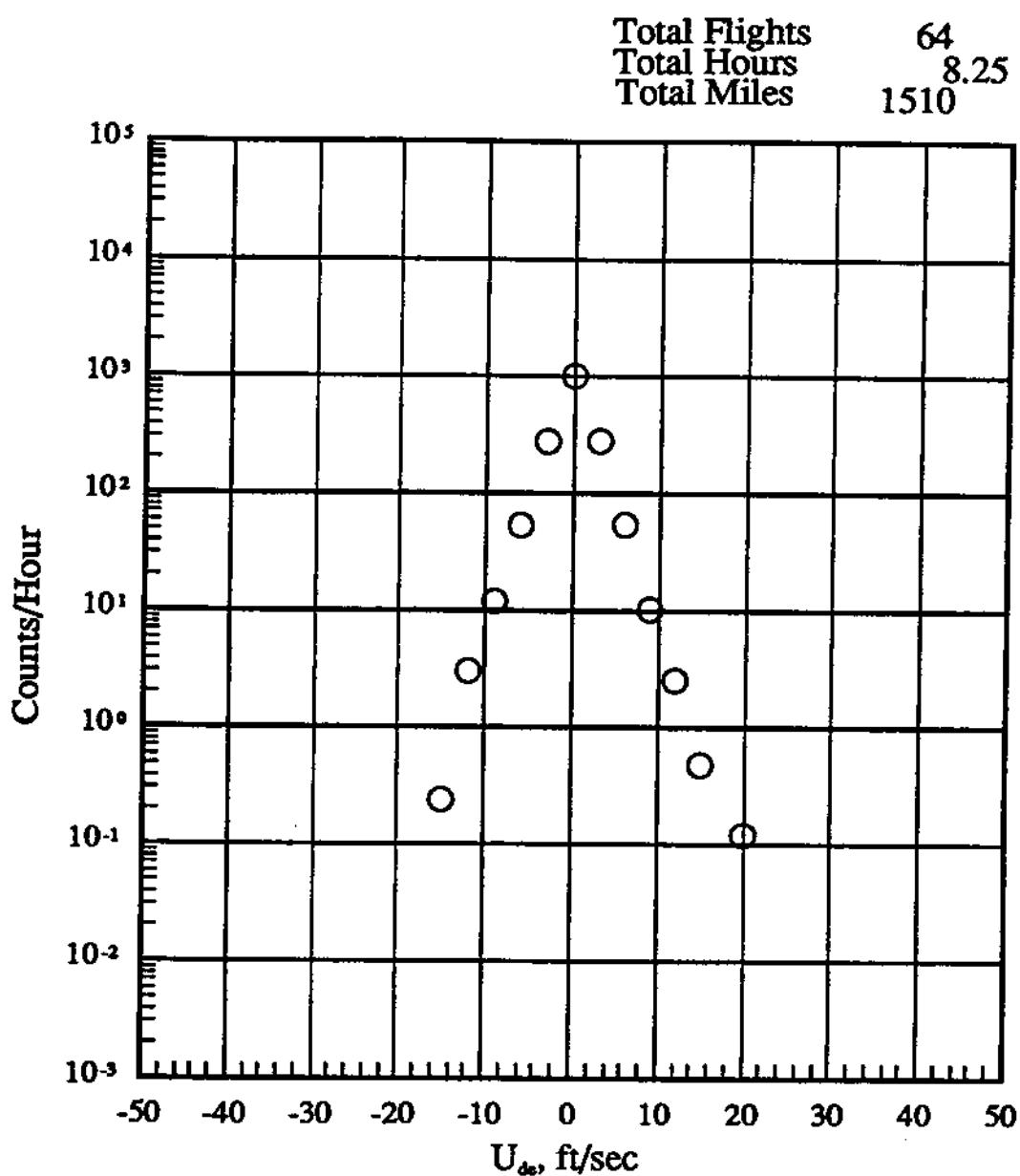


(k) -500 to 44500 feet altitude

Figure 23.- Concluded.

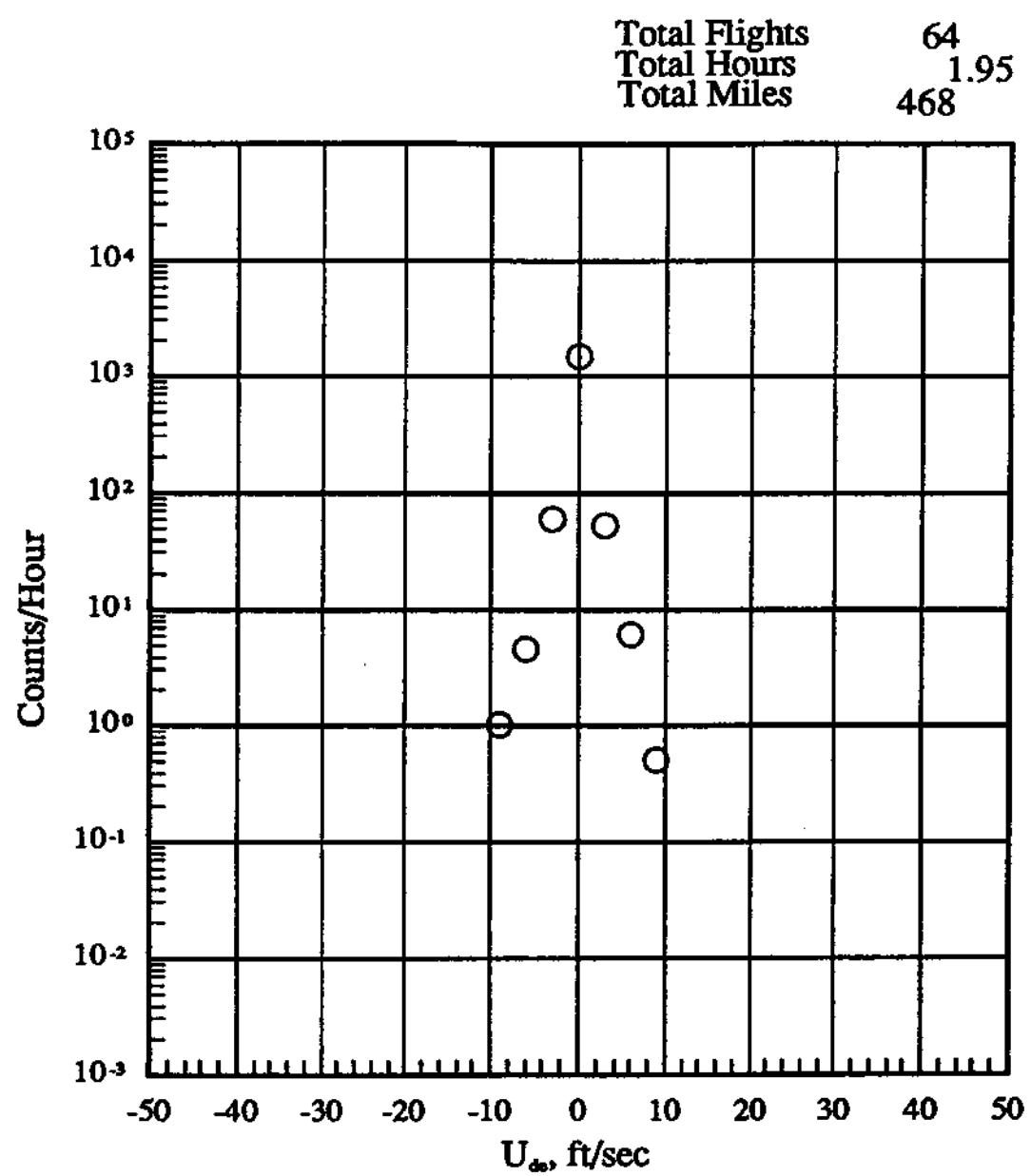
U_{de} ft/sec	-500 TO 4500 FT	9500 TO 9500 FT	14500 TO 14500 FT	19500 TO 19500 FT	24500 TO 24500 FT	29500 TO 29500 FT	34500 TO 34500 FT	39500 TO 39500 FT	-500 TO 44500 FT
DERIVED COST									
VELOCITY LEVEL									
100	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0
20	0.12	0	0	0	0	0	0	0	0.04
15	0.48	0	0	0	0	0	0	0	0.15
12	2.54	0	0	0	0	0	0	0	0.81
9	10.30	0.51	0	0	0	0	0	0	3.32
6	53.91	6.14	0.65	0.90	0	1.03	0	0	0
3	279.50	52.72	25.88	29.93	3.62	5.25	6.70	0.41	17.78
0	1005.46	1486.99	1538.98	1278.56	1713.08	1645.66	1782.90	1543.03	96.02
-3	276.72	59.89	21.35	14.45	4.66	4.37	5.67	0.41	1391.52
-6	53.07	4.61	0.65	0	0	0.52	0	0	95.56
-9	11.99	1.02	0	0	0	0	0	0	17.31
-12	3.03	0	0	0	0	0	0	0	3.69
-15	0.24	0	0	0	0	0	0	0	0.96
-20	0	0	0	0	0	0	0	0	0.08
-30	0	0	0	0	0	0	0	0	0
-40	0	0	0	0	0	0	0	0	0
-50	0	0	0	0	0	0	0	0	0
-60	0	0	0	0	0	0	0	0	0
-70	0	0	0	0	0	0	0	0	0
-80	0	0	0	0	0	0	0	0	0
-90	0	0	0	0	0	0	0	0	0
-100	0	0	0	0	0	0	0	0	0
FLIGHT HOURS & ALT	8.25	1.95	1.55	1.11	1.93	1.14	1.94	7.26	0.30
FLIGHT MILES & ALT	1509.00	468.11	473.05	419.35	770.93	480.15	669.28	3264.04	358.21
TOTAL FLIGHTS									25.93
TOTAL FLIGHT HOURS FLAPS UP AND DOWN									64
TOTAL FLIGHT MILES FLAPS UP AND DOWN									25.93
									8618.85

(a) U_{de} Level crossing counts per hour within pressure altitude bandsFigure 24.- U_{de} exceedances: Non-revenue flights.



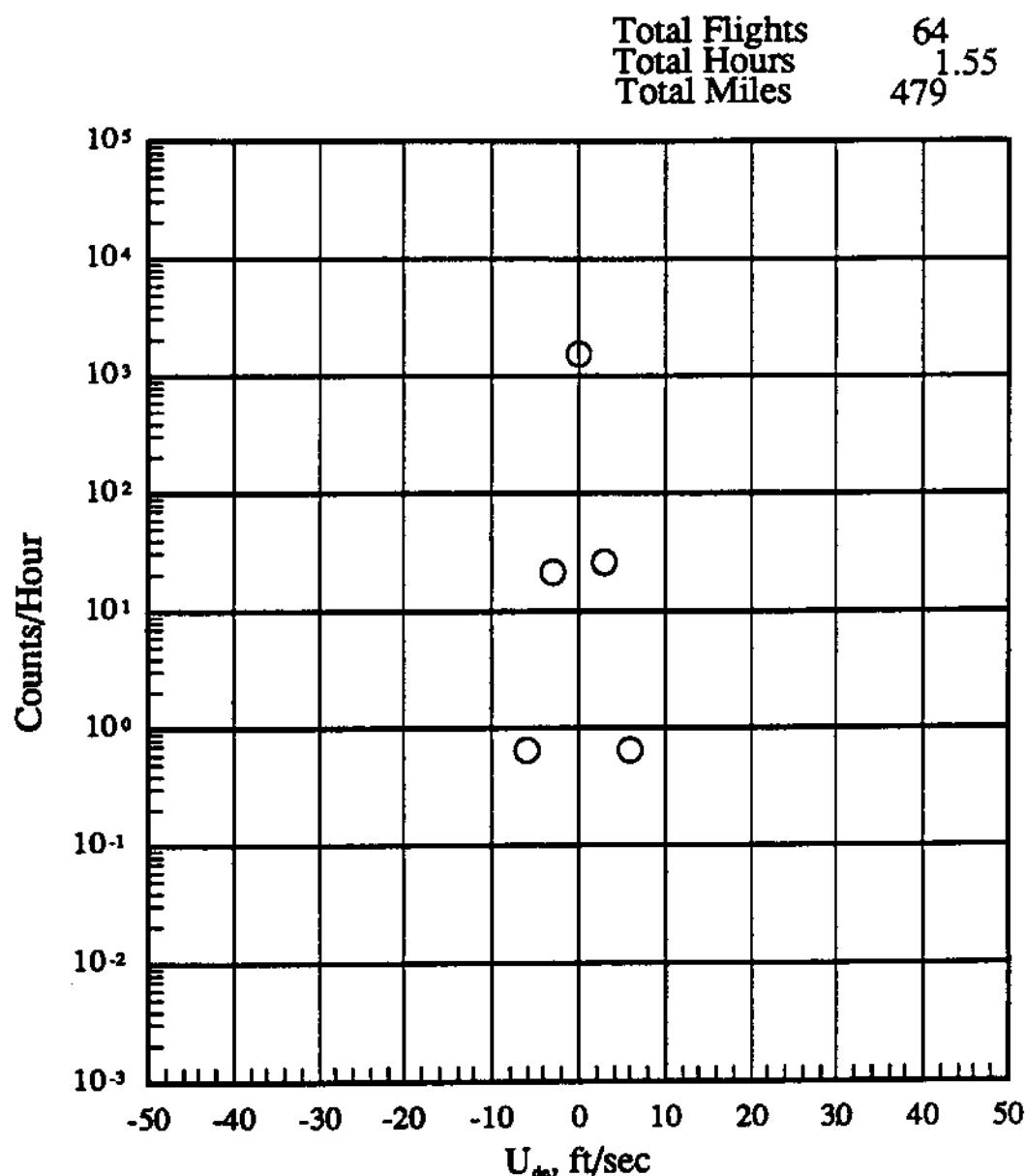
(b) -500 to 4500 feet altitude

Figure 24.- Continued.



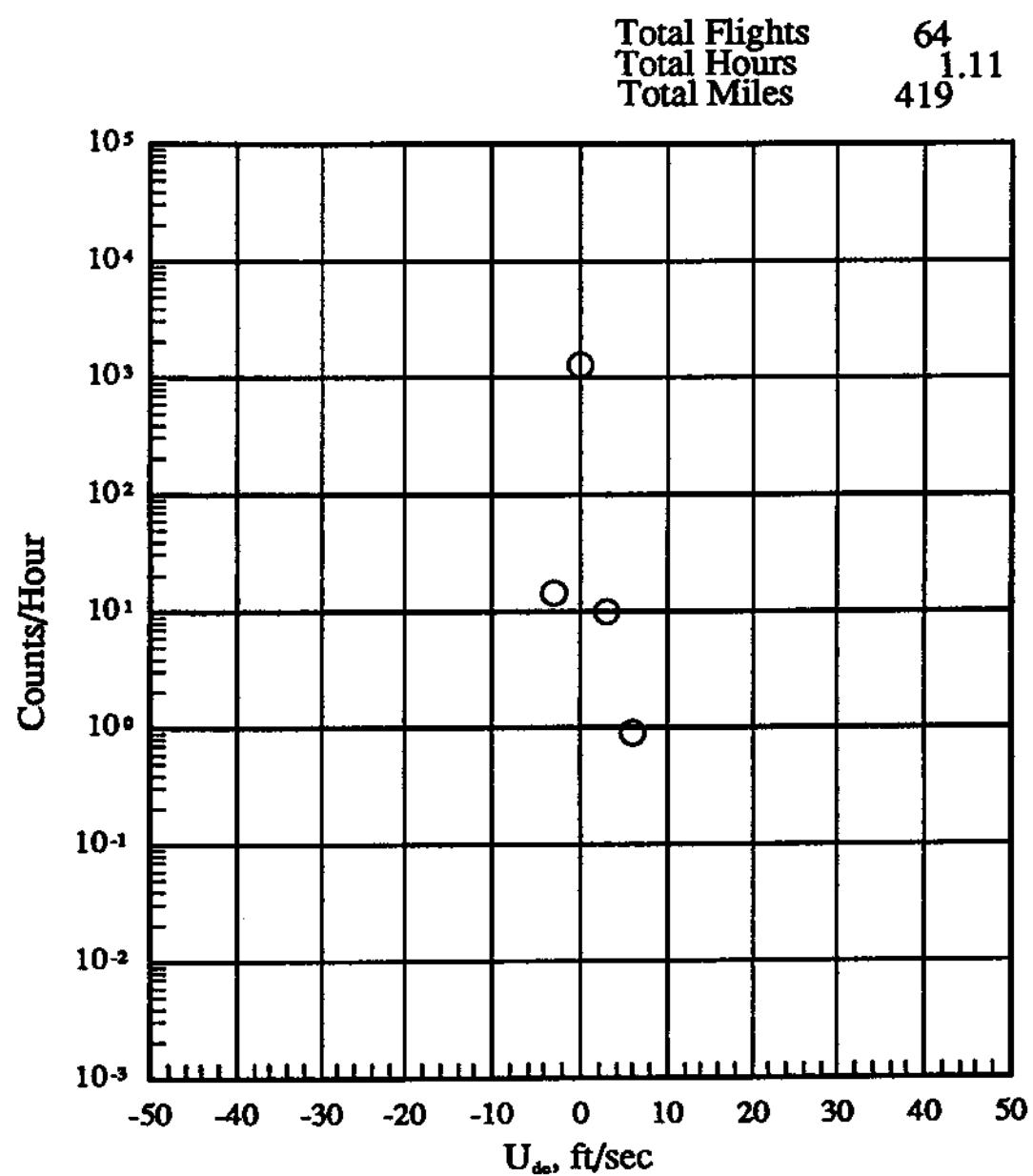
(c) 4500 to 9500 feet altitude

Figure 24.- Continued.



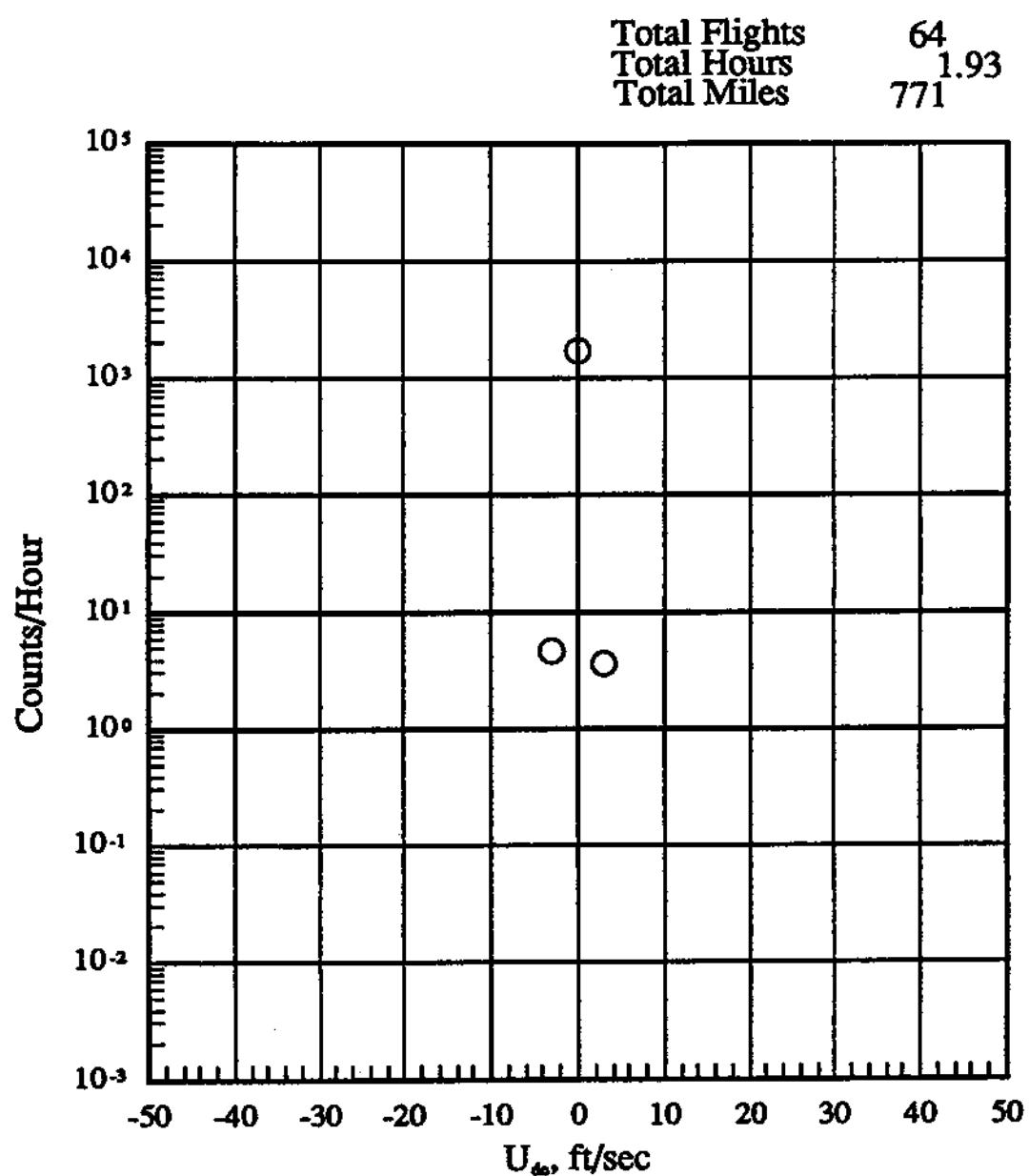
(d) 9500 to 14500 feet altitude

Figure 24.- Continued



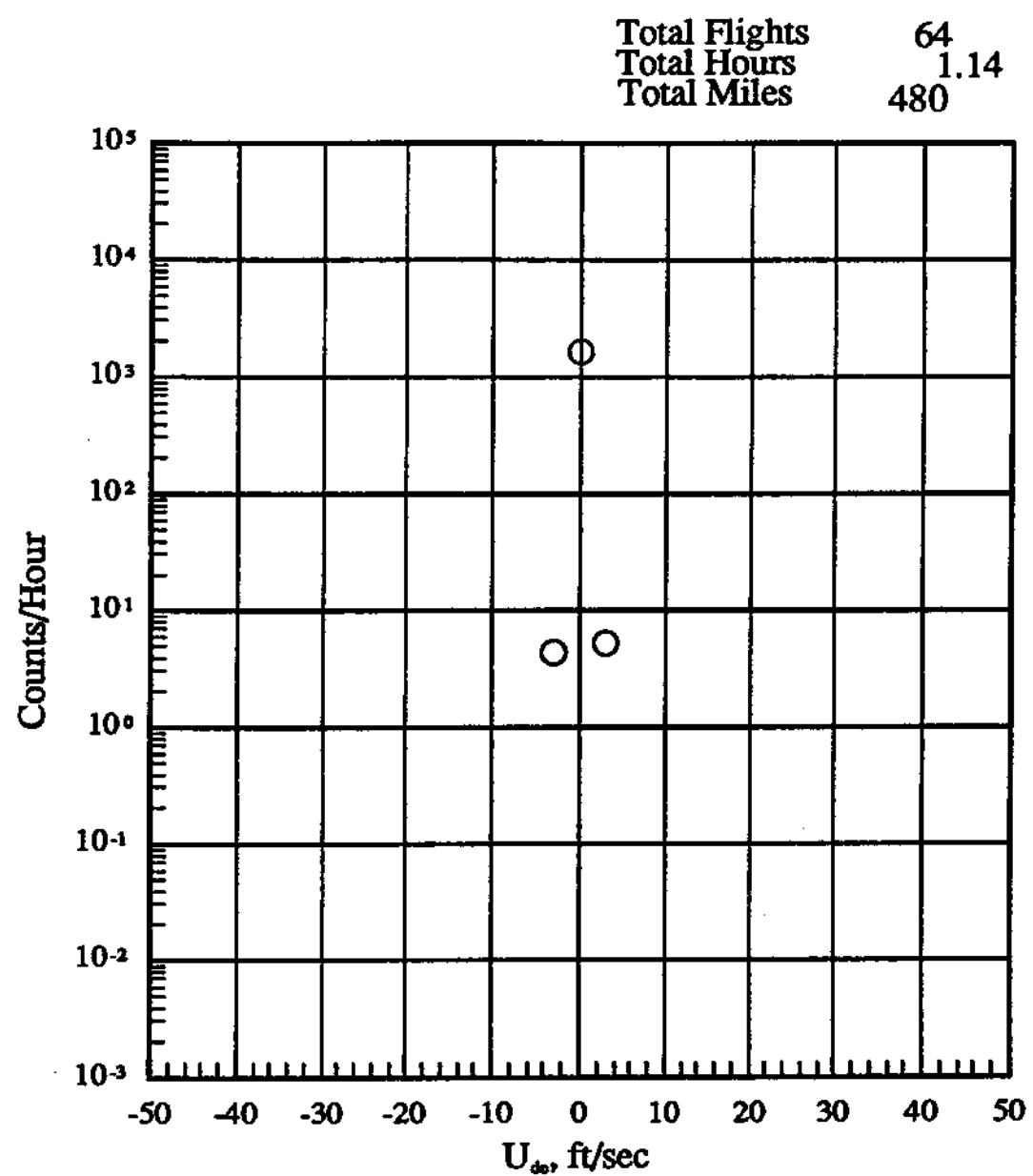
(e) 14500 to 19500 feet altitude

Figure 24.- Continued.



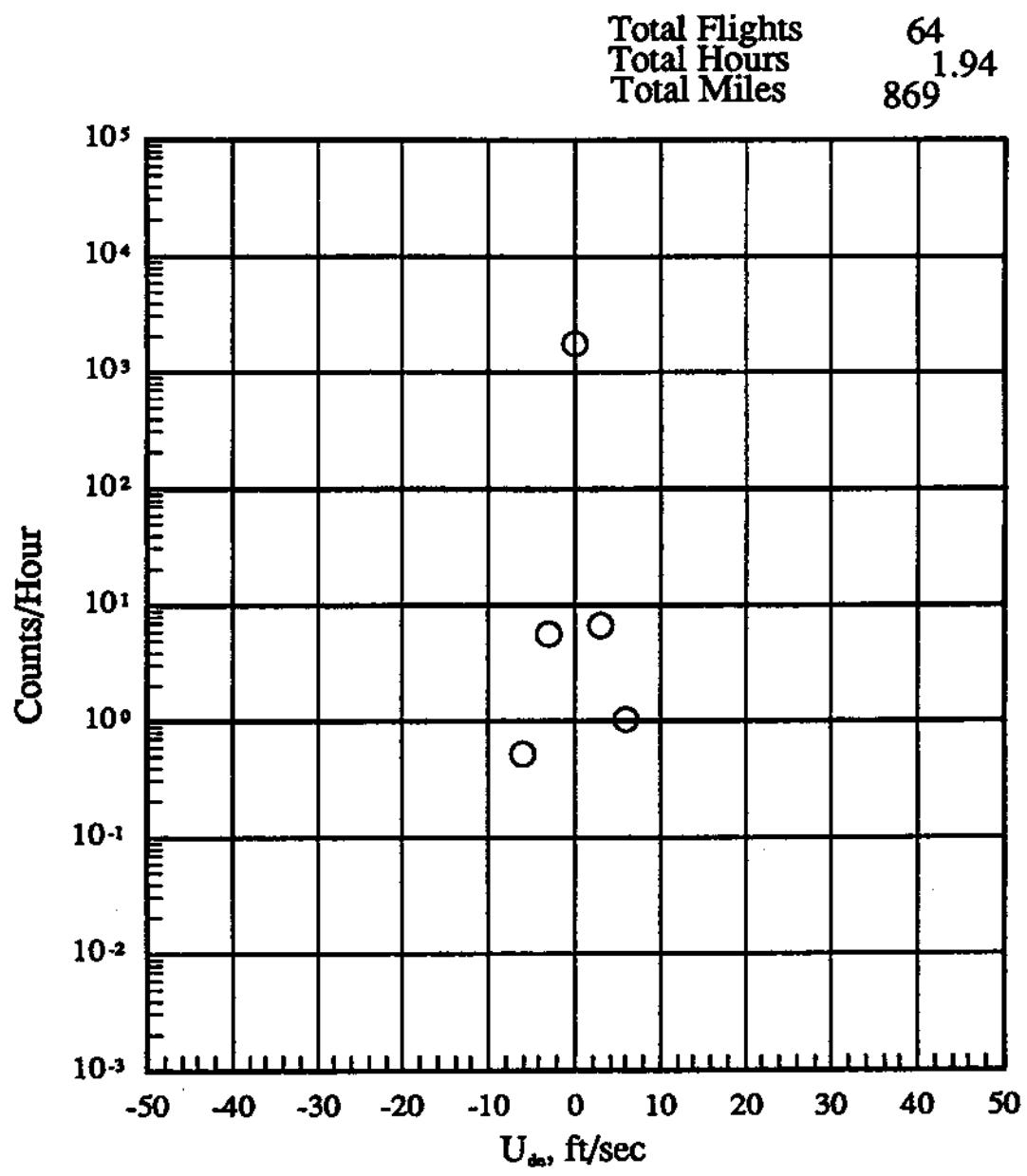
(f) 19500 to 24500 feet altitude

Figure 24.- Continued.



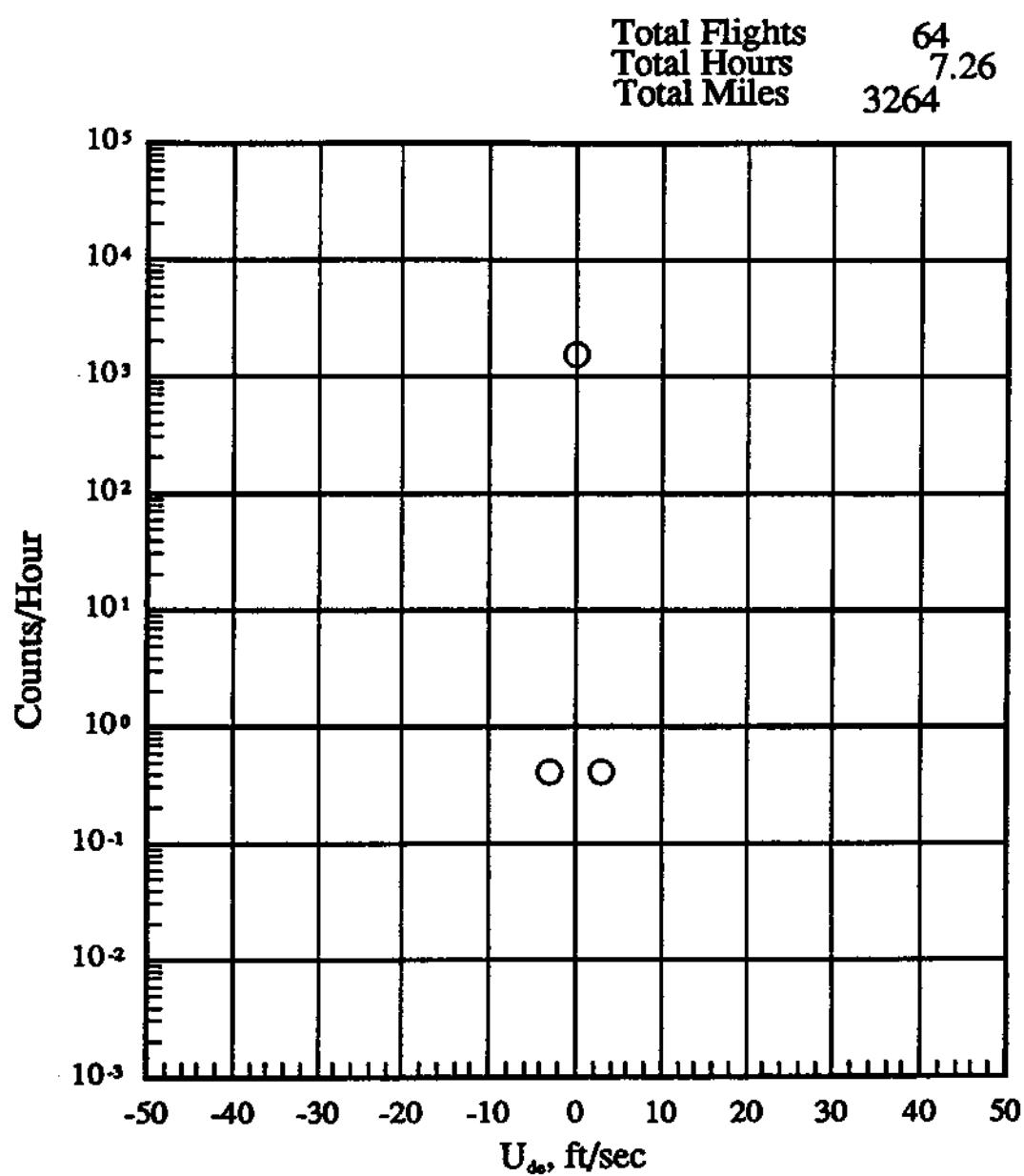
(g) 24500 to 29500 feet altitude

Figure 24.- Continued.



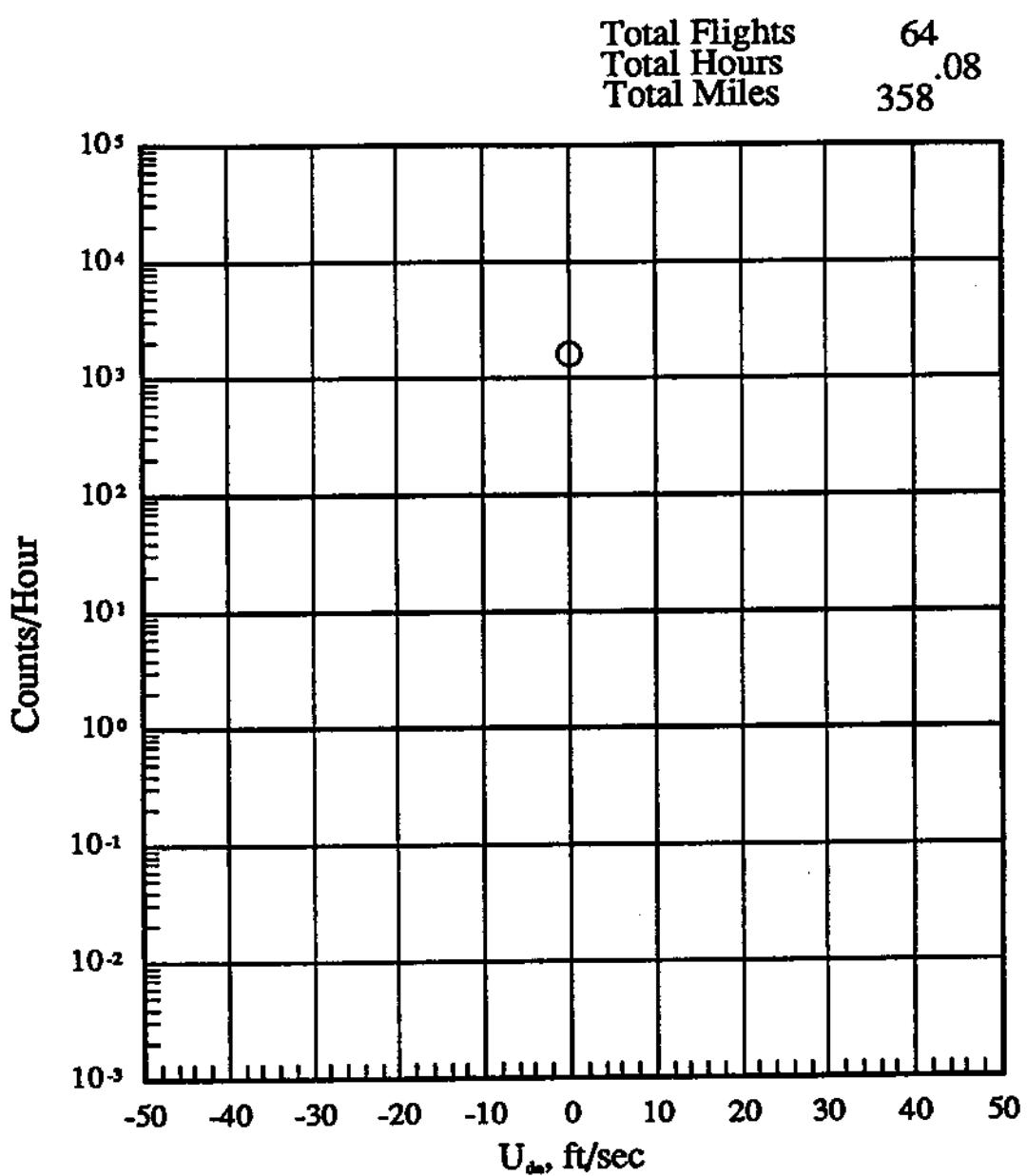
(h) 29500 to 34500 feet altitude

Figure 24.- Continued.



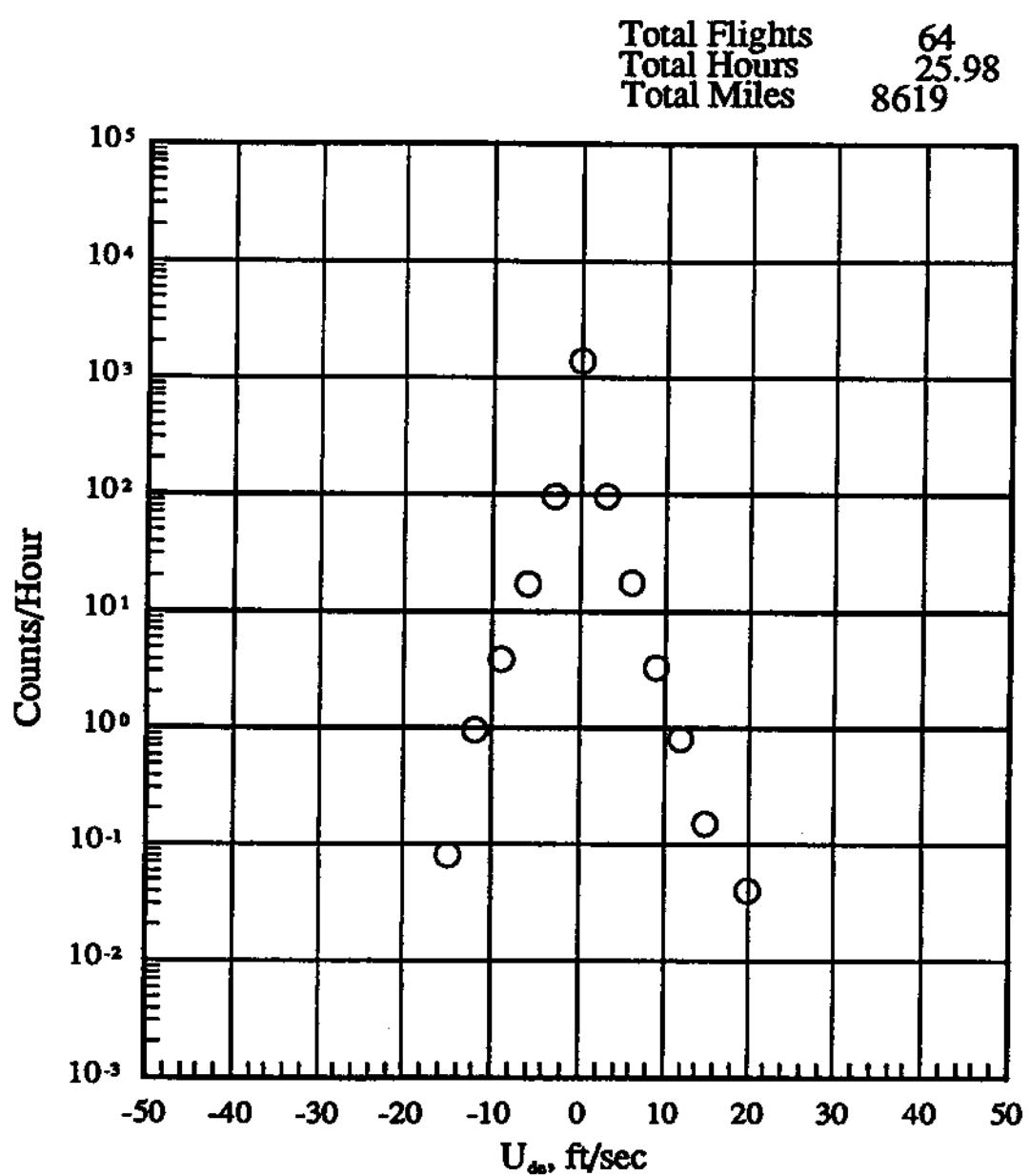
(i) 34500 to 39500 feet altitude

Figure 24.- Continued.



(j) 39500 to 44500 feet altitude

Figure 24.- Continued.



(k) -500 to 44500 feet altitude

Figure 24.- Concluded.

DATA FROM 223 HOURS & 146 FLIGHTS

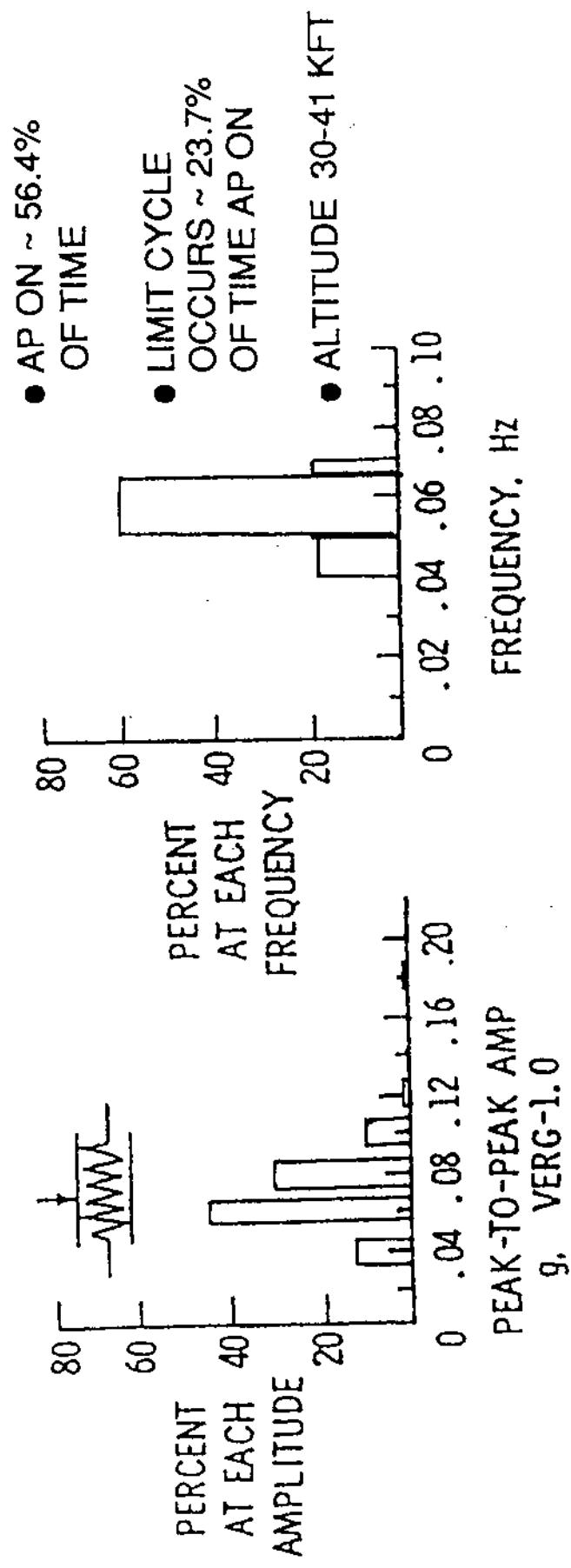


Figure 25.- Autopilot "limit cycle" experience.

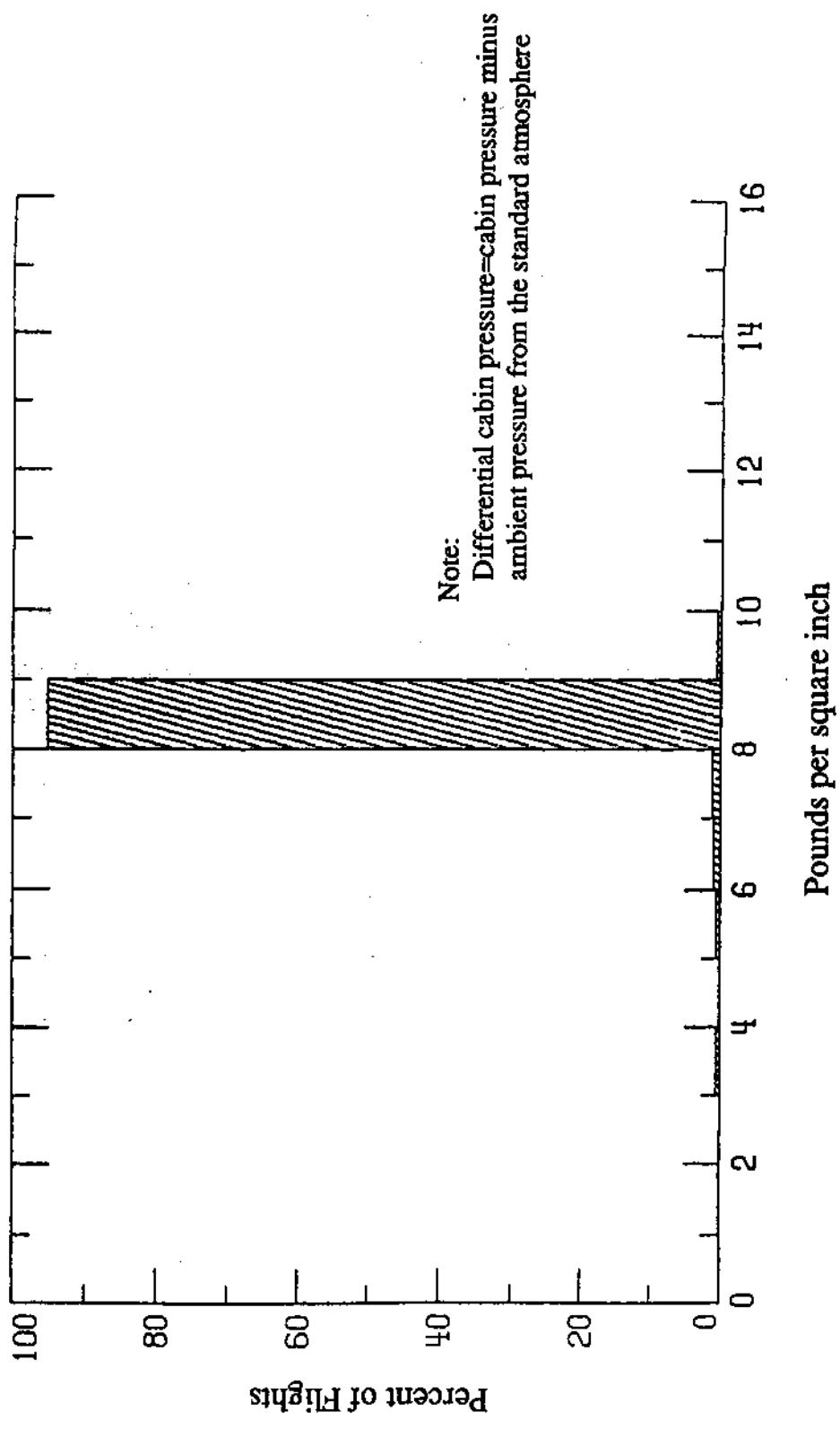


Figure 26.- Maximum differential cabin pressure per flight; Percent of flights.



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