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

## Volume II - L 1011 Data 1978-1979: 1619 HOURS

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# FOREWORD

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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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# THE NASA DIGITAL VGH PROGRAM-
# EXPLORATION OF METHODS AND FINAL RESULTS
# Volume II: L 1011 Data 1978-1979: 1619 Hours

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## SUMMARY

Data obtained from the Digital Flight Data Recorder system of a L 1011 aircraft in 914 flights and 1619 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 23 hours on nonrevenue flights.

## INTRODUCTION

This document presents the results of the NASA DVGH Program obtained during 1978-1979 operations of a Lockheed L 1011 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 thcse reported in Volume I. However, this report does contain additional data on autopilot usage and some limited acceleration-derived exceedance data obtained from non-revenue flights.

## AIRCRAFT AND INSTRUMENTATION

### Aircraft

The aircraft was a Lockheed L 1011 as in Volume I. Aircraft characteristics used in the analysis are given in Table I; the configuration is shown in figure 1 with the location of the accelerometers as indicated.

### Instrumentation

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

| Parameter | Range and Units | Samples per Second |
|---|---|---|
| $a_n + 1$ | -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 | $-5^\circ$ to $60^\circ$ | 1 |
| Autopilot Status | Off or On | Discrete |

Note that Spoiler data are not reported here, although they were in Volume I.

## SCOPE OF DATA

Data were collected from a single aircraft operating in regular airline service over the service area shown in figure 2 during 1978 and 1979. Almost all of the data (914 flights and 1619 hours) were obtained during passenger-carrying revenue service; a

small amount (56 flights and 23 hours) was obtained during non-revenue service (ferry flights mainly, although some training and maintenance flights may have been included). As in Volume I, some gaps in the data exist due to faulty or missing records, etc., but this is believed to be small (less than 10 percent of the number of flights).

## 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 the same since the data are for the same type of aircraft described in Volume 1. 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 through the autopilot status was being monitored in this investigation.

## RESULTS

### Flight Profile and Acceleration Derived Statistics

Presentation of Flight Profile Statistics results is similar to that described in Volume I. 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 during flap retraction after lift off, and the conditions existing during flap deflection before landing are given.

Acceleration Derived Statistics are also presented as in Volume I, except that with Flaps Deflected, the maximum $a_n$ and Equivalent Airspeeds during that part of the flight 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 ferry, training, and maintenance 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

Autopilot status was monitored as off, or on, without regard to the exact on-mode. The altitudes for autopilot turn-on during climb, turn-off during descent, and percent-of-time and percent-of-flights it was on are given in figure 25. The characteristics of a low amplitude oscillation in normal acceleration that appears sporadically in cruise, as first reported in Volume I, are summarized in figure 26. This phenomenon is believed to be due to off-nominal autopilot operation in the altitude-hold mode. The presence of such a low-frequency resonance was predicted in reference 13. Figure 27 shows normal acceleration power spectra

with autopilot off and on. It can be seen that the effect of the autopilot operation is to shift the gust response of aircraft to a higher frequency, that is from 0.35 Hz to 0.8 Hz in this example as predicted in reference 13. Reference 13 also indicates that another effect of the autopilot is a reduction in the gust response by 10 to 25 percent. However, these autopilot effects were not factored into the $U_{de}$ transfer function in this analyses in order to maintain comparability with the previous VGH results.

## CONCLUDING REMARKS

Data obtained from the Digital Flight Data Recorder system of an L 1011 aircraft in 914 flights and 1619 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 23 hours on non-revenue flights. No general discussion of the data is presented.

TABLE I

LOCKHEED L 1011-1 CHARACTERISTICS USED IN THE ANALYSIS

- Geometrical Characteristics
  - Wing Area S = 3456 $ft^2$
  - Wing Mean Chord = 22.3 ft

- Lift Curve Slope $C_{L_\alpha}$ per degree

Flaps up = f(M, HP)

| M | HP = 0 | 10kft | 20kft | 40 kft |
|---|---|---|---|---|
| .20 | .0923 | .0928 | .0929 | .0936 |
| .35 | .0923 | .0928 | .0930 | .0938 |
| .50 | .0913 | .0920 | .0929 | .0946 |
| .60 | .0918 | .0928 | .0940 | .0963 |
| .70 | .0940 | .0954 | .0970 | .1003 |
| .80 | -- | .1038 | .1058 | .1100 |
| .89 | -- | .1210 | .1240 | .1305 |
| .91 | -- | -- | .1227 | .1286 |
| .95 | -- | -- | .1030 | .1081 |

Flaps Down = f(FLP)

| FLP, deg | HP = 0 |
|---|---|
| 0 | .0925 |
| 4 | .0973 |
| 10 | .0980 |
| 18 | .0975 |
| 22 | .0971 |
| 27 | .0962 |
| 33 | .0948 |
| 45 | .0912 |

- Weight was computed linearly with time from take off 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 | 27-33 |
| 10 | Flap Deflection Times | 34-36 |
| 11 | Equivalent Airspeeds and Detents | 37 |
| 12 | Flap Use above 10,000 ft | 38-39 |

TABLE II (continued)

ACCELERATION DERIVED STATISTICS

o ENTIRE FLIGHTS


| Figure Number | Subject | Page Numbers |
|---|---|---|
| 13 | Normal Acceleration Exceedances | |
| (a) | $a_n$ matrix | 40 |
| (b) | $a_{nM}$ matrix | 41 |
| (c) | $a_{nG}$ matrix | 42 |
| (d)-(k) | $a_n$, $a_{nM}$, $a_{nG}$ plots | 43-52 |
| 14 | Lateral Acceleration Exceedances | |
| (a) | $a_y$ matrix | 53 |
| (b)-(k) | $a_y$ plots | 54-63 |
| 15 | $U_{de}$ Exceedances | |
| (a) | $U_{de}$ matrix | 64 |
| (b)-(k) | $U_{de}$ plots | 65-74 |
| 16 | Peak Positive and Negative $a_n$ vs. Altitude | |
| (a) | $a_n$ matrix | 75 |
| (b)-(k) | $a_n$ plots | 76-85 |
| 17 | Peak Positive and Negative $a_{nM}$ vs. Altitude | |
| (a) | $a_{nM}$ matrix | 86 |
| (b)-(k) | $a_{nM}$ plots | 87-96 |
| 18 | Peak Positive and Negative $a_{nG}$ vs. Altitude | |
| (a) | $a_{nG}$ matrix | 97 |
| (b)-(k) | $a_{nG}$ plots | 98-107 |

TABLE II (concluded)


19 Peak Positive and Negative $U_{de}$ vs. Altitude

(a) $U_{de}$ matrix 108

(b)-(k) $U_{de}$ plots 109-118

o FLAPS DEFLECTED

Figure Number Subject Page Numbers

20 $a_n$ Exceedances with Flaps Deflected

(a) Take Off Detents matrix 119

(b) Take Off Detents plot 120

(c) Landing Detents matrix 121

(d) Landing Detents plot 122

21 Peak Positive and Negative $a_n$ per flight and EAS bands

(a)-(d) Take Off Detents 123-126

(e)-(k) Landing Detents 127-133

o NON-REVENUE FLIGHTS

Figure Number Subject Page Numbers

22 Normal Acceleration Exceedances

(a) $a_n$ matrix 134

(b) $a_{nM}$ matrix 135

(c) $a_{nG}$ matrix 136

(d) $a_n$, $a_{nM}$, $a_{nG}$ plots 137-146

23 Lateral Acceleration Exceedances

(a) $a_y$ matrix 147

(b)-(k) $a_y$ plots 148-157

24 $U_{de}$ Exceedances

(a) $U_{de}$ matrix 158

(b)-(k) $U_{de}$ plots 159-168

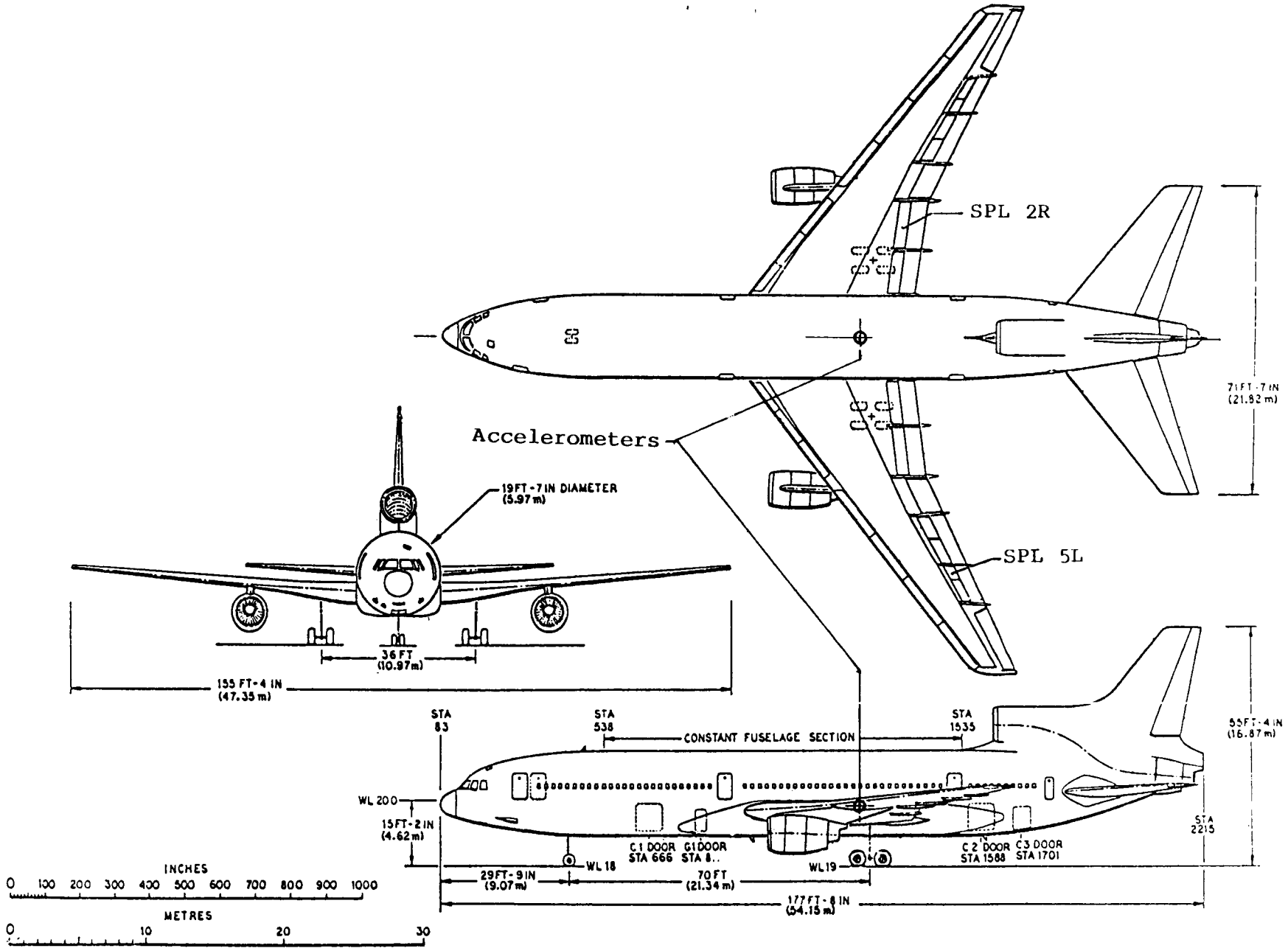
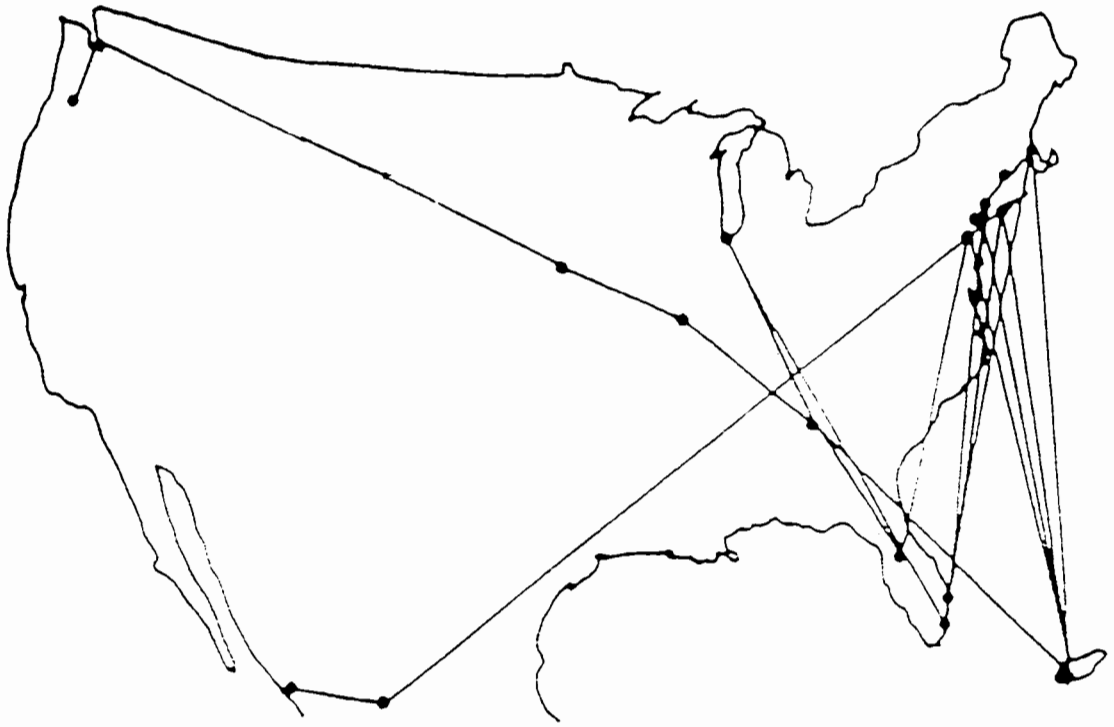



FIGURE 1.- Aircraft three-view with locations of accelerometers and spoilers.



MARCH 1978 - JULY 1979

914 FLIGHTS

1619 HOURS

700,000 N. MILES

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

PERCENT OF FLIGHTS

| DURATION OF FLIGHT, HOURS | 250 TO 270 KLBS | 270 TO 290 KLBS | 290 TO 310 KLBS | 310 TO 330 KLBS | 330 TO 350 KLBS | 350 TO 370 KLBS | 370 TO 390 KLBS | 390 TO 410 KLBS | 410 TO 430 KLBS |
|---|---|---|---|---|---|---|---|---|---|
| 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 | 0.1 | 0.1 | 0 |
| 4.5-5.0 | 0 | 0 | 0 | 0 | 0 | 0.1 | 0.1 | 0.3 | 0.2 |
| 4.0-4.5 | 0 | 0 | 0 | 0 | 0 | 0.2 | 0.8 | 1.0 | 0.1 |
| 3.5-4.0 | 0 | 0 | 0 | 0 | 0 | 0.7 | 1.3 | 1.6 | 0.7 |
| 3.0-3.5 | 0 | 0 | 0 | 0 | 0.1 | 1.5 | 3.8 | 3.0 | 0.4 |
| 2.5-3.0 | 0 | 0 | 0 | 0.1 | 0.8 | 1.9 | 3.4 | 2.6 | 0.2 |
| 2.0-2.5 | 0 | 0 | 0 | 1.3 | 3.9 | 6.2 | 4.9 | 0.5 | 0 |
| 1.5-2.0 | 0 | 0 | 0.1 | 1.1 | 3.6 | 3.9 | 2.5 | 0.1 | 0 |
| 1.0-1.5 | 0 | 0 | 0.5 | 2.4 | 4.9 | 6.0 | 1.5 | 0 | 0 |
| .8-1.0 | 0 | 0 | 0.2 | 1.4 | 2.7 | 1.4 | 0 | 0 | 0 |
| .6-.8 | 0 | 0 | 0.5 | 1.9 | 1.2 | 0.7 | 0 | 0 | 0 |
| .5-.6 | 0 | 0 | 1.4 | 2.2 | 2.2 | 0.9 | 0 | 0 | 0 |
| .4-.5 | 0 | 0.3 | 1.6 | 2.6 | 1.4 | 0.5 | 0 | 0 | 0 |
| .3-.4 | 0 | 0.3 | 1.9 | 2.5 | 1.5 | 0 | 0 | 0 | 0 |
| .0-.3 | 0 | 0.2 | 0.5 | 0.7 | 0.1 | 0 | 0 | 0 | 0 |
| TOTAL PERCENTS, ALL FLIGHTS | 0 | 0.9 | 6.9 | 16.2 | 22.5 | 24.1 | 18.5 | 9.3 | 1.6 |

(a) Gross weight at take off

Figure 3.- Percent of flights: Weight vs duration.

PERCENT OF FLIGHTS

| DURATION OF FLIGHT, HOURS | 250 TO 270 KLBS | 270 TO 290 KLBS | 290 TO 310 KLBS | 310 TO 330 KLBS | 330 TO 350 KLBS | 350 TO 370 KLBS | 370 TO 390 KLBS | 390 TO 410 KLBS | 410 TO 430 KLBS |
|---|---|---|---|---|---|---|---|---|---|
| 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 | 0.1 | 0.1 | 0 | 0 | 0 | 0 | 0 |
| 4.5-5.0 | 0 | 0.1 | 0.1 | 0.3 | 0.2 | 0 | 0 | 0 | 0 |
| 4.0-4.5 | 0 | 0 | 0.5 | 1.1 | 0.4 | 0 | 0 | 0 | 0 |
| 3.5-4.0 | 0 | 0 | 0.4 | 2.2 | 1.5 | 0.1 | 0 | 0 | 0 |
| 3.0-3.5 | 0 | 0.1 | 0.5 | 4.2 | 3.6 | 0.4 | 0 | 0 | 0 |
| 2.5-3.0 | 0 | 0.1 | 1.4 | 2.4 | 4.5 | 0.5 | 0 | 0 | 0 |
| 2.0-2.5 | 0 | 1.0 | 3.3 | 6.2 | 5.7 | 0.8 | 0 | 0 | 0 |
| 1.5-2.0 | 0 | 0.7 | 1.5 | 4.3 | 4.3 | 0.7 | 0 | 0 | 0 |
| 1.0-1.5 | 0 | 0.4 | 2.7 | 4.9 | 6.1 | 1.2 | 0 | 0 | 0 |
| .8-1.0 | 0 | 0.2 | 0.4 | 3.2 | 2.0 | 0 | 0 | 0 | 0 |
| .6-.8 | 0 | 0.1 | 1.5 | 1.4 | 1.2 | 0 | 0 | 0 | 0 |
| .5-.6 | 0 | 0.3 | 2.3 | 2.2 | 1.3 | 0.5 | 0 | 0 | 0 |
| .4-.5 | 0 | 0.8 | 2.2 | 2.1 | 1.3 | 0.2 | 0 | 0 | 0 |
| .3-.4 | 0 | 0.5 | 2.5 | 2.1 | 1.1 | 0 | 0 | 0 | 0 |
| .0-.3 | 0 | 0.2 | 0.5 | 0.7 | 0.1 | 0 | 0 | 0 | 0 |
| TOTAL PERCENTS, ALL FLIGHTS | 0 | 4.6 | 20.2 | 37.3 | 33.4 | 4.5 | 0 | 0 | 0 |

(b) Gross weight at landing

Figure 3.- Continued.

PERCENT OF FLIGHTS

| DURATION OF FLIGHT, HOURS | 10 TO 30 KLBS | 30 TO 50 KLBS | 50 TO 70 KLBS | 70 TO 90 KLBS | 90 TO 110 KLBS | 110 TO 130 KLBS | 130 TO 150 KLBS | 150 TO 170 KLBS | 170 TO 190 KLBS |
|---|---|---|---|---|---|---|---|---|---|
| 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 | 0.1 | 0.1 | 0 | 0 | 0 |
| 4.5-5.0 | 0 | 0 | 0 | 0 | 0.3 | 0.4 | 0 | 0 | 0 |
| 4.0-4.5 | 0 | 0 | 0 | 0 | 1.8 | 0.3 | 0 | 0 | 0 |
| 3.5-4.0 | 0 | 0 | 0 | 1.2 | 3.0 | 0.1 | 0 | 0 | 0 |
| 3.0-3.5 | 0 | 0 | 0 | 6.6 | 2.3 | 0 | 0 | 0 | 0 |
| 2.5-3.0 | 0 | 0 | 1.1 | 6.8 | 1.1 | 0 | 0 | 0 | 0 |
| 2.0-2.5 | 0 | 0 | 13.0 | 3.5 | 0.4 | 0 | 0 | 0 | 0 |
| 1.5-2.0 | 0 | 0.1 | 8.8 | 2.2 | 0.3 | 0 | 0 | 0 | 0 |
| 1.0-1.5 | 0 | 4.6 | 9.8 | 1.0 | 0 | 0 | 0 | 0 | 0 |
| .8-1.0 | 0 | 3.2 | 2.2 | 0.4 | 0 | 0 | 0 | 0 | 0 |
| .6-.8 | 0 | 2.3 | 2.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .5-.6 | 0 | 4.0 | 2.0 | 0.7 | 0 | 0 | 0 | 0 | 0 |
| .4-.5 | 0 | 4.4 | 2.0 | 0.2 | 0 | 0 | 0 | 0 | 0 |
| .3-.4 | 0.2 | 3.9 | 2.1 | 0 | 0 | 0 | 0 | 0 | 0 |
| .0-.3 | 0.3 | 0.7 | 0.5 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL PERCENTS, ALL FLIGHTS | 0.5 | 23.2 | 43.4 | 22.5 | 9.3 | 1.0 | 0 | 0 | 0 |

(c) Fuel weight at take off

Figure 3.- Continued.

PERCENT OF FLIGHTS

| DURATION OF FLIGHT, HOURS | 10 TO 30 KLBS | 30 TO 50 KLBS | 50 TO 70 KLBS | 70 TO 90 KLBS | 90 TO 110 KLBS | 110 TO 130 KLBS | 130 TO 150 KLBS | 150 TO 170 KLBS | 170 TO 190 KLBS |
|---|---|---|---|---|---|---|---|---|---|
| 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 | 0.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.5-5.0 | 0.2 | 0.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.0-4.5 | 1.1 | 1.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.5-4.0 | 2.3 | 2.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.0-3.5 | 4.0 | 4.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.5-3.0 | 4.2 | 4.4 | 0.4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.0-2.5 | 11.3 | 5.0 | 0.7 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.5-2.0 | 4.6 | 5.5 | 1.3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.0-1.5 | 5.4 | 9.1 | 1.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .8-1.0 | 1.4 | 3.8 | 0.5 | 0 | 0 | 0 | 0 | 0 | 0 |
| .6-.8 | 1.1 | 2.5 | 0.7 | 0 | 0 | 0 | 0 | 0 | 0 |
| .5-.6 | 1.6 | 3.6 | 0.9 | 0.5 | 0 | 0 | 0 | 0 | 0 |
| .4-.5 | 1.0 | 4.4 | 1.0 | 0.2 | 0 | 0 | 0 | 0 | 0 |
| .3-.4 | 1.1 | 3.7 | 1.4 | 0 | 0 | 0 | 0 | 0 | 0 |
| .0-.3 | 0.3 | 0.7 | 0.5 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL PERCENTS, ALL FLIGHTS | 39.8 | 51.0 | 8.4 | 0.8 | 0 | 0 | 0 | 0 | 0 |

(d) Fuel weight at landing

Figure 3.- Continued.

PERCENT OF FLIGHTS

| DURATION OF FLIGHT, HOURS | 0 TO 20 KLBS | 20 TO 40 KLBS | 40 TO 60 KLBS | 60 TO 80 KLBS | 80 TO 100 KLBS | 100 TO 120 KLBS | 120 TO 140 KLBS | 140 TO 160 KLBS | 160 TO 180 KLBS |
|---|---|---|---|---|---|---|---|---|---|
| 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 | 0.2 | 0 | 0 | 0 | 0 |
| 4.5-5.0 | 0 | 0 | 0 | 0.5 | 0.2 | 0 | 0 | 0 | 0 |
| 4.0-4.5 | 0 | 0 | 0 | 2.0 | 0.1 | 0 | 0 | 0 | 0 |
| 3.5-4.0 | 0 | 0 | 0.8 | 3.5 | 0 | 0 | 0 | 0 | 0 |
| 3.0-3.5 | 0 | 0 | 7.9 | 1.0 | 0 | 0 | 0 | 0 | 0 |
| 2.5-3.0 | 0 | 0.7 | 8.3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.0-2.5 | 0 | 13.7 | 3.3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.5-2.0 | 0 | 11.3 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.0-1.5 | 5.9 | 9.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .8-1.0 | 5.7 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .6-.8 | 4.3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .5-.6 | 6.7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .4-.5 | 6.6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .3-.4 | 6.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .0-.3 | 1.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL PERCENTS, ALL FLIGHTS | 36.9 | 35.2 | 20.4 | 7.0 | 0.5 | 0 | 0 | 0 | 0 |

(e) Fuel burn vs flight duration

Figure 3.- Continued.

PERCENT OF FLIGHTS

| DURATION OF FLIGHT, HOURS | 0 TO 20 KLBS | 20 TO 40 KLBS | 40 TO 60 KLBS | 60 TO 80 KLBS | 80 TO 100 KLBS | 100 TO 120 KLBS | 120 TO 140 KLBS | 140 TO 160 KLBS | 160 TO 180 KLBS |
|---|---|---|---|---|---|---|---|---|---|
| 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 | 0.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.5-5.0 | 0.1 | 0.3 | 0.3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.0-4.5 | 0.2 | 0.8 | 1.0 | 0.1 | 0 | 0 | 0 | 0 | 0 |
| 3.5-4.0 | 0 | 0.9 | 2.3 | 1.1 | 0 | 0 | 0 | 0 | 0 |
| 3.0-3.5 | 0.1 | 2.4 | 4.0 | 2.3 | 0 | 0 | 0 | 0 | 0 |
| 2.5-3.0 | 0.1 | 2.4 | 3.9 | 2.5 | 0 | 0 | 0 | 0 | 0 |
| 2.0-2.5 | 1.8 | 5.0 | 6.7 | 3.5 | 0 | 0 | 0 | 0 | 0 |
| 1.5-2.0 | 1.1 | 3.7 | 4.9 | 1.6 | 0 | 0 | 0 | 0 | 0 |
| 1.0-1.5 | 1.4 | 4.6 | 5.4 | 4.0 | 0 | 0 | 0 | 0 | 0 |
| .8-1.0 | 0.4 | 2.0 | 3.2 | 0.2 | 0 | 0 | 0 | 0 | 0 |
| .6-.8 | 1.3 | 1.5 | 1.1 | 0.3 | 0 | 0 | 0 | 0 | 0 |
| .5-.6 | 2.8 | 1.8 | 1.8 | 0.3 | 0 | 0 | 0 | 0 | 0 |
| .4-.5 | 2.6 | 2.6 | 1.2 | 0.1 | 0 | 0 | 0 | 0 | 0 |
| .3-.4 | 2.8 | 2.5 | 0.8 | 0.1 | 0 | 0 | 0 | 0 | 0 |
| .0-.3 | 1.1 | 0.2 | 0.2 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL PERCENTS, ALL FLIGHTS | 16.0 | 31.0 | 36.8 | 16.3 | 0 | 0 | 0 | 0 | 0 |

(f) Payload weight vs flight duration.

Figure 3.- Concluded.

PRESSURE ALTITUDE BANDS

| GROSS WEIGHT KLBS | -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 |
|---|---|---|---|---|---|---|---|---|---|---|
| ***CLIMB*** | | | | | | | | | | |
| 250-270 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 270-290 | 0.0163 | 0.0097 | 0.0056 | 0.0026 | 0.0006 | 0 | 0 | 0 | 0 | 0.0347 |
| 290-310 | 0.1037 | 0.1176 | 0.1110 | 0.0812 | 0.0547 | 0.0447 | 0.0499 | 0.0413 | 0.0099 | 0.6140 |
| 310-330 | 0.2683 | 0.3059 | 0.3629 | 0.3093 | 0.2991 | 0.3770 | 0.4765 | 0.2901 | 0.0069 | 2.6961 |
| 330-350 | 0.4056 | 0.4321 | 0.5335 | 0.4886 | 0.5379 | 0.6953 | 0.8288 | 0.4155 | 0 | 4.3373 |
| 350-370 | 0.4645 | 0.5076 | 0.6480 | 0.6441 | 0.8088 | 1.1113 | 1.4090 | 0.6716 | 0 | 6.2650 |
| 370-390 | 0.3895 | 0.4014 | 0.4882 | 0.4780 | 0.6133 | 0.8607 | 1.0575 | 0.2857 | 0 | 4.5743 |
| 390-410 | 0.2076 | 0.1971 | 0.2363 | 0.2370 | 0.2925 | 0.3668 | 0.3950 | 0.0342 | 0 | 1.9664 |
| 410-430 | 0.0381 | 0.0371 | 0.0441 | 0.0320 | 0.0367 | 0.0279 | 0.0157 | 0 | 0 | 0.2316 |
| PERCENT TOTAL TIME = | 1.8937 | 2.0084 | 2.4296 | 2.2726 | 2.6436 | 3.4838 | 4.2324 | 1.7384 | 0.0169 | 20.7194 |
| AVE GROSS WEIGHT IN ALTITUDE BAND | 355.78 | 354.74 | 355.71 | 357.25 | 360.05 | 360.54 | 359.83 | 351.19 | 308.23 | |
| ***LEVEL*** | | | | | | | | | | |
| 250-270 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 270-290 | 0.0493 | 0.1229 | 0.0305 | 0.0081 | 0.0110 | 0.0069 | 0.0050 | 0.0692 | 0.0110 | 0.3141 |
| 290-310 | 0.2012 | 0.2475 | 0.2592 | 0.0722 | 0.1831 | 0.1105 | 0.0804 | 1.7220 | 0.1396 | 3.0158 |
| 310-330 | 0.3938 | 0.3934 | 0.6388 | 0.2421 | 0.1971 | 0.3003 | 0.6058 | 7.5552 | 0.0244 | 10.3509 |
| 330-350 | 0.3632 | 0.4346 | 0.4546 | 0.2157 | 0.2765 | 0.4818 | 2.1031 | 14.8063 | 0 | 19.1359 |
| 350-370 | 0.0659 | 0.0807 | 0.1402 | 0.0763 | 0.1035 | 0.4437 | 3.7598 | 14.1293 | 0 | 18.7994 |
| 370-390 | 0 | 0.0201 | 0.0022 | 0 | 0.0045 | 0.1727 | 3.0682 | 4.5582 | 0 | 7.8258 |
| 390-410 | 0.0016 | 0.0055 | 0.0014 | 0 | 0.0011 | 0 | 0.7742 | 0.5306 | 0 | 1.3145 |
| 410-430 | 0 | 0.0012 | 0 | 0 | 0 | 0 | 0.0797 | 0 | 0 | 0.0810 |
| PERCENT TOTAL TIME = | 1.0751 | 1.3059 | 1.5269 | 0.6145 | 0.7769 | 1.5160 | 10.4763 | 43.3707 | 0.1751 | 60.8373 |
| AVE GROSS WEIGHT IN ALTITUDE BAND | 323.75 | 322.92 | 325.60 | 329.11 | 327.62 | 343.26 | 362.44 | 346.29 | 301.53 | |
| ***DESCENT*** | | | | | | | | | | |
| 250-270 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 270-290 | 0.2089 | 0.1166 | 0.0487 | 0.0294 | 0.0250 | 0.0218 | 0.0269 | 0.0153 | 0.0019 | 0.4945 |
| 290-310 | 0.8501 | 0.6147 | 0.4338 | 0.2600 | 0.2120 | 0.2045 | 0.1718 | 0.1069 | 0.0007 | 2.8546 |
| 310-330 | 1.6165 | 1.1890 | 0.9742 | 0.6359 | 0.5453 | 0.5677 | 0.5078 | 0.2760 | 0 | 6.3125 |
| 330-350 | 1.5097 | 1.2241 | 1.0400 | 0.7301 | 0.6966 | 0.7383 | 0.7115 | 0.2451 | 0 | 6.8953 |
| 350-370 | 0.2186 | 0.2113 | 0.2584 | 0.2216 | 0.2430 | 0.2725 | 0.3072 | 0.0856 | 0 | 1.8212 |
| 370-390 | 0 | 0.0023 | 0.0025 | 0.0019 | 0.0019 | 0.0115 | 0.0257 | 0.0186 | 0 | 0.0644 |
| 390-410 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0009 | 0 | 0.0009 |
| 410-430 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PERCENT TOTAL TIME = | 4.4038 | 3.3580 | 2.7577 | 1.8789 | 1.7238 | 1.8194 | 1.7509 | 0.7483 | 0.0026 | 18.4433 |
| AVE GROSS WEIGHT IN ALTITUDE BAND | 323.08 | 324.80 | 327.49 | 329.16 | 330.75 | 331.83 | 333.45 | 329.03 | 285.62 | |

| | |
|---|---|
| TOTAL FLIGHTS | 914 |
| TOTAL TIME | 1619.24 |
| TOTAL AIRMILES | 708383.64 |

$$\text{PERCENT TIME} = \frac{\text{HOURS IN ALTITUDE \& CLIMB (LEVEL, DESCENT) \& GROSS WEIGHT BANDS}}{\text{TOTAL TIME, HOURS}} \times 100$$

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

PRESSURE ALTITUDE BANDS

| CAS BAND, KTS | -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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 120-130 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 130-140 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 140-150 | 0.0001 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0001 |
| 150-160 | 0.0014 | 0.0003 | 0.0001 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0018 |
| 160-170 | 0.0111 | 0.0011 | 0.0004 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0126 |
| 170-180 | 0.0647 | 0.0028 | 0.0003 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0678 |
| 180-190 | 0.1742 | 0.0048 | 0.0003 | 0 | 0 | 0 | 0 | 0 | 0 | 0.1792 |
| 190-200 | 0.2351 | 0.0045 | 0.0003 | 0 | 0 | 0 | 0 | 0 | 0 | 0.2398 |
| 200-210 | 0.2121 | 0.0077 | 0.0043 | 0.0017 | 0 | 0 | 0 | 0 | 0 | 0.2257 |
| 210-220 | 0.2292 | 0.0144 | 0.0032 | 0.0007 | 0 | 0 | 0 | 0 | 0 | 0.2475 |
| 220-230 | 0.2565 | 0.0350 | 0.0040 | 0.0007 | 0 | 0 | 0.0006 | 0 | 0 | 0.2968 |
| 230-240 | 0.1894 | 0.0875 | 0.0102 | 0.0031 | 0.0008 | 0.0006 | 0.0011 | 0 | 0 | 0.2926 |
| 240-250 | 0.1855 | 0.4576 | 0.0980 | 0.0096 | 0.0024 | 0.0014 | 0.0016 | 0.0075 | 0.0015 | 0.7650 |
| 250-260 | 0.1952 | 0.7525 | 0.2293 | 0.0170 | 0.0040 | 0.0038 | 0.0057 | 0.0769 | 0.0122 | 1.2966 |
| 260-270 | 0.0582 | 0.1889 | 0.1632 | 0.0126 | 0.0047 | 0.0033 | 0.0231 | 0.3653 | 0.0031 | 0.8225 |
| 270-280 | 0.0242 | 0.0654 | 0.1602 | 0.0295 | 0.0132 | 0.0118 | 0.1180 | 0.7650 | 0 | 1.1872 |
| 280-290 | 0.0153 | 0.0446 | 0.1962 | 0.0830 | 0.0791 | 0.0936 | 0.7517 | 0.4611 | 0 | 1.7245 |
| 290-300 | 0.0143 | 0.0831 | 0.5243 | 0.7714 | 0.9290 | 1.2477 | 1.7773 | 0.0621 | 0 | 5.4092 |
| 300-310 | 0.0165 | 0.1335 | 0.6549 | 0.8712 | 1.0971 | 1.5036 | 1.3085 | 0.0006 | 0 | 5.5859 |
| 310-320 | 0.0071 | 0.0644 | 0.1914 | 0.2392 | 0.2831 | 0.3620 | 0.2172 | 0 | 0 | 1.3644 |
| 320-330 | 0.0031 | 0.0249 | 0.0811 | 0.1005 | 0.1112 | 0.1429 | 0.0266 | 0 | 0 | 0.4903 |
| 330-340 | 0.0005 | 0.0136 | 0.0441 | 0.0514 | 0.0532 | 0.0699 | 0.0011 | 0 | 0 | 0.2339 |
| 340-350 | 0 | 0.0138 | 0.0328 | 0.0415 | 0.0426 | 0.0382 | 0 | 0 | 0 | 0.1689 |
| 350-360 | 0 | 0.0079 | 0.0225 | 0.0323 | 0.0226 | 0.0045 | 0 | 0 | 0 | 0.0899 |
| 360-370 | 0 | 0.0002 | 0.0070 | 0.0072 | 0.0008 | 0.0002 | 0 | 0 | 0 | 0.0154 |
| 370-380 | 0 | 0 | 0.0014 | 0.0003 | 0 | 0 | 0 | 0 | 0 | 0.0018 |
| 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 | 222.1913 | 261.9649 | 291.8472 | 303.6753 | 304.1234 | 303.6186 | 296.7216 | 275.2610 | 255.9756 | |
| TOTAL HRS IN ALT.& CLIMB | 30.6635 | 32.5208 | 39.3414 | 36.7997 | 42.8065 | 56.4105 | 68.5331 | 28.1487 | 0.2733 | 335.4975 |
| PERCENT TIME, IN ALT.& CLIMB | 1.8937 | 2.0084 | 2.4296 | 2.2726 | 2.6436 | 3.4838 | 4.2324 | 1.7384 | 0.0169 | 20.7194 |

| | |
|---|---|
| TOTAL FLIGHTS | 914 |
| TOTAL HOURS | 1619.2 |

(a) Climb

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

PRESSURE ALTITUDE BANDS

| CAS BAND KTS | -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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 120-130 | 0.0001 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0001 |
| 130-140 | 0.0011 | 0.0002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0013 |
| 140-150 | 0.0105 | 0.0017 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0122 |
| 150-160 | 0.0741 | 0.0032 | 0.0010 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0784 |
| 160-170 | 0.1836 | 0.0230 | 0.0007 | 0 | 0 | 0 | 0 | 0 | 0 | 0.2073 |
| 170-180 | 0.1564 | 0.0439 | 0.0078 | 0 | 0 | 0 | 0 | 0 | 0 | 0.2080 |
| 180-190 | 0.1307 | 0.0395 | 0.0053 | 0 | 0 | 0 | 0 | 0 | 0 | 0.1755 |
| 190-200 | 0.0516 | 0.0169 | 0.0036 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0721 |
| 200-210 | 0.0539 | 0.0939 | 0.0242 | 0.0002 | 0 | 0 | 0 | 0 | 0 | 0.1722 |
| 210-220 | 0.0700 | 0.1691 | 0.1152 | 0.0010 | 0 | 0 | 0 | 0 | 0 | 0.3554 |
| 220-230 | 0.0541 | 0.0752 | 0.0817 | 0.0011 | 0.0067 | 0 | 0 | 0.0040 | 0 | 0.2229 |
| 230-240 | 0.0510 | 0.0645 | 0.0689 | 0.0025 | 0.0583 | 0.0135 | 0.0026 | 0.0165 | 0 | 0.2779 |
| 240-250 | 0.0641 | 0.2159 | 0.1361 | 0.0125 | 0.0126 | 0.0103 | 0.0039 | 0.0502 | 0.0062 | 0.5119 |
| 250-260 | 0.0792 | 0.2874 | 0.1978 | 0.0138 | 0.0253 | 0.0096 | 0.0014 | 0.2037 | 0.1684 | 0.9867 |
| 260-270 | 0.0234 | 0.1047 | 0.1048 | 0.0049 | 0.0092 | 0.0056 | 0.0034 | 3.1522 | 0.0004 | 3.4087 |
| 270-280 | 0.0113 | 0.0293 | 0.0768 | 0.0037 | 0.0138 | 0.0045 | 0.0168 | 15.0436 | 0 | 15.1998 |
| 280-290 | 0.0092 | 0.0210 | 0.0753 | 0.0062 | 0.0061 | 0.0063 | 0.0482 | 12.2956 | 0 | 12.4680 |
| 290-300 | 0.0085 | 0.0253 | 0.0770 | 0.0127 | 0.0093 | 0.0144 | 0.8929 | 12.6007 | 0 | 13.6407 |
| 300-310 | 0.0071 | 0.0201 | 0.0879 | 0.0122 | 0.0170 | 0.0310 | 6.6572 | 0.0041 | 0 | 6.8366 |
| 310-320 | 0.0057 | 0.0145 | 0.0960 | 0.0147 | 0.0303 | 0.0820 | 2.2265 | 0 | 0 | 2.4698 |
| 320-330 | 0.0113 | 0.0102 | 0.0918 | 0.0355 | 0.0547 | 0.4939 | 0.6232 | 0 | 0 | 1.3207 |
| 330-340 | 0.0114 | 0.0137 | 0.0789 | 0.0821 | 0.1047 | 0.5902 | 0.0002 | 0 | 0 | 0.8812 |
| 340-350 | 0.0064 | 0.0139 | 0.0816 | 0.1437 | 0.1626 | 0.1791 | 0 | 0 | 0 | 0.5872 |
| 350-360 | 0 | 0.0163 | 0.0666 | 0.1881 | 0.1817 | 0.0698 | 0 | 0 | 0 | 0.5226 |
| 360-370 | 0 | 0.0024 | 0.0446 | 0.0778 | 0.0827 | 0.0057 | 0 | 0 | 0 | 0.2131 |
| 370-380 | 0 | 0 | 0.0033 | 0.0017 | 0.0020 | 0 | 0 | 0 | 0 | 0.0070 |
| 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 | 204.1130 | 242.0146 | 279.7108 | 338.9914 | 327.6451 | 329.2281 | 307.2635 | 282.7732 | 254.6688 | |
| TOTAL HRS IN ALT.& LEVEL | 17.4081 | 21.1458 | 24.7247 | 9.9497 | 12.5792 | 24.5475 | 169.6369 | 702.2781 | 2.8350 | 985.1050 |
| PERCENT TIME IN ALT. & LEVEL | 1.0751 | 1.3059 | 1.5269 | 0.6145 | 0.7769 | 1.5160 | 10.4763 | 43.3707 | 0.1751 | 60.8373 |
| | | | | | | | | TOTAL FLIGHTS | | 914 |
| | | | | | | | | TOTAL HOURS | | 1619.2 |

(b) Level

Figure 5.- Continued.

PRESSURE ALTITUDE BANDS

| CAS BAND KTS | -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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 120-130 | 0.0105 | 0.0009 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0115 |
| 130-140 | 0.2221 | 0.0076 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.2297 |
| 140-150 | 0.8841 | 0.0128 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.8970 |
| 150-160 | 0.8058 | 0.0339 | 0.0021 | 0 | 0 | 0 | 0 | 0 | 0 | 0.8418 |
| 160-170 | 0.5278 | 0.0976 | 0.0043 | 0 | 0 | 0 | 0 | 0 | 0 | 0.6298 |
| 170-180 | 0.3724 | 0.1697 | 0.0135 | 0 | 0 | 0 | 0 | 0 | 0 | 0.5557 |
| 180-190 | 0.2995 | 0.1762 | 0.0211 | 0 | 0 | 0 | 0 | 0 | 0 | 0.4968 |
| 190-200 | 0.1979 | 0.1382 | 0.0172 | 0.0004 | 0 | 0 | 0 | 0 | 0 | 0.3537 |
| 200-210 | 0.1789 | 0.2093 | 0.0391 | 0.0008 | 0 | 0 | 0 | 0 | 0 | 0.4280 |
| 210-220 | 0.1887 | 0.3161 | 0.0822 | 0.0068 | 0.0029 | 0 | 0 | 0 | 0 | 0.5967 |
| 220-230 | 0.1289 | 0.2039 | 0.0479 | 0.0152 | 0.0071 | 0.0008 | 0.0013 | 0 | 0 | 0.4049 |
| 230-240 | 0.1149 | 0.2058 | 0.0680 | 0.0229 | 0.0181 | 0.0049 | 0.0031 | 0 | 0 | 0.4378 |
| 240-250 | 0.1522 | 0.5020 | 0.2034 | 0.0404 | 0.0350 | 0.0190 | 0.0043 | 0.0011 | 0 | 0.9574 |
| 250-260 | 0.1170 | 0.6136 | 0.2629 | 0.0803 | 0.0339 | 0.0209 | 0.0066 | 0.0111 | 0.0021 | 1.1484 |
| 260-270 | 0.0334 | 0.1313 | 0.1011 | 0.0193 | 0.0165 | 0.0161 | 0.0177 | 0.0658 | 0.0005 | 0.4019 |
| 270-280 | 0.0243 | 0.0563 | 0.0821 | 0.0214 | 0.0168 | 0.0161 | 0.0284 | 0.1287 | 0 | 0.3741 |
| 280-290 | 0.0252 | 0.0469 | 0.0809 | 0.0344 | 0.0247 | 0.0201 | 0.0557 | 0.2634 | 0 | 0.5512 |
| 290-300 | 0.0224 | 0.0385 | 0.1000 | 0.0870 | 0.0637 | 0.0457 | 0.1956 | 0.2382 | 0 | 0.7911 |
| 300-310 | 0.0184 | 0.0394 | 0.1317 | 0.0799 | 0.0767 | 0.0661 | 0.4186 | 0.0400 | 0 | 0.8708 |
| 310-320 | 0.0199 | 0.0437 | 0.1366 | 0.0687 | 0.0646 | 0.0941 | 0.4617 | 0.0001 | 0 | 0.8894 |
| 320-330 | 0.0184 | 0.0523 | 0.1641 | 0.0916 | 0.0655 | 0.1980 | 0.3941 | 0 | 0 | 0.9840 |
| 330-340 | 0.0202 | 0.0676 | 0.2276 | 0.1505 | 0.1125 | 0.4107 | 0.1557 | 0 | 0 | 1.1447 |
| 340-350 | 0.0160 | 0.0926 | 0.3207 | 0.2920 | 0.2314 | 0.4843 | 0.0081 | 0 | 0 | 1.4452 |
| 350-360 | 0.0045 | 0.0706 | 0.3782 | 0.4606 | 0.4040 | 0.3109 | 0 | 0 | 0 | 1.6289 |
| 360-370 | 0.0002 | 0.0295 | 0.2544 | 0.3793 | 0.5002 | 0.0994 | 0 | 0 | 0 | 1.2630 |
| 370-380 | 0 | 0.0014 | 0.0183 | 0.0275 | 0.0501 | 0.0122 | 0 | 0 | 0 | 0.1095 |
| 380-390 | 0 | 0 | 0 | 0 | 0.0002 | 0 | 0 | 0 | 0 | 0.0003 |
| 390-400 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AV CAS | 179.8910 | 240.3053 | 304.3755 | 333.4549 | 339.8685 | 334.8912 | 311.8291 | 285.2743 | 257.0915 | |
| TOTAL HRS IN ALT.& DESCENT | 71.3083 | 54.3736 | 44.6533 | 30.4234 | 27.9122 | 29.4610 | 28.3508 | 12.1172 | 0.0425 | 298.6423 |
| PERCENT TIME IN ALT.& DESCENT | 4.4038 | 3.3580 | 2.7577 | 1.8789 | 1.7238 | 1.8194 | 1.7509 | 0.7483 | 0.0026 | 18.4433 |
| | | | | | | | TOTAL FLIGHTS | | | 914 |
| | | | | | | | TOTAL HOURS | | | 1619.2 |

(c) Descent

Figure 5.- Continued.

PRESSURE ALTITUDE BANDS

| CAS BAND KTS | -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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 120-130 | 0.0107 | 0.0009 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0116 |
| 130-140 | 0.2232 | 0.0079 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.2310 |
| 140-150 | 0.8948 | 0.0145 | 0.0001 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9093 |
| 150-160 | 0.8812 | 0.0375 | 0.0033 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9220 |
| 160-170 | 0.7226 | 0.1217 | 0.0054 | 0 | 0 | 0 | 0 | 0 | 0 | 0.8497 |
| 170-180 | 0.5935 | 0.2165 | 0.0216 | 0 | 0 | 0 | 0 | 0 | 0 | 0.8315 |
| 180-190 | 0.6044 | 0.2205 | 0.0267 | 0 | 0 | 0 | 0 | 0 | 0 | 0.8516 |
| 190-200 | 0.4846 | 0.1596 | 0.0212 | 0.0004 | 0 | 0 | 0 | 0 | 0 | 0.6657 |
| 200-210 | 0.4448 | 0.3109 | 0.0675 | 0.0027 | 0 | 0 | 0 | 0 | 0 | 0.8260 |
| 210-220 | 0.4879 | 0.4997 | 0.2007 | 0.0084 | 0.0029 | 0 | 0 | 0 | 0 | 1.1996 |
| 220-230 | 0.4396 | 0.3141 | 0.1336 | 0.0170 | 0.0137 | 0.0008 | 0.0019 | 0.0040 | 0 | 0.9247 |
| 230-240 | 0.3553 | 0.3578 | 0.1471 | 0.0285 | 0.0772 | 0.0191 | 0.0068 | 0.0165 | 0 | 1.0083 |
| 240-250 | 0.4018 | 1.1755 | 0.4375 | 0.0625 | 0.0501 | 0.0307 | 0.0098 | 0.0587 | 0.0077 | 2.2343 |
| 250-260 | 0.3914 | 1.6535 | 0.6901 | 0.1111 | 0.0632 | 0.0343 | 0.0137 | 0.2916 | 0.1827 | 3.4317 |
| 260-270 | 0.1151 | 0.4249 | 0.3692 | 0.0367 | 0.0303 | 0.0251 | 0.0442 | 3.5834 | 0.0041 | 4.6330 |
| 270-280 | 0.0599 | 0.1510 | 0.3191 | 0.0546 | 0.0437 | 0.0324 | 0.1632 | 15.9372 | 0 | 16.7611 |
| 280-290 | 0.0497 | 0.1126 | 0.3524 | 0.1235 | 0.1098 | 0.1200 | 0.8556 | 13.0201 | 0 | 14.7438 |
| 290-300 | 0.0453 | 0.1469 | 0.7013 | 0.8710 | 1.0020 | 1.3007 | 2.8657 | 12.9010 | 0 | 19.8410 |
| 300-310 | 0.0420 | 0.1930 | 0.8745 | 0.9633 | 1.1907 | 1.6008 | 8.3842 | 0.0447 | 0 | 13.2932 |
| 310-320 | 0.0327 | 0.1227 | 0.4240 | 0.3226 | 0.3780 | 0.5382 | 2.9054 | 0.0001 | 0 | 4.7235 |
| 320-330 | 0.0328 | 0.0874 | 0.3370 | 0.2276 | 0.2315 | 0.8349 | 1.0439 | 0 | 0 | 2.7950 |
| 330-340 | 0.0322 | 0.0949 | 0.3507 | 0.2839 | 0.2704 | 1.0708 | 0.1570 | 0 | 0 | 2.2598 |
| 340-350 | 0.0224 | 0.1203 | 0.4351 | 0.4771 | 0.4366 | 0.7016 | 0.0081 | 0 | 0 | 2.2013 |
| 350-360 | 0.0046 | 0.0948 | 0.4674 | 0.6810 | 0.6083 | 0.3853 | 0 | 0 | 0 | 2.2414 |
| 360-370 | 0.0002 | 0.0321 | 0.3060 | 0.4643 | 0.5836 | 0.1053 | 0 | 0 | 0 | 1.4915 |
| 370-380 | 0 | 0.0014 | 0.0230 | 0.0296 | 0.0520 | 0.0122 | 0 | 0 | 0 | 0.1183 |
| 380-390 | 0 | 0 | 0 | 0 | 0.0002 | 0 | 0 | 0 | 0 | 0.0003 |
| 390-400 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AV CAS | 194.2882 | 247.1595 | 294.2328 | 319.9683 | 319.6600 | 317.6557 | 305.0384 | 282.5293 | 254.8149 | |
| TOTAL HRS IN ALTITUDE BAND | 119.3799 | 108.0403 | 108.7194 | 77.1728 | 83.2978 | 110.4190 | 266.5208 | 742.5439 | 3.1508 | 1619.2448 |
| PERCENT TIME, IN ALTITUDE BAND | 7.3726 | 6.6723 | 6.7142 | 4.7660 | 5.1442 | 6.8192 | 16.4596 | 45.8574 | 0.1946 | 100.0000 |
| | | | | | | | TOTAL FLIGHTS | | | 914 |
| | | | | | | | TOTAL HOURS | | | 1619.2 |

(d) All flight modes

Figure 5.- Concluded.

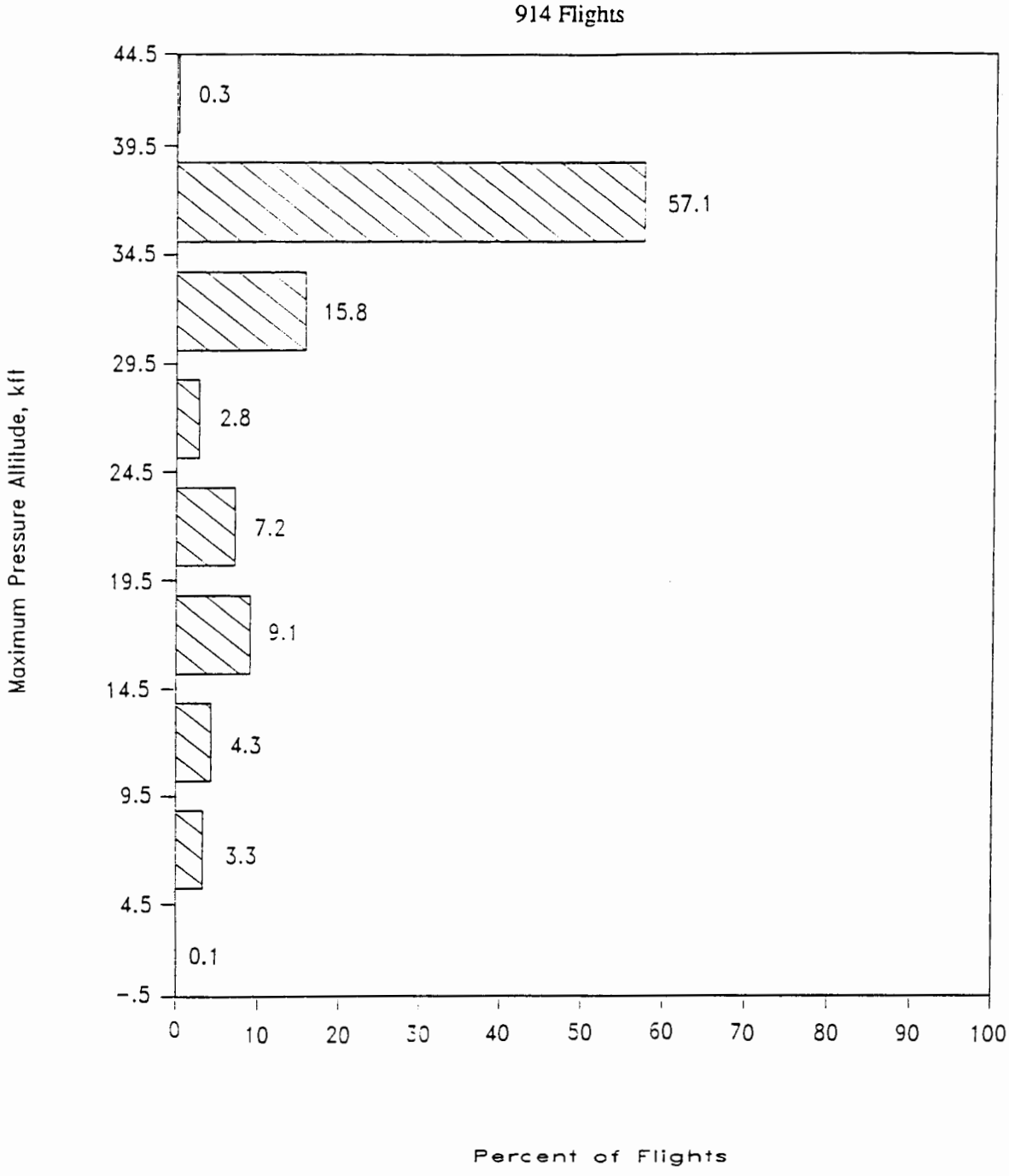
| | PRESSURE ALTITUDE BANDS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME INTERVAL HOURS IN ALT. BAND | -500 TO 4500 FT | 4500 TO 9500 FT | 9500 TO 14500 FT | 14500 TO 19500 FT | 19500 TO 24500 FT | 24500 TO 29500 FT | 29500 TO 34500 FT | 34500 TO 39500 FT | 39500 TO 44500 FT |
| 6.50-7.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6.00-6.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5.50-6.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5.00-5.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.50-5.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.00-4.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.219 | 0 |
| 3.50-4.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.547 | 0 |
| 3.00-3.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0.109 | 1.641 | 0 |
| 2.50-3.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0.766 | 4.048 | 0 |
| 2.00-2.50 | 0 | 0 | 0 | 0 | 0 | 0.109 | 2.626 | 8.425 | 0 |
| 1.50-2.00 | 0 | 0 | 0 | 0 | 0 | 0.109 | 0.985 | 7.768 | 0 |
| 1.00-1.50 | 0 | 0.109 | 0 | 0 | 0 | 0.547 | 2.845 | 15.755 | 0.219 |
| .90-1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 1.313 | 0.985 | 0 |
| .80-.90 | 0 | 0.109 | 0 | 0 | 0.109 | 0.219 | 1.532 | 1.969 | 0 |
| .70-.80 | 0 | 0.109 | 0 | 0 | 0.109 | 0 | 0.985 | 1.641 | 0 |
| .60-.70 | 0 | 0 | 0.109 | 0 | 0 | 0 | 0.875 | 2.626 | 0 |
| .50-.60 | 0.109 | 0.109 | 0 | 0 | 0 | 0.219 | 0.985 | 2.298 | 0.109 |
| .45-.50 | 0 | 0 | 0 | 0 | 0 | 0.547 | 0.656 | 2.626 | 0 |
| .40-.45 | 0.109 | 0 | 0.328 | 0 | 0.109 | 0.656 | 1.204 | 1.094 | 0 |
| .35-.40 | 0.219 | 0.109 | 0 | 0 | 0 | 0.109 | 1.422 | 1.313 | 0 |
| .30-.35 | 0.547 | 0.438 | 0.328 | 0 | 0 | 0.438 | 2.516 | 0.656 | 0 |
| .25-.30 | 1.532 | 0.875 | 0.766 | 0.766 | 0.438 | 0.985 | 2.298 | 0.328 | 0 |
| .20-.25 | 4.267 | 4.376 | 3.173 | 1.422 | 2.079 | 4.267 | 6.236 | 0.985 | 0 |
| .15-.20 | 16.849 | 10.832 | 19.365 | 3.173 | 4.923 | 12.582 | 21.444 | 1.422 | 0 |
| .10-.15 | 53.282 | 36.433 | 37.856 | 14.770 | 30.197 | 47.593 | 23.523 | 0.766 | 0 |
| .05-.10 | 21.991 | 46.171 | 34.354 | 71.444 | 45.295 | 7.659 | 0.875 | 0.219 | 0 |
| .00-.05 | 1.094 | 0.219 | 0.328 | 0.766 | 0 | 0 | 0 | 0.109 | 0 |
| TOTAL HOURS IN ALT BAND | 119.3799 | 108.0403 | 108.7194 | 77.1728 | 83.2978 | 110.4190 | 266.5208 | 742.5439 | 3.1508 |
| TOTAL PERCENT TIME IN ALT BAND | 7.3726 | 6.6723 | 6.7142 | 4.7660 | 5.1442 | 6.8192 | 16.4596 | 45.8574 | 0.1946 |
| | | | | | | | TOTAL FLIGHTS | | 914 |
| | | | | | | | TOTAL HOURS | | 1619.2 |

Figure 6.- Percent of flights that spend indicated time in pressure altitude bands.

| DURATION OF FLIGHT, HOURS | -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 |
|---|---|---|---|---|---|---|---|---|---|
| 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 | 0.2 | 0 |
| 4.5-5.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.8 | 0 |
| 4.0-4.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0.1 | 2.0 | 0 |
| 3.5-4.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.4 | 3.8 | 0 |
| 3.0-3.5 | 0 | 0 | 0 | 0 | 0 | 0 | 1.0 | 7.9 | 0 |
| 2.5-3.0 | 0 | 0 | 0 | 0 | 0 | 0.1 | 2.4 | 6.5 | 0 |
| 2.0-2.5 | 0 | 0 | 0 | 0.1 | 0 | 0.1 | 1.3 | 15.2 | 0.2 |
| 1.5-2.0 | 0 | 0 | 0 | 0 | 0 | 0.3 | 2.1 | 8.9 | 0.1 |
| 1.0-1.5 | 0 | 0.1 | 0 | 0 | 0 | 0.9 | 4.0 | 10.4 | 0 |
| .8-1.0 | 0 | 0 | 0 | 0.1 | 0 | 0.7 | 3.6 | 1.4 | 0 |
| .6-.8 | 0 | 0 | 0.1 | 1.5 | 1.3 | 0.5 | 0.7 | 0.1 | 0 |
| .5-.6 | 0 | 0 | 0.1 | 1.2 | 5.0 | 0.2 | 0.1 | 0 | 0 |
| .4-.5 | 0 | 0.7 | 1.3 | 3.7 | 0.9 | 0 | 0 | 0 | 0 |
| .3-.4 | 0 | 1.5 | 2.3 | 2.4 | 0 | 0 | 0 | 0 | 0 |
| .0-.3 | 0.1 | 1.0 | 0.4 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL PERCENT ALL FLIGHTS | 0.1 | 3.3 | 4.3 | 9.1 | 7.2 | 2.8 | 15.8 | 57.1 | 0.3 |

(a) Maximum altitude vs flight duration - matrix

Figure 7.- Percent of flights to maximum pressure altitude.




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

Figure 7.- Concluded.

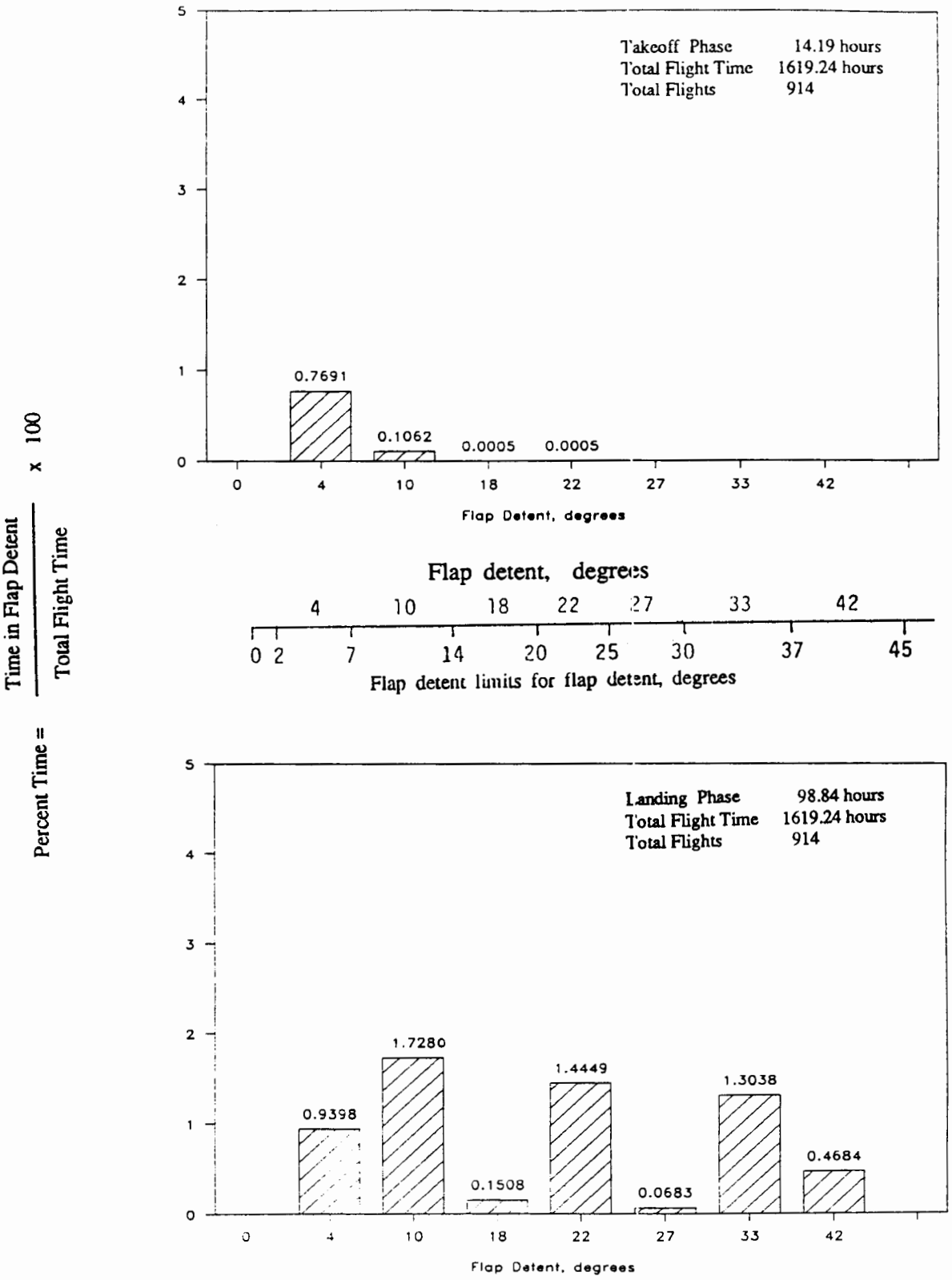
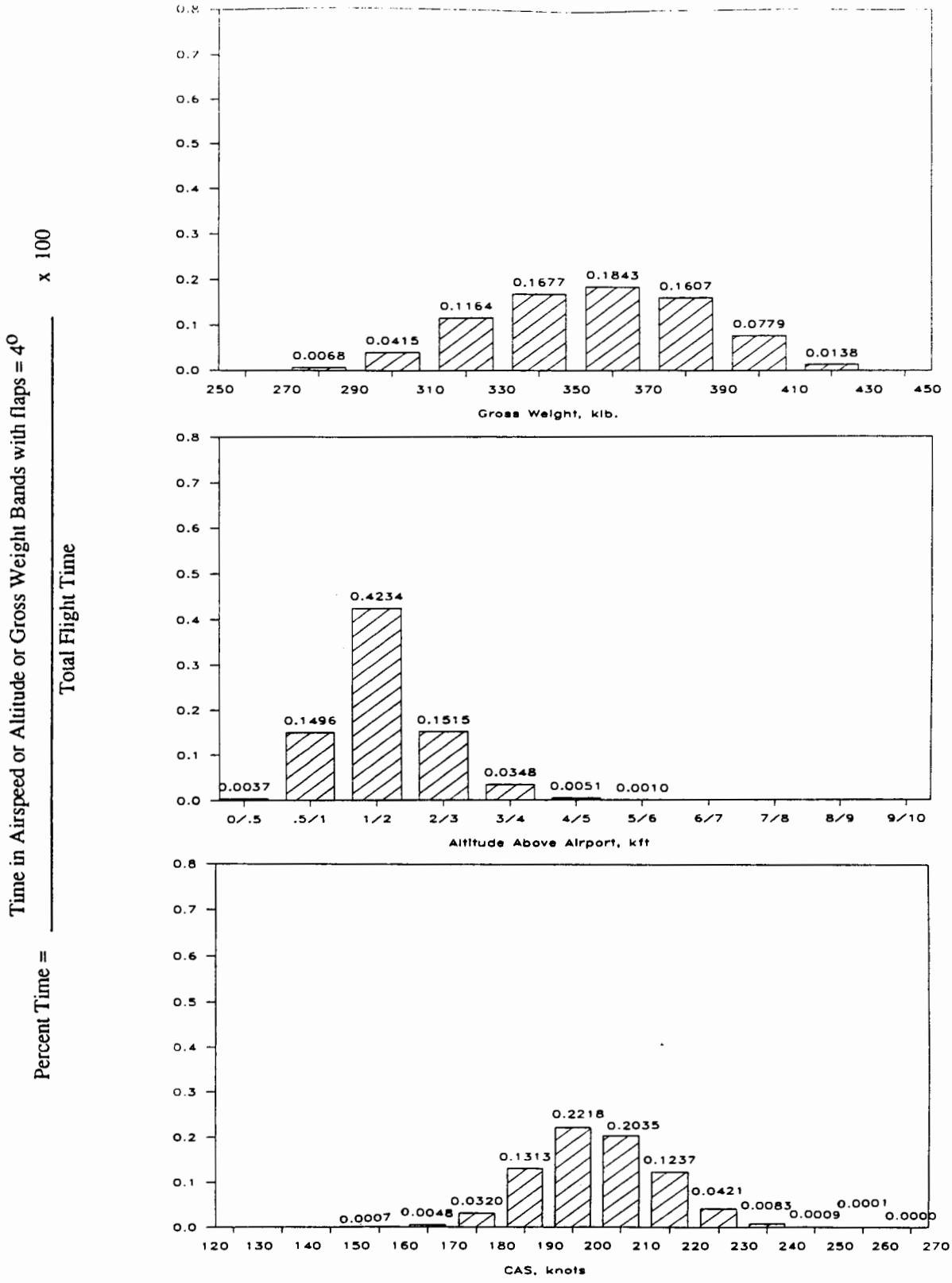
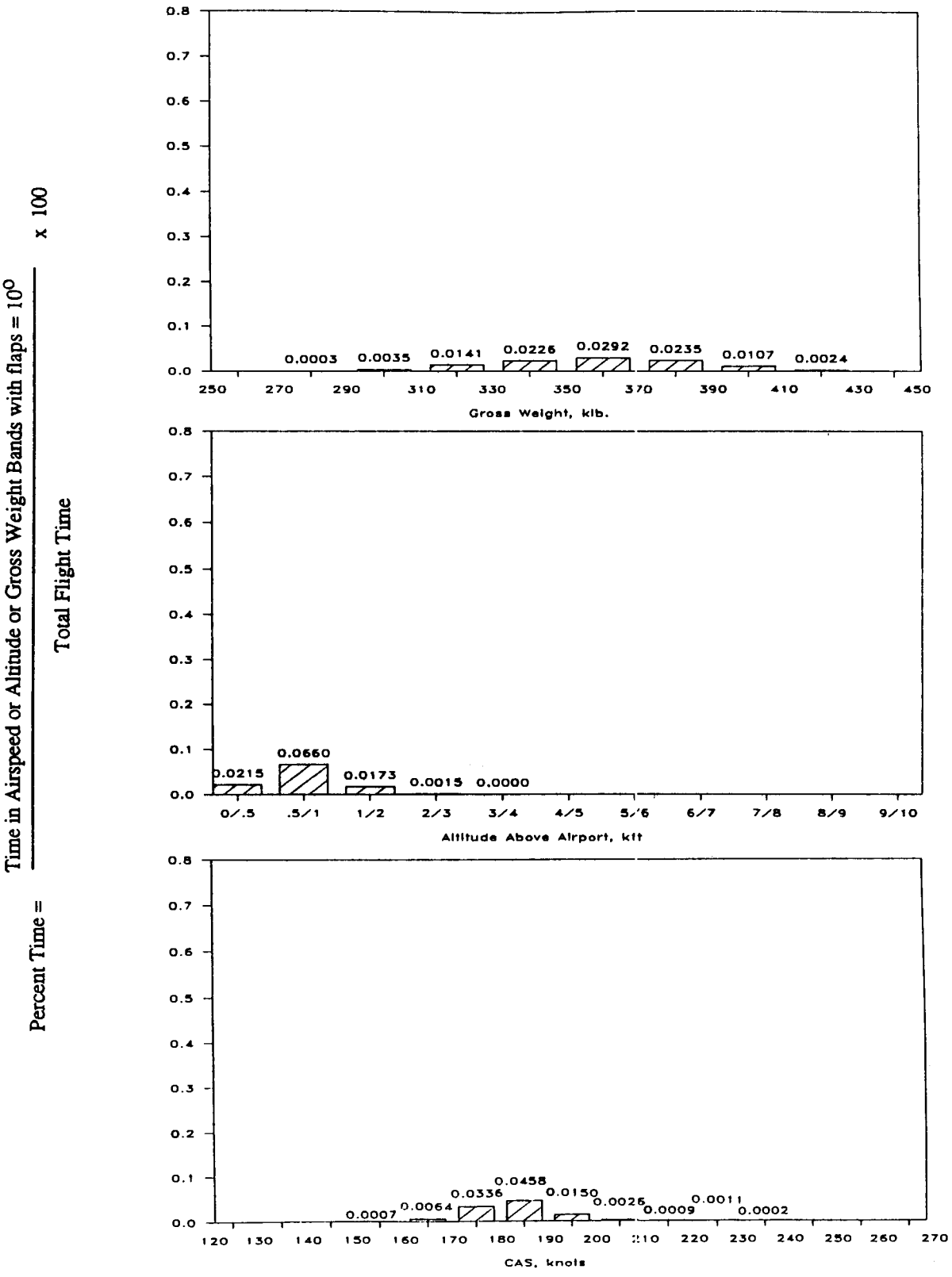



Figure 8.- Percent of total flight time at each flap detent.



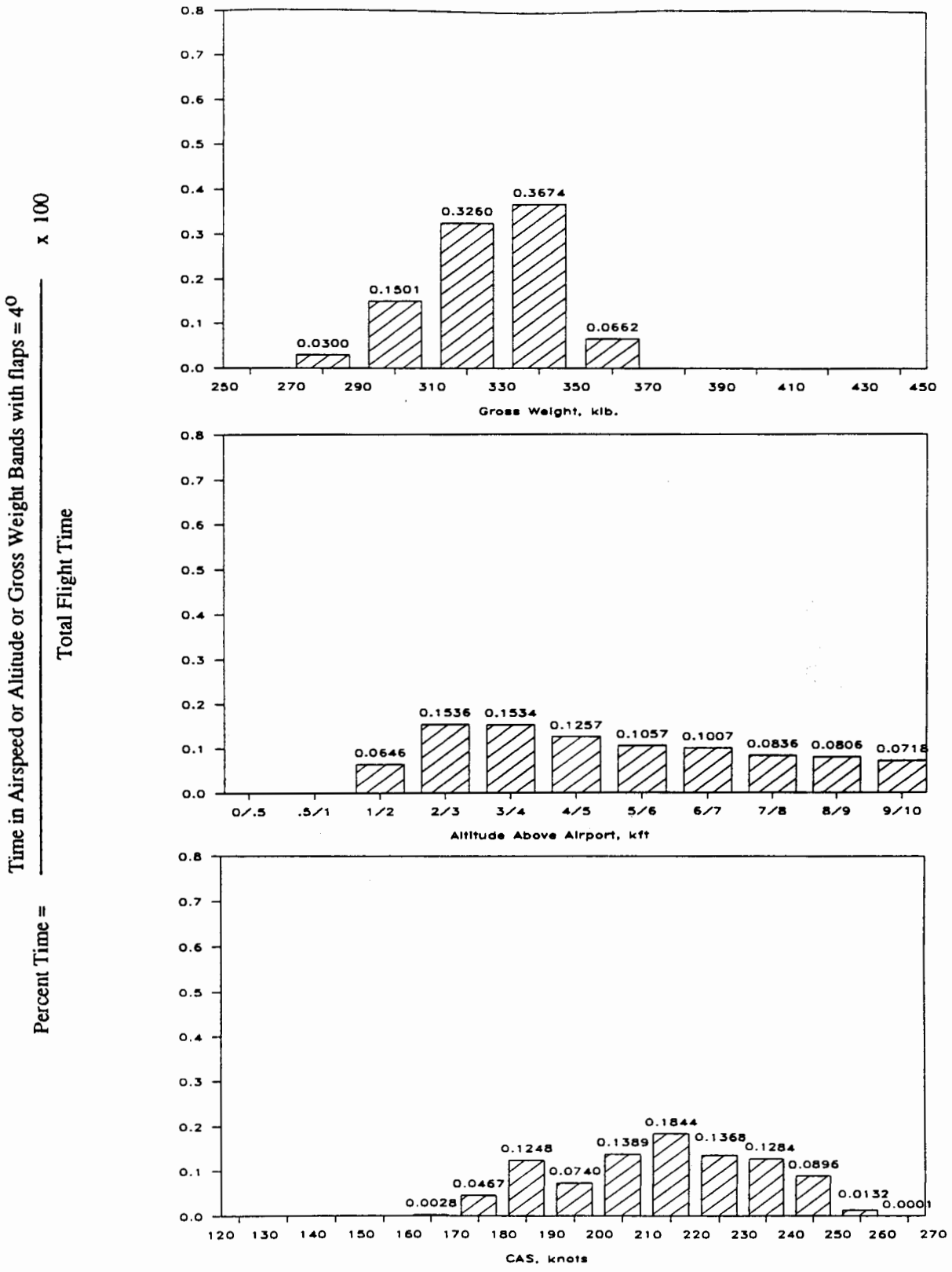

(a) Take off, flaps = $4^{o}$; 12.4544 hours

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



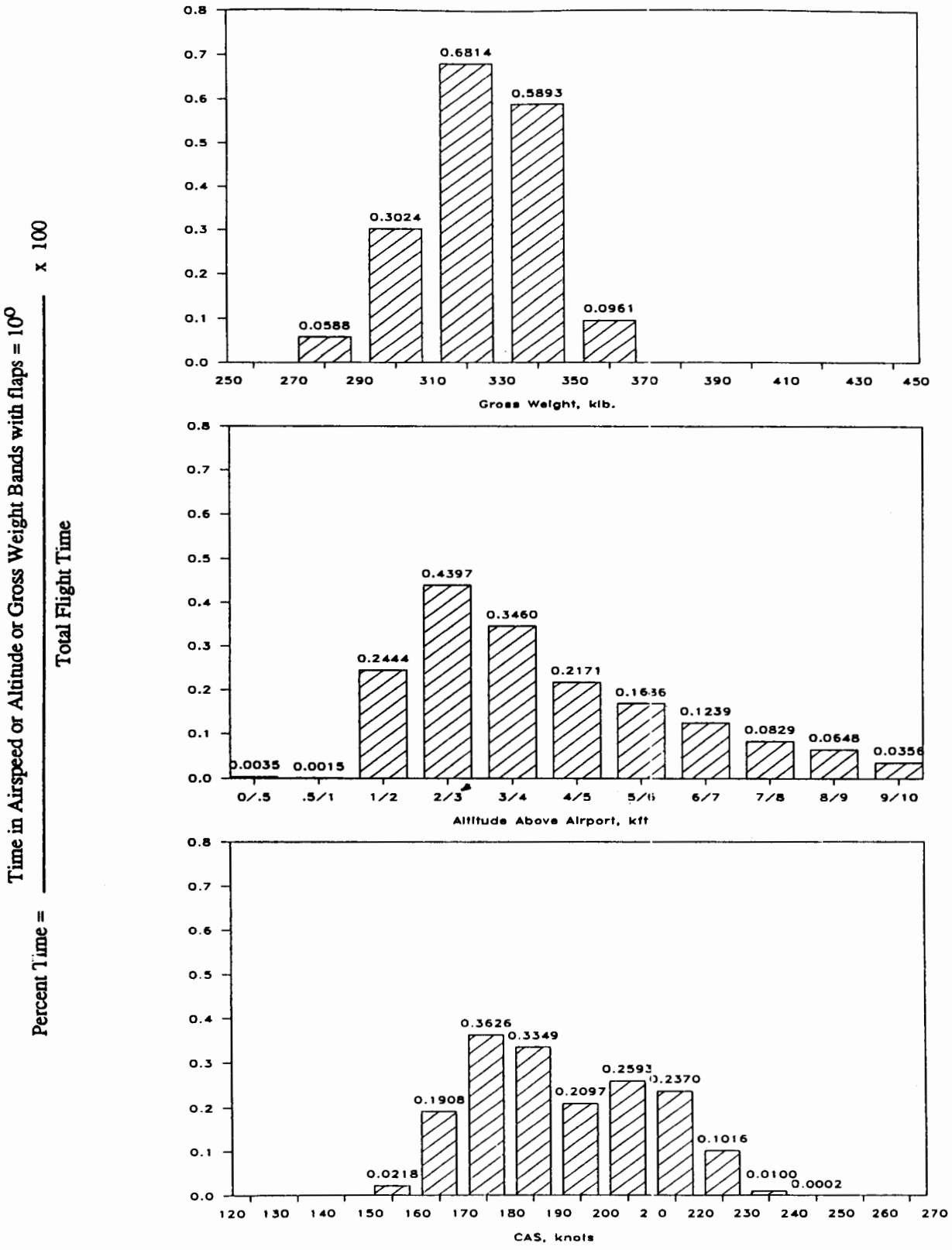

(b) Take off, flaps = $10^{o}$; 1.7203 hours

Figure 9. - Continued.



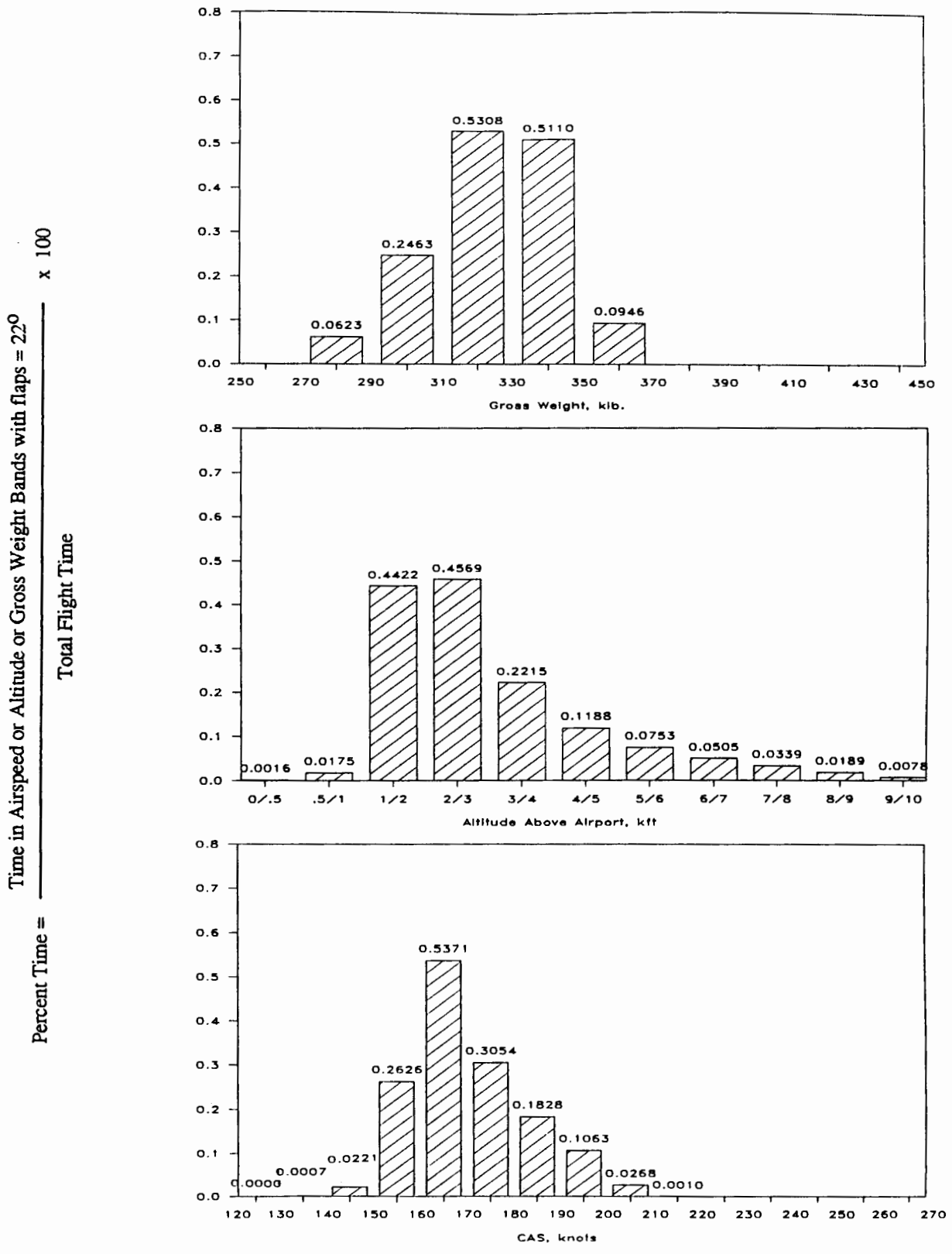

(c) Landing, flaps = $4^{o}$; 15.2172 hours

Figure 9. - Continued.



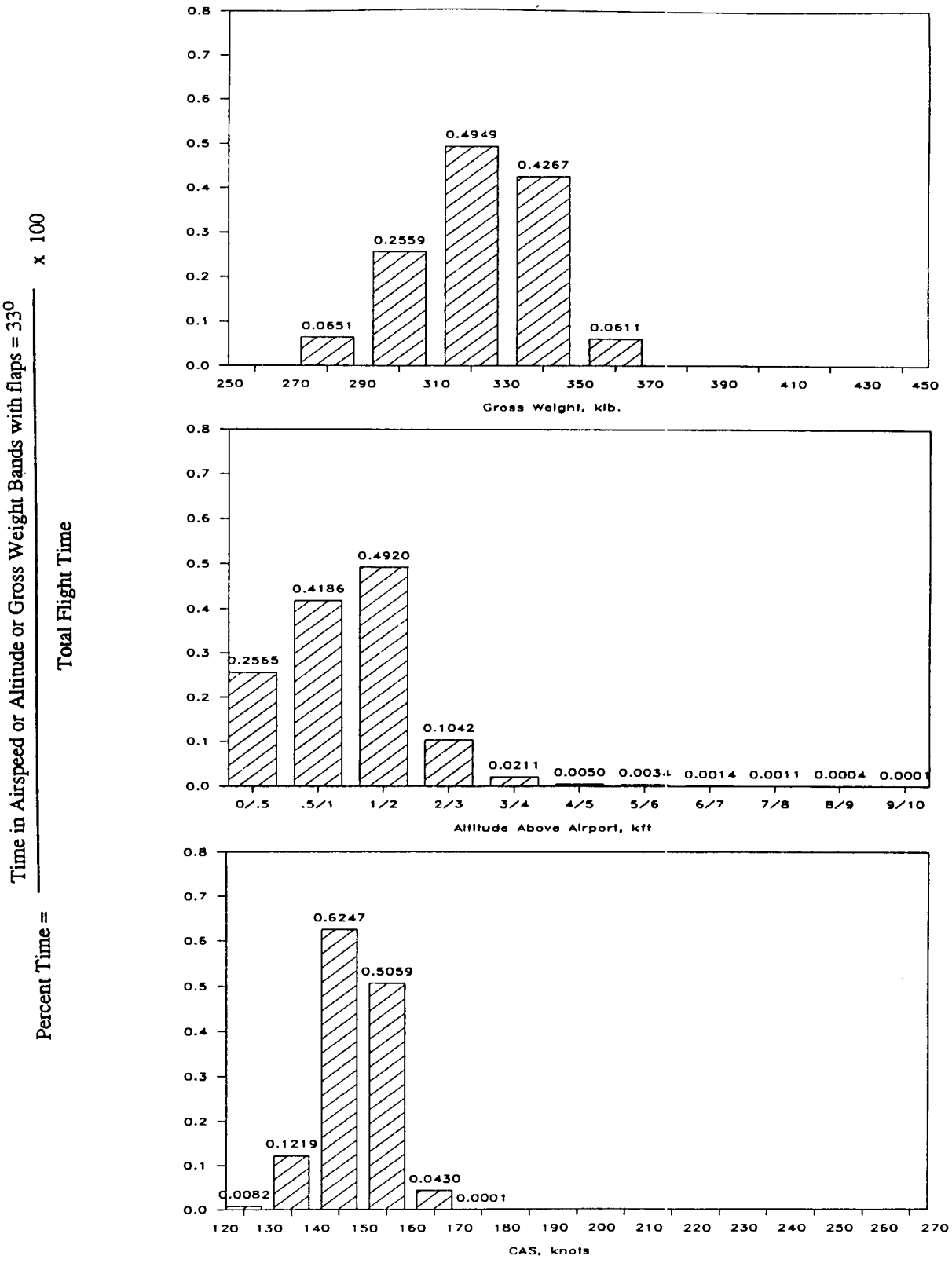

(d) Landing, flaps = $10^{o}$; 27.9800 hours

Figure 9. - Continued.



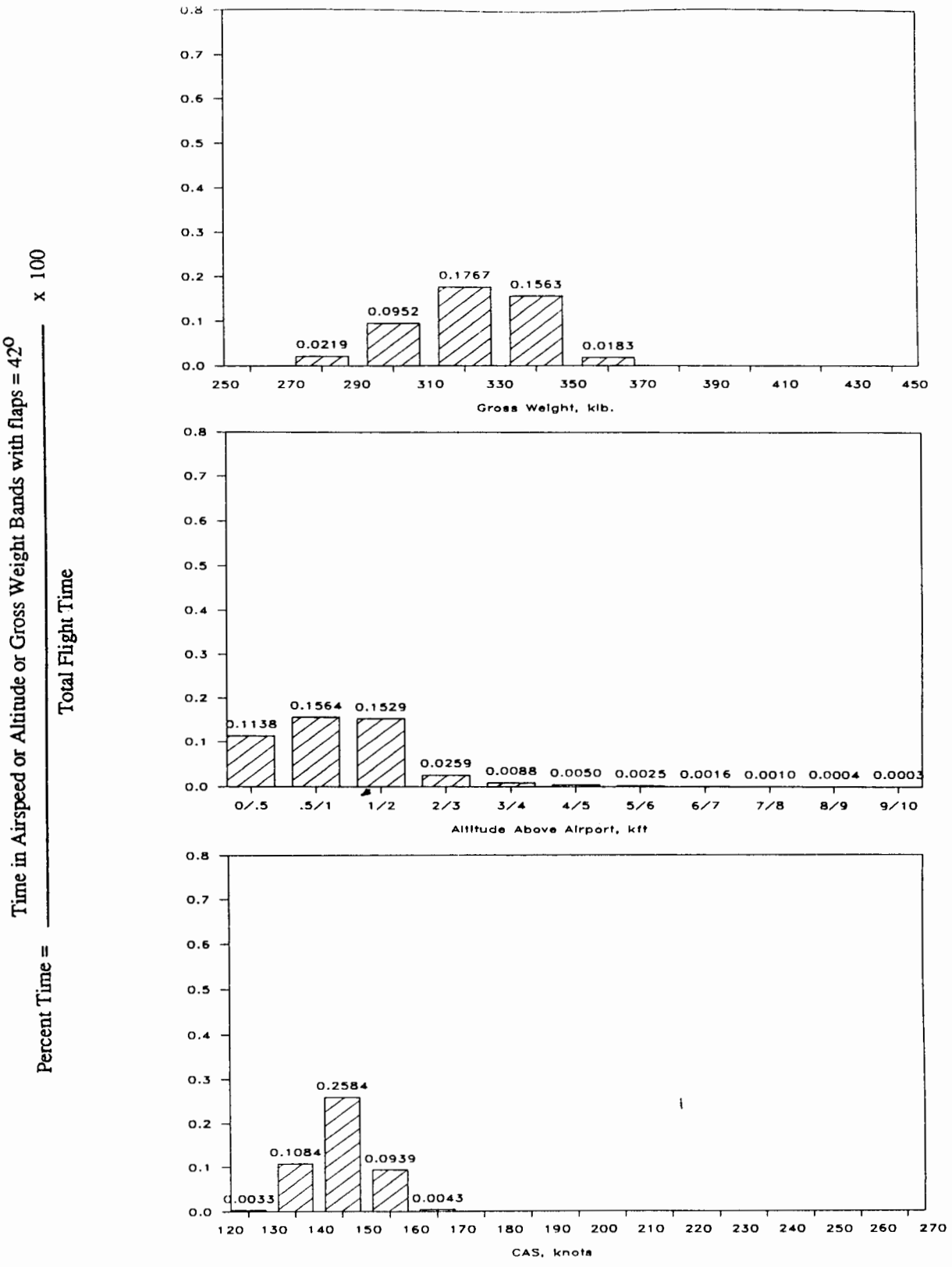

(e) Landing, flaps = $22^{o}$; 23.3960 hours

Figure 9. - Continued.




(f) Landing, flaps = $33^{o}$; 21.1119 hours

Figure 9. - Continued.




(g) Landing, flaps = $42^{o}$; 7.5845 hours

Figure 9. - Concluded.

FLAP DEFLECTION, DEGREES

| TIME AFTER LIFTOFF MINUTES | 30.0 | 25.0 | 20.0 | 14.0 | 7.0 | 2.0 |
|---|---|---|---|---|---|---|
| 0.0 - .1 | 0 | 0 | 0.1 | 0.2 | 46.4 | 0 |
| .1 - .2 | 0 | 0 | 0.1 | 0 | 23.1 | 0 |
| .2 - .3 | 0 | 0 | 0.1 | 0.1 | 7.3 | 1.3 |
| .3 - .4 | 0 | 0 | 0 | 0.2 | 2.4 | 1.3 |
| .4 - .5 | 0 | 0 | 0 | 0 | 1.4 | 6.8 |
| .5 - .6 | 0 | 0 | 0 | 0 | 0.9 | 7.9 |
| .6 - .8 | 0 | 0 | 0 | 0 | 1.0 | 26.5 |
| .8 - 1.0 | 0 | 0 | 0 | 0 | 0.2 | 22.5 |
| 1.0 - 1.2 | 0 | 0 | 0 | 0 | 0 | 14.2 |
| 1.2 - 1.4 | 0 | 0 | 0 | 0 | 0 | 7.9 |
| 1.4 - 1.6 | 0 | 0 | 0 | 0 | 0.1 | 6.0 |
| 1.6 - 1.8 | 0 | 0 | 0 | 0 | 0 | 2.4 |
| 1.8 - 2.0 | 0 | 0 | 0 | 0 | 0 | 2.0 |
| 2.0 - 2.2 | 0 | 0 | 0 | 0 | 0 | 0.2 |
| 2.2 - 2.4 | 0 | 0 | 0 | 0 | 0 | 0.3 |
| 2.4 - 2.6 | 0 | 0 | 0 | 0 | 0 | 0.3 |
| 2.6 - 2.8 | 0 | 0 | 0 | 0 | 0 | 0.1 |
| 2.8 - 3.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.0 - 3.5 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.5 - 4.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.0 - 4.5 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.5 - 5.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5.0 - 6.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6.0 - 7.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7.0 - 8.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8.0 - 9.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9.0 - 10.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10.0 - 15.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15.0 - 20.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20.0 - 25.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.0 - 25.0 | 0 | 0 | 0.3 | 0.5 | 82.8 | 99.9 |

Notes:
1. 914 flights
2. The first 15 seconds after liftoff for each flight are not included.
3. Flap deflections less than 2 degrees were considered to be zero.

(a) Takeoff: Percent of flights vs times when takeoff flap deflecion is reduced to less than indicated values

Figure 10.- Flap deflection times.

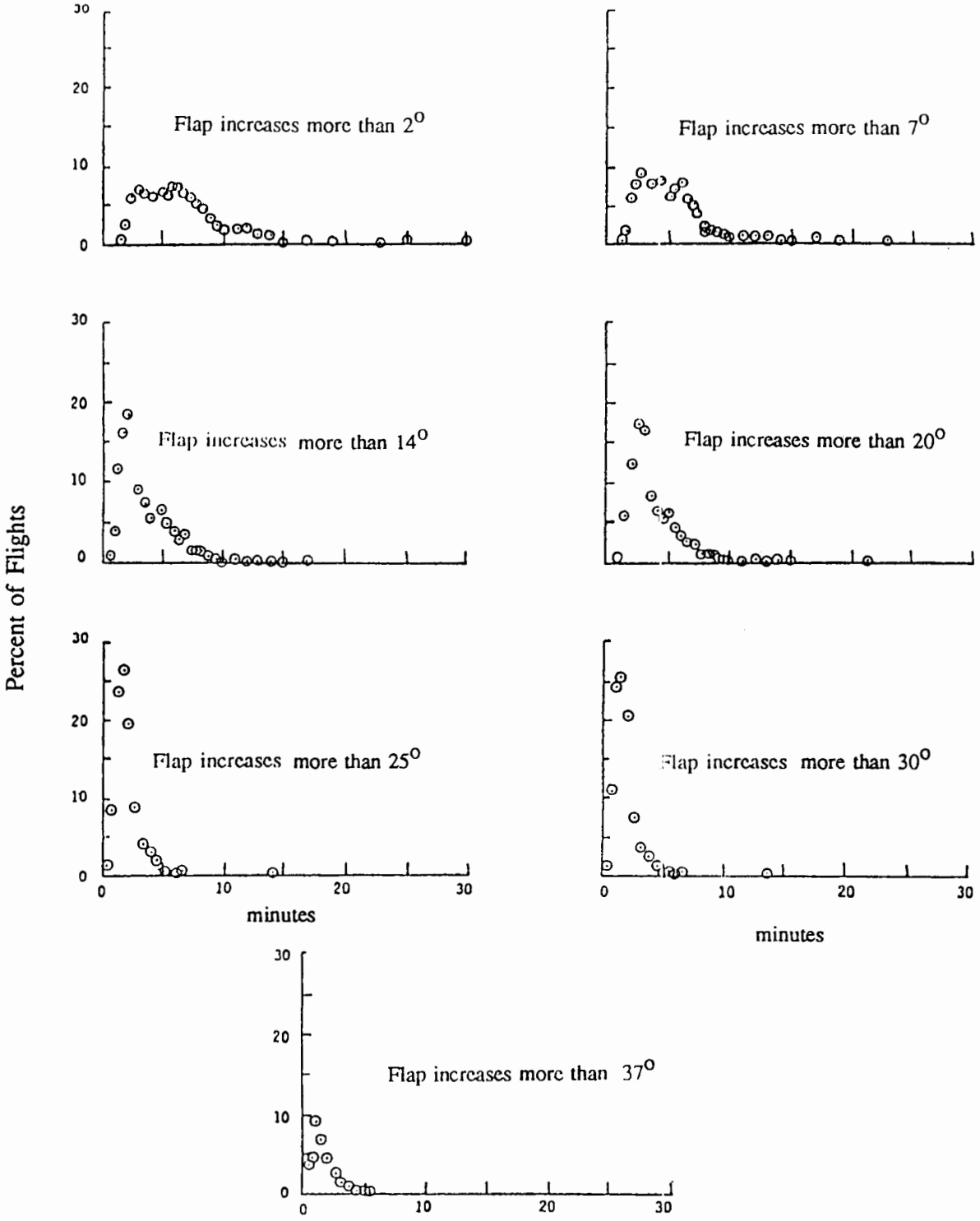
FLAP DEFLECTIONS, DEGREES

| TIME BEFORE TOUCHDOWN MINUTES | 2.0 | 7.0 | 14.0 | 20.0 | 25.0 | 30.0 | 37.0 |
|---|---|---|---|---|---|---|---|
| 0.0 - .5 | 0 | 0 | 0 | 0 | 1.1 | 1.5 | 3.9 |
| .5 - 1.0 | 0 | 0 | 0.8 | 0.8 | 8.4 | 10.4 | 4.7 |
| 1.0 - 1.5 | 0 | 0.4 | 4.0 | 5.9 | 23.4 | 24.7 | 9.0 |
| 1.5 - 2.0 | 0.7 | 2.0 | 11.5 | 12.3 | 26.9 | 25.5 | 6.5 |
| 2.0 - 2.5 | 2.4 | 6.3 | 16.2 | 17.6 | 19.7 | 20.5 | 4.8 |
| 2.5 - 3.0 | 5.7 | 8.1 | 17.3 | 16.7 | 8.9 | 7.5 | 2.3 |
| 3.0 - 3.5 | 6.8 | 9.6 | 9.1 | 8.4 | 3.9 | 3.6 | 1.1 |
| 3.5 - 4.0 | 6.3 | 8.0 | 7.1 | 6.8 | 3.0 | 2.5 | 1.0 |
| 4.0 - 4.5 | 5.9 | 8.5 | 5.7 | 5.7 | 2.1 | 1.8 | 0.3 |
| 4.5 - 5.0 | 6.9 | 6.7 | 6.9 | 6.3 | 0.4 | 0.4 | 0.2 |
| 5.0 - 5.5 | 6.6 | 7.5 | 4.5 | 4.4 | 0.5 | 0.5 | 0.1 |
| 5.5 - 6.0 | 7.7 | 8.2 | 3.6 | 3.2 | 0.3 | 0.2 | 0 |
| 6.0 - 6.5 | 6.8 | 5.8 | 2.8 | 2.7 | 0.7 | 0.7 | 0 |
| 6.5 - 7.0 | 6.8 | 5.1 | 3.0 | 2.6 | 0 | 0 | 0 |
| 7.0 - 7.5 | 6.0 | 4.6 | 1.3 | 1.0 | 0 | 0 | 0 |
| 7.5 - 8.0 | 5.0 | 3.3 | 1.3 | 1.4 | 0 | 0 | 0 |
| 8.0 - 8.5 | 4.8 | 3.5 | 1.3 | 1.2 | 0 | 0 | 0 |
| 8.5 - 9.0 | 3.5 | 2.2 | 1.0 | 0.9 | 0 | 0 | 0 |
| 9.0 - 9.5 | 3.4 | 1.5 | 0.5 | 0.3 | 0 | 0 | 0 |
| 9.5 - 10.0 | 2.1 | 1.8 | 0.2 | 0.3 | 0 | 0 | 0 |
| 10.0 - 11.0 | 2.2 | 1.6 | 0.5 | 0.3 | 0 | 0 | 0 |
| 11.0 - 12.0 | 2.3 | 1.3 | 0.3 | 0.4 | 0 | 0 | 0 |
| 12.0 - 13.0 | 1.9 | 1.5 | 0.2 | 0.1 | 0 | 0 | 0 |
| 13.0 - 14.0 | 1.6 | 0.3 | 0.2 | 0.2 | 0.1 | 0.1 | 0 |
| 14.0 - 15.0 | 0.5 | 0.4 | 0.1 | 0.1 | 0 | 0 | 0 |
| 15.0 - 17.0 | 0.8 | 0.7 | 0.1 | 0 | 0 | 0 | 0 |
| 17.0 - 19.0 | 0.4 | 0.3 | 0 | 0 | 0 | 0 | 0 |
| 19.0 - 21.0 | 0 | 0 | 0 | 0.1 | 0 | 0 | 0 |
| 21.0 - 23.0 | 0.1 | 0.1 | 0 | 0 | 0 | 0 | 0 |
| 23.0 - 25.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25.0 - 30.0 | 0.4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30.0 - 35.0 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 35.0 - 40.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 40.0 - 60.0 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.0 - 60.0 | 97.8 | 99.6 | 99.7 | 99.9 | 99.5 | 100.0 | 33.9 |

NOTES:
1. 914 flights
2. The last 15 seconds before touchdown on each flight are not included.
3. Flap deflections less than 2 degrees were considered to be zero.

(b) Landing: Percent of flights vs. time when landing flap deflection is increased to greater than indicated value

Figure 10.- Continued.




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

Figure 10. - Concluded.

KIAS

| FLAP DEFLECTION RANGE | FLAP DETENT | 120 TO 130 KTS | 130 TO 140 KTS | 140 TO 150 KTS | 150 TO 160 KTS | 160 TO 170 KTS | 170 TO 180 KTS | 180 TO 190 KTS | 190 TO 200 KTS | 200 TO 210 KTS | 210 TO 220 KTS | 220 TO 230 KTS | 230 TO 240 KTS | 240 TO 250 KTS | 250 TO 260 KTS | 260 TO 270 KTS | 270 TO 280 KTS | 280 TO 290 KTS | 290 TO 300 KTS | 300 TO 310 KTS | 310 TO 320 KTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 37-45 | 42 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30-37 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25-30 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20-25 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 14-20 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7-14 | 10 | 0 | 0 | 0 | 0 | 4 | 29 | 37 | 9 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2- 7 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 28 | 48 | 16 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |

(a) Takeoff

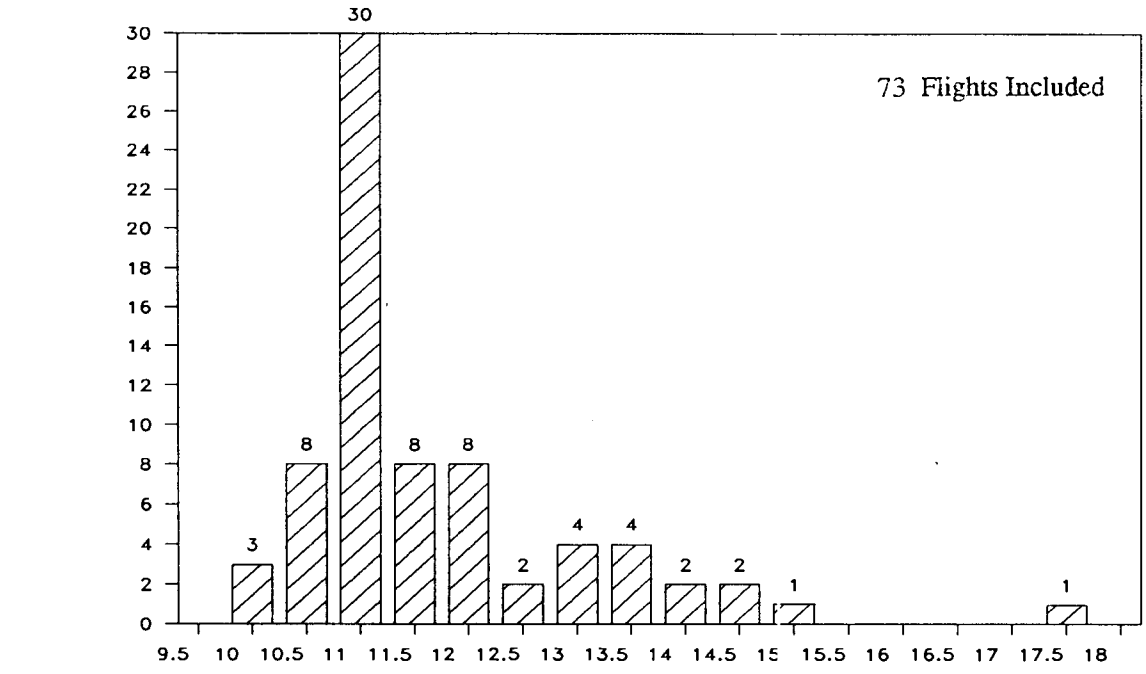
KIAS

| FLAP DEFLECTION RANGE | FLAP DETENT | 120 TO 130 KTS | 130 TO 140 KTS | 140 TO 150 KTS | 150 TO 160 KTS | 160 TO 170 KTS | 170 TO 180 KTS | 180 TO 190 KTS | 190 TO 200 KTS | 200 TO 210 KTS | 210 TO 220 KTS | 220 TO 230 KTS | 230 TO 240 KTS | 240 TO 250 KTS | 250 TO 260 KTS | 260 TO 270 KTS | 270 TO 280 KTS | 280 TO 290 KTS | 290 TO 300 KTS | 300 TO 310 KTS | 310 TO 320 KTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2- 7 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 8 | 16 | 16 | 22 | 25 | 8 | 0 | 0 | 0 | 0 | 0 | 2 |
| 7-14 | 10 | 0 | 0 | 0 | 0 | 1 | 3 | 7 | 8 | 17 | 24 | 31 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 14-20 | 18 | 0 | 0 | 0 | 4 | 14 | 21 | 17 | 16 | 21 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 20-25 | 22 | 0 | 0 | 0 | 6 | 18 | 21 | 18 | 19 | 15 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 25-30 | 27 | 0 | 0 | 5 | 42 | 45 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 30-37 | 33 | 0 | 0 | 7 | 54 | 37 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 37-40 | 42 | 0 | 1 | 10 | 17 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

(b) Landing

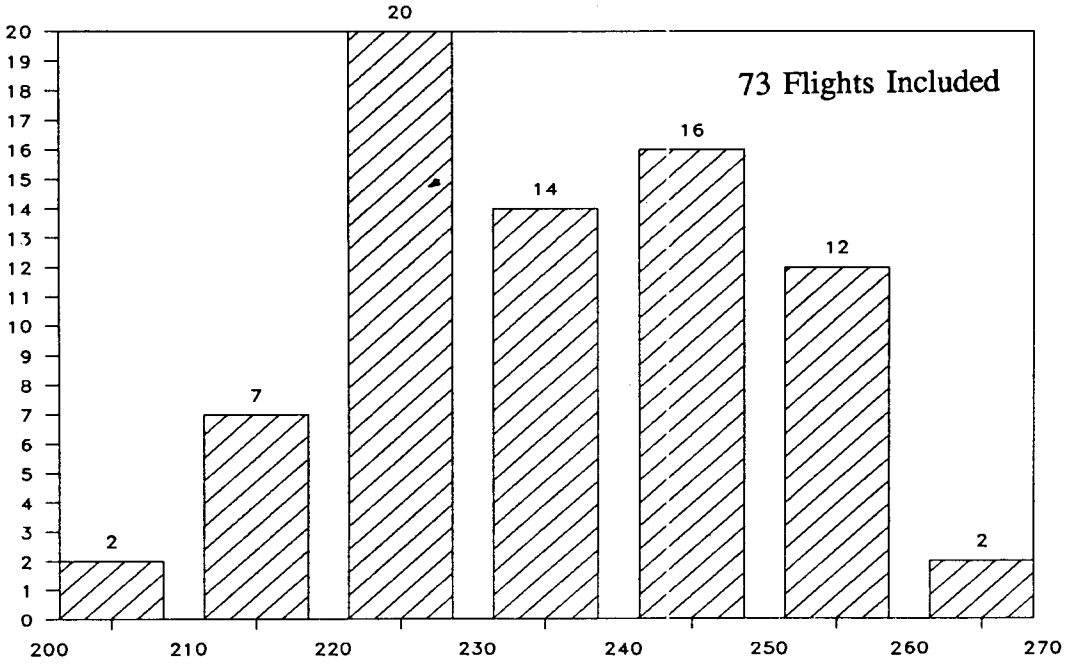


Figure 11.- Percent of flights vs. equivalent airspeed at flap detent change.



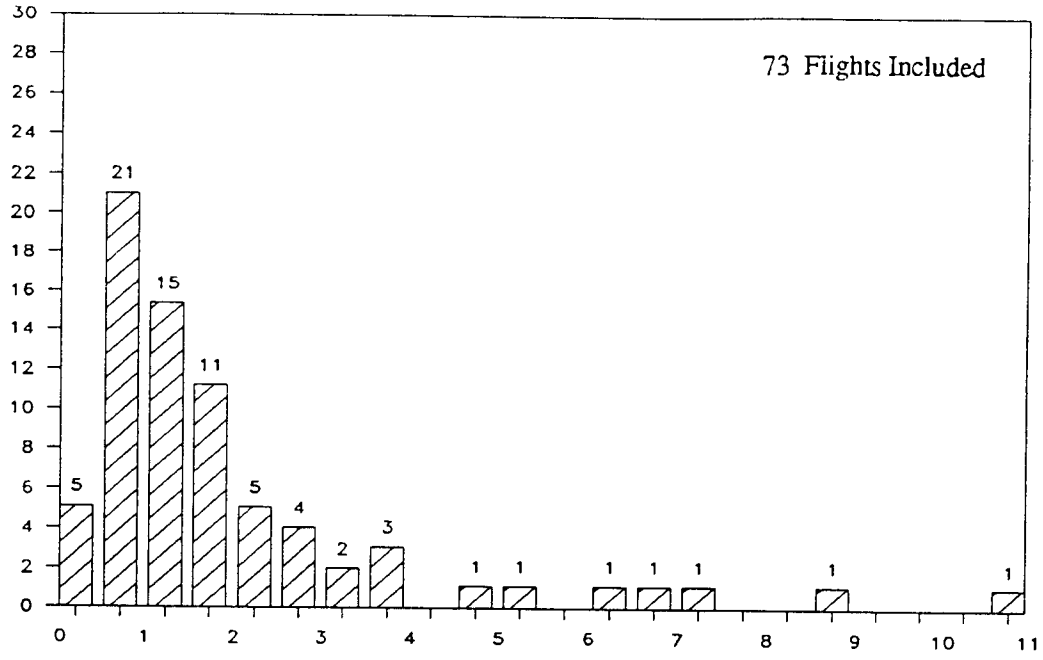

(a) Pressure altitude at initial flap deflection, kft

Number of Flights

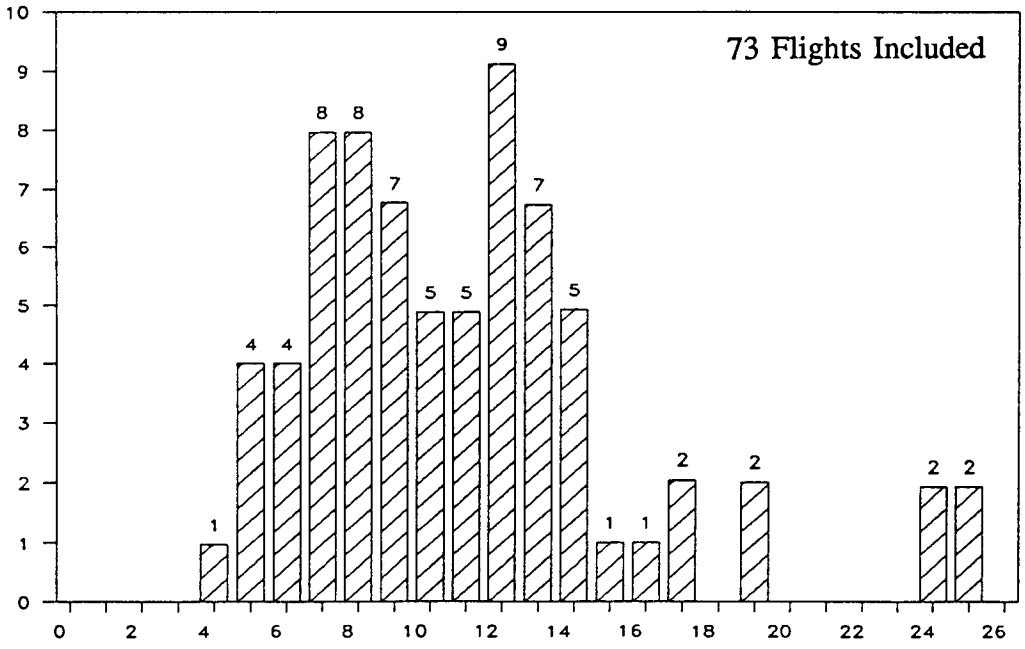



(b) Calibrated airspeed at initial flap deflection, kts

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




(c) Minutes above 10,000 ft. that flaps deflected > 2 deg




(d) Minutes before touchdown of initial flap deflection

Figure 12.- Concluded.

PRESSURE ALTITUDE BANDS

| $a_n$ LEVEL g's | -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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .80 | 0 | 0.01 | 0.01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .70 | 0 | 0.03 | 0.01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .60 | 0 | 0.06 | 0.03 | 0.01 | 0 | 0 | 0 | 0 | 0 | 0.01 |
| .50 | 0 | 0.12 | 0.10 | 0.04 | 0 | 0 | 0.02 | 0 | 0 | 0.02 |
| .40 | 0.13 | 0.36 | 0.28 | 0.17 | 0.01 | 0.01 | 0.04 | 0.01 | 0 | 0.07 |
| .30 | 1.57 | 1.37 | 0.97 | 0.65 | 0.24 | 0.09 | 0.10 | 0.03 | 0 | 0.35 |
| .20 | 14.58 | 9.31 | 5.89 | 3.41 | 1.21 | 0.80 | 0.58 | 0.39 | 0 | 2.64 |
| .15 | 43.58 | 25.84 | 15.83 | 9.58 | 3.83 | 2.54 | 1.82 | 1.26 | 0 | 7.71 |
| .10 | 140.52 | 101.17 | 64.10 | 35.52 | 17.95 | 13.09 | 8.71 | 6.70 | 4.76 | 29.44 |
| .05 | 362.38 | 208.06 | 194.39 | 148.89 | 115.24 | 92.28 | 67.81 | 53.17 | 70.77 | 108.65 |
| 0.00 | 865.02 | 811.63 | 947.45 | 1041.56 | 1123.34 | 1301.39 | 1533.91 | 1677.95 | 1741.76 | 1403.05 |
| -.05 | 283.09 | 148.22 | 135.16 | 122.23 | 90.73 | 71.59 | 57.67 | 48.77 | 93.94 | 87.25 |
| -.10 | 74.69 | 39.01 | 34.15 | 23.99 | 13.69 | 9.82 | 7.81 | 6.05 | 10.47 | 17.00 |
| -.15 | 17.14 | 9.77 | 8.40 | 6.26 | 3.11 | 1.73 | 1.61 | 1.20 | 0.95 | 3.87 |
| -.20 | 4.42 | 3.36 | 3.31 | 2.31 | 1.06 | 0.55 | 0.49 | 0.35 | 0.32 | 1.22 |
| -.30 | 0.34 | 0.64 | 0.55 | 0.36 | 0.13 | 0.02 | 0.08 | 0.04 | 0 | 0.16 |
| -.40 | 0.04 | 0.17 | 0.14 | 0.14 | 0.02 | 0 | 0.02 | 0.01 | 0 | 0.04 |
| -.50 | 0 | 0.06 | 0.04 | 0.06 | 0 | 0 | 0.01 | 0 | 0 | 0.01 |
| -.60 | 0 | 0.03 | 0 | 0.01 | 0 | 0 | 0.01 | 0 | 0 | 0 |
| -.70 | 0 | 0.01 | 0 | 0 | 0 | 0 | 0.01 | 0 | 0 | 0 |
| -.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FLIGHT HOURS @ ALT | 119.38 | 108.04 | 108.72 | 77.17 | 83.30 | 110.42 | 266.52 | 742.54 | 3.15 | 1619.24 |
| FLIGHT MILES @ ALT | 24014.89 | 29500.10 | 37757.93 | 31445.86 | 36596.70 | 52344.52 | 131369.92 | 363808.53 | 1545.14 | 708383.60 |

| | |
|---|---|
| TOTAL FLIGHTS | 914 |
| TOTAL FLIGHT HOURS FLAPS UP AND DOWN | 1619.24 |
| TOTAL FLIGHT MILES FLAPS UP AND DOWN | 708383.60 |

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

Figure 13.- Normal acceleration exceedances.

PRESSURE ALTITUDE BANDS

| $a_{nM}$ LEVEL g's | -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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .40 | 0 | 0 | 0.01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .30 | 0.04 | 0.06 | 0.03 | 0.03 | 0.01 | 0 | 0 | 0 | 0 | 0.01 |
| .20 | 1.03 | 0.69 | 0.23 | 0.21 | 0.06 | 0.05 | 0.02 | 0 | 0 | 0.16 |
| .15 | 4.32 | 3.22 | 1.22 | 0.69 | 0.38 | 0.18 | 0.07 | 0.02 | 0 | 0.70 |
| .10 | 17.18 | 15.48 | 7.49 | 3.25 | 1.73 | 0.92 | 0.26 | 0.12 | 0 | 3.21 |
| .05 | 47.74 | 42.94 | 32.77 | 20.53 | 13.24 | 8.47 | 3.71 | 2.15 | 1.27 | 12.42 |
| 0.00 | 153.48 | 129.03 | 122.85 | 119.14 | 120.15 | 139.09 | 165.95 | 184.68 | 181.22 | 161.87 |
| -.05 | 30.05 | 26.10 | 22.35 | 17.65 | 11.72 | 7.01 | 3.23 | 2.02 | 3.17 | 8.84 |
| -.10 | 4.15 | 3.94 | 3.09 | 1.98 | 1.02 | 0.39 | 0.21 | 0.10 | 0.32 | 1.03 |
| -.15 | 0.39 | 0.43 | 0.29 | 0.26 | 0.12 | 0.05 | 0.05 | 0.01 | 0 | 0.11 |
| -.20 | 0.03 | 0.06 | 0.03 | 0.03 | 0.01 | 0.01 | 0.01 | 0 | 0 | 0.01 |
| -.30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FLIGHT HOURS @ ALT | 119.38 | 108.04 | 108.72 | 77.17 | 83.30 | 110.42 | 266.52 | 742.54 | 3.15 | 1619.24 |
| FLIGHT MILES @ ALT | 24014.89 | 29500.10 | 37757.93 | 31445.86 | 36596.70 | 52344.52 | 131369.92 | 363808.53 | 1545.14 | 708383.60 |

| | |
|---|---|
| TOTAL FLIGHTS | 914 |
| TOTAL FLIGHT HOURS FLAPS UP AND DOWN | 1619.24 |
| TOTAL FLIGHT MILES FLAPS UP AND DOWN | 708383.60 |

(b) $a_{nM}$ level crossing counts per hour within pressure altitude bands

Figure 13.- Continued.

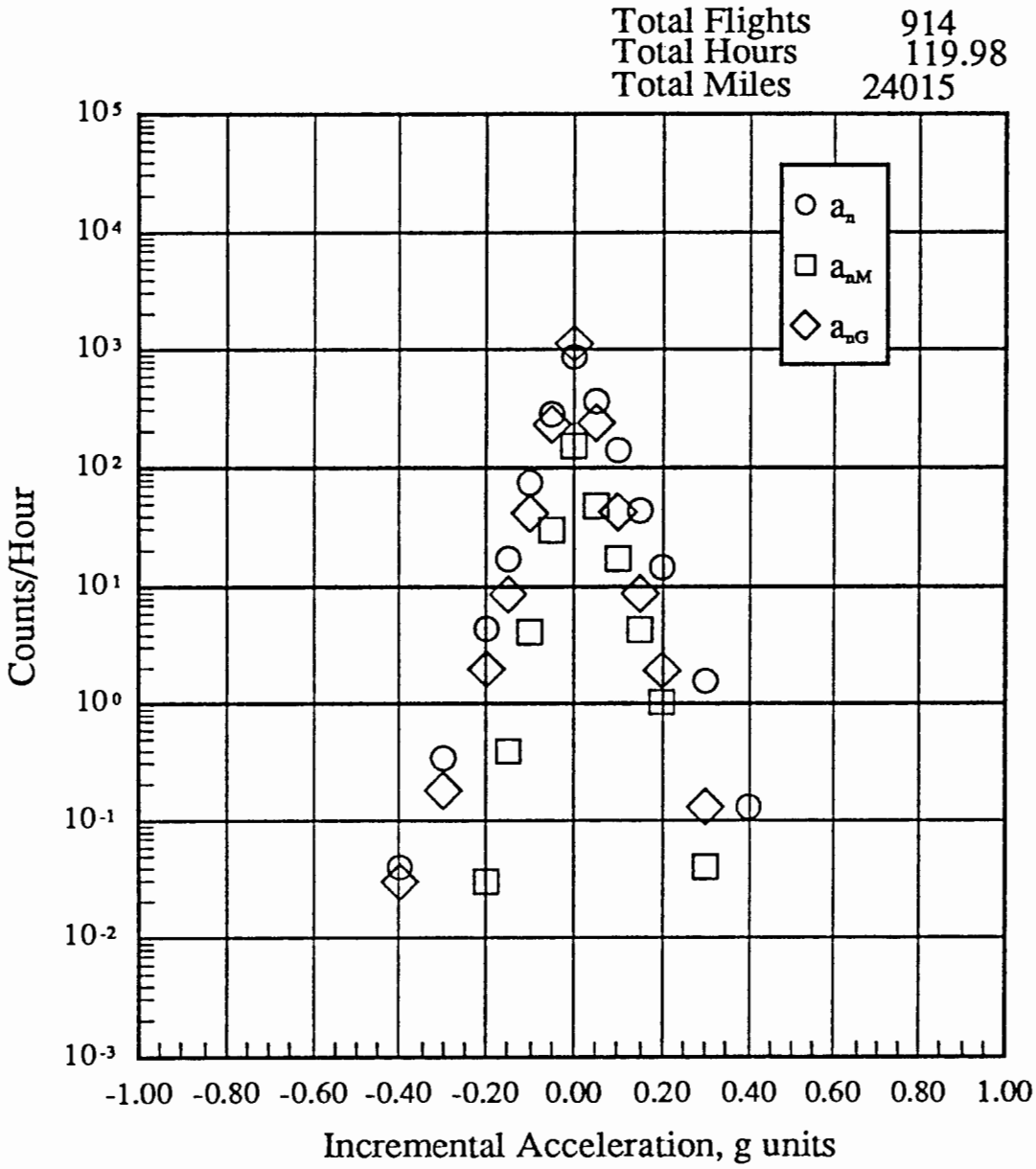
PRESSURE ALTITUDE BANDS

| $a_{nG}$ LEVEL g's | -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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .70 | 0 | 0 | 0.01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .60 | 0 | 0.02 | 0.02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .50 | 0 | 0.06 | 0.03 | 0.03 | 0 | 0 | 0 | 0 | 0 | 0.01 |
| .40 | 0 | 0.14 | 0.13 | 0.04 | 0.01 | 0 | 0.01 | 0 | 0 | 0.02 |
| .30 | 0.13 | 0.35 | 0.40 | 0.26 | 0.02 | 0.01 | 0.06 | 0.01 | 0 | 0.09 |
| .20 | 1.94 | 1.80 | 1.70 | 1.10 | 0.24 | 0.14 | 0.20 | 0.11 | 0 | 0.54 |
| .15 | 8.73 | 5.00 | 4.67 | 2.84 | 0.95 | 0.59 | 0.72 | 0.51 | 0 | 1.87 |
| .10 | 42.48 | 17.92 | 15.35 | 9.56 | 4.31 | 3.29 | 3.37 | 2.73 | 0.95 | 8.07 |
| .05 | 239.27 | 92.41 | 72.85 | 50.69 | 31.24 | 27.47 | 27.95 | 23.90 | 32.37 | 50.21 |
| 0 | 1121.52 | 1205.66 | 1383.02 | 1505.45 | 1602.97 | 1623.82 | 1647.05 | 1651.64 | 1702.41 | 1552.74 |
| -.05 | 232.50 | 94.22 | 73.75 | 51.73 | 32.35 | 27.29 | 27.53 | 23.69 | 31.74 | 49.83 |
| -.10 | 41.39 | 17.75 | 15.44 | 9.25 | 4.57 | 3.31 | 3.26 | 2.62 | 1.27 | 7.91 |
| -.15 | 8.64 | 4.98 | 4.68 | 2.73 | 0.92 | 0.67 | 0.68 | 0.45 | 0 | 1.82 |
| -.20 | 1.99 | 2.02 | 1.89 | 1.10 | 0.18 | 0.19 | 0.20 | 0.10 | 0 | 0.56 |
| -.30 | 0.18 | 0.45 | 0.36 | 0.19 | 0.02 | 0 | 0.03 | 0.01 | 0 | 0.09 |
| -.40 | 0.03 | 0.14 | 0.08 | 0.06 | 0 | 0 | 0.01 | 0 | 0 | 0.02 |
| -.50 | 0 | 0.06 | 0.03 | 0.01 | 0 | 0 | 0.01 | 0 | 0 | 0.01 |
| -.60 | 0 | 0.01 | 0 | 0.01 | 0 | 0 | 0.01 | 0 | 0 | 0 |
| -.70 | 0 | 0.01 | 0 | 0 | 0 | 0 | 0.01 | 0 | 0 | 0 |
| -.80 | 0 | 0.01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FLIGHT HOURS @ ALT | 119.38 | 108.04 | 108.72 | 77.17 | 83.30 | 110.42 | 266.52 | 742.54 | 3.15 | 1619.24 |
| FLIGHT MILES @ ALT | 24014.89 | 29500.10 | 37757.93 | 31445.86 | 36596.70 | 52344.52 | 131369.92 | 363808.53 | 1545.14 | 708383.60 |

| | |
|---|---|
| TOTAL FLIGHTS | 914 |
| TOTAL FLIGHT HOURS FLAPS UP AND DOWN | 1619.24 |
| TOTAL FLIGHT MILES FLAPS UP AND DOWN | 708383.60 |

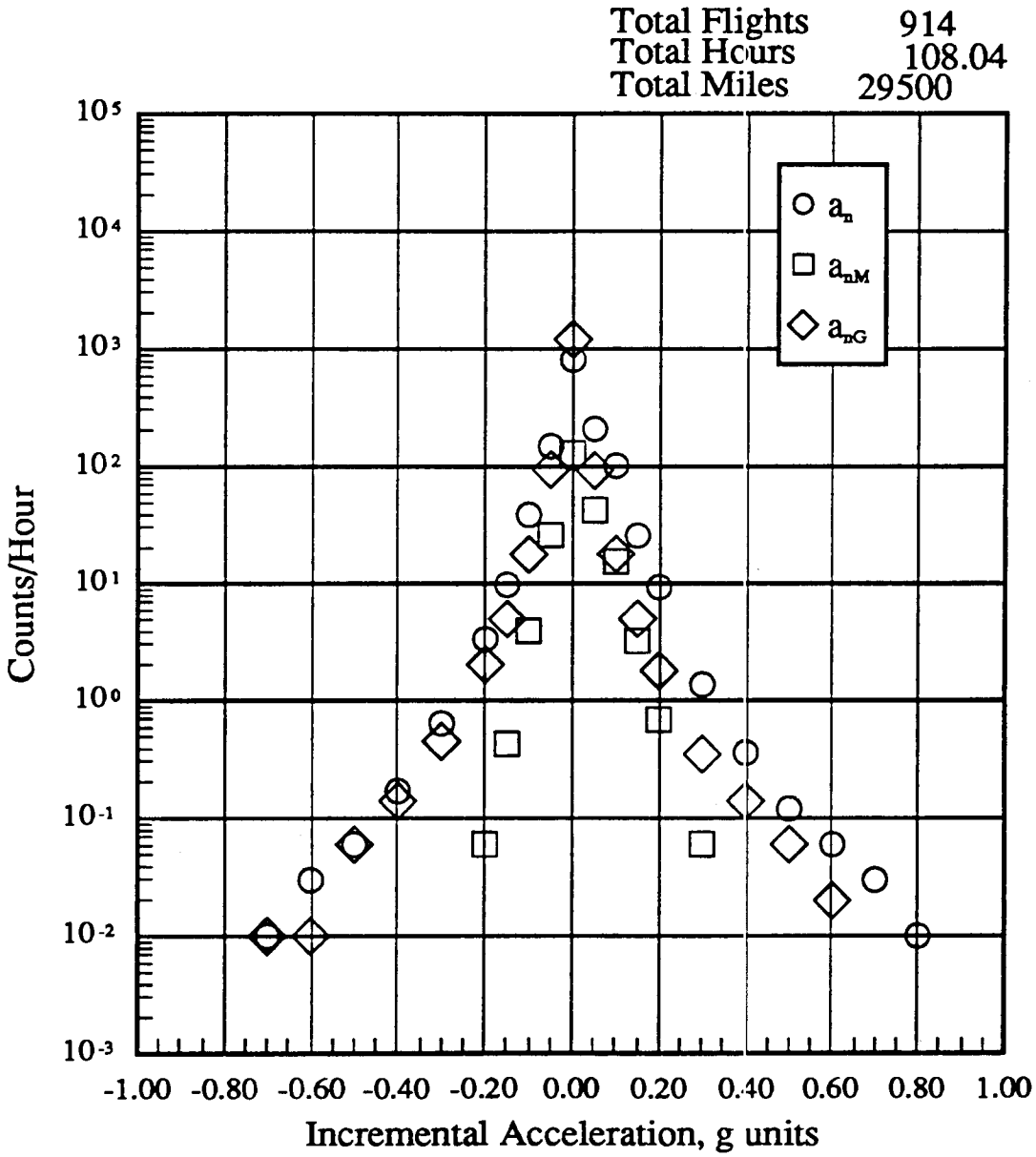
(c) $a_{nG}$ level crossing counts per hour within pressure altitude bands

Figure 13.- Continued.



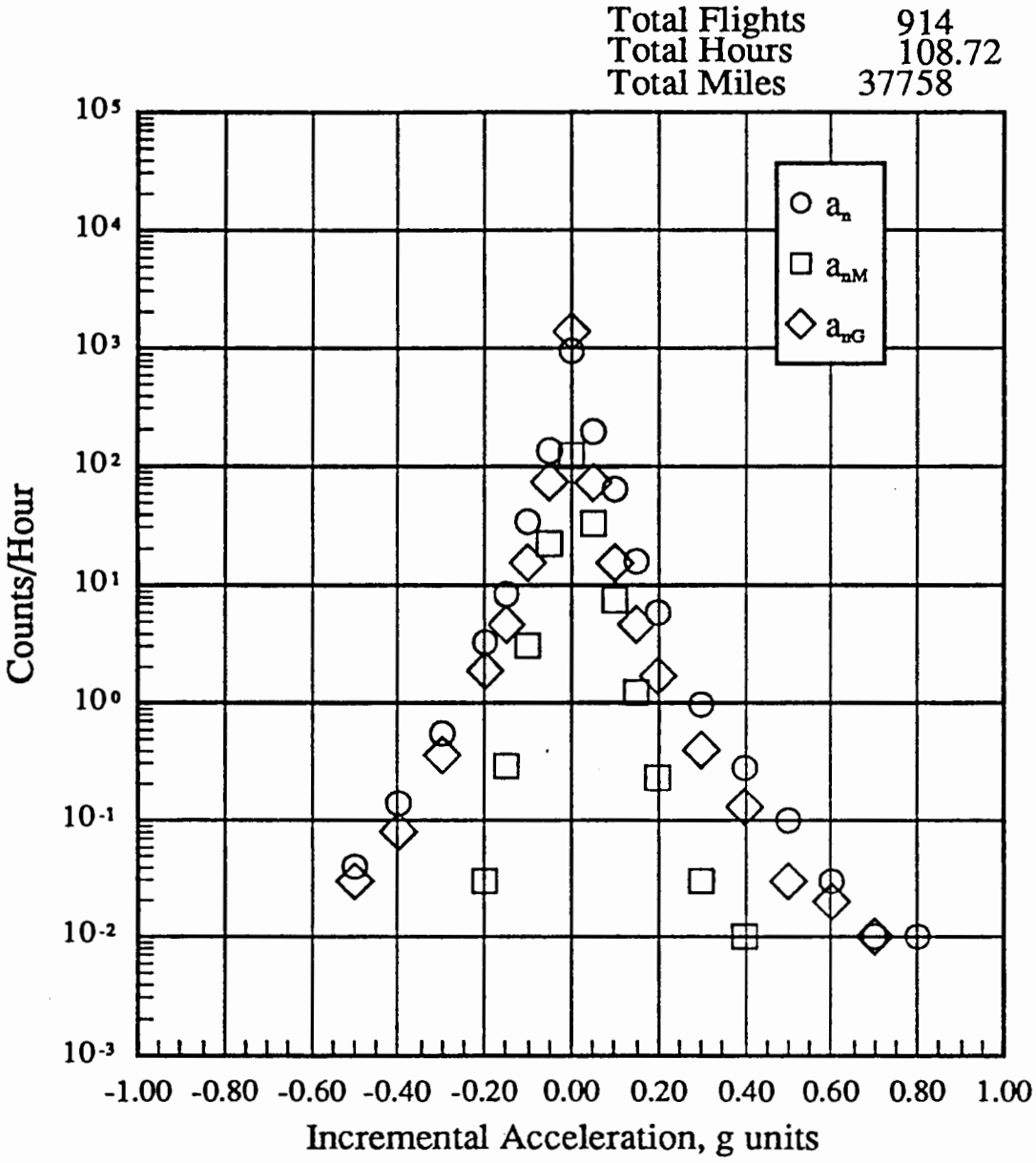

(d) $a_n$, $a_{nM}$, $a_{nG}$, -500 to 4500 feet altitude

Figure 13.- Continued.



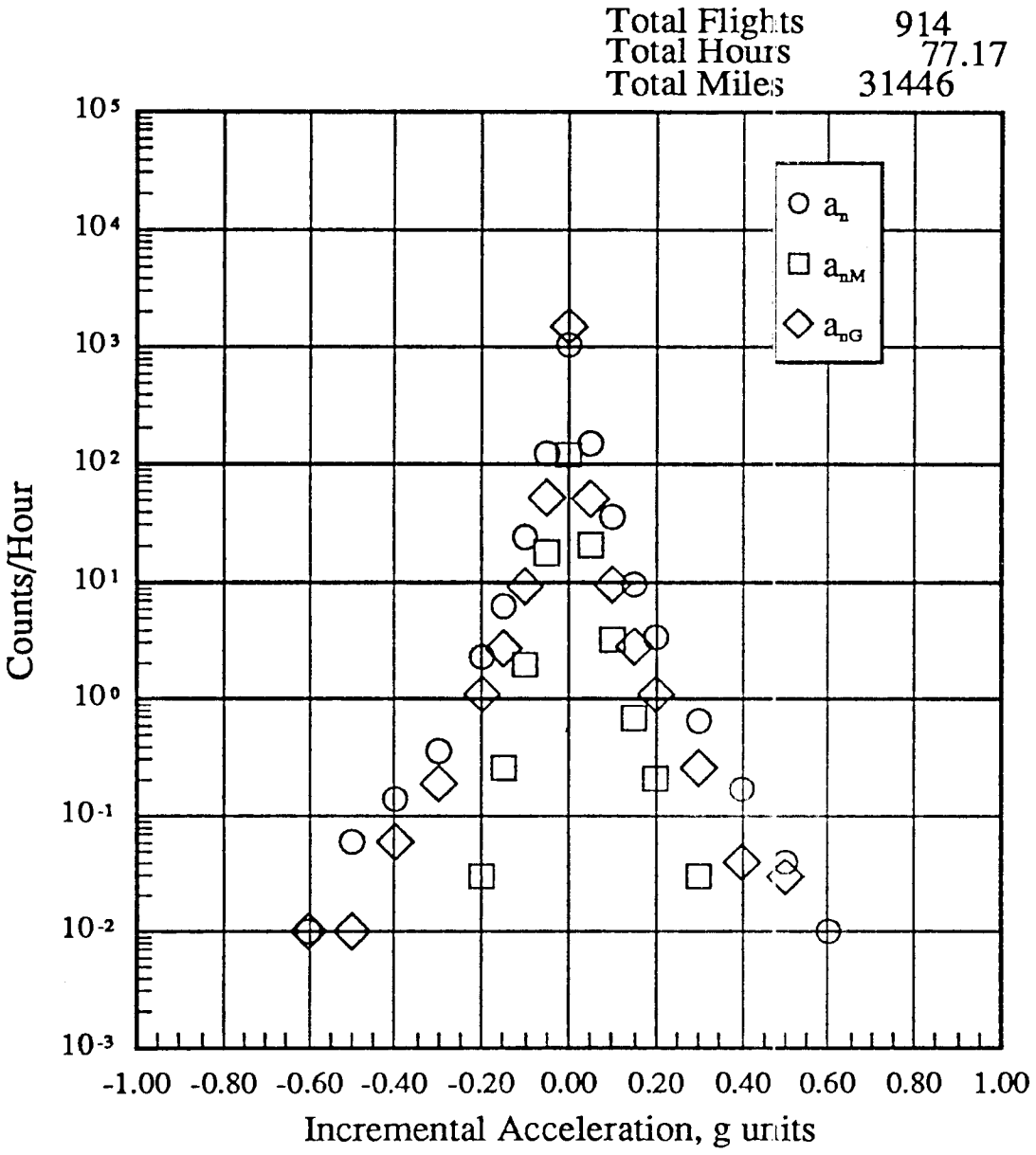

(e) $a_n$, $a_{nM}$, $a_{nG}$, 4500 to 9500 feet altitude

Figure 13.- Continued.



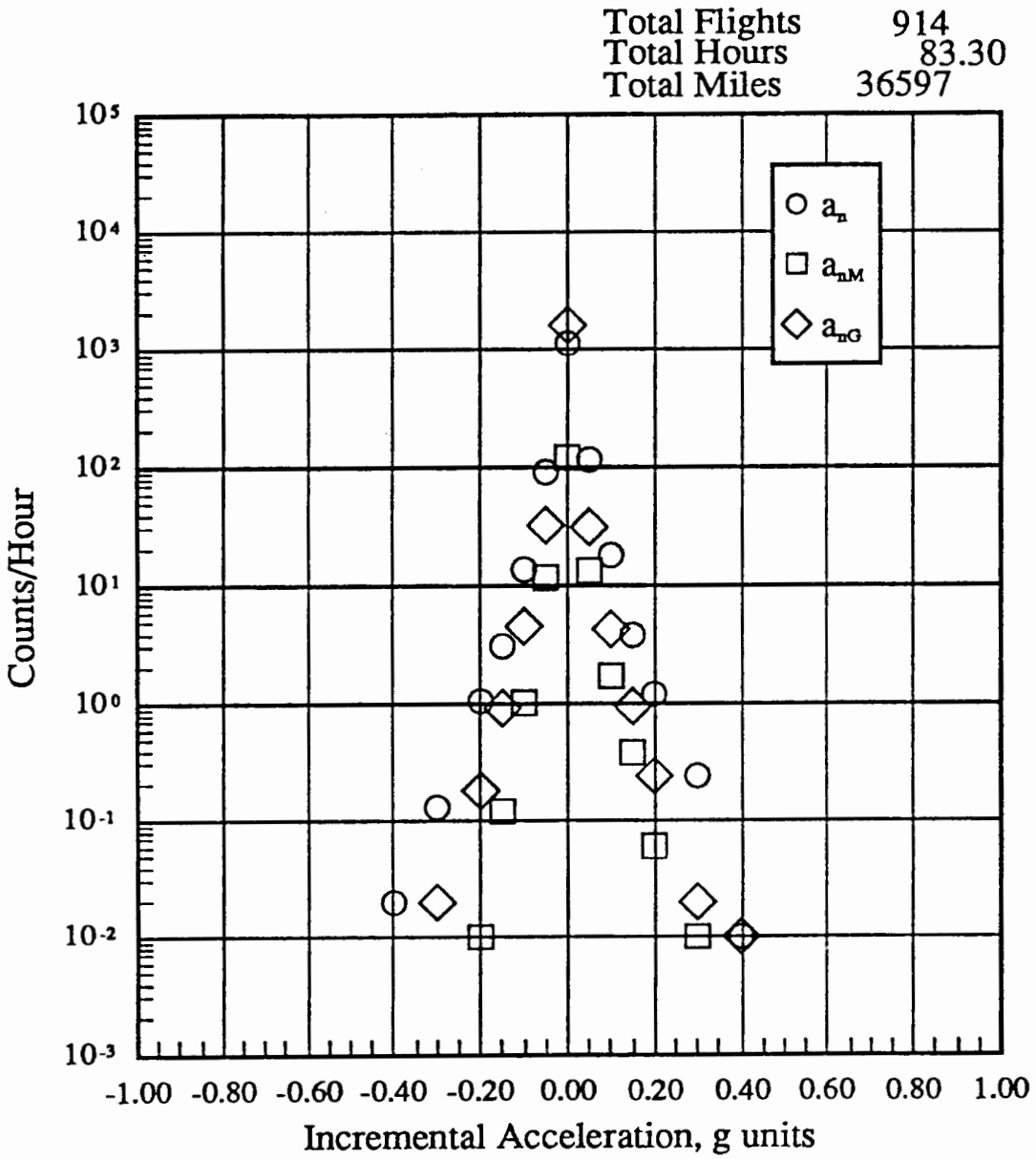

(f) $a_n$, $a_{nM}$, $a_{nG}$, 9500 to 14500 feet altitude

Figure 13.- Continued.



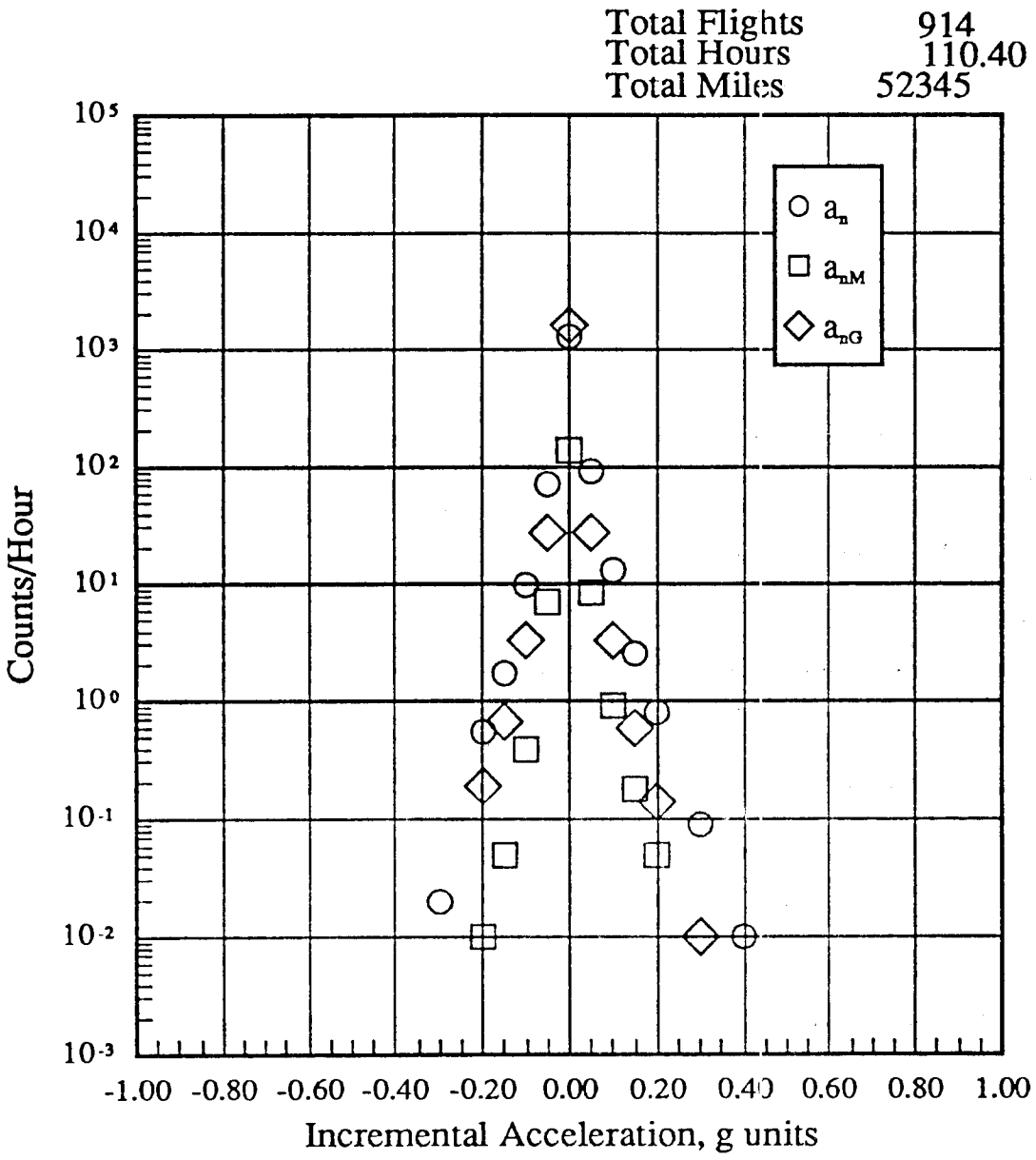

(g) $a_n$, $a_{nM}$, $a_{nG}$, 14500 to 19500 feet altitude

Figure 13.- Continued.



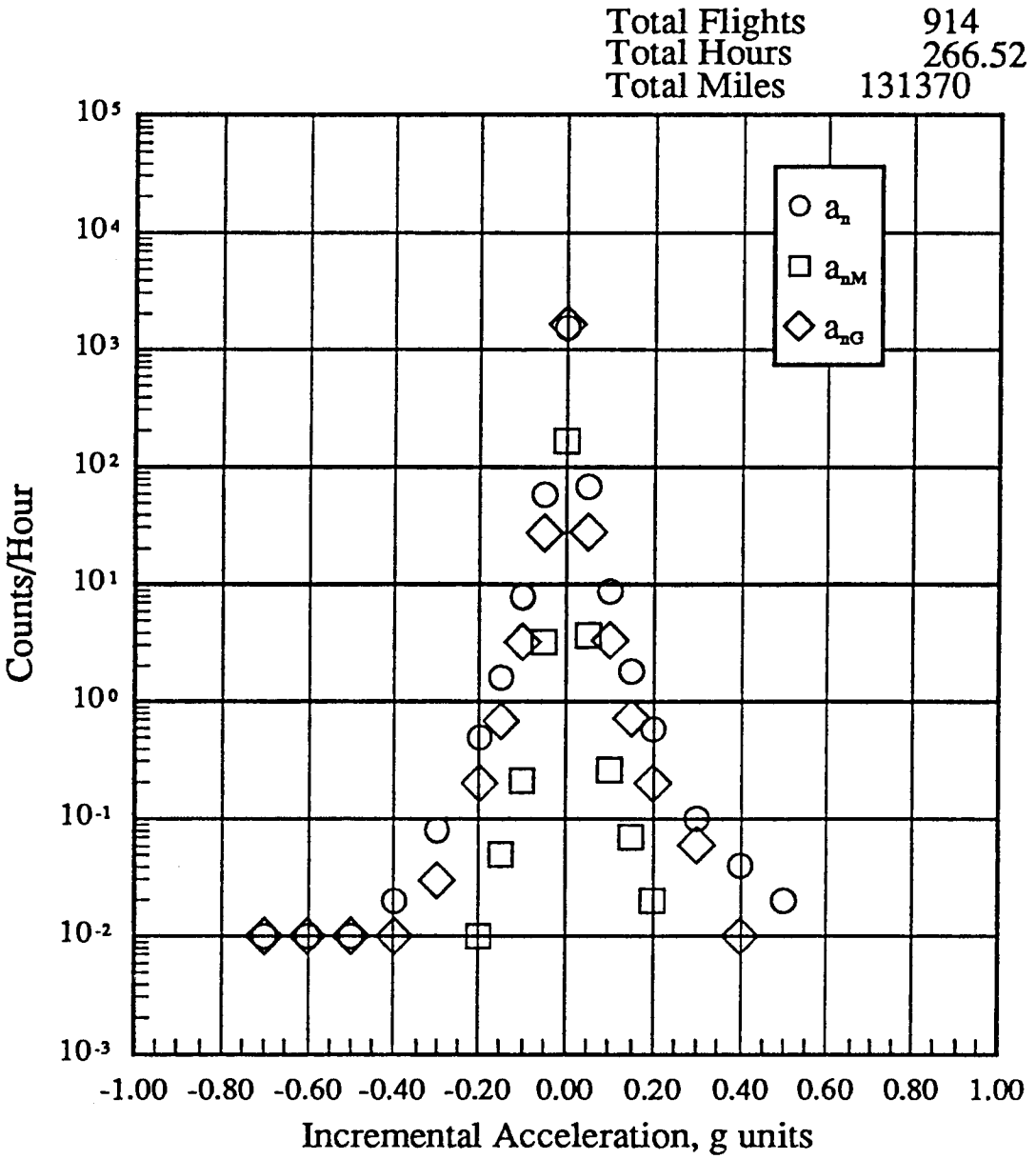

(h) $a_n$, $a_{nM}$, $a_{nG}$, 19500 to 24500 feet altitude

Figure 13.- Continued.



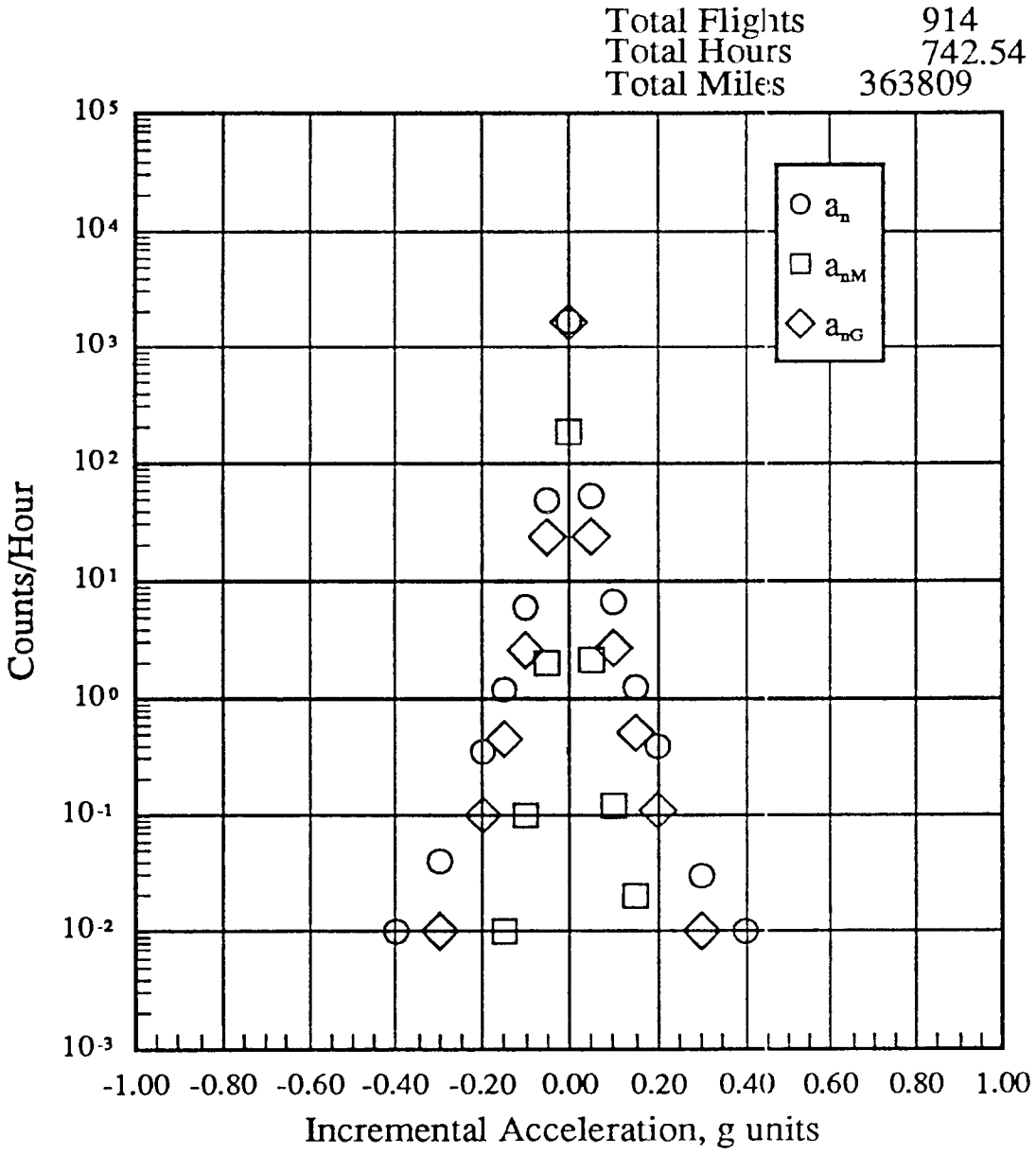

(i) $a_n$, $a_{nM}$, $a_{nG}$, 24500 to 29500 feet altitude

Figure 13.- Continued.



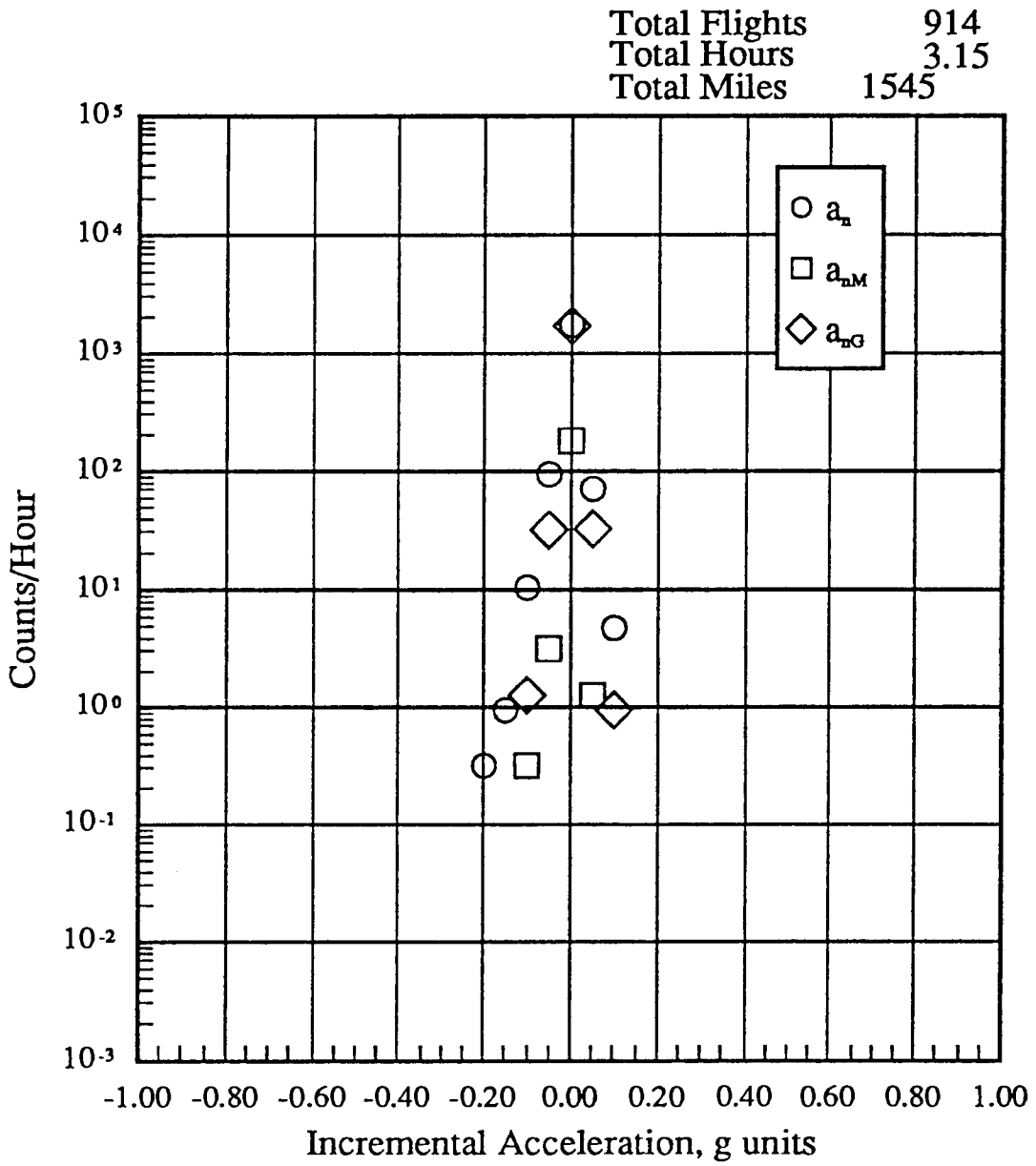

(j) $a_n$, $a_{nM}$, $a_{nG}$, 29500 to 34500 feet altitude

Figure 13.- Continued.



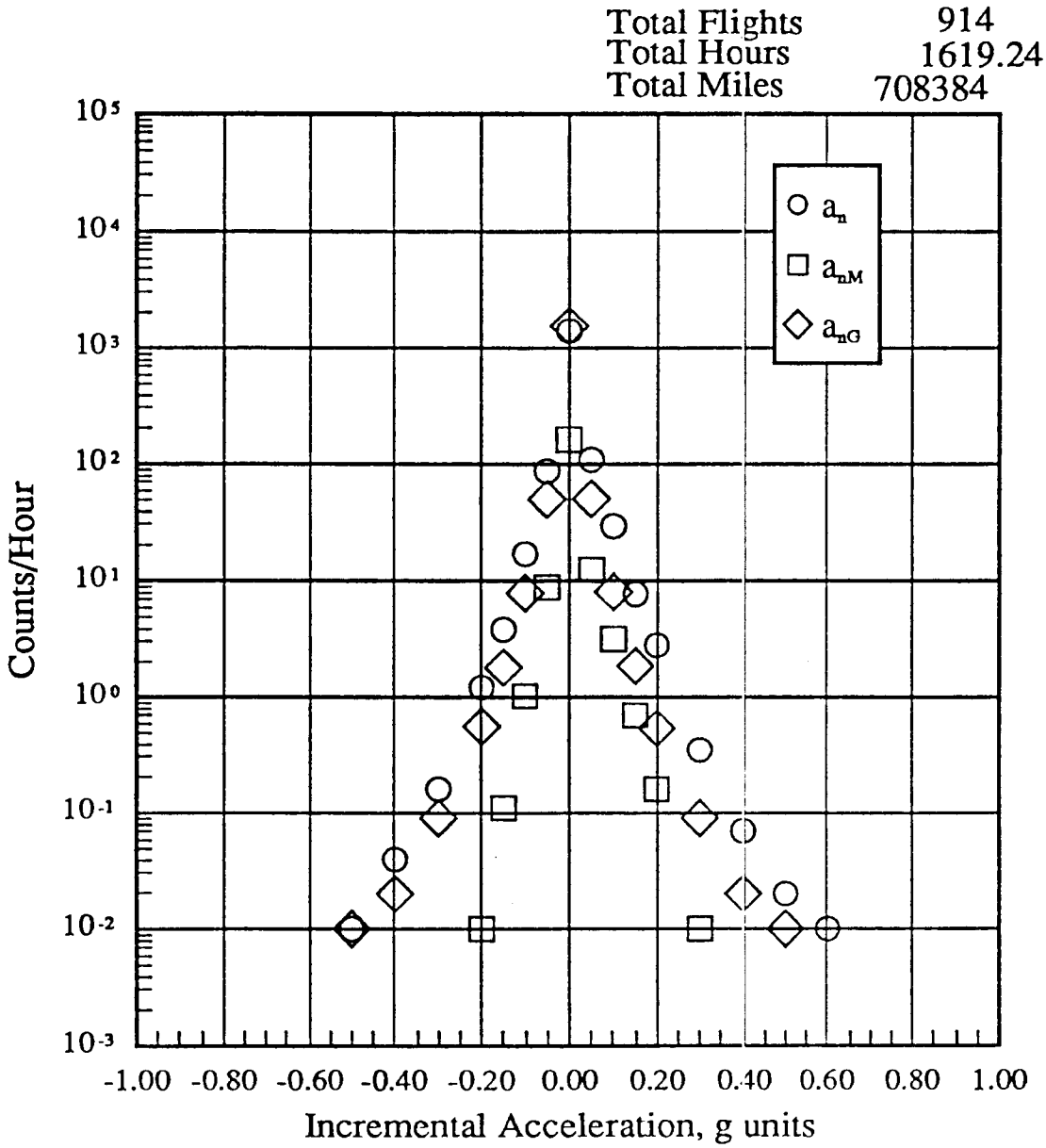

(k) $a_n$, $a_{nM}$, $a_{nG}$, 34500 to 39500 feet altitude

Figure 13.- Continued.




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

Figure 13.- Continued.




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

Figure 13.- Concluded.

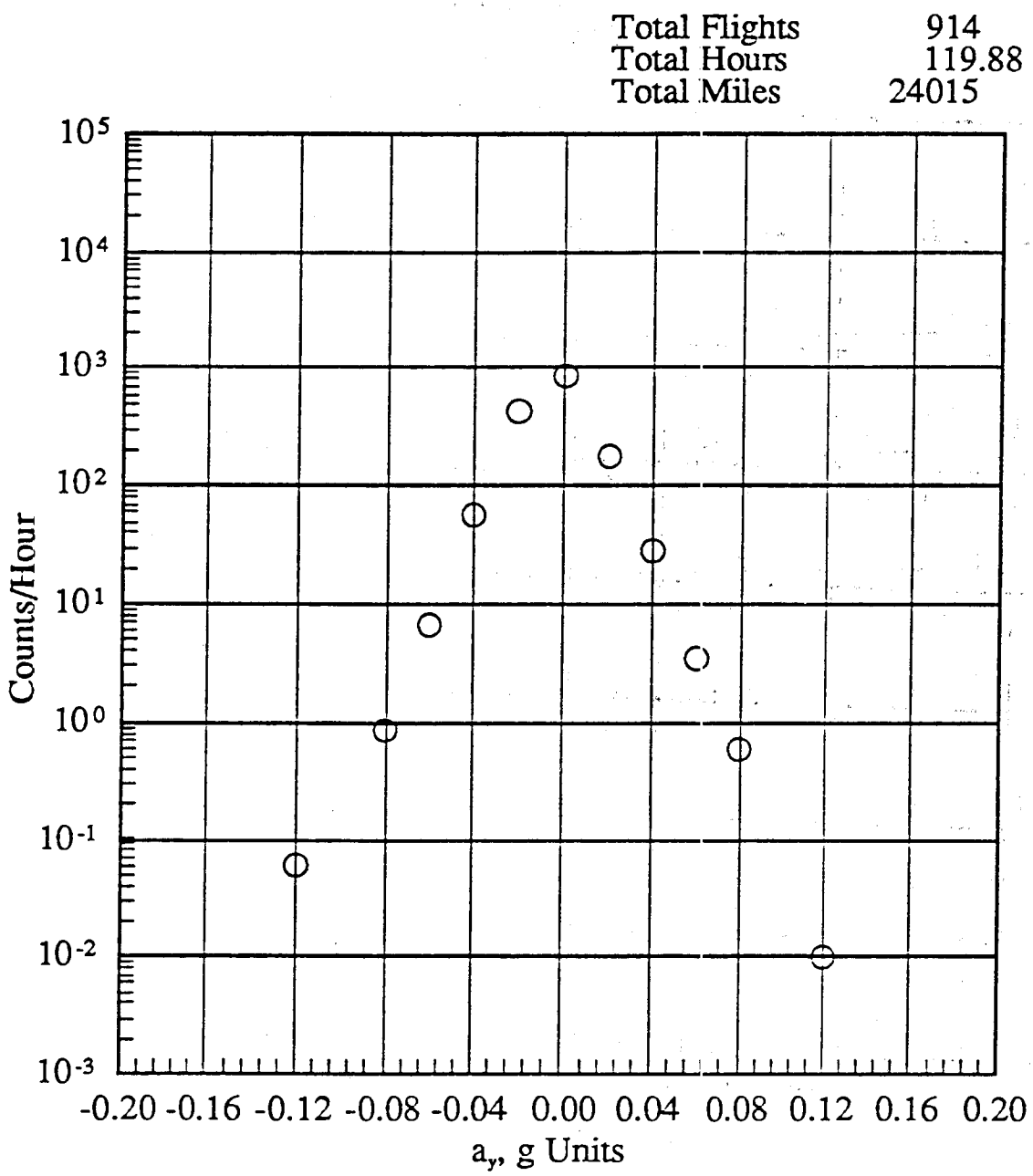
PRESSURE ALTITUDE BANDS

| $a_y$ g's | -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 |
|---|---|---|---|---|---|---|---|---|---|---|
| .48 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .44 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .36 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .16 | 0 | 0.02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .12 | 0.01 | 0.04 | 0.01 | 0.01 | 0.02 | 0 | 0 | 0 | 0 | 0.01 |
| .08 | 0.59 | 0.43 | 0.43 | 0.27 | 0.08 | 0.11 | 0.08 | 0.04 | 0.32 | 0.16 |
| .06 | 3.47 | 1.89 | 1.78 | 0.83 | 0.44 | 0.37 | 0.27 | 0.22 | 0.32 | 0.74 |
| .04 | 28.28 | 12.22 | 10.33 | 6.10 | 3.27 | 2.79 | 2.01 | 1.70 | 3.49 | 5.36 |
| .02 | 178.39 | 84.20 | 74.01 | 58.79 | 40.25 | 29.99 | 20.82 | 18.29 | 45.07 | 42.56 |
| 0 | 859.73 | 718.92 | 727.68 | 768.95 | 787.00 | 969.87 | 1323.92 | 1497.85 | 1679.24 | 1211.54 |
| -.02 | 430.65 | 172.22 | 120.92 | 81.14 | 47.85 | 33.95 | 25.77 | 19.75 | 32.69 | 73.36 |
| -.04 | 56.94 | 19.50 | 11.39 | 6.97 | 2.59 | 2.12 | 1.86 | 1.39 | 2.22 | 7.82 |
| -.06 | 6.73 | 2.76 | 1.94 | 1.21 | 0.40 | 0.26 | 0.22 | 0.21 | 0 | 1.04 |
| -.08 | 0.86 | 0.63 | 0.50 | 0.29 | 0.16 | 0.05 | 0.04 | 0.04 | 0 | 0.19 |
| -.12 | 0.06 | 0.12 | 0.06 | 0.04 | 0 | 0 | 0 | 0 | 0 | 0.02 |
| -.16 | 0 | 0.04 | 0 | 0.01 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.20 | 0 | 0.01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.36 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.44 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.48 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FLIGHT HOURS @ ALT | 119.38 | 108.04 | 108.72 | 77.17 | 83.30 | 110.42 | 266.52 | 742.54 | 3.15 | 1619.24 |
| FLIGHT MILES @ ALT | 24014.89 | 29500.10 | 37757.93 | 31445.86 | 36596.70 | 52344.52 | 131369.92 | 363808.53 | 1545.14 | 708383.60 |

| | |
|---|---|
| TOTAL FLIGHTS | 914 |
| TOTAL FLIGHT HOURS FLAPS UP AND DOWN | 1619.24 |
| TOTAL FLIGHT MILES FLAPS UP AND DOWN | 708383.60 |

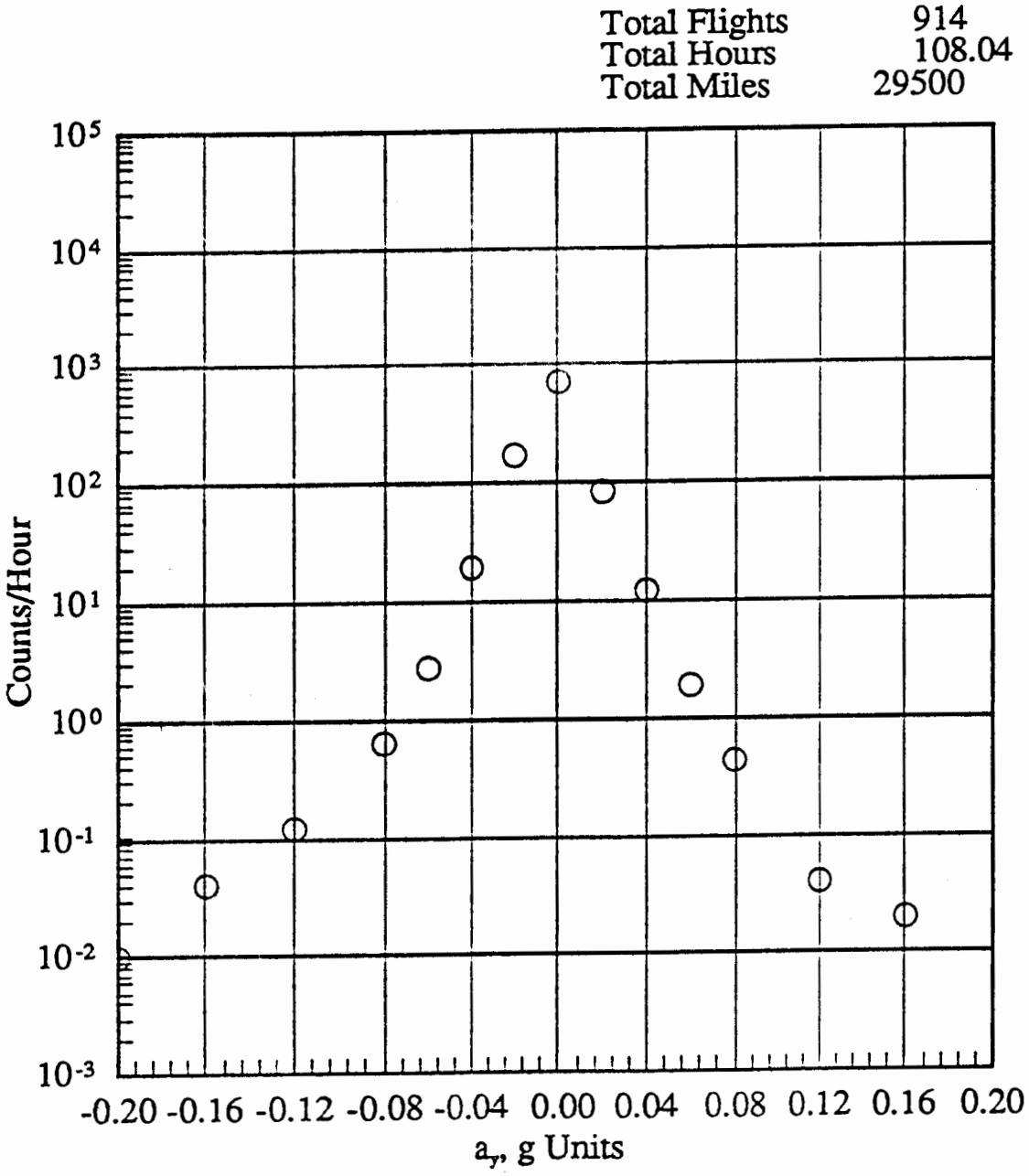
(a) $a_y$ Level crossing counts per hour with in pressure altitude bands

Figure 14.- Lateral acceleration exceedances.



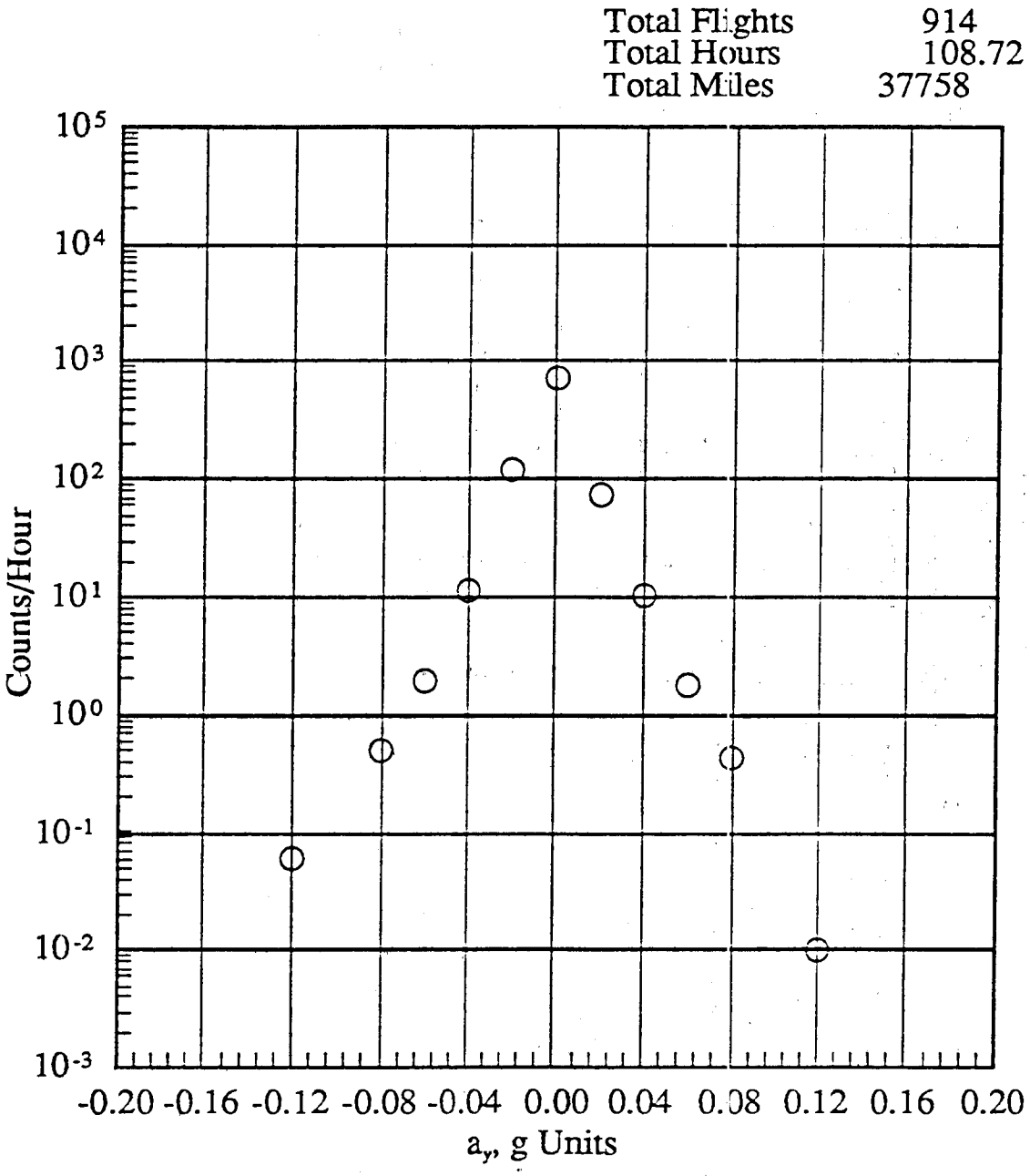

(b) -500 to 4500 feet altitude

Figure 14.- Continued.



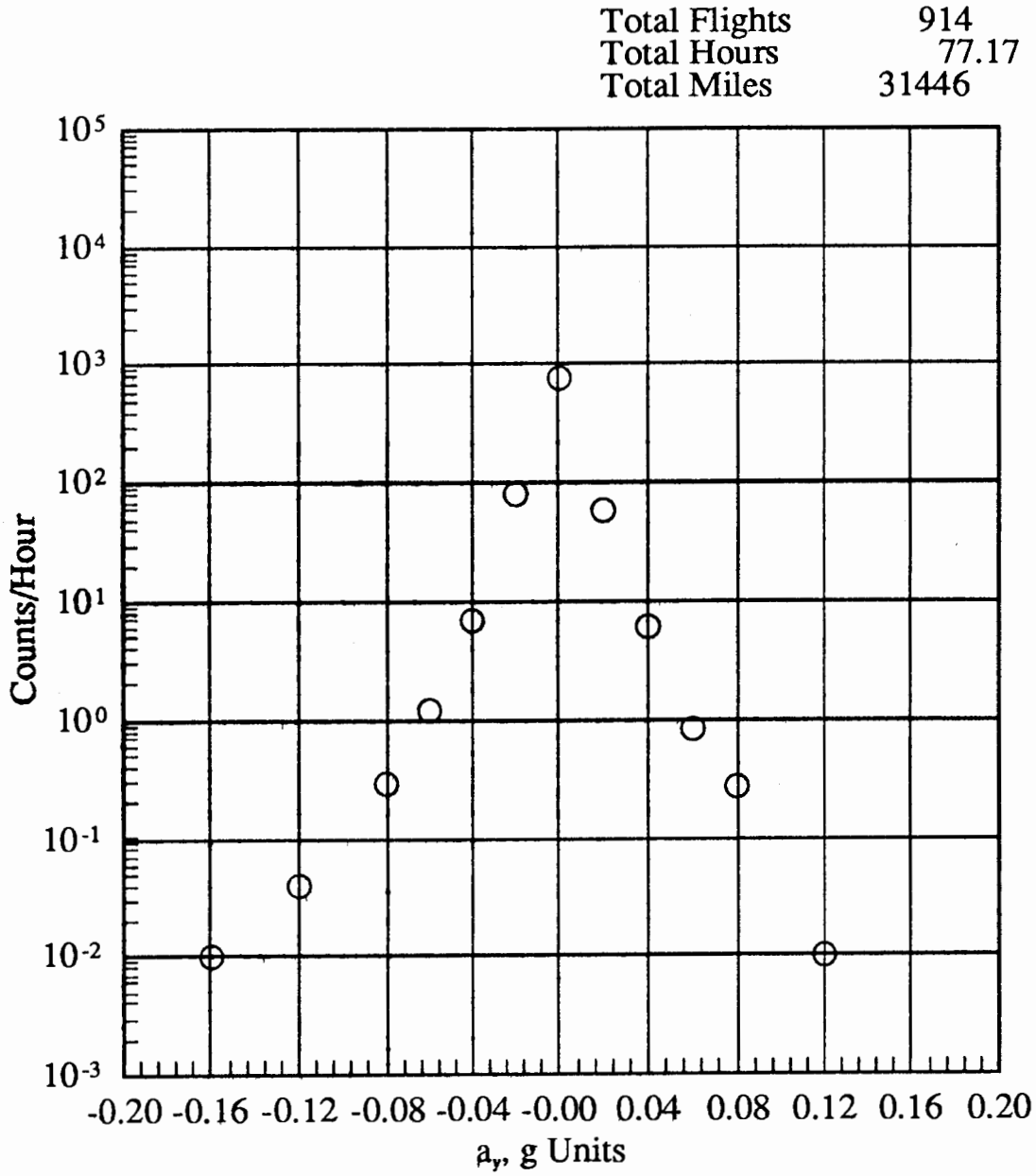

(c) 4500 to 9500 feet altitude

Figure 14.- Continued.



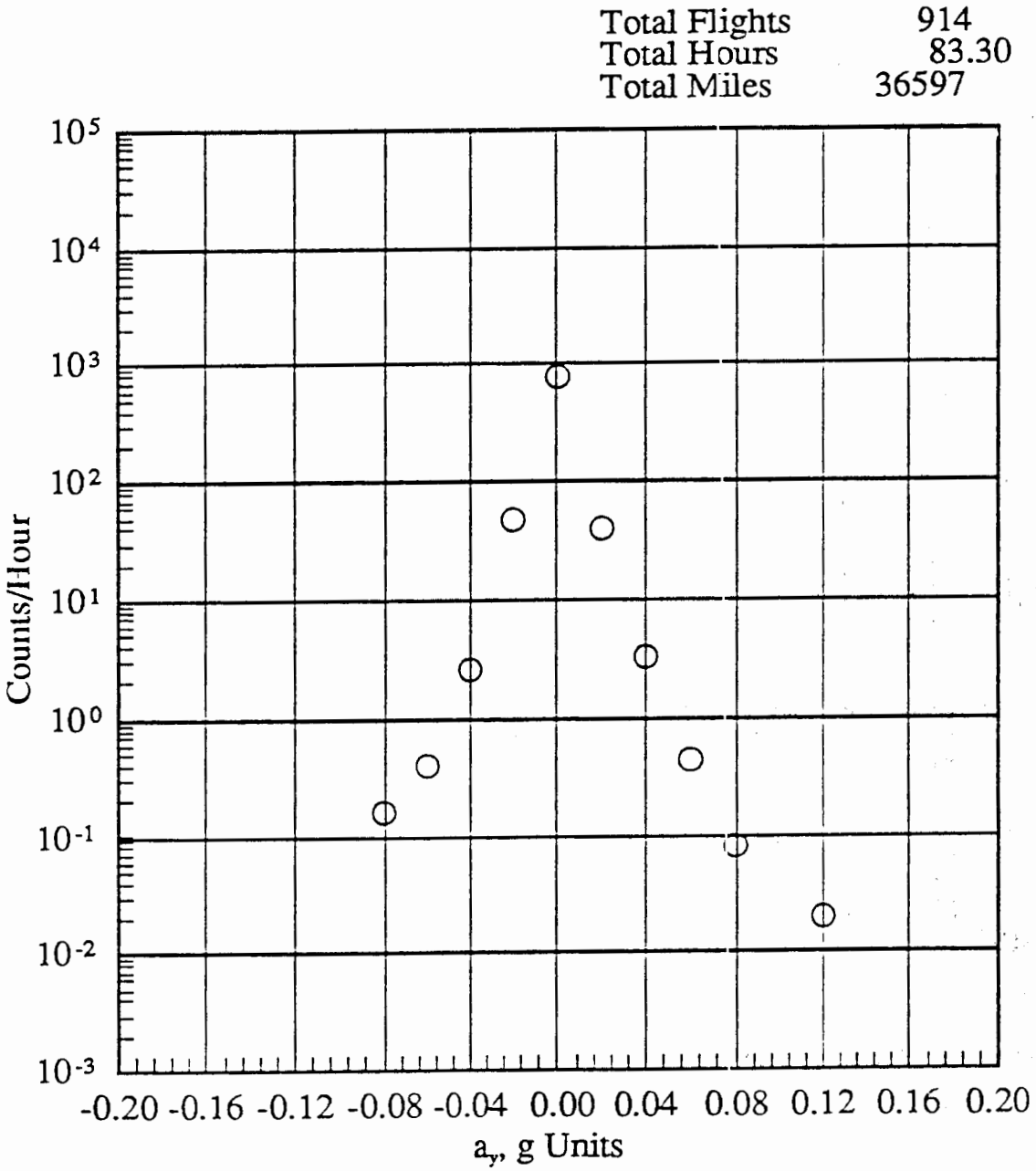

(d) 9500 to 14500 feet altitude

Figure 14.- Continued.



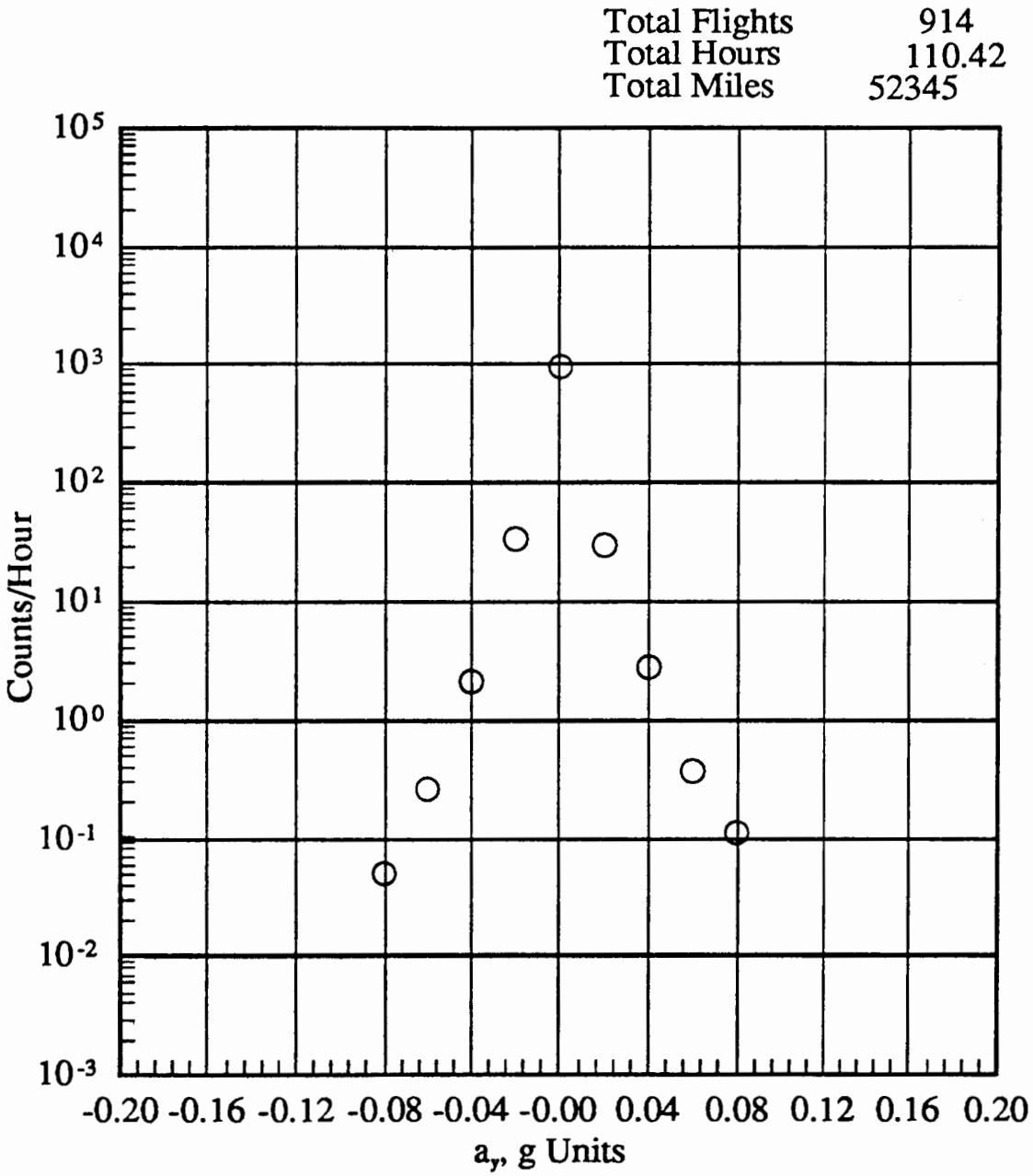

(e) 14500 to 19500 feet altitude

Figure 14.- Continued.



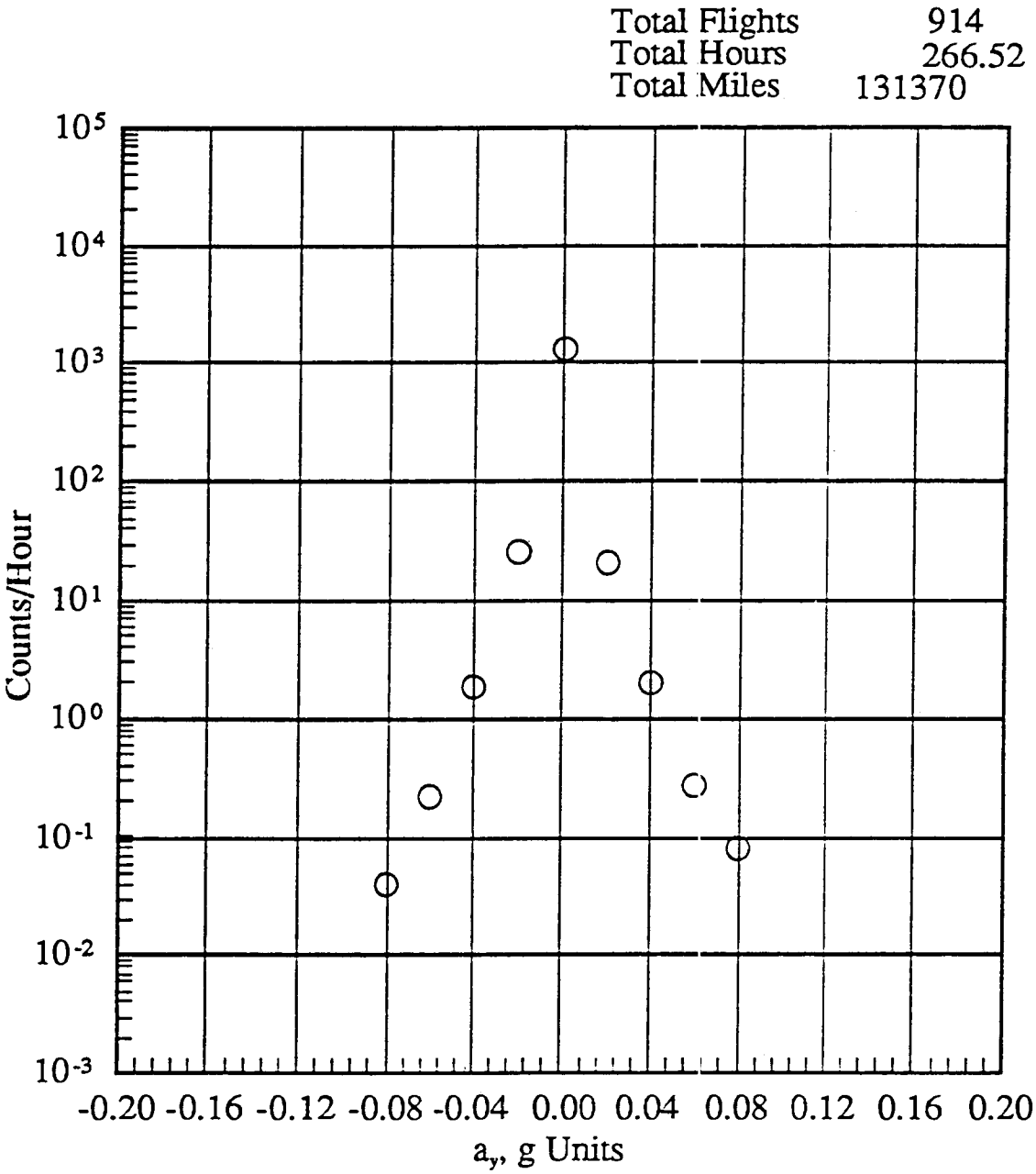

(f) 19500 to 24500 feet altitude

Figure 14.- Continued.



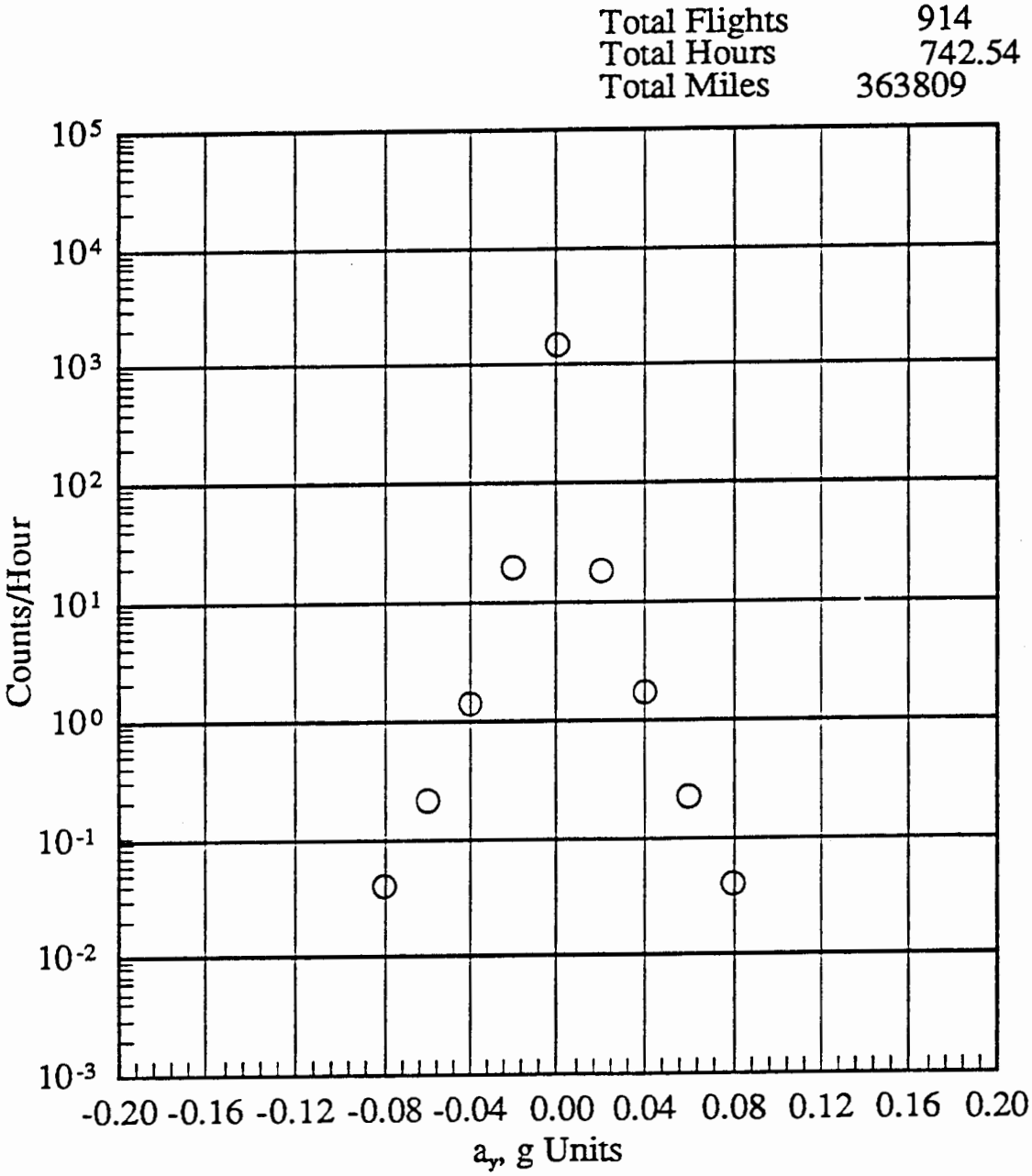

(g) 24500 to 29500 feet altitude

Figure 14.- Continued.



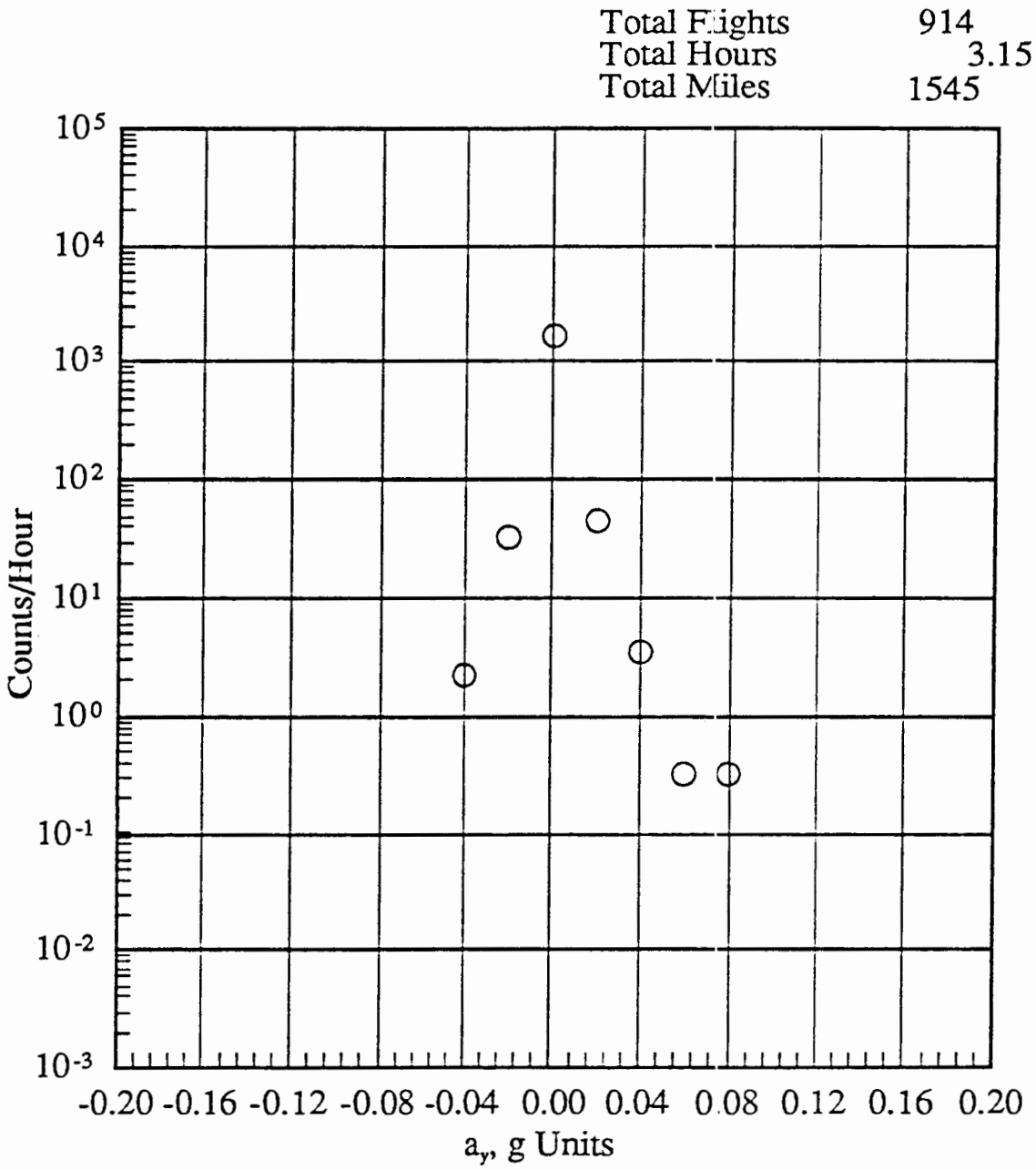

(h) 29500 to 34500 feet altitude

Figure 14.- Continued.



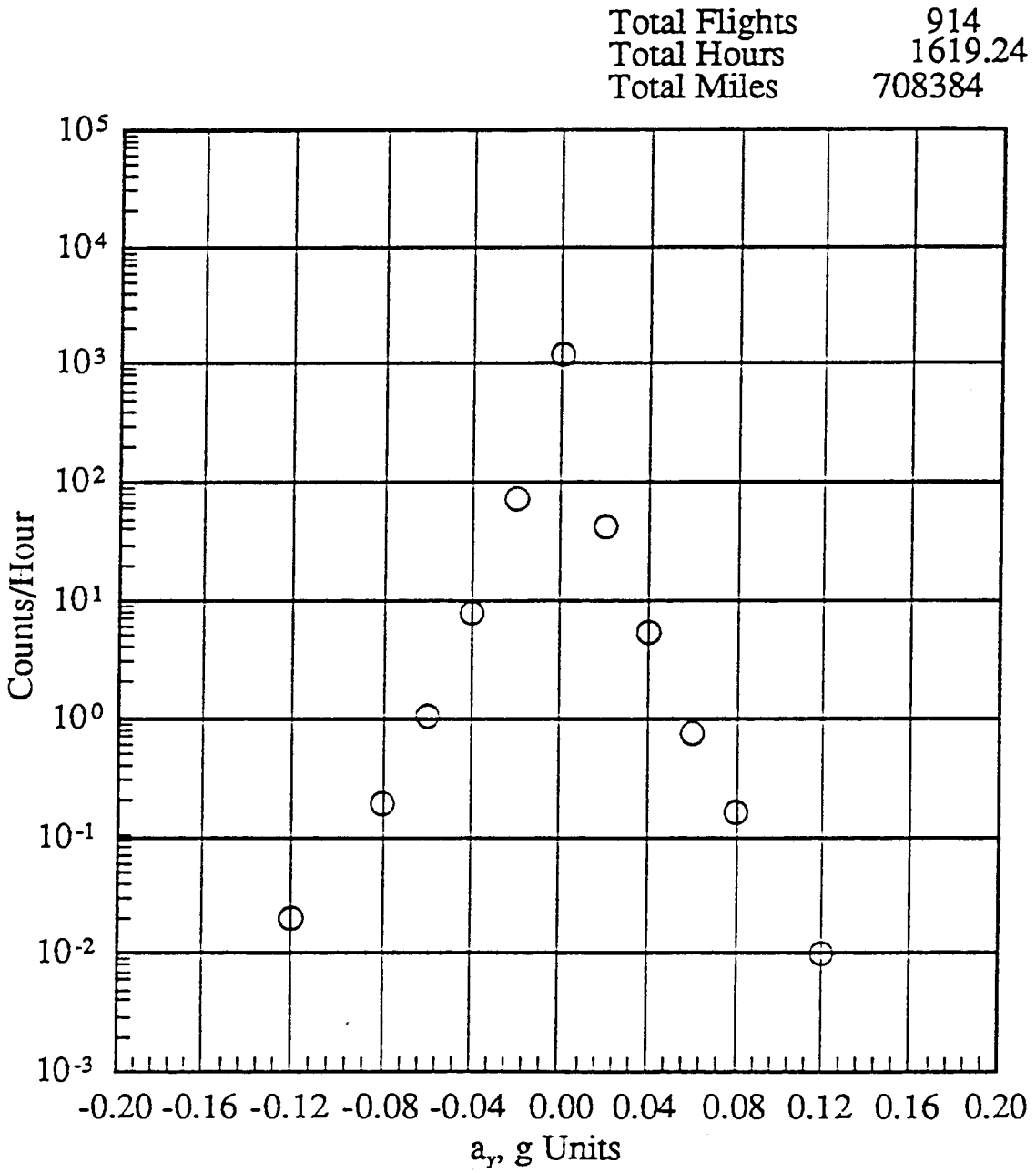

(i) 34500 to 39500 feet altitude

Figure 14.- Continued.




(j) 39500 to 44500 feet altitude

Figure 14.- Continued.




(k) -500 to 44500 feet altitude

Figure 14.- Concluded.

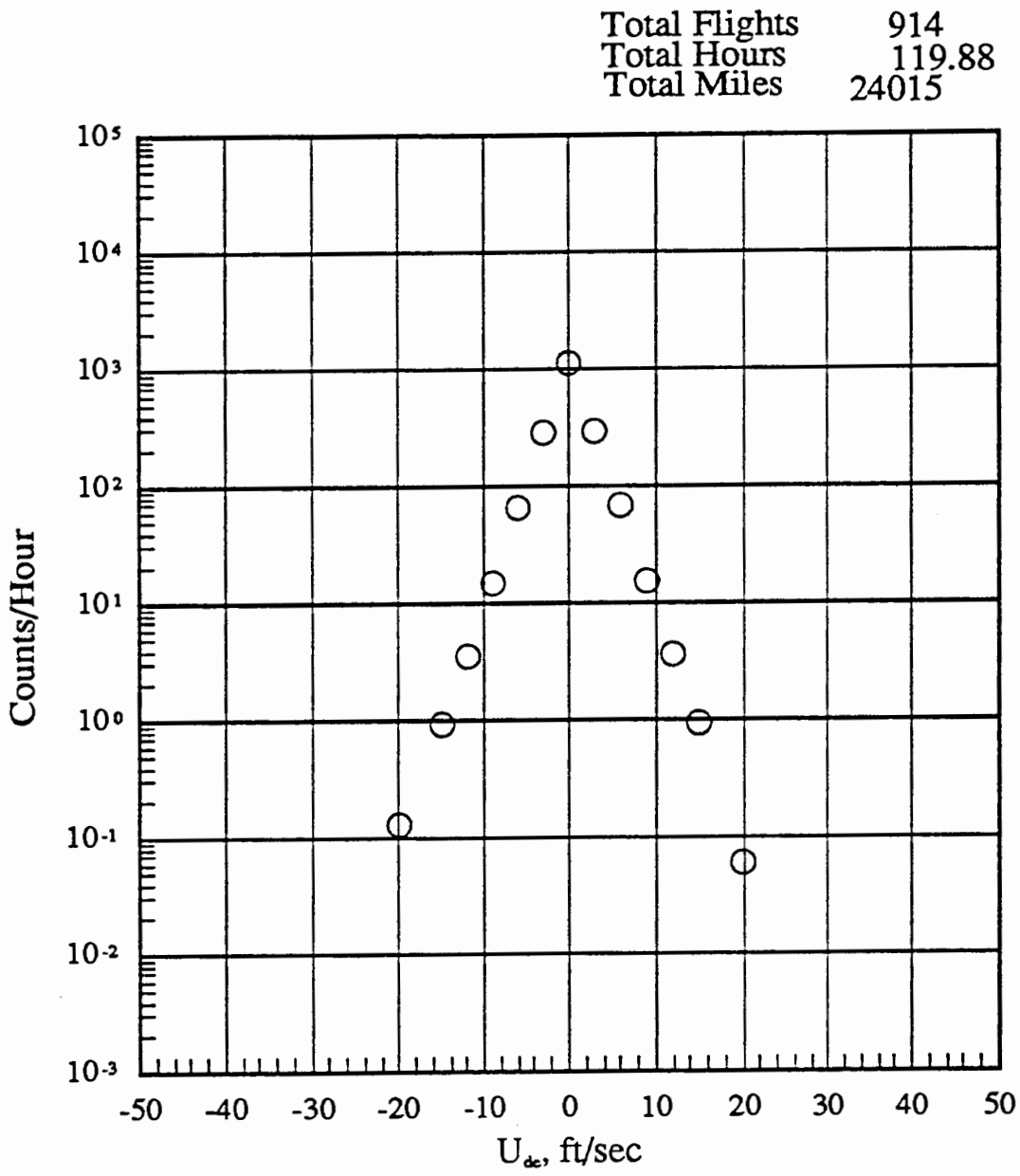
PRESSURE ALTITUDE BANDS

| DERIVED GUST VELOCITY LEVEL FT/SEC | -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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 90 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 40 | 0 | 0 | 0.01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 | 0 | 0.01 | 0.02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | 0.06 | 0.10 | 0.06 | 0.03 | 0 | 0 | 0 | 0 | 0 | 0.02 |
| 15 | 0.94 | 0.41 | 0.29 | 0.13 | 0.01 | 0 | 0 | 0 | 0 | 0.12 |
| 12 | 3.64 | 1.12 | 0.56 | 0.26 | 0.04 | 0.01 | 0.03 | 0 | 0 | 0.40 |
| 9 | 15.31 | 3.41 | 1.64 | 0.71 | 0.11 | 0.04 | 0.09 | 0.02 | 0 | 1.53 |
| 6 | 67.82 | 13.76 | 7.06 | 2.73 | 0.71 | 0.38 | 0.40 | 0.21 | 0 | 6.75 |
| 3 | 294.80 | 71.46 | 38.04 | 18.43 | 8.18 | 5.41 | 4.93 | 4.30 | 1.59 | 33.51 |
| 0 | 1121.52 | 1205.66 | 1383.02 | 1505.45 | 1602.97 | 1623.82 | 1647.05 | 1651.64 | 1702.41 | 1552.74 |
| -3 | 286.81 | 72.53 | 38.67 | 19.37 | 8.34 | 5.30 | 4.78 | 4.14 | 1.90 | 32.98 |
| -6 | 64.94 | 13.24 | 6.55 | 2.67 | 0.77 | 0.37 | 0.36 | 0.20 | 0 | 6.45 |
| -9 | 14.83 | 3.46 | 1.89 | 0.67 | 0.14 | 0.06 | 0.06 | 0.03 | 0 | 1.52 |
| -12 | 3.55 | 1.21 | 0.57 | 0.17 | 0.04 | 0 | 0.02 | 0.01 | 0 | 0.40 |
| -15 | 0.93 | 0.51 | 0.24 | 0.08 | 0 | 0 | 0.01 | 0 | 0 | 0.12 |
| -20 | 0.13 | 0.11 | 0.06 | 0.01 | 0 | 0 | 0.01 | 0 | 0 | 0.02 |
| -30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -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 |
| FLIGHT HOURS @ ALT | 119.38 | 108.04 | 108.72 | 77.17 | 83.30 | 110.42 | 266.52 | 742.54 | 3.15 | 1619.24 |
| FLIGHT MILES @ ALT | 24014.89 | 29500.10 | 37757.93 | 31445.86 | 36596.70 | 52344.52 | 131369.92 | 363808.53 | 1545.14 | 708383.60 |

| | |
|---|---|
| TOTAL FLIGHTS | 914 |
| TOTAL FLIGHT HOURS FLAPS UP AND DOWN | 1619.24 |
| TOTAL FLIGHT MILES FLAPS UP AND DOWN | 708383.60 |

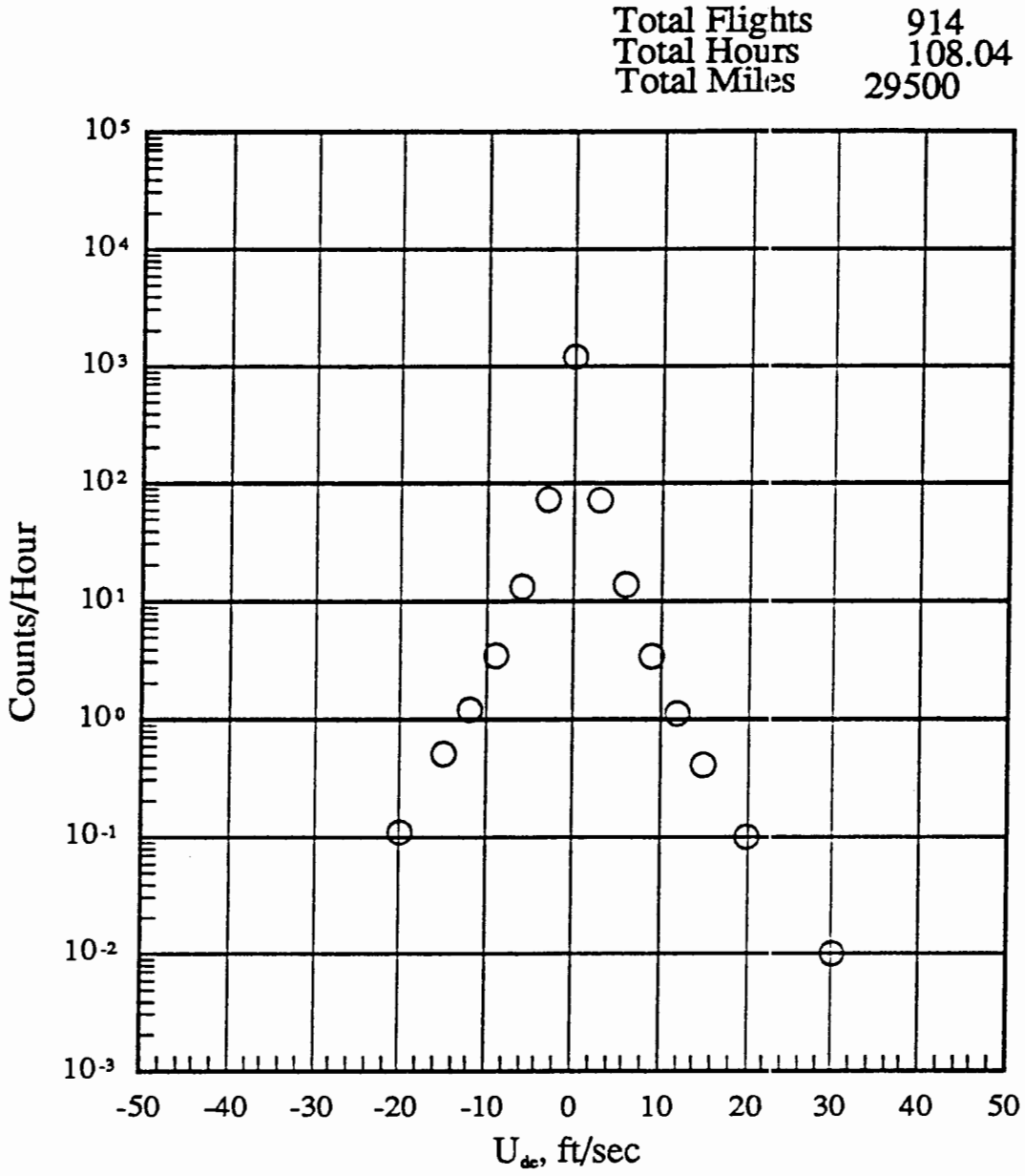
(a) $U_{de}$ Level crossing counts per hour within pressure altitude bands.

Figure 15.- $U_{de}$ Exceedances



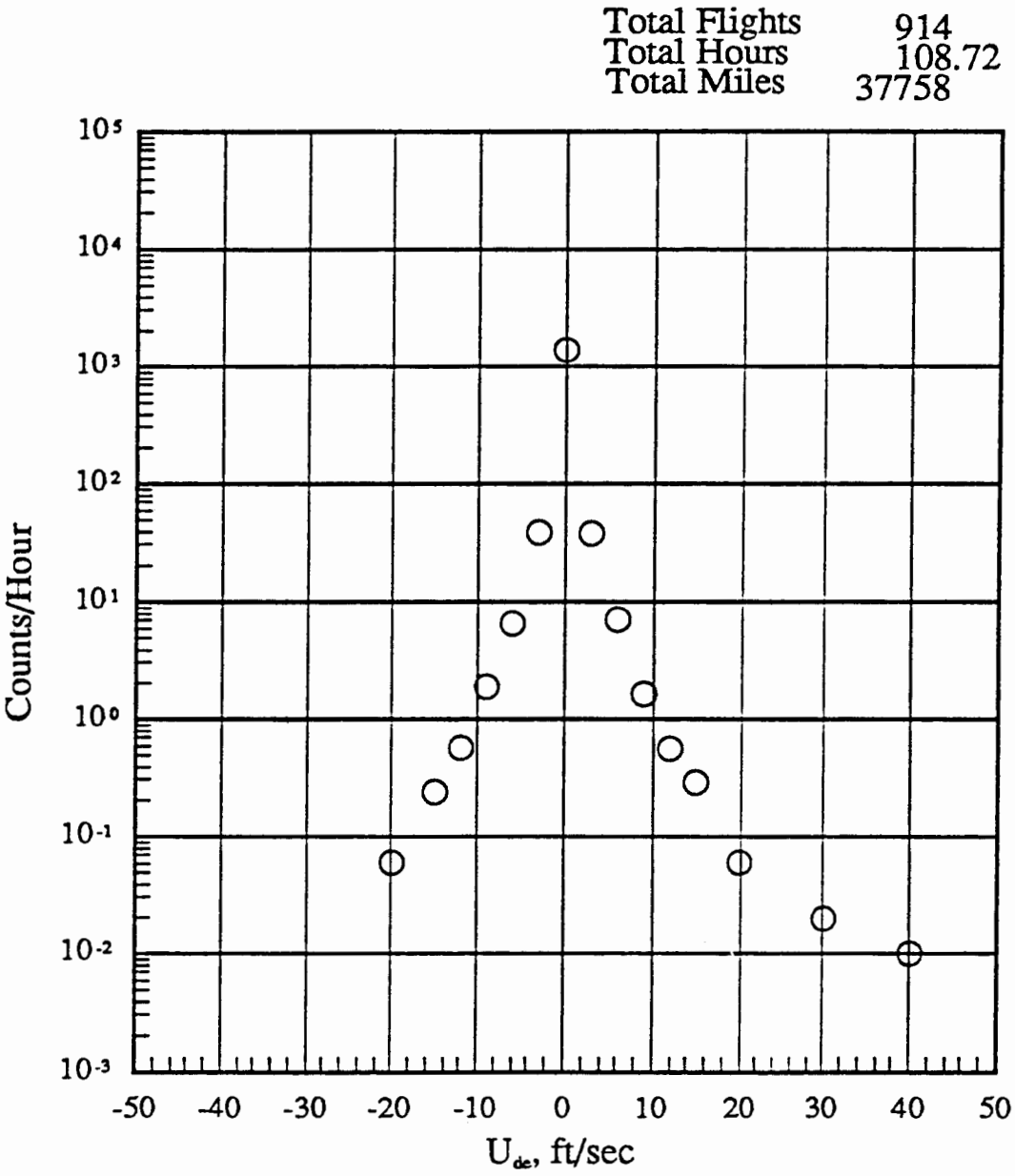

(b) -500 to 4500 feet altitude

Figure 15.- Continued.



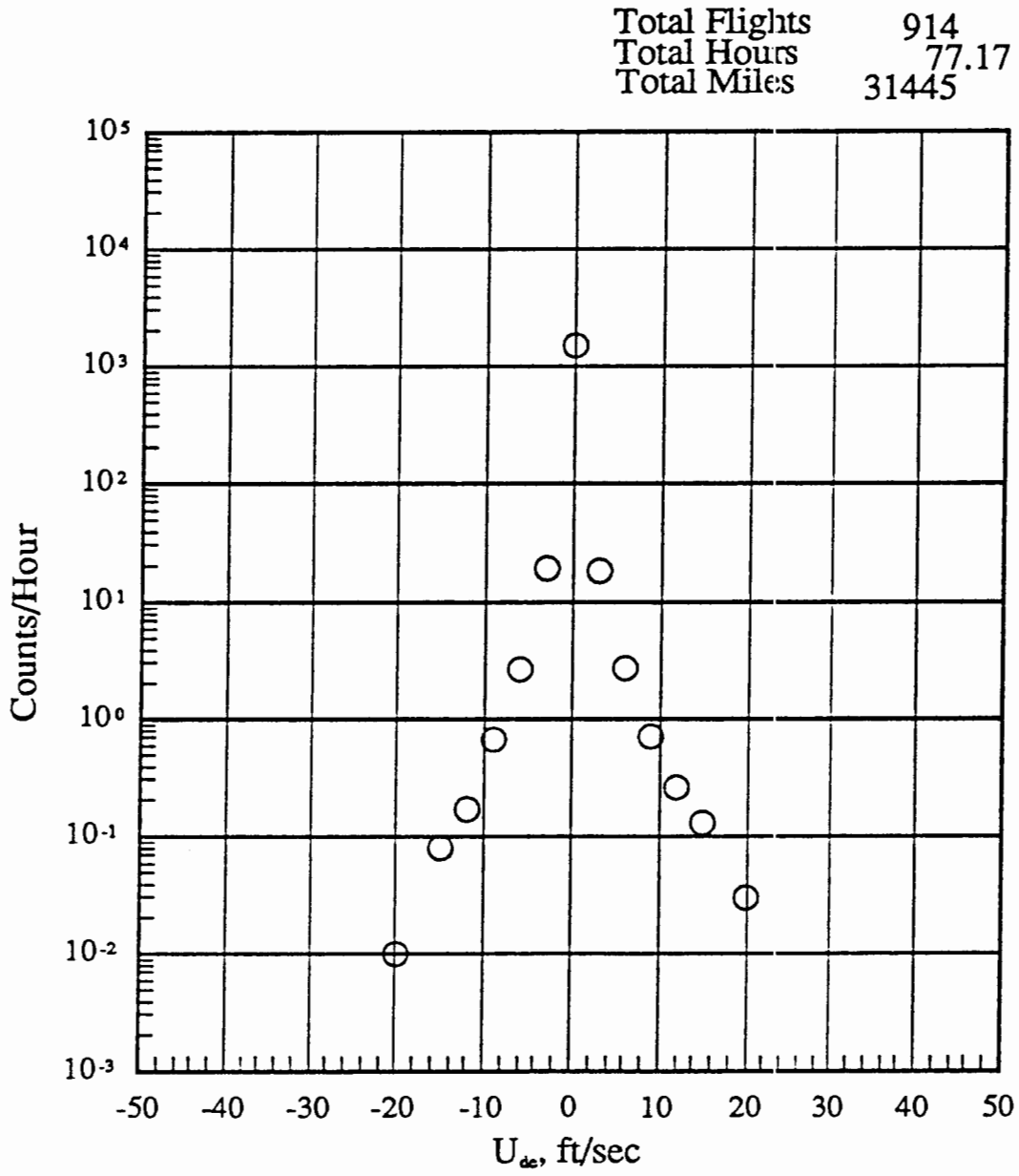

(c) 4500 to 9500 feet altitude

Figure 15.- Continued.



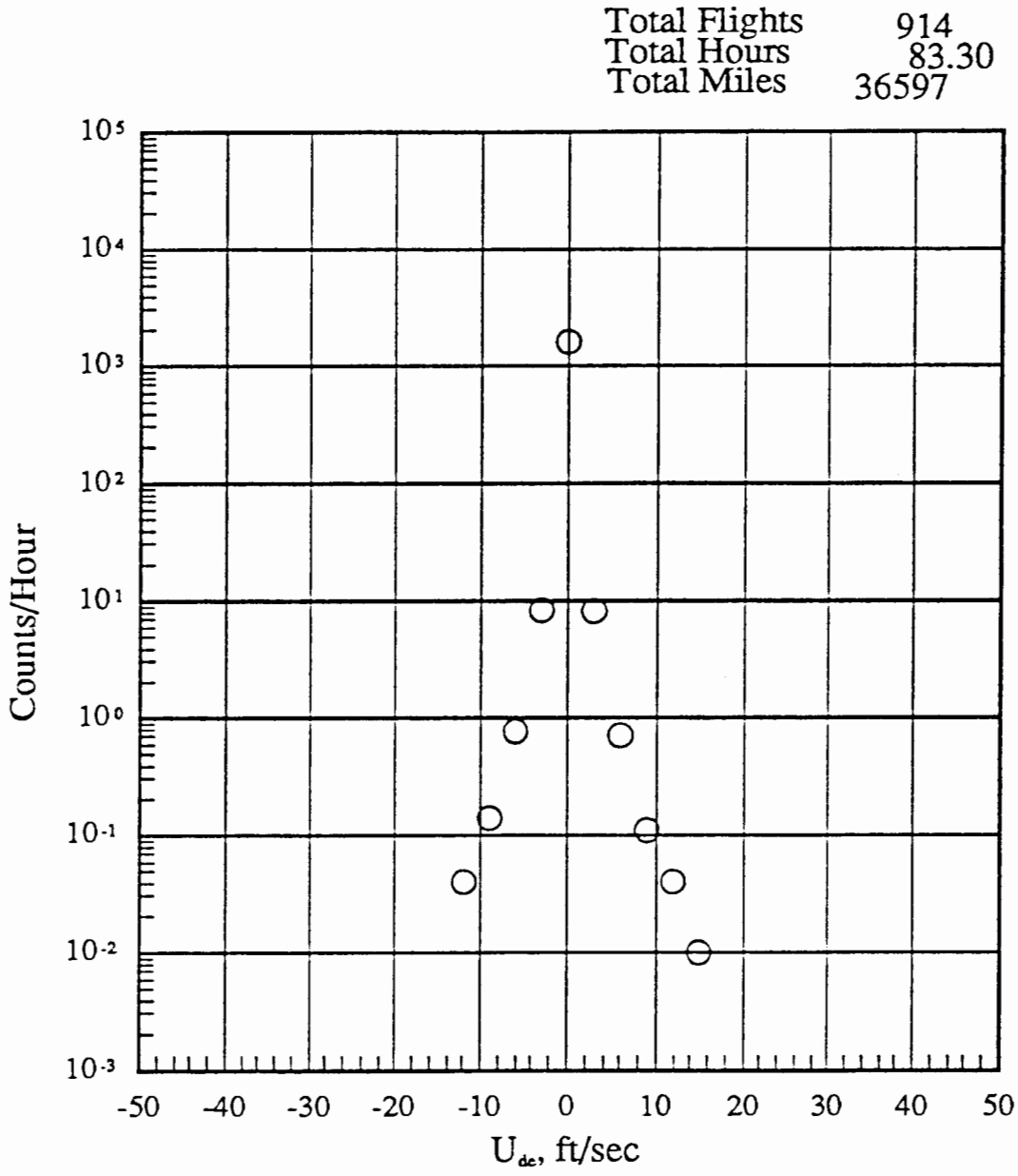

(d) 9500 to 14500 feet altitude

Figure 15.- Continued.



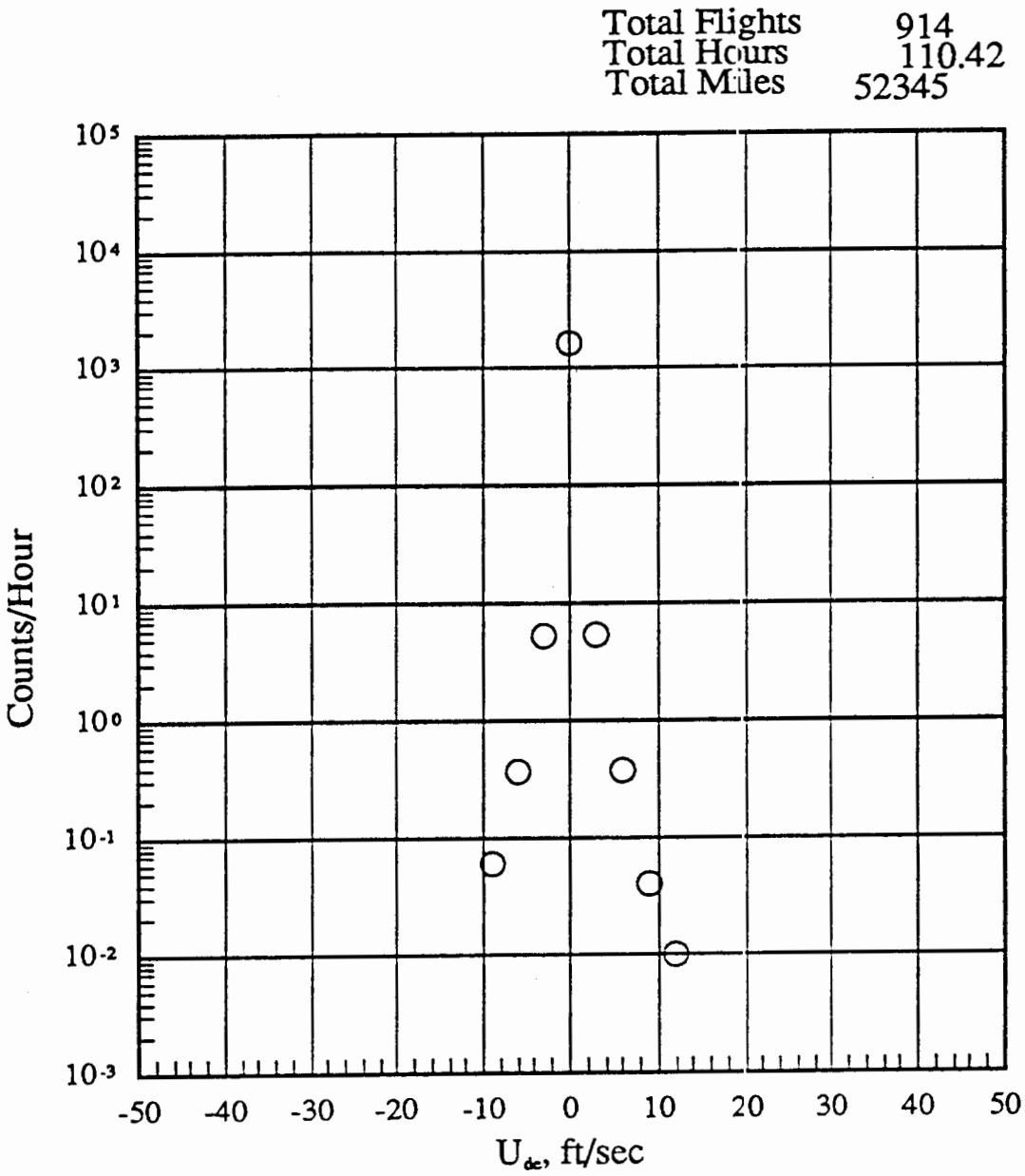

(e) 14500 to 19500 feet altitude

Figure 15.- Continued.



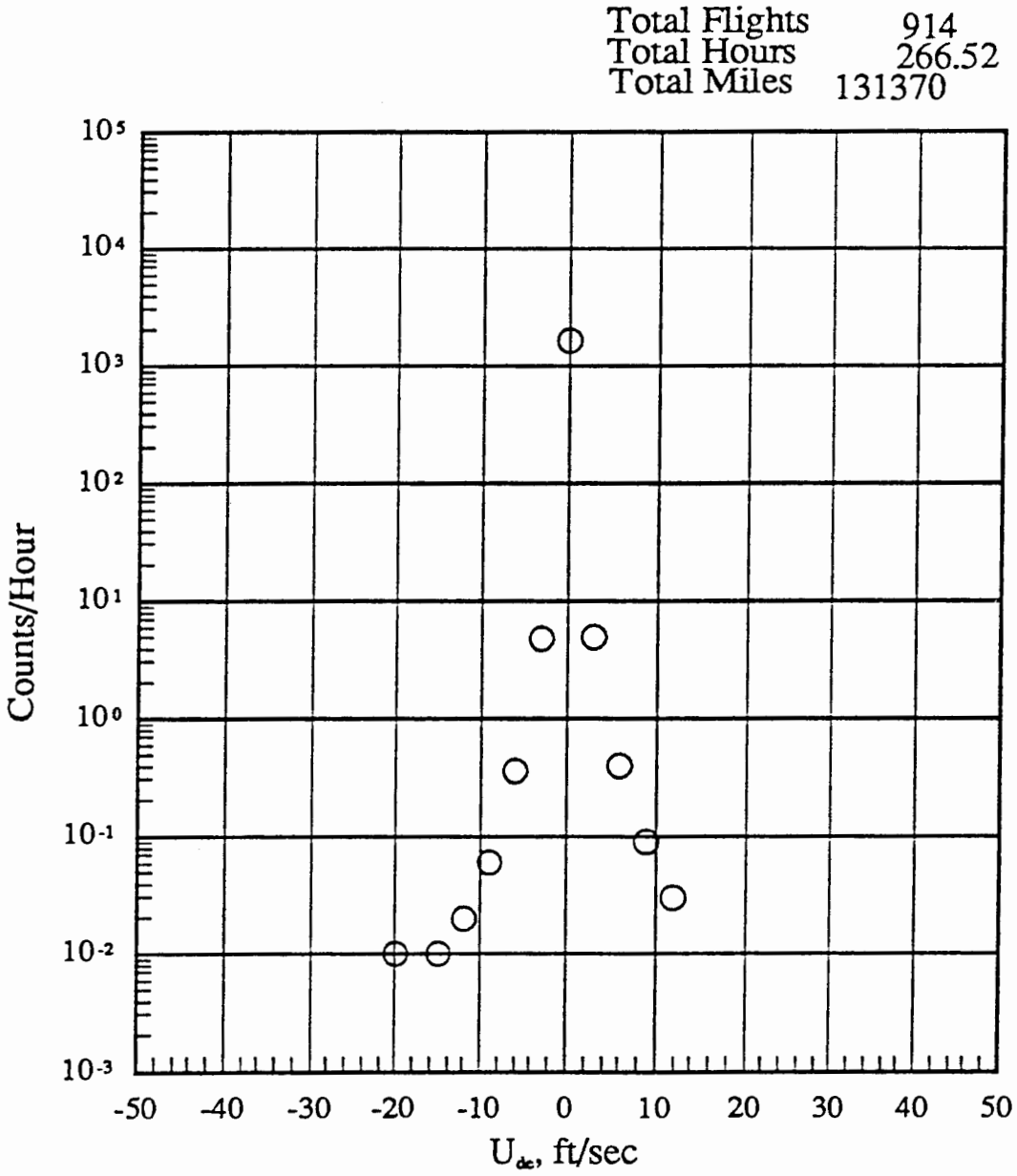

(f) 19500 to 24500 feet altitude

Figure 15.- Continued.



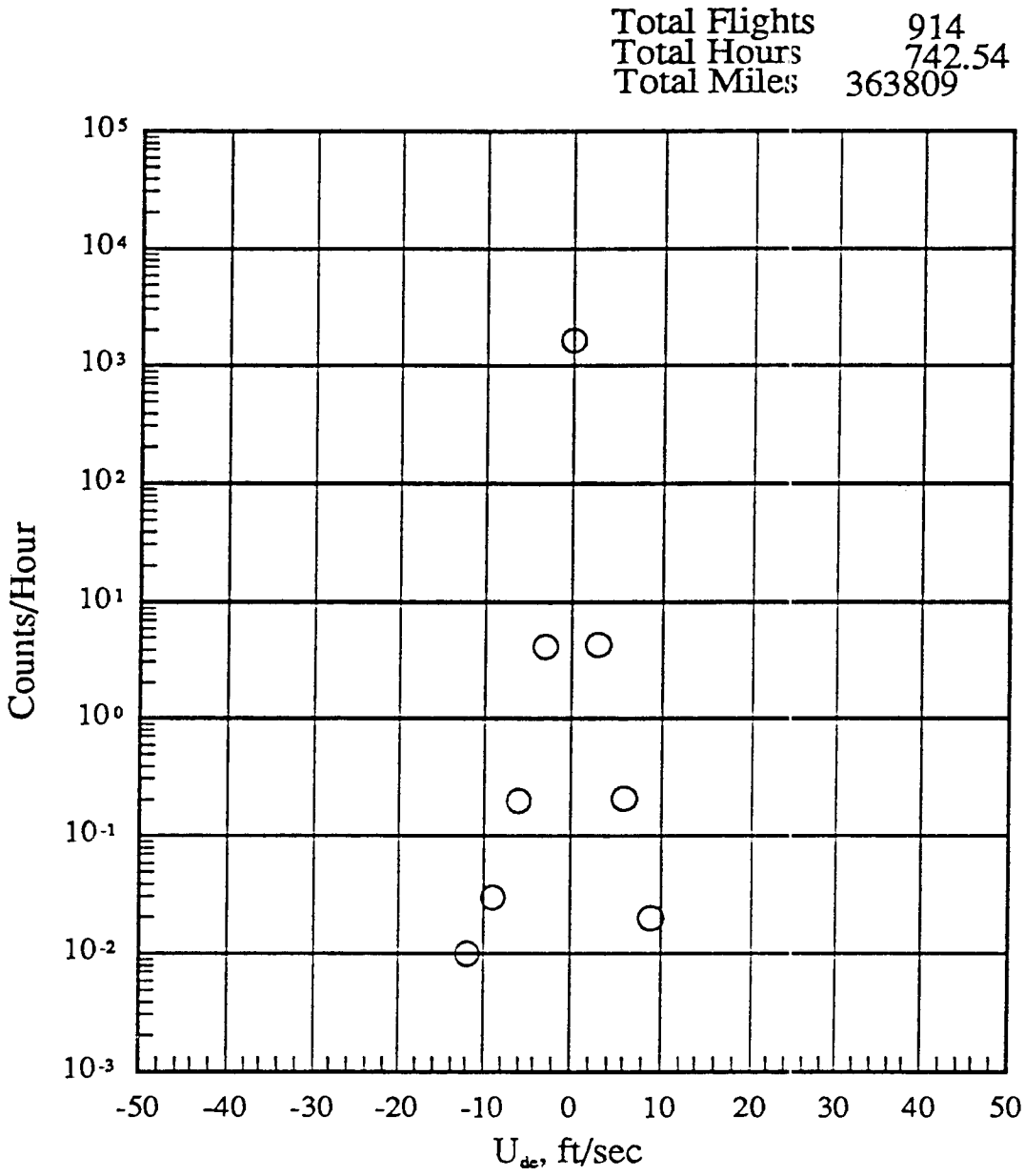

(g) 24500 to 29500 feet altitude

Figure 15.- Continued.



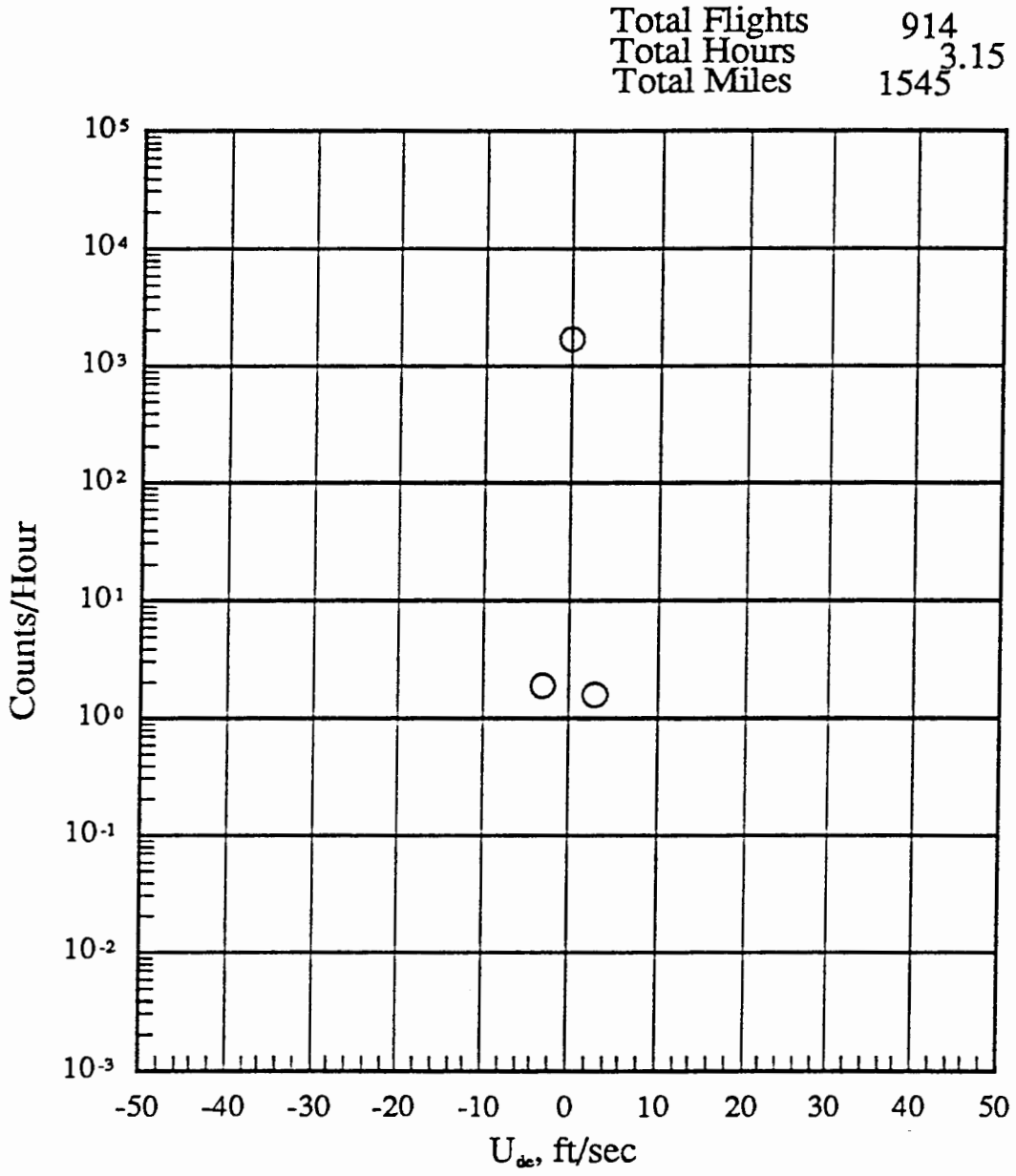

(h) 29500 to 34500 feet altitude

Figure 15.- Continued.



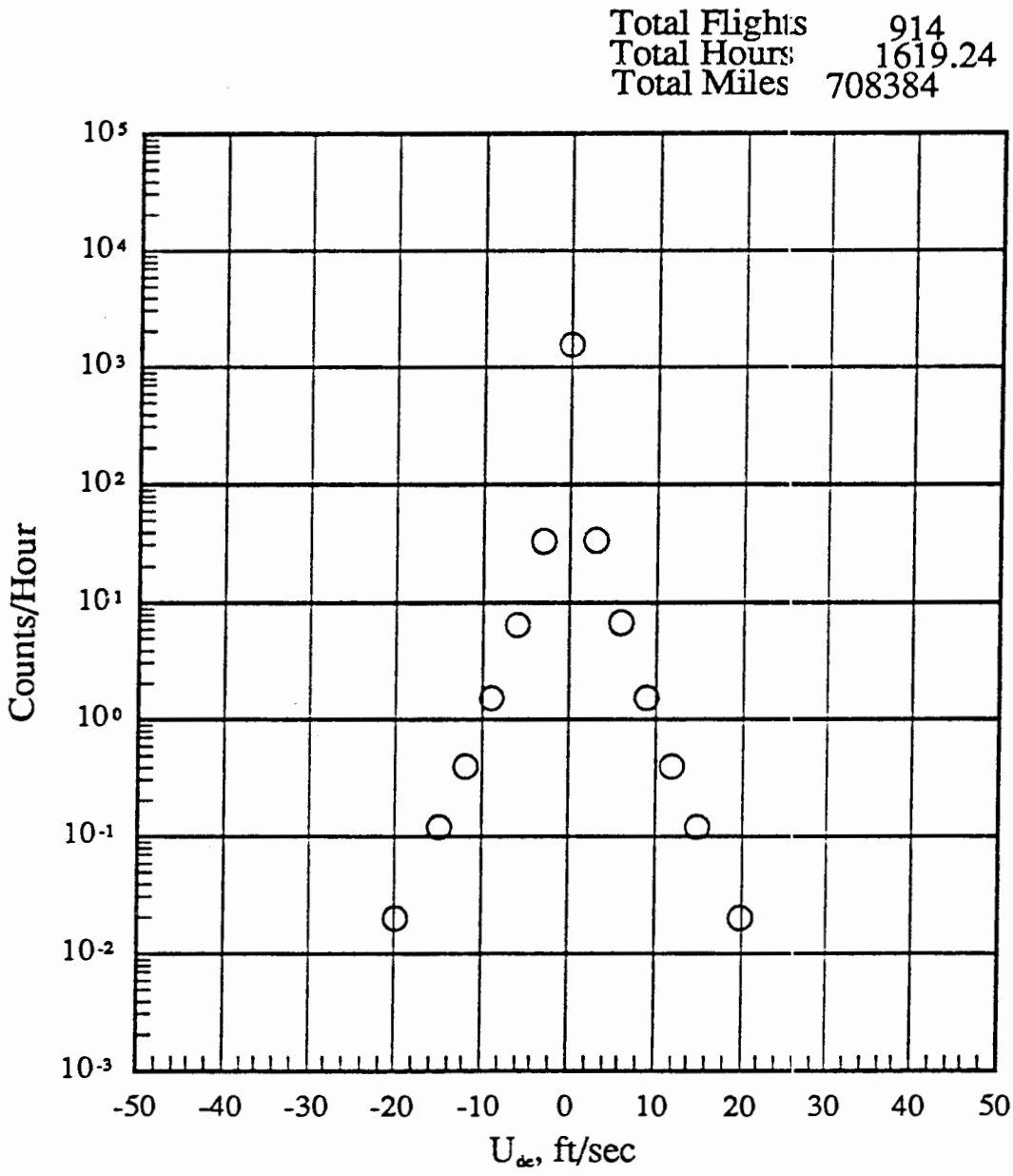

(i) 34500 to 39500 feet altitude

Figure 15.- Continued.




(j) 39500 to 44500 feet altitude

Figure 15.- Continued.




(k) -500 to 44500 feet altitude

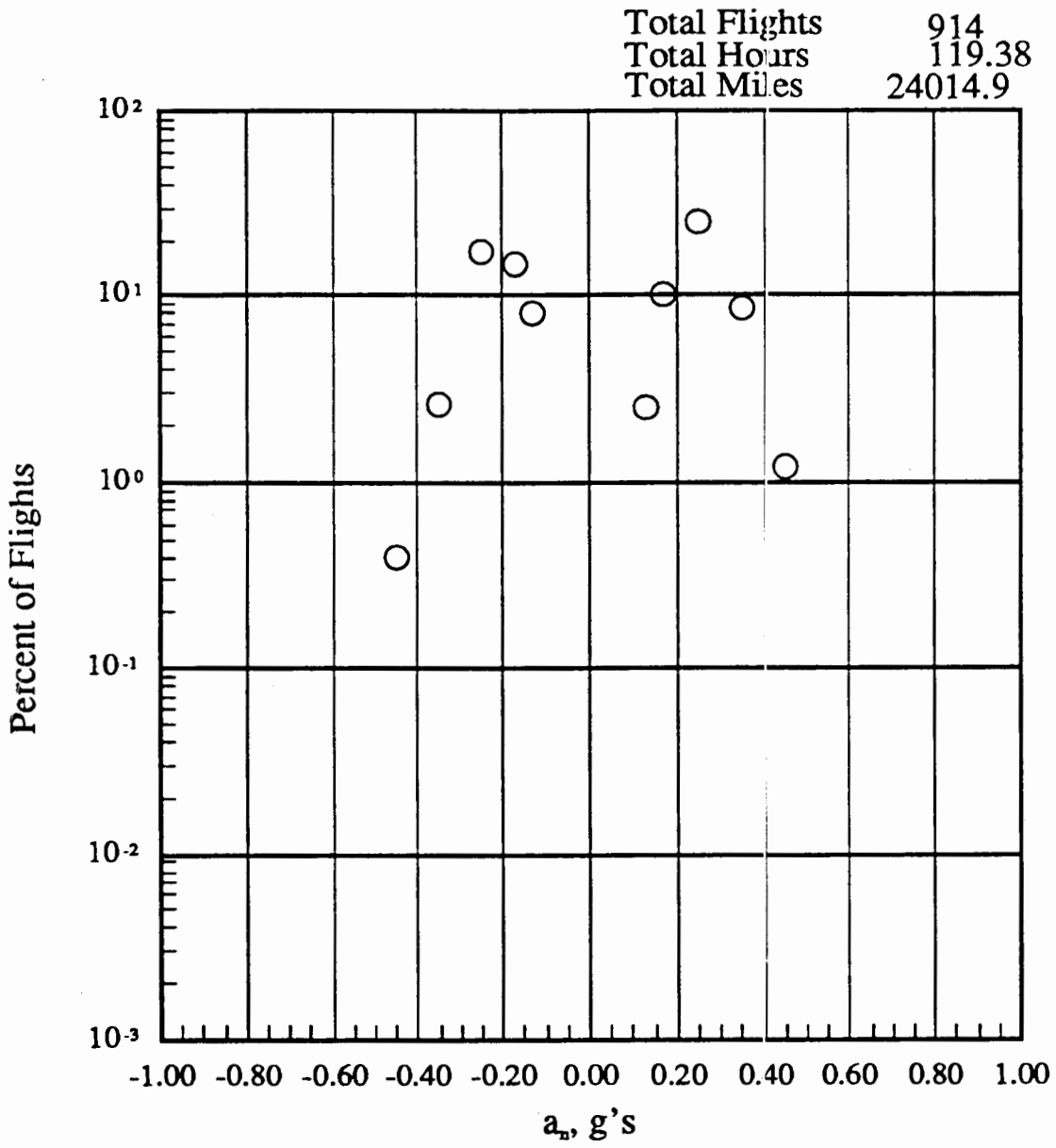
Figure 15.- Concluded

PRESSURE ALTITUDE BANDS

| MAXIMUM $a_n$ LEVEL FOR EACH FLIGHT g's FROM | TO | -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 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 0.1 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0.2 |
| .70 | 0.80 | 0 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.1 |
| .60 | 0.70 | 0 | 0.2 | 0 | 0.1 | 0 | 0 | 0.1 | 0 | 0 | 0.4 |
| .50 | 0.60 | 0 | 0.2 | 0.4 | 0.2 | 0 | 0 | 0.2 | 0 | 0 | 1.1 |
| .40 | 0.50 | 1.2 | 1.3 | 0.9 | 0.2 | 0.1 | 0.1 | 0.3 | 0.2 | 0 | 4.4 |
| .30 | 0.40 | 8.6 | 4.0 | 2.1 | 1.4 | 0.7 | 0.1 | 0.2 | 0.8 | 0 | 17.9 |
| .20 | 0.30 | 25.1 | 11.9 | 5.6 | 2.5 | 0.8 | 1.1 | 1.3 | 3.6 | 0 | 51.9 |
| .15 | 0.20 | 10.2 | 4.0 | 1.8 | 1.0 | 0.2 | 0.2 | 0.9 | 0.9 | 0 | 19.1 |
| .10 | 0.15 | 2.5 | 1.4 | 0.5 | 0.1 | 0 | 0.1 | 0.1 | 0 | 0 | 4.8 |
| .05 | 0.10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.05 | -0.10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.10 | -0.15 | 8.1 | 3.5 | 2.1 | 0.7 | 0.7 | 0.2 | 0.3 | 1.2 | 0 | 16.7 |
| -.15 | -0.20 | 14.9 | 5.9 | 3.6 | 1.4 | 0.7 | 0.8 | 0.9 | 2.0 | 0 | 30.1 |
| -.20 | -0.30 | 17.4 | 6.5 | 5.9 | 2.5 | 1.2 | 1.6 | 2.3 | 3.4 | 0 | 40.8 |
| -.30 | -0.40 | 2.6 | 1.9 | 1.9 | 0.8 | 0 | 0.1 | 0.9 | 0.5 | 0 | 8.6 |
| -.40 | -0.50 | 0.4 | 0.7 | 0.4 | 0.1 | 0.2 | 0 | 0.1 | 0.3 | 0 | 2.3 |
| -.50 | -0.60 | 0 | 0.2 | 0.3 | 0.2 | 0 | 0 | 0 | 0 | 0 | 0.8 |
| -.60 | -0.70 | 0 | 0.2 | 0 | 0.1 | 0 | 0 | 0 | 0.1 | 0 | 0.4 |
| -.70 | -0.80 | 0 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.1 |
| -.80 | -1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0.1 | 0 | 0 | 0.1 |
| -1.00 | -1.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.20 | -1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.40 | -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 @ ALT | | 119.38 | 108.04 | 108.72 | 77.17 | 83.30 | 110.42 | 266.52 | 742.54 | 3.15 | 1619.24 |
| FLIGHT MILES @ ALT | | 24014.89 | 29500.10 | 37757.94 | 31445.86 | 36596.71 | 52344.5 | 131369.93 | 363808.56 | 1545.14 | 708383.64 |
| | | | | | | | TOTAL FLIGHTS | | | | 914 |

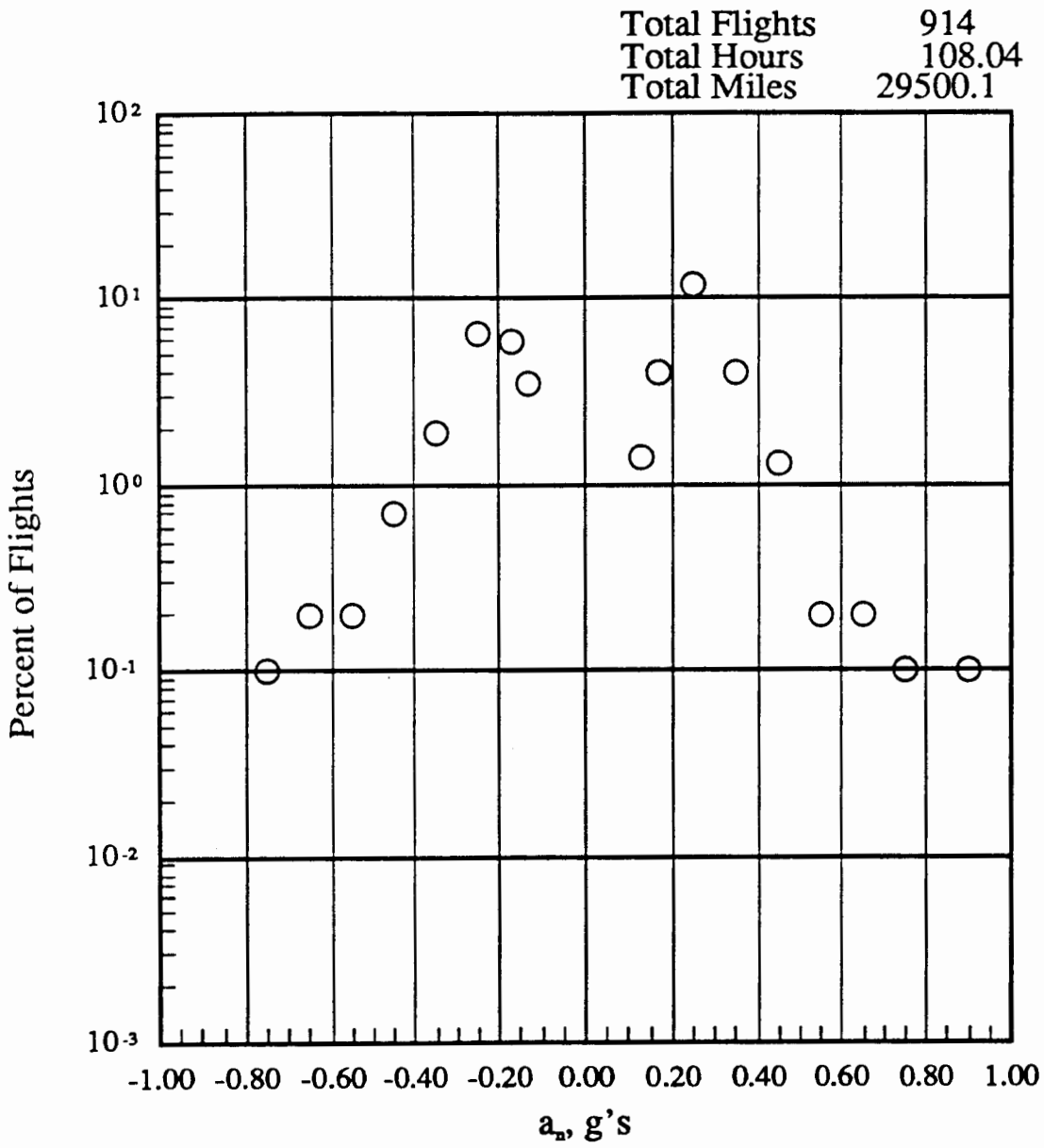
(a) Percent of flights where peak positive and negative $a_n$ per flight occurs within pressure altitude bands, any flap

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



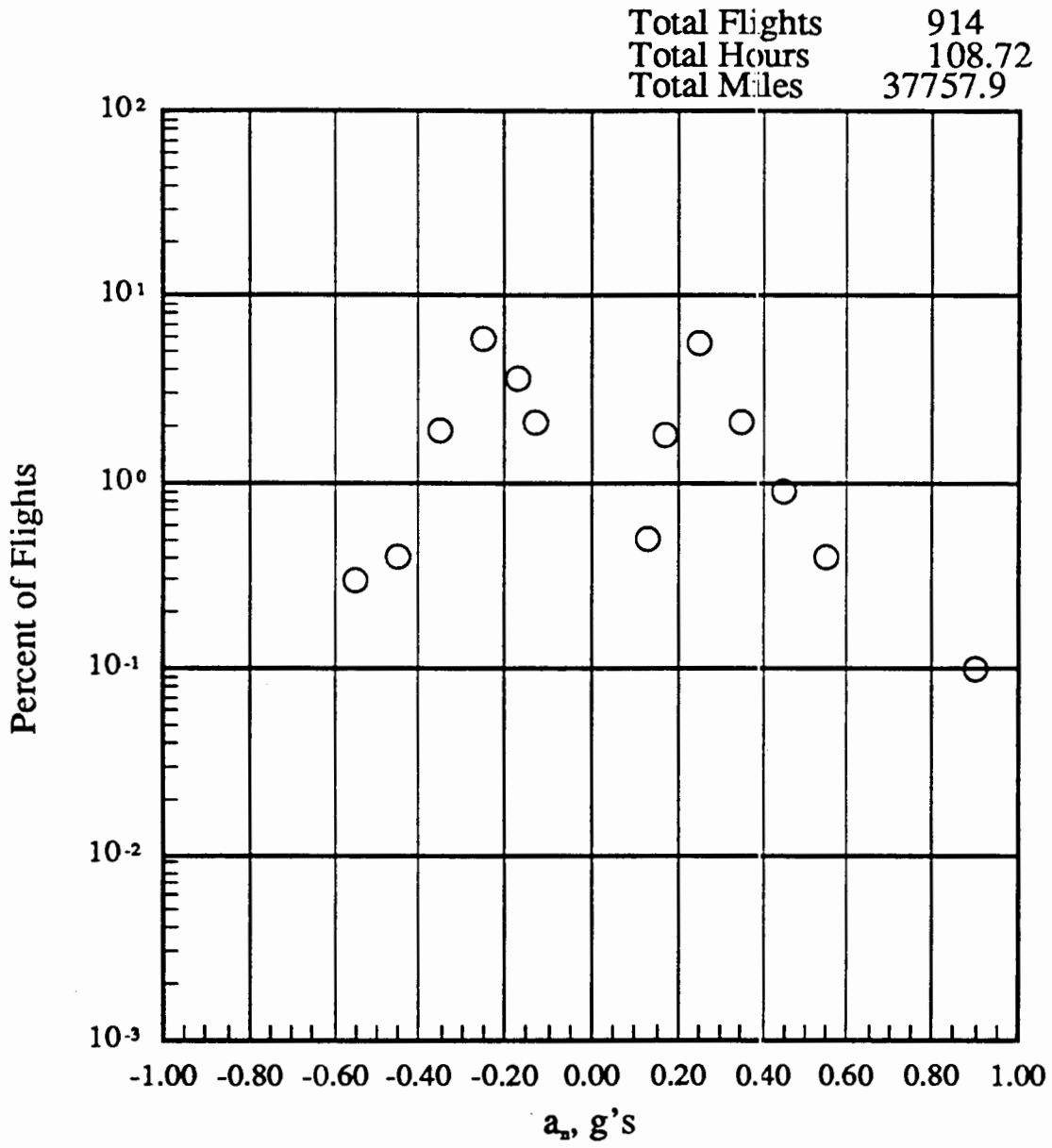

(b) -500 to 4500 feet altitude

Figure 16.- Continued.



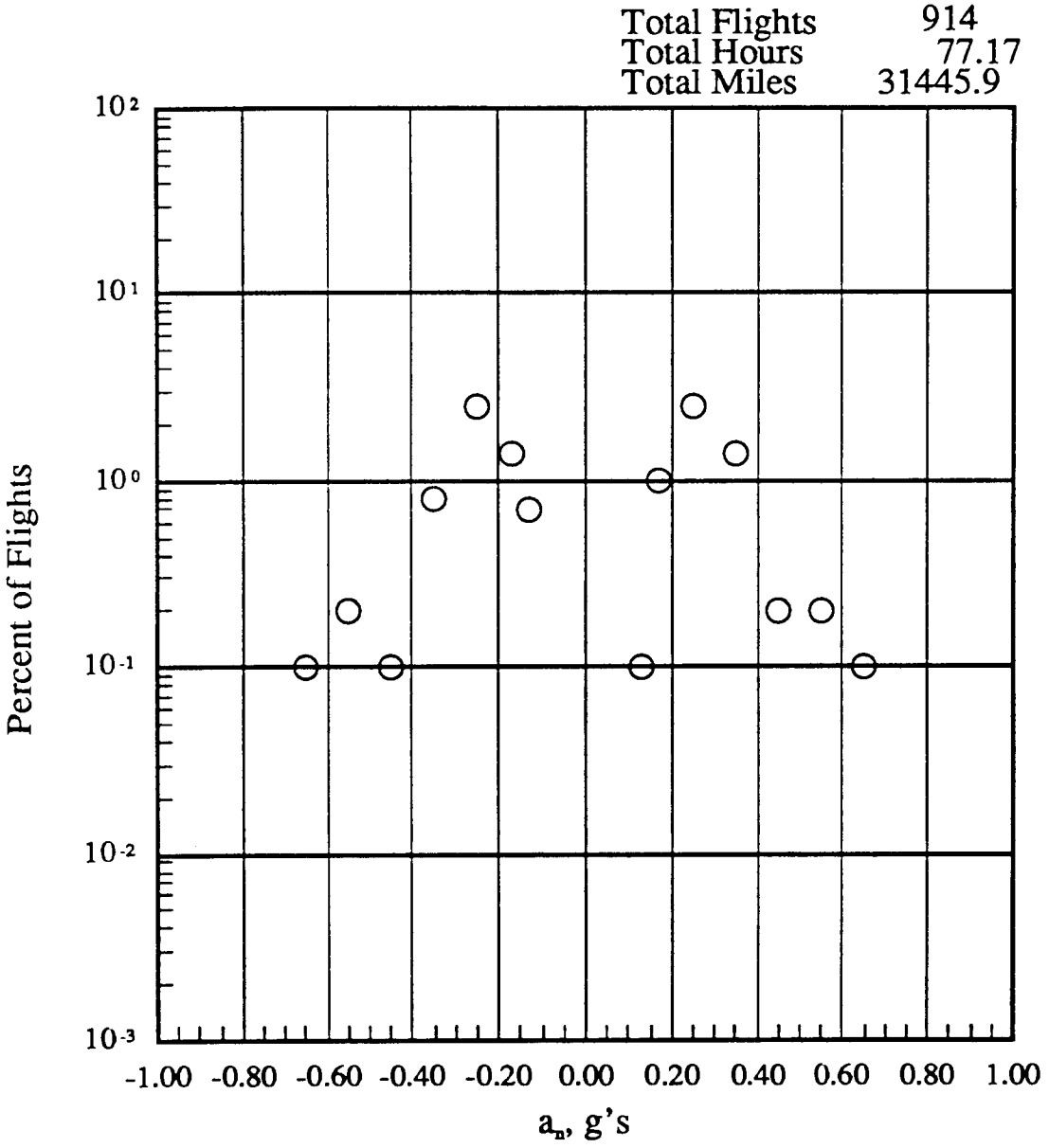

(c) 4500 to 9500 feet altitude

Figure 16.- Continued.



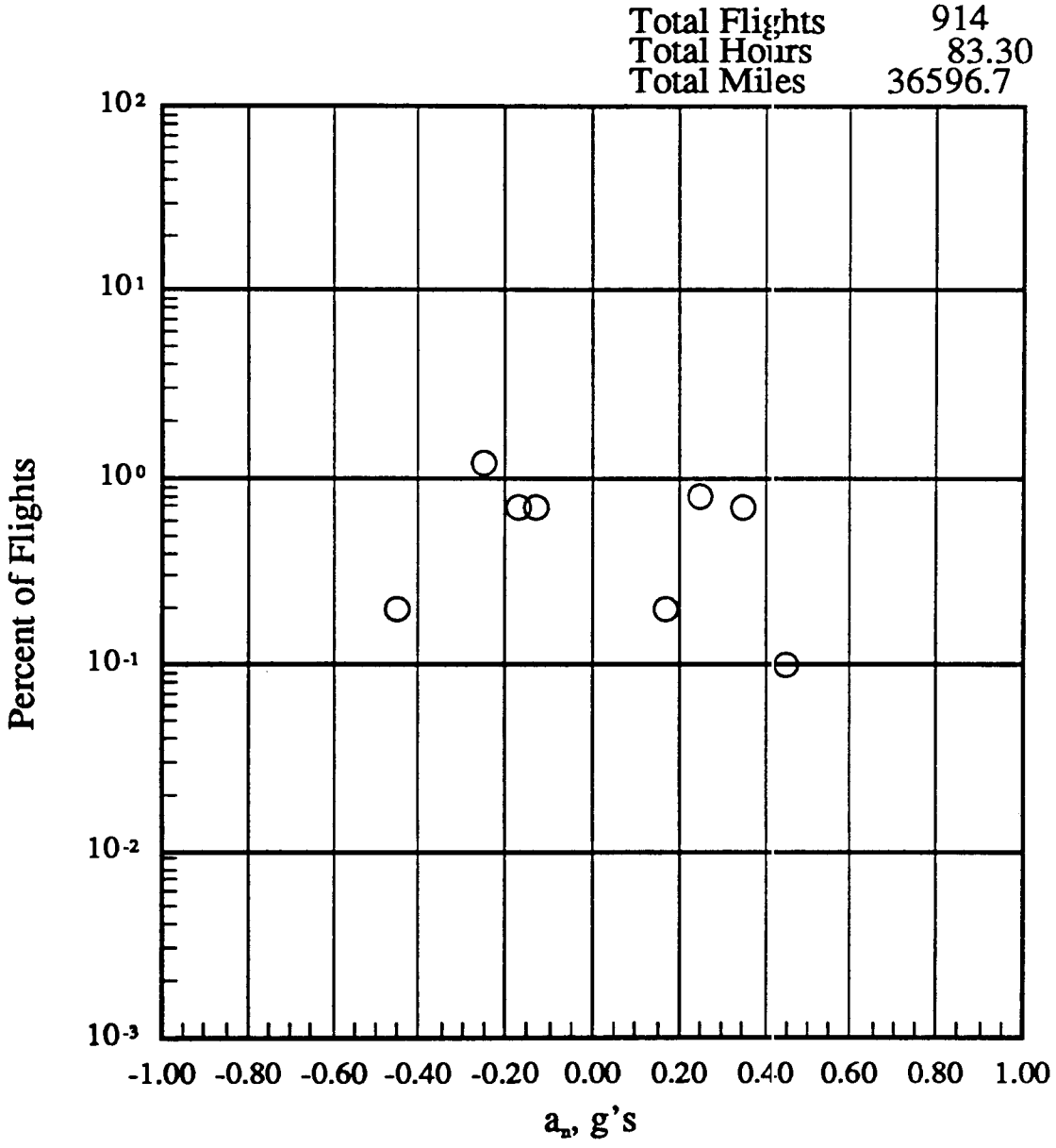

(d) 9500 to 14500 feet altitude

Figure 16.- Continued.



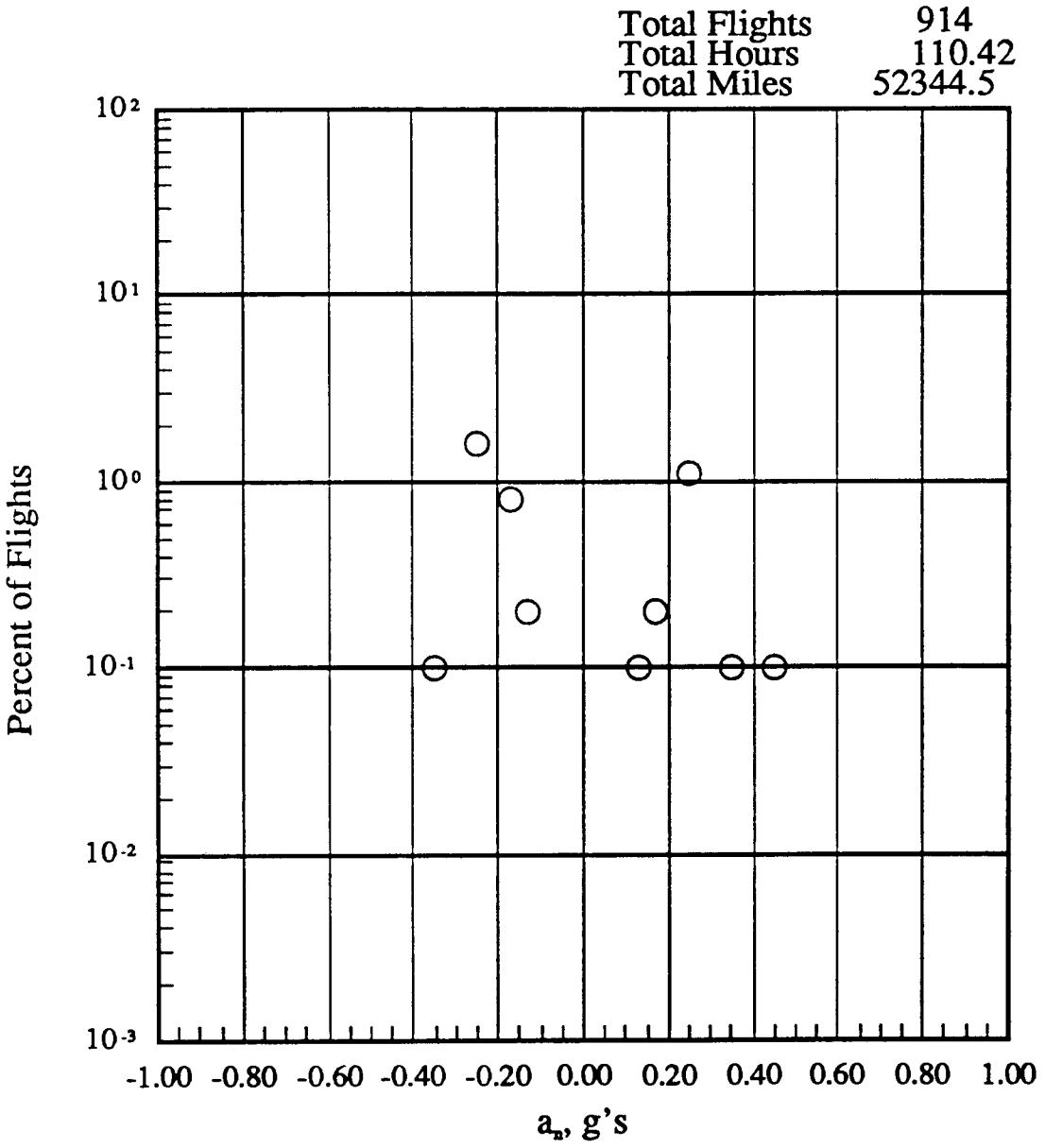

(e) 14500 to 19500 feet altitude

Figure 16.- Continued.



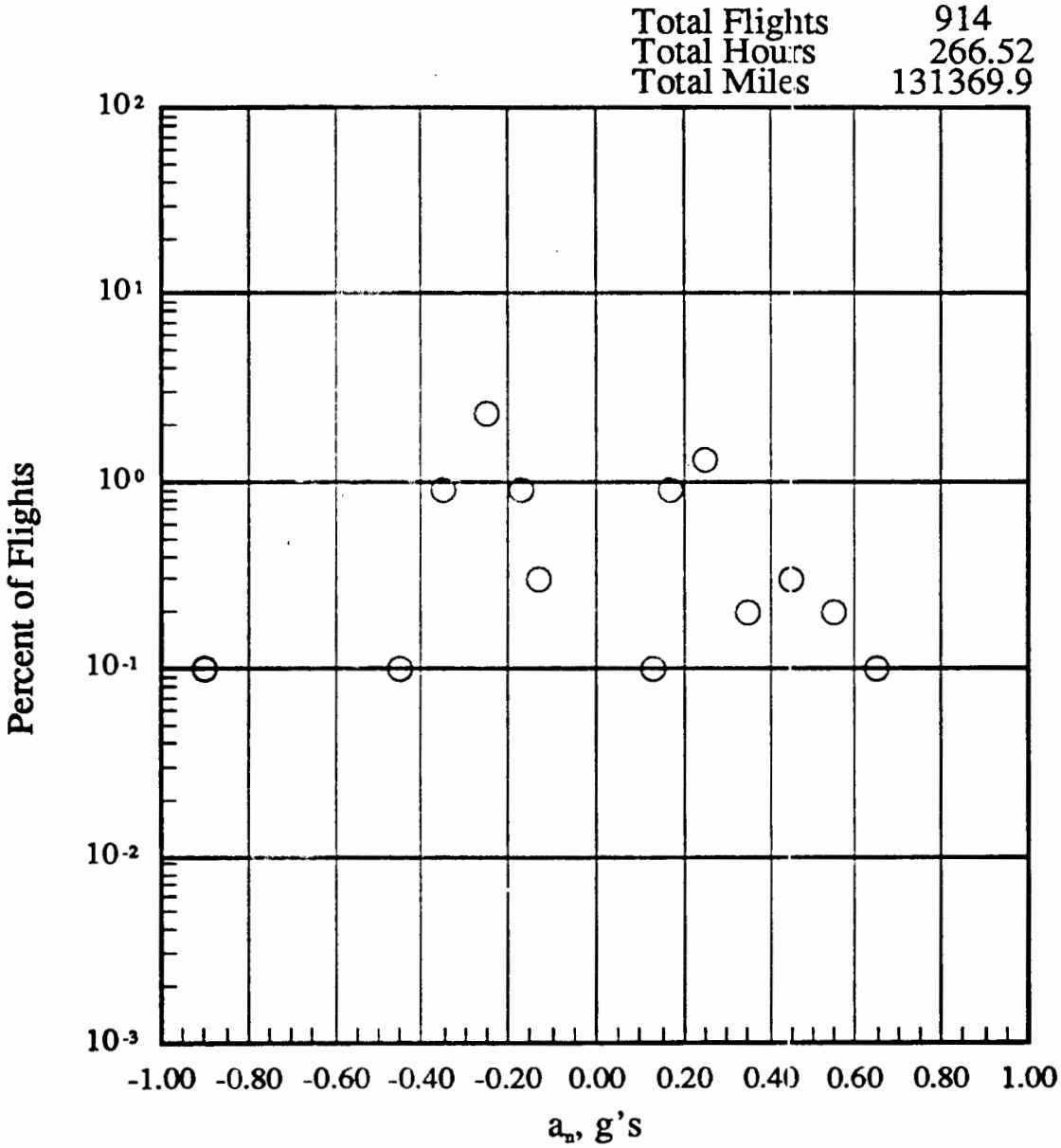

(f) 19500 to 24500 feet altitude

Figure 16.- Continued.



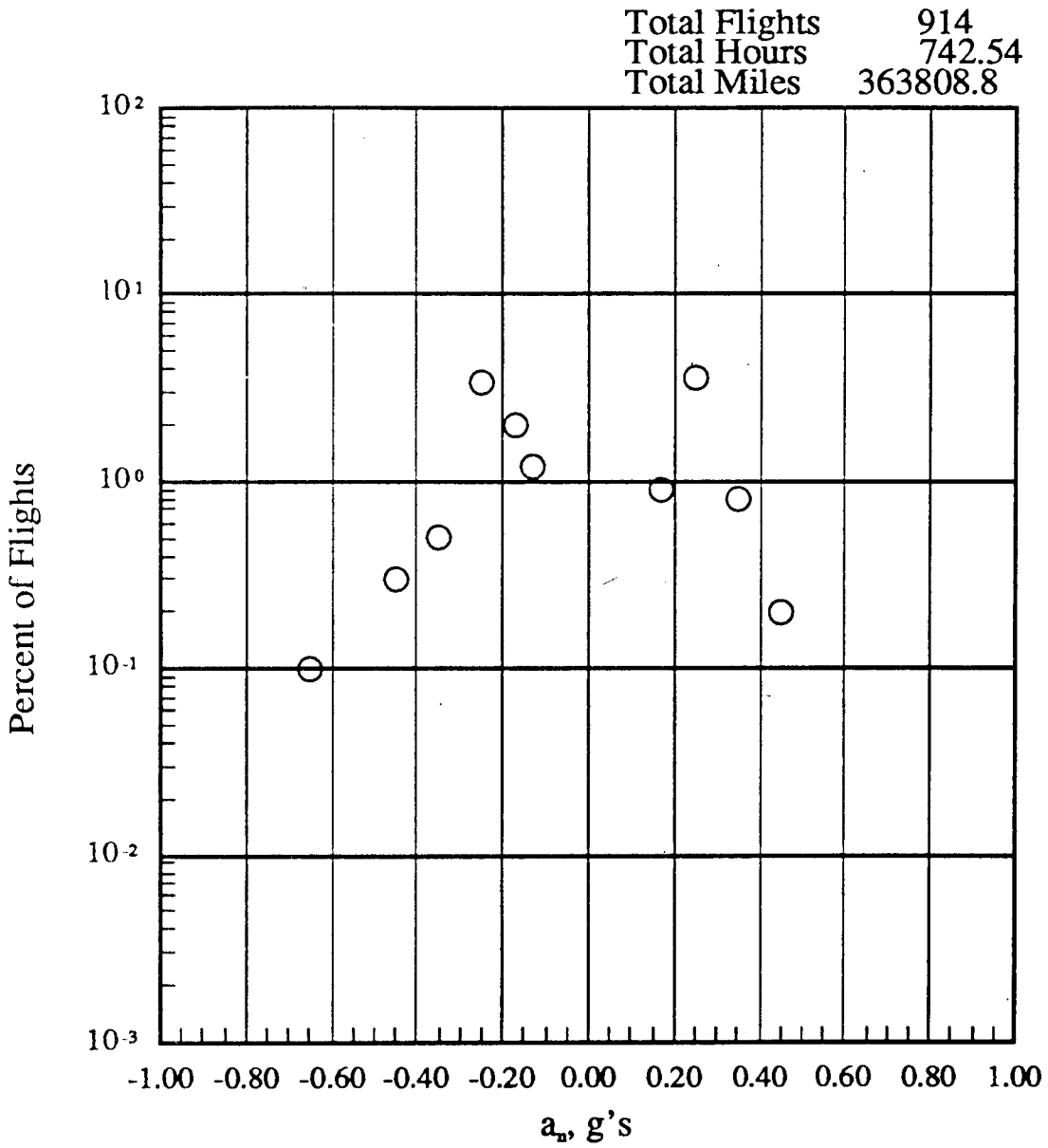

(g) 24500 to 29500 feet altitude

Figure 16.- Continued.



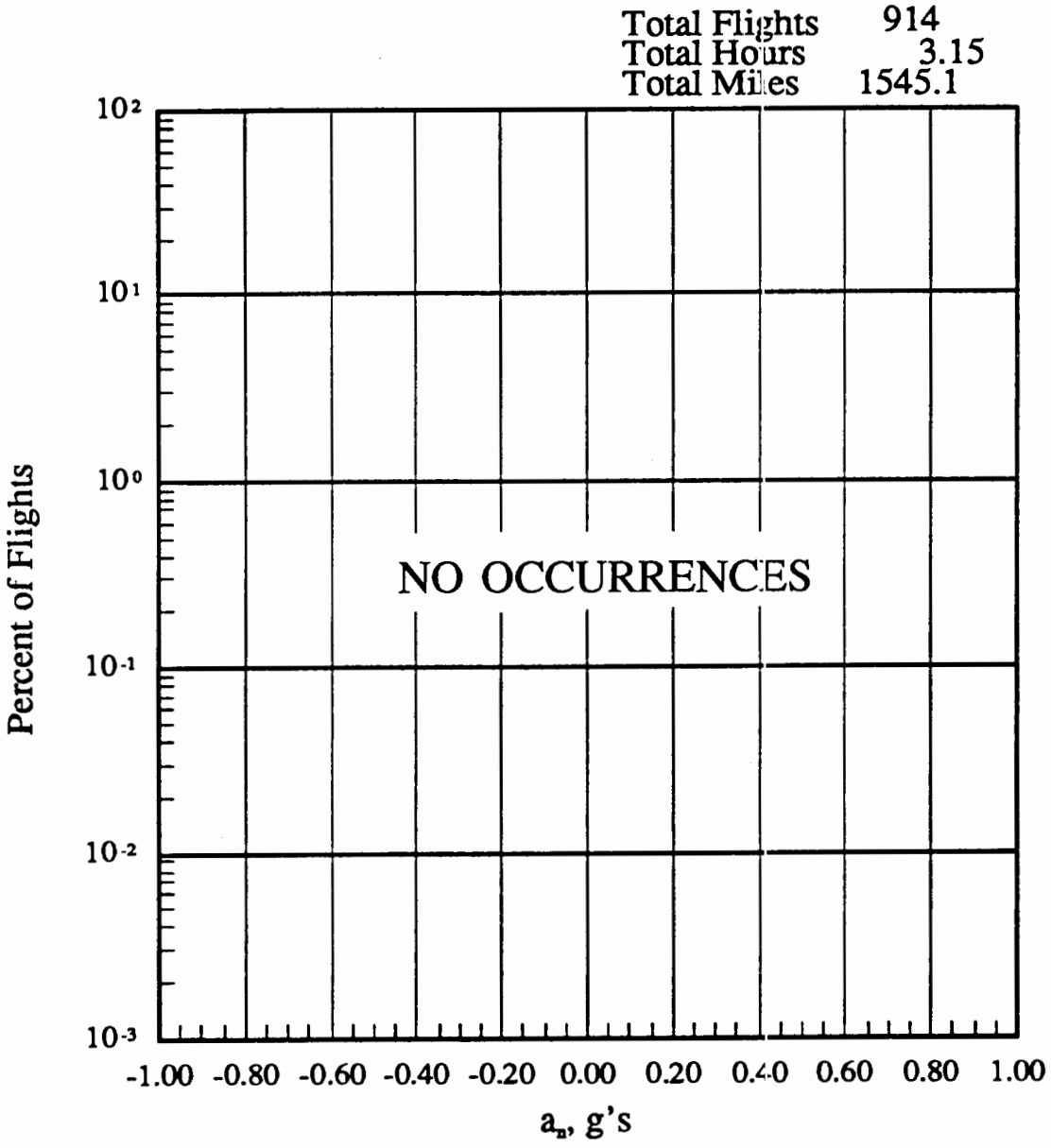

(h) 29500 to 34500 feet altitude

Figure 16.- Continued.



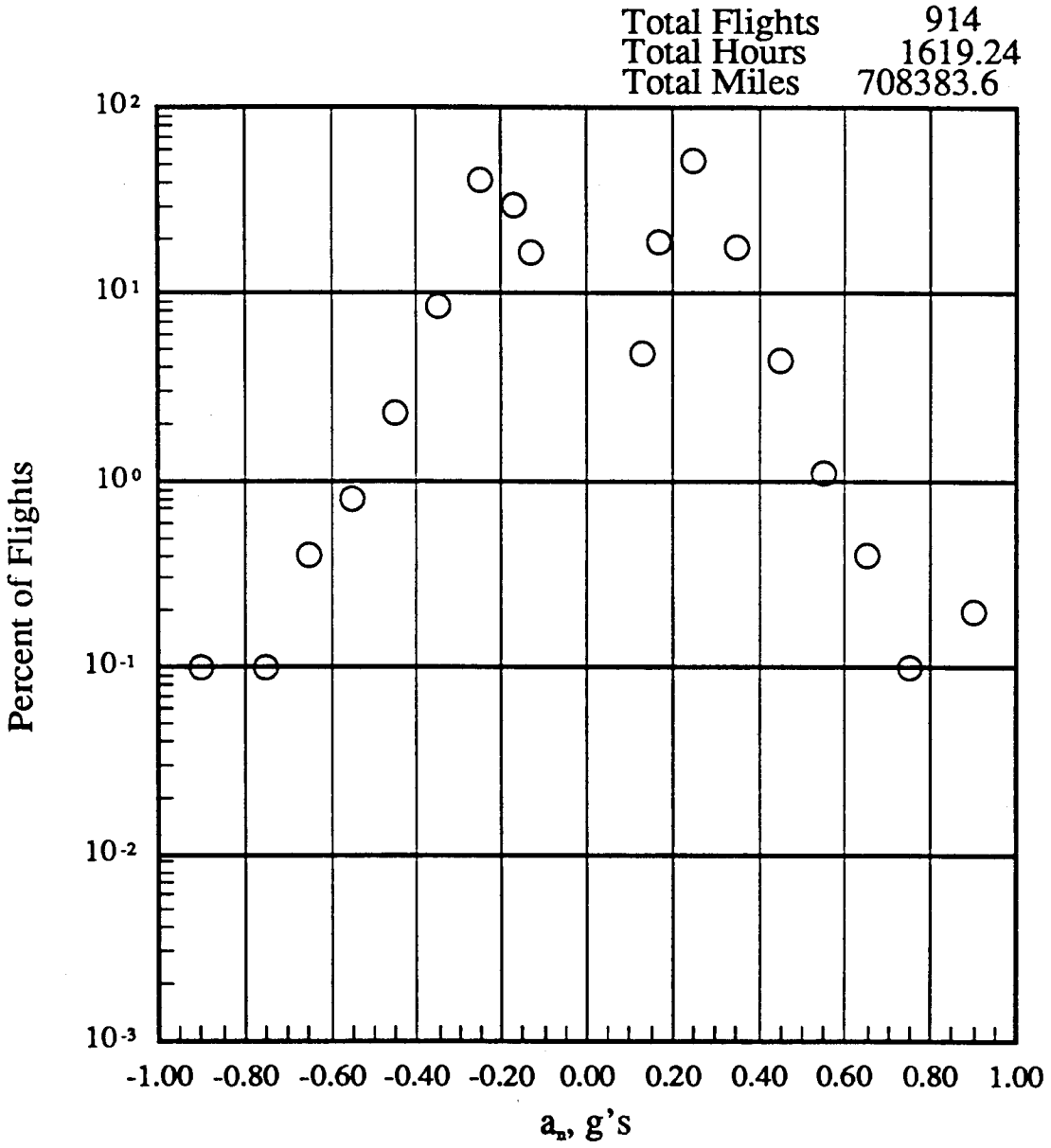

(i) 34500 to 39500 feet altitude

Figure 16.- Continued.




(j) 39500 to 44500 feet altitude

Figure 16.- Continued.



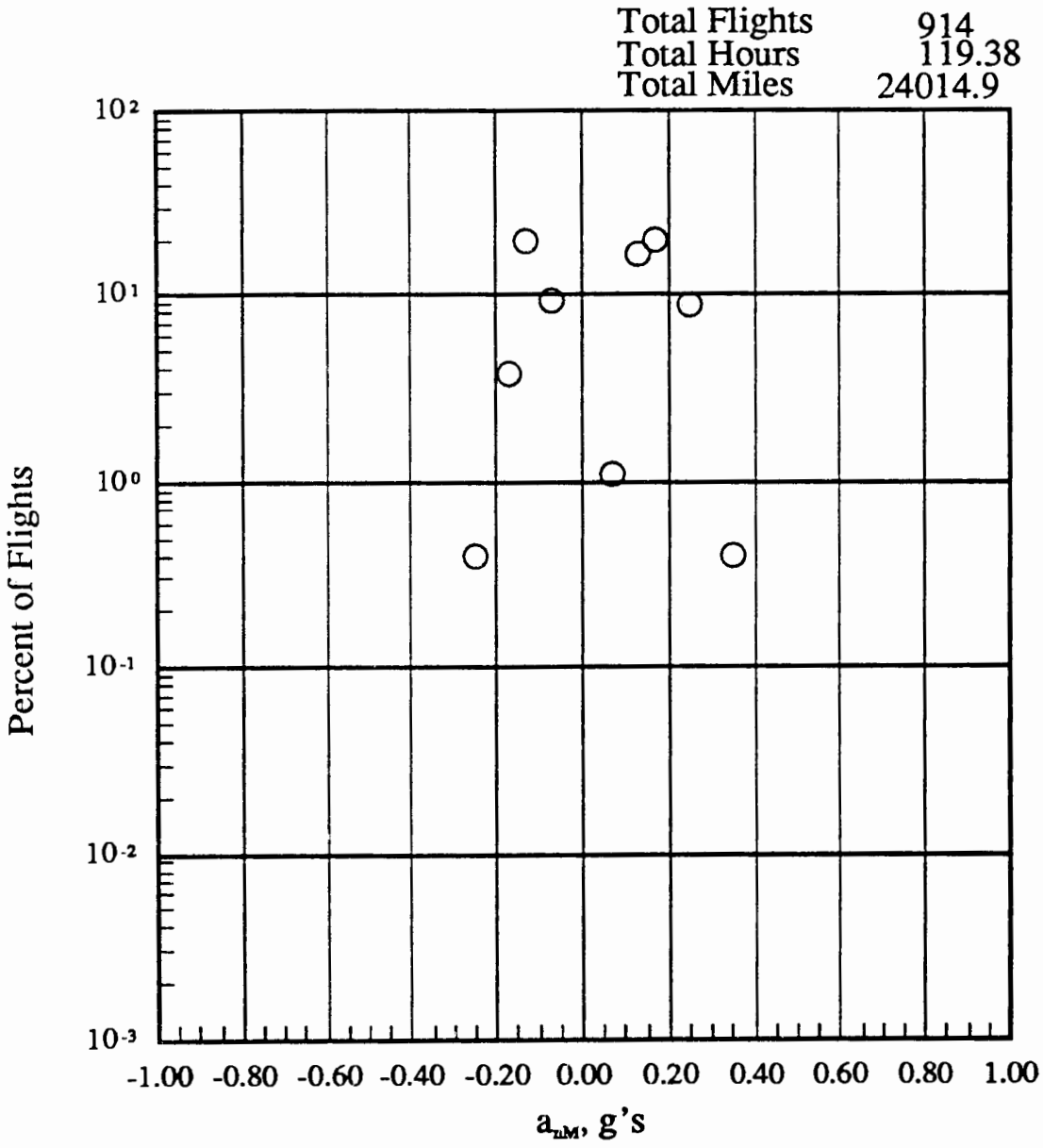

(k) -500 to 44500 feet altitude

Figure 16.- Concluded.

| MAXIMUM $a_{nM}$ LEVEL FOR EACH FLIGHT g's FROM | TO | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 |
| .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 | 0 | 0 | 0 | 0 | 0 |
| .40 | .50 | 0 | 0 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0.1 |
| .30 | .40 | 0.4 | 0.7 | 0.2 | 0.2 | 0.1 | 0 | 0.1 | 0 | 0 | 1.8 |
| .20 | .30 | 8.9 | 5.9 | 1.5 | 1.0 | 0.4 | 0.4 | 0.3 | 0.2 | 0 | 18.7 |
| .15 | .20 | 19.9 | 12.3 | 4.2 | 1.4 | 1.2 | 0.5 | 1.0 | 0.3 | 0 | 40.8 |
| .10 | .15 | 16.7 | 11.6 | 4.6 | 1.4 | 0.2 | 0.1 | 0.3 | 0.2 | 0 | 35.2 |
| .05 | .10 | 1.1 | 1.2 | 0.5 | 0.3 | 0 | 0 | 0.1 | 0.1 | 0 | 3.4 |
| -.05 | -.10 | 9.4 | 4.7 | 5.0 | 1.8 | 0.5 | 0.9 | 0.9 | 1.0 | 0 | 24.2 |
| -.10 | -.15 | 19.7 | 16.1 | 11.2 | 6.0 | 2.1 | 1.1 | 1.5 | 1.4 | 0 | 59.1 |
| -.15 | -.20 | 3.8 | 3.5 | 3.1 | 1.6 | 0.8 | 0.4 | 0.9 | 0.3 | 0 | 14.4 |
| -.20 | -.30 | 0.4 | 0.7 | 0.3 | 0.2 | 0.1 | 0.1 | 0.2 | 0.2 | 0 | 2.3 |
| -.30 | -.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.40 | -.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.50 | -.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.60 | -.70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.70 | -.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.80 | -1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.00 | -1.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.20 | -1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.40 | -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 @ ALT | | 119.38 | 108.04 | 108.72 | 77.17 | 83.30 | 110.42 | 266.52 | 742.54 | 3.15 | 1619.24 |
| FLIGHT MILES @ ALT | | 24014.89 | 29500.10 | 37757.94 | 31445.86 | 36596.71 | 52344.52 | 131369.93 | 363808.56 | 1545.14 | 708383.64 |
| | | | | | | | TOTAL FLIGHTS | | | | 914.0 |

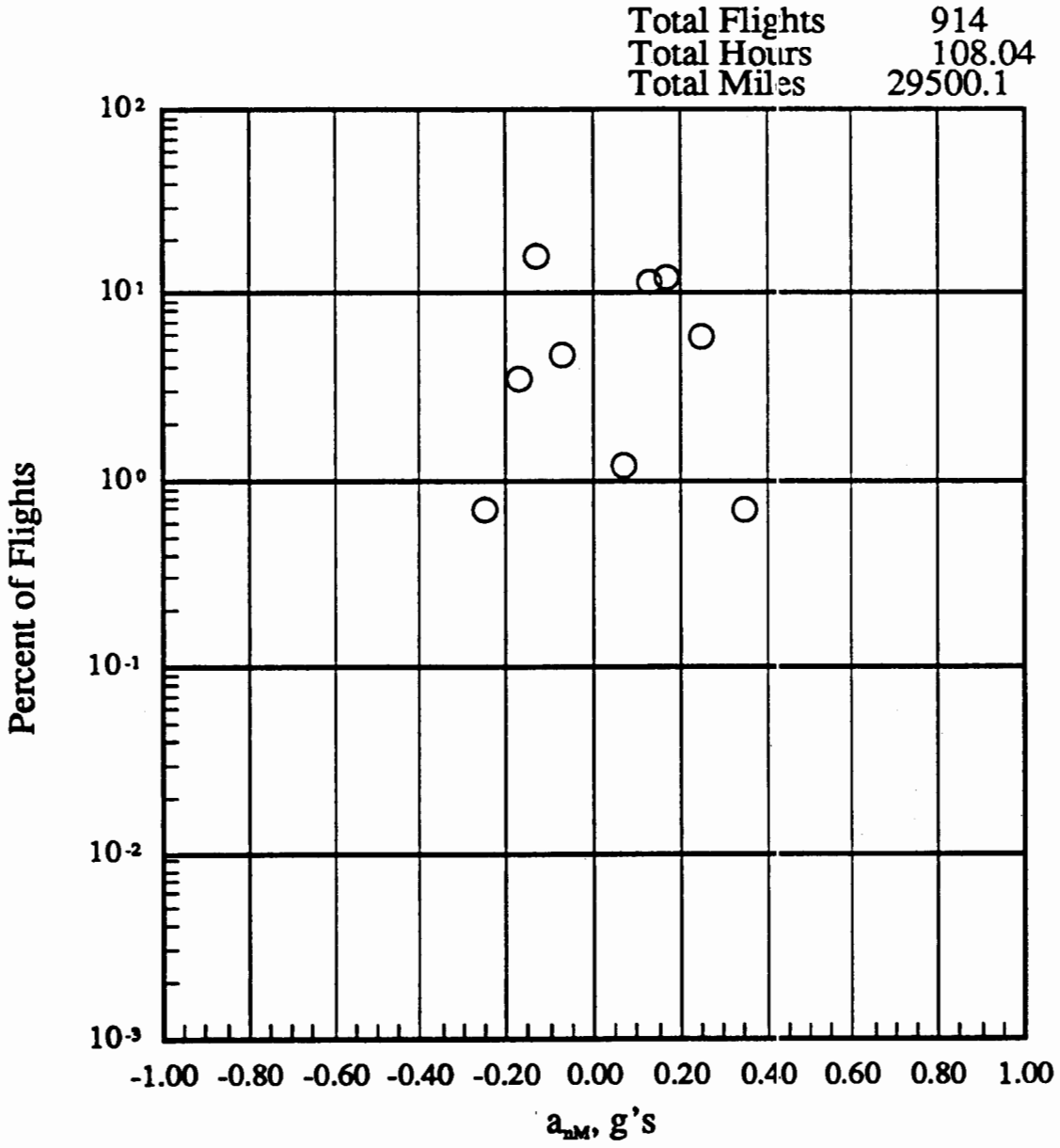
(a) Percent of flights where peak positive and negative $a_{nM}$ per flight occurs within pressure altitude bands, any flap

Figure 17.- Peak Positive and negative $a_{nM}$ vs. altitude.



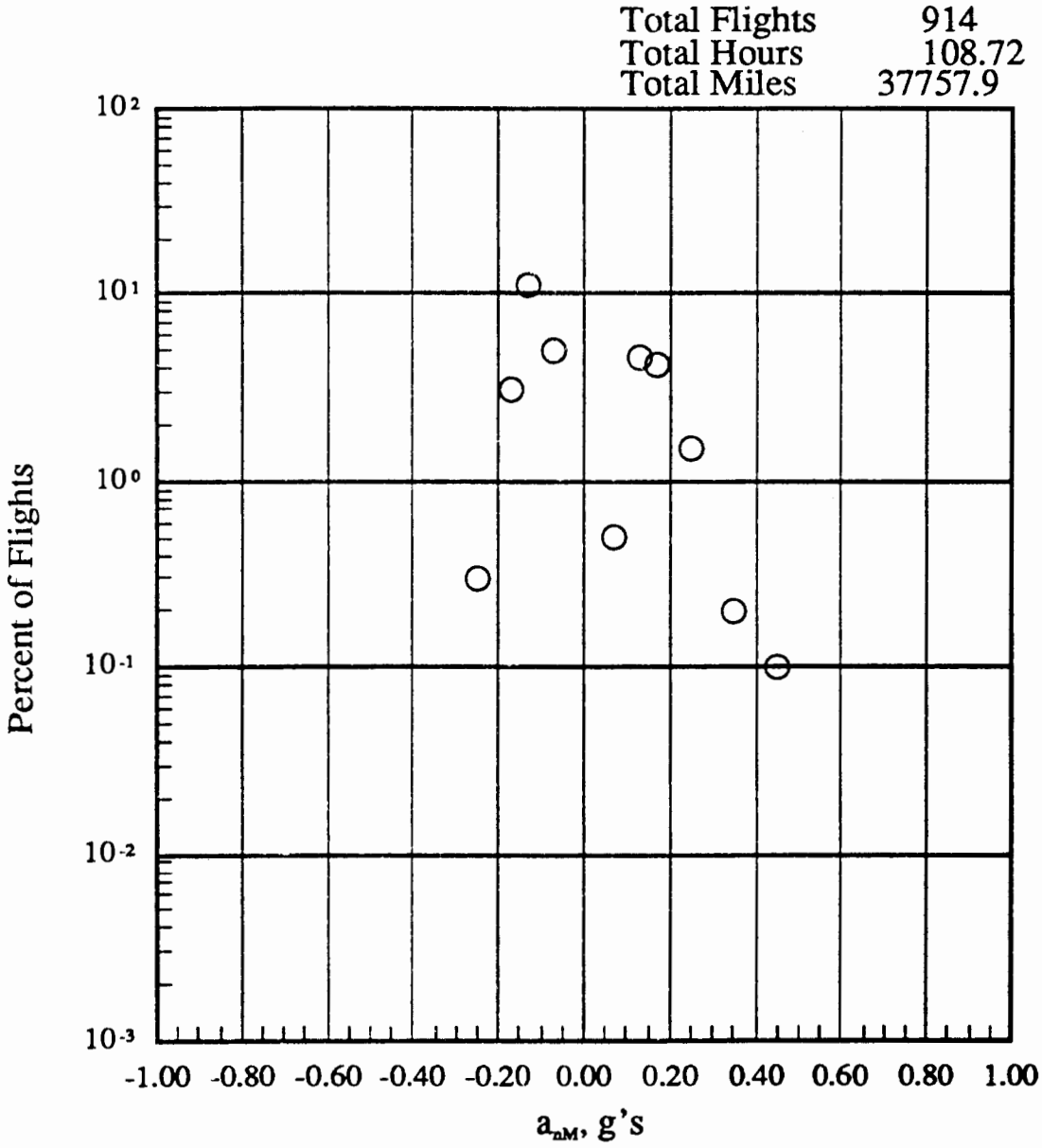

(b) -500 to 4500 feet altitude

Figure 17.- Continued.



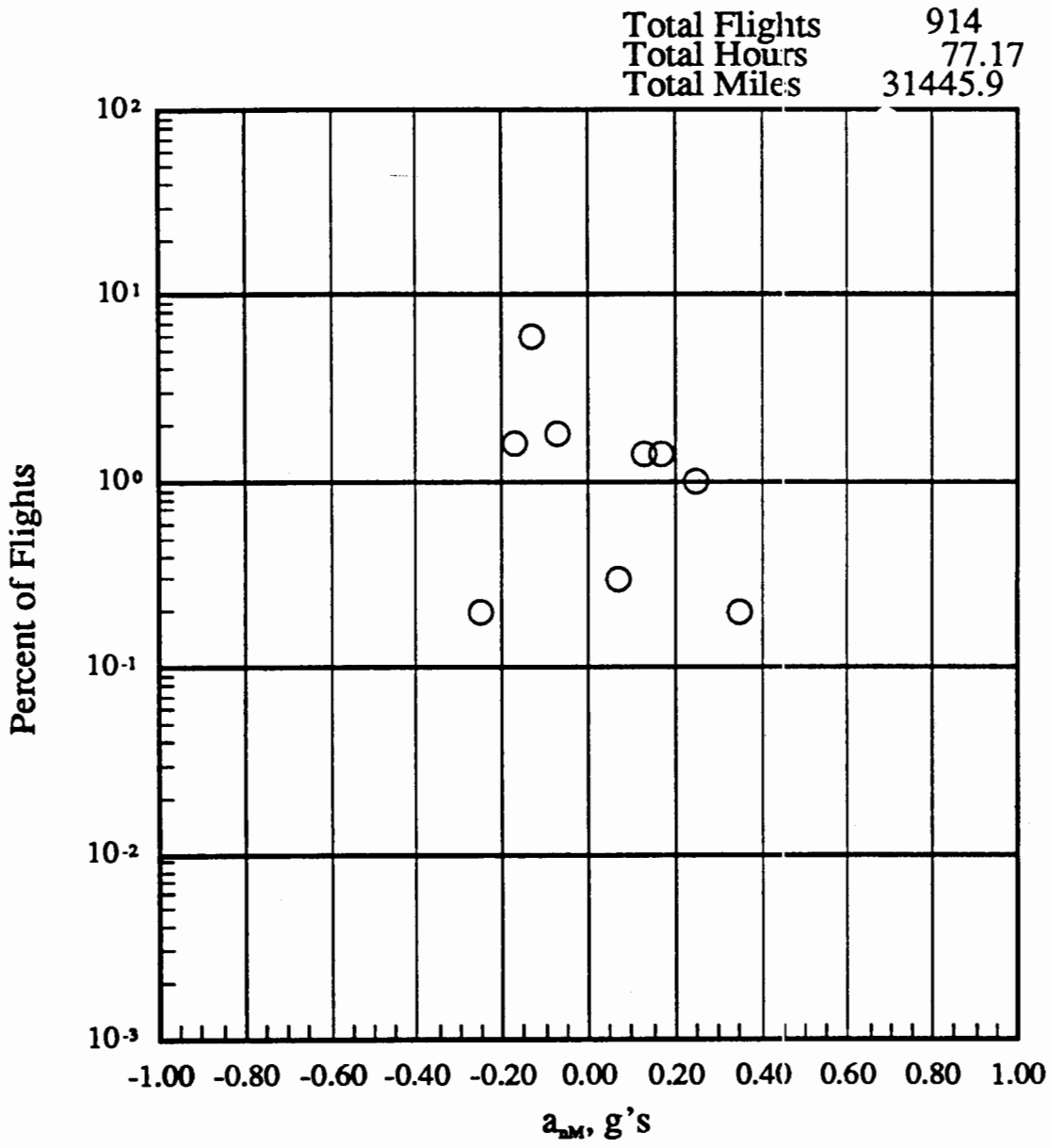

(c) 4500 to 9500 feet altitude

Figure 17.- Continued.



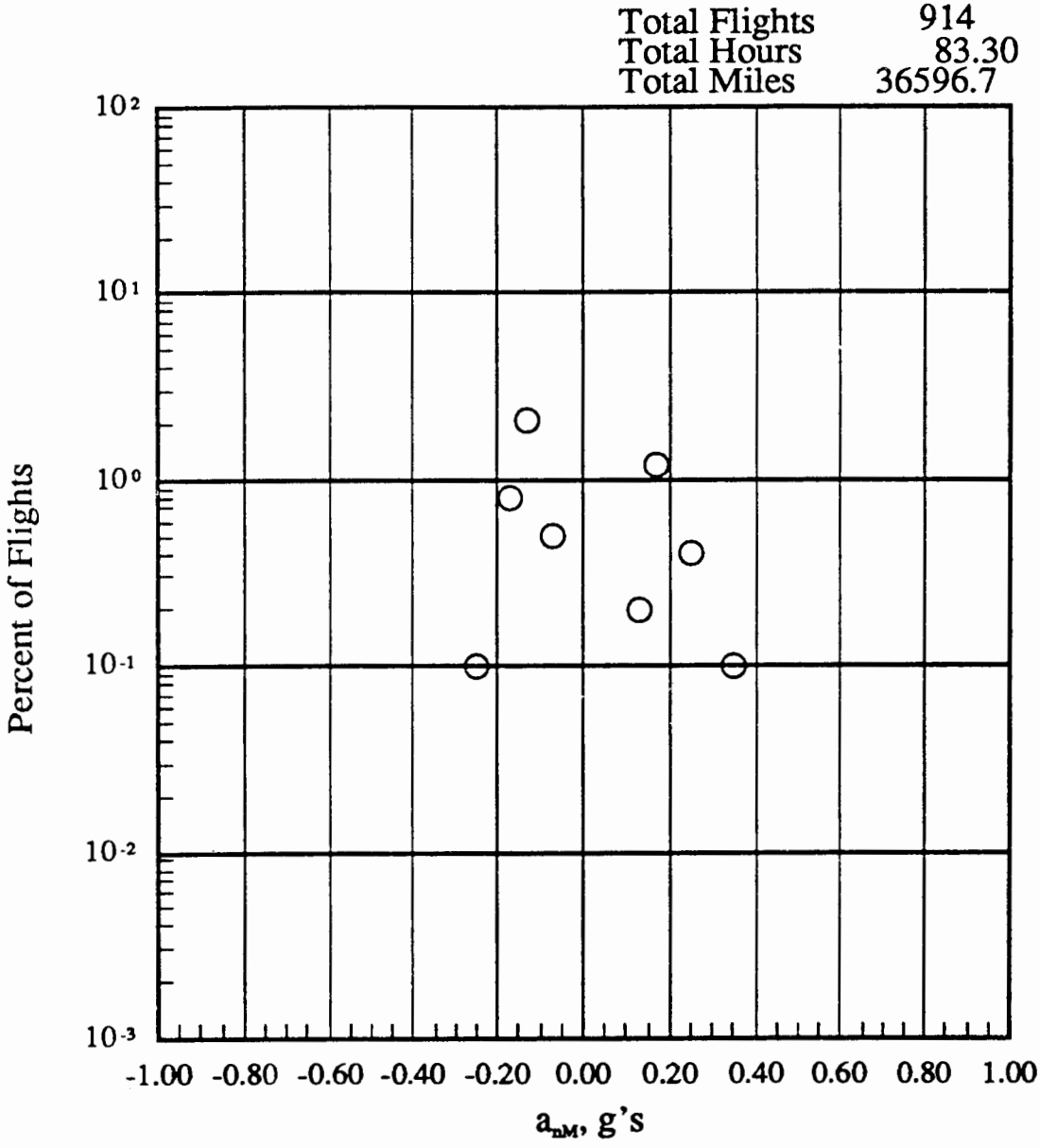

(d) 9500 to 14500 feet altitude

Figure 17.- Continued.



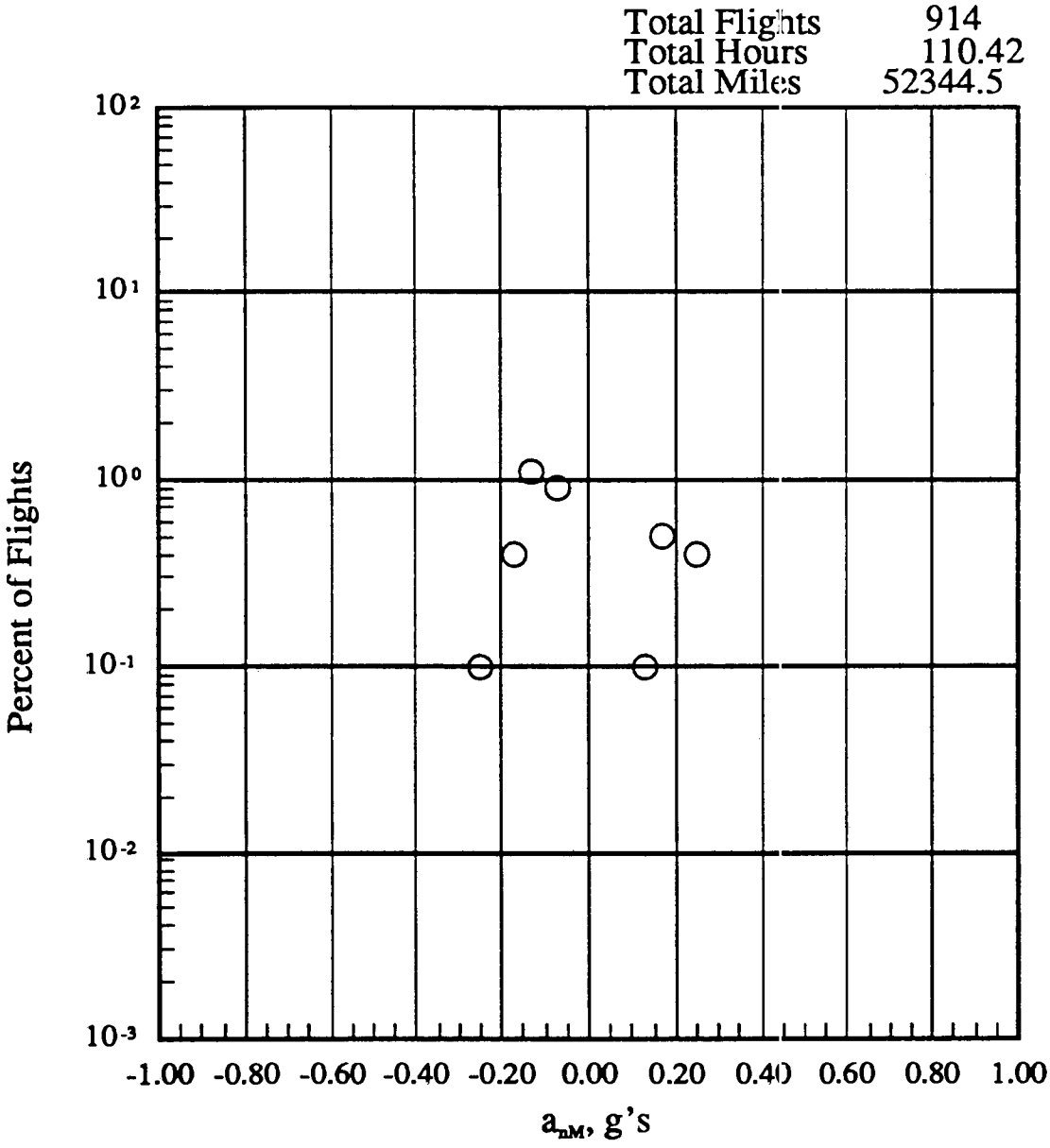

(e) 14500 to 19500 feet altitude

Figure 17.- Continued.



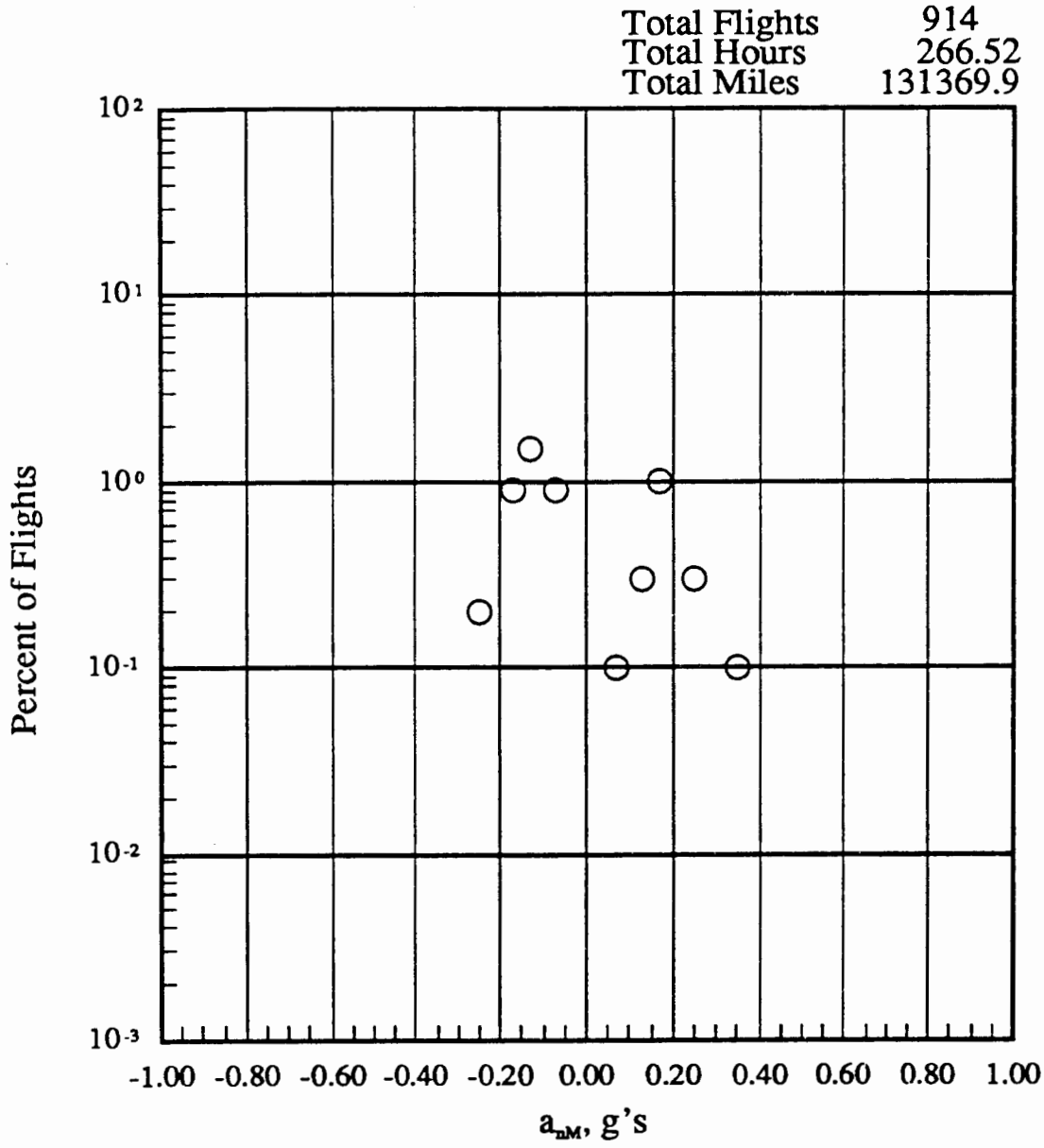

(f) 19500 to 24500 feet altitude

Figure 17.- Continued.



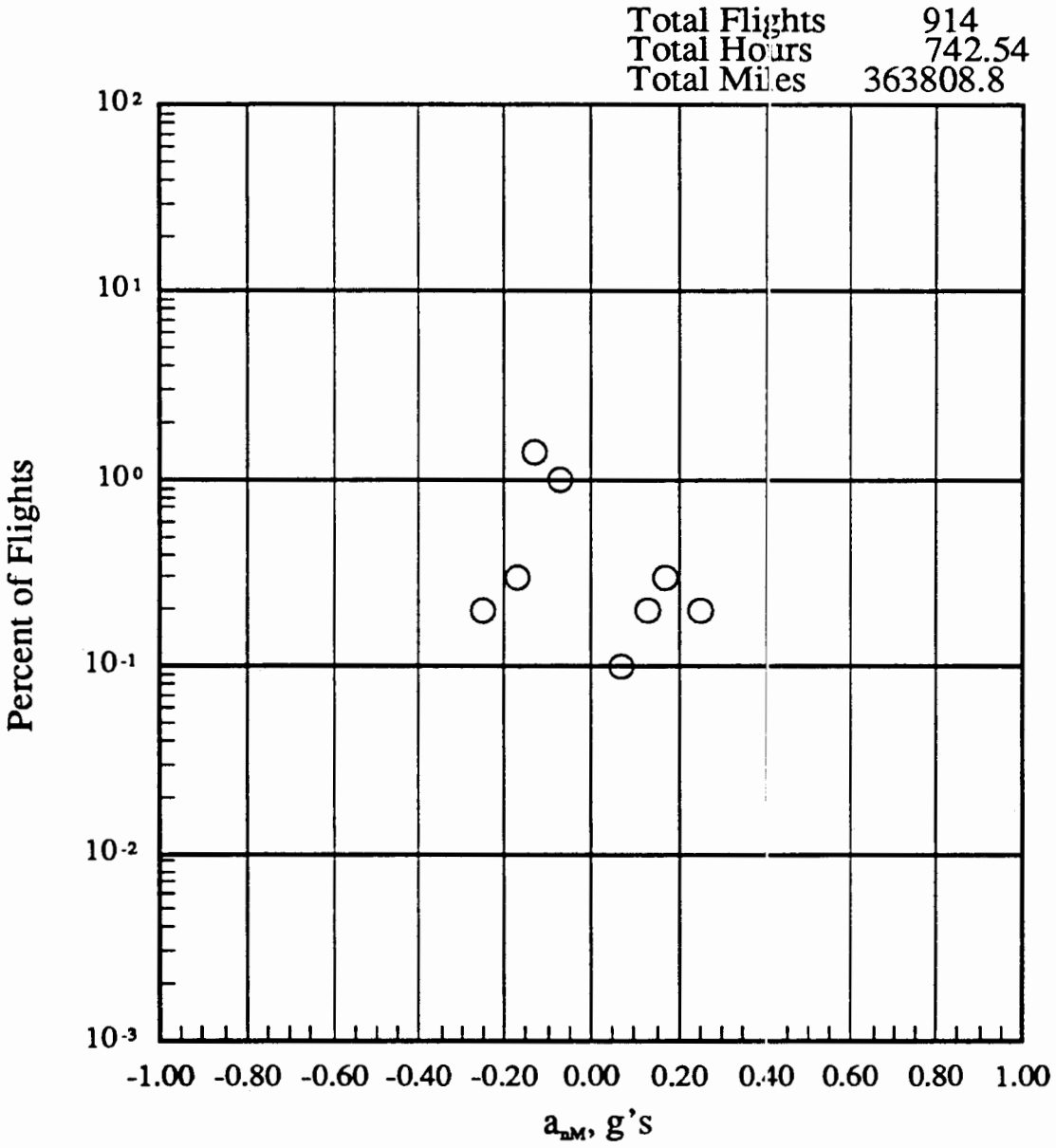

(g) 24500 to 29500 feet altitude

Figure 17.- Continued.



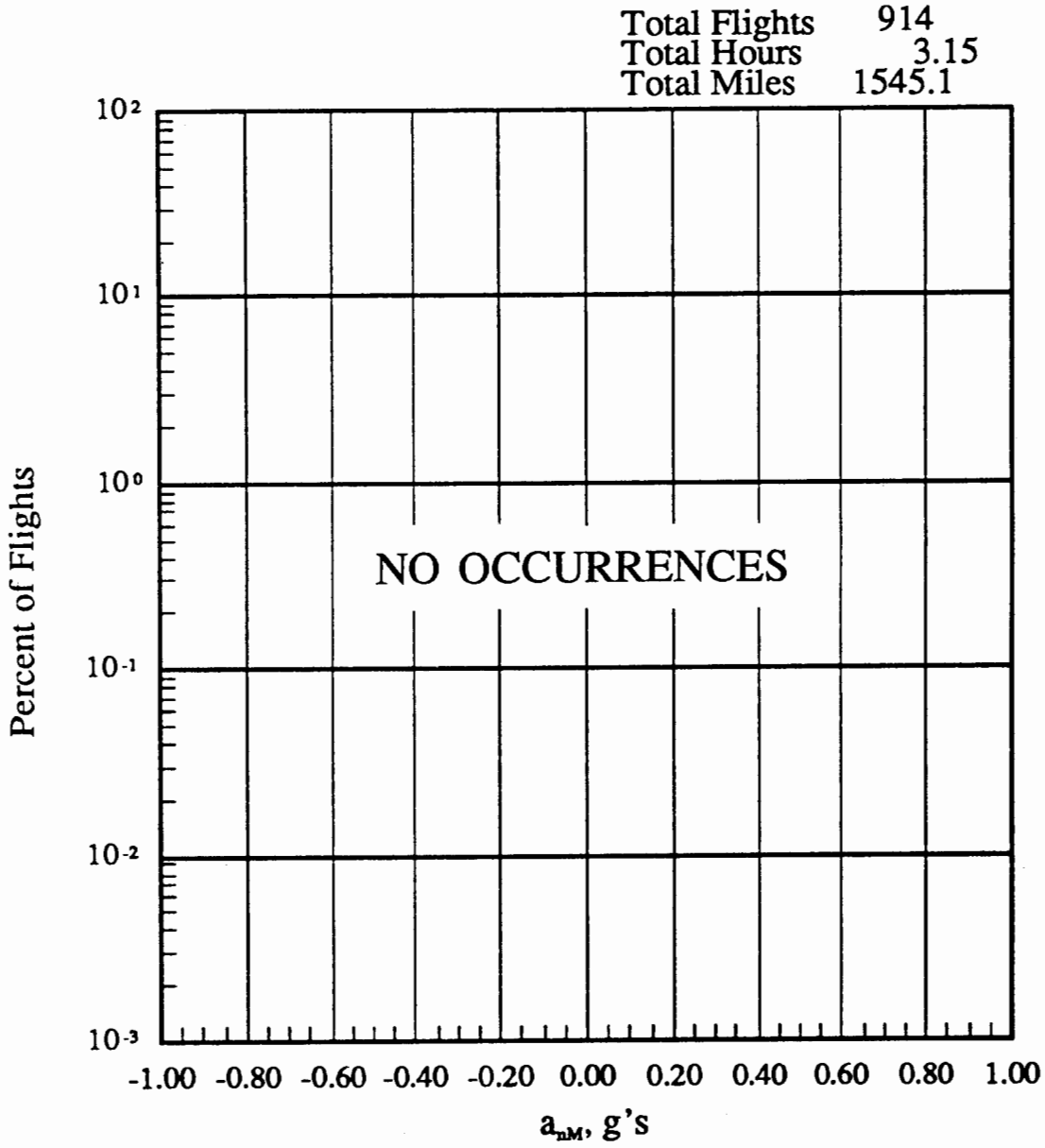

(h) 29500 to 34500 feet altitude

Figure 17.- Continued.



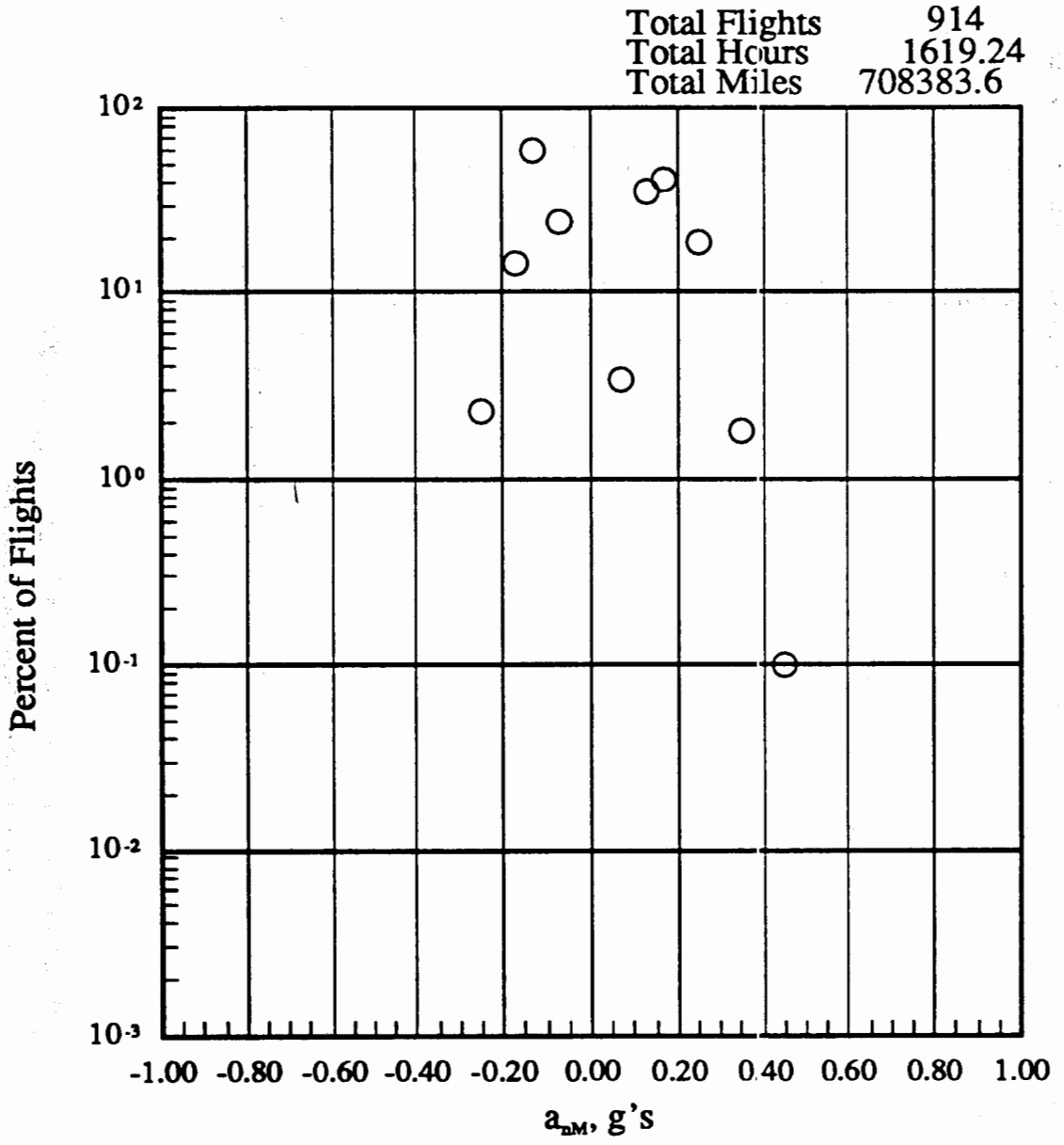

(i) 34500 to 39500 feet altitude

Figure 17.- Continued.




(j) 39500 to 44500 feet altitude

Figure 17.- Continued.




(k) -500 to 44500 feet altitude

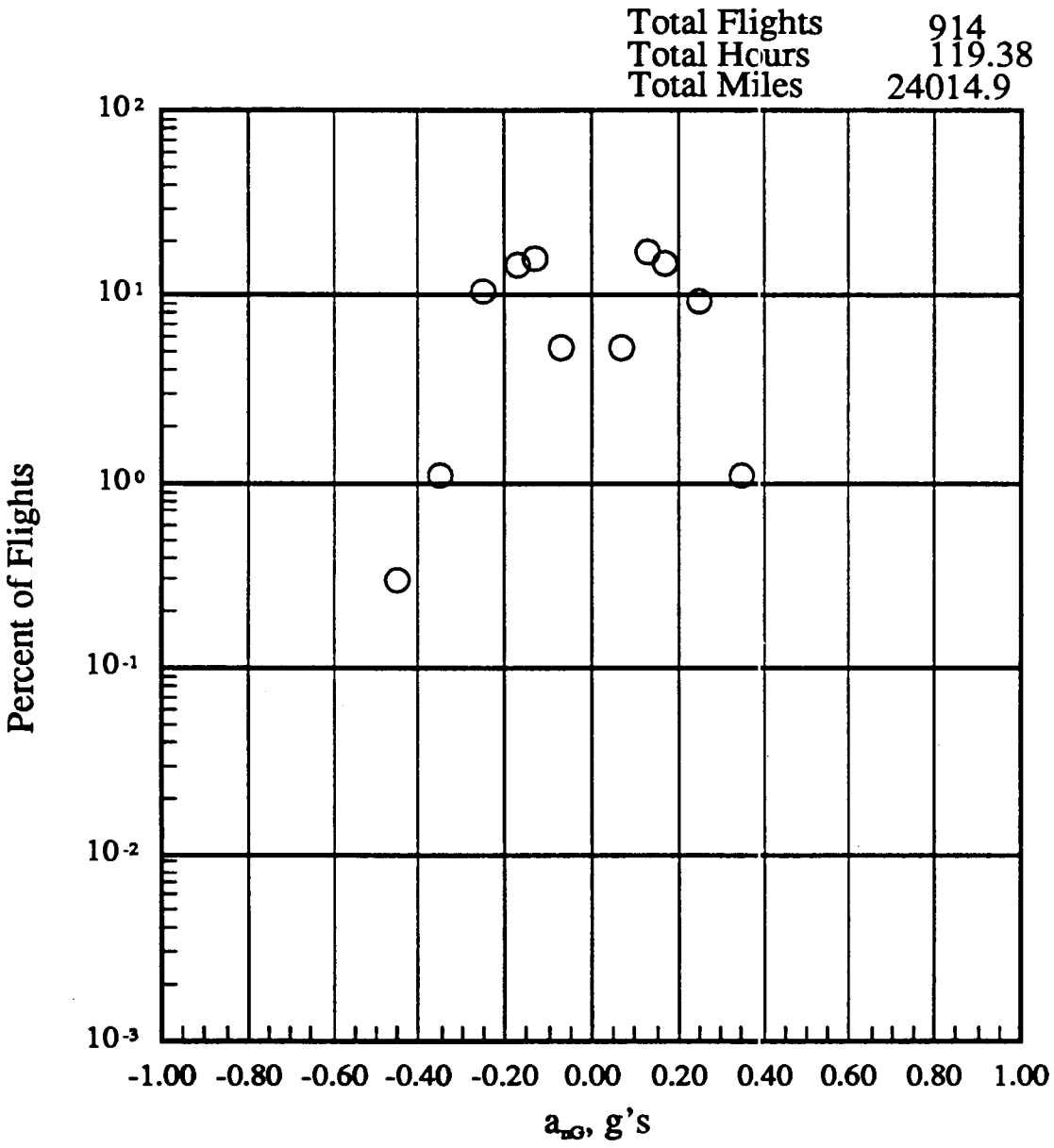
**Figure 17.- Concluded.**

PRESSURE ALTITUDE BANDS

| MAXIMUM $a_{nG}$ LEVEL FOR EACH FLIGHT g's FROM | TO | -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 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 |
| .70 | .80 | 0 | 0 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0.1 |
| .60 | .70 | 0 | 0.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.2 |
| .50 | .60 | 0 | 0.3 | 0 | 0.2 | 0 | 0 | 0 | 0 | 0 | 0.5 |
| .40 | .50 | 0 | 0.4 | 0.7 | 0 | 0.1 | 0 | 0.1 | 0 | 0 | 1.3 |
| .30 | .40 | 1.1 | 0.9 | 1.5 | 0.4 | 0 | 0.1 | 0.8 | 0.3 | 0 | 5.1 |
| .20 | .30 | 9.4 | 4.5 | 3.3 | 1.6 | 0.8 | 0.5 | 0.8 | 2.6 | 0 | 23.5 |
| .15 | .20 | 15.0 | 4.0 | 2.6 | 1.0 | 0.7 | 0.9 | 2.1 | 3.8 | 0 | 30.1 |
| .10 | .15 | 17.3 | 4.0 | 2.3 | 0.7 | 1.4 | 0.7 | 1.6 | 1.6 | 0 | 29.6 |
| .05 | .10 | 5.3 | 1.3 | 0.9 | 0.5 | 0.3 | 0.2 | 0.5 | 0.3 | 0 | 9.4 |
| -.05 | -.10 | 5.3 | 1.9 | 0.5 | 0.4 | 0.2 | 0.1 | 0.5 | 0.8 | 0 | 9.7 |
| -.10 | -.15 | 15.9 | 4.5 | 2.3 | 1.1 | 0.9 | 0.7 | 1.6 | 2.5 | 0 | 29.4 |
| -.10 | -.20 | 14.7 | 3.5 | 2.7 | 1.4 | 0.9 | 0.5 | 1.3 | 3.3 | 0 | 28.3 |
| -.20 | -.30 | 10.6 | 4.6 | 4.4 | 1.1 | 0.2 | 0.8 | 1.2 | 2.2 | 0 | 25.1 |
| -.30 | -.40 | 1.1 | 1.3 | 1.0 | 0.5 | 0 | 0 | 0.4 | 0.5 | 0 | 5.0 |
| -.40 | -.50 | 0.3 | 0.8 | 0.2 | 0.1 | 0 | 0 | 0 | 0.1 | 0 | 1.5 |
| -.50 | -.60 | 0 | 0.3 | 0.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0.5 |
| -.60 | -.70 | 0 | 0 | 0 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0.1 |
| -.70 | -.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0.1 | 0 | 0 | 0.1 |
| -.80 | -1.00 | 0 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.1 |
| -1.00 | -1.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.20 | -1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.40 | -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 @ ALT | | 119.38 | 108.04 | 108.72 | 77.17 | 83.30 | 110.42 | 266.52 | 742.54 | 3.15 | 1619.24 |
| FLIGHT MILES @ ALT | | 24014.89 | 29500.10 | 37757.94 | 31445.86 | 36596.71 | 52344.52 | 131369.93 | 363808.56 | 1545.14 | 708383.64 |
| | | | | | | | TOTAL FLIGHTS | | | | 914 |

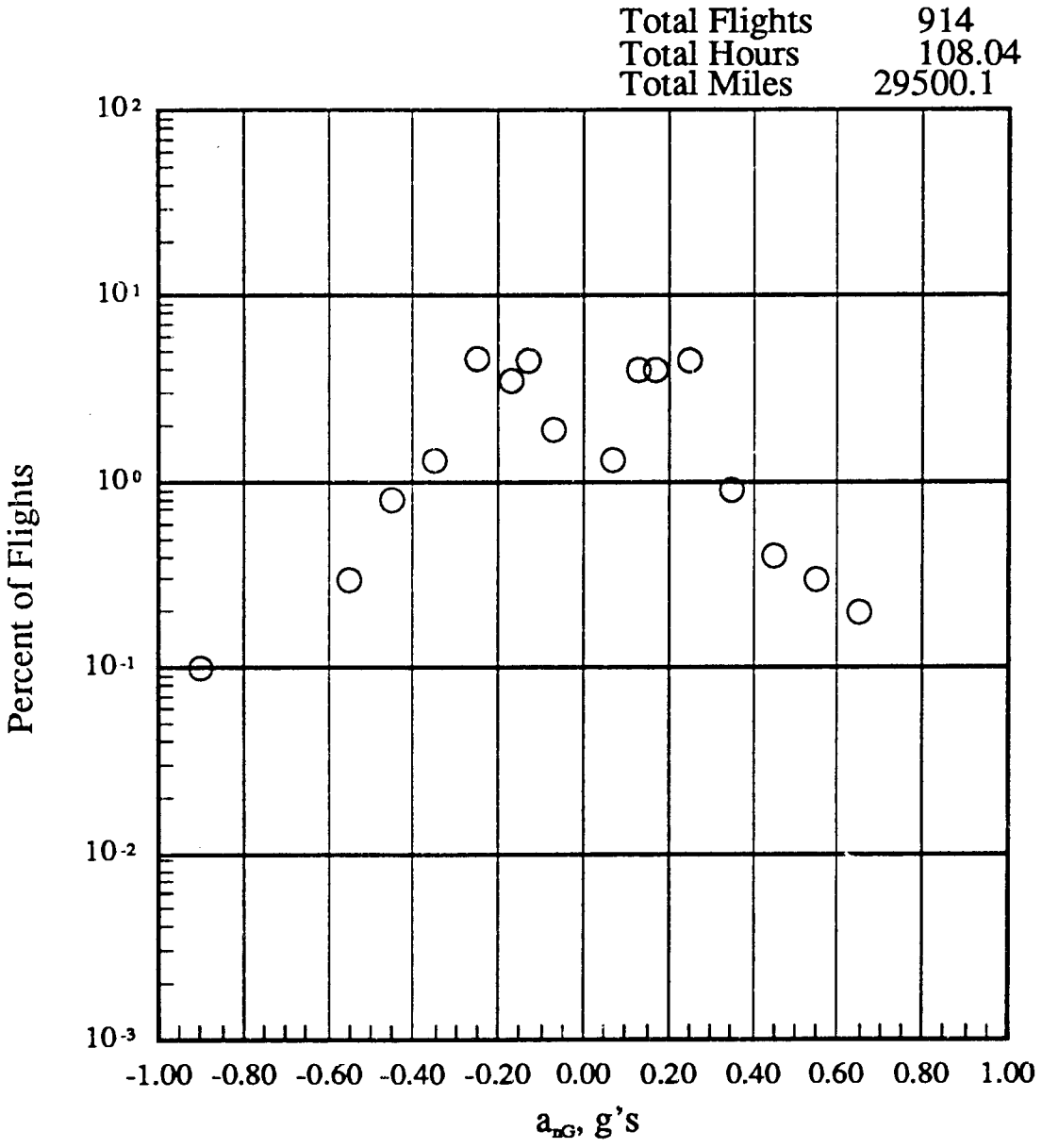
(a) $a_{nG}$ Percent of flights where peak positive and negative $a_{nG}$ per flight occurs within pressure altitude bands, any flap

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



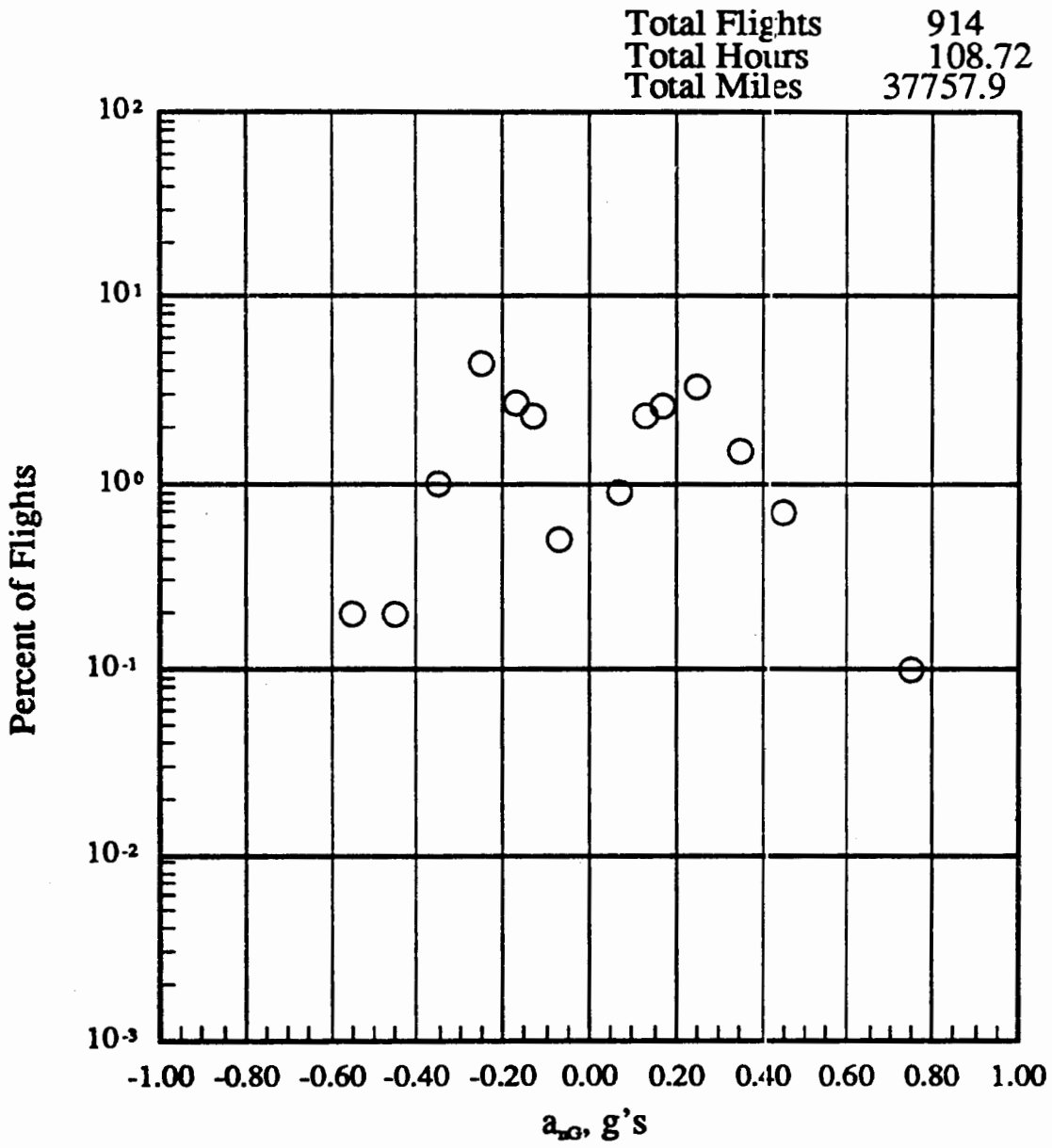

(b) -500 to 4500 feet altitude

Figure 18.- Continued.



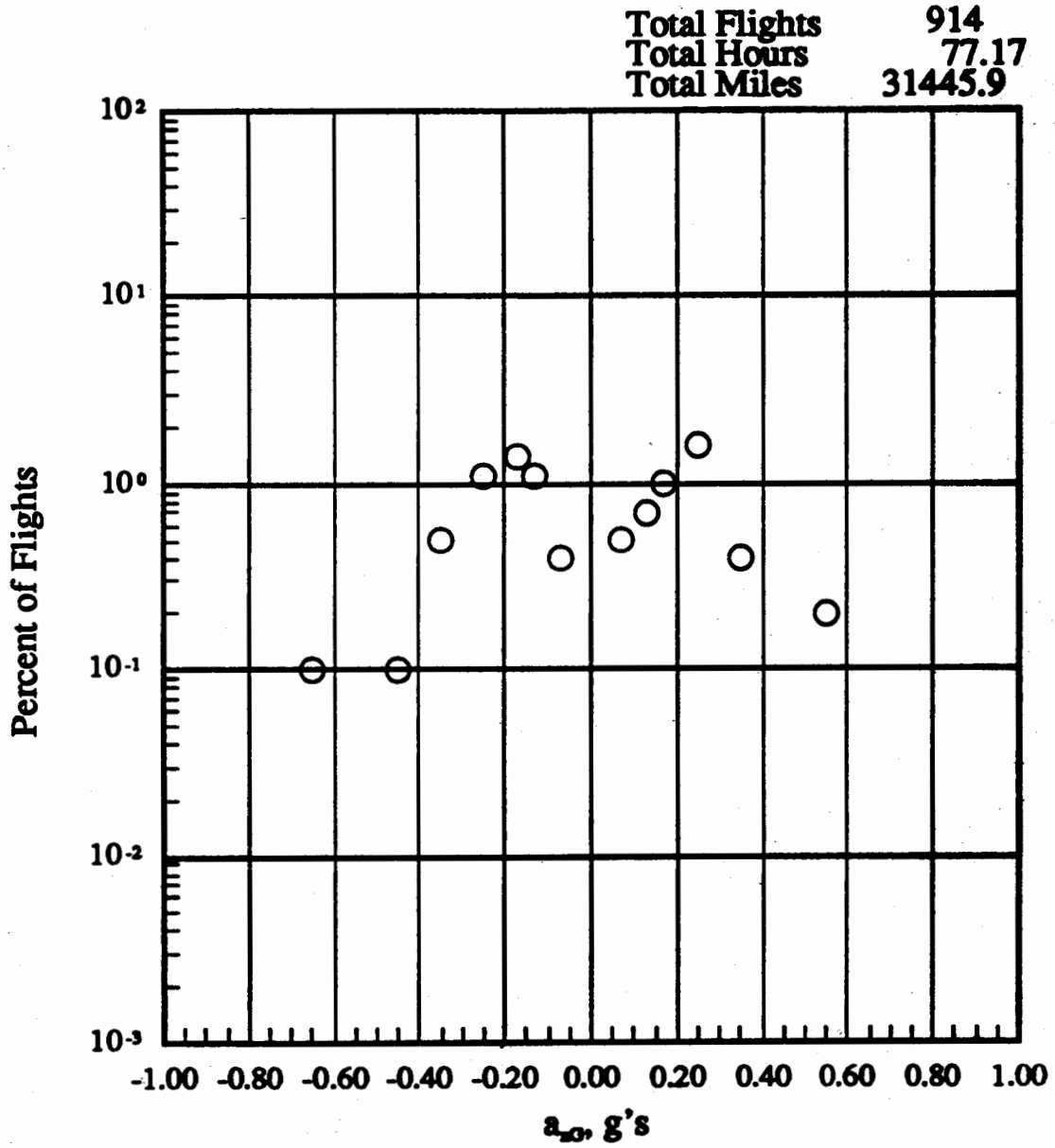

(c) 4500 to 9500 feet altitude

Figure 18.- Continued.



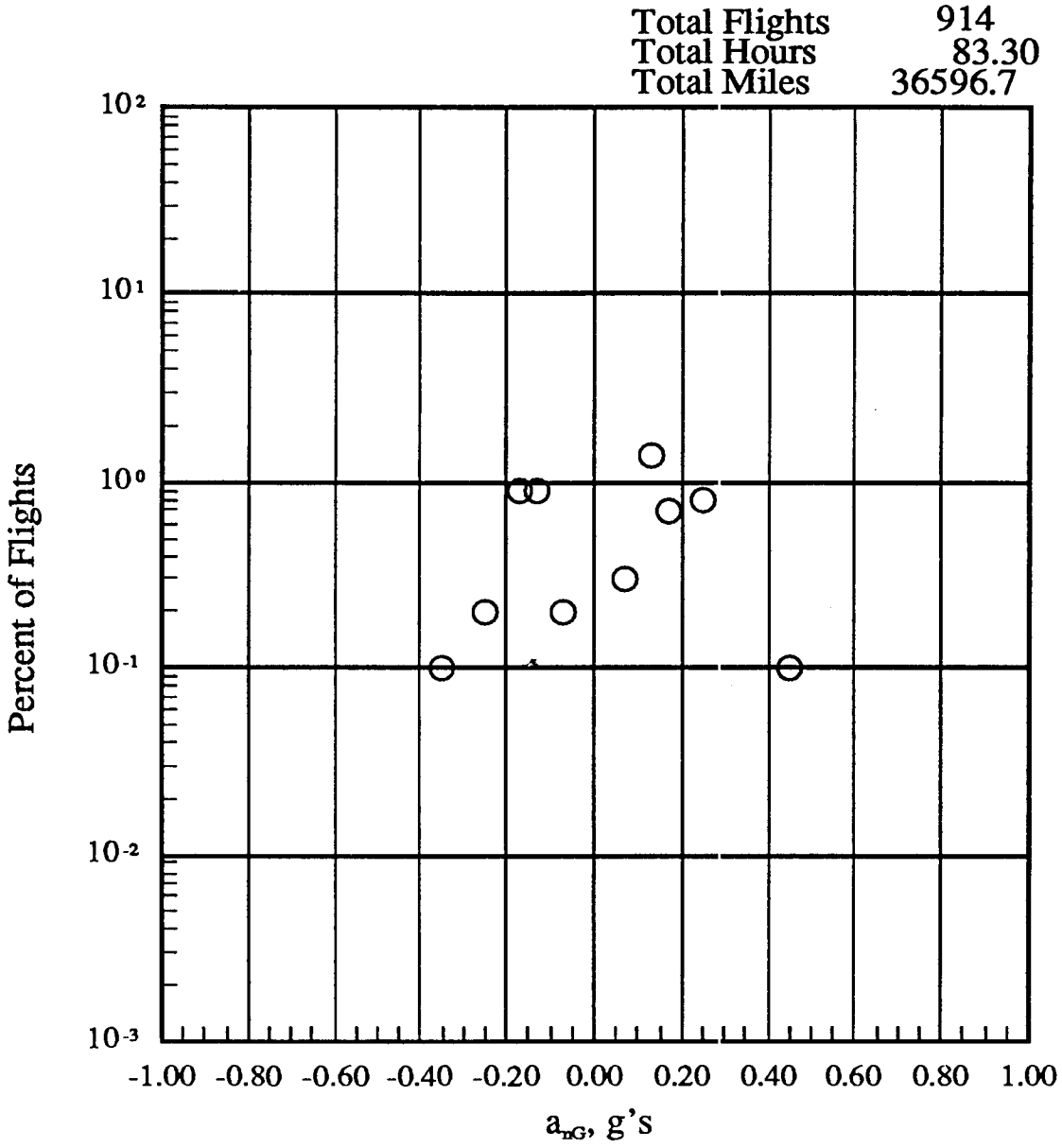

(d) 9500 to 14500 feet altitude

Figure 18.- Continued.



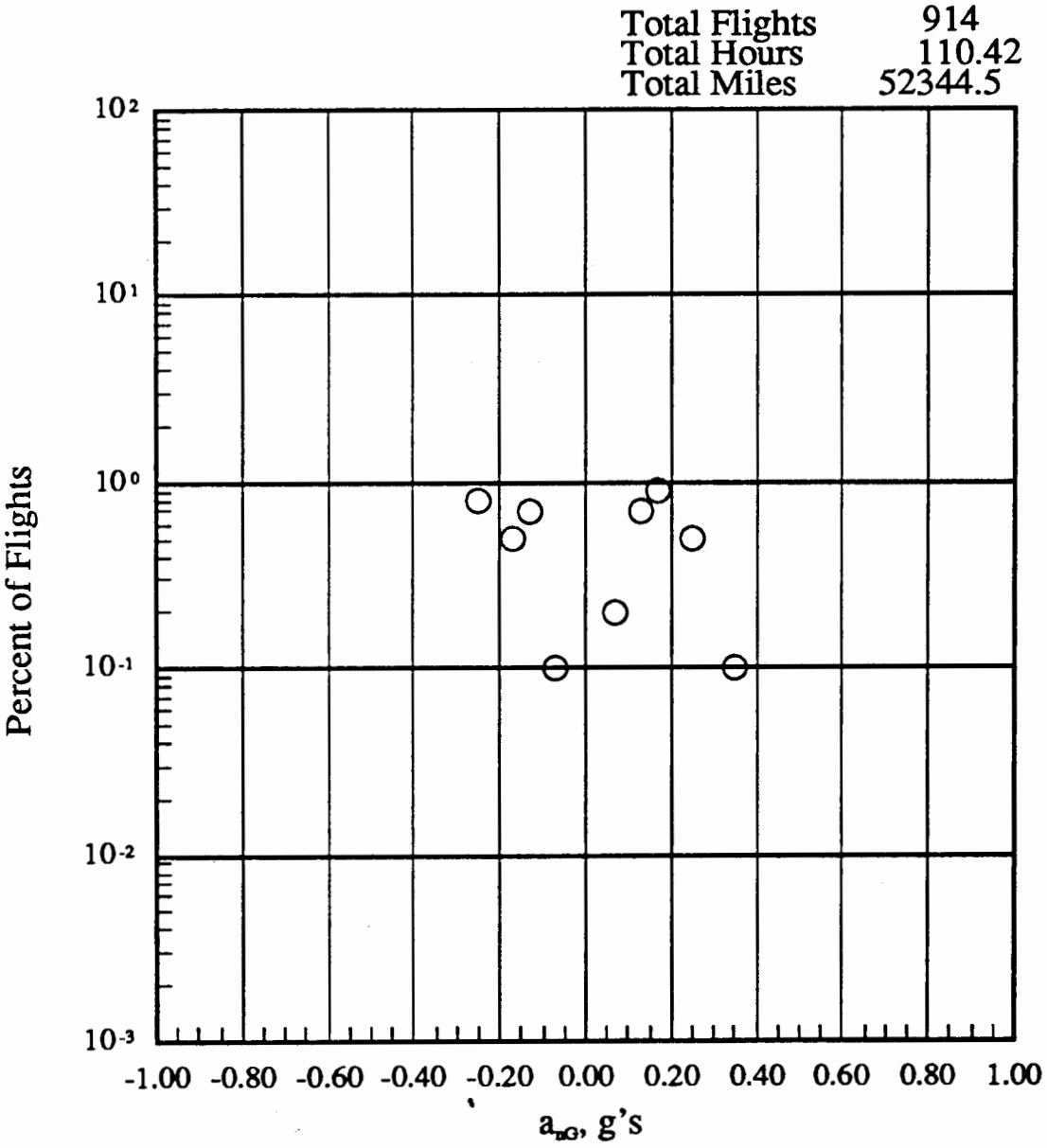

(e) 14500 to 19500 feet altitude

Figure 18.- Continued.



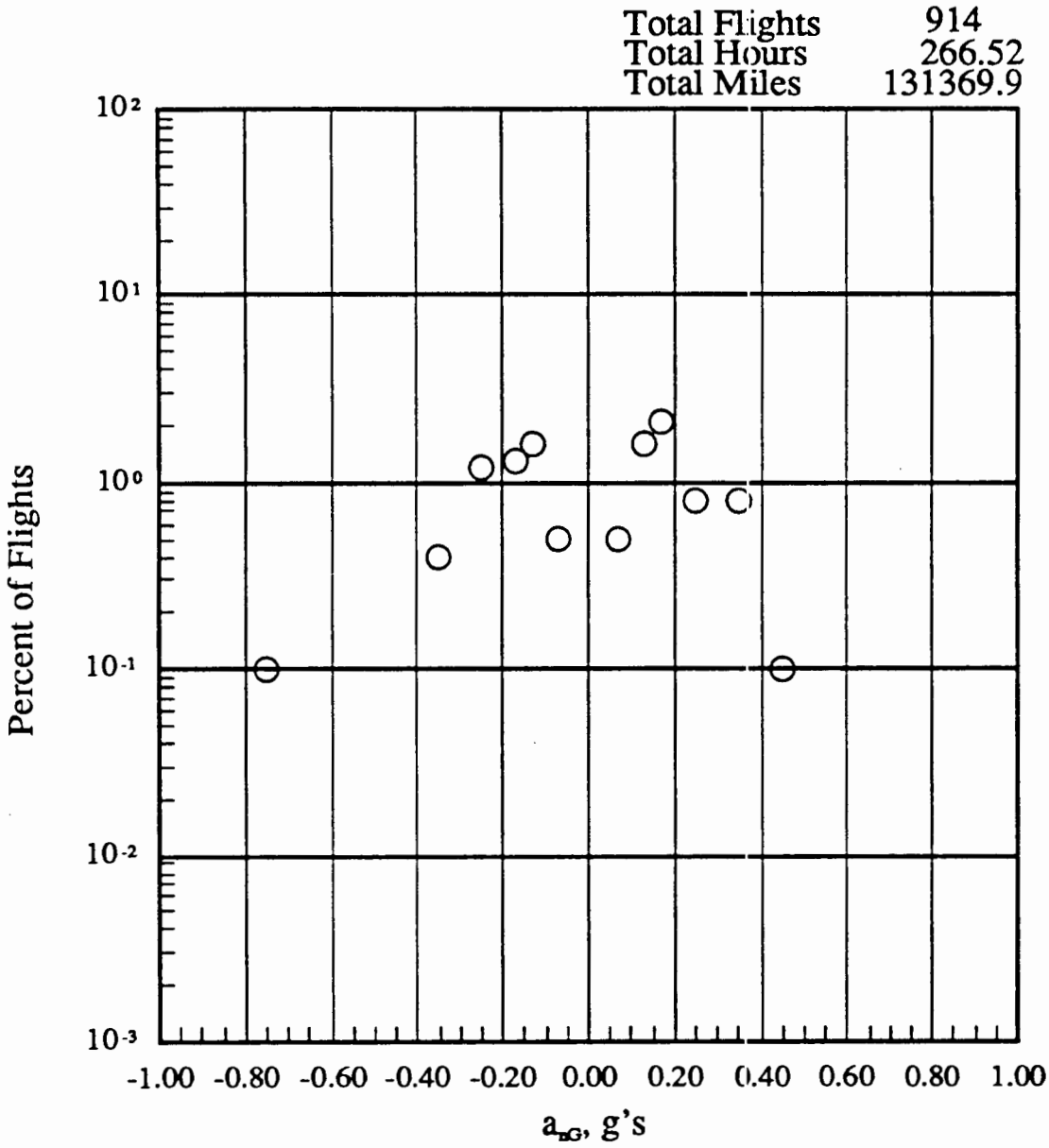

(f) 19500 to 24500 feet altitude

Figure 18.- Continued.



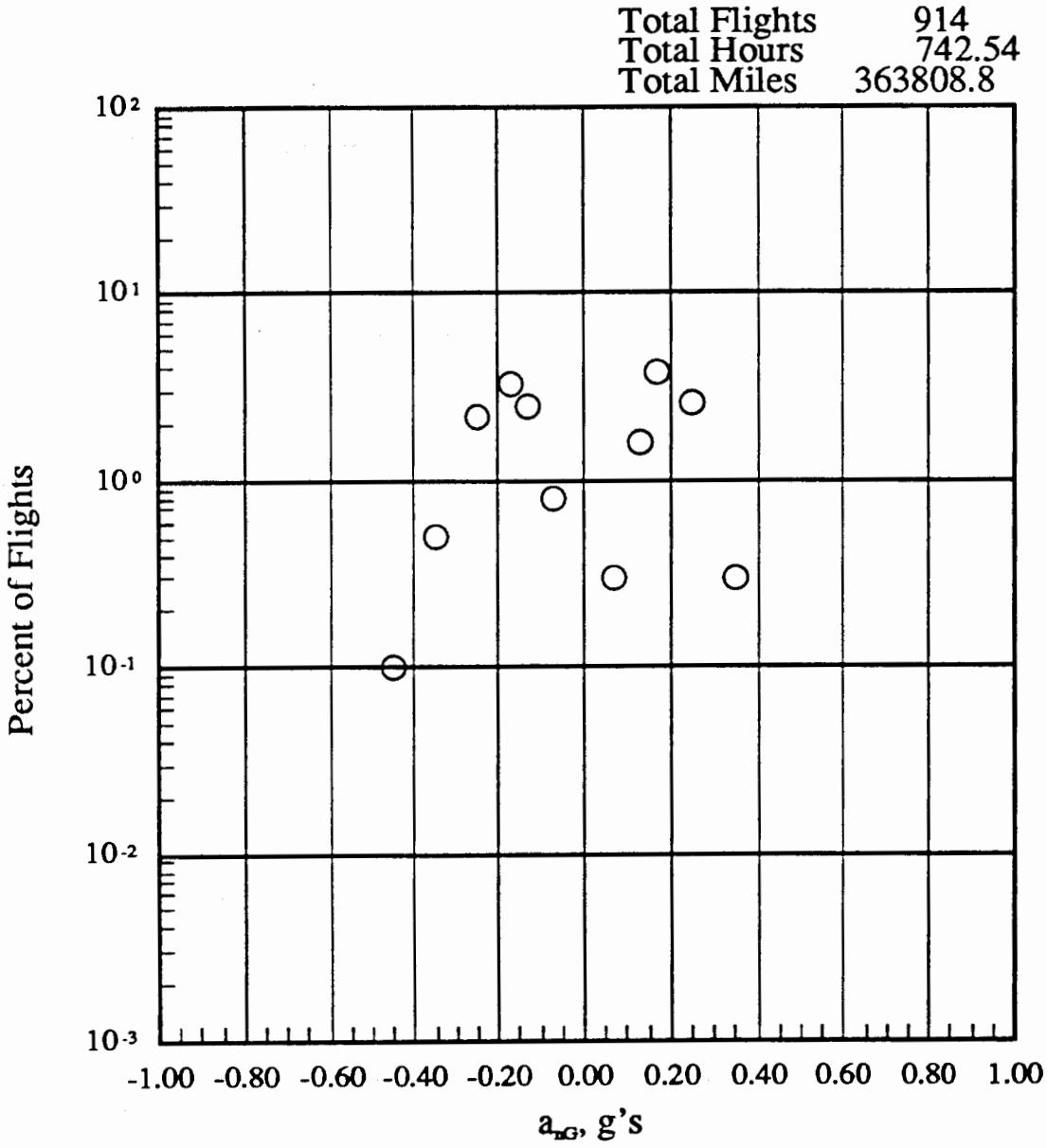

(g) 24500 to 29500 feet altitude

Figure 18.- Continued.



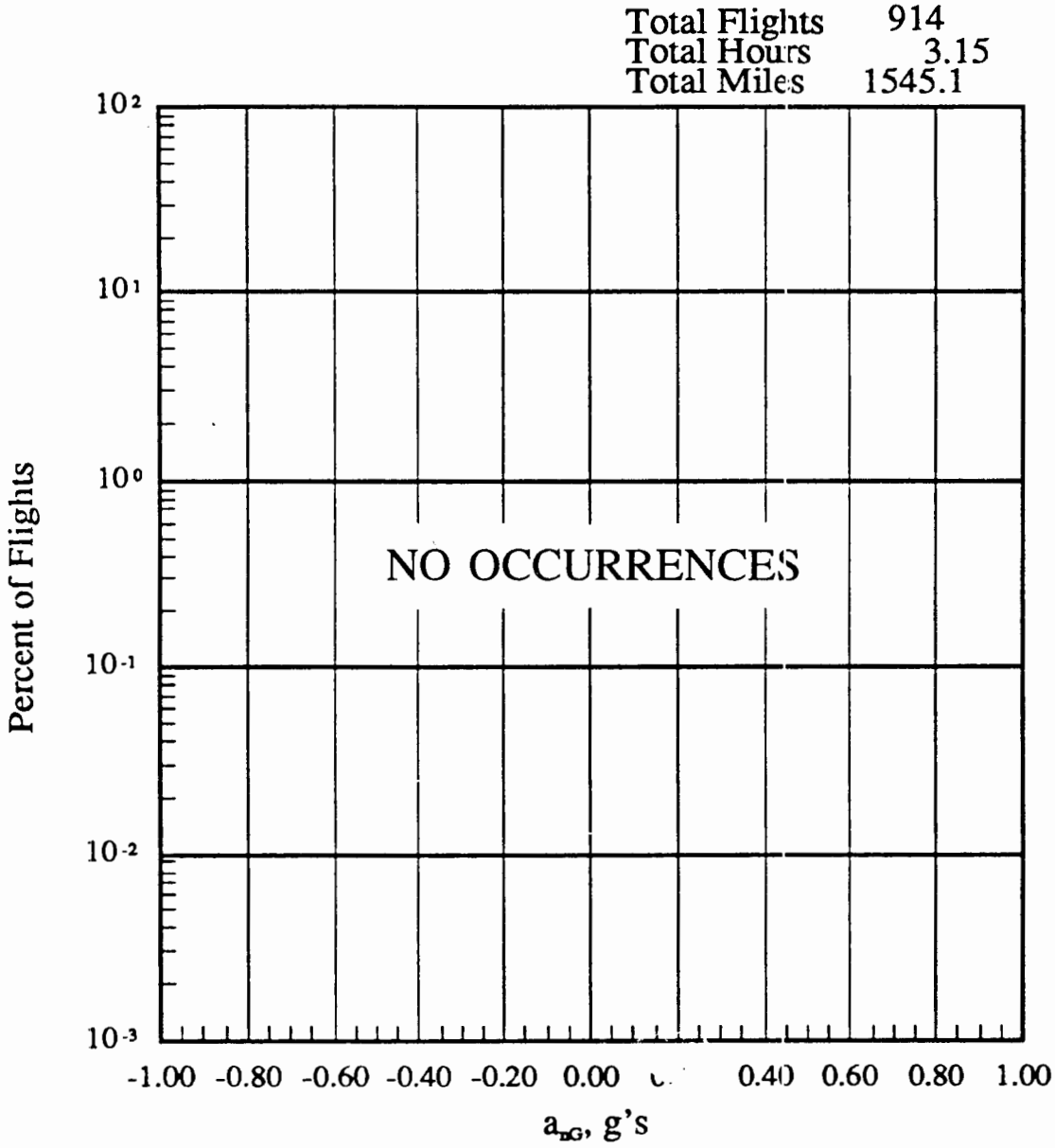

(h) 29500 to 34500 feet altitude

Figure 18.- Continued.



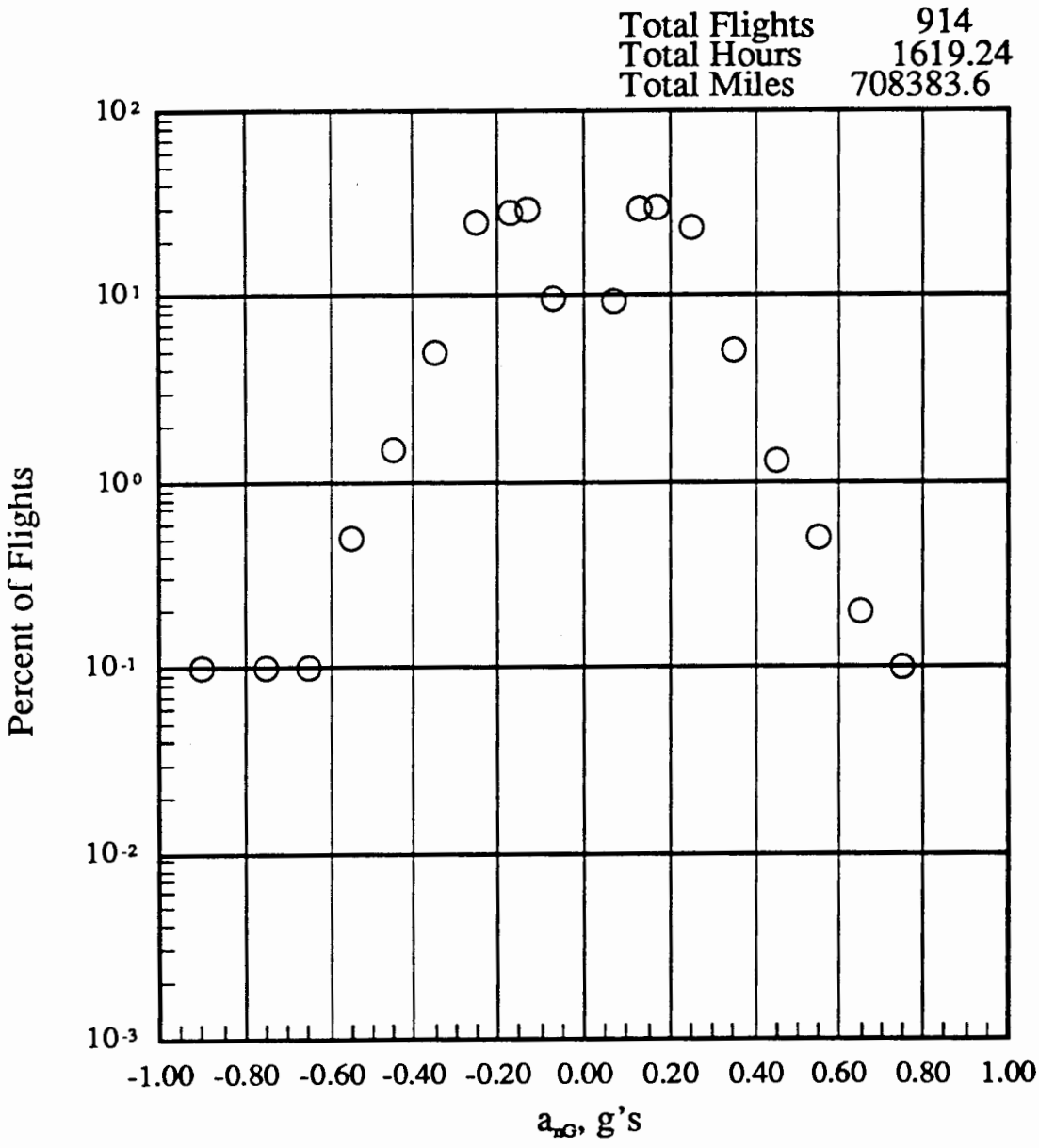

(i) 34500 to 39500 feet altitude

Figure 18.- Continued.




(j) 39500 to 44500 feet altitude

Figure 18.- Continued.



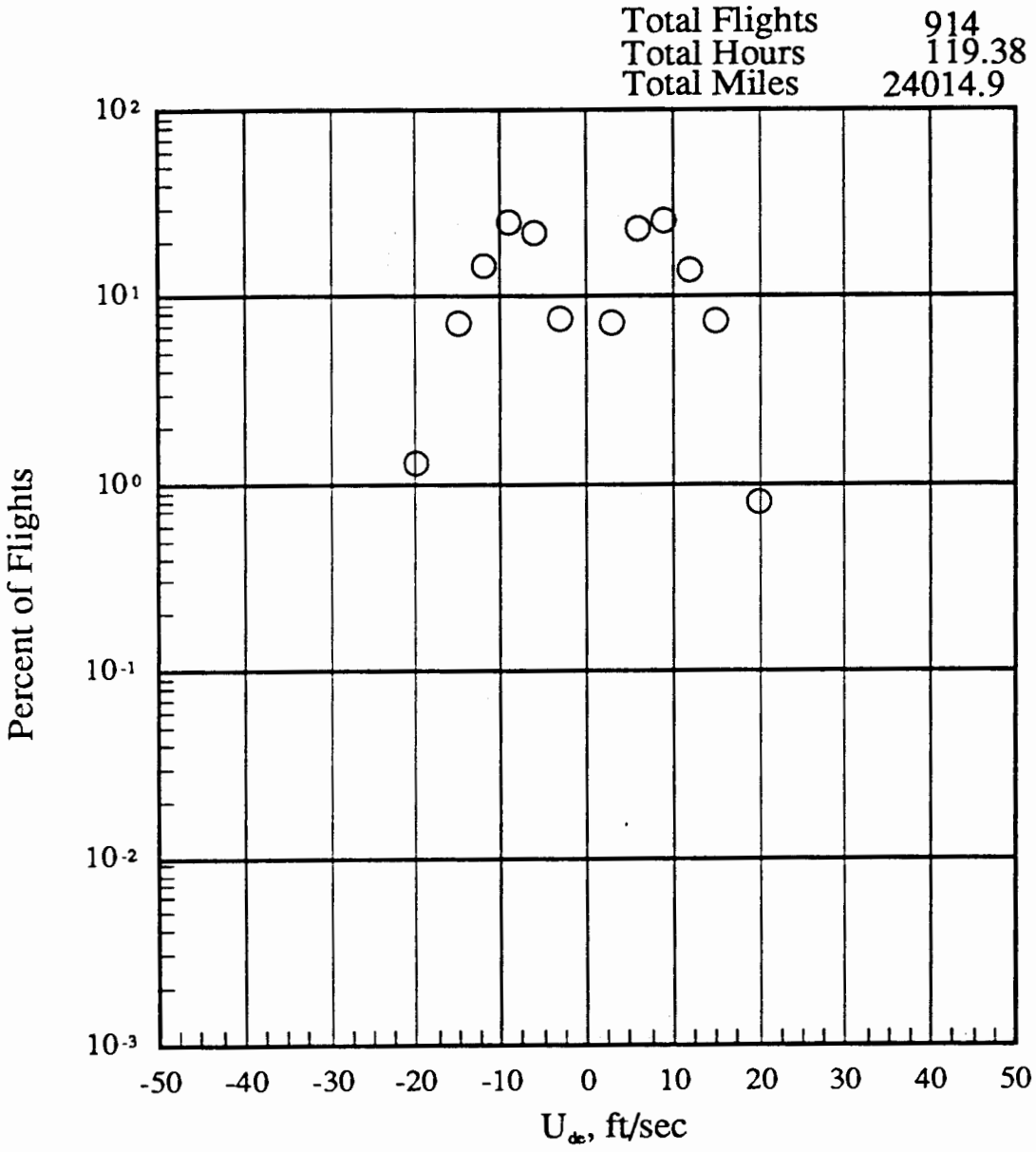

(k) -500 to 44500 feet altitude

Figure 18.- Concluded.

| MAXIMUM $U_{DE}$ LEVEL FOR EACH FLIGHT FT/SEC | -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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 90 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 40 | 0 | 0 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0.1 |
| 30 | 0 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.1 |
| 20 | 0.8 | 0.5 | 0.1 | 0.2 | 0 | 0 | 0 | 0 | 0 | 1.6 |
| 15 | 7.5 | 1.8 | 1.4 | 0.2 | 0.1 | 0 | 0.1 | 0 | 0 | 11.2 |
| 12 | 14.0 | 1.8 | 0.8 | 0 | 0.1 | 0 | 0.3 | 0 | 0 | 17.0 |
| 9 | 25.7 | 3.6 | 1.3 | 0.4 | 0.1 | 0.1 | 0.1 | 0.3 | 0 | 31.7 |
| 6 | 23.3 | 2.7 | 1.9 | 0.4 | 0.1 | 0.1 | 0.3 | 0.7 | 0 | 29.5 |
| 3 | 7.3 | 0.7 | 0.3 | 0 | 0 | 0.1 | 0 | 0.3 | 0 | 8.8 |
| -3 | 7.7 | 0.7 | 0.4 | 0.1 | 0.1 | 0 | 0 | 0.2 | 0 | 9.2 |
| -6 | 22.2 | 2.7 | 1.3 | 0.5 | 0.1 | 0.1 | 0.4 | 1.3 | 0 | 28.8 |
| -9 | 25.3 | 2.5 | 2.0 | 0.4 | 0.1 | 0.3 | 0.1 | 0.2 | 0 | 31.0 |
| -12 | 14.8 | 1.6 | 0.7 | 0.2 | 0 | 0 | 0.1 | 0.3 | 0 | 17.7 |
| -15 | 7.3 | 2.3 | 0.8 | 0.1 | 0 | 0 | 0 | 0 | 0 | 10.5 |
| -20 | 1.3 | 1.0 | 0.3 | 0 | 0 | 0 | 0.1 | 0 | 0 | 2.7 |
| -30 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| -40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -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 |
| FLIGHT HOURS @ ALT | 119.38 | 108.04 | 108.72 | 77.17 | 83.30 | 110.42 | 266.52 | 742.54 | 3.15 | 1619.24 |
| FLIGHT MILES @ ALT | 24014.89 | 29500.10 | 37757.94 | 31445.86 | 36596.71 | 52344.52 | 131369.93 | 363808.56 | 1545.14 | 708383.64 |
| | | | | | | | TOTAL FLIGHTS | | | 914 |

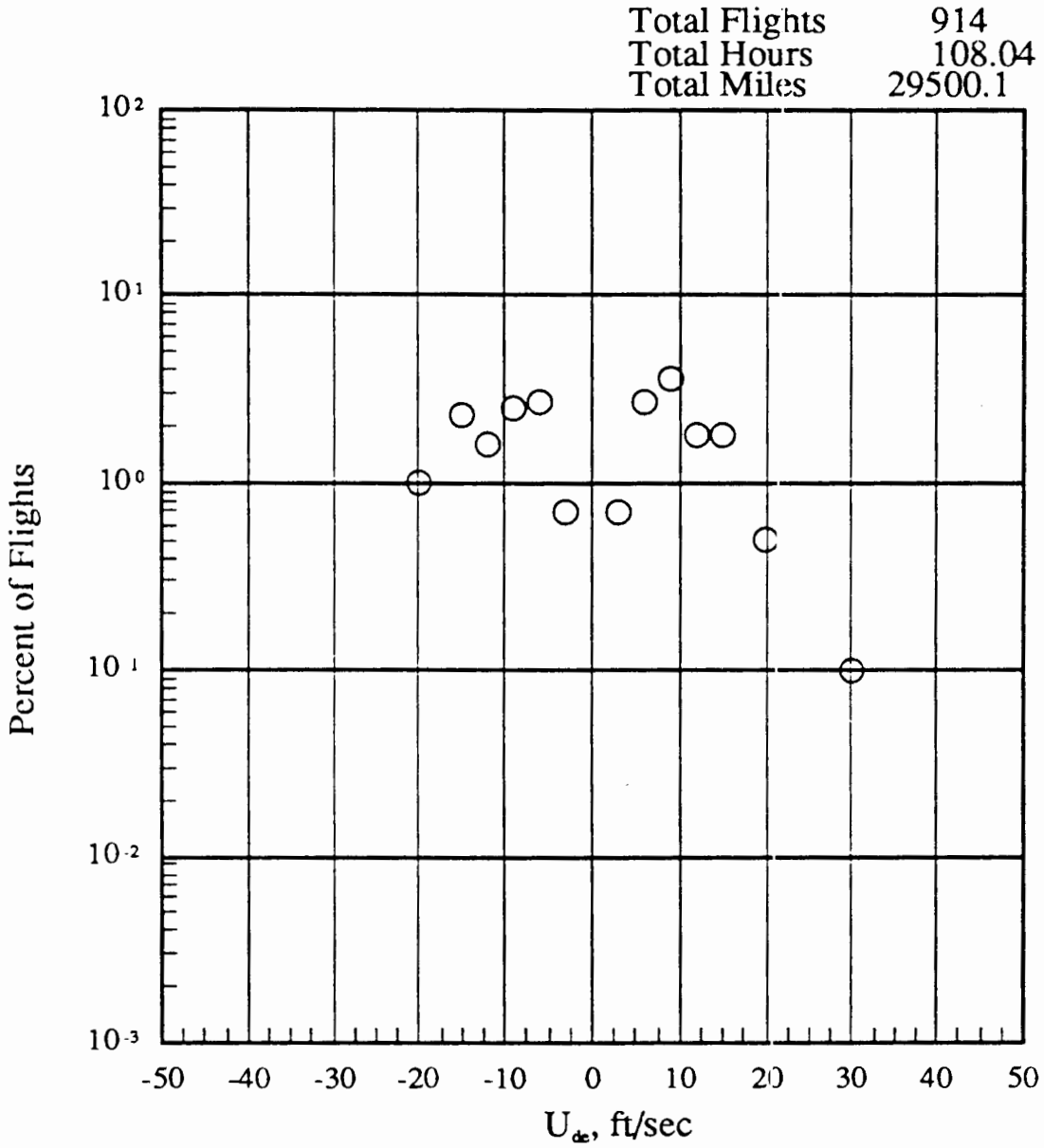
(a) Percent of flights where peak positive and negative $U_{de}$ per flight occurs within pressure altitude bands, any flap

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



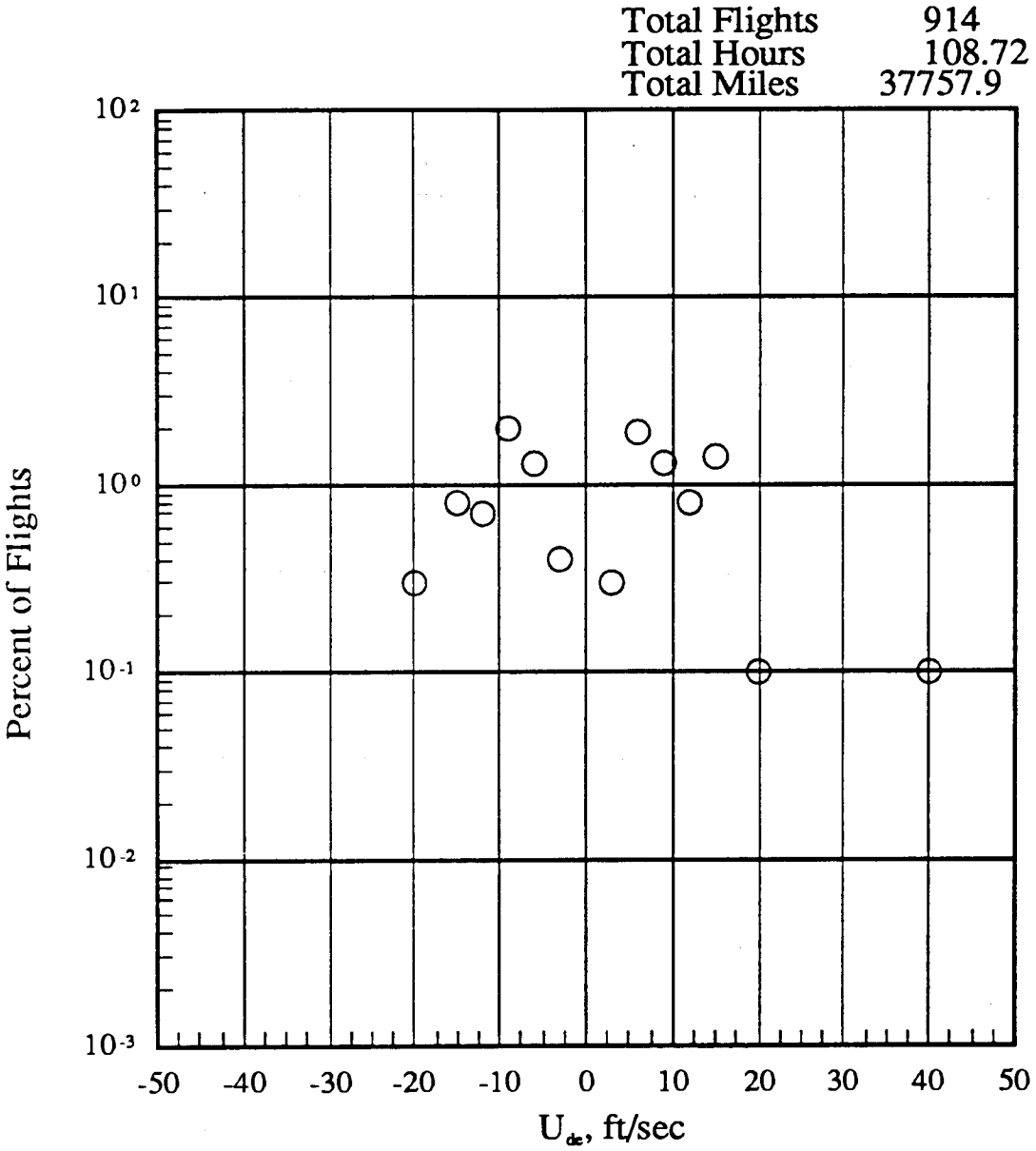

(b) -500 to 4500 feet altitude

Figure 19.- Continued.



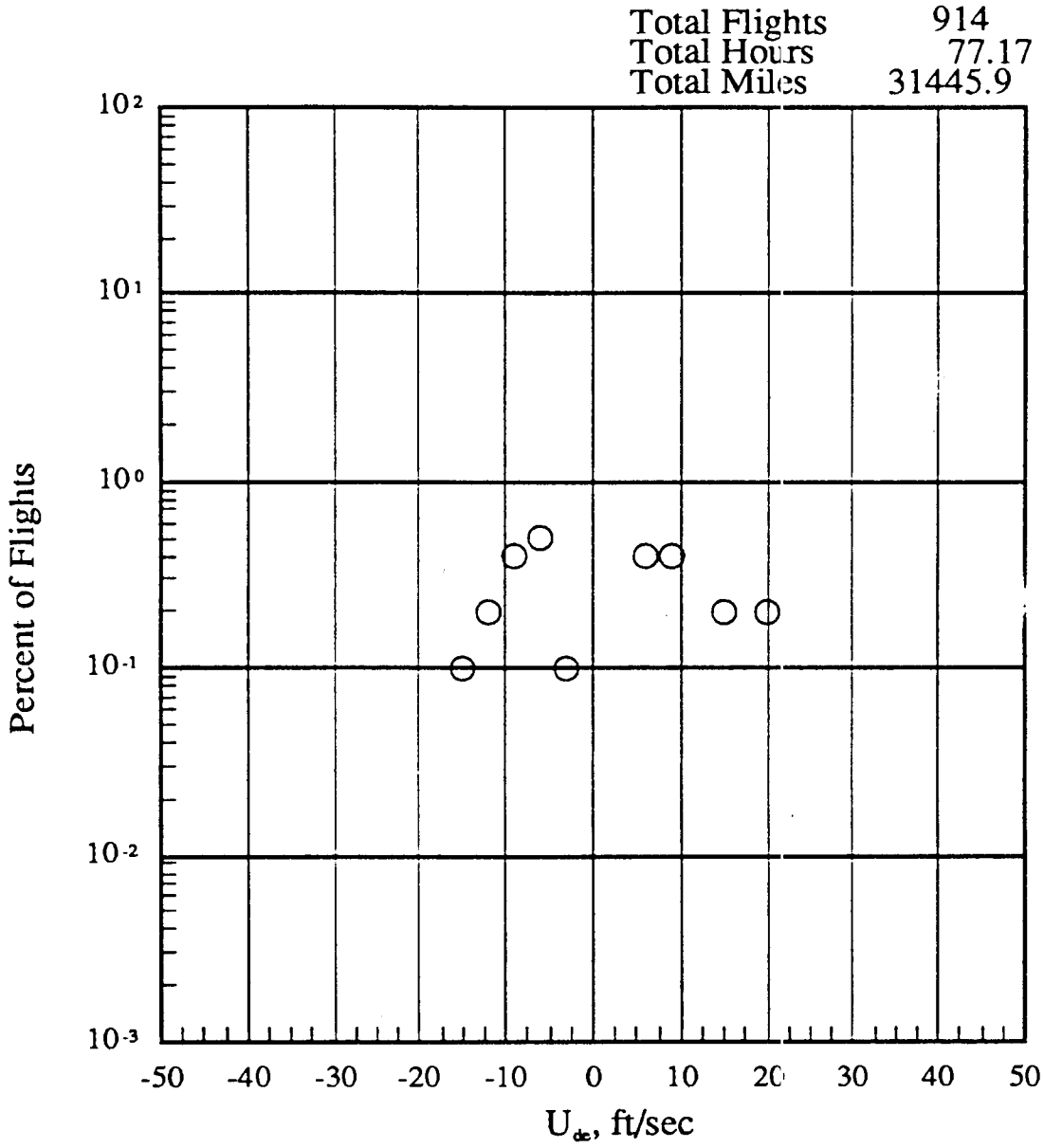

(c) 4500 to 9500 feet altitude

Figure 19.- Continued.



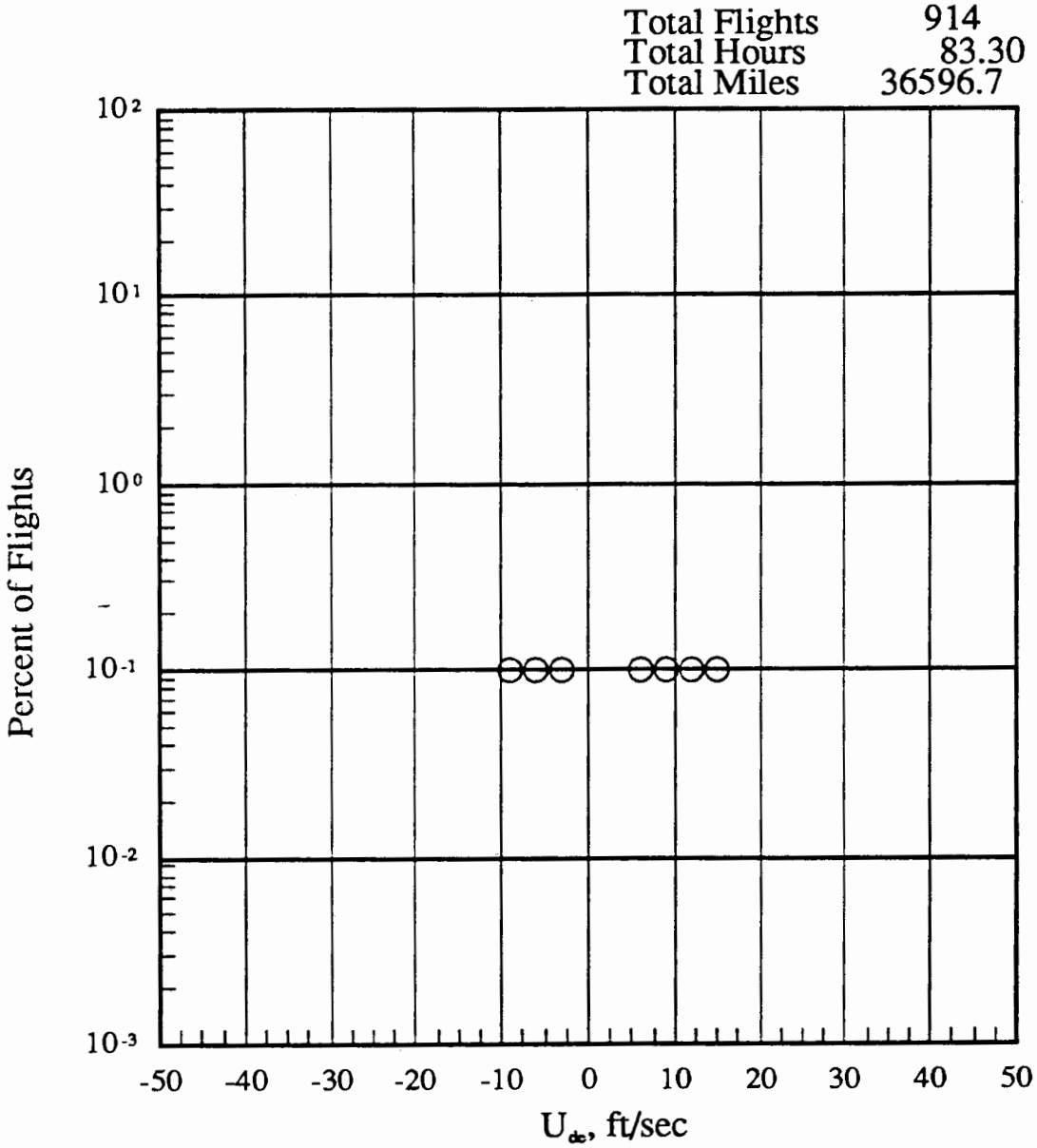

(d) 9500 to 14500 feet altitude

Figure 19.- Continued.



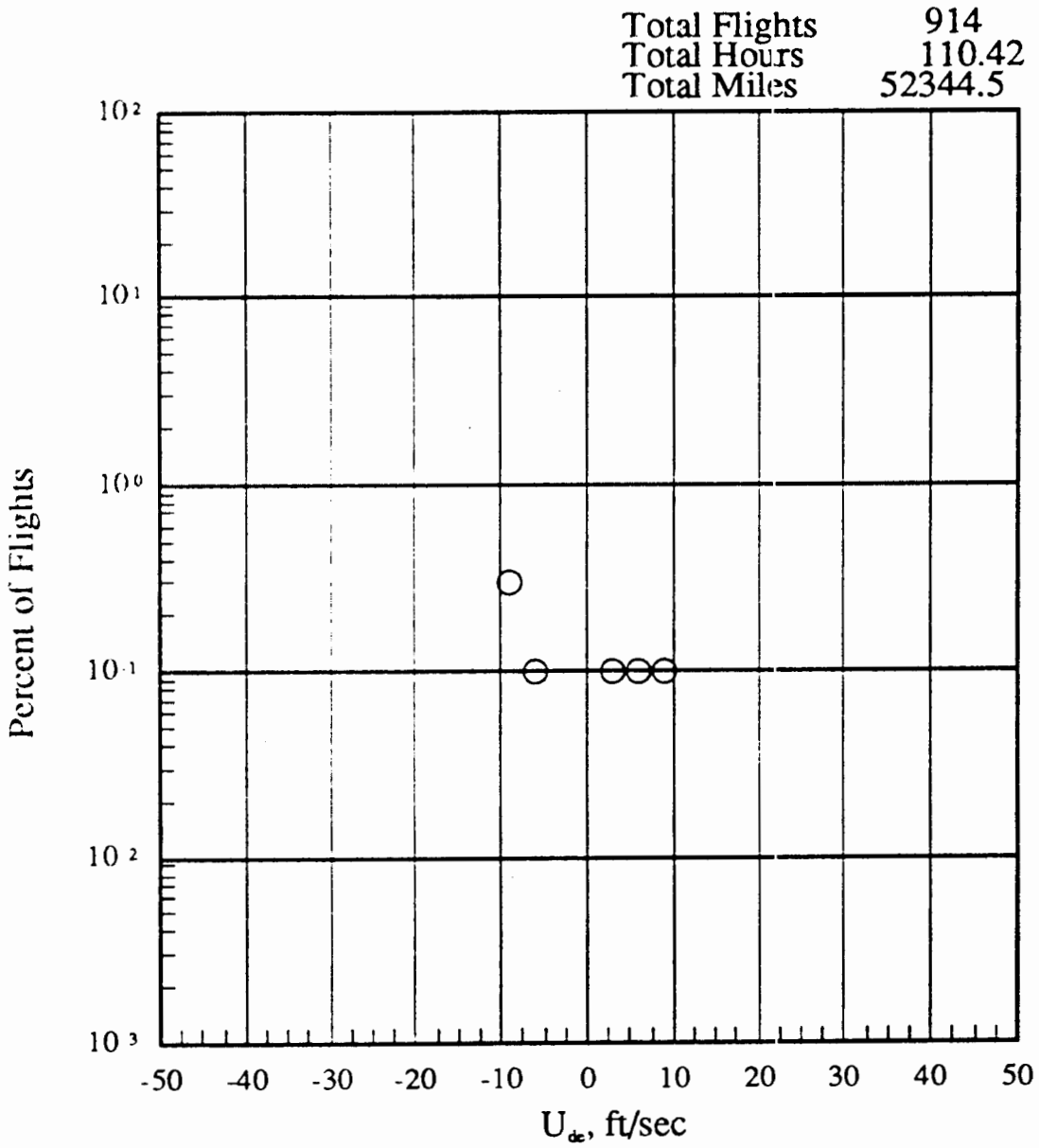

(e) 14500 to 19500 feet altitude

Figure 19.- Continued.



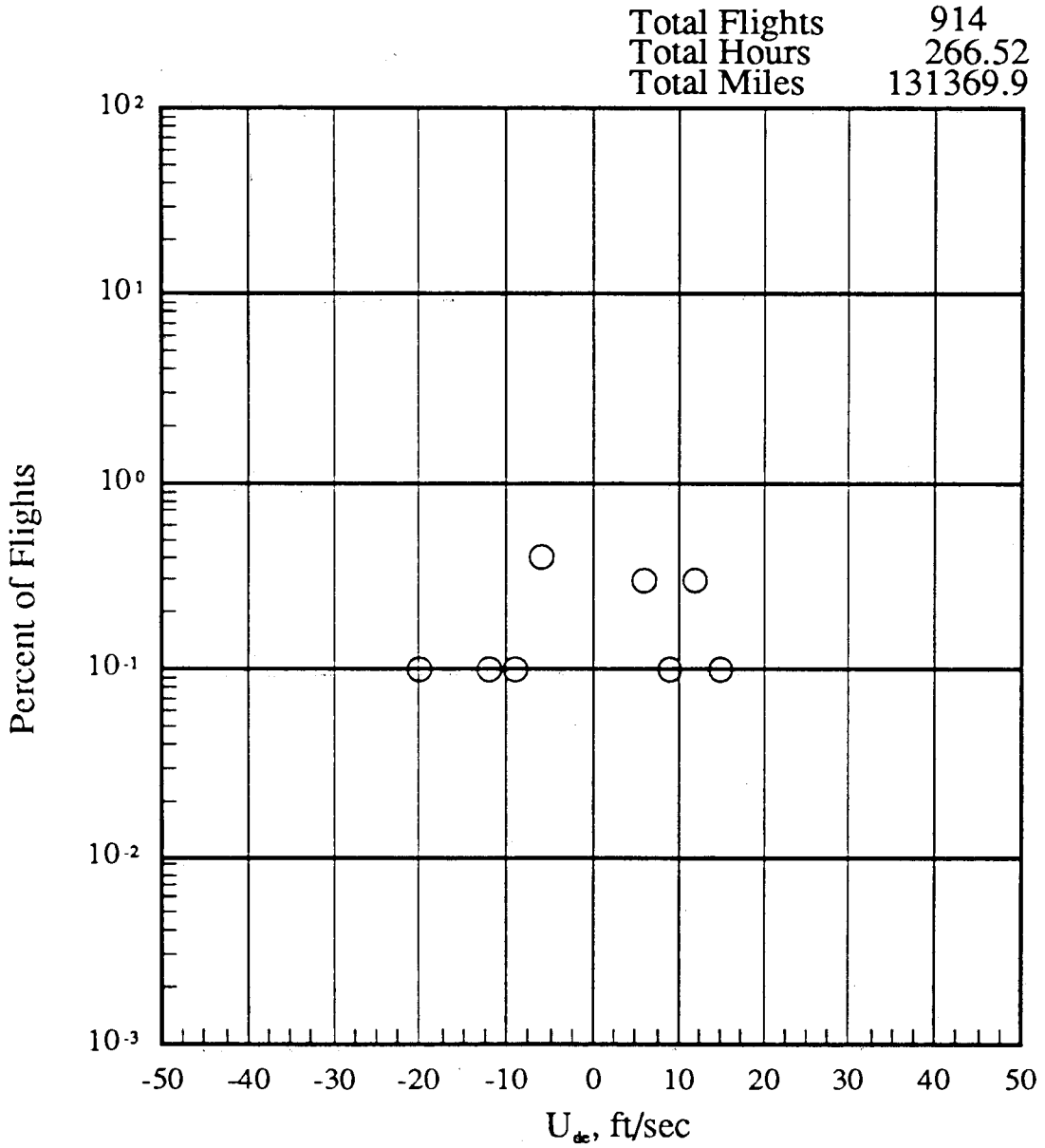

(f) 19500 to 24500 feet altitude

Figure 19.- Continued.



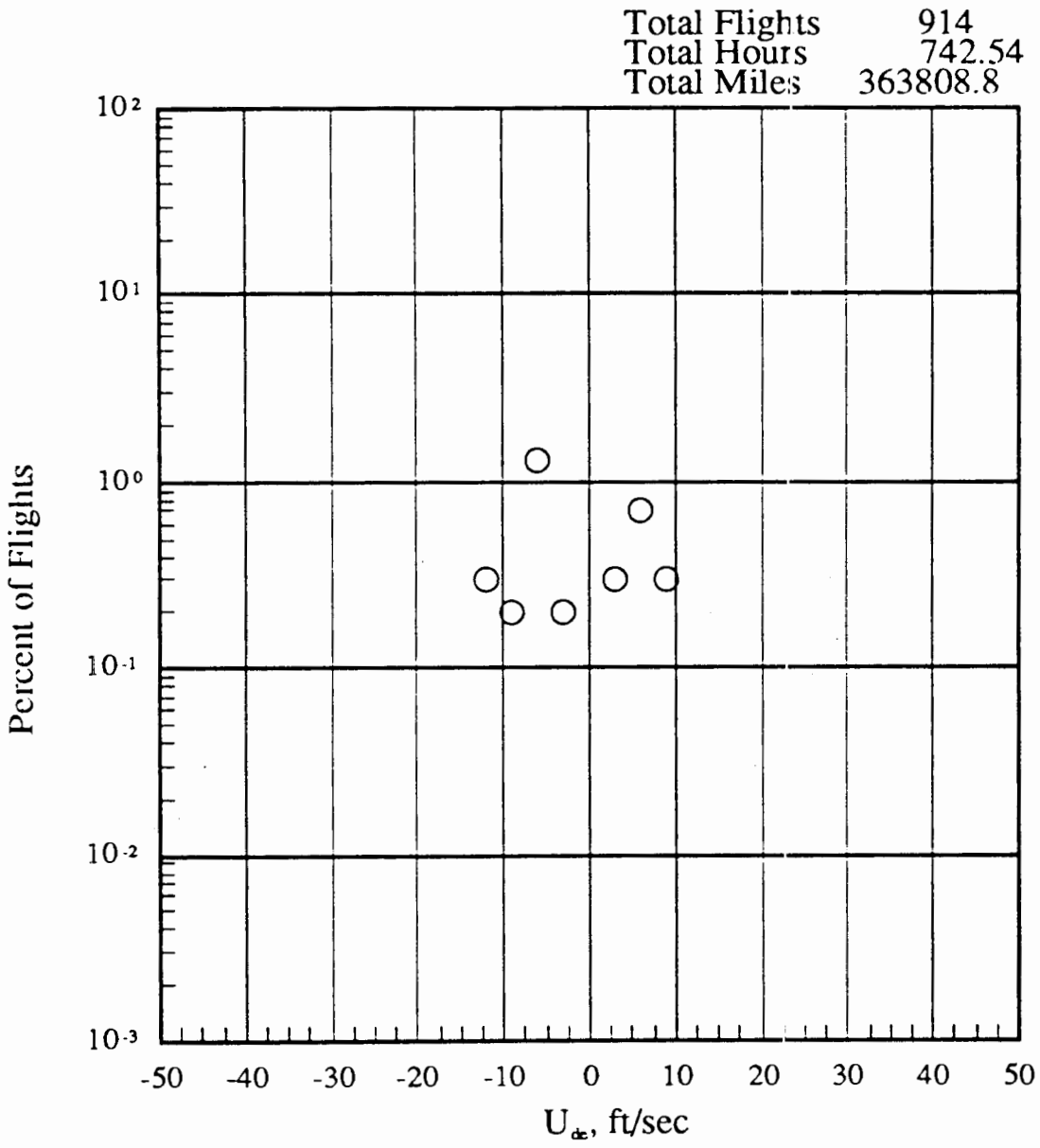

(g) 24500 to 29500 feet altitude

Figure 19.- Continued.



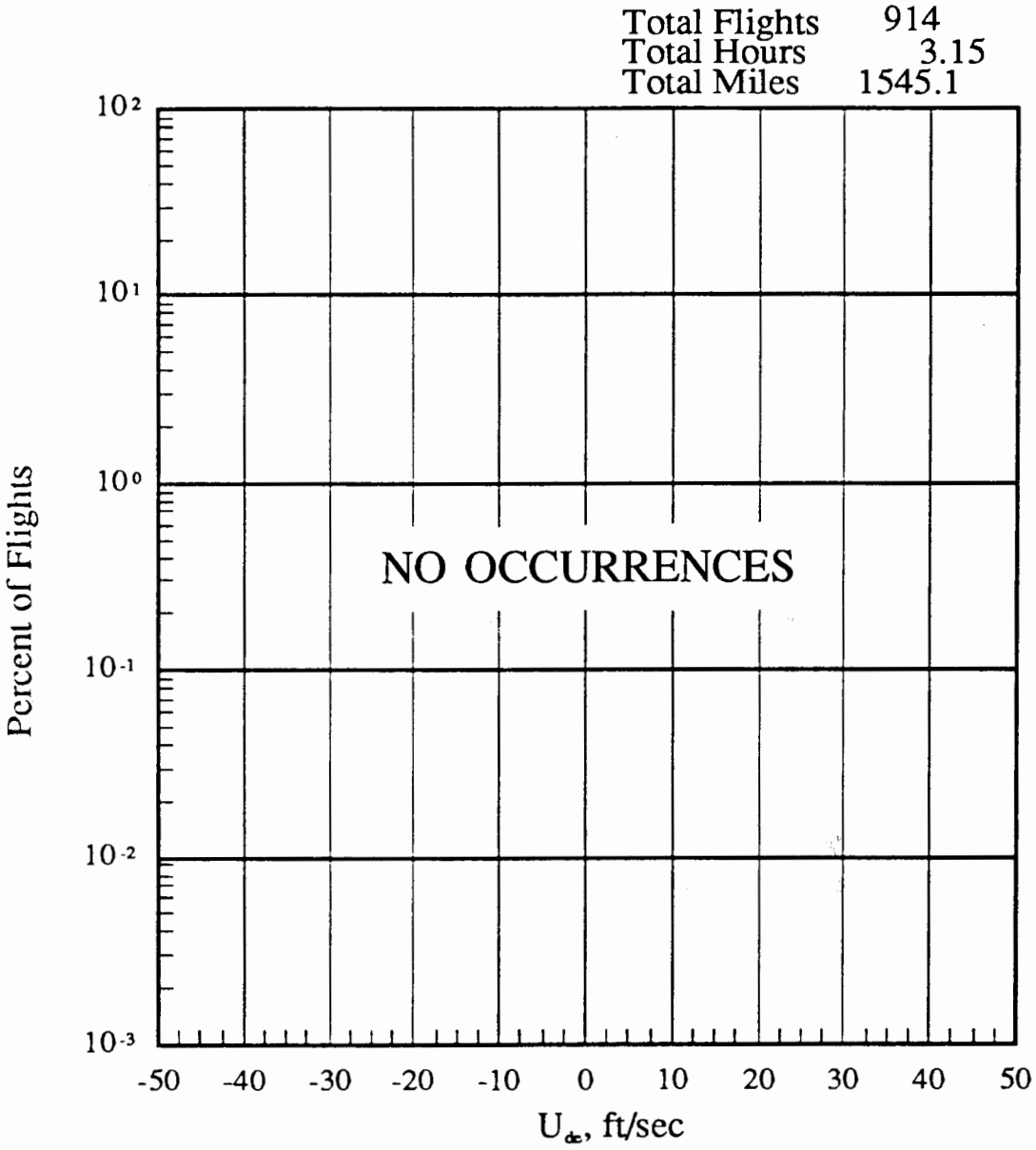

(h) 29500 to 34500 feet altitude

Figure 19.- Continued.



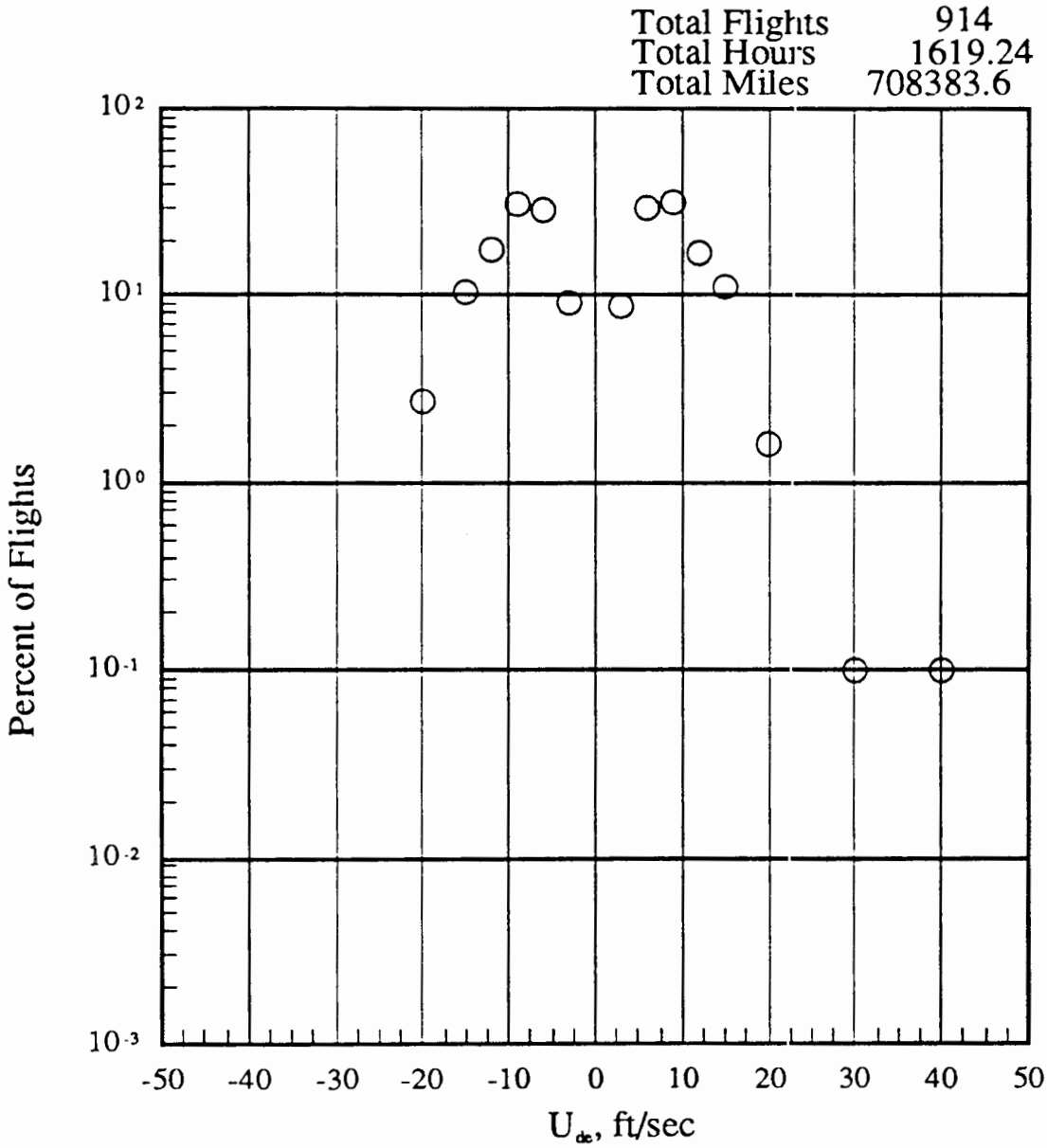

(i) 34500 to 39500 feet altitude

Figure 19.- Continued.




(j) 39500 to 44500 feet altitude

Figure 19.- Continued.




(k) -500 to 44500 feet altitude

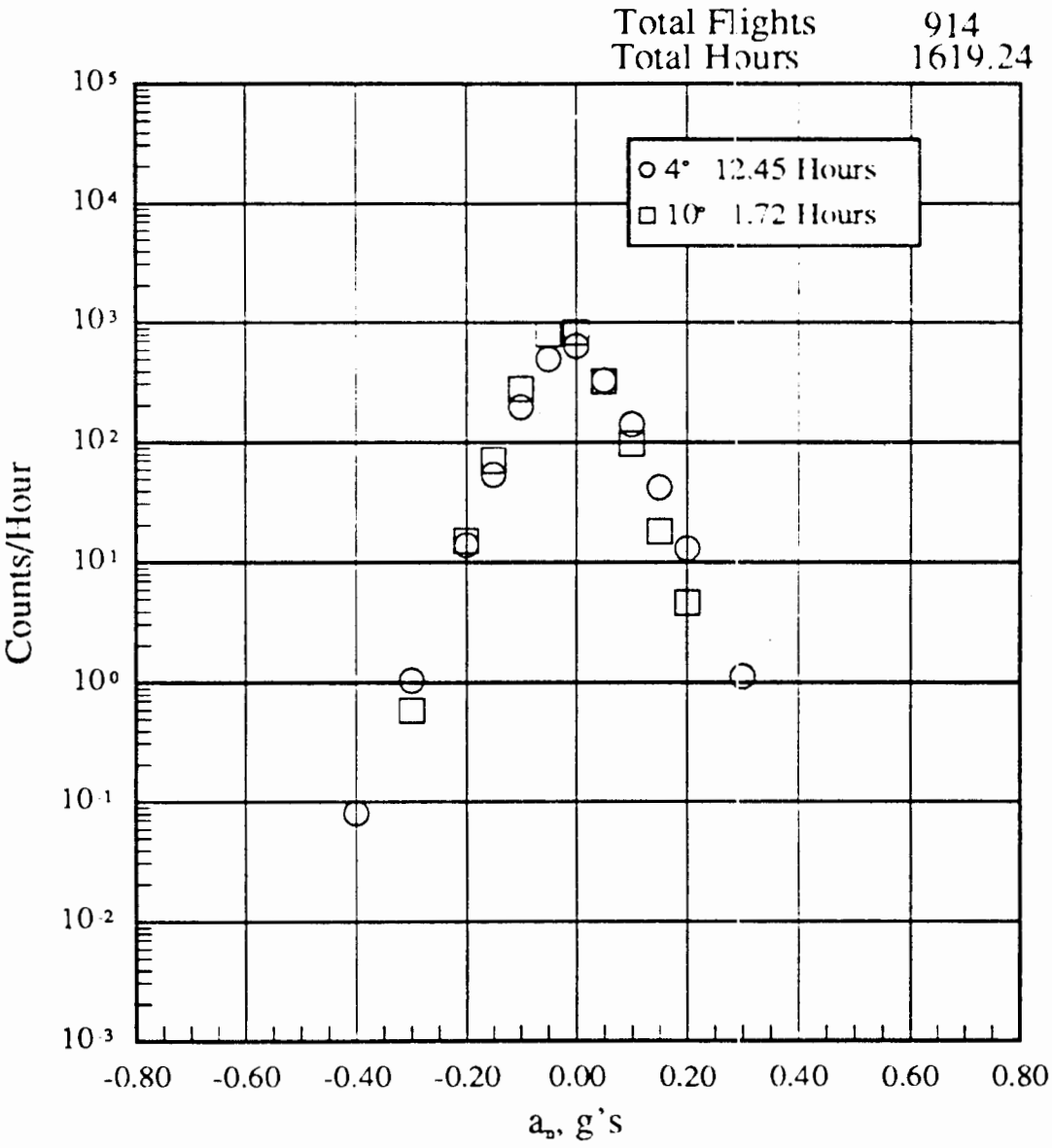
Figure 19.- Concluded.

| | FLAP DETENT | | | | | | |
|---|---|---|---|---|---|---|---|
| $a_n$ LEVEL g's | 4 | 10 | 18 | 22 | 27 | 33 | 42 |
| 1.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .30 | 1.124 | 0 | 0 | 0 | 0 | 0 | 0 |
| .20 | 13.007 | 4.650 | 0 | 0 | 0 | 0 | 0 |
| .15 | 41.993 | 18.020 | 0 | 0 | 0 | 0 | 0 |
| .10 | 140.754 | 97.077 | 0 | 128.571 | 0 | 0 | 0 |
| .05 | 327.275 | 320.878 | 240.00 | 128.571 | 0 | 0 | 0 |
| 0 | 634.877 | 826.029 | 1080.00 | 900.000 | 0 | 0 | 0 |
| -.05 | 493.321 | 801.033 | 720.00 | 642.857 | 0 | 0 | 0 |
| -.10 | 196.638 | 279.025 | 480.00 | 257.143 | 0 | 0 | 0 |
| -.15 | 53.555 | 70.919 | 0 | 128.571 | 0 | 0 | 0 |
| -.20 | 13.891 | 15.114 | 0 | 0 | 0 | 0 | 0 |
| -.30 | 1.044 | 0.581 | 0 | 0 | 0 | 0 | 0 |
| -.40 | 0.080 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FLIGHT HOURS IN DETENT | 12.454 | 1.720 | 0.008 | 0.008 | 0 | 0 | 0 |

| | |
|---|---|
| TOTAL HOURS | 14.19 |
| TOTAL FLIGHTS | 914 |
| TOTAL FLIGHT HOURS FLAPS UP AND DOWN | 1619.24 |
| TOTAL FLIGHT MILES FLASPS UP AND DOWN | 708383.60 |

(a) Take off

Figure 20.- $a_n$ Exceedances with flaps deflected.




(b) Take off

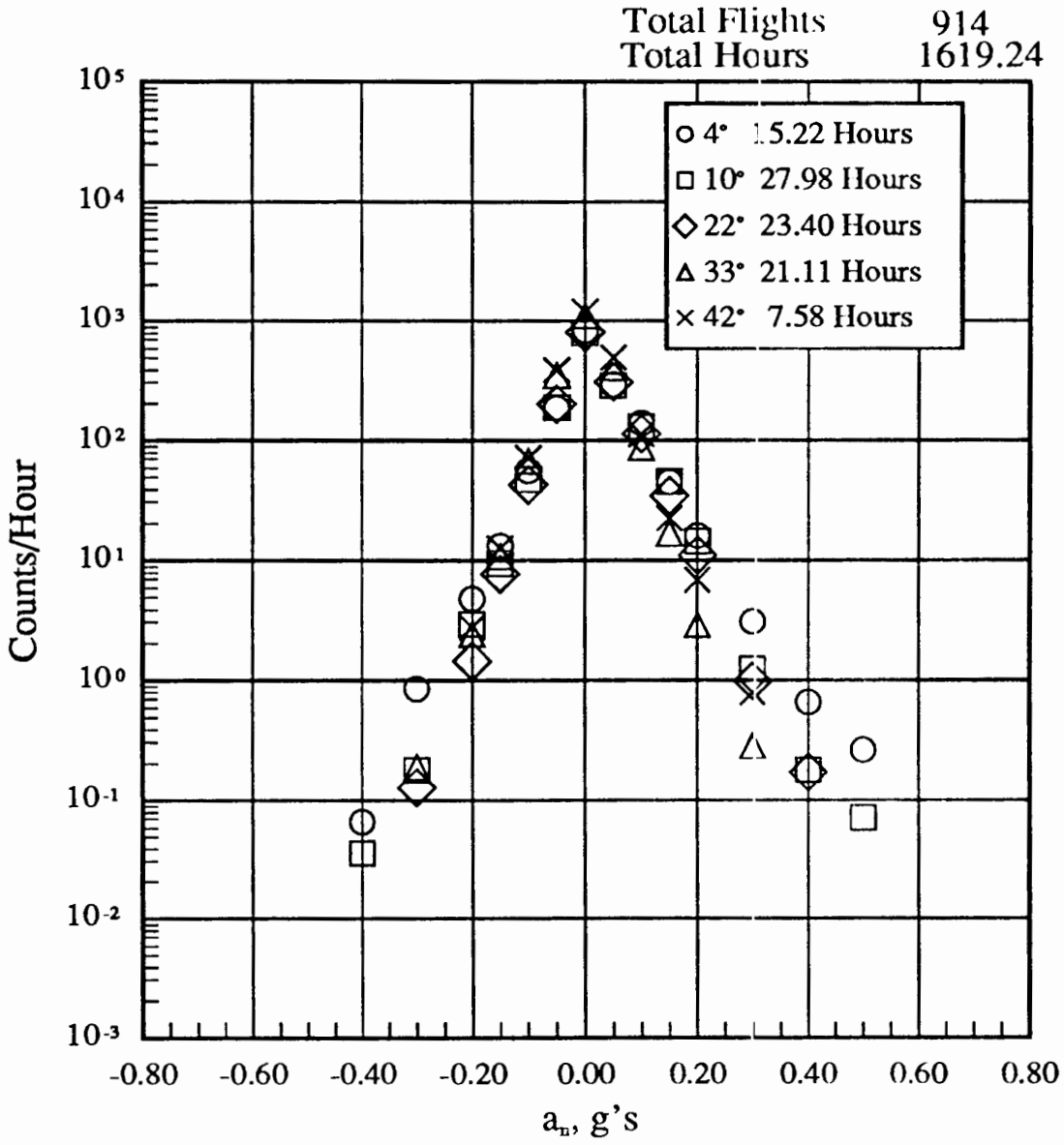
Figure 20.- Continued.

| | FLAP DETENT | | | | | | |
|---|---|---|---|---|---|---|---|
| $a'_n$ LEVEL g's | 4 | 10 | 18 | 22 | 27 | 33 | 42 |
| 1.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .50 | 0.263 | 0.071 | 0 | 0 | 0 | 0 | 0 |
| .40 | 0.657 | 0.179 | 0 | 0.171 | 0 | 0 | 0 |
| .30 | 3.089 | 1.251 | 2.048 | 0.983 | 0 | 0.284 | 0.791 |
| .20 | 16.034 | 14.332 | 15.971 | 11.028 | 9.943 | 2.889 | 6.856 |
| .15 | 45.081 | 45.318 | 54.055 | 34.621 | 37.964 | 16.768 | 22.414 |
| .10 | 140.039 | 130.522 | 167.899 | 113.695 | 137.393 | 86.918 | 112.466 |
| .05 | 293.418 | 286.633 | 395.177 | 308.942 | 390.484 | 403.185 | 495.483 |
| 0 | 832.478 | 793.388 | 731.384 | 806.848 | 687.866 | 1109.944 | 1197.836 |
| -.05 | 185.711 | 188.349 | 199.431 | 201.488 | 361.559 | 351.508 | 389.214 |
| -.10 | 55.858 | 47.427 | 49.141 | 42.700 | 105.756 | 66.882 | 71.593 |
| -.15 | 13.209 | 9.507 | 10.238 | 7.736 | 23.501 | 10.752 | 12.657 |
| -.20 | 4.797 | 2.931 | 3.276 | 1.453 | 2.712 | 2.416 | 2.769 |
| -.30 | 0.854 | 0.179 | 0.410 | 0.128 | 0 | 0.189 | 0 |
| -.40 | 0.066 | 0.036 | 0 | 0 | 0 | 0 | 0 |
| -.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FLIGHT HOURS IN DETENT | 15.217 | 27.980 | 2.442 | 23.396 | 1.106 | 21.112 | 7.585 |

| | |
|---|---|
| TOTAL HOURS | 98.84 |
| TOTAL FLIGHTS | 914 |
| TOTAL FLIGHT HOURS FLAPS UP A | 1619.24 |
| TOTAL FLIGHT MILES FLAPS UP AND DOWN | 708383.60 |

(c) Landing

Figure 20.- Continued.




(d) Landing.

Figure 20.- Concluded.

| MAXIMUM an LEVEL FOR EACH FLIGHT | | EAS, KTS | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| g's FROM | TO | 120 TO 130 KTS | 130 TO 140 KTS | 140 TO 150 KTS | 150 TO 160 KTS | 160 TO 170 KTS | 170 TO 180 KTS | 180 TO 190 KTS | 190 TO 200 KTS | 200 TO 210 KTS | 210 TO 220 KTS | 220 TO 230 KTS | 230 TO 240 KTS | 240 TO 250 KTS | 250 TO 260 KTS | 260 TO 270 KTS | 270 TO 280 KTS | 280 TO 290 KTS | 290 TO 300 KTS | 300 TO 310 KTS | 310 TO 320 KTS |
| 1.60 | 1.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.20 | 1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .80 | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .60 | 0.70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .40 | 0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .30 | 0.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .20 | 0.30 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 3 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .15 | 0.20 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 4 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .10 | 0.15 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 6 | 8 | 8 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| .05 | 0.10 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 6 | 8 | 6 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.05 | -0.10 | 0 | 0 | 0 | 0 | 0 | 2 | 5 | 7 | 5 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.10 | -0.15 | 0 | 0 | 0 | 0 | 1 | 4 | 13 | 14 | 8 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| -.15 | -0.20 | 0 | 0 | 0 | 0 | 0 | 2 | 6 | 7 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.20 | -0.30 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.30 | -0.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.50 | -0.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.70 | -0.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.20 | -1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.60 | -1.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL PEAKS @ EAS | | 0 | 0 | 0 | 1 | 19 | 111 | 358 | 451 | 381 | 227 | 62 | 8 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 29 |
| FLIGHT HOURS @ EAS | | 0 | 0 | 0 | 0 | 0 | 0.9 | 2.7 | 3.7 | 3 | 1.4 | 0.4 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.2 |
| FLIGHT MILES @ EAS | | 0 | 0 | 0 | 3 | 23 | 164 | 513 | 755 | 644 | 310 | 85 | 18 | 3 | 0 | 0 | 0 | 0 | 1 | 4 | 38 |

| | |
|---|---|
| TOTAL FLIGHTS INCLUDED | 913 |
| TOTAL FLIGHTS ANALYZED | 914 |
| TOTAL FLIGHT HOURS, ANY FLAP | 1619.24 |
| TOTAL FLIGHT MILES, ANY FLAP | 708383.64 |

(a) Take off; flaps 4 degree detent

Figure 21.- Percent of flights with peak positive and negative $a_n$ per flight vs. EAS bands.

MAXIMUM an LEVEL FOR EACH FLIGHT

| G'S FROM | TO | 120 TO 130 KTS | 130 TO 140 KTS | 140 TO 150 KTS | 150 TO 160 KTS | 160 TO 170 KTS | 170 TO 180 KTS | 180 TO 190 KTS | 190 TO 200 KTS | 200 TO 210 KTS | EAS 210 TO 220 KTS | 220 TO 230 KTS | 230 TO 240 KTS | 240 TO 250 KTS | 250 TO 260 KTS | 260 TO 270 KTS | 270 TO 280 KTS | 280 TO 290 KTS | 290 TO 300 KTS | 300 TO 310 KTS | 310 TO 320 KTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.60 | 1.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.20 | 1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .80 | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .60 | 0.70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .40 | 0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .30 | 0.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .20 | 0.30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .15 | 0.20 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .10 | 0.15 | 0 | 0 | 0 | 0 | 1 | 4 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .05 | 0.10 | 0 | 0 | 0 | 0 | 1 | 9 | 9 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.05 | -0.10 | 0 | 0 | 0 | 0 | 2 | 18 | 20 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.10 | -0.15 | 0 | 0 | 0 | 0 | 2 | 11 | 9 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.15 | -0.20 | 0 | 0 | 0 | 0 | 1 | 4 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.20 | -0.30 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.30 | -0.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.50 | -0.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.70 | -0.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.20 | -1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.60 | -1.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL FLAPS @ EAS | | 0 | 0 | 0 | 7 | 68 | 360 | 364 | 82 | 12 | 5 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 4 |
| FLIGHT HOURS @ EAS | | 0 | 0 | 0 | 0 | 0.2 | 0.7 | 0.7 | 0.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FLIGHT MILES @ EAS | | 0 | 0 | 0 | 3 | 27 | 121 | 124 | 31 | 6 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |

| | |
|---|---|
| TOTAL FLIGHTS INCLUDED | 755.00 |
| TOTAL FLIGHTS ANALYZED | 914.00 |
| TOTAL FLIGHT HOURS, ANY FLAP | 1619.24 |
| TOTAL FLIGHT MILES, ANY FLAP | 708383.64 |

(b) Take off; flap 10 degree detent

Figure 21.- Continued.

MAXIMUM $a_n$ LEVEL

FOR EACH FLIGHT

| g's FROM | TO | | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | EAS, KTS 210 | 220 | 230 | 240 | 250 | 260 | 270 | 280 | 290 | 300 | 310 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 210 | 220 | 230 | 240 | 250 | 260 | 270 | 280 | 290 | 300 | 310 | 320 |
| 1.60 | 1.80 | | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.20 | 1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .80 | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .60 | 0.70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .40 | 0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .30 | 0.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .20 | 0.30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .15 | 0.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .10 | 0.15 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .05 | 0.10 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.05 | -0.10 | 0 | 0 | 0 | 0 | 0 | 20 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.10 | -0.15 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.15 | -0.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.20 | -0.30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.30 | -0.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.50 | -0.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.70 | -0.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.20 | -1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.60 | -1.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL PEAK @ EAS | | 0 | 0 | 0 | 0 | 0 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FLIGHT HOURS @ EAS | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FLIGHT MILES @ EAS | | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | |
|---|---|
| TOTAL FLIGHTS INCLUDED | 5 |
| TOTAL FLIGHTS ANALYZED | 914 |
| TOTAL FLIGHT HOURS ,ANY FLAP | 16[illegible] 24 |
| TOTAL FLIGHT MILES ,ANY FLAP | 7083 |



(c) Take off; flap 18 degree detent

Figure 21.- Continued.

MAXIMUM $a_n$ LEVEL

| FOR EACH FLIGHT G'S FRO | TO | EAS, KTS 120 130 | 130 140 | 140 150 | 150 160 | 160 170 | 170 180 | 180 190 | 190 200 | 200 210 | 210 220 | 220 230 | 230 240 | 240 250 | 250 260 | 260 270 | 270 280 | 280 290 | 290 300 | 300 310 | 310 320 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.60 | 1.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.20 | 1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .80 | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .60 | 0.70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .40 | 0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .30 | 0.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .20 | 0.30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .15 | 0.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .10 | 0.15 | 0 | 0 | 0 | 0 | 0 | 40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .05 | 0.10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.05 | -0.10 | 0 | 0 | 0 | 0 | 0 | 40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.10 | -0.15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.15 | -0.20 | 0 | 0 | 0 | 0 | 40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.20 | -0.30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.30 | -0.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.50 | -0.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.70 | -0.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.20 | -1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.60 | -1.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL PEAKS @ EAS | | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FLIGHT HOURS @ EAS | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FLIGHT MILES @ EAS | | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | |
|---|---|
| TOTAL FLIGHTS INCLUDED | 2.50 |
| TOTAL FLIGHTS ANALYZED | 4 |
| TOTAL FLIGHT HOURS ,ANY FLAP | 3.24 |
| TOTAL FLIGHT MILES ,ANY FLAP | 708383.64 |



(d) Take off; flap 22 degree detent

Figure 21.- Continued.

MAXIMUM $a_n$ LEVEL FLIGHT

| FOR EACH g's FROM | TO | EAS, KTS 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 210 | 220 | 230 | 240 | 250 | 260 | 270 | 280 | 290 | 300 | 310 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 210 | 220 | 230 | 240 | 250 | 260 | 270 | 280 | 290 | 300 | 310 | 320 |
| 1.60 | 1.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.20 | 1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .80 | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .60 | 0.70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .40 | 0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .30 | 0.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .20 | 0.30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .15 | 0.20 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 3 | 3 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .10 | 0.15 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 3 | 6 | 5 | 5 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| .05 | 0.10 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 4 | 5 | 8 | 7 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.05 | -0.10 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 4 | 7 | 7 | 7 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.10 | -0.15 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 3 | 3 | 4 | 4 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| -.15 | -0.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.20 | -0.30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.30 | -0.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.50 | -0.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.70 | -0.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.20 | -1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.60 | -1.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL PEAK @ EAS | | 0 | 0 | 0 | 0 | 3 | 28 | 50 | 63 | 173 | 251 | 278 | 285 | 179 | 38 | 0 | 0 | 0 | 0 | 0 | 26 |
| FLIGHT HOURS @ EAS | | 0 | 0 | 0 | 0 | 0.1 | 0.9 | 1.8 | 1.1 | 2.3 | 2.7 | 2.1 | 2.2 | 1.6 | 0.2 | 0 | 0 | 0 | 0 | 0 | 0.2 |
| FLIGHT MILES @ EAS | | 0 | 0 | 0 | 0 | 12 | 166 | 357 | 233 | 518 | 621 | 500 | 565 | 426 | 60 | 1 | 0 | 0 | 0 | 2 | 526 |

| | |
|---|---|
| TOTAL FLIGHTS INCLUDED | 898 |
| TOTAL FLIGHTS ANALYZED | 914 |
| TOTAL FLIGHT HOURS ,ANY FLAP | 1619.24 |
| TOTAL FLIGHT MILES ,ANY FLAP | 708383.64 |

(e) Landing; flaps 4 degree detent

Figure 21.- Continued.

MAXIMUM $a_n$ LEVEL

| FOR EACH FLIGHT g's FROM | TO | EAS, KTS 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 210 | 220 | 230 | 240 | 250 | 260 | 270 | 280 | 290 | 300 | 310 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 210 | 220 | 230 | 240 | 250 | 260 | 270 | 280 | 290 | 300 | 310 | 320 |
| 1.60 | 1.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.20 | 1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .80 | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .60 | 0.70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .40 | 0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .30 | 0.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .20 | 0.30 | 0 | 0 | 0 | 0 | 0 | 3 | 2 | 2 | 3 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .15 | 0.20 | 0 | 0 | 0 | 0 | 1 | 2 | 3 | 4 | 4 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .10 | 0.15 | 0 | 0 | 0 | 0 | 3 | 4 | 4 | 4 | 5 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .05 | 0.10 | 0 | 0 | 0 | 0 | 1 | 1 | 3 | 4 | 5 | 4 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| -.05 | -0.10 | 0 | 0 | 0 | 0 | 3 | 5 | 6 | 6 | 6 | 6 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.10 | -0.15 | 0 | 0 | 0 | 0 | 2 | 5 | 4 | 3 | 5 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.15 | -0.20 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.20 | -0.30 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.30 | -0.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.50 | -0.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.70 | -0.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.20 | -1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.60 | -1.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL PEAKS @ EAS | | 0 | 0 | 0 | 18 | 104 | 203 | 223 | 233 | 296 | 256 | 167 | 21 | 1 | 0 | 0 | 1 | 4 | 1 | 3 | 17 |
| FLIGHT HOURS @ EAS | | 0 | 0 | 0 | 4.0 | 3.1 | 5.7 | 5.0 | 3.4 | 4.1 | 4.0 | 1.8 | 0.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0.1 | 0.1 |
| FLIGHT MILES @ EAS | | 0 | 0 | 0 | 60 | 551 | 1069 | 965 | 701 | 902 | 952 | 425 | 42 | 2 | 0 | 0 | 1 | 0 | 7 | 11 | 21 |

| | |
|---|---|
| TOTAL FLIGHTS INCLUDED | 909.50 |
| TOTAL FLIGHTS ANALYZED | 914 |
| TOTAL FLIGHT HOURS , ANY FLAP | 1619.24 |
| TOTAL FLIGHT MILES , ANY FLAP | 708383.64 |



(f) Landing; flaps 10 degree detent

Figur. 21.- Continued.

MAXIMUM $a_n$ LEVEL FOR EACH FLIGHT

| g's FROM | TO | EAS, KTS 120 130 | 130 140 | 140 150 | 150 160 | 160 170 | 170 180 | 180 190 | 190 200 | 200 210 | 210 220 | 220 230 | 230 240 | 240 250 | 250 260 | 260 270 | 270 280 | 280 290 | 290 300 | 300 310 | 310 320 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.60 | 1.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.20 | 1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .80 | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .60 | 0.70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .40 | 0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .30 | 0.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .20 | 0.30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .15 | 0.20 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .10 | 0.15 | 0 | 0 | 0 | 1 | 3 | 4 | 3 | 4 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .05 | 0.10 | 0 | 0 | 0 | 2 | 6 | 9 | 7 | 8 | 7 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.05 | -0.10 | 0 | 0 | 0 | 1 | 3 | 3 | 2 | 2 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.10 | -0.15 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.15 | -0.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.20 | -0.30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.30 | -0.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.50 | -0.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.70 | -0.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.20 | -1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.60 | -1.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL PEAK @ EAS | | 0 | 0 | 0 | 37 | 118 | 180 | 133 | 160 | 159 | 34 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 7 | 2 | 3 |
| FLIGHT HOURS @ EAS | | 0 | 0 | 0 | 0.1 | 0.4 | 0.6 | 0.3 | 0.4 | 0.4 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FLIGHT MILES @ EAS | | 0 | 0 | 2 | 20 | 77 | 102 | 65 | 78 | 89 | 17 | 2 | 0 | 0 | 0 | 1 | 3 | 5 | 6 | 1 | 1 |

| | |
|---|---|
| TOTAL FLIGHTS INCLUDED | 909 |
| TOTAL FLIGHTS ANALYZED | 914 |
| TOTAL FLIGHT HOURS ,ANY FLAP | 1619.24 |
| TOTAL FLIGHT MILES ,ANY FLAP | 708383.64 |

(g) Landing; flaps 18 degree detent

Figure 21.- Continued.

MAXIMUM $n_z$ LEVEL

FOR EACH FLIGHT

| g'S FROM | TO | EAS, KTS 120 130 | 130 140 | 140 150 | 150 160 | 160 170 | 170 180 | 180 190 | 190 200 | 200 210 | 210 220 | 220 230 | 230 240 | 240 250 | 250 260 | 260 270 | 270 280 | 280 290 | 290 300 | 300 310 | 310 320 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.60 | 1.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.20 | 1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .80 | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .60 | 0.70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .40 | 0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .30 | 0.40 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .20 | 0.30 | 0 | 0 | 0 | 1 | 3 | 2 | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .15 | 0.20 | 0 | 0 | 0 | 2 | 5 | 4 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .10 | 0.15 | 0 | 0 | 0 | 3 | 11 | 6 | 4 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .05 | 0.10 | 0 | 0 | 1 | 5 | 11 | 7 | 4 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.05 | -0.10 | 0 | 0 | 1 | 8 | 15 | 9 | 3 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.10 | -0.15 | 0 | 0 | 1 | 6 | 12 | 6 | 3 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.15 | -0.20 | 0 | 0 | 0 | 2 | 4 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.20 | -0.30 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.30 | -0.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.50 | -0.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.70 | -0.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.20 | -1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.60 | -1.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL PEAK @ EAS | | 0 | 0 | 33 | 246 | 568 | 342 | 204 | 119 | 51 | 4 | 0 | 0 | 0 | 5 | 6 | 7 | 4 | 2 | 3 | 2 |
| FLIGHT HOURS @ EAS | | 0 | 0 | 0.3 | 4.2 | 8.2 | 4.9 | 3.0 | 1.8 | 0.5 | 0 | 0 | 0 | 0 | 0 | 0.1 | 0.1 | 0.1 | 0 | 0 | 0 |
| FLIGHT MILES @ EAS | | 0 | 2 | 51 | 683 | 1399 | 891 | 592 | 383 | 115 | 5 | 0 | 0 | 0 | 6 | 14 | 14 | 10 | 6 | 9 | 6 |

| | |
|---|---|
| TOTAL FLIGHTS INCLUDED | 913 |
| TOTAL FLIGHTS ANALYZED | 914 |
| TOTAL FLIGHT HOURS ,ANY FLAP | 1619.24 |
| TOTAL FLIGHT MILES ,ANY FLAP | 708383.64 |

(h) Landing; flaps 22 degree detent

Figure 21.- Continued.

MAXIMUM $a_n$ LEVEL
FOR EACH FLIGHT

| g's FROM | TO | EAS, KTS 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 210 | 220 | 230 | 240 | 250 | 260 | 270 | 280 | 290 | 300 | 310 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 210 | 220 | 230 | 240 | 250 | 260 | 270 | 280 | 290 | 300 | 310 | 320 |
| 1.60 | 1.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.20 | 1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .80 | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .60 | 0.70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .40 | 0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .30 | 0.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .20 | 0.30 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .15 | 0.20 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .10 | 0.15 | 0 | 0 | 0 | 3 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .05 | 0.10 | 0 | 0 | 2 | 12 | 13 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.05 | -0.10 | 0 | 0 | 1 | 10 | 11 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.10 | -0.15 | 0 | 0 | 0 | 3 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.15 | -0.20 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.20 | -0.30 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.30 | -0.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.50 | -0.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.70 | -0.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.20 | -1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.60 | -1.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL PEAK @ EAS | | 0 | 1 | 33 | 282 | 329 | 43 | 7 | 1 | 0 | 0 | 0 | 0 | 1 | 4 | 2 | 4 | 0 | 0 | 0 | 0 |
| FLIGHT HOURS @ EAS | | 0 | 0 | 0 | 0.4 | 0.5 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FLIGHT MILES @ EAS | | 0 | 0 | 6 | 57 | 85 | 24 | 8 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |

| | |
|---|---|
| TOTAL FLIGHTS INCLUDED | 907 |
| TOTAL FLIGHTS ANALYZED | 914 |
| TOTAL FLIGHT HOURS ,ANY FLAP | 1619.24 |
| TOTAL FLIGHT MILES ,ANY FLAP | 708383.64 |



(i) Landing; flaps 27 degree detent

Figure 21.- Continued.

MAXIMUM $a_n$ LEVEL

| FOR EACH FLIGHT g's FROM | TO | EAS, KTS 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 210 | 220 | 230 | 240 | 250 | 260 | 270 | 280 | 290 | 300 | 310 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 210 | 220 | 230 | 240 | 250 | 260 | 270 | 280 | 290 | 300 | 310 | 320 |
| 1.60 | 1.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.20 | 1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .80 | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .60 | 0.70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .40 | 0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .30 | 0.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .20 | 0.30 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .15 | 0.20 | 0 | 1 | 7 | 8 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .10 | 0.15 | 0 | 2 | 13 | 12 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .05 | 0.10 | 0 | 2 | 13 | 14 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.05 | -0.10 | 0 | 3 | 16 | 15 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.10 | -0.15 | 0 | 3 | 12 | 13 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.15 | -0.20 | 0 | 1 | 4 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.20 | -0.30 | 0 | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.30 | -0.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.50 | -0.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.70 | -0.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.20 | -1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.60 | -1.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL PEAK @ EAS | | 2 | 116 | 625 | 645 | 141 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 10 | 7 | 3 | 1 | 0 | 0 | 0 | 0 |
| FLIGHT HOURS @ EAS | | 0.1 | 2 | 10 | 7.8 | 0.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.1 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 |
| FLIGHT MILES @ EAS | | 18 | 284 | 1486 | 1217 | 150 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 13 | 15 | 2 | 0 | 0 | 0 | 0 | 0 |

| | |
|---|---|
| TOTAL FLIGHTS INCLUDED | 914 |
| TOTAL FLIGHTS ANALYZED | 914 |
| TOTAL FLIGHT HOURS ,ANY FLAP | 1619.24 |
| TOTAL FLIGHT MILES ,ANY FLAP | 708383.64 |

(j) Landing; flaps 33 degree detent

Figure 21.- Continued.

MAXIMUM $n_z$ LEVEL FLIGHT

| FOR EACH FLIGHT g's FROM | TO | KAS, KTS 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 210 | 220 | 230 | 240 | 250 | 260 | 270 | 280 | 290 | 300 | 310 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 210 | 220 | 230 | 240 | 250 | 260 | 270 | 280 | 290 | 300 | 310 | 320 |
| 1.60 | 1.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.20 | 1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .80 | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .60 | 0.70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .40 | 0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .30 | 0.40 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .20 | 0.30 | 0 | 1 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .15 | 0.20 | 0 | 2 | 8 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .10 | 0.15 | 0 | 6 | 25 | 6 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .05 | 0.10 | 0 | 6 | 16 | 6 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.05 | -0.10 | 1 | 9 | 22 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.10 | -0.15 | 0 | 7 | 17 | 7 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.15 | -0.20 | 0 | 1 | 7 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.20 | -0.30 | 1 | 0 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.30 | -0.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.50 | -0.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.70 | -0.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.20 | -1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.60 | -1.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL PEAK @ KAS | | 6 | 101 | 315 | 132 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 7 | 2 | 1 | 1 | 0 | 0 | 0 | 0 |
| FLIGHT HOURS @ KAS | | 0.1 | 1.8 | 4 | 1.5 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0.1 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FLIGHT MILES @ KAS | | 7 | 245 | 590 | 239 | 14 | 0 | 0 | 0 | 0 | 0 | 3 | 8 | 10 | 4 | 1 | 0 | 0 | 0 | 0 | 0 |

| | |
|---|---|
| TOTAL FLIGHTS INCLUDED | 309 |
| TOTAL FLIGHTS ANALYZED | 914 |
| TOTAL FLIGHT HOURS , ANY FLAP | 1619.24 |
| TOTAL FLIGHT MILES , ANY FLAP | 708383.64 |

(k) Landing; flaps 42 degree detent

Figure 21.- Concluded.

PRESSURE ALTITUDE BANDS

| $a_n$ LEVEL g's | -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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .50 | 0.11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.04 |
| .40 | 0.77 | 0 | 0.45 | 0.52 | 0 | 0 | 0 | 0 | 0 | 0.38 |
| .30 | 2.21 | 1.92 | 1.79 | 1.03 | 2.50 | 0 | 0 | 0 | 0 | 1.48 |
| .20 | 22.76 | 9.59 | 11.16 | 2.58 | 9.99 | 0 | 4.73 | 0 | 0 | 11.89 |
| .15 | 57.00 | 20.56 | 27.23 | 5.16 | 27.48 | 0 | 9.45 | 1.38 | 0 | 29.27 |
| .10 | 159.96 | 74.29 | 84.38 | 25.27 | 51.21 | 13.42 | 33.09 | 15.85 | 0 | 87.69 |
| .05 | 335.94 | 130.22 | 226.36 | 95.92 | 146.15 | 148.56 | 115.01 | 101.68 | 12.42 | 205.29 |
| 0.00 | 752.41 | 1248.16 | 888.03 | 1006.10 | 954.34 | 1095.53 | 951.60 | 1489.98 | 696.26 | 976.33 |
| -.05 | 272.09 | 111.85 | 144.66 | 81.48 | 178.63 | 98.72 | 143.37 | 117.19 | 14.49 | 170.87 |
| -.10 | 88.93 | 33.72 | 45.09 | 17.02 | 27.48 | 5.75 | 17.33 | 14.13 | 0 | 48.17 |
| -.15 | 25.08 | 8.50 | 12.50 | 2.58 | 2.50 | 0 | 3.15 | 1.72 | 0 | 12.65 |
| -.20 | 6.63 | 3.56 | 5.36 | 1.55 | 1.25 | 0 | 1.58 | 0.34 | 0 | 3.84 |
| -.30 | 0.33 | 0.27 | 1.34 | 0.52 | 0 | 0 | 1.58 | 0 | 0 | 0.38 |
| -.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FLIGHT HOURS @ ALT | 9.05 | 3.65 | 2.24 | 1.94 | 0.80 | 1.04 | 0.63 | 2.90 | 1.45 | 23.71 |
| FLIGHT MILES @ ALT | 1758.01 | 966.39 | 794.83 | 793.19 | 358.67 | 505.83 | 309.94 | 1419.36 | 710.03 | 7616.26 |

| | |
|---|---|
| TOTAL FLIGHTS | 56 |
| TOTAL FLIGHT HOURS FLAPS UP AND DOWN | 23.71 |
| TOTAL FLIGHT MILES FLAPS UP AND DOWN | 7616.26 |

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

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

PRESSURE ALTITUDE BANDS

| $a_{nM}$ LEVEL g's | -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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .30 | 0.22 | 0 | 0 | 0 | 1.25 | 0 | 0 | 0 | 0 | 0.13 |
| .20 | 2.32 | 0.55 | 0.89 | 0 | 2.50 | 0 | 0 | 0 | 0 | 1.14 |
| .15 | 8.62 | 2.47 | 3.57 | 0 | 5.00 | 0 | 0 | 0 | 0 | 4.18 |
| .10 | 26.84 | 15.63 | 12.50 | 3.61 | 11.24 | 0 | 0 | 1.03 | 0 | 14.64 |
| .05 | 58.88 | 35.91 | 41.52 | 21.14 | 23.73 | 18.21 | 23.63 | 7.58 | 4.14 | 37.08 |
| 0.00 | 171.01 | 149.68 | 134.39 | 124.80 | 123.66 | 145.69 | 135.49 | 199.90 | 208.40 | 162.64 |
| -.05 | 36.79 | 22.48 | 25.90 | 21.66 | 28.73 | 11.50 | 15.75 | 8.27 | 1.38 | 24.72 |
| -.10 | 6.85 | 4.66 | 5.80 | 2.58 | 3.75 | 0 | 0 | 0.34 | 0 | 4.26 |
| -.15 | 0.99 | 0.82 | 0.89 | 0.52 | 0 | 0 | 0 | 0 | 0 | 0.63 |
| -.20 | 0.11 | 0.55 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.13 |
| -.30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FLIGHT HOURS @ ALT | 9.05 | 3.65 | 2.24 | 1.94 | 0.80 | 1.04 | 0.63 | 2.90 | 1.45 | 23.71 |
| FLIGHT MILES @ ALT | 1758.01 | 966.39 | 794.83 | 793.19 | 358.67 | 505.83 | 309.94 | 1419.36 | 710.03 | 7616.26 |

| | |
|---|---|
| TOTAL FLIGHTS | 56 |
| TOTAL FLIGHT HOURS FLAPS UP AND DOWN | 23.71 |
| TOTAL FLIGHT MILES FLAPS UP AND DOWN | 7616.26 |

(b) $a_{nM}$ Level crossing counts per hour wihtin pressure altitude bands

Figure 22.- Continued.

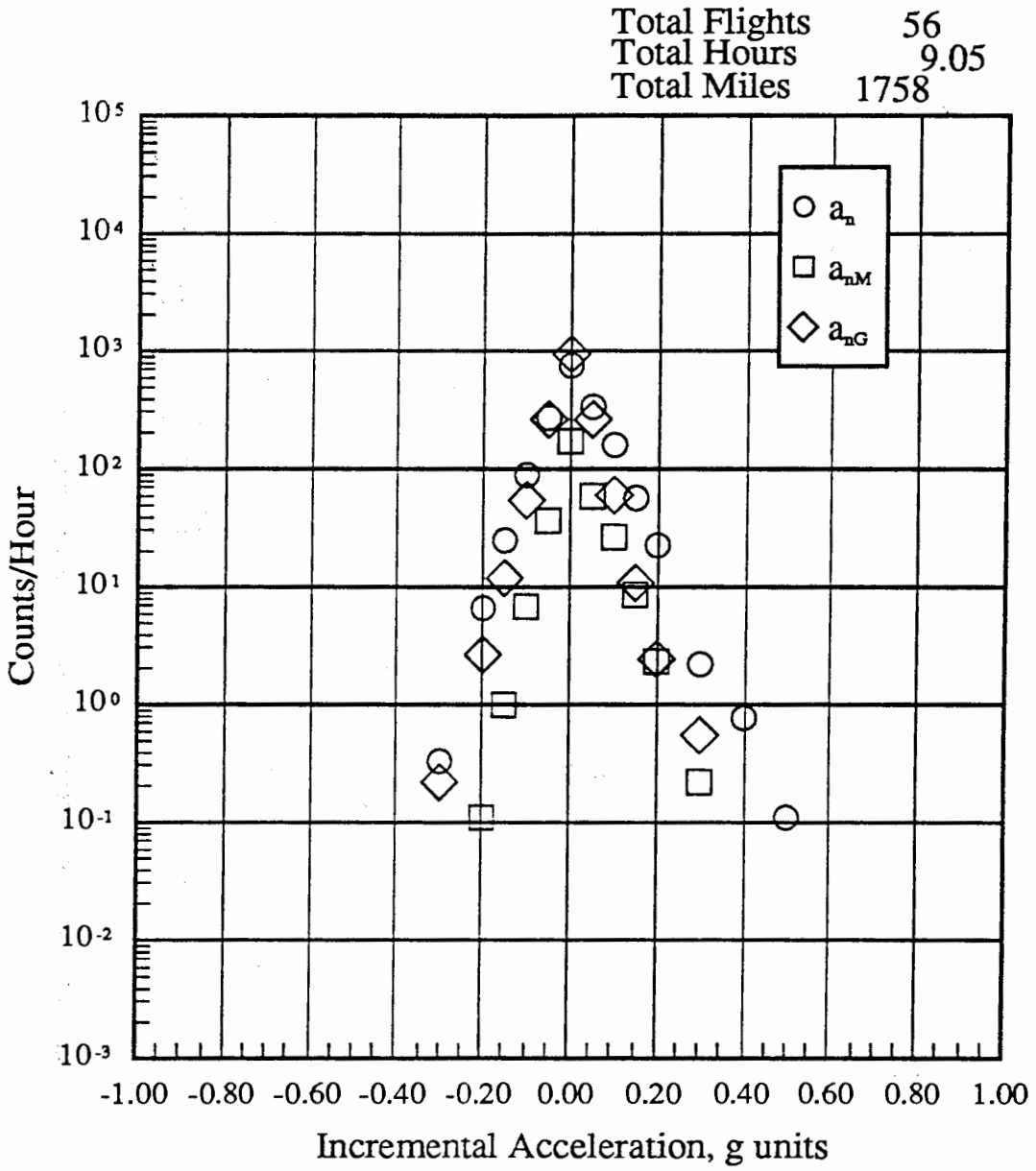
PRESSURE ALTITUDE BANDS

| $a_{nG}$ LEVEL g's | -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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .40 | 0 | 0 | 0.45 | 0 | 0 | 0 | 0 | 0 | 0 | 0.04 |
| .30 | 0.55 | 0 | 0.89 | 0.52 | 0 | 0 | 0 | 0 | 0 | 0.34 |
| .20 | 2.43 | 3.02 | 3.13 | 0.52 | 0 | 0 | 3.15 | 0 | 0 | 1.81 |
| .15 | 10.83 | 4.11 | 7.59 | 1.03 | 1.25 | 0 | 4.73 | 1.03 | 0 | 5.86 |
| .10 | 60.32 | 13.16 | 18.75 | 5.16 | 9.99 | 2.88 | 14.18 | 4.48 | 0 | 28.64 |
| .05 | 262.92 | 69.91 | 99.56 | 29.39 | 68.70 | 23.00 | 40.96 | 55.84 | 0 | 134.22 |
| 0.00 | 938.44 | 1256.66 | 1288.96 | 1466.61 | 1366.55 | 1478.91 | 1350.20 | 1416.56 | 1419.44 | 1200.90 |
| -.05 | 263.47 | 67.44 | 100.01 | 28.36 | 81.19 | 24.92 | 39.39 | 53.77 | 0.69 | 134.26 |
| -.10 | 54.57 | 13.98 | 28.13 | 3.61 | 8.74 | 2.88 | 9.45 | 5.17 | 0 | 27.25 |
| -.15 | 11.93 | 6.03 | 8.93 | 1.03 | 1.25 | 0 | 4.73 | 0.34 | 0 | 6.62 |
| -.20 | 2.65 | 1.10 | 2.68 | 0.52 | 0 | 0 | 0 | 0 | 0 | 1.48 |
| -.30 | 0.22 | 0 | 0.89 | 0.52 | 0 | 0 | 0 | 0 | 0 | 0.21 |
| -.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -1.60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FLIGHT HOURS @ ALT | 9.05 | 3.65 | 2.24 | 1.94 | 0.80 | 1.04 | 0.63 | 2.90 | 1.45 | 23.71 |
| FLIGHT MILES @ ALT | 1758.01 | 966.39 | 794.83 | 793.19 | 358.67 | 505.83 | 309.94 | 1419.36 | 710.03 | 7616.26 |

| | |
|---|---|
| TOTAL FLIGHTS | 56 |
| TOTAL FLIGHT HOURS FLAPS UP AND DOWN | 23.71 |
| TOTAL FLIGHT MILES FLAPS UP AND DOWN | 7616.26 |

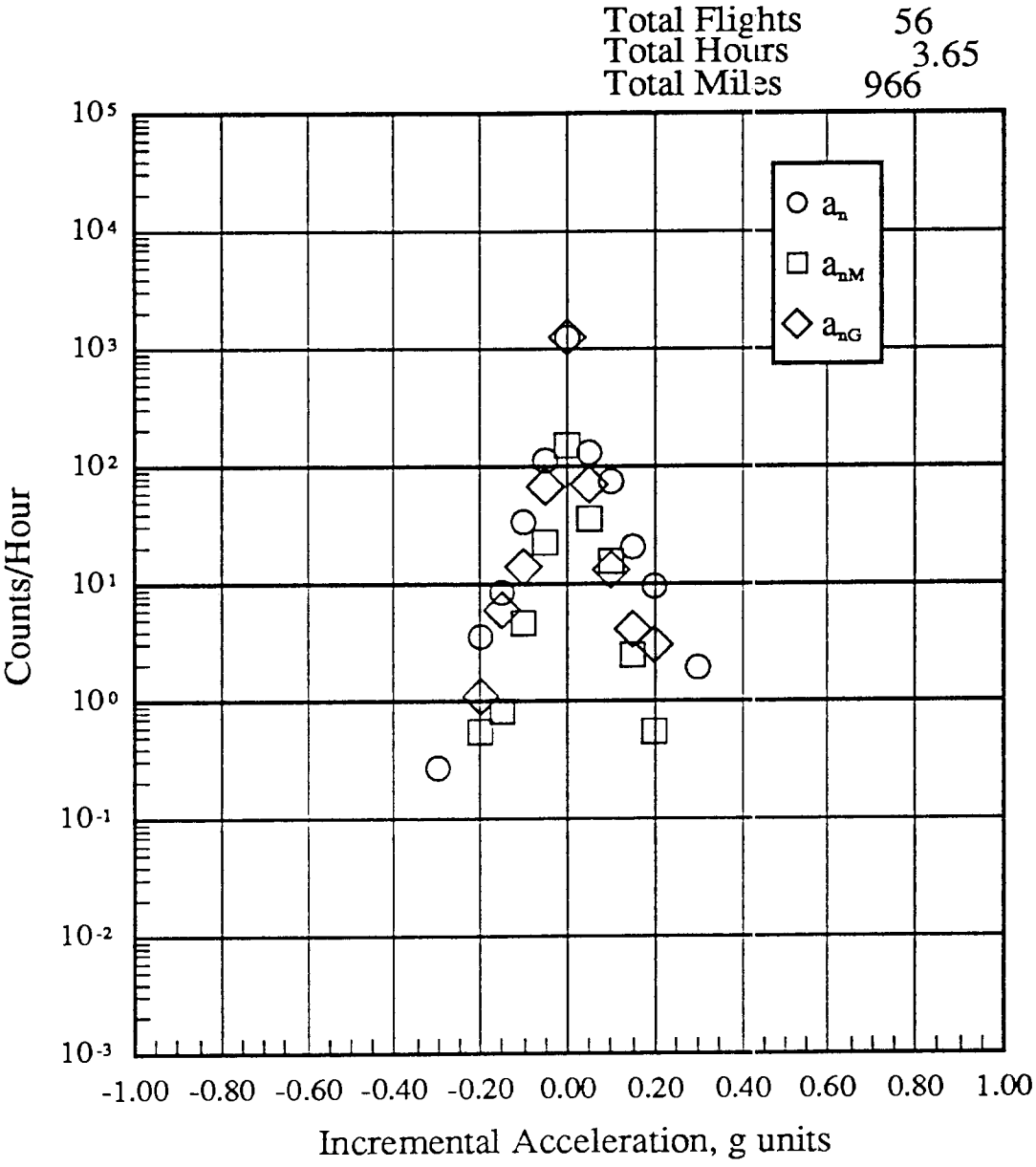
(c) $a_{nG}$ Level crossing counts per hour wihtin pressure altitude bands

Figure 22.- Continued.



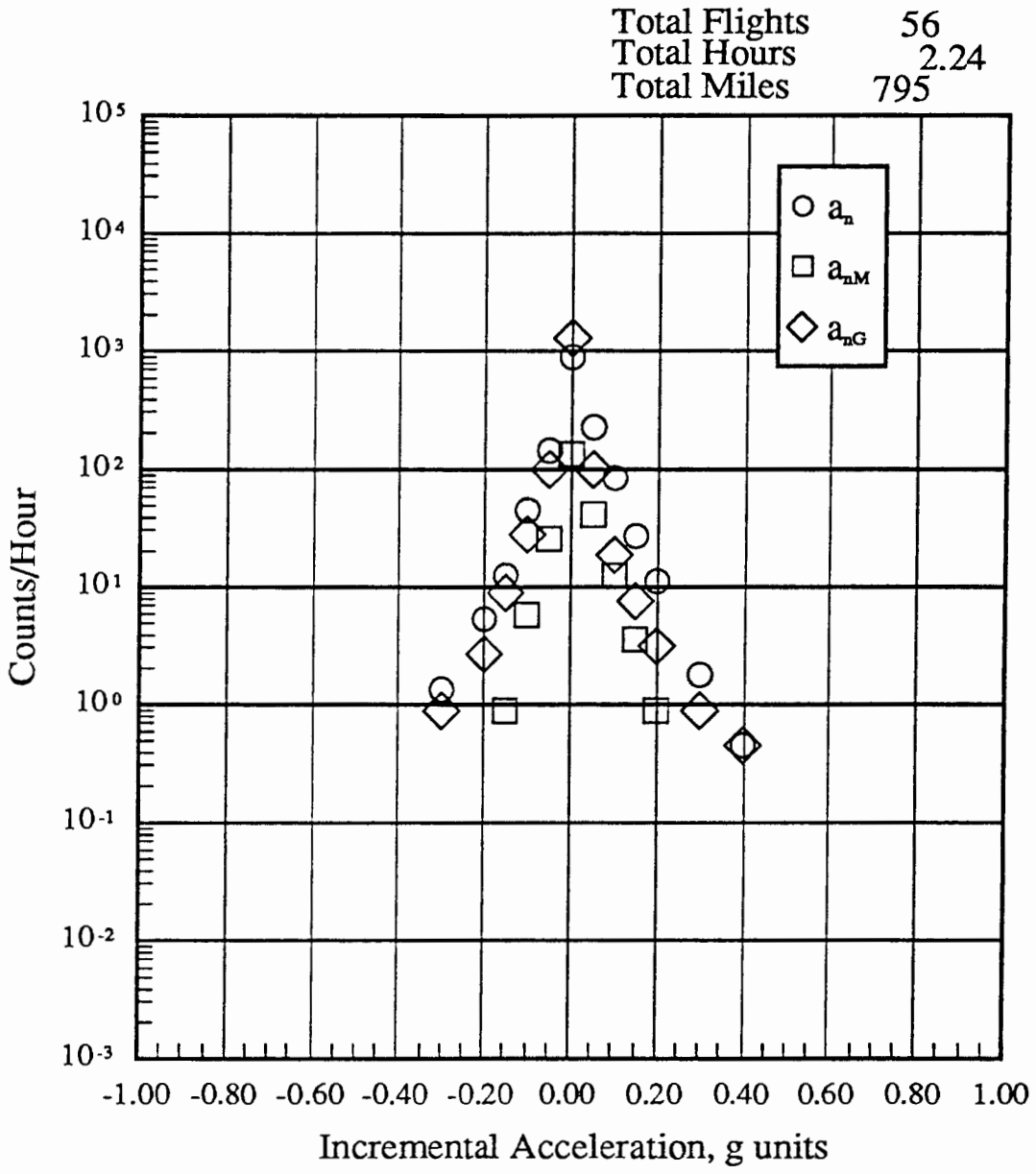

(d) $a_n$, $a_{nM}$, $a_{nG}$, -500 to 4500 feet altitude

Figure 22.- Continued.



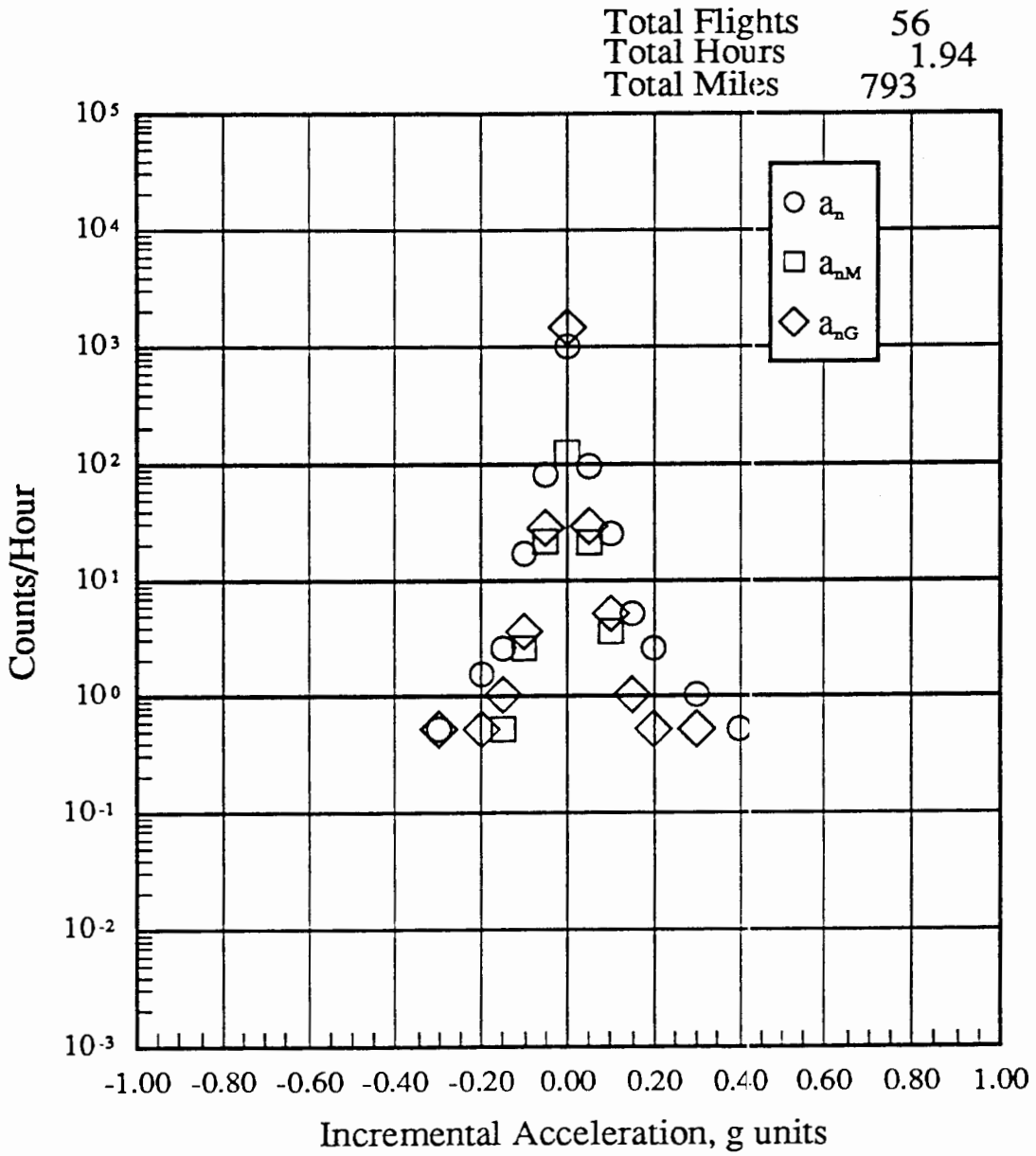

(e) $a_n$, $a_{nM}$, $a_{nG}$, 4500 to 9500 feet altitude

Figure 22.- Continued.



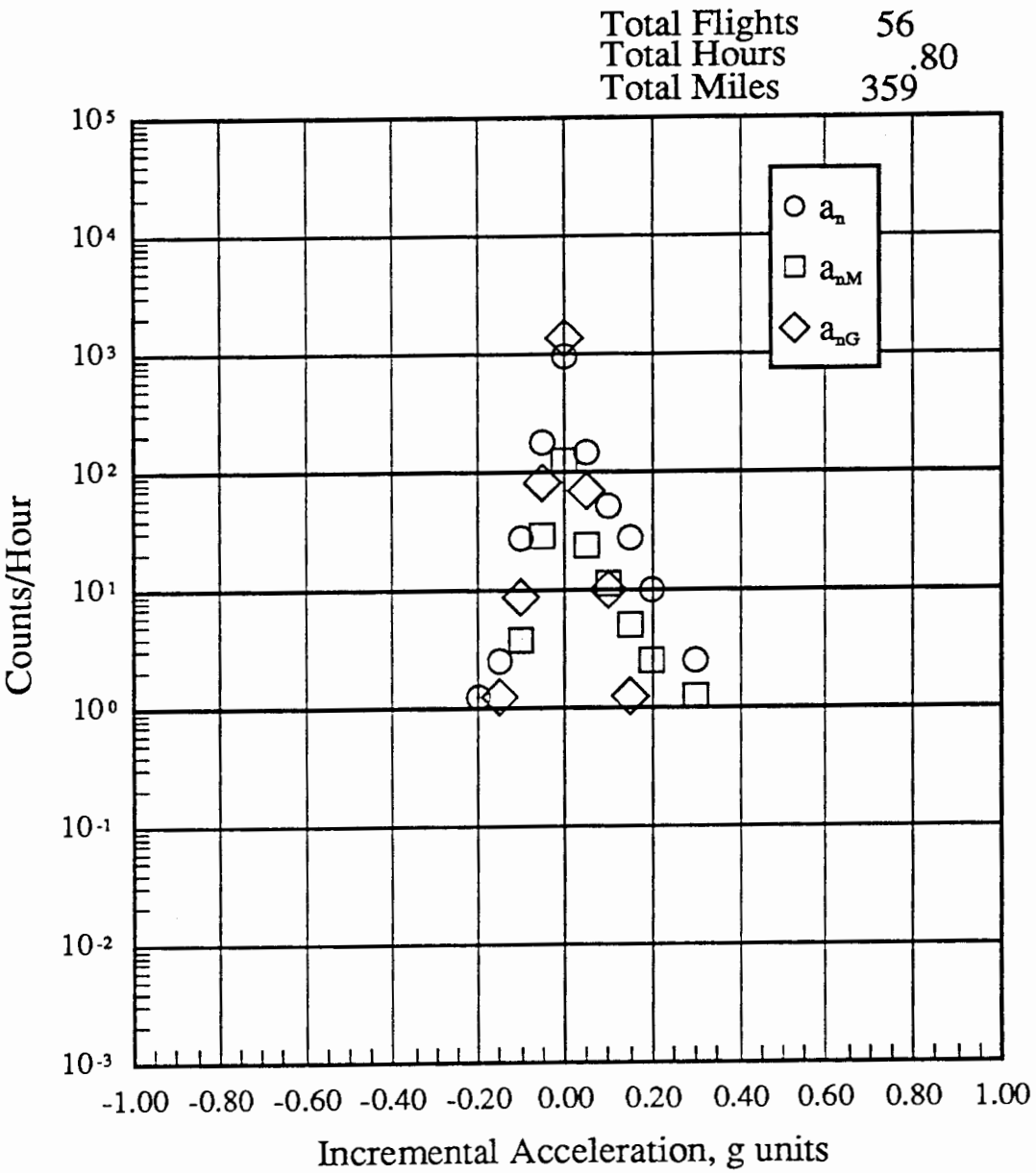

(f) $a_n$, $a_{nM}$, $a_{nG}$, 9500 to 14500 feet altitude

Figure 22.- Continued.



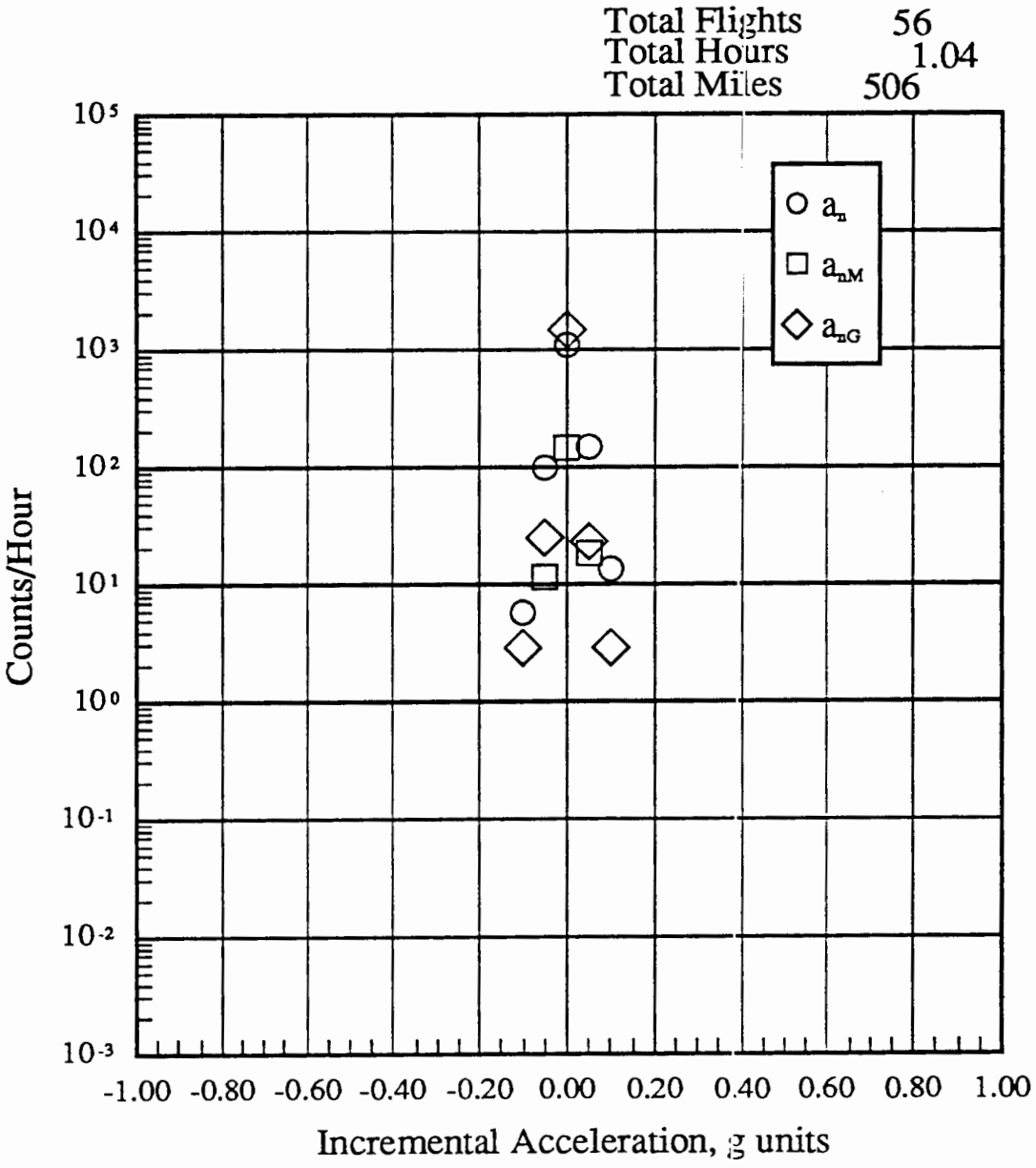

(g) $a_n$, $a_{nM}$, $a_{nG}$, 14500 to 19500 feet altitude

Figure 22.- Continued.



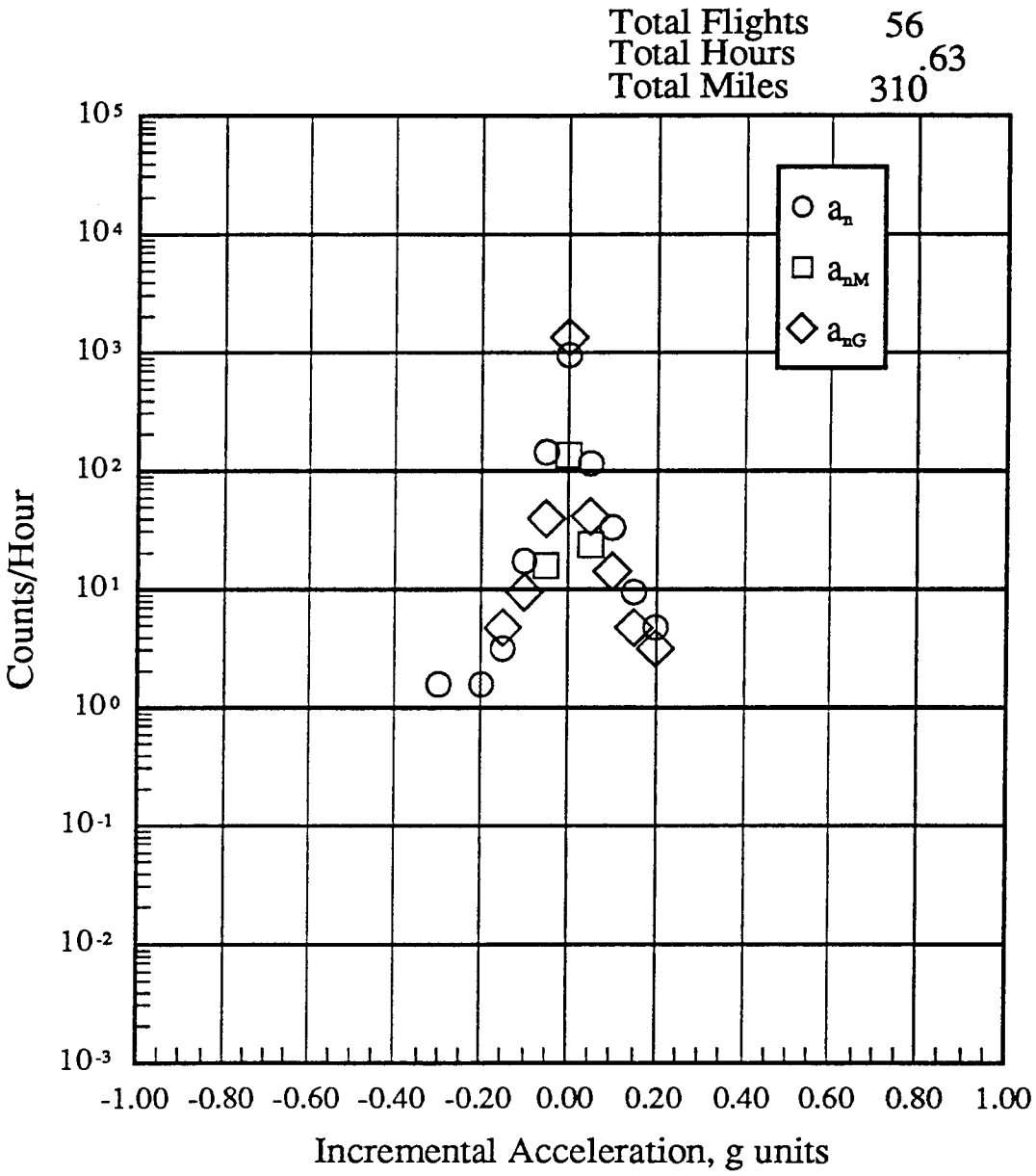

(h) $a_n$, $a_{nM}$, $a_{nG}$, 19500 to 24500 feet altitude

Figure 22.- Continued.



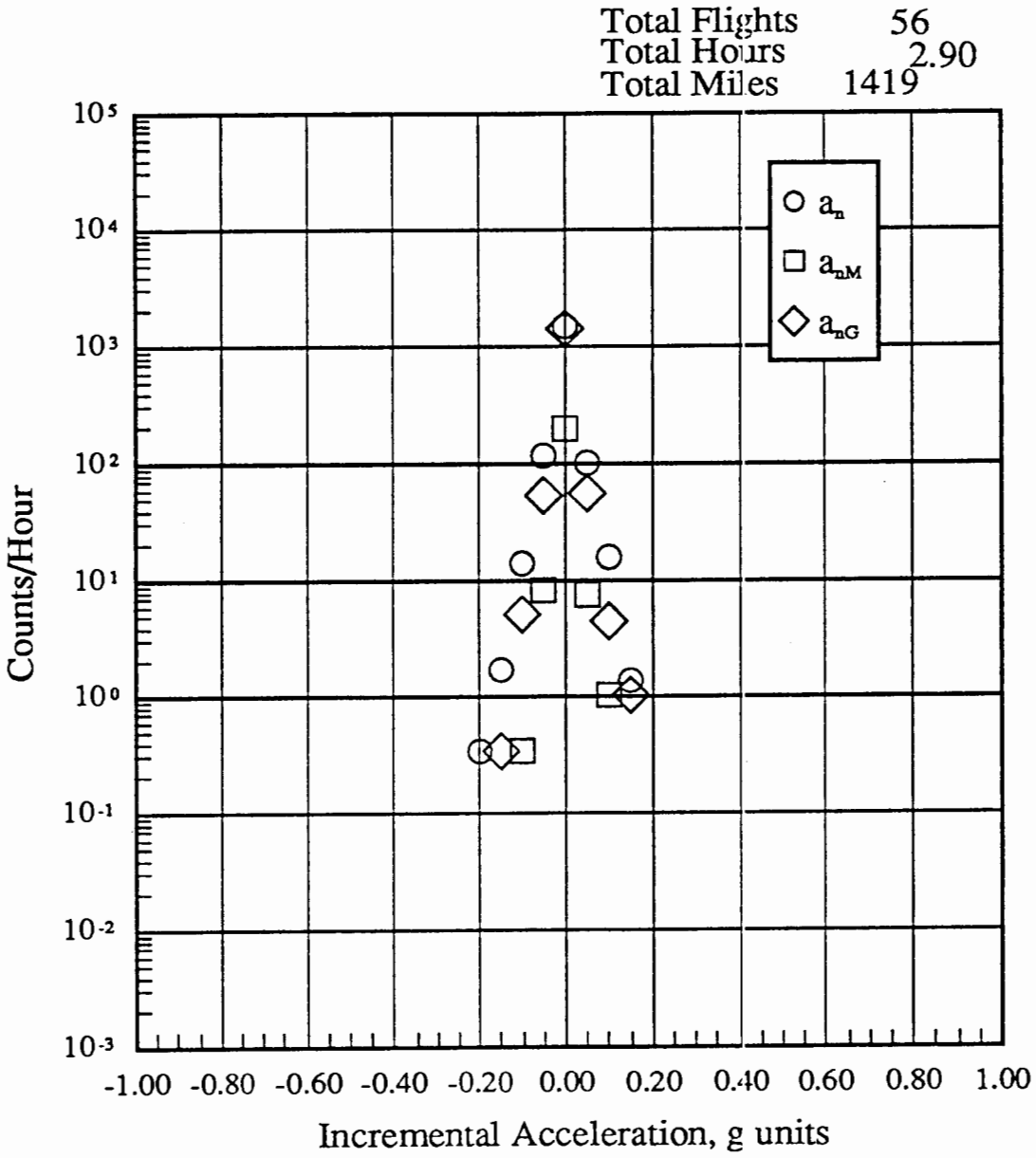

(i) $a_n$, $a_{nM}$, $a_{nG}$, 24500 to 29500 feet altitude

Figure 22.- Continued.



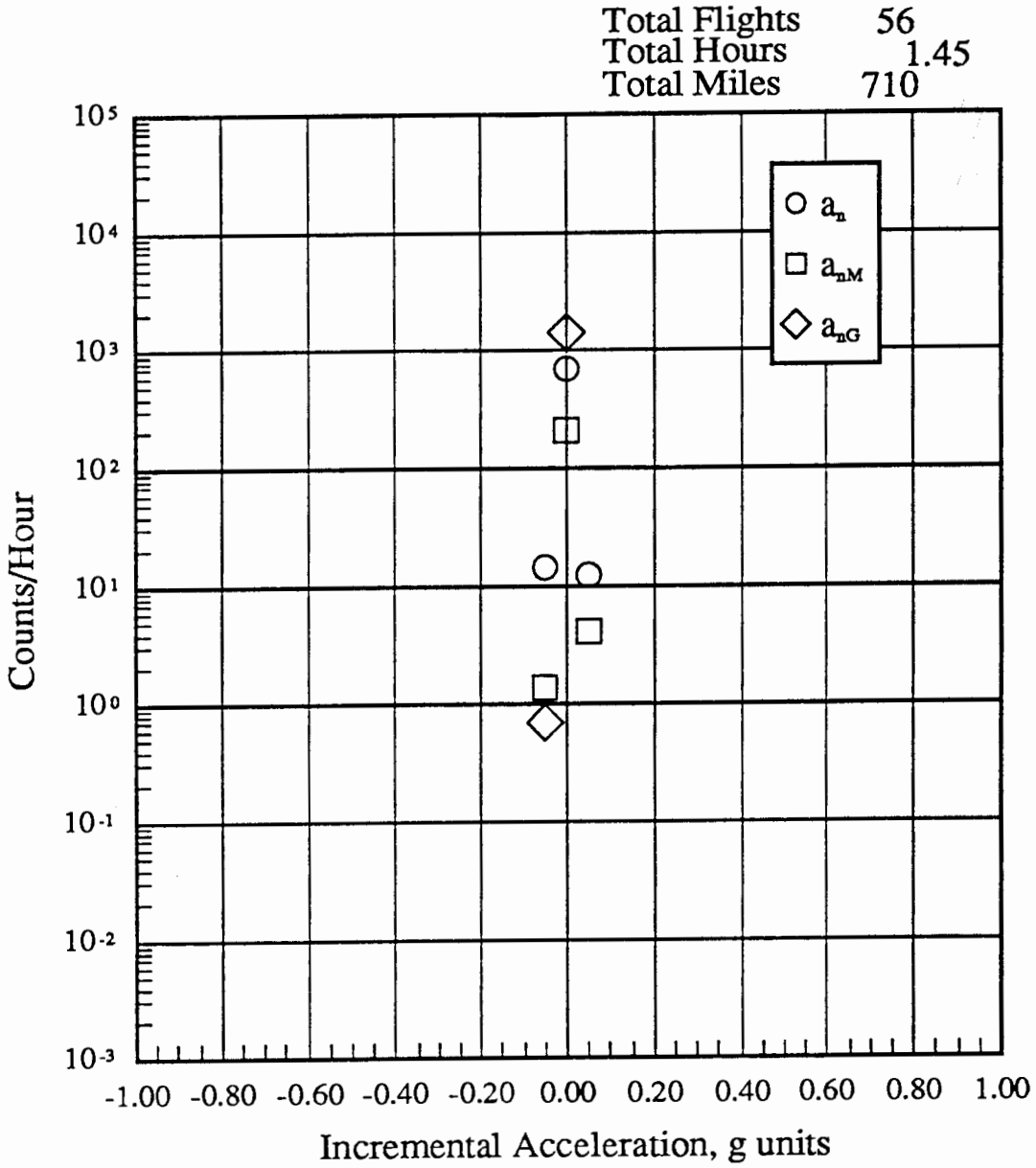

(j) $a_n$, $a_{nM}$, $a_{nG}$, 29500 to 34500 feet altitude

Figure 22.- Continued.



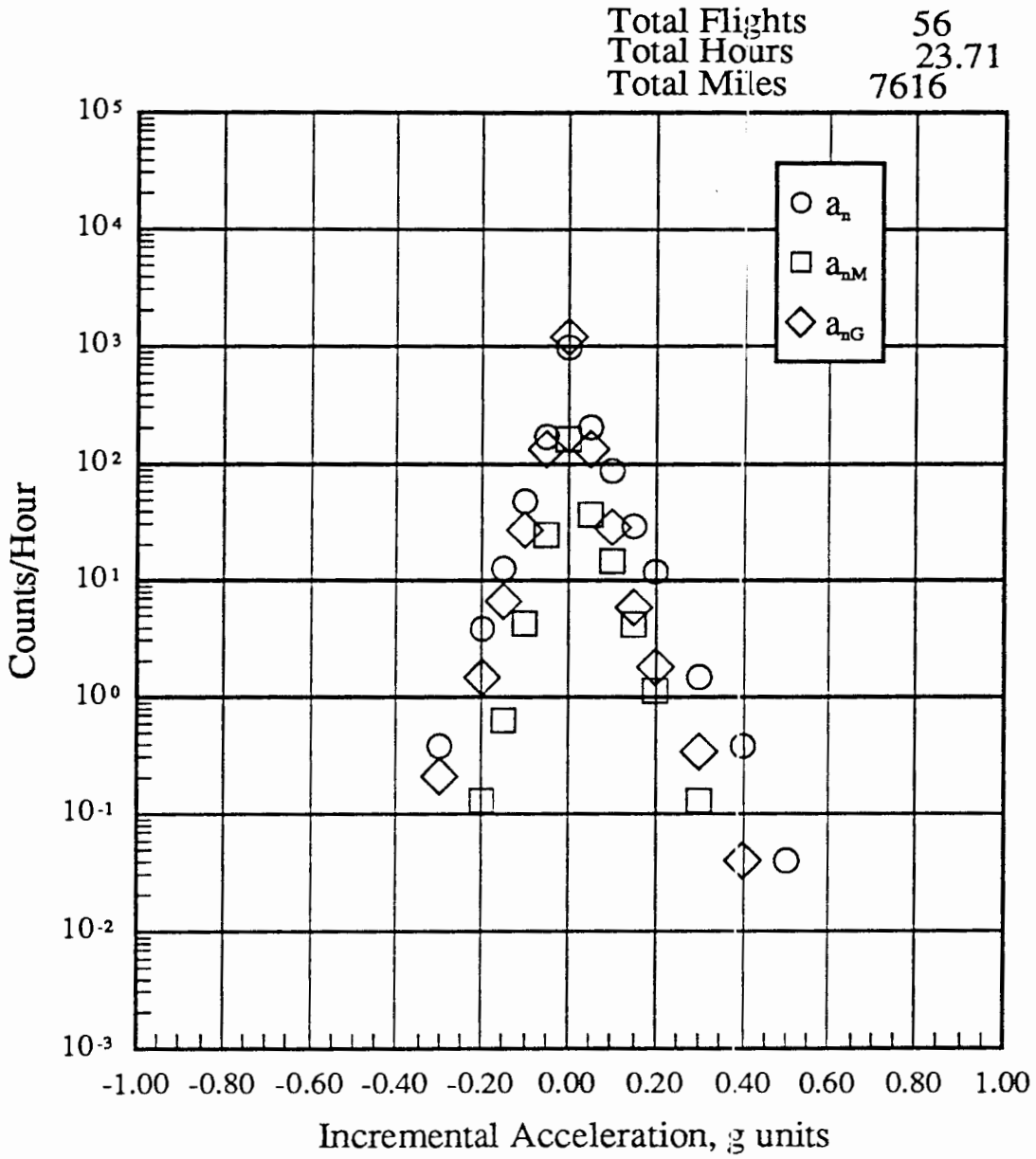

(k) $a_n$, $a_{nM}$, $a_{nG}$, 34500 to 39500 feet altitude

Figure 22.- Continued.




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

Figure 22.- Continued.




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

Figure 22.- Concluded.

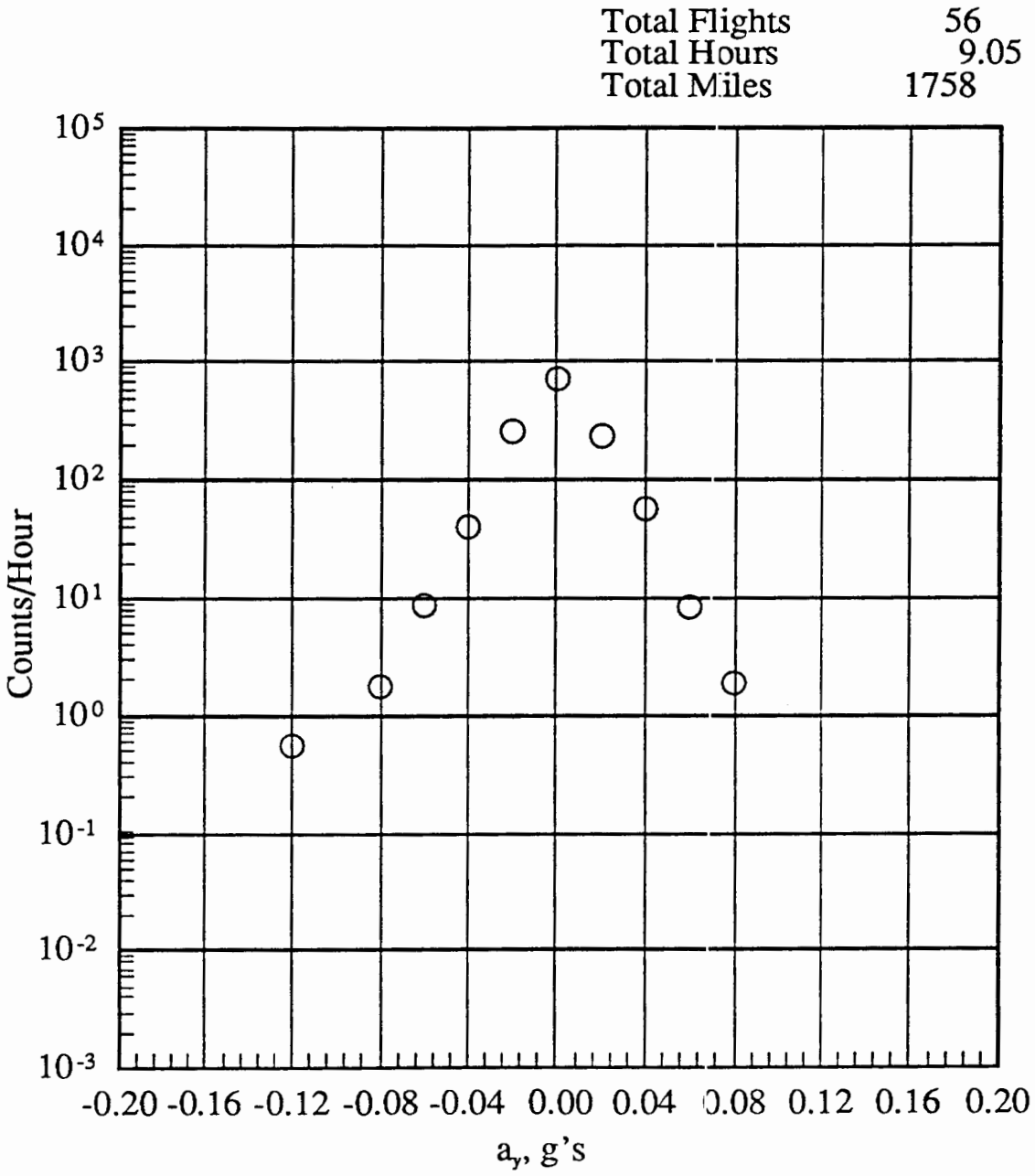
PRESSURE ALTITUDE BAND

| $a_y$ LEVEL g's | -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 |
|---|---|---|---|---|---|---|---|---|---|---|
| .48 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .44 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .36 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| .12 | 0 | 0 | 0 | 1.03 | 0 | 0 | 0 | 0 | 0 | 0.08 |
| .08 | 1.88 | 1.10 | 0.45 | 3.61 | 0 | 0 | 0 | 0 | 0 | 1.22 |
| .06 | 8.40 | 2.47 | 3.13 | 1.55 | 1.25 | 0 | 0 | 0 | 0 | 4.05 |
| .04 | 57.33 | 13.98 | 22.32 | 2.58 | 16.24 | 0 | 3.15 | 2.76 | 0 | 27.33 |
| .02 | 236.07 | 82.79 | 92.87 | 70.65 | 156.14 | 110.22 | 40.96 | 39.64 | 0 | 133.50 |
| 0 | 723.69 | 710.30 | 792.04 | 885.95 | 783.21 | 923.00 | 819.26 | 1419.66 | 1126.16 | 864.47 |
| -.02 | 260.27 | 100.61 | 163.41 | 47.96 | 78.70 | 46.01 | 39.39 | 40.67 | 0 | 144.93 |
| -.04 | 40.65 | 18.09 | 12.95 | 1.55 | 6.25 | 0.96 | 9.45 | 2.41 | 0 | 20.46 |
| -.06 | 8.73 | 2.47 | 2.68 | 1.03 | 0 | 0 | 1.58 | 0 | 0 | 4.09 |
| -.08 | 1.77 | 0.27 | 0.45 | 0 | 0 | 0 | 0 | 0 | 0 | 0.76 |
| -.12 | 0.55 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.21 |
| -.16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.36 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.44 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -.48 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FLIGHT HOURS @ ALT | 9.05 | 3.65 | 2.24 | 1.94 | 0.80 | 1.04 | 0.63 | 2.90 | 1.45 | 23.71 |
| FLIGHT MILES @ ALT | 1758.01 | 966.39 | 794.83 | 793.19 | 358.67 | 505.83 | 309.94 | 1419.36 | 710.03 | 7616.26 |

| | |
|---|---|
| TOTAL FLIGHTS | 56 |
| TOTAL FLIGHT HOURS FLAPS UP AND DOWN | 23.71 |
| TOTAL FLIGHT MILES FLAPS UP AND DOWN | 7616.26 |

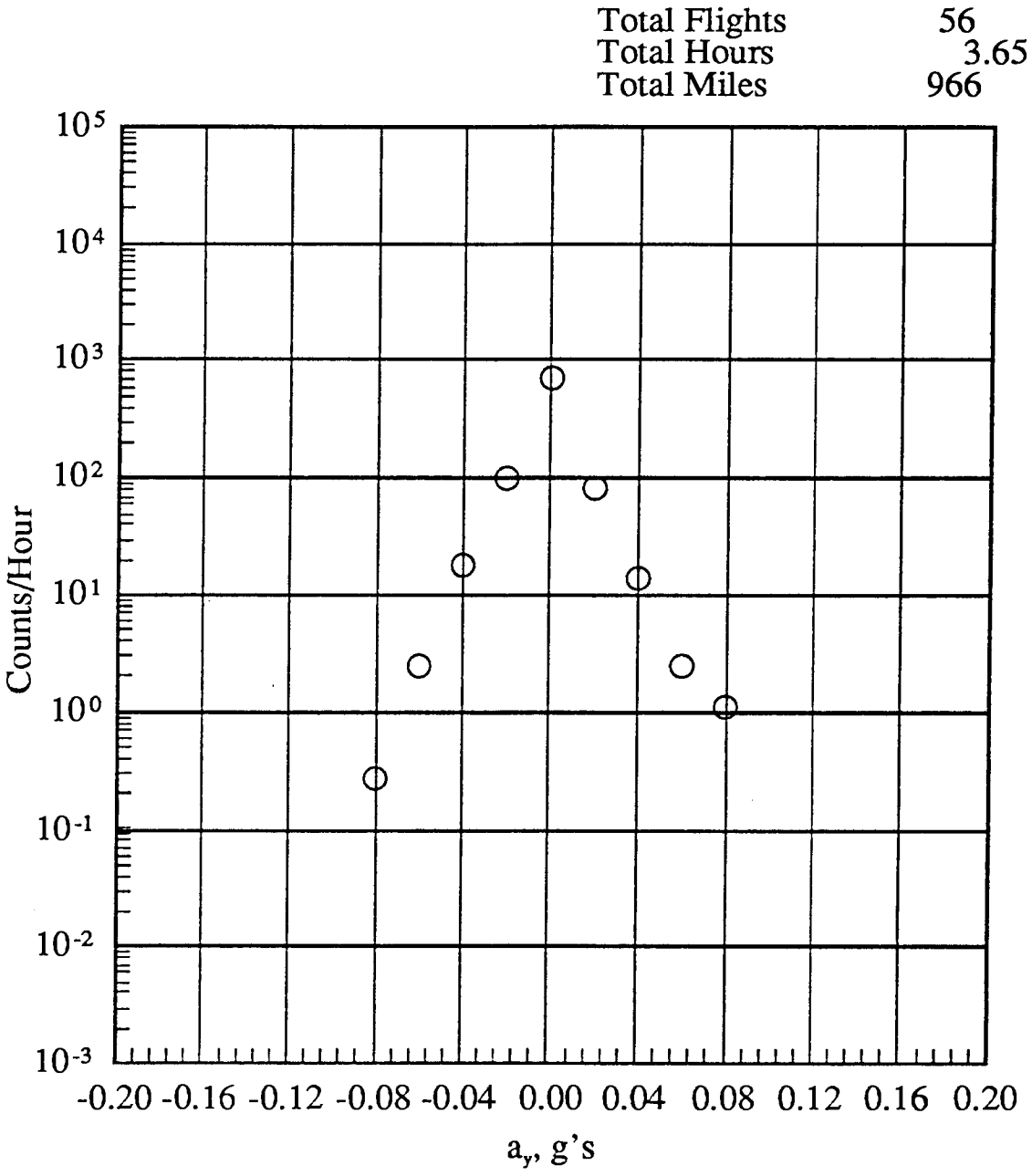
(a) $a_y$ Level crossing counts per hour within pressure altitude bands

Figure 23.- Lateral acceleration exceedances: Nonrevenue flights.



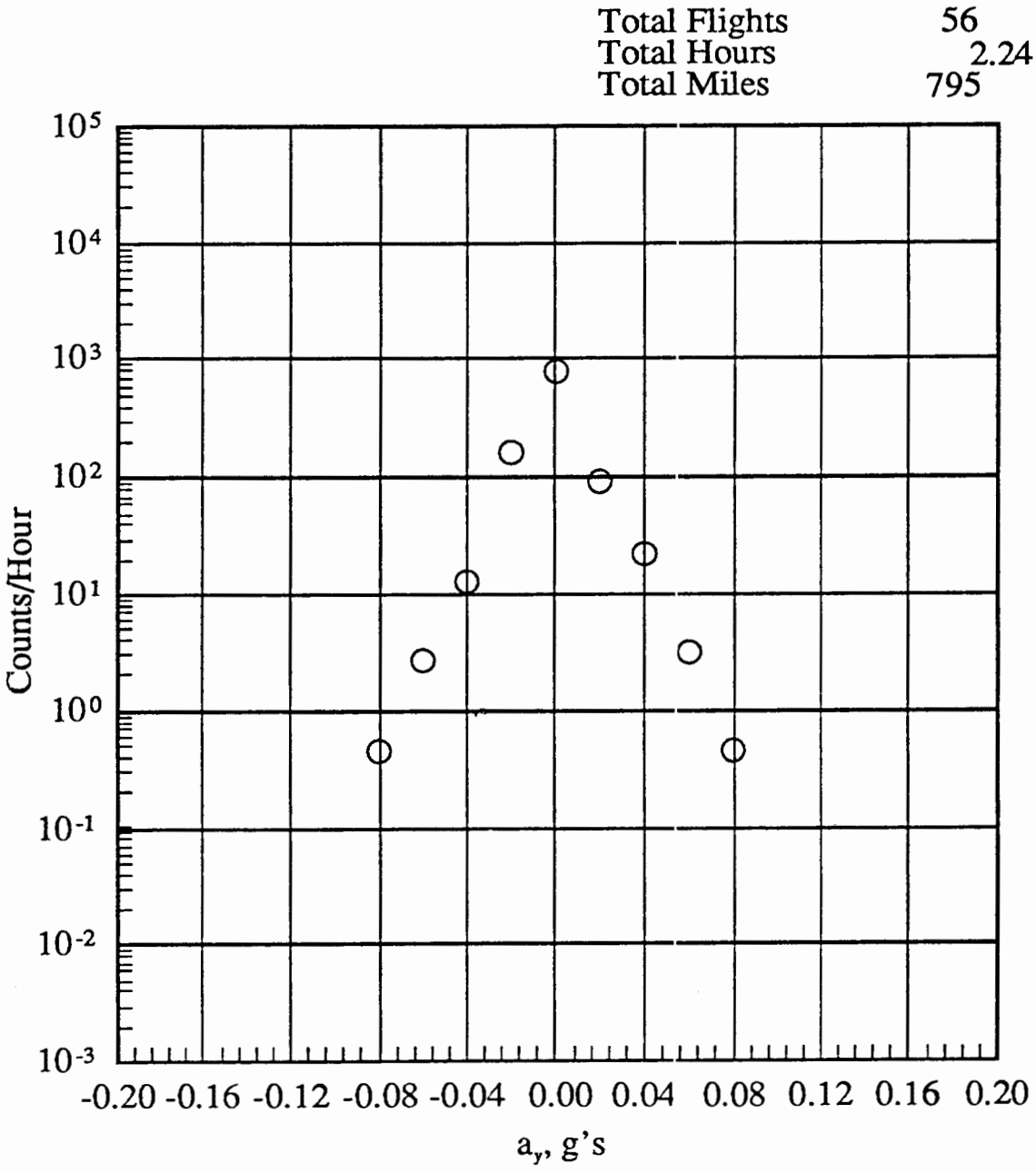

(b) -500 to 4500 feet altitude

Figure 23.- Continued.



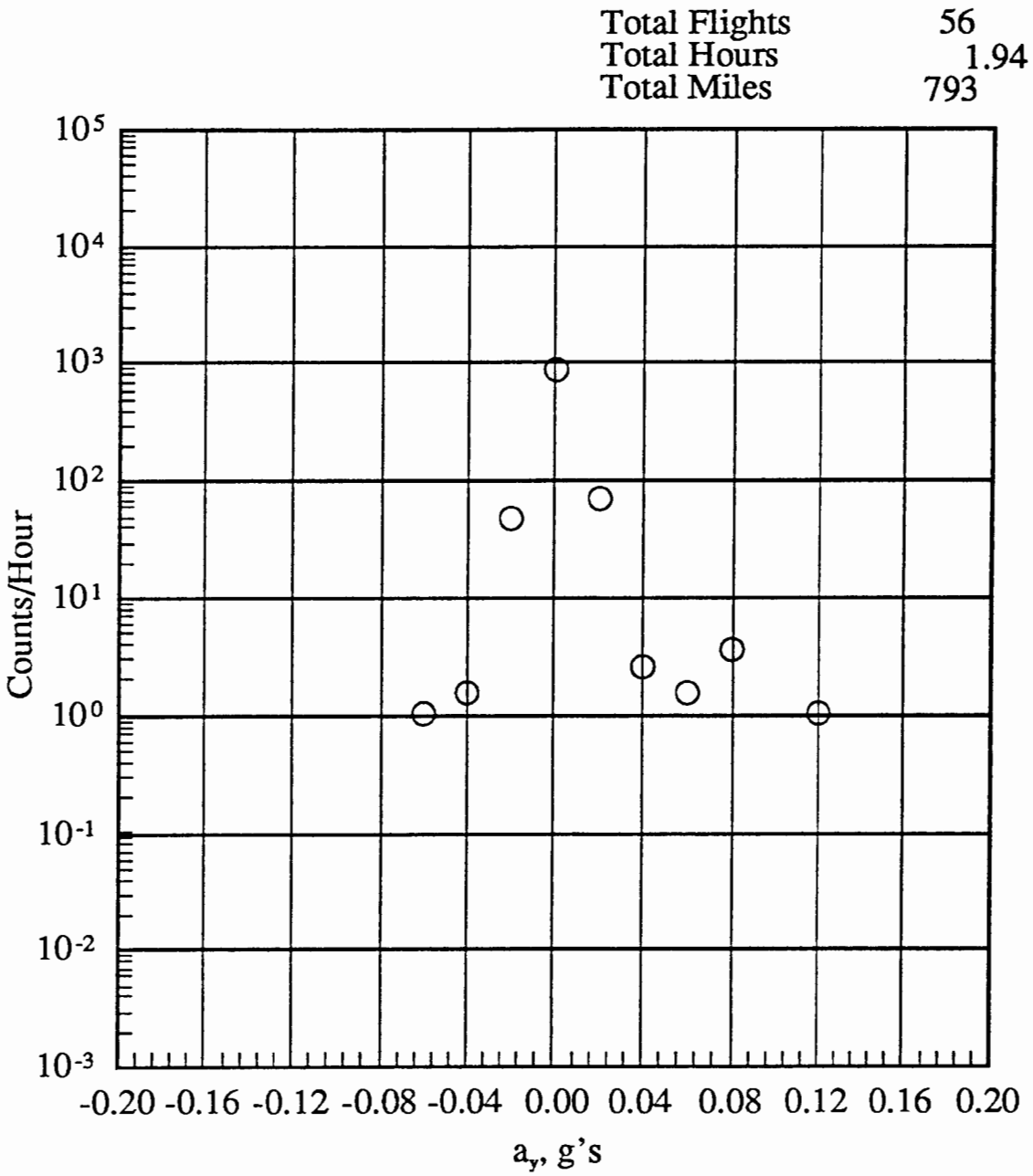

(c) 4500 to 9500 feet altitude

Figure 23.- Continued.



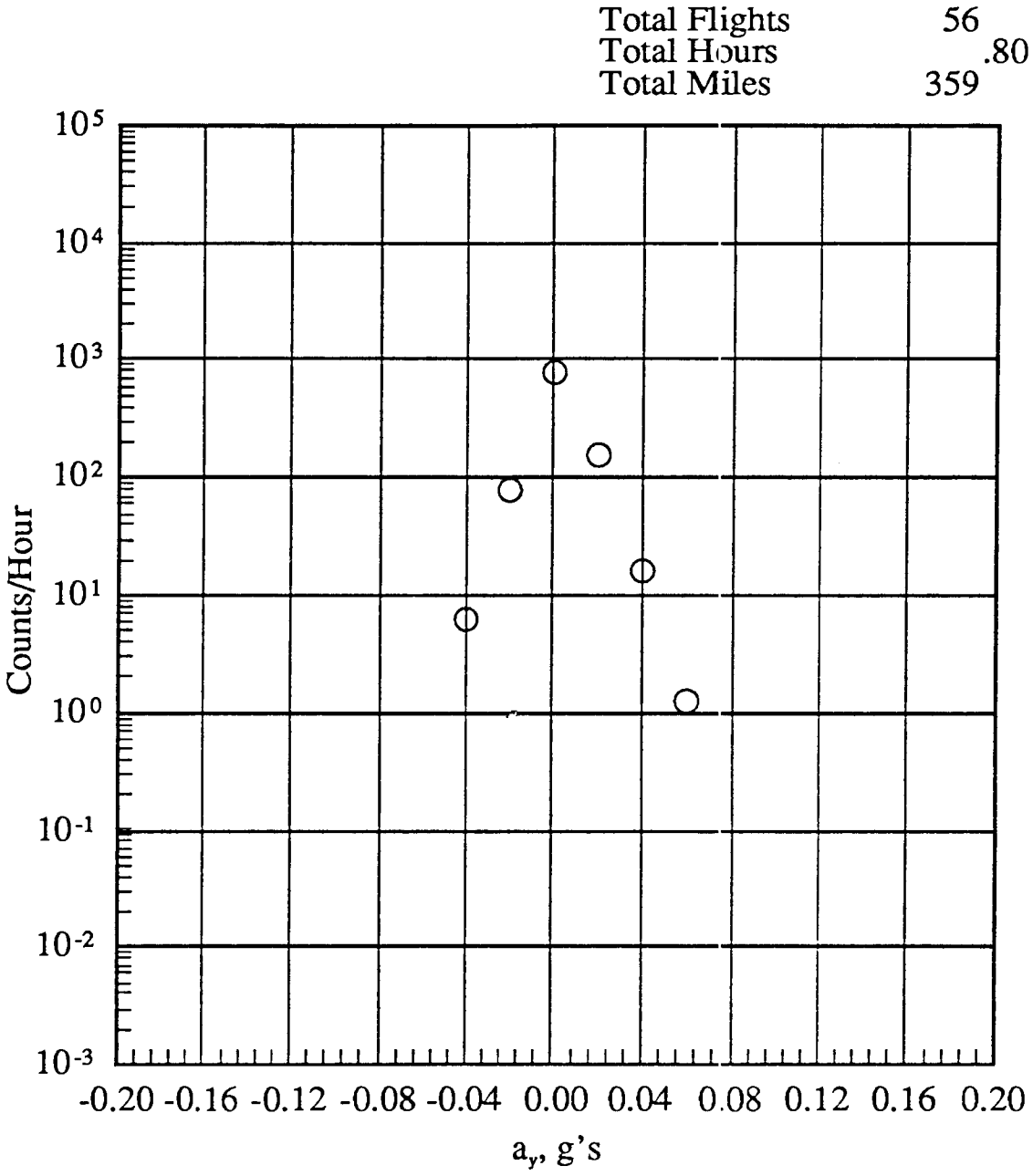

(d) 9500 to 14500 altitude

Figure 23.- Continued.



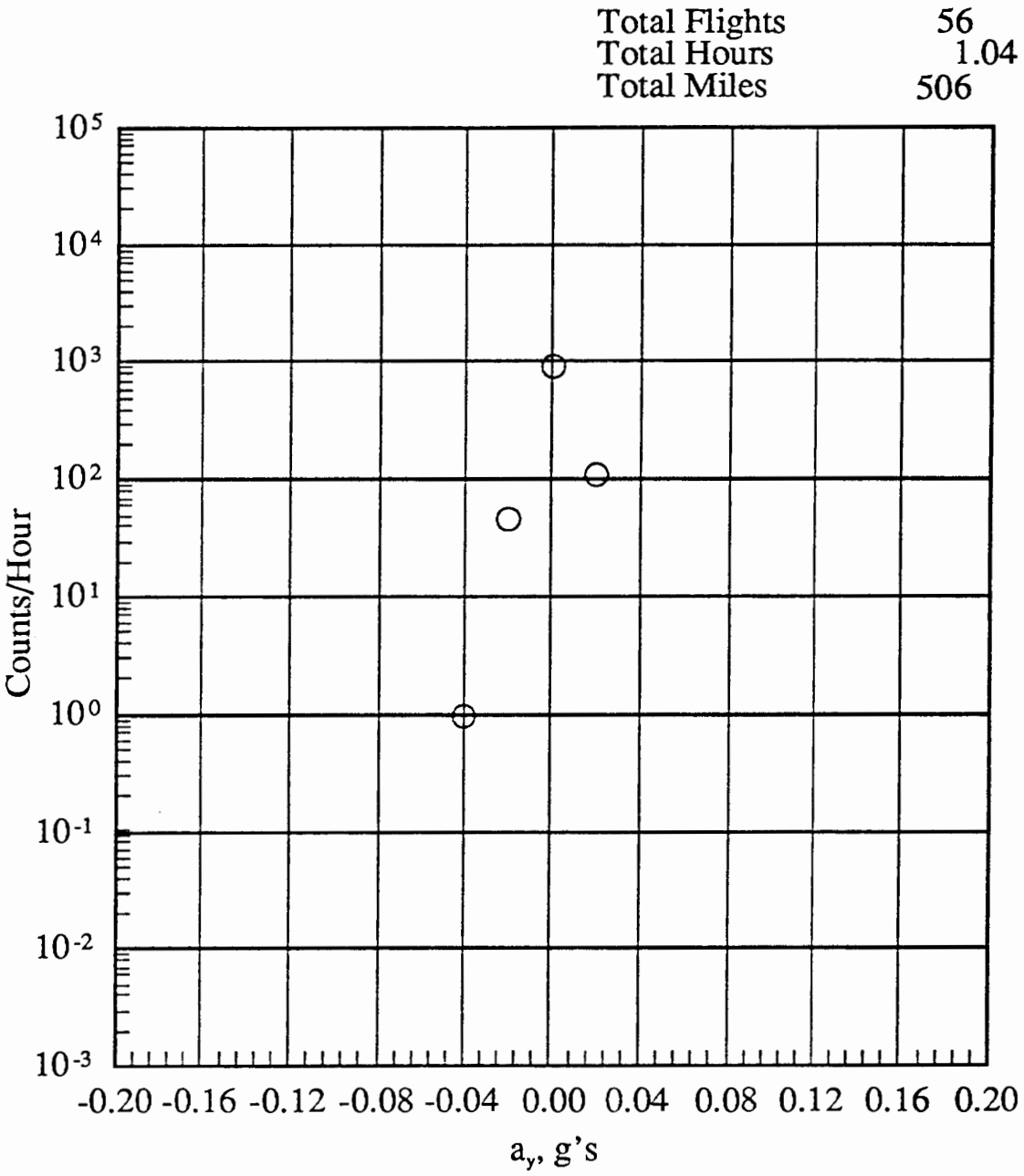

(e) 14500 to 19500 feet altitude

Figure 23.- Continued.



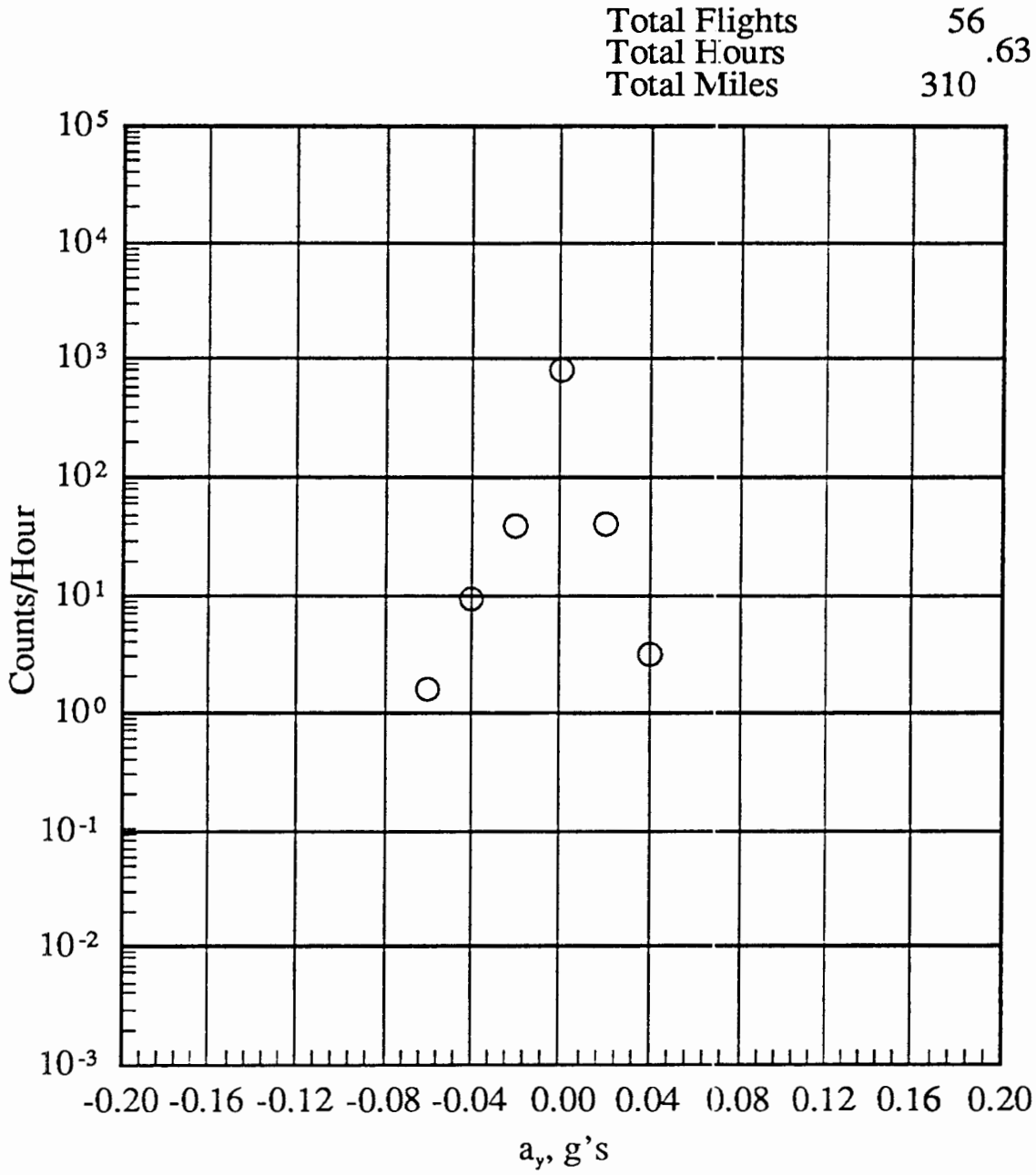

(f) 19500 to 24500 feet altitude

Figure 23.- Continued.



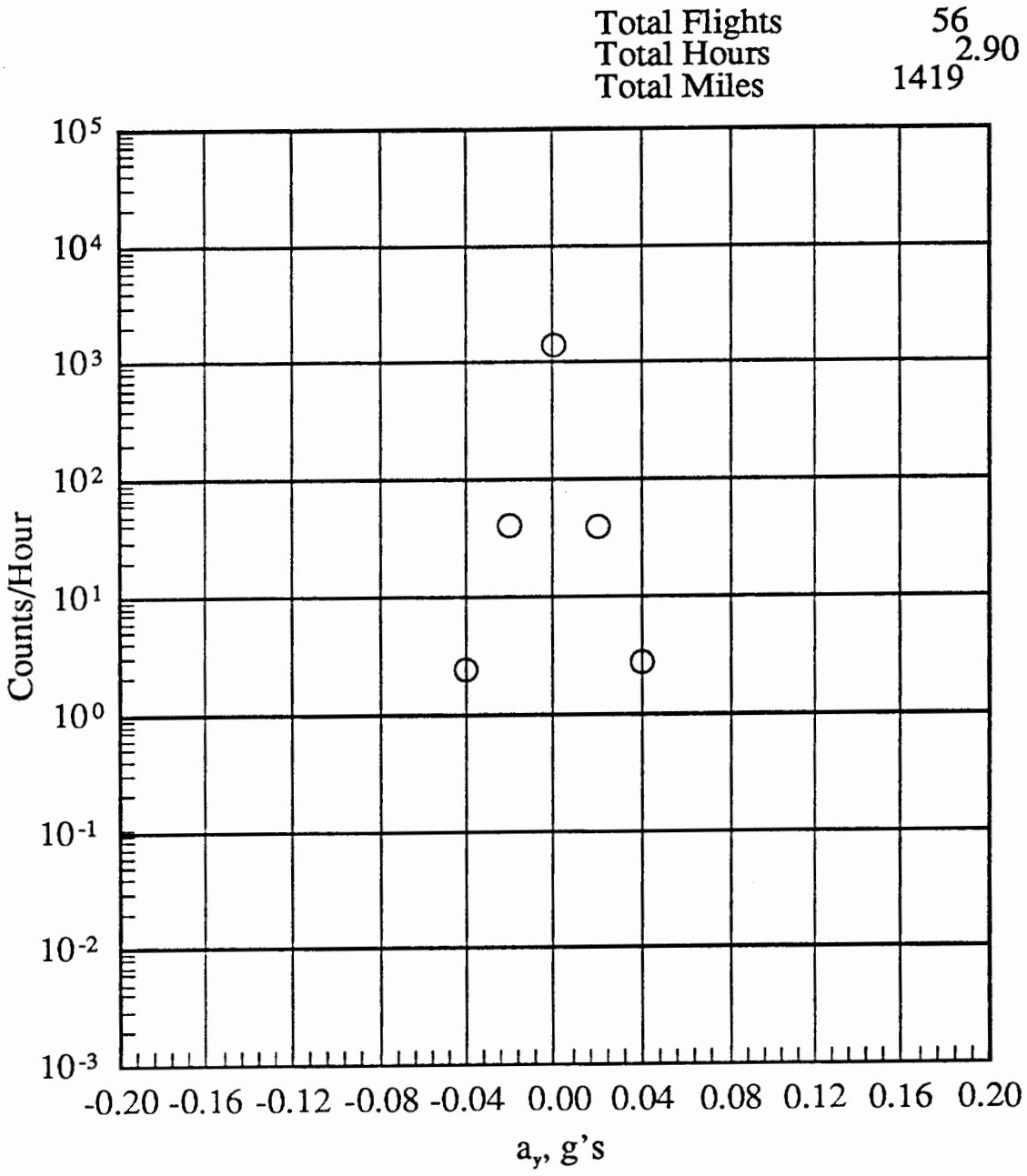

(g) 24500 to 29500 feet altitude

Figure 23.- Continued.



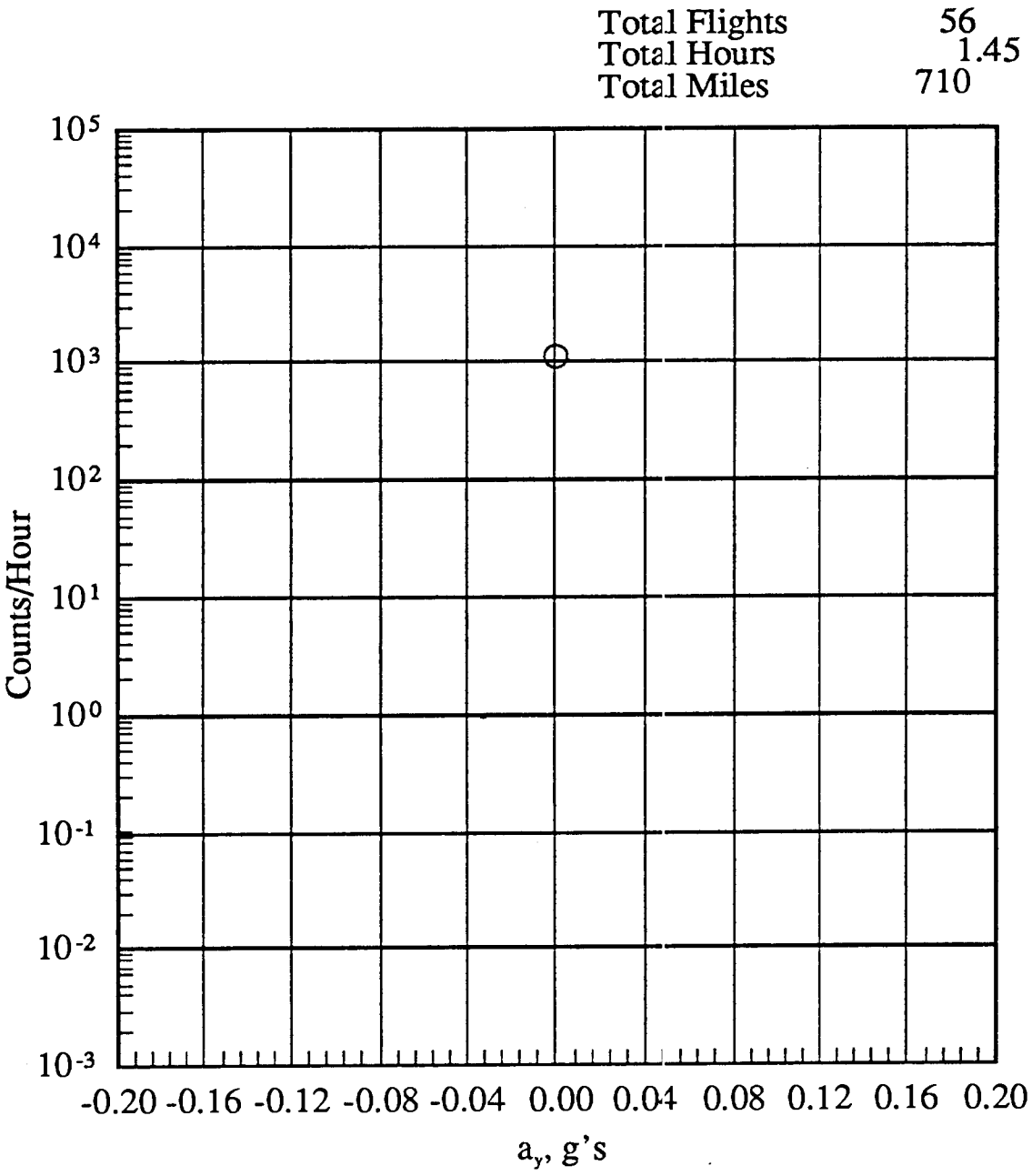

(h) 29500 to 34500 feet altitude

Figure 23.- Continued.



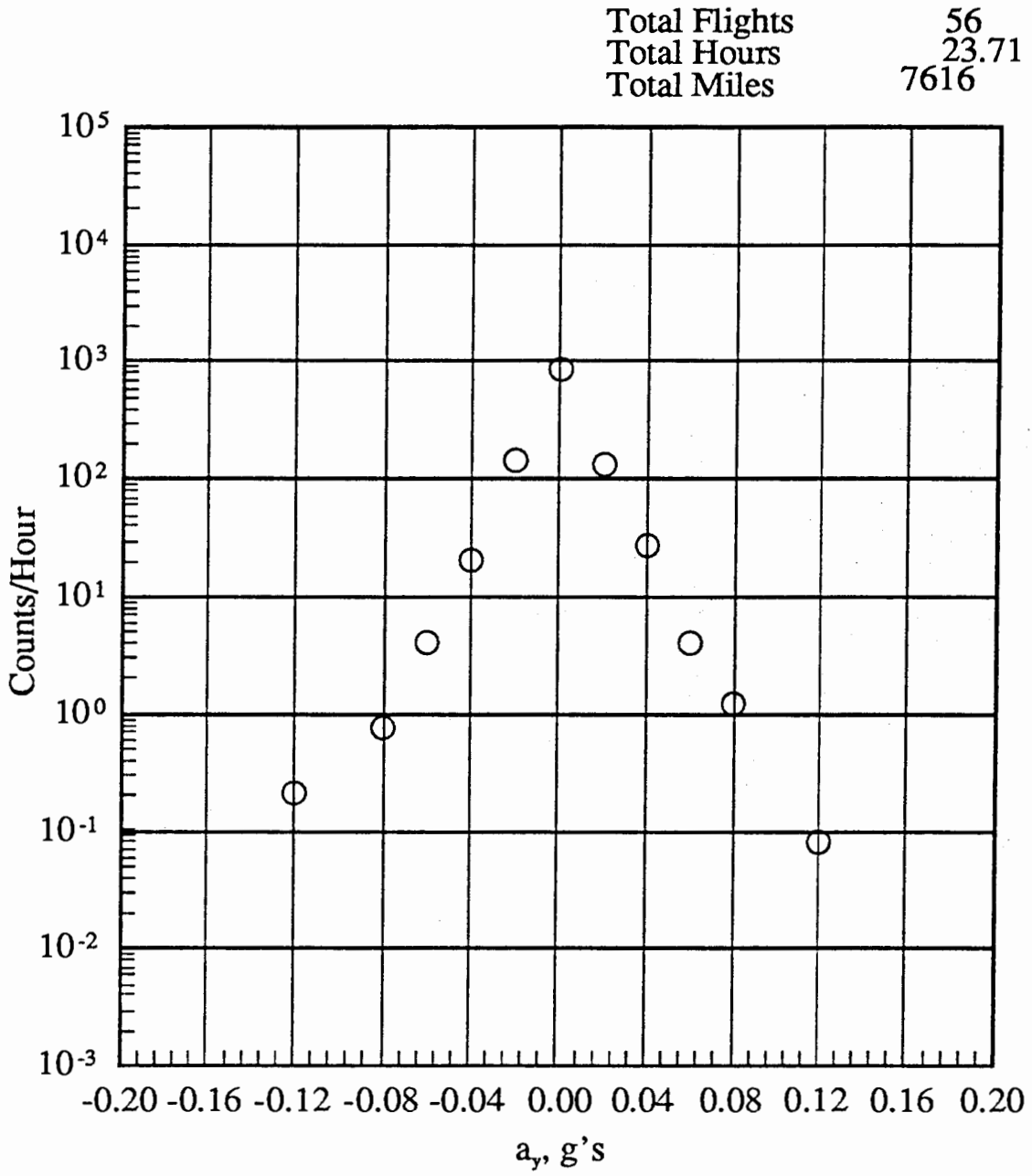

(i) 34500 to 39500 feet altitude

Figure 23.- Continued.




(j) 39500 to 44500 feet altitude

Figure 23.- Continued.




(k) -500 to 44500 feet altitude

Figure 23.- Concluded

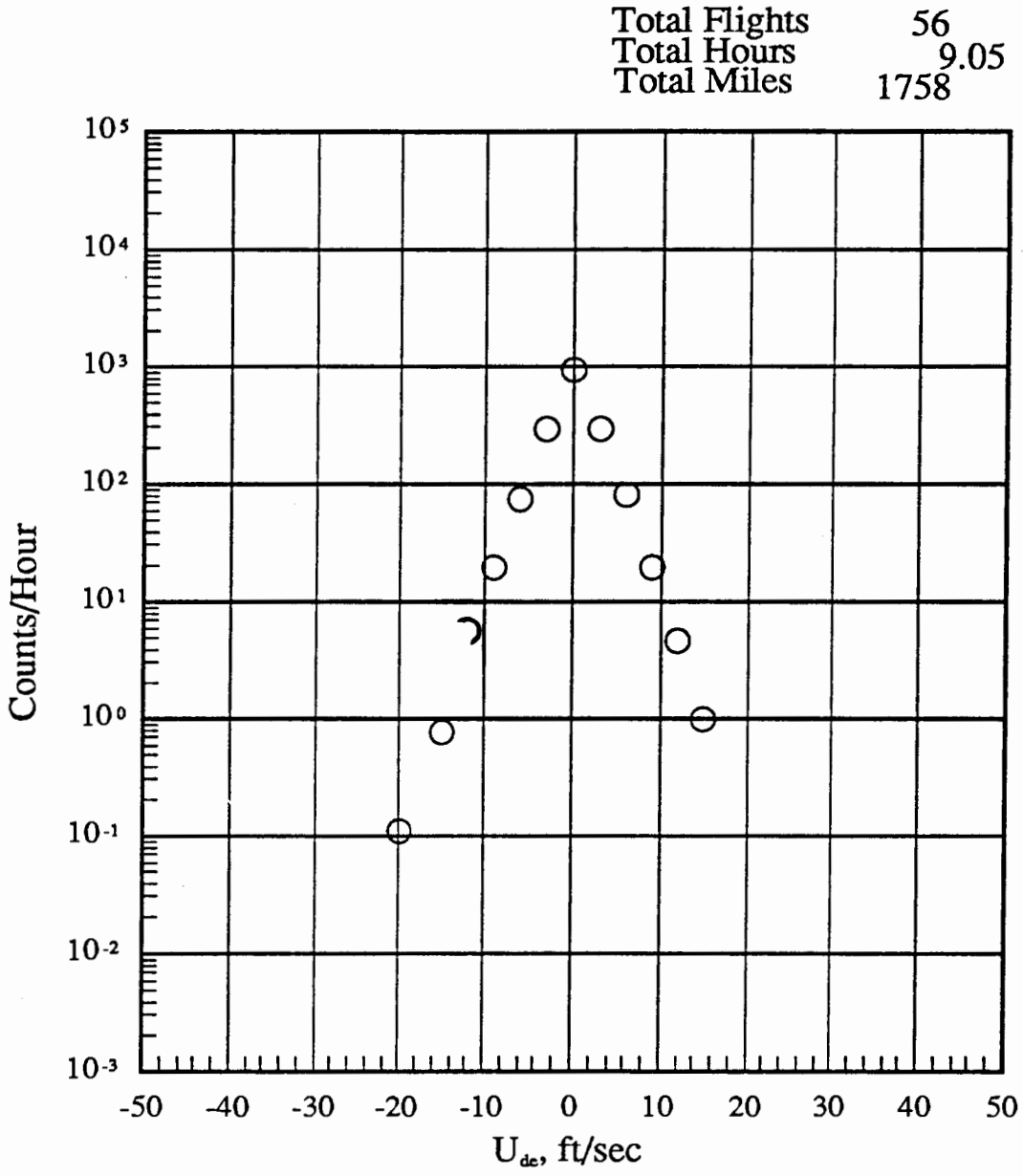
PRESSURE ALTITUDE BAND

| $U_{de}$ DERIVED GUST VELOCITY LEVEL FT/SEC | -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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 90 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 | 0.99 | 0 | 0.89 | 0 | 0 | 0 | 0 | 0 | 0 | 0.46 |
| 12 | 4.64 | 0.27 | 0.89 | 0 | 0 | 0 | 0 | 0 | 0 | 1.90 |
| 9 | 19.55 | 3.02 | 2.68 | 0.52 | 0 | 0 | 0 | 0 | 0 | 8.23 |
| 6 | 80.75 | 7.40 | 7.59 | 1.03 | 0 | 0 | 3.15 | 1.03 | 0 | 32.98 |
| 3 | 293.08 | 41.94 | 40.63 | 7.74 | 12.49 | 4.79 | 15.75 | 6.55 | 0 | 124.68 |
| 0 | 938.44 | 1256.66 | 1288.96 | 1466.61 | 1366.55 | 1478.91 | 1350.20 | 1416.56 | 1419.44 | 1200.90 |
| -3 | 292.75 | 41.40 | 42.86 | 4.64 | 13.74 | 1.92 | 11.03 | 6.89 | 0 | 124.26 |
| -6 | 74.35 | 8.22 | 10.72 | 0.52 | 0 | 0 | 0 | 0.34 | 0 | 30.75 |
| -9 | 19.55 | 1.92 | 2.23 | 0.52 | 0 | 0 | 0 | 0 | 0 | 8.01 |
| -12 | 5.63 | 0.27 | 1.34 | 0 | 0 | 0 | 0 | 0 | 0 | 2.32 |
| -15 | 0.77 | 0 | 0.45 | 0 | 0 | 0 | 0 | 0 | 0 | 0.34 |
| -20 | 0.11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.04 |
| -30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| -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 |
| FLIGHT HOURS @ ALT | 9.05 | 3.65 | 2.24 | 1.94 | 0.80 | 1.04 | 0.63 | 2.90 | 1.45 | 23.71 |
| FLIGHT MILES @ ALT | 1758.01 | 966.39 | 794.83 | 793.19 | 358.67 | 505.83 | 309.94 | 1419.36 | 710.03 | 7616.26 |

| | |
|---|---|
| TOTAL FLIGHTS | 56 |
| TOTAL FLIGHT HOURS FLAPS UP A | 23.71 |
| TOTAL FLIGHT MILES FLAPS UP AND DOWN | 7616.26 |

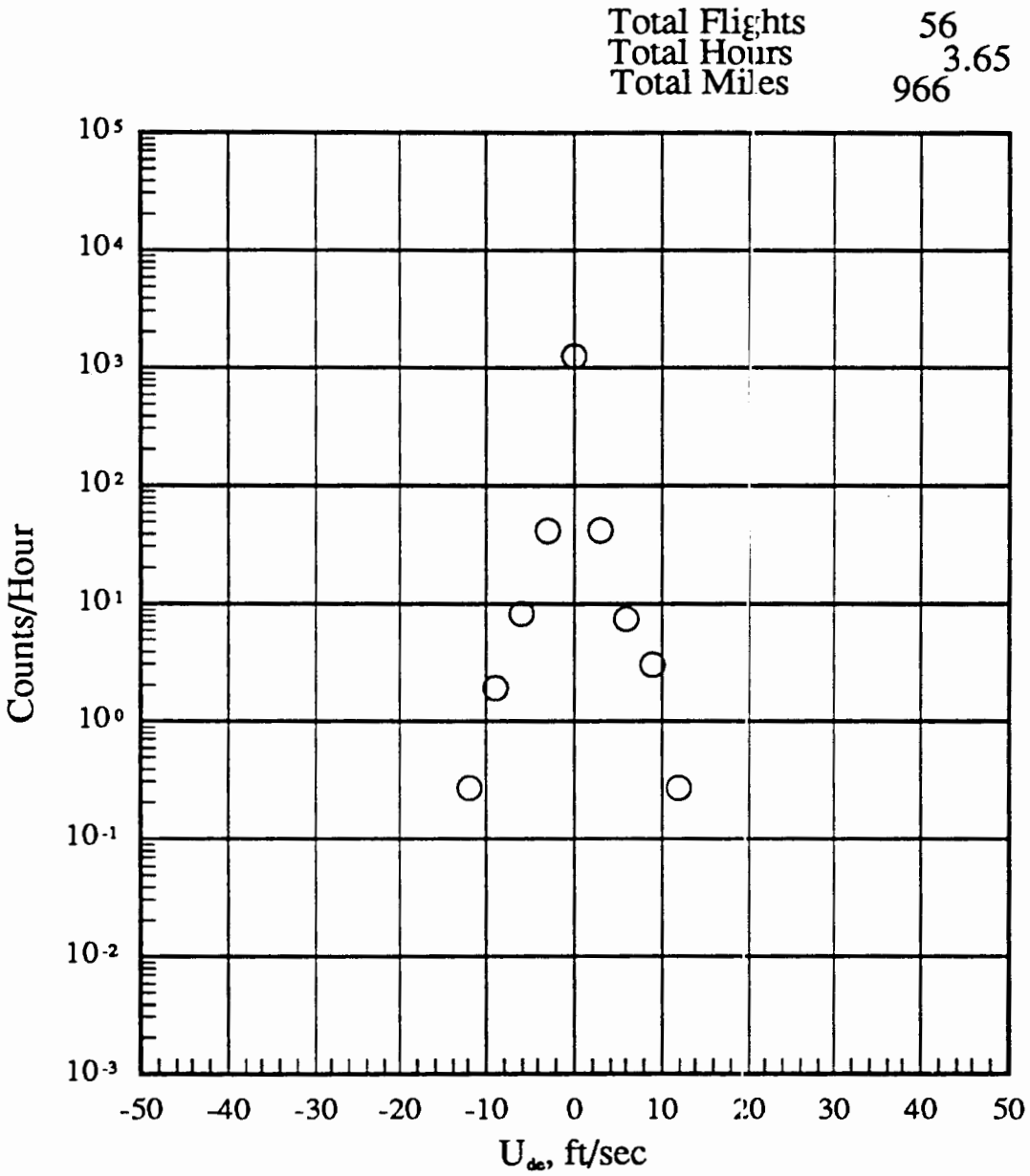
(a) $U_{de}$ Level crossing counts per hour within pressure altitude bands

Figure 24.- $U_{de}$ exceedances: Nonrevenue flights.



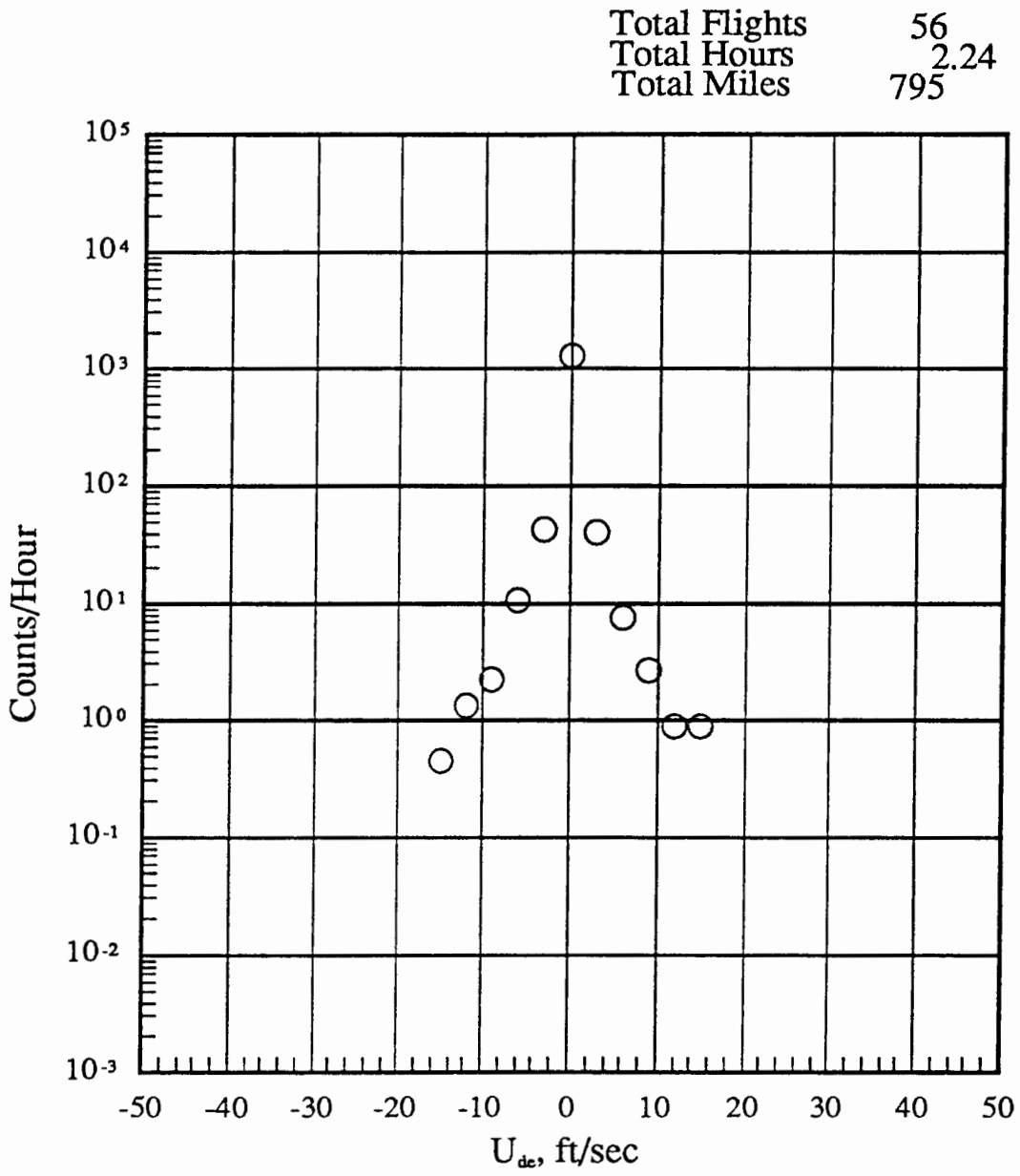

(b) -500 to 4500 feet altitude

Figure 24.- Continued.



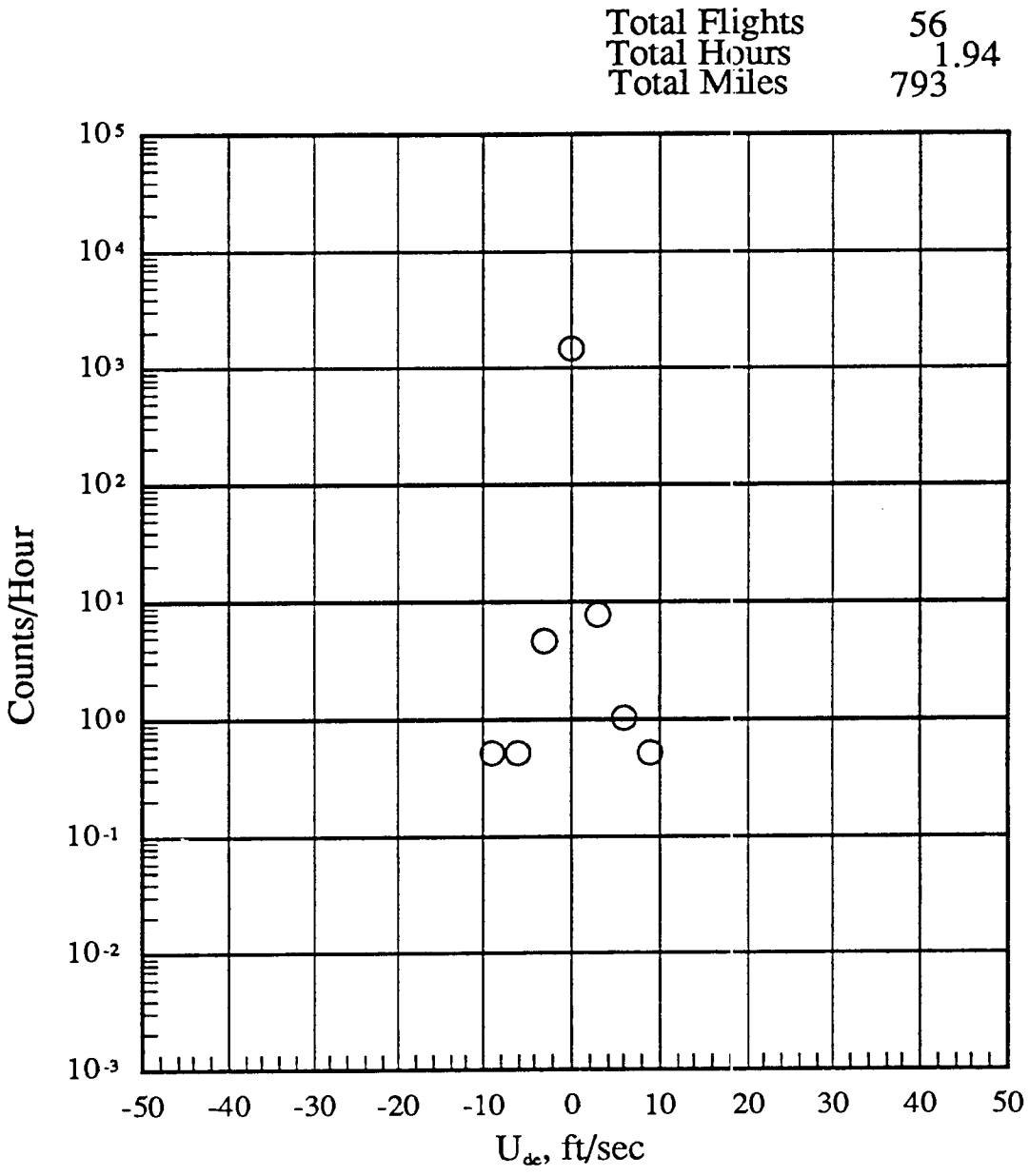

(c) 4500 to 9500 feet altitude

Figure 24.- Continued.



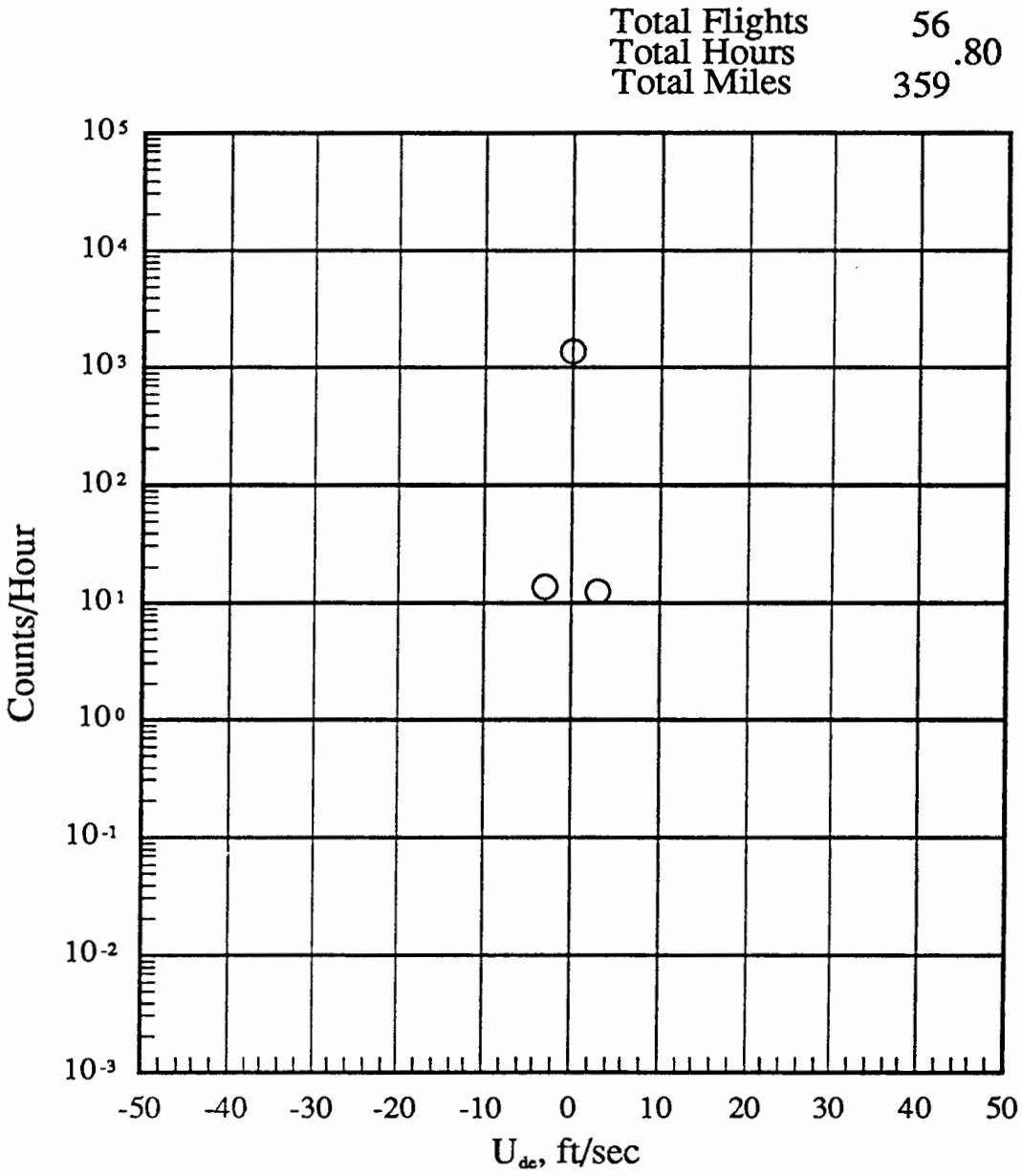

(d) 9500 to 14500 feet altitud

Figure 24.- Continued.



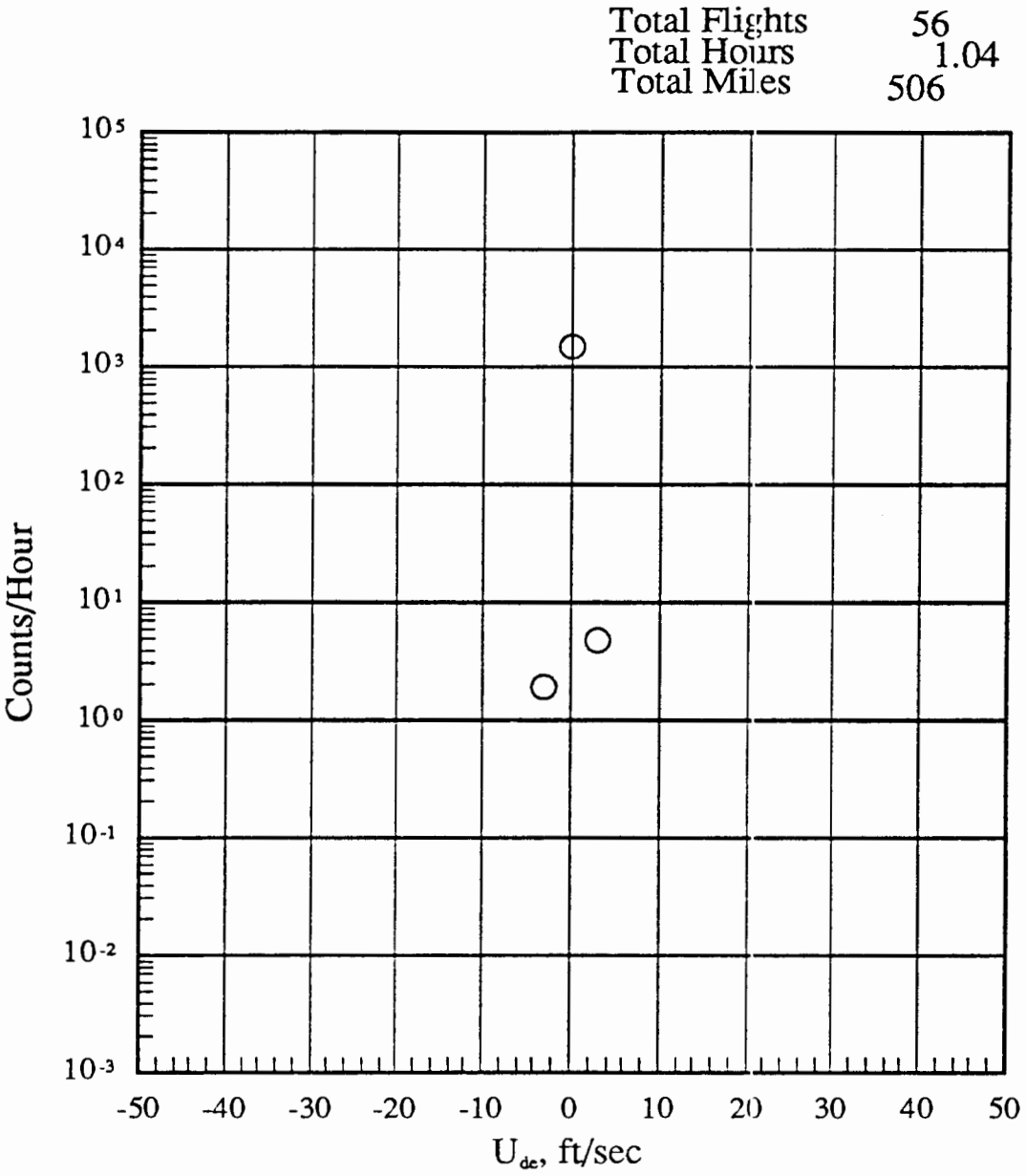

(e) 14500 to 19500 feet altitude

Figure 24.- Continued.



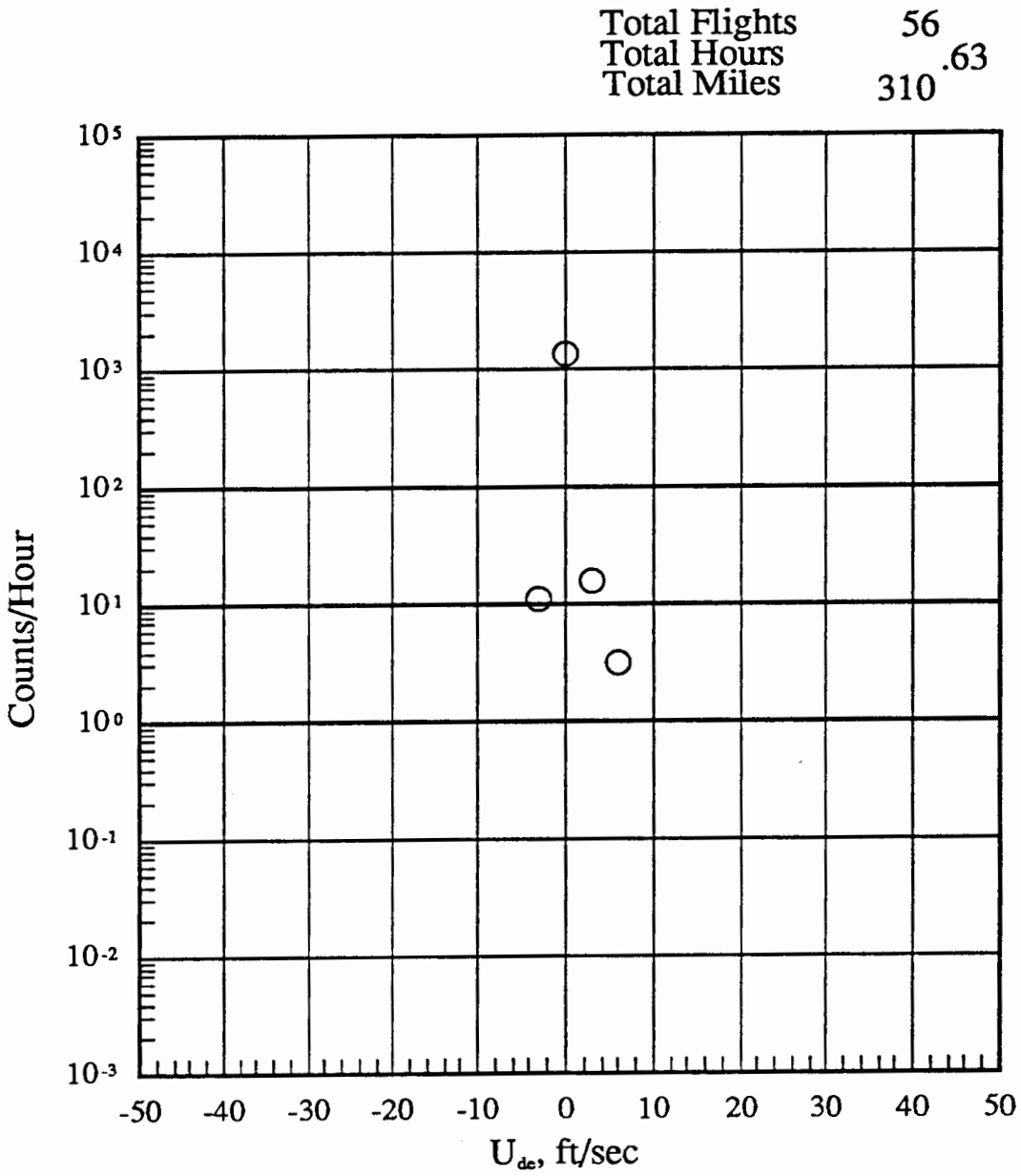

(f) 19500 to 24500 feet altitude

Figure 24.- Continued.



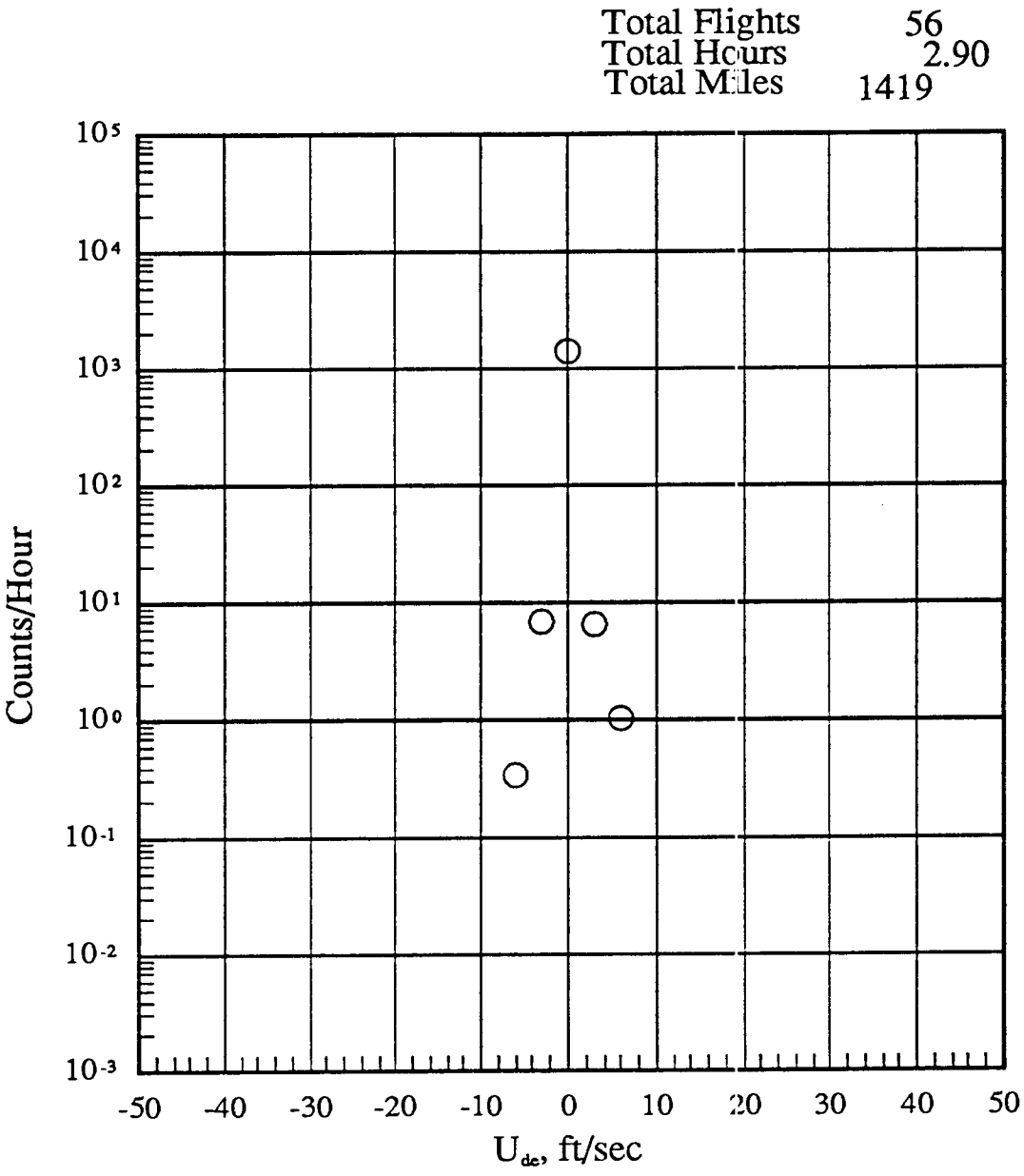

(g) 24500 to 29500 feet altitude

Figure 24.- Continued.



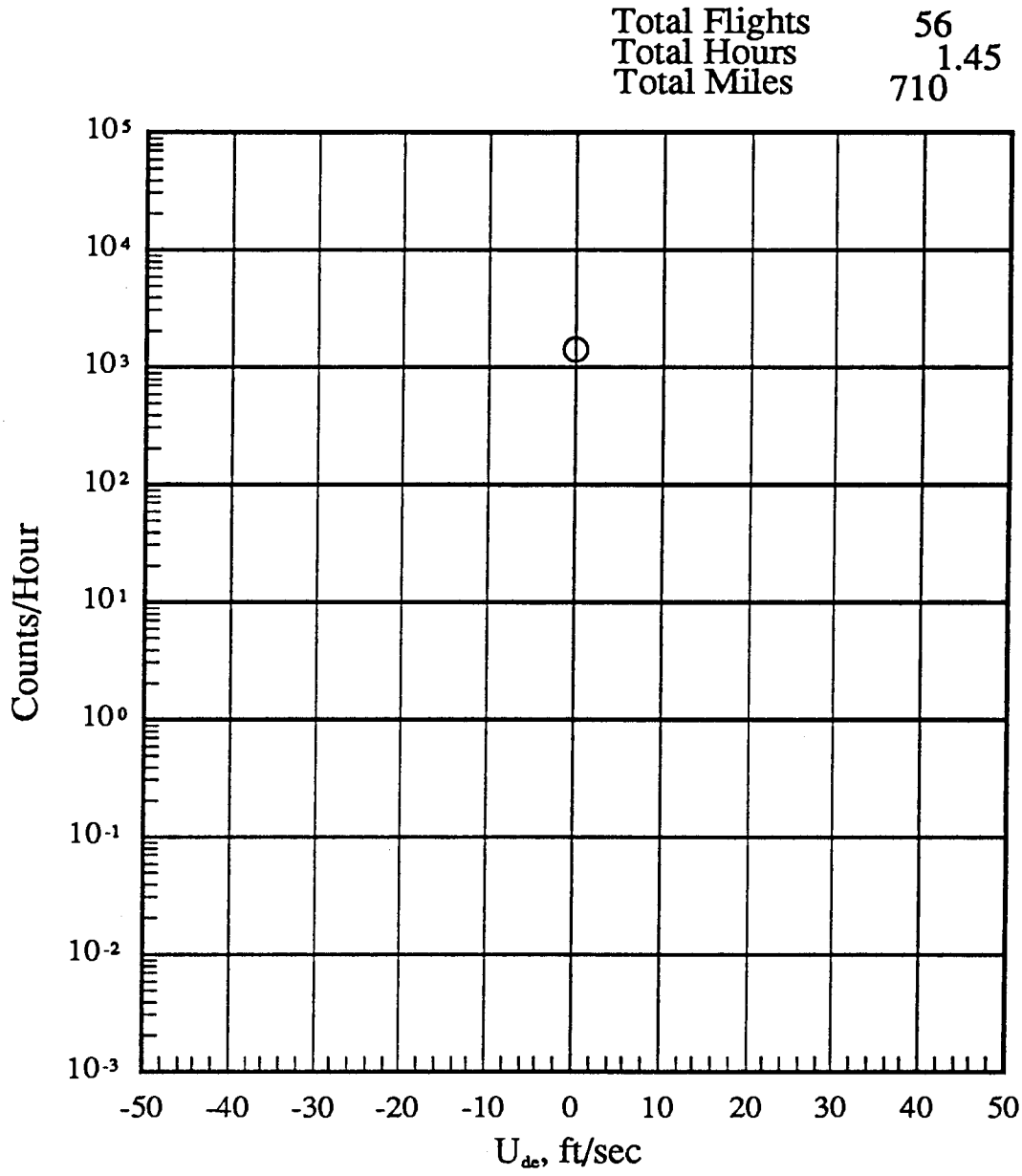

(h) 29500 to 34500 feet altitude

Figure 24.- Continued.



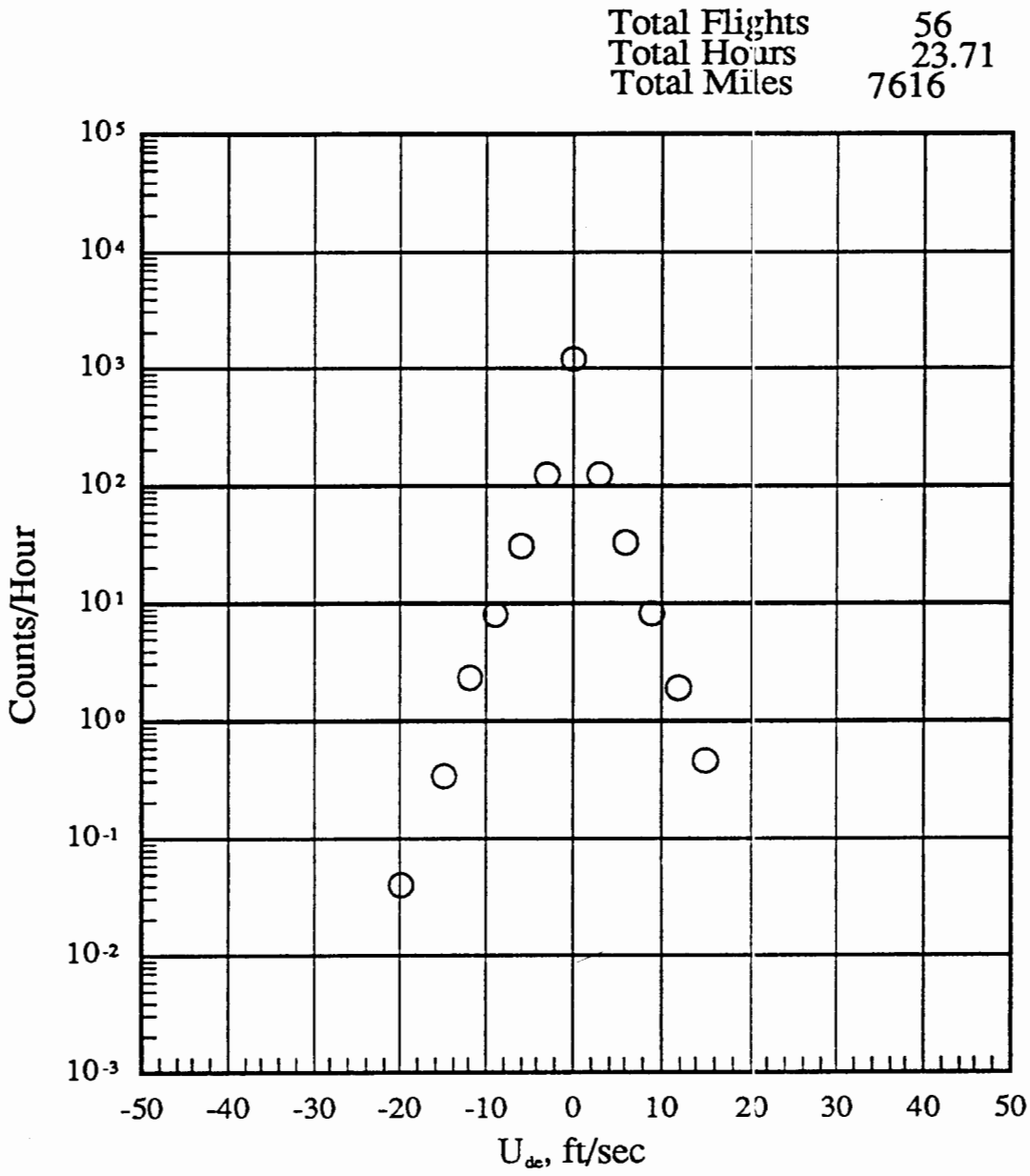

(i) 34500 to 39500 feet altitude

Figure 24.- Continued.



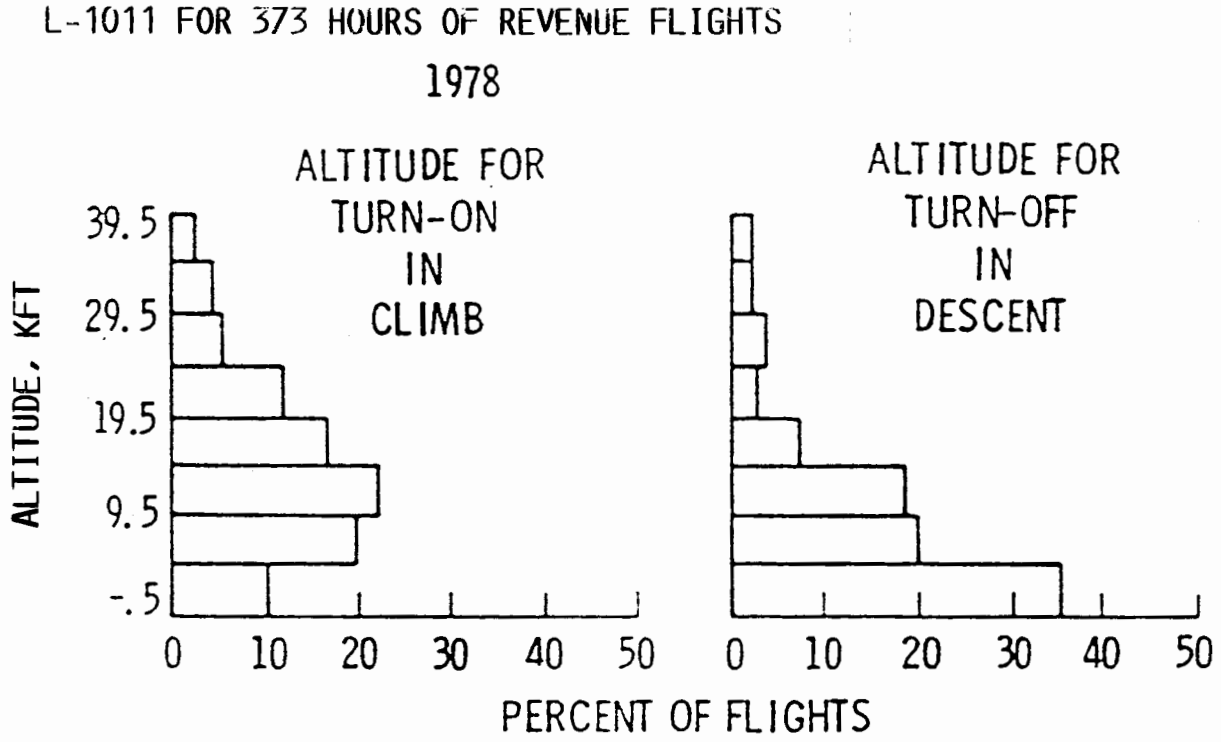

(j) 39500 to 44500 feet altitude

Figure 24.- Continued.




(k) -500 to 44500 feet altitude

Figure 24.- Concluded.




SUMMARY

- AUTOPILOT WAS "ON" ABOUT 75% OF THE TIME
- AUTOPILOT WAS "ON" AT TOUCHDOWN FOR 5% OF THE FLIGHTS
- AUTOPILOT WAS NOT USED ON 8% OF THE FLIGHTS

Figure 25. - Autopilot on-off statistics.

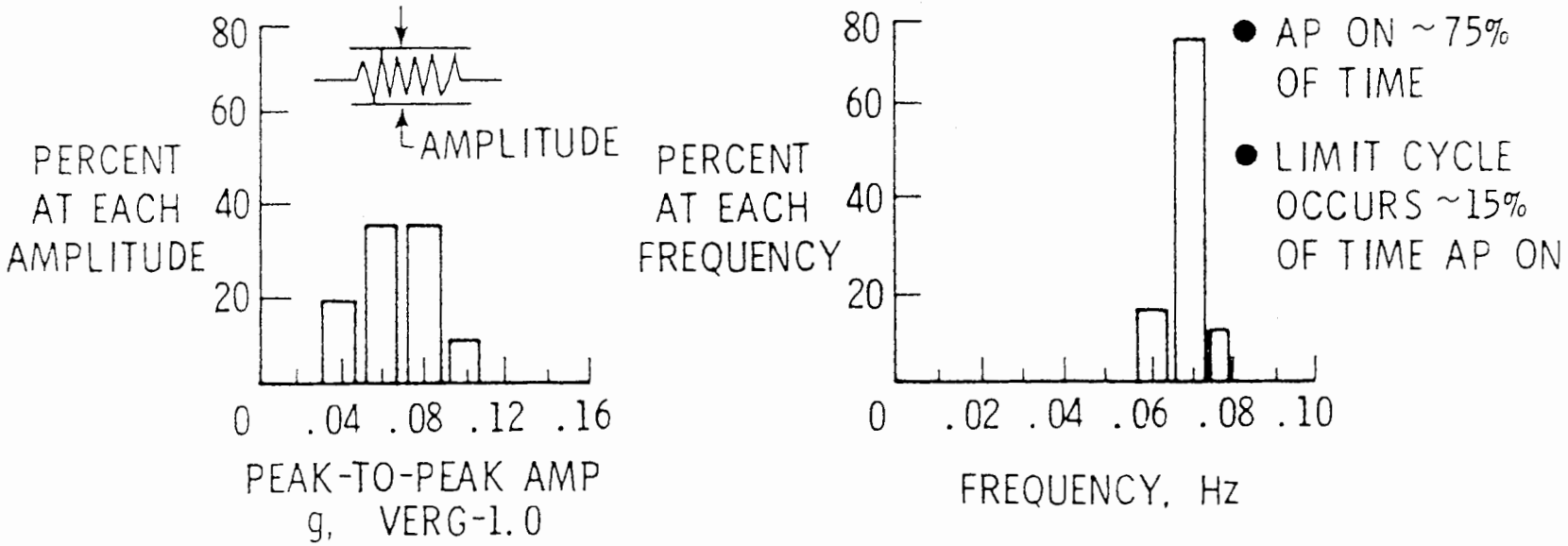



Figure 26.- Autopilot "limit cycle" experience.

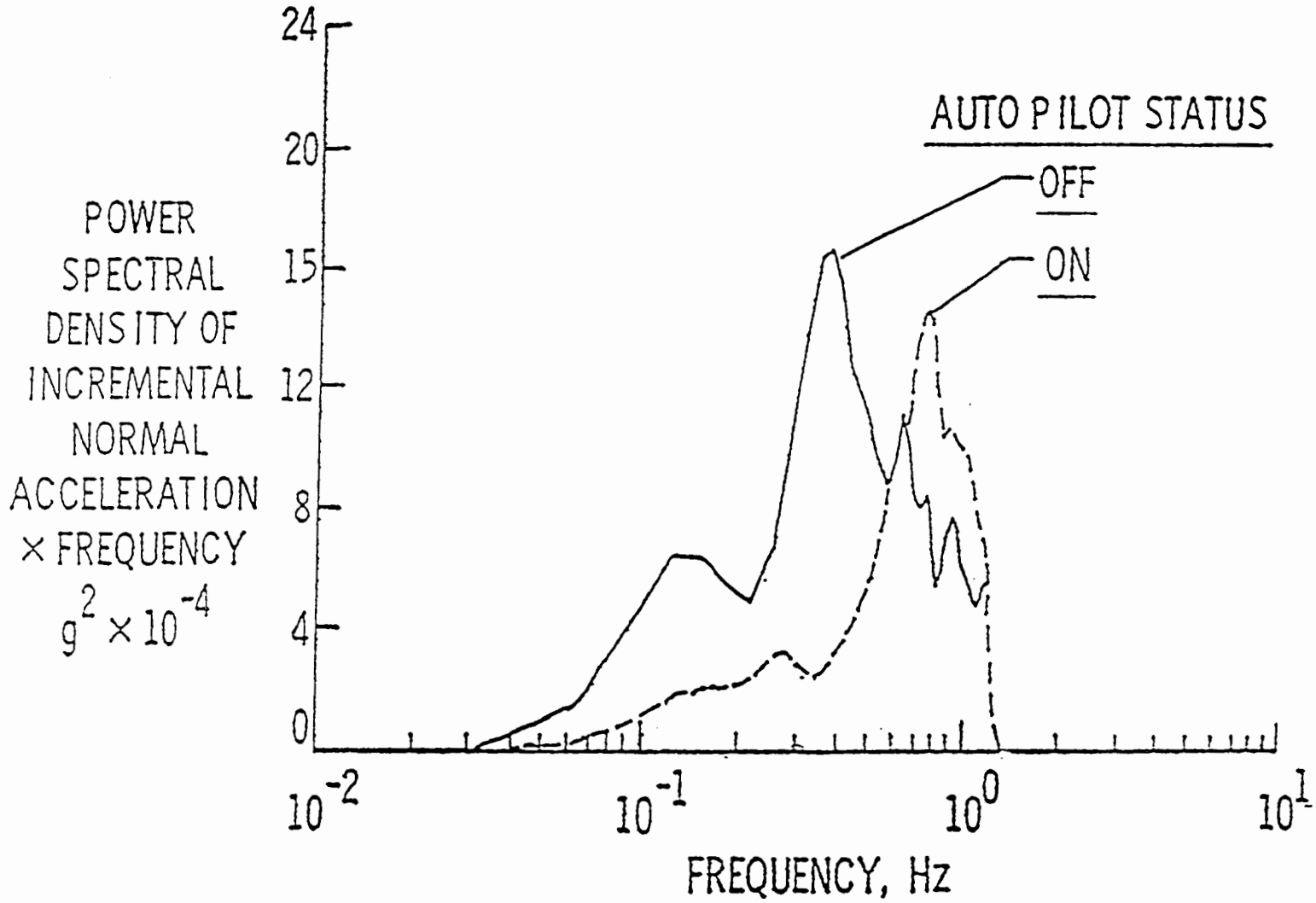



FIGURE 27.- Effect of autopilot on normal acceleration power spectra.

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**16. Abstract**

L 1011 Digital Flight Data Recorder data taken in 1978-1979 were analyzed to provide many statistical data types useful for updating airliner airworthiness design criteria.

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