TAER WIND CONVERSION PROGRAM (TARWON)

USER'S MANUAL

May 1971

Lockheed

HUNTSVILLE RESEARCH & ENGINEERING CENTER

LOCKHEED MISSILES & SPACE COMPANY

A GROUP DIVISION OF LOCKHEED AIRCRAFT CORPORATION

HUNTSVILLE, ALABAMA

LOCKHEED MISSILES & SPACE COMPANY

HUNTSVILLE RESEARCH & ENGINEERING CENTER

HUNTSVILLE RESEARCH PARK

4800 BRADFORD DRIVE, HUNTSVILLE, ALABAMA

TAER WIND CONVERSION PROGRAM
(TARWON)
USER'S MANUAL

May 1971

Contract NAS8-26128

by

John E. Tyson

APPROVED: _____

E. A. Carter, Supervisor
Meteorology Section

_____

Donald McDonald, Manager
Structures & Mechanics Dept.

_____

J.S. Farrior
Resident Director

FOREWORD

This document presents the results of work performed
by the Meteorology Section, Structures & Mechanics Depart-
ment of Lockheed's Huntsville Research & Engineering Center.
This work was carried out under Contract NAS8-26128, "Opti-
mum FPS-16/Jimsphere Data Reduction Procedures," for the
Marshall Space Flight Center. The NASA contracting officer
representative for this contract was Dr. George Fichtl of the
Aerospace Environment Division, Aero-Astrodynamics Labo-
ratory.

ACKNOWLEDGMENT

The author is grateful to Mr. S. J. Krivo and Mr. R. E.
DeMandel of Lockheed-Huntsville for their assistance and
helpful discussions during the study and program develop-
ment.

CONTENTS

ILLUSTRATIONS

TABLES

Section 1
INTRODUCTION AND SUMMARY

Raw FPS-16/Jimsphere radar tracking data are presently stored at NASA-Marshall Space Flight Center on magnetic tapes. These data consist of Time, Azimuth, Elevation and slant Range (TAER) measurements recorded at 0.1-second time intervals. As more data are gathered daily, the number of computer tapes required for storing the data is becoming larger and is presenting storage and data handling problems. Thus, in order to retain all previously recorded data, some of which have been discarded for lack of storage space, a method was developed by which a computer program is used to reduce the number of tapes required for storing these data. Specifically, this method converts all 0.1-second TAER data to 1-second velocity component data using editing and low-pass filtering techniques. The new 1-second velocity data contain all the useful information present in the 0.1-second TAER data, as discussed in Ref. 1 with an added benefit of a 90% reduction in the number of computer tapes required for storage.

This document provides the necessary information for using the Lockheed-Huntsville TAER Wind Conversion Program (TARWON) to convert raw FPS-16 radar tracking data of the Jimsphere balloon to smoothed, 1-second velocity component data. The approach used in TARWON to edit the TAER data and to derive 0.1-second values of the Cartesian coordinates of the balloon's position are basically the same, except for differences in numerical techniques, as those currently used by NASA in the process of deriving 25-meter wind data (Ref. 2). Beyond this point, however, the two procedures are entirely different. TARWON converts the 0.1-second position coordinates to 0.1-second values of meridional, zonal and vertical components of the balloon's velocity. The TARWON program is primarily designed to be operational on the NASA-MSFC Univac 1108, Exec 8 computing system, but with little effort, its operation

1-1

can be extended to other computing systems. Included in this user's manual is the mathematical model, general program description, input guide and three appendices. Appendix A presents the user with the derivation of the equations used in linear curve fitting; Appendix B presents a program listing; and Appendix C presents a sample data case illustrating both program input and output. Tables and figures are also presented to aid in the discussion of program development.

Copies of the TARWON program will be presented to NASA-MSFC in deck form and in magnetic tape form — stored at the NASA-MSFC Computation Laboratory — for program utilization.

Section 2

MATHEMATICAL MODEL

The purpose of the TAER Wind Conversion Program (TARWON) is to compute 1-second velocity data from one-tenth second slant range, azimuth and elevation (RAE) data as observed while tracking the Jimsphere balloon with the FPS-16 radar unit at 0.1-second time intervals continuously. Section 2 presents the equations used in editing the RAE data to obtain the 1-second Z_s (altitude), U_s (zonal), V_s (meridional) and W_s (rise-rate) velocity components. Figures, tables and discussion of program procedures are also presented.

2.1 PROGRAM GENERATED TIME

Program generated time is defined as a monotonic increasing array of points in time, equally spaced by one-tenth second. An analysis of time as recorded by the FPS-16 radar unit while tracking the Jimsphere balloon revealed that tracking time was recorded erroneously in some cases because of tracking errors or magnetic tape faults. Since possible discontinuities in time could arise from such erroneous recordings of tracking time, the actual tracking time is used only as a reference and the program-generated time array is used in computations to prevent discontinuities in time. Time, when referred to in this report, should be regarded as program generated time unless noted otherwise.

2.2 EDITING

The first phase of program development, sometimes called a pre-editing phase, is concerned with eliminating errors in RAE data that were induced by tracking errors or tape unit faults such as bit-dropping during initial recording of data. These induced errors are characterized as "stray" points and data gaps (a thorough discussion of these induced errors can be found in Ref. 3),

and are eliminated using a least squares linear curve fitting technique, as discussed in Appendix A. Program generated time is used to obtain the equations below for computing the least squares coefficients necessary to fit a linear curve through nine values of range, azimuth and elevation data.

$$C_{1_R} = \frac{1}{6} \sum_{j=K}^{K_2} (j-K-4) R_j$$

$$C_{0_R} = \frac{1}{9} \sum_{j=K}^{K_2} R_j - C_{1_R} T_{K+4}$$

$$C_{1_A} = \frac{1}{6} \sum_{j=K}^{K_2} (j-K-4) A_j$$

(2.2.1)

$$C_{0_A} = \frac{1}{9} \sum_{j=K}^{K_2} A_j - C_{1_A} T_{K+4}$$

$$C_{1_E} = \frac{1}{6} \sum_{j=K}^{K_2} (j-K-4) E_j$$

$$C_{0_E} = \frac{1}{9} \sum_{j=K}^{K_2} E_j - C_{1_E} T_{K+4}$$

where R, A and E are the arrays of slant range, azimuth and elevation; T_{K+4} is the current time in seconds associated with the (K+4)th or midpoint of the nine point array and $K_2 = K + 8$, (K = 1, 2, ...). The derivation and discussion of Eqs. (2.2.1) are presented in Appendix A. Using Eqs. (2.2.1), midpoints of the 9-point intervals are computed and denoted as midpoint estimates. In addition, a tenth point or look-ahead estimate is computed. The following

2-2

equations are used to compute the midpoint and look-ahead estimates.

$$\hat{r}_m = C_{0_R} + C_{1_R} t_m$$

$$\hat{a}_m = C_{0_A} + C_{1_A} t_m$$

$$\hat{e}_m = C_{0_E} + C_{1_E} t_m$$

$$\hat{r}_L = C_{0_R} + C_{1_R} t_{10}$$

$$\hat{a}_L = C_{0_A} + C_{1_A} t_{10}$$

$$\hat{e}_L = C_{0_E} + C_{1_E} t_{10}$$

(2.2.2)

where t_m and t_{10} are the current times of the midpoint and the tenth point respectively and $\wedge$ denotes estimate.

Comparisons are made between (1) the computed midpoint estimates and the observed midpoint values, and (2) the computed look-ahead estimates and the observed look-ahead values. The comparisons take the form:

$$\left| \text{L. S. Est.} - \text{OBS} \right| \leq (\text{FACTOR})(\text{RMS ERROR})$$

(2.2.3)

where the RMS error is defined as the amount of error which can be induced into the RAE data by the FPS-16 radar unit while tracking the Jimsphere balloon. The RMS errors provided by the radar unit manufacturer are 5 yards, 0.01 degrees and 0.01 degrees for slant range, azimuth angle and elevation angle observations respectively (see Ref. 2, the NASA-MSFC TAER edit program). Lockheed-Huntsville as well as Ref. 2 uses a factor of three (3) for midpoint comparisons and factors of twenty (20), fifteen (15) and fifteen (15) for range, azimuth and elevation look-ahead comparisons respectively. The factors used in the look-ahead comparisons are larger than those used in the midpoint

comparisons since the tenth point was not used in the original curve fitting. If the tolerance test (Eq. 2.2.3) fails, the observed value is replaced with the L. S. estimate, thus removing the stray point. Look-ahead editing prevents inclusion of a stray point when computing L. S. coefficients from the next nine points. The general procedure for 9-point editing is depicted in Fig. 1 and discussed on the following page.
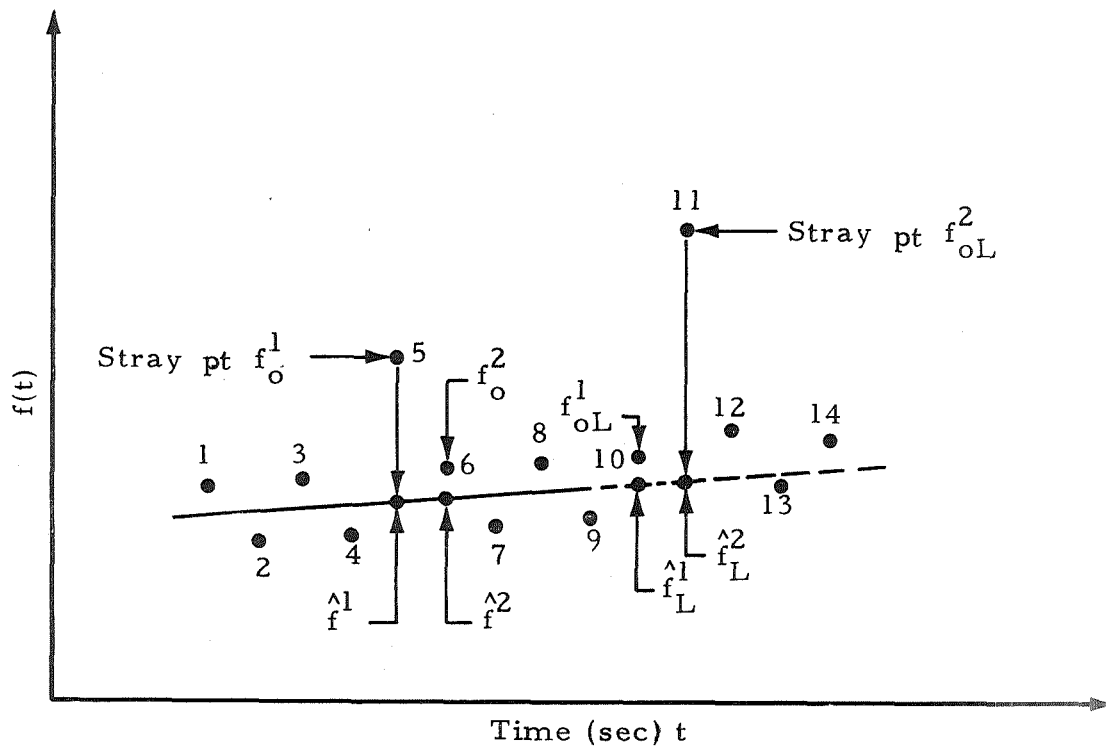
Fig. 1 - Depiction of Stray Point Removal

2-4

Stray Points

From Fig. 1, points 1 through 9 are curve-fit to obtain f(t). Using f(t), estimate $\hat{f}^1$ is computed for midpoint 5 and compared with the observed value f_o^1. Assuming that the comparison test fails, the observed value f_o^1 is replaced with $\hat{f}^1$. The look-ahead point 10 estimate $\hat{f}_L^1$ is computed and compared with the observed look-ahead point f_{oL}^1. Assuming the comparison test is satisfied, no replacements are made and the 9-point editing proceeds to curve fit points 2 through 10, where the previous midpoint replacement value $\hat{f}^1$ is used in curve fitting points 2 through 10. Using the equation describing points 2 through 10, the midpoint estimate $\hat{f}^2$ for point 6 is computed and compared with the observed value f_o^2 of midpoint 6. Assuming the comparison test is satisfied and no midpoint replacement is necessary, the look-ahead estimate $\hat{f}_L^2$ is computed and compared with the observed look-ahead value, f_{oL}^2. Assuming that the look-ahead comparison test fails, the observed value f_{oL}^2 is replaced with the computed estimate $\hat{f}_L^2$ and the 9 point editing process begins anew with points 3 through 11.

Data Gap

A discontinuity in tracking data is characterized as a data gap. Data following a data gap appear as many adjacent stray points when compared to data preceding the data gap and will be replaced with the computed least squares estimates during the look-ahead editing process. A data gap is assumed if ten (10) consecutive look-ahead replacements are made. A data gap occurrence is depicted in Fig. 2 and discussed on the following page.
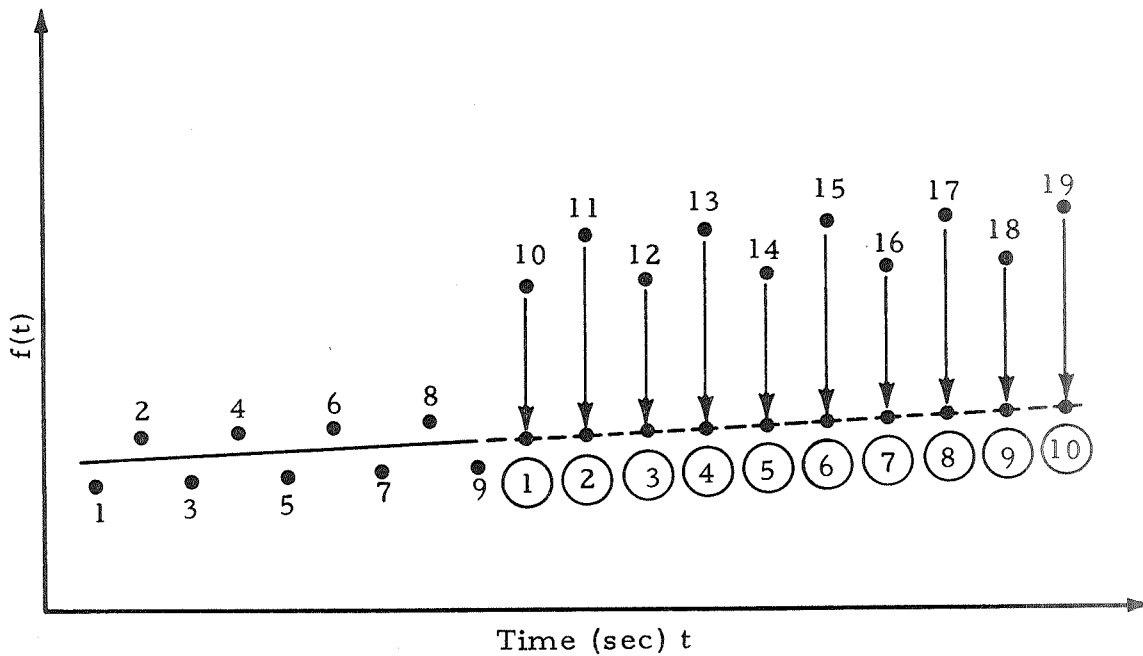
Fig. 2 - Depiction of Data Gap Occurrence

As shown in Fig. 2, points 1 through 9 are curve fitted, look-ahead point 10 is replaced with the estimated point ①; points 2 through ① are curve fitted and look-ahead point 11 is found to be "stray" and is replaced with the estimate ②; continuing this process and curve fitting points ① through ⑨, the look-ahead point 19 is examined. If look-ahead point 19 is replaced by estimate ⑩, a data gap is assumed to have occurred in the data and all ten replacements are considered invalid and the original values are restored. After restoration of the original values, points 9 of each array of range, azimuth and elevation, which are the last "good" values of each array, are replaced with a value of -10^6 to indicate a data gap follows this point. The curve fitting then begins again with points 10 through 18.

2.3 ONE-TENTH SECOND VELOCITY COMPUTATIONS

One-tenth second velocity components zonal (u), meridional (v) and rise-rate (w) with the associated altitude (z) are computed from the one-tenth second RAE data. Transformations of slant range, azimuth and elevation are made from spherical coordinates to a rectangular coordinate system whose origin is at the earth's center; thus accounting for the earth's curvature with the rectangular coordinates. The equations for determining X_c, Y_c and Z_c (the "c" denoting with respect to the earth's curvature) are:

$$X_c = R_E \tan^{-1} \left[\frac{X_s}{Z_s + R_E} \right] \qquad \text{(positive east)}$$

$$Y_c = R_E \tan^{-1} \left\{ \frac{Y_s}{\left[X_s^2 + (Z_s + R_E)^2 \right]^{\frac{1}{2}}} \right\} \qquad \text{(positive north)} \qquad (2.3.1)$$

$$Z_c = \left[X_s^2 + Y_s^2 + (Z_s + R_E)^2 \right]^{\frac{1}{2}} - R_E \qquad \text{(positive upward)}$$

where R_E, the radius of the earth at the Eastern Test Range, Cape Kennedy (6,373,334 meters) is considered to be that of a spherical earth, and

$$X_s = \rho \cos\theta \sin\phi \qquad \text{(positive east)}$$

$$Y_s = \rho \cos\theta \cos\phi \qquad \text{(positive north)}$$

$$Z_s = \rho \sin\theta \qquad \text{(positive upward)}$$

where

$$\rho \quad - \quad \text{slant range (meters)}$$
$$\theta \quad - \quad \text{elevation (radians)}$$
$$\phi \quad - \quad \text{azimuth (radians)}$$

From Eqs. (2.3.1), one-tenth second velocity components are computed using the following relations:

$$u_K = \frac{1}{2\Delta t} (X_{c_{K+1}} - X_{c_{K-1}})$$

$$v_K = \frac{1}{2\Delta t} (Y_{c_{K+1}} - Y_{c_{K-1}})$$

$$\hspace{10cm} (2.3.2)$$

$$w_K = \frac{1}{2\Delta t} (Z_{c_{K+1}} - Z_{c_{K-1}})$$

$$z_K = Z_{c_K}$$

where $\Delta t = 0.1$ since the data are equally spaced by 0.1 second.

As stated previously, a large negative number, -10^6, is used to identify the presence of a data gap. If this large negative quantity is encountered at some (K+1)th point in the TAER data when computing the 0.1-second velocity data, the Kth, (K+1)th and (K+2)nd values of z, u, v and w in Eqs. (2.3.2) above are flagged with the same quantity, -10^6, and calculations begin again.

2.4   ONE SECOND VELOCITY CALCULATIONS

One-second velocity components, U_s (zonal), V_s (meridional), W_s (rise-rate) and Z_s (altitude) are computed from the 0.1-second velocity components

using a Martin-Graham low-pass filter. Fifty-five weights are applied over a
55-point interval so that the points are equally weighted on either side of the
midpoint to produce a mirror image. For example, the weights for points 1
and 55 are the same, 2 and 54 are the same, etc. These weights were chosen
since they provide a desirable frequency response as discussed in Ref. 1.
These weights are presented in Table 1.

Table 1

WEIGHTS USED TO OBTAIN SMOOTHED ONE SECOND
VELOCITY DATA

Points	Weight	Points	Weight
(1,55)	-.00170115	(15,41)	.00536330
(2,54)	-.00335008	(16,40)	.01109891
(3,53)	-.00509943	(17,39)	.01746935
(4,52)	-.00685550	(18,38)	.02431932
(5,51)	-.00850874	(19,37)	.03146420
(6,50)	-.00993790	(20,36)	.03869666
(7,49)	-.01101528	(21,35)	.04579480
(8,48)	-.01161294	(22,34)	.05253129
(9,47)	-.01160935	(23,33)	.05868300
(10,46)	-.01089632	(24,32)	.06404076
(11,45)	-.00938586	(25,31)	.06841865
(12,44)	-.00701636	(26,30)	.07166239
(13,43)	-.00375800	(27,29)	.07365641
(14,42)	.00038329	(28,28)	.07432916

The equations used to determine the 1-second Z_s (altitude) and velocity com-
ponents U_s (zonal), V_s (meridional) and W_s (rise-rate) are the following.

$$Z_{s_k} = \omega_{28} z_{i+27} + \sum_{j=1}^{27} \omega_j \left[z_{i-j+27} + z_{i+j+27} \right]$$

2-9

$$U_{s_k} = \omega_{28} u_{i+27} + \sum_{j=1}^{27} \omega_j \left[u_{i-j+27} + u_{i+j+27} \right]$$

$$V_{s_k} = \omega_{28} v_{i+27} + \sum_{j=1}^{27} \omega_j \left[v_{i-j+27} + v_{i+j+27} \right]$$

$$W_{s_k} = \omega_{28} w_{i+27} + \sum_{j=1}^{27} \omega_j \left[w_{i-j+27} + w_{i+j+27} \right]$$

where ω_j are the weights, $j=1, 2, \ldots, 28$

$$i=1, 11, 21, \ldots, 991, \quad k = \left[\frac{i}{10} \right] + 1$$

where $\left[\quad \right]$ denotes integral portion and k has the range: $1 \leq k \leq 100$.

LOCKHEED - HUNTSVILLE RESEARCH & ENGINEERING CENTER

Section 3
PROGRAM DESCRIPTION

Computing system requirements and available program options are discussed, as well as each program unit of the TAER Wind Conversion Program.

3.1 SUMMARY OF PROGRAM OPTIONS

Several options are available in the TAER Wind Conversion program and in summary these are:

- An option is available for skipping any number of files on the TAER data tape before processing is begun.

- Variable logical tape/Fastrand numbers may be inputted to be used in accordance with the various input/output options. See the Input Guide.

- An unlimited number of files of TAER data may be processed. The number of files is input data to the program.

- Physical record length of TAER data may be 60 words/record or 600 words/record. The record size is input.

- One-tenth (0.1) second wind velocity components may be computed. If requested, x, y and z transformations are computed from the TAER data with corrections for the earth's curvature and a 0.1-second velocity tape is generated. The physical record length of each record on tape is 1000 words/record consisting of 250 values of altitude, zonal, meridional and rise-rate components.

- An option is available to smooth one-tenth (0.1) second velocity components using the Martin-Graham low-pass filter with fifty-five (55) weights and create a tape with one (1) second velocity components. All files of 0.1-second velocity data will be read from logical unit ND2 and all files of 1-second velocity data will be written on logical unit ND4 with physical record lengths of 800 words. Each record will consist of 200 values of 1.0-second velocity components.

- Plotting may be requested for TAER data (edited or unedited) and/or 1-second velocity data, using program generated time. The SC 4020 plotter is used for all plotting.

- All files of TAER data need not be edited. If editing is requested, two options are available:

  1. Editing midpoints and look-ahead points.

  2. Editing look-ahead points only.

● Whether editing of a particular file of TAER data is requested or not, an option is available for skipping any number of records initially due to initial "wild" points or due to the presence of an identification record which is sometimes written at the beginning of each file of data.

Each of the above options will be discussed in the following subsections and in Section 4, the Input Guide.

3.2 COMPUTING REQUIREMENTS

The hardware and software requirements, core storage requirements and program run times for the TAER Wind Conversion program are discussed with the following paragraphs.

3.2.1 Hardware and Software Requirements

Effort was made to provide the program user with an efficient third generation computer program which could be used on the Univac 1108, Exec 8 multiprocessing system available at NASA-MSFC. Both FORTRAN IV and FORTRAN V languages are utilized in the program.

3.2.2 Core Storage Utilized

The amount of storage required for program operation is as follows:

● IBANK — 14,682
● DBANK — 15,800
Total   30,482 words

3.2.3 Program Run Time

A timing study was made to determine the program run time required to edit one file of TAER data to obtain one file of 1-second velocity data. Editing options (1) midpoint/look-ahead editing and (2) look-ahead editing only were used to obtain the following run times:

Edit Option	Min/File (Average)
Midpoint/Look-Ahead	1.8
Look-Ahead	1.3

Three assumptions were made to obtain the times above. They are:

- One File of TAER data consisted of 600 words/record and contained an average of 125 records/File.
- No Plotting required.

Program execution time on the Univac 1108, Exec 8 multiprocessing system cannot be determined exactly; a reasonable average must be assumed. Experience with this system reveals that execution time for a sample case can vary as much as 25% when it is executed several times.

3.3 MAIN PROGRAM

The main program is basically a driver to all subprograms necessary to perform the following tasks:

- Edit 0.1-second TAER data.
- Plot the 0.1-second TAER data (edited or unedited).
- Compute X_c, Y_c and Z_c transformations of the TAER data accounting for the earth's curvature.
- Create an edited 0.1-second TAER data tape.
- Create a 0.1-second wind velocity data tape with altitude and zonal, meridional and rise-rate velocity components.
- Create a 1-second wind velocity data tape containing altitude and zonal, meridional and rise-rate velocity components using a Martin-Graham low-pass filtering technique.

3.4 SUBPROGRAMS

The subprograms referenced by the main program are of two forms: (1) entry points within a subroutine and (2) subroutines. Entry points are used to combine similar or related operations and to minimize the complexity and physical size of the program.

3-3

The following subprograms are referenced by the main program:

- TAPE
- PLOTT
- CALCOF
- EDITM

- EDITL
- TRANS
- OUTPUT
- FILTER

In addition, system routines for I/O operations, SC 4020 plotting and arithmetic operations are utilized.

CALCOF

Subroutine CALCOF is referenced if editing of TAER data is requested. The purpose of CALCOF is to compute the necessary coefficients to fit least squares curves of degree one through nine points of slant range, azimuth and elevation as a function of equally spaced points in time. The equations for this operation are presented in Section 2.

The calling sequence for CALCOF is:

CALL CALCOF (K)

where K is the subscript of the first of nine points of the TAER data arrays to be used in curve fitting and K has the range $1 \leq K \leq 1000$.

EDITM

Subprogram EDITM is an entry point located within subroutine CALCOF and is referenced if midpoint editing is desired. Within CALCOF, as mentioned previously, nine points of range, azimuth and elevation are used to determine six unique least squares coefficients, see Eqs. (2.2.3), which describe three linear curve fits over these data. Using these three least squares fits, the midpoints of each nine point interval are computed and compared with the original

3-4

values to locate "stray" points. A point is considered "stray" if the numerical difference of the original and least squares estimate exceeds a specific tolerance. Tolerances of 15.0 yd, 0.03 deg and 0.03 deg are used for midpoint comparisons when editing range, azimuth and elevation respectively. Values of range, azimuth or elevation data which fail these tolerance tests are replaced with the least squares estimate and the program flag ICOFER is set to allow the data to be printed out and studied. Figure 1, page 2-4, is an example of midpoint replacements. The mathematical equations for these comparisons are presented in Section 2.

The calling sequence for EDITM is:

CALL EDITM (K+4)

where K+4 is the subscript of the midpoints of the nine data values of the range, azimuth and elevation arrays and K has the range: $1 \leq K \leq 1000$.

EDITL

Subprogram EDITL is an entry point located within subroutine CALCOF and is referenced to search for "stray" points and gaps in range, azimuth and elevation data. Data gaps are defined as missing TAER data values within a specified time interval which force the functions of range, azimuth and elevation (RAE data) versus time to be discontinuous. EDITL analyzes one point ahead of the original nine values of range, azimuth and elevation used in determining the least squares coefficients to check for extreme variation in the following data and to reduce the possibility of using "stray" points in computing the next set of coefficients. The linear equations, determined from the six previously computed coefficients for range, azimuth and elevation least squares estimates, are used to extrapolate projected estimates of these RAE data at the next point (or tenth point). See Eqs. (2.2.2), page 2-3. The projected values and observed values are compared as in the midpoint editing. The tolerances used in the tenth or look-ahead point comparisons are 100 yd, 0.15 deg and 0.15 deg for the range, azimuth and elevation respectively. Observed values of RAE data

3-5

which exceed the projected values by the appropriate tolerances are replaced with the projected or least squares estimate and the program flag ICOFER is set to allow the data to be printed. Unlike EDITM, an error counter (KOUNT) is used in EDITL to count the number of replacements. If 10 consecutive references to EDITL result in replacements, a data gap is assumed to have been encountered, the replacements are considered invalid, and the original observed values of RAE data are restored. To indicate this data gap, the last "good" values of range, azimuth and elevation (see Fig. 2) preceding the occurrence of the data gap are set equal to the value -10^6. The current point counter K is then modified to allow the 9-point curve fitting to begin again with the values of RAE data immediately following the flagged values, and the error counter KOUNT is reinitialized.

The equations used in EDITL are in Section 2.

The calling sequence for EDITL is:

CALL EDITL (K)

where K is the subscript of the first values of RAE data used in the least squares curve fitting. Note that K+9 will be the subscript of the look-ahead values of range, azimuth and elevation.

TRANS

Subprogram TRANS is an entry point within subroutine CALCOF which is referenced to transform the values of slant range, azimuth and elevation from spherical coordinates into rectangular coordinates with a correction for the earth's curvature to allow one-tenth second velocity data to be computed later in the main program. The equations used in computing the transformations are in Section 2.

The calling sequence for TRANS is:

CALL TRANS (R, A, E, XC, YC, ZC)

where R, A and E are given values of slant range, azimuth and elevation respectively, and XC, YC and ZC are the resulting cartesian coordinates.

OUTPUT

Subprogram OUTPUT is a general purpose I/O package which contains the entry point TAPE. Subroutine OUTPUT is referenced when detailed printout is requested for the edited RAE data (noting that replacements were made during editing) and the 0.1-second velocity data that were computed from the edited RAE data. All data printed will be from the WARAY, located in the labeled common block TRAN1, which will contain either the TAER data or the velocity data, depending upon when subroutine OUTPUT is called. The calling sequence of subroutine OUTPUT is:

CALL OUTPUT (TITLE)

where TITLE is a five (5) word Hollerith array used to identify the data being printed.

TAPE

Subroutine TAPE is an entry point within subroutine OUTPUT and is referenced from all program units requiring I/O operations on devices other than 5, 6 and 7.

Entry point TAPE contains logic necessary to allow all output devices to be used in a FORTRAN mode for Fastrand utilization or a non-FORTRAN mode for tape utilization. The non-FORTRAN mode is considered more desirable for production work since physical record size of data can be controlled to conserve the amount of tape used and the I/O transfers are faster in the non-FORTRAN mode. The non-FORTRAN/FORTRAN mode option is controlled by the variable

IFOR (see input guide, Section 4), which is input as zero (0) for the non-FORTRAN mode and input as one (1) for the FORTRAN mode. The FORTRAN mode utilizes the FORTRAN V language.

The following table depicts the operations that are available in entry point TAPE.

Table 2
LIST OF PROGRAM I/O OPERATIONS

Non-FORTRAN MODE, IFOR = 0		
Option	Command	I/O Statement
1	Write	CALL WRITER (NT, 2, IER, NW, ARRAY)
2	Read	CALL REDTPR (NT, 2, IERR, NWR, NW, ARRAY)
3	Open Buffers & Rewind	CALL OPEN (NT, 1, 2*)
4	Close Buffers End File & Rewind	CALL CLOSE (NT, 2)
5	Rewind Only	CALL CLOSE (NT, 4), CALL OPEN (NT, 1, 2)
6	End File Only	CALL CLOSE (NT, 3)
7	Skip Files	CALL SKFBIN (NT, IARG, IERR)
8	Skip Records	CALL SKRBIN (NT, IARG, IERR)
FORTRAN Mode, IFOR = 1		
Option	Command	I/O Statement
1	Write	**WRITE (NT) (ARRAY (NJ), NJ = 1, NW)
2	Read	**READ (NT, END = 170) (ARRAY (NJ), NJ = 1, NW)
3	Rewind Only	REWIND NT
4	End File & Rewind	END FILE NT, REWIND NT
5	Rewind Only	REWIND NT
6	End File Only	END FILE NT

*Integer specifying buffer size to be used for the File NT. This option added to NASA-MSFC Exec 8 system 26 April 1971.

**Only FORTRAN V statement used in program.

3-8

As shown in Table 2, options 7 and 8 cannot be used in the FORTRAN mode. These options are restricted to use with the TAER data input tape. Also, option 2 in the FORTRAN mode involves use of the special non-formatted read command available on the 1108 system. The purpose of its use is to detect end-of-file marks on the one-tenth second velocity tape when creating a one second velocity data tape.

The ability to detect an end-of-file mark in the FORTRAN mode is extremely useful when using the 1108, since output devices can be assigned as either tapes or Fastrand. This flexibility was used extensively during program checkout. The calling sequence for entry point TAPE is of the general form:

CALL TAPE (IUNIT, IOP, IARG, ARRAY, IERR)

where

IUNIT   The logical unit number for the I/O request.

IOP   I/O option to be performed (see Table 2).

IARG   Number of words to be transferred to/from unit number IUNIT — for options 1 and 2.
= 0 for options 3 through 6.
= number of files of TAER data to skip on unit IUNIT before processing data — option 7 only.
= number of records of TAER data to skip on unit IUNIT before processing data — option 8 only.

ARRAY   Storage location of data to be transferred to/from unit IUNIT — for options 1 and 2.
- N/A for all other options. The variable DUM is used in the calling sequence for all other options.

IERR   Error status of the read request — option 2.
= 1 - transmission of data valid.
= 2 - end of file encountered during read.
= 3 or 4 - redundancy during read request.

PLOTT

Subroutine PLOTT is referenced if data are to be plotted, utilizing the SC 4020 plotter. Four (4) options are available within subroutine PLOTT.

    1. Open plot file buffers.

    2. Compute minimum and maximum values of TAER data arrays to be plotted later using option 3.

    3. Plot TAER data, three grids per frame.

    4. Close plot file buffers.

In addition, options 1 and 4 are referenced if one (1) second velocity plots are requested.

The calling sequence for subroutine PLOTT is:

$$\text{CALL PLOTT (IOP)}$$

where IOP is the option within PLOTT to be performed.

SCRND

Subroutine SCRND is referenced by subroutine PLOTT to obtain rounded up/off maximum and minimum values of data to be plotted. SCRND is an 1108 systems routine normally referenced by the 1108 plot routines.

The calling sequence for subroutine SCRND is:

$$\text{CALL SCRND (XMAX, XMIN, X2, X1)}$$

where

XMAX, XMIN	Maximum and minimum values of some array X to be plotted.
X2, X1	Rounded up/off values of XMAX and XMIN, respectively, to be used as suitable end points for the SC 4020 grid.

For additional information concerning SCRND, see page 10.21.4.1-16 of the Univac 1108 Programmer Procedures Manual.

FILTER

Subroutine FILTER is referenced if one second wind velocity components are to be computed from the one-tenth second velocity components previously written on logical I/O Unit ND2. FILTER provides the logic necessary to apply the Martin-Graham low-pass filter (discussed in detail in Refs. 1 and 4) to the 0.1-sec velocity components using a fifty-five (55) point smoothing procedure, one weight per point. The equations used in the smoothing procedure are presented in Section 2. The low-pass filter is applied to all files of 0.1-sec velocity data furnished via logical Unit ND2. At the completion of each file, the remaining data are processed to form the final record of data for that file. The remaining unused locations in the final record are filled with zeros. All 1-second velocity data are written on logical Unit ND4.

One-second velocity data plots may be requested via program option, see the Input Guide, using the SC 4020 routine QUIK3V.

The calling sequence for FILTER is

CALL FILTER

The input/output unit numbers, ND2 and ND4; number of files to process, NFILES; and the plotting option variable IPLOT are transferred via labeled common UNITS.

Section 4

INPUT GUIDE

Section 4 serves as a user's guide for inputting data into the TAER Wind Conversion Program, TARWON. Included in this section is the input format of each data card, a brief discussion of each variable, the basic deck set-up, a sample instruction card and examples of SAVE labels which must be used to save the generated output tapes.

4.1 CARD INPUT

The following is a list of the input variables and their input format.

Card	Variables	Format
1	ISKIP, ND1, NFILES, NWPREC, ND3, ITRAN, ND2, IFILTR, ND4, IPLOT, IFOR	(11I6)
2*	IEDIT, NREC	(2I6)

*Card 2 is repeated for each file of TAER data processed. A Card 2 will be read NFILES times.

4.2 DESCRIPTION OF INPUT VARIABLES

Variable	Description
ISKIP	Number of files to skip on input tape ND1 before processing TAER data.
ND1	Logical tape number containing the TAER data. If ND1 is input as zero, logical unit 8 is used.
NFILES	Number of files of TAER data to process. All need not be edited. Files that are to be skipped are not included.

Variable	Description
NWPREC	Number of words per physical record of TAER data supplied via logical unit ND1. Only two options are available: 60 words/record or 600 words/record.
ND3	Logical unit number for edited TAER data to be written. If ND3 is input as zero, ND3 is set to logical unit number 10, but is not referenced unless IEDIT (which is discussed later) becomes nonzero.
ITRAN	$\neq 0$ Compute x, y and z coordinates from edited or unedited TAER data (using corrections for the earth's curvature) and from these values, compute 0.1-second velocity components writing these data on logical unit ND2. = 0 Do not compute x, y and z coordinates and do not create a 0.1-second velocity tape.
ND2	Logical unit number for 0.1-second velocity components to be written. If ND2 is input as zero, ND2 is set to logical unit 9, but is not referenced unless ITRAN is nonzero.
IFILTR	$\neq 0$ Compute 1-second velocity components from the 0.1-second velocity components stored on unit ND2 and write the resulting data on unit ND4. If this option is requested, ITRAN is set equal to one since 0.1-second velocities must be computed. = 0 Do not compute 1-second velocity components.
ND4	Logical unit number for 1-second velocity data to be written. If ND4 is input as zero, ND4 will be set to logical unit 11 but will not be referenced unless IFILTR is nonzero.
IPLOT	= 0 No plots. = 1 Plot TAER data (edited or unedited) only. = 2 Plot 1-second velocity data only. = 3 Plot both options 1 and 2.
IFOR	= 0 Generate output tapes in non-FORTRAN mode. = 1 Generate output tapes in FORTRAN mode.
IEDIT	= 0 Do not edit this file of TAER data. = 1 Edit midpoints and look-ahead points in this file of TAER data. = 2 Edit look-ahead points only in this file.
NREC	$\neq 0$ Skip NREC records on this file of TAER data before processing (whether editing is requested or not). = 0 Do not skip any records on this file before processing (whether editing is requested or not).

4-2

4.3 TAER DATA INPUT TAPE FORMAT

The TAER data input tape is assumed to be written in IBM 7094 floating point binary as illustrated in the deck set-up, Subsection 4.7. The "W" option on assign card 1 denotes this assumption. If the TAER data input tape is written in Univac floating point binary, the "W" option must be removed. The format structure is of two forms:

1. 60 word physical records, each block containing 10 values of TAER data (6 words per 0.1-second time step).

2. 600 word physical records, each block containing 100 values of TAER data. (6 words per 0.1-second time step).

Word	Data
1	Time in hours
2	Time in seconds
3	Slant range in yards
4	Azimuth in degrees
5	Elevation in degrees
6	Radar number
7	Time in hours
8	Time in seconds (word 2 + 0.1-second)
.	
.	
.	
60*	Same as 6
61	Time in hours
.	
.	
.	
599	Elevation in degrees
600	Same as 6

*If data are written in 60 word physical records, word 60 is last word of that record.

Words 1 and 6 of each 0.1-second time step are not utilized. In some cases, a 9 word tape identification record may appear as the first record on each file. This identification record is skipped using the "skip record" option described earlier in this section.

4.4 EDITED TAER DATA OUTPUT TAPE FORMAT

An edited TAER data tape will be written if requested via program option. As stated previously in this report, all output tapes may be written in a non-FORTRAN mode or a FORTRAN mode. If the non-FORTRAN mode is requested, data will be written in 1000 word physical word records. Use of

the FORTRAN mode will result in 1000 word logical records. Each 1000 word record contains 250 values of tracking time, slant range, azimuth and elevation with four words per 0.1-second time step. The format structure is:

Word	Data
1	Time in seconds (Tracking)
2	Range in yards
3	Azimuth in degrees
4	Elevation in degrees
5	Word 1 + 0.1 second
6	Range in yards
⋮	
1000	Elevation in degrees

4.5 ONE-TENTH SECOND VELOCITY OUTPUT TAPE FORMAT

A one-tenth second velocity output tape will be written if requested via program option. Data will be written in either 1000 word physical records or 1000 word logical records depending upon the mode (FORTRAN or non-FORTRAN) requested. Each 1000 word record contains 250 values of each velocity component described below. The format structure is four words per 0.1-second time step as follows:

Word	Component
1	Altitude (m)
2	Zonal (m-sec^{-1})
3	Meridional (m sec^{-1})
4	Rise-rate (m sec^{-1})
5	Same as 1
6	Same as 2
⋮	
1000	Same as 4

4.6 ONE SECOND VELOCITY OUTPUT TAPE FORMAT

A one second velocity output tape is written if requested via program option. Data are written in either 800 words per physical record (non-FORTRAN mode) or 800 words per logical record (FORTRAN mode). Each 800 word record contains 200 values of each velocity component described on the following page. The format structure is four words per one second time step as follows:

4-4

Word	Component
1	Altitude (m)
2	Zonal (m sec^{-1})
3	Meridional (m sec^{-1})
4	Rise rate (m sec^{-1})
5	Same as 1
6	Same as 2
.	
.	
.	
800	Same as 4

LOCKHEED - HUNTSVILLE RESEARCH & ENGINEERING CENTER

4.7   DECK SETUP FOR UNIVAC 1108, EXEC 8
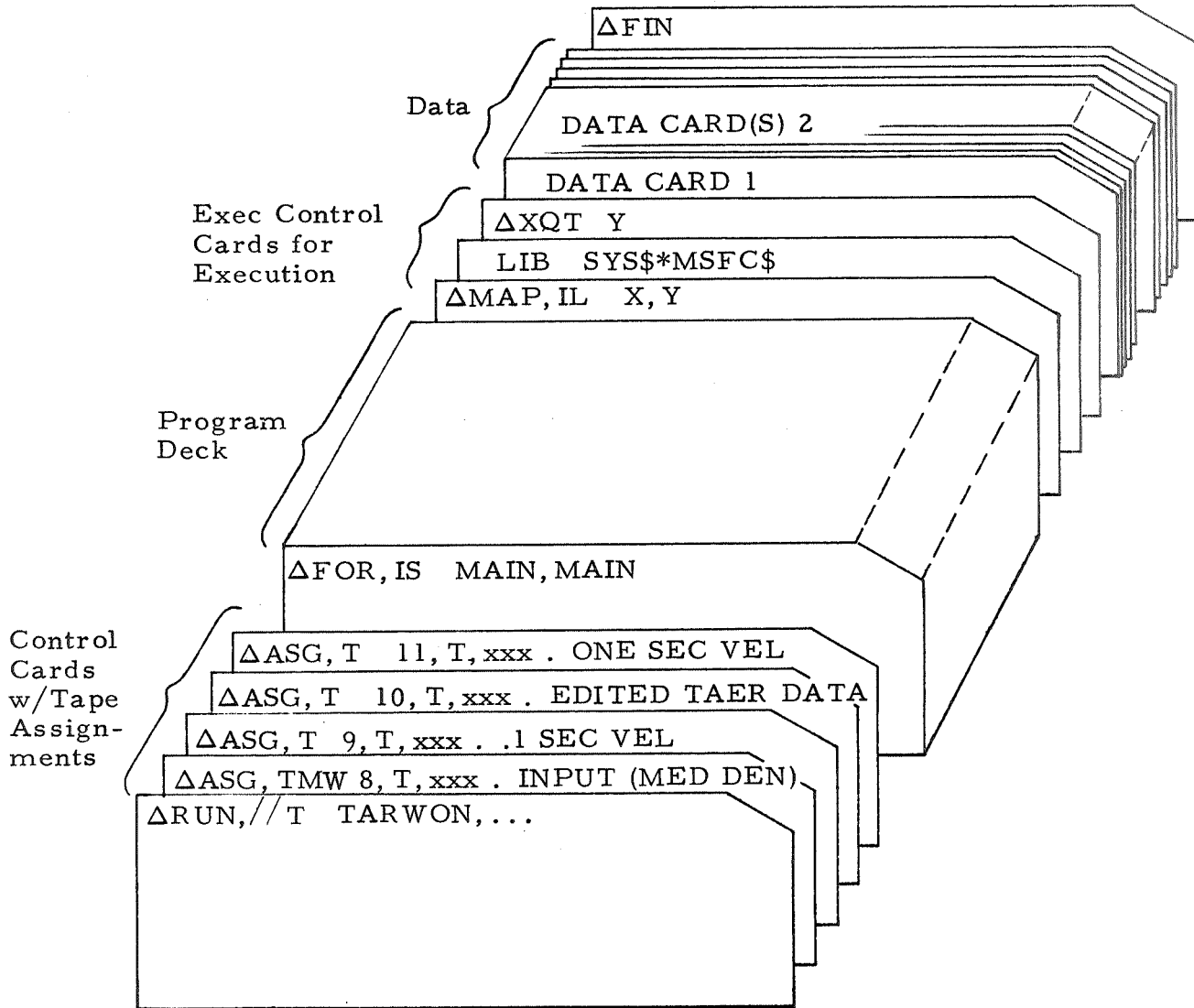
Comments:

The "M" and "W" options appearing on the first assign card indicate that the input tape containing the raw TAER data is written in medium density (556 BPI) and in IBM 7094 floating point binary.   The absence of M and W implies high density (800 BPI) and 1108 floating point binary repectively.   The symbol "Δ" denotes the master space 7/8 punch.

4.8 INSTRUCTION CARD FORMAT

1108 RUN REQUEST & INSTRUCTIONS

NAME (LAST & INITIAL)		OP CODE	JOB#		PROD #
TYSON, J		11	XXXXXX		

BIN#	BLDG#	RM#	RUN-ID		RUN	
XXX	XXXX		TARWON		OF 1	1

EST. CPU RUN TIME	CORE SIZE	PUNCH	☒ COMPILE
___ HRS. 10 MINS.	30K		☒ EXECUTE ☐ SORT

☐ ☒ EXEC VIII	LANGUAGE FOR	MAX. PAGES 100	☐ SPECIAL FORMS TYPE COPIES

DOES THIS JOB HAVE A RESTART PROCEDURE? ☐ YES ☒ NO

INPUT TAPES			OUTPUT TAPES ONLY				
REEL NO.	FILE NAME	UNIT	REEL NO.	FILE NAME	LOG-IC	UNIT	SAVE
36548	8	/		9		/	✳
		/		10		/	✳
		/		11		/	✳
		/				/	
		/				/	
		/				/	
		/				/	
		/				/	
		/				/	
		/				/	
		/				/	
		/				/	
		/				/	
		/				/	

PROGRAMMER COMMENTS:

☐ OVER

MICRO FILM		COPIES		COPY FLO		OPER. INIT.
#FILES	#FRAMES	P	F	P	F	SEQ.#
8	200	✓	✓			

OPERATOR COMMENTS: ☐ SEE TECH. ☐ SEE OPER.

MSFC - Form 3019 (Rev August 1969)   ☐ OVER

LOCKHEED - HUNTSVILLE RESEARCH & ENGINEERING CENTER

4.9 SAVE LABEL FORMAT

The following SAVE label format is used on the Univac 1108 system.

CENTRAL SITE SAVE LABEL		MONTH	DAY	YEAR
PROGRAMMER (LAST & INITIAL) TYSON, J		JOB NUMBER XX XX XX		

DR. #	DENSITY 8	BIN X	B C D	REEL 1	REELS OF 1

FILE NAME: B5 (9)

TITLE: EDITED TAER DATA

PUNCH	BIN # XXX	# COPIES	FORM #

CLASS 5	SEQ. #	# FILES 4	UNIT CODE

MSFC FORM 340 (REV. FEB. 1968)

CENTRAL SITE SAVE LABEL		MONTH	DAY	YEAR
PROGRAMMER (LAST & INITIAL) TYSON, J		JOB NUMBER XXXXXX		

DR. #	DENSITY 8	BIN X	B C D	REEL 1	REELS OF 1

FILE NAME: A6(10)

TITLE: .1 SEC VEL DATA

PUNCH	BIN # XXX	# COPIES	FORM #

CLASS 5	SEQ. #	# FILES 4	UNIT CODE

MSFC FORM 340 (REV. FEB. 1968)

CENTRAL SITE SAVE LABEL		MONTH	DAY	YEAR
PROGRAMMER (LAST & INITIAL) TYSON, J		JOB NUMBER XXXXXX		

DR. #	DENSITY 8	BIN X	B C D	REEL 1	REELS OF 1

FILE NAME: B6 (11)

TITLE: ONE SEC VEL DATA

PUNCH	BIN # XXX	# COPIES	FORM #

CLASS 5	SEQ. #	# FILES 4	UNIT CODE

MSFC FORM 340 (REV. FEB. 1968)

REFERENCES

1. DeMandel, R.E., and S.J. Krivo, "Study to Improve the Accuracy and Resolution of FPS-16 Radar/Jimsphere Wind Measurements, Final Report," LMSC-HREC D225068, Lockheed Missiles & Space Company, Huntsville, Ala., June 1971.

2. Biner, Daniel J., "FPS-16 Spherical Balloon Reduction," Document No. 0189, Computer Science Corporation in support of NASA-MSFC, 29 April 1967.

3. DeMandel, R.E., and S.J. Krivo, "Characteristics and Processing of FPS-16/Jimsphere Raw Radar Data," NASA CR-61290, NASA-MSFC, May 1969.

4. DeMandel, R.E., and S.J. Krivo, "Selecting Digital Filters for Application to Detailed Wind Profiles," NASA CR-61325, NASA-MSFC, October 1969.

BIBLIOGRAPHY

1. Ralston, Anthony, A First Course in Numerical Analysis, Chapter 6, McGraw-Hill, New York, 1965.

2. Scoggins, James R., "An Evaluation of Detailed Wind Data as Measured by the FPS-16 Radar/Spherical Balloon Technique," NASA Technical Note D-1572, National Aeronautics and Space Administration, 1963.

3. Scoggins, James R., "Sphere Behavior and the Measurement of Wind Profiles," NASA TN D-3994, NASA-MSFC, June 1967.

4. Scoggins, James R. and Michael Susko, "FPS-16 Radar/Jimsphere Wind Data Measured at the Eastern Test Range," NASA TM X-53290, 1965.

Appendix A

METHOD OF LEAST SQUARES LINEAR CURVE FITTING
FOR DISCRETE EQUALLY SPACED DATA POINTS

INVESTIGATION AND APPLICATION

Appendix A

A.1 INTRODUCTION

The method of least squares is employed extensively in the TAER WIND CONVERSION PROGRAM, TARWON, in search of "stray" points and discontinuities in the observed TAER (Time, Azimuth, Elevation and Range) data. Each of the observed TAER data are approximated with a linear least squares approximation of the form

$$P_{(t)} = C_o + C_1 t$$

where C_o and C_1 must be determined and time is the independent variable in seconds. Omitting the rigorous theory of least squares, it is true that the above coefficients, C_o and C_1 must be computed such that

$$S = \sum_{i=1}^{N} \left[y_i(t) - P_i(t) \right]^2$$

is a minimum for all t_i, $i=1, 2, \ldots, N$ where $P_i(t) = C_o + C_1 t_i$ is the approximating polynomial of degree one (1) and $y_i(t)$ are the observed data values at the ith points. Using calculus and taking partial derivatives of S with respect to C_o and C_1, we obtain the following equations respectively.

$$\sum_{i=1}^{N} C_o + C_1 \sum_{i=1}^{N} t_i = \sum_{i=1}^{N} y_i \qquad \text{(A.1.1)}$$

and

$$C_o \sum_{i=1}^{N} t_i + C_1 \sum_{i=1}^{N} t_i^2 = \sum_{i=1}^{N} t_i y_i \qquad \text{(A.1.2)}$$

Solving these equations simultaneously, equations for C_o and C_1, below, are obtained which produce an absolute minimum.

$$C_o = \frac{\sum_{i=1}^{N}(1)\sum_{i=1}^{N}y_i - \sum_{i=1}^{N}t_i\sum_{i=1}^{N}t_iy_i}{\sum_{i=1}^{N}(1)\sum_{i=1}^{N}t_i^2 - \left(\sum_{i=1}^{N}t_i\right)^2} \qquad (A.1.3)$$

$$C_1 = \frac{\sum_{i=1}^{N}(1)\sum_{i=1}^{N}t_iy_i - \sum_{i=1}^{N}t_i\sum_{i=1}^{N}y_i}{\sum_{i=1}^{N}(1)\sum_{i=1}^{N}t_i^2 - \left(\sum_{i=1}^{N}t_i\right)^2} \qquad (A.1.4)$$

These equations for C_o and C_1 are considered the classical equations for computing a linear least squares approximation of N discrete data points and were used initially in developing the TAER WIND CONVERSION PROGRAM with good results. As development of the program proceeded, numerical errors were encountered in the curve fitting procedure which led to a study of these equations. The results of the study found the classical equations for C_o and C_1 to be inappropriate when applied to the TAER data due to the magnitude of the independent variable, time.

Analytically speaking, it can be proved that the denominator, which we shall denote as D, can never be zero. The proof will be omitted since it can be found in any numerical analysis textbook. Numerically speaking however, the denominator D can be zero. It was found that as the magnitudes of the quantities $\sum_{i=1}^{N}(1)\sum_{i=1}^{N}t_i^2$ and $\left(\sum_{i=1}^{N}t_i\right)^2$ increased, the difference of these two quantities, D, while being perfectly acceptable analytically, became numerically unacceptable. The usable single precision computer word size available on

A-2

both the IBM 7094 and Univac 1108 systems provide decimal accuracy to only eight places and therefore resulted in divisions by zero and consequently numerical errors induced into the data. In addition, an observation was made that errors were induced infrequently on the IBM 7094 computing system and very frequently using the Univac 1108 computing system. This observation can be attributed to the differences in handling floating point divisions by zero on the two computing systems. Figure A-1 depicts a typical example of errors being induced into the TAER data as a result of dividing by zero.

It should be noted at this time that the classical equations for computing the coefficients C_o and C_1, Eqs. (A.1.3) and (A.1.4) respectively, are general equations and are in no way restrictive to equally or unequally spaced data.

Two approaches were considered to eliminate possible divisions by zero: the use of double-precision in the computations and a re-evaluation of Eqs. (A.1.3) and (A.1.4) to reflect the equally spaced property of the independent variable time associated with TAER data. Due to the large amounts of data normally processed when editing, the use of double precision was felt unwise since program run time would be greatly increased. Therefore, a re-derivation of the equations for C_o and C_1 was decided upon that would reflect the equally spaced property that exists with the TAER data and provide new equations for C_o and C_1 more suitable for computer application. The re-derivation and method of programming is presented herein.
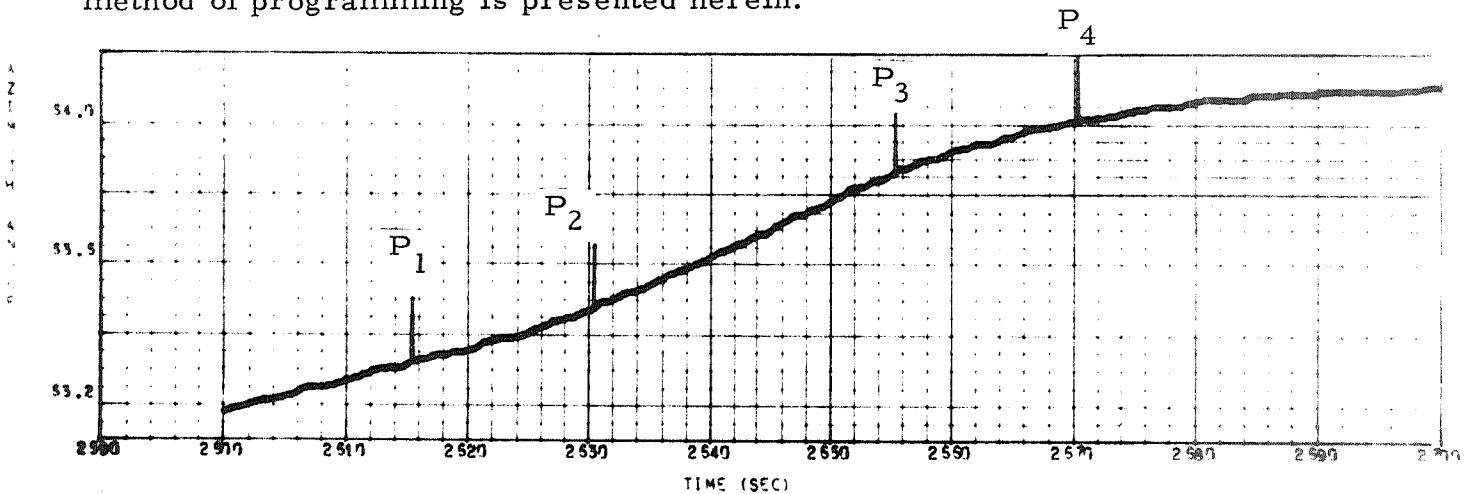
Fig. A-1 - Example of Induced Errors in Curve Fitting (Points P_1, P_2, P_3, and P_4 are Values of Azimuth that were Induced into the data Resulting from Divisions by Zero)

A-3

A.2 DERIVATION

Equation (A.1.4) may be written in the general form

$$C_1 = \frac{\displaystyle\sum_{i=K}^{K_2} (1) \sum_{i=K}^{K_2} y_i t_i - \sum_{i=K}^{K_2} t_i \sum_{i=K}^{K_2} y_i}{\displaystyle\sum_{i=K}^{K_2} (1) \sum_{i=K}^{K_2} t_i^2 - \left(\sum_{i=K}^{K_2} t_i\right)^2} \qquad (A.2.1)$$

where $K = 1, 2, \ldots, N$, $K_2 = K + K^*$ and K^* is the number of data points minus one to be used in the curve fitting. Since the denominator in the equation above, which we shall again denote as D, is identical to the denominator in the equation for C_o, Eq. (A.1.3), the discussion concerning D above is sufficient for this analysis. For convenience we shall omit the use of i under the summation symbols unless clarification is felt needed. We can now let

$$D = (K_2 - K + 1) \sum_{K}^{K_2} t_i^2 - \left(\sum_{K}^{K_2} t_i\right)^2 \qquad (A.2.2)$$

where t_i are equally spaced points in time by a quantity Δt. Furthermore let $t_{i+1} > t_i$, $i = 1, 2, \ldots$ so that we construct an infinite sequence of points of the form:

$$s_n = (\Delta t) 1, \ (\Delta t) 2, \ (\Delta t) 3, \ \ldots$$

whose sum is defined as

$$S_t = \sum_{i=1}^{\infty} t_i = \Delta t \left[1 + 2 + \ldots\right]$$

such that we have

$$S_t = \Delta t \sum_{i=1}^{\infty} n_i, \quad n_i = 1, 2, \ldots, \tag{A.2.3}$$

for all i.

By definition the K_2^{th} partial sum of Eq. (A.2.3) is defined as

$$S_{p_{K_2}} = \Delta t \sum_1^{K_2} n_i = \frac{K_2 (K_2 + 1)}{2} \Delta t$$

and likewise, the $(K-1)^{th}$ partial sum can be written as

$$S_{p_{K-1}} = \Delta t \sum_1^{K-1} n_i = \frac{K (K-1)}{2} \Delta t$$

Since the identity is true

$$\sum_K^{K_2} t_i = \Delta t \sum_1^{K_2} n_i - \Delta t \sum_1^{K-1} n_i \quad ,$$

substituting the equations for the partial sums into the equation above yields the following.

$$\sum_K^{K_2} t_i = \frac{\Delta t}{2} \left[(K_2 + K) (K_2 - K + 1) \right] \tag{A.2.4}$$

A-5

Similarly, let us construct an infinite sequence of points where

$$s_{n_2} = (\Delta t)^2 \, 1^2, \; (\Delta t)^2 \, 2^2, \; (\Delta t)^2 \, 3^2, \; \ldots$$

whose sum can be defined as

$$S_{t_2} = \sum_{i=1}^{\infty} t_i^2 = \Delta t^2 \left[1^2 + 2^2 + 3^2 + \ldots \right]$$

such that we have

$$S_{t_2} = (\Delta t)^2 \sum_{i=1}^{\infty} n_i^2 \; , \; n_i = 1, 2, \ldots \qquad (A.2.5)$$

We know also by definition that the $K_2{}^{th}$ partial sum of Eq. (A.2.5) is defined as

$$S_{p^2{}_{K_2}} = (\Delta t)^2 \sum_{1}^{K_2} n_i^2 = \left[\frac{K_2 \, (K_2 + 1) \, (2K_2 + 1)}{6} \right] (\Delta t)^2$$

and likewise the $(K-1)^{th}$ partial sum would be

$$S_{p^2{}_{K-1}} = (\Delta t)^2 \sum_{1}^{K-1} n_i^2 = \left[\frac{K \, (K - 1) \, (2 \, K - 1)}{6} \right] (\Delta t)^2 \quad .$$

Since

$$\sum_{K}^{K_2} t_i^2 = (\Delta t)^2 \sum_{1}^{K_2} n_i^2 - (\Delta t)^2 \sum_{1}^{K-1} n_i^2$$

A-6

then by substituting the values of partial sums above we get

$$\sum_{K}^{K_2} t_i^2 = \frac{(\Delta t)^2}{6} \left[K_2 (K_2 + 1)(2 K_2 + 1) - K(K - 1)(2 K - 1) \right] \qquad (A.2.6)$$

Substituting Eqs. (A.2.4) and (A.2.6) into Eq. (A.2.2), D becomes

$$D = (K_2 - K + 1)\frac{(\Delta t)^2}{12} \left[(K_2 - K + 1) - 1 \right] \left[K_2 - K + 1 \right] \left[(K_2 - K + 1) + 1 \right]$$

which can be written generally as

$$D = \frac{(\Delta t)^2}{12} (K_2 - K + 1) \prod_{j=0}^{2} \left[(K_2 - K + 1) + (j - 1) \right] \qquad (A.2.7)$$

The equation of D above redefines the denominator of Eq. (A.2.1) which by observation can be seen to be a function of Δt and the number of points used in the curve fitting only; the variable time, t_i, being eliminated completely since we have equally spaced points in time.

From Eq. (A.2.1), we let Q denote the numerator so that

$$Q = \sum_{K}^{K_2} (1) \sum_{K}^{K_2} y_i t_i - \sum_{K}^{K_2} t_i \sum_{K}^{K_2} y_i \qquad (A.2.8)$$

We shall now rederive Q for suitable program application.

Since the independent variable time, t, always takes the form

$$t_i = t_{i-1} + \Delta t \quad ,$$

A-7

it follows in general that

$$\sum_{i=K}^{K_2} t_i = \sum_{i=K}^{K_2} \left[t_{K-1} + (i - K + 1) \; \Delta t \right] \tag{A.2.9}$$

which reduces to

$$\sum_{i=K}^{K_2} t_i = (K_2 - K + 1) \left[t_K + K \, \Delta t \right] + \Delta t \sum_{i=K}^{K_2} i$$

and finally through the use of partial sums to

$$\sum_{i=K}^{K_2} t_i = (K_2 - K + 1) \left\{ t_K + \frac{\Delta t}{2} \left[(K_2 - K + 1) - 1 \right] \right\} \tag{A.2.10}$$

where $K = 1, 2, \ldots, N$, $K_2 = K + K^*$ and where K^* is the number of points to be used in the curve fitting minus one.

Using the identity for t_i in Eq. (A.2.9), it follows that

$$\sum_{i=K}^{K_2} y_i t_i = t_{K-1} \sum_{i=K}^{K_2} y_i + \Delta t \sum_{i=K}^{K_2} (i - K + 1) \; y_i$$

and from Eq. (A.2.10)

$$\sum_{i=K}^{K_2} t_i \sum_{i=K}^{K_2} y_i = (K_2 - K + 1) \left\{ t_K + \frac{\Delta t}{2} \left[(K_2 - K + 1) - 1 \right] \right\} \sum_{i=K}^{K_2} y_i$$

A-8

which when substituted into the equation for Q (A.2.8) and reduced yields

$$Q = (K_2 - K + 1) \left\{ (t_{K-1} - t_K) \sum_K^{K_2} y_i + \Delta t \left[\sum_K^{K_2} (i - K + 1) y_i \right. \right.$$

$$\left. \left. - \frac{1}{2} \left\{ (K_2 - K + 1) - 1 \right\} \sum_K^{K_2} y_i \right] \right\}$$

which finally reduces to

$$Q = \frac{\Delta t}{2} (K_2 - K + 1) \sum_K^{K_2} \left[2(i - K) - (K_2 - K + 1) + 1 \right] y_i \qquad (A.2.11)$$

We have now redefined the numerator Q and denominator D of Eq. (A.2.1) for use with equally spaced data. Substituting the values of Q and D into the equation for C_1 we get

$$C_1 = \left(\frac{6}{\Delta t} \right) \frac{\sum_{i=K}^{K_2} \left[2(i - K) - (K_2 - K + 1) + 1 \right] y_i}{\prod_{j=0}^{2} \left[(K_2 - K + 1) + (j - 1) \right]} \qquad (A.2.12)$$

Now that the coefficient C_1 has been re-evaluated in a form more suitable for computer application, we can also re-evaluate the y-intercept or coefficient C_o.

A-9

From Eq. (A.1.1) we know that

$$\sum_{i=1}^{N} y_i = C_1 \sum_{i=1}^{N} t_i + C_o \sum_{i=1}^{N} \quad (1)$$

can be expressed generally as

$$\sum_{i=K}^{K_2} y_i = C_1 \sum_{i=K}^{K_2} t_i + C_o \sum_{i=K}^{K_2} \quad (1) \quad .$$

Solving for C_o from the latter equation we get

$$C_o = \frac{\sum\limits_{i=K}^{K_2} y_i - C_1 \sum\limits_{i=K}^{K_2} t_i}{(K_2 - K + 1)}$$

and since we have the expression

$$\sum_{i=K}^{K_2} t_i = (K_2 - K + 1) \left\{ t_K + \frac{\Delta t}{2} \left[(K_2 - K + 1) - 1 \right] \right\} \quad ,$$

from Eq. (A.2.10), it follows that by substitution

$$C_o = \frac{1}{(K_2 - K + 1)} \sum_{i=K}^{K_2} y_i - \frac{C_1}{2} \left\{ 2 \, t_K + \Delta t \left[(K_2 - K + 1) - 1 \right] \right\} \quad (A.2.13)$$

We have now derived two new equations for C_1 and C_o, Eqs. (A.2.12) and (A.2.13) respectively, which can be used to fit a given number of equally spaced points with a linear least squares approximation.

An application of these new equations for C_o and C_1 is presented in the following section.

A.3 APPLICATION

This section pertains to Eqs. (A.2.12) and (A.2.13) and their application in the TAER WIND CONVERSION PROGRAM.

As mentioned previously in this report, nine equally spaced (by .1 second) TAER data points are used in the least squares curve fitting procedure of the TAER WIND CONVERSION PROGRAM. Therefore we know the following:

$$\sum_{i=K}^{K_2} (1) = (K_2 - K + 1) = 9$$

and

$$\Delta t = .1$$

Substituting these known quantities into Eqs. (A.2.12) and (A.2.13) respectively, we obtain the following equations.

$$C_1 = \frac{1}{6} \sum_{i=K}^{K_2} \left[i - K - 4 \right] y_i \qquad (A.3.1)$$

and

$$C_o = \frac{1}{9} \sum_{i=K}^{K_2} y_i - C_1 t_{K+4} \qquad (A.3.2)$$

A-11

where

$$t_{K+4} = t_K + .4$$

The equations for C_0 and C_1 above can now be applied to curve fitting the TAER data. Upon comparison of the above equations with the classical equations for C_0 and C_1, Eqs. (A.1.3) and (A.1.4) respectively, one can see that the denominators have been eliminated so that they do not appear in the above equations. Another observation is that only the value of time at the midpoint of the nine points is actually used in the curve fitting.

The FORTRAN programming procedure using the above equations is presented in general by the following statements

```
C**     * X6  = 1./6.  , X9 = 1./9.
        DATA X6 /1.6666666E-01 /, X9 /1.1111111E-01 /
        K2   = K + 8
        K4   = K + 4
        TK4  = TIME(K4)
        SUM1 = 0.0
        SUMO = 0.0
        DO 10 I = K,K2
        SUM1 = SUM1 + FLOAT(I - K4)*Y(I)
  10    SUMO = SUMO + Y(I)
        C1   = X6 * SUM1
        CO   = X9 * SUMO - C1 * TK4
```

where TIME is the independent variable, Y is the dependent variable and K has the range: $1 \leq K \leq 1000$.

Results of applying the above procedure to the induced errors depicted in Fig. A-1, page A-3, are presented in Fig. A-2. Comparison of the two figures shows that the stray points P_1, P_2, P_3 and P_4 in Fig. A-1 have been eliminated using the new procedure.

A-12
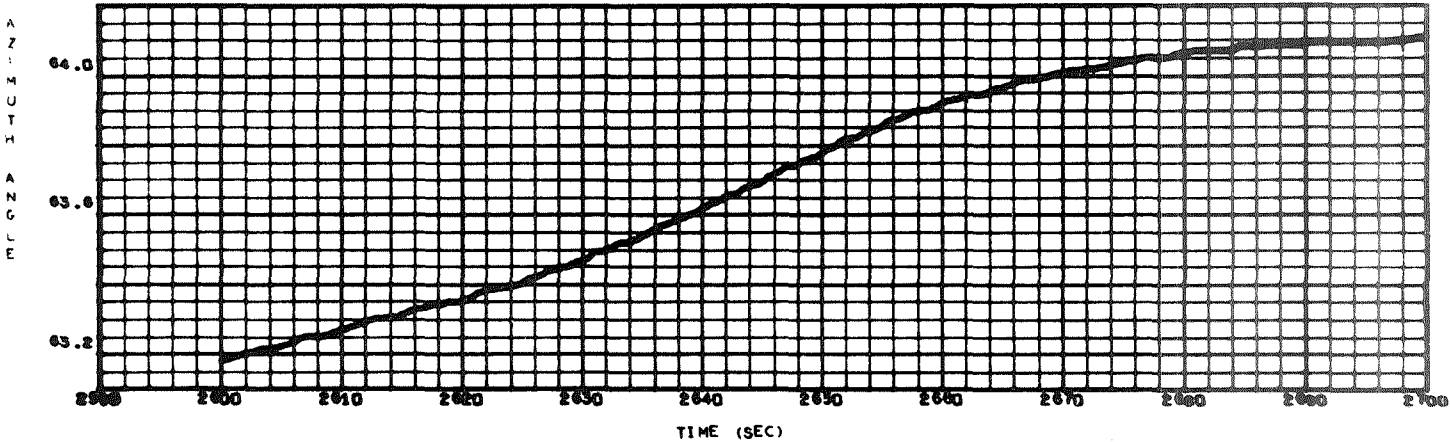
Fig. A-2 - Example of Removal of Induced Errors in Curve Fitting

Appendix B

PROGRAM LISTING

aFOR,S MAIN,MAIN
HVH 088-05/14-10:04 (0,)

MAIN PROGRAM

STORAGE USED: CODE(1) 001224; DATA(0) 0CC337; BLANK COMMON(2) 000000

COMMON BLOCKS:

```
0003    TAPEV   013724
0004    EDIT1   000003
0005    TRAN1   001750
0006    UNITS   000007
```


EXTERNAL REFERENCES (BLOCK, NAME)

```
0007    TAPE
0010    PLOTT
0011    CALCCF
0012    EDITM
0013    EDITL
0014    TRANS
0015    OUTPUT
0016    FILTER
0017    NINTR$
0020    NRDU$
0021    NIO2$
0022    NWDU$
0023    NIO1$
0024    NERR2$
0025    NSTOP$
```


STORAGE ASSIGNMENT (BLOCK, TYPE, RELATIVE LOCATION, NAME)

```
0001    000145 10L      0001    000455 100L     0001    000460 110L     0001    000465 120L     0001    000504 130L
0001    000556 150L     0001    000627 170L     0001    000652 180L     0001    000672 190L     0001    000176 20L
0001    000724 210L     0001    000743 220L     0001    001000 240L     0001    000304 246G     0001    000323 256G
0001    001013 260L     0001    001031 270L     0001    001076 280L     0001    000206 30L      0001    001153 300L
0001    001161 310L     0000    000073 320F     0000    000074 330F     0000    000171 340F     0000    000205 350F
0001    000561 350G     0001    000565 355G     0000    000213 360F     0000    000251 370F     0001    000631 374G
0000    000257 380F     0000    000262 390F     0001    000270 40L      0000    000274 400F     0000    000304 410F
0001    001036 472G     0001    000275 5CL      0001    000372 8CL      0001    000447 90L      0000 R CC0035 A
0003 R 012574 AA        0003 R 004230 AZ        0000 R 000000 C1        0000 R 000001 C2        0000 R 000033 DRT
0000 R 000011 DUM       0000 R 000036 E         0003 R 006344 ELEV      0000 I 000004 FILE      0000 I 000004 FNUM
0000 I 000037 I         0000 I 000002 IBAD      0004 I 000002 ICOFER    0000 I 000022 IEDIT     0000 I 000012 IERR
0000 I 000010 IFILTR    0000 I 000014 IFIRST    0004 I 000001 IFLAGN    0006 I 000006 IFOR      0000 I 000056 IM1
0006 I 000005 IPLOT     0000 I 000013 IPLOTT    0000 I 000005 ISKIP     0000 I 000053 ISPL      0000 I 000024 IT
0000 I 000007 ITRAN     0000 I 000032 K         0004 I 000000 KOUNT     0000 I 000031 L         0000 I 000054 LA
0000 I 000055 LA1       0000 I 000045 LN        0000 I 000025 M         0000 I 000020 MAXI      0000 I 000017 MAXP
0000 I 000047 MJ        0000 I 000015 MNEXT     0000 I 000030 N         0006 I 000000 ND1       0006 I 000001 ND2
0005 I 000002 ND3       0006 I 000003 ND4       0006 I 000004 NFILES    0000 I 000026 NM        0000 I 000016 NP
0000 I 000021 NR        0000 I 000023 NREC      0000 I 000046 NU        0000 I 000006 NWPREC    0000 R 000034 R
0003 R 002114 RANGE     0003 R 000000 T         0003 R 010460 TIME      0005 R 000000 WARAY     0000 R 000037 XM1
```

```
     0000 R 000050 XP1        0000 R 000042 XSA        0000 R 000040 YM1       0000 R 000051 YP1       0000 R 000043 YSA
     0000 R 000041 ZM1        0000 R 000052 ZP1        0000 R 000044 ZSA
```

```
00100     1*   C         T A E R   W I N D   C O N V E R S I O N   P R O G R A M        TER   10
00100     2*   C                                                                        TER   20
00100     3*   C                          - TARWON -                                    TER   30
00100     4*   C                                                                        TER   40
00100     5*   C                      DEVELOPED BY JOHN TYSON                           TER   50
00100     6*   C                       LOCKHEED-HUNTSVILLE                              TER   60
00100     7*   C                       DEPT 54/50   EXT 411                             TER   70
00100     8*   C                          MAY, 1971                                     TER   80
00100     9*   C                                                                        TER   90
00100    10*   C                                                                        TER  100
00100    11*   C    * ALL TAER DATA RECORDS ARE NOT USED. IF THE DO-LOOP READING    *   TER  110
00100    12*   C    * INPUT DATA DOES NOT COMPLETE NORMALLY, PROGRAM PROCESSING      *   TER  120
00100    13*   C    * FOR THAT FILE WILL TERMINATE AND PROCESSING OF THE NEXT FILE   *   TER  130
00100    14*   C    * WILL COMMENCE.                                                 *   TER  140
00100    15*   C    * ISKIP - NUMBER OF FILES TO BE SKIPPED ON THE INPUT TAPE        *   TER  150
00100    16*   C    * BEFORE PROCESSING IS BEGUN.                                    *   TER  160
00100    17*   C    * NREC - VARIABLE INPUT VIA INPUT CARD TO INDICATE NUMBER OF     *   TER  170
00100    18*   C    * RECORDS TO SKIP ON THAT PARTICULAR FILE DUE TO WILD POINTS.    *   TER  180
00100    19*   C                                                                        TER  190
00100    20*   C    ******* EDIT PROCEDURE**********                                    TER  200
00100    21*   C      0  -  DO NOT EDIT                                                  TER  210
00100    22*   C      1  -  EDIT MIDPOINTS AND LAST POINTS.                             TER  220
00100    23*   C      2  -  EDIT LAST POINTS ONLY.                                      TER  230
00100    24*   C                                                                        TER  240
00100    25*   C    ****** PLOT PROCEDURE  *******                                      TER  250
00100    26*   C      IPLOT = 0 - NO PLOTS.                                             TER  260
00100    27*   C            = 1 - PLOT TAER DATA ONLY                                   TER  270
00100    28*   C            = 2 - PLOT ONE SEC VEL ONLY.                               TER  280
00100    29*   C            = 3 - PLOT BOTH 1 AND 2.                                   TER  290
00101    30*        COMMON /TAPEV/ T(1100),RANGE(1100),AZ(1100),ELEV(1100),TIME(1100),TER  300
00101    31*       1AA(600)                                                             TER  310
00103    32*        COMMON /EDIT1/ KOUNT,IFLAGN,ICODER                                  TER  320
00104    33*        COMMON /TRAN1/ WARAY(1000)                                          TER  330
00105    34*        COMMON /UNITS/ ND1,ND2,ND3,ND4,NFILES,IPLOT,IFOR                    TER  340
00106    35*        DATA C1/.91440183/,C2/.01745329/,IBAD/0/                            TER  350
00112    36*        INTEGER FILE,FNUM                                                   TER  360
00113    37*        READ (5,320) ISKIP,ND1,NFILES,NWPREC,ND3,ITRAN,ND2,IFILTR,ND4,IPLOTER  370
00113    38*       1T,IFOR                                                              TER  380
00113    39*   C                                                                        TER  390
00130    40*        IF (ND1.EQ.0) ND1=8                                                 TER  400
00132    41*        IF (ND2.EQ.0) ND2=9                                                 TER  410
00134    42*        IF (ND3.EQ.0) ND3=10                                                TER  420
00136    43*        IF (ND4.EQ.0) ND4=11                                                TER  430
00140    44*        IF (IFILTR.NE.0) ITRAN=1                                            TER  440
00140    45*   C                                                                        TER  450
00142    46*        WRITE (6,330) ISKIP,ND1,NFILES,NWPREC,ITRAN,ND2,IFILTR,ND4,IPLOT,ITER  460
00142    47*       1FOR                                                                 TER  470
00142    48*   C    * INITIAL REWIND OF UNITS ND1 (INPUT) AND ND2 (EDITED OUTPUT). *    TER  480
00156    49*        CALL TAPE (ND1,3,0,DUM,IERR)                                        TER  490
00157    50*        IF (ITRAN.NE.0) CALL TAPE (ND2,3,0,DUM,IERR)                        TER  500
```

```
00161    51*           IF (ISKIP.EQ.0) GO TO 10                          TER  510
00161    52*    C      * BEGIN PROCESSING FILE NUMBER 'ISKIP+1'. *       TER  520
00163    53*           CALL TAPE (ND1,7,ISKIP,DUM,IERR)                  TER  530
00164    54*           IF (IERR.NE.0) WRITE (6,370) IERR                 TER  540
00164    55*    C                                                        TER  550
00170    56*           IPLOTT=0                                          TER  560
00171    57*           IF (IPLOT.EQ.1.OR.IPLOT.EQ.3) IPLOTT=1            TER  570
00173    58*        10 FILE=0                                            TER  580
00174    59*           IFIRST=0                                          TER  590
00175    60*           IF (NWPREC.EQ.60) GO TO 20                        TER  600
00177    61*           MNEXT=101                                         TER  610
00200    62*           NP=100                                           TER  620
00201    63*           MAXP=1100                                         TER  630
00202    64*           MAXI=11                                           TER  640
00203    65*           IF (NWPREC.EQ.600) GO TO 30                       TER  650
00205    66*           WRITE (6,380) NWPREC                             TER  660
00210    67*           GO TO 310                                         TER  670
00211    68*        20 MNEXT=11                                          TER  680
00212    69*           NP=10                                            TER  690
00213    70*           MAXP=1010                                         TER  700
00214    71*           MAXI=101                                          TER  710
00214    72*    C                                                        TER  720
00214    73*    C      *****************************************************************  TER  730
00214    74*    C      *****************************************************************  TER  740
00215    75*        30 NR=0                                             TER  750
00216    76*           FILE=FILE+1                                       TER  760
00217    77*           IF (IPLOTT.EQ.1) CALL PLOTT (1)                   TER  770
00221    78*           READ (5,320) IEDIT,NREC                           TER  780
00221    79*    C      * SKIP NREC RECORDS OF ND1 BECAUSE OF WILD POINT. *  TER  790
00225    80*           IF (NREC.NE.0) CALL TAPE (ND1,8,NREC,DUM,IERR)    TER  800
00227    81*           WRITE (6,340) IEDIT,FILE,ND3                      TER  810
00227    82*    C      * INITIAL REWIND OF UNIT ND3 (EDITED TAER OUTPUT). *  TER  820
00234    83*           IF (IEDIT.EQ.0) GO TO 40                          TER  830
00236    84*           IF (IFIRST.EQ.1) GO TO 40                         TER  840
00240    85*           CALL TAPE (ND3,3,0,DUM,IERR)                     TER  850
00241    86*           IFIRST=1                                          TER  860
00242    87*        40 IT=-1                                            TER  870
00243    88*           M=1                                             TER  880
00244    89*           NM=1                                            TER  890
00244    90*    C                                                        TER  900
00244    91*    C      *****************************************************************  TER  910
00245    92*        50 DO 70 I=NM,MAXI                                   TER  920
00250    93*           N=1                                             TER  930
00251    94*           CALL TAPE (ND1,2,NWPREC,AA,IERR)                  TER  940
00252    95*           IF (IERR-2) 60,290,300                           TER  950
00255    96*        60 DO 70 L=1,NP                                     TER  960
00260    97*           IT=IT+1                                           TER  970
00261    98*           TIME(M)=.1*FLOAT(IT)                              TER  980
00262    99*           T(M)=AA(N+1)                                      TER  990
00263   100*           RANGE(M)=AA(N+2)                                  TER 1000
00264   101*           AZ(M)=AA(N+3)                                     TER 1010
00265   102*           ELEV(M)=AA(N+4)                                   TER 1020
00266   103*           N=N+6                                             TER 1030
00267   104*        70 M=M+1                                           TER 1040
00267   105*    C                                                        TER 1050
00272   106*           IF (IPLOTT.EQ.1) CALL PLOTT (2)                   TER 1060
```

```
00274    107*         KOUNT=0                                                TER 1070
00275    108*         IFLAGN=1                                               TER 1080
00276    109*         ICOFER=0                                               TER 1090
00277    110*         K=0                                                    TER 1100
00277    111*  C       ***************************************************   TER 1110
00300    112*      80 K=K+1                                                  TER 1120
00300    113*  C      DRT  IS THE TIME INTERVAL                             TER 1130
00301    114*         DRT=T(K+1)-T(K)                                       TER 1140
00302    115*         IF (DRT.GT..11.OR.DRT.LT..099) WRITE (6,390) K,T(K),DRT  TER 1150
00310    116*         IF (IEDIT.EQ.0) GO TO 110                             TER 1160
00312    117*         CALL CALCOF (K)                                       TER 1170
00313    118*         GO TO (90,100), IEDIT                                 TER 1180
00314    119*      90 CALL EDITM (K+4)                                      TER 1190
00315    120*     100 CALL EDITL (K)                                        TER 1200
00316    121*     110 IF (K.EQ.1000) GO TO 120                              TER 1210
00320    122*         GO TO 80                                              TER 1220
00320    123*  C       ***************************************************   TER 1230
00321    124*     120 IF (IPLOTT.EQ.1) CALL FLOTT (3)                       TER 1240
00323    125*         IF (KOUNT.EQ.0) GO TO 130                             TER 1250
00325    126*         WRITE (6,400) KOUNT                                   TER 1260
00330    127*     130 IF (ITRAN+IEDIT) 260,260,140                          TER 1270
00330    128*  C                                                            TER 1280
00333    129*     140 IF (ITRAN.EQ.0) GO TO 150                             TER 1290
00335    130*         R=C1*RANGE(1)                                         TER 1300
00336    131*         A=C2*AZ(1)                                            TER 1310
00337    132*         E=C2*ELEV(1)                                          TER 1320
00340    133*         CALL TRANS (R,A,E,XM1,YM1,ZM1)                        TER 1330
00341    134*         R=C1*RANGE(2)                                         TER 1340
00342    135*         A=C2*AZ(2)                                            TER 1350
00343    136*         E=C2*ELEV(2)                                          TER 1360
00344    137*         CALL TRANS (R,A,E,XSA,YSA,ZSA)                        TER 1370
00345    138*         LN=3                                                  TER 1380
00346    139*     150 NU=1                                                  TER 1390
00346    140*  C       ***************************************************   TER 1400
00347    141*         DO 250 I=1,4                                          TER 1410
00352    142*         IF (IEDIT.EQ.0) GO TO 170                             TER 1420
00354    143*         DO 160 L=1,250                                        TER 1430
00357    144*         MJ=4*L-3                                              TER 1440
00360    145*         WARAY(MJ)=T(NU)                                       TER 1450
00361    146*         WARAY(MJ+1)=RANGE (NU)                                TER 1460
00362    147*         WARAY(MJ+2)=AZ(NU)                                    TER 1470
00363    148*         WARAY(MJ+3)=ELEV(NU)                                  TER 1480
00364    149*     160 NU=NU+1                                               TER 1490
00364    150*  C      * WRITE EDITED TRAE ON UNIT NO3. *                    TER 1500
00366    151*         CALL TAPE (NO3,1,1000,WARAY,IERR)                     TER 1510
00367    152*         IF (ICOFER.NE.0) CALL OUTPUT (30H PRINTOUT OF .1 SEC TAER DATA )  TER 1520
00371    153*         IF (ITRAN.EQ.0) GO TO 240                             TER 1530
00371    154*  C                                                            TER 1540
00371    155*  C      * GAP OCCURRENCE AT LOCN LN CAUSES CURRENT VALUES *   TER 1550
00371    156*  C      *  AT LOCNS MJ,MJ+1,MJ+2 TO BE CHANGED TO -10**6  *   TER 1560
00373    157*     170 DO 230 L=1,250                                        TER 1570
00376    158*         MJ=4*L-3                                              TER 1580
00377    159*         IF (IEDIT.EQ.0) GO TO 190                             TER 1590
00401    160*         IF (IBAD.NE.0) GO TO 180                              TER 1600
00403    161*         IF (RANGE(LN).GT.-1.E+5) GO TO 190                    TER 1610
00405    162*     180 IBAD=IBAD+1                                           TER 1620
```

```
00406    163*         WARAY(MJ)=-1.E+6                                              TER 1630
00407    164*         WARAY(MJ+1)=-1.E+6                                            TER 1640
00410    165*         WARAY(MJ+2)=-1.E+6                                            TER 1650
00411    166*         WARAY(MJ+3)=-1.E+6                                            TER 1660
00412    167*         IF (IBAD.NE.1) GO TO 190                                      TER 1670
00414    168*         XP1=0.                                                        TER 1680
00415    169*         YP1=0.                                                        TER 1690
00416    170*         ZP1=0.                                                        TER 1700
00417    171*         GO TO 220                                                     TER 1710
00420    172*     190 R=C1*RANGE(LN)                                                TER 1720
00421    173*         A=C2*AZ(LN)                                                   TER 1730
00422    174*         E=C2*ELEV(LN)                                                 TER 1740
00423    175*         CALL TRANS (R,A,E,XP1,YP1,ZP1)                                TER 1750
00424    176*         IF (IBAD.EQ.0) GO TO 210                                      TER 1760
00426    177*         IF (IBAD-2) 220,220,200                                       TER 1770
00431    178*     200 IBAD=0                                                        TER 1780
00432    179*         GO TO 220                                                     TER 1790
00433    180*     210 WARAY(MJ)=ZSA                                                 TER 1800
00434    181*         WARAY(MJ+1)=(XP1-XM1)*5.0                                     TER 1810
00435    182*         WARAY(MJ+2)=(YP1-YM1)*5.0                                     TER 1820
00436    183*         WARAY(MJ+3)=(ZP1-ZM1)*5.0                                     TER 1830
00437    184*     220 XM1=XSA                                                       TER 1840
00440    185*         YM1=YSA                                                       TER 1850
00441    186*         ZM1=ZSA                                                       TER 1860
00442    187*         XSA=XP1                                                       TER 1870
00443    188*         YSA=YP1                                                       TER 1880
00444    189*         ZSA=ZP1                                                       TER 1890
00445    190*     230 LN=LN+1                                                       TER 1900
00445    191*   C                                                                   TER 1910
00445    192*   C     * WRITE ZUVW ON UNIT NO2. *                                   TER 1920
00447    193*         CALL TAPE (ND2,1,1000,WARAY,IERR)                             TER 1930
00450    194*         IF (ICOFER.NE.0) CALL OUTPUT (30H PRINTOUT OF .1 SEC VEL DATA ) TER 1940
00452    195*     240 NR=NR+1                                                       TER 1950
00453    196*         WRITE (6,350) NR,FILE                                         TER 1960
00457    197*     250 CONTINUE                                                      TER 1970
00457    198*   C     ******************************,**********************         TER 1980
00461    199*     260 CONTINUE                                                      TER 1990
00462    200*         IF (IPLOTT.EQ.0) GO TO 270                                    TER 2000
00464    201*         ISPL=MOD(NR,80)                                              TER 2010
00465    202*         IF (ISPL.NE.0) GO TO 270                                      TER 2020
00467    203*         CALL PLOTT (4)                                                TER 2030
00470    204*         CALL PLOTT (1)                                                TER 2040
00470    205*   C                                                                   TER 2050
00470    206*   C     THE CARRY OVER OF THE LAST 'NP' POINTS.                       TER 2060
00471    207*     270 DO 280 LA=1001,MAXP                                           TER 2070
00474    208*         LA1=LA-1000                                                   TER 2080
00475    209*         ELEV(LA1)=ELEV(LA)                                            TER 2090
00476    210*         AZ(LA1)=AZ(LA)                                                TER 2100
00477    211*         T(LA1)=T(LA)                                                  TER 2110
00500    212*         RANGE(LA1)=RANGE(LA)                                          TER 2120
00501    213*     280 TIME(LA1)=TIME(LA)                                            TER 2130
00503    214*         M=MNEXT                                                       TER 2140
00504    215*         NM=2                                                          TER 2150
00505    216*         IT=TIME(NP)*10.+.1                                            TER 2160
00506    217*         GO TO 50                                                      TER 2170
00506    218*   C     ******************************,**********************         TER 2180
```

```
00506    219*    C                                                          TER 2190
00506    220*    C        * END FILE ONLY. *                               TER 2200
00507    221*        290 IF (ITRAN.NE.0) CALL TAPE (ND2,6,0,DUM,IERR)       TER 2210
00511    222*            IF (IEDIT.NE.0) CALL TAPE (ND3,6,0,DUM,IERR)       TER 2220
00511    223*    C    FOR INCOMPLETE NEW RECORD LENGTH                      TER 2230
00513    224*            IM1=I-1                                            TER 2240
00514    225*            FNUM=ISKIP+FILE                                    TER 2250
00515    226*            WRITE (6,360) FNUM,IM1,NR                          TER 2260
00522    227*            IF (IPLOTT.EQ.1) CALL PLOTT (4)                    TER 2270
00524    228*            IF (FILE.GE.NFILES) GO TO 310                      TER 2280
00526    229*            GO TO 30                                           TER 2290
00526    230*    C     ************************************************     TER 2300
00526    231*    C     ************************************************     TER 2310
00526    232*    C                                                          TER 2320
00527    233*        300 WRITE (6,410) IERR                                 TER 2330
00527    234*    C        * REWIND UNIT ND1. *                             TER 2340
00532    235*        310 CALL TAPE (ND1,5,0,DUM,IERR)                       TER 2350
00532    236*    C        * CLOSE UNITS ND2 AND ND3 W/ENDFILE AND REWIND. * TER 2360
00533    237*            IF (ITRAN.NE.0) CALL TAPE (ND2,4,0,DUM,IERR)       TER 2370
00535    238*            IF (IEDIT.NE.0) CALL TAPE (ND3,4,0,DUM,IERR)       TER 2380
00537    239*            IF (IFILTR.GT.0) CALL FILTER                       TER 2390
00541    240*            STOP                                               TER 2400
00541    241*    C                                                          TER 2410
00542    242*        320 FORMAT (13I6)                                      TER 2420
00543    243*        330 FORMAT (6H1 SKIPI2,16H FILES FROM TAPEI2,18H BEFORE PROCESSING/2X4TER 2430
00543    244*           1 0HNUMBER OF FILES TO BE PROCESSED IS       I4/2X40HNUMBER OF WORDS TER 2440
00543    245*           2 PER PHYSICAL RECORD IS  I4/2X7HITRAN =I2,45H-OUTPUT .1 SECOND VELOTER 2450
00543    246*           3 CITY DATA(ZUVW) ON UNITI5/2X7HIFILTR=I2,40H-OUTPUT ONE SECOND VELOTER 2460
00543    247*           4 CITY DATA ON UNITI5/2X56HPLOTTING-(0,NONE),(1,TAER),(2,1 SEC VEL),TER 2470
00543    248*           5 (3,BOTH 1 AND 2)  IPLOT =I2/2X5HIFOR=I2)          TER 2480
00544    249*        340 FORMAT (2X7HIEDIT =I2,20H FOR PROCESSING FILEI2,20H OUTPUT DATA ONTER 2490
00544    250*           1 UNITI3)                                           TER 2500
00545    251*        350 FORMAT (/14H END OF RECORDI3,5H FILEI3/)           TER 2510
00546    252*        360 FORMAT (//27H PROCESSING OF FILE NUMBER I2,27H OF INPUT TAPE IS COTER 2520
00546    253*           1 MPLETE./15H THE REMAINING I3,23H RECORDS WERE NOT USED./52H THE NUTER 2530
00546    254*           2 MBER OF RECORDS CREATED ON OUTPUT TAPE(S) IS I4/1H1)    TER 2540
00547    255*        370 FORMAT (28H ERROR WHILE SKIPPING FILES-I3)         TER 2550
00550    256*        380 FORMAT (8H NWPREC=I5)                              TER 2560
00551    257*        390 FORMAT (/75X18HTAPE TIME ERROR T(I4,3H) =F11.2,7H  DRT =F11.2)  TER 2570
00552    258*        400 FORMAT (41H AT THE END OF 1000 POINT PROCESS,.KOUNT=I5)    TER 2580
00553    259*        410 FORMAT (/10X20HTAPE ERROR - IERR = I2)             TER 2590
00554    260*            END                                               TER 2600
```

END OF COMPILATION: NO   DIAGNOSTICS.

@FOR,S CALCOF,CALCOF
HVH C88-05/14-10:04 (0,)

       SUBROUTINE CALCOF   ENTRY POINT 000523
                EDITM   ENTRY POINT 000637
                EDITL   ENTRY POINT 000644
                TRANS   ENTRY POINT 000660

   STORAGE USED: CODE(1) 000677; DATA(0) 000234; BLANK COMMON(2) 000000

   COMMON BLOCKS:

   0003   TAPEV   013724
   0004   EDIT1   000003

   EXTERNAL REFERENCES (BLOCK, NAME)

   0005   NWDU$
   0006   NIO2$
   0007   COS
   0010   SIN
   0011   ATAN
   0012   SQRT
   0013   NERR3$

   STORAGE ASSIGNMENT (BLOCK, TYPE, RELATIVE LOCATION, NAME)

   0001   000503 100L   0000   000102 110F   0000   000105 120F   0001   000022 124G   0000   CC0117 130F
   0000   000131 140F   0000   000143 150F   0000   000155 160F   0000   000167 170F   0001   000200 20L
   0001   CC0221 30L   0001   000455 305G   0001   000242 40L   0001   000402 50L   0001   CC0423 60L
   0001   000444 70L   0001   000500 90L   0003   012574 AA   0003 R 004230 AZ   0000 R 000041 C
   0000 R 000057 COEFO   0000 R 000060 COEFOA   0000 R 000061 COEFOE   0000 R 000054 COEF1   0000 R 000055 COEF1A
   0000 R 000056 COEF1E   0000 R 000042 C1   0000 R 000043 C2   0000 R 000044 D   0000 R 000066 DIF
   0000 R 000073 DIFO   0000 R 000067 DIF1   0000 R 000074 DIF10   0000 R 000070 DIF2   0000 R 000075 DIF20
   0000 R 000045 D1   0000 R 000046 D2   0003 R 006344 ELEV   0004 I 000002 ICOFER   0000 I 000076 IFLAGL
   0004 I 000001 IFLAGN   0000   000210 INJPS   0000 I 000052 J   0000 I 000077 KK   0000 I 000100 KKK9
   0004 I 000000 KOUNT   0000 I 000071 K10   0000 I 000051 K2   0000 I 000047 K4   0003 R 002114 RANGE
   0000 R 000040 RE   0000 R 000000 SAVE   0003   000000 T   0003 R 010460 TIME   0000 R 000062 TIMK4
   0000 R 000072 TIM10   0000 R 000050 TX4   0000 R 000064 X   0000 R 000053 XJK4   0000 R 000036 X6
   0000 R 000037 X9   0000 R 000063 Y   0000 R 000065 Z   0000 R 000101 ZC3

00101   1*   SUBROUTINE CALCOF (K)   COF   10
00103   2*   COMMON /TAPEV/ T(1100),RANGE(1100),AZ(1100),ELEV(1100),TIME(1100),COF   20
00103   3*   1AA(600)   COF   30
00104   4*   COMMON /EDIT1/ KOUNT,IFLAGN,ICOFER   COF   40
00105   5*   DIMENSION SAVE(10,3)   COF   50
00106   6*   DATA X6/1.6666666E-01/,X9/1.1111111E-01/,RE/6373334./   COF   60
00106   7*   C   COF   70
00106   8*   C   * TOLERANCES =(FACTOR)*(RMS ERROR)   *   COF   80

```
00106    9*   C      *          -RMS ERROR-                    *                    COF   90
00106   10*   C      *          SLANT RANGE = 5.00 YARDS       *                    COF  100
00106   11*   C      *          AZIMUTH     = 0.01 DEGREES     *                    COF  110
00106   12*   C      *          ELEVATION   = 0.01 DEGREES     *                    COF  120
00106   13*   C                                                                     COF  130
00112   14*            C=0.                                                         COF  140
00113   15*            C1=0.                                                        COF  150
00114   16*            C2=0.                                                        COF  160
00115   17*            D=0.                                                         COF  170
00116   18*            D1=0.                                                        COF  180
00117   19*            D2=0.                                                        COF  190
00120   20*            K4=K+4                                                       COF  200
00121   21*            TK4=TIME(K4)                                                 COF  210
00122   22*            K2=K+8                                                       COF  220
00123   23*            DO 10 J=K,K2                                                 COF  230
00126   24*            C=C+RANGE(J)                                                 COF  240
00127   25*            C1=C1+AZ(J)                                                  COF  250
00130   26*            C2=C2+ELEV(J)                                                COF  260
00131   27*            XJK4=FLOAT(J-K4)                                             COF  270
00132   28*            D=D+XJK4*RANGE(J)                                            COF  280
00133   29*            D1=D1+XJK4*AZ(J)                                             COF  290
00134   30*         10 D2=D2+XJK4*ELEV(J)                                          COF  300
00136   31*            COEF1=X6*D                                                   COF  310
00137   32*            COEF1A=X6*D1                                                 COF  320
00140   33*            COEF1E=X6*D2                                                 COF  330
00141   34*            COEF0=X9*C-TK4*COEF1                                         COF  340
00142   35*            COEF0A=X9*C1-TK4*COEF1A                                      COF  350
00143   36*            COEF0E=X9*C2-TK4*COEF1E                                      COF  360
00144   37*            RETURN                                                       COF  370
00144   38*   C                                                                     COF  380
00145   39*            ENTRY EDITM(KM)                                              COF  390
00147   40*            TIMK4=TIME(KM)                                               COF  400
00150   41*            Y=COEF0+COEF1*TIMK4                                          COF  410
00151   42*            X=COEF0A+COEF1A*TIMK4                                        COF  420
00152   43*            Z=COEF0E+COEF1E*TIMK4                                        COF  430
00152   44*   C        DIF  IS THE RANGE DIFFERENCE FOR MID-POINT                   COF  440
00152   45*   C        DIF1 IS THE AZIMUTH DIFFERENCE  FOR  MID-POINT               COF  450
00152   46*   C        DIF2 IS THE ELEVATION DIFFERENCE FOR MID-POINT               COF  460
00153   47*            DIF=ABS(RANGE(KM)-Y)                                         COF  470
00154   48*            DIF1=ABS(AZ(KM)-X)                                           COF  480
00155   49*            DIF2=ABS(ELEV(KM)-Z)                                         COF  490
00156   50*            IF ((DIF.LE.15.0).AND.(DIF1.LE.0.03).AND.(DIF2.LE.0.03)) GO TO 40 COF  500
00160   51*            ICOFER=1                                                     COF  510
00161   52*            IF (DIF.LE.15.0) GO TO 20                                    COF  520
00163   53*            WRITE (6,120) RANGE(KM),Y,TIME(KM),DIF                       COF  530
00171   54*            RANGE(KM)=Y                                                  COF  540
00172   55*         20 IF (DIF1.LE.0.03) GO TO 30                                   COF  550
00174   56*            WRITE (6,130) AZ(KM),X,TIME(KM),DIF1                         COF  560
00202   57*            AZ(KM)=Y                                                     COF  570
00203   58*         30 IF (DIF2.LE.0.03) GO TO 40                                   COF  580
00205   59*            WRITE (6,140) ELEV(KM),Z,TIME(KM),DIF2                       COF  590
00213   60*            ELEV(KM)=Z                                                   COF  600
00214   61*         40 RETURN                                                       COF  610
00214   62*   C                                                                     COF  620
00215   63*            ENTRY EDITL(K)                                               COF  630
00217   64*            K10=K+9                                                      COF  640
```

```
00220    65*              TIM10=TIME(K10)                                              COF   650
00221    66*              Y=COEF0+COEF1*TIM10                                          COF   660
00222    67*              X=COEF0A+COEF1A*TIM10                                        COF   670
00223    68*              Z=COEF0E+COEF1E*TIM10                                        COF   680
00223    69*     C        DIF0   IS THE RANGE   DIFFERENCE FOR  LOOK-A-HEAD            COF   690
00223    70*     C        DIF10 IS THE AZIMUTH DIFFERENCE FOR LOOK-A-HEAD             COF   700
00223    71*     C        DIF20 IS THE ELEVATION DIFFERENCE FOR LOOK-A-HEAD            COF   710
00224    72*              DIF0=ABS(RANGE(K10)-Y)                                       COF   720
00225    73*              DIF10=ABS(AZ(K10)-X)                                         COF   730
00226    74*              DIF20=ABS(ELEV(K10)-Z)                                       COF   740
00227    75*              IFLAGL=IFLAGN                                                COF   750
00230    76*              IFLAGN=0                                                     COF   760
00231    77*              IF ((DIF0.GT.100.).OR.(DIF10.GT..15).OR.(DIF20.GT..15)) IFLAGN=1   COF   770
00233    78*              IF ((IFLAGN+IFLAGL).NE.2) GO TO 90                           COF   780
00235    79*              KOUNT=KOUNT+1                                                COF   790
00236    80*              ICOFER=1                                                     COF   800
00237    81*              WRITE (6,110) KOUNT                                          COF   810
00242    82*              SAVE(KOUNT,1)=RANGE(K10)                                     COF   820
00243    83*              SAVE(KOUNT,2)=AZ(K10)                                        COF   830
00244    84*              SAVE(KOUNT,3)=ELEV(K10)                                      COF   840
00245    85*              IF (DIF0.LE.100.0) GO TO 50                                  COF   850
00247    86*              WRITE (6,150) RANGE(K10),Y,TIME(K10),DIF0                    COF   860
00255    87*              RANGE(K10)=Y                                                 COF   870
00256    88*        50 IF (DIF10.LE.0.15) GO TO 60                                     COF   880
00260    89*              WRITE (6,160) AZ(K10),X,TIME(K10),DIF10                      COF   890
00266    90*              AZ(K10)=X                                                    COF   900
00267    91*        60 IF (DIF20.LE.0.15) GO TO 70                                     COF   910
00271    92*              WRITE (6,170) ELEV(K10),Z,TIME(K10),DIF20                    COF   920
00277    93*              ELEV(K10)=Z                                                  COF   930
00300    94*        70 CONTINUE                                                        COF   940
00301    95*              IF (KOUNT.NE.10) GO TO 100                                   COF   950
00303    96*              KK=K10-10                                                    COF   960
00304    97*              DO 80 KKK9=1,10                                              COF   970
00307    98*              KK=KK+1                                                      COF   980
00310    99*              RANGE(KK)=SAVE(KKK9,1)                                       COF   990
00311   100*              AZ(KK)=SAVE(KKK9,2)                                          COF  1000
00312   101*        80 ELEV(KK)=SAVE(KKK9,3)                                           COF  1010
00314   102*              K=K-1                                                        COF  1020
00315   103*              RANGE(K)=-1.E+6                                              COF  1030
00316   104*              AZ(K)=-1.E+6                                                 COF  1040
00317   105*              ELEV(K)=-1.E+6                                               COF  1050
00320   106*        90 IFLAGN=1                                                        COF  1060
00321   107*              KOUNT=0                                                      COF  1070
00321   108*     C                                                                     COF  1080
00322   109*       100 RETURN                                                          COF  1090
00322   110*     C                                                                     COF  1100
00323   111*              ENTRY TRANS(R,A,EL,XT,YT,ZT)                                 COF  1110
00325   112*              X=R*COS(EL)*SIN(A)                                           COF  1120
00326   113*              Y=R*COS(EL)*COS(A)                                           COF  1130
00327   114*              ZC3=R*SIN(EL)+RE                                             COF  1140
00330   115*              XT=RE*ATAN(X/ZC3)                                            COF  1150
00331   116*              YT=RE*ATAN(Y/SQRT(X**2+ZC3**2))                              COF  1160
00332   117*              ZT=SQRT(X**2+ZC3**2+Y**2)-RE                                 COF  1170
00333   118*              RETURN                                                       COF  1180
00333   119*     C                                                                     COF  1190
00334   120*       110 FORMAT (7H KOUNT=I5)                                            COF  1200
```

```
00335    121*      120 FORMAT (7H RANGE=F13.5,3H Y=F13.5,6H TIME=F12.2,7H DIF  =F13.5)   COF 1210
00336    122*      130 FORMAT (7H AZ    =F13.5,3H X=F13.5,6H TIME=F12.2,7H DIF1 =F13.5)   COF 1220
00337    123*      140 FORMAT (7H ELEV =F13.5,3H Z=F13.5,6H TIME=F12.2,7H DIF2 =F13.5)    COF 1230
00340    124*      150 FORMAT (7H RANGE=F13.5,3H Y=F13.5,6H TIME=F12.2,7H DIF0 =F13.5)    COF 1240
00341    125*      160 FORMAT (7H AZ    =F13.5,3H X=F13.5,6H TIME=F12.2,7H DIF10=F13.5)   COF 1250
00342    126*      170 FORMAT (7H ELEV =F13.5,3H Z=F13.5,6H TIME=F12.2,7H DIF20=F13.5)    COF 1260
00343    127*          END                                                               COF 1270

         END OF COMPILATION:       NO   DIAGNOSTICS.
```

@FOR,S OUTPUT,OUTPUT
HVH 08B-05/14-10:05 (0,)

      SUBROUTINE OUTPUT   ENTRY POINT 000340
                TAPE   ENTRY POINT 000345

      STORAGE USED: CODE(1) 000411; DATA(0) 000040; BLANK COMMON(2) 000000

      COMMON BLOCKS:

      0003   TRAN1   001750
      0004   UNITS   000007

      EXTERNAL REFERENCES (BLOCK, NAME)

      0005   WRITER
      0006   REDTPR
      0007   OPEN
      0010   CLOSE
      0011   SKFBIN
      0012   SKRBIN
      0013   NWDU$
      0014   NIO1$
      0015   NIO2$
      0016   NERR2$
      0017   NWBU$
      0020   NRPU$
      0021   NWEF$
      0022   NREW$
      0023   NERR3$

      STORAGE ASSIGNMENT   (BLOCK, TYPE, RELATIVE LOCATION, NAME)

      0001   000214 100L   0001   000007 110G   0001   000224 110L   0001   000015 115G   0001   000234 120L
      0001   000041 124G   0001   000253 13CL   0001   000273 140L   0001   000276 150L   0001   000304 160L
      0001   000312 170L   0001   000244 173G   0000   000007 180F   0000   000010 190F   0001   000065 20L
      0001   000264 203G   0001   000103 3CL   0001   000117 4CL   0001   000137 50L   0001   000152 60L
      0001   000152 70L   0001   000171 80L   0001   000205 90L   0000 I 000000 I   0000 I 000004 IER
      0004 I 000006 IFOR   0000 I 000001 IJ   0000   000021 INJP$ 0004   000005 IPLOT   0000 I 000002 J
      0004 I 000000 ND1   0004   000001 ND2   0004   000002 ND3   0004   000003 ND4   0004   000004 NFILES
      0000 I 000006 NJ   0000 I 000003 NW   0000 I 000005 NWR   0003 R 000000 WARAY

      00101   1*   SUBROUTINE OUTPUT (NAME)   OUT   10
      00103   2*   COMMON /TRAN1/ WARAY(1000)   OUT   20
      00104   3*   COMMON /UNITS/ ND1,ND2,ND3,ND4,NFILES,IPLOT,IFOR   OUT   30
      00105   4*   DIMENSION NAME(5)   OUT   40
      00106   5*   WRITE (6,180) NAME   OUT   50
      00114   6*   DO 10 I=1,1000,12   OUT   60
      00117   7*   IJ=I+11   OUT   70

```
00120      8*            IF (IJ.GT.1000) IJ=1000                                        OUT    80
00122      9*         10 WRITE (6,190) (WARAY(J),J=T,IJ)                                OUT    90
00131     10*            RETURN                                                         OUT   100
00131     11*    C                                                                      OUT   110
00132     12*            ENTRY TAPE(NT,IOP,IARG,ARRAY,IERR)                             OUT   120
00134     13*            DIMENSION ARRAY(1)                                             OUT   130
00134     14*    C                                                                      OUT   140
00134     15*    C       ** IOP = 1   - WRITE                                           OUT   150
00134     16*    C       ** IOP = 2   - READ                                            OUT   160
00134     17*    C       ** IOP = 3   - OPEN W/REWIND                                   OUT   170
00134     18*    C       ** IOP = 4   - CLOSE W/ENDFILE AND REWIND                      OUT   180
00134     19*    C       ** IOP = 5   - REWIND ONLY                                     OUT   190
00134     20*    C       ** IOP = 6   - END FILE ONLY                                   OUT   200
00134     21*    C       ** IOP = 7   - SKIP FILES                                      OUT   210
00134     22*    C       ** IOP = 8   - SKIP RECORDS                                    OUT   220
00134     23*    C                                                                      OUT   230
00134     24*    C       **                **                    **                   **OUT   240
00134     25*    C       ** IFOR = 0   - NON FORTRAN OUTPUT ON 1108 TAPE DEVICES.      **OUT   250
00134     26*    C       ** IFOR = 1   - FORTRAN OUTPUT ON 1108 FASTRAND DEVICES.      **OUT   260
00134     27*    C       **                **                    **                   **OUT   270
00135     28*            IERR=1                                                         OUT   280
00136     29*            NW=IARG                                                        OUT   290
00137     30*            IF (ND1.EQ.NT) GO TO 20                                        OUT   300
00141     31*            IF (IFOR.EQ.1) GO TO 30                                        OUT   310
00143     32*         20 GO TO (40,50,60,70,80,90,100,110), IOP                        OUT   320
00143     33*    C                                                                      OUT   330
00144     34*         30 GO TO (120,130,150,140,150,160), IOP                          OUT   340
00144     35*    C       *NON-FORTRAN*                                                  OUT   350
00145     36*         40 CALL WRITER (NT,2,IER,NW,ARRAY)                               OUT   360
00146     37*            IF (IER.EQ.2) GO TO 170                                        OUT   370
00150     38*            IERR=IER                                                       OUT   380
00151     39*            RETURN                                                         OUT   390
00152     40*         50 CALL REDTPR (NT,2,IERR,NWR,NW,ARRAY)                          OUT   400
00153     41*            RETURN                                                         OUT   410
00154     42*         60 CALL OPEN (NT,1,2)                                            OUT   420
00155     43*            RETURN                                                         OUT   430
00156     44*         70 CALL CLOSE (NT,2)                                             OUT   440
00157     45*            RETURN                                                         OUT   450
00160     46*         80 CALL CLOSE (NT,4)                                             OUT   460
00161     47*            CALL OPEN (NT,1,2)                                            OUT   470
00162     48*            RETURN                                                         OUT   480
00163     49*         90 CALL CLOSE (NT,3)                                             OUT   490
00164     50*            RETURN                                                         OUT   500
00165     51*        100 CALL SKFBIN (NT,IARG,IERR)                                    OUT   510
00166     52*            RETURN                                                         OUT   520
00167     53*        110 CALL SKRBIN (NT,IARG,IERR)                                    OUT   530
00170     54*            RETURN                                                         OUT   540
00170     55*    C       *FORTRAN*                                                      OUT   550
00171     56*        120 WRITE (NT) (ARRAY(NJ),NJ=1,NW)                                OUT   560
00177     57*            RETURN                                                         OUT   570
00200     58*        130 CONTINUE                                                       OUT   580
00201     59*            READ(NT,END=170) (ARRAY(NJ),NJ=1,NW)   @ FOR 1108 ONLY        OUT   590
00207     60*            RETURN                                                         OUT   600
00210     61*        140 END FILE NT                                                    OUT   610
00211     62*        150 REWIND NT                                                      OUT   620
00212     63*            RETURN                                                         OUT   630
```

```
00213    64*      160 END FILE NT                            OUT  640
00214    65*          RETURN                                 OUT  650
00215    66*      170 IERR=2                                 OUT  660
00216    67*          RETURN                                 OUT  670
00216    68*    C                                            OUT  680
00217    69*      180 FORMAT (5A6)                           OUT  690
00220    70*      190 FORMAT (3(7X,4F9.2))                   OUT  700
00221    71*          END                                    OUT  710
```

          END OF COMPILATION: NO DIAGNOSTICS.

@FOR,S PLOTT,PLOTT
HVH 088-05/14-10:05 (0,)

   SUBROUTINE PLOTT   ENTRY POINT 000225

   STORAGE USED: CODE(1) 000237; DATA(0) 000124; BLANK COMMON(2) 000000

   COMMON BLOCKS:

   0003   TAPEV   013724
   0004   PLSYM   000001

   EXTERNAL REFERENCES (BLOCK, NAME)

   0005   IDENT
   0006   SCRND
   0007   QUIK3L
   0010   ENDJOB
   0011   NERR2$
   0012   NERR3$

   STORAGE ASSIGNMENT (BLOCK, TYPE, RELATIVE LOCATION, NAME)

   0001   000012 10L   0001   000033 120G   0001   000020 2CL   0001   000134 40L   0001   000206 50L
   0003   012574 AA   0003 R 004230 AZ   0000 R 000063 AZMN   0000 R 000062 AZMX   0000 R 000000 BCDX
   0000 R 000014 BCDY   0000 R 000030 CCDY   0000 R 000044 DCDY   0003 R 006344 ELEV   0000 R 000065 ELMN
   0000 R 000064 ELMX   0000   000104 INJP$ 0004 I 000000 ISYM   0000 I 000066 L   0003 R 002114 RANGE
   0000 R 000061 RGMN   0000 R 000060 RGMX   0003   000000 T   0003 R 010460 TIME   0000 R 000070 XL
   0000 R 000067 XR   0000 R 000074 YBA   0000 R 000076 YBE   0000 R 000072 YBR   0000 R 000073 YTA
   0000 R 000075 YTE   0000 R 000071 YTR

00101   1*   SUBROUTINE PLOTT (IOP)   TER   10
00103   2*   COMMON /TAPEV/ T(1100),RANGE(1100),AZ(1100),ELEV(1100),TIME(1100),TER   20
00103   3*   1AA(600)   TER   30
00104   4*   DIMENSION BCDX(12), BCDY(12), CCDY(12), DCDY(12)   TER   40
00105   5*   COMMON /PLSYM/ ISYM   TER   50
00106   6*   GO TO (10,20,40,50), IOP   TER   60
00106   7*   C   TER   70
00107   8*   10 CALL IDENT (35)   TER   80
00110   9*   RETURN   TER   90
00110   10*   C   TER   100
00111   11*   20 RGMX=RANGE(1)   TER   110
00112   12*   RGMN=RANGE(1)   TER   120
00113   13*   AZMX=AZ(1)   TER   130
00114   14*   AZMN=AZ(1)   TER   140
00115   15*   ELMX=ELEV(1)   TER   150
00116   16*   ELMN=ELEV(1)   TER   160
00117   17*   DO 30 L=2,1000   TER   170
00122   18*   RGMX=AMAX1(RGMX,RANGE(L))   TER   180

```
00123    19*          RGMN=AMIN1(RGMN,RANGE(L))                                        TER  190
00124    20*          AZMX=AMAX1(AZMX,AZ(L))                                           TER  200
00125    21*          AZMN=AMIN1(AZMN,AZ(L))                                           TER  210
00126    22*          ELMX=AMAX1(ELMX,ELEV(L))                                         TER  220
00127    23*       30 ELMN=AMIN1(ELMN,ELEV(L))                                         TER  230
00131    24*          CALL SCRND (TIME(1000),TIME(1),XR,XL)                            TER  240
00132    25*          CALL SCRND (RGMX,RGMN,YTR,YBR)                                   TER  250
00133    26*          CALL SCRND (AZMX,AZMN,YTA,YBA)                                   TER  260
00134    27*          CALL SCRND (ELMX,ELMN,YTE,YBE)                                   TER  270
00135    28*          RETURN                                                           TER  280
00135    29*    C                                                                      TER  290
00136    30*       40 CALL QUIK3L  (-3,XL,XR,YBR,YTR,ISYM,BCDX,BCDY,-1000,TIME,RANGE)  TER  300
00137    31*          CALL QUIK3L  (+3,XL,XR,YBA,YTA,ISYM,BCDX,CCDY,-1000,TIME,AZ)     TER  310
00140    32*          CALL QUIK3L  (+3,XL,XR,YBE,YTE,ISYM,BCDX,DCDY,-1000,TIME,ELEV)   TER  320
00141    33*          RETURN                                                           TER  330
00141    34*    C                                                                      TER  340
00142    35*       50 CALL ENDJOB                                                      TER  350
00143    36*          RETURN                                                           TER  360
00143    37*    C                                                                      TER  370
00144    38*          DATA ISYM/35/                                                    TER  380
00146    39*          DATA BCDX/6HTIME (,6HSEC)  ,10*1H /                              TER  390
00150    40*          DATA BCDY/6HRANGE ,6H*YDS* ,10*1H /                              TER  400
00152    41*          DATA CCDY/6HAZIMUT,6HH*DEG*,10*1H /                              TER  410
00154    42*          DATA DCDY/6HELEVAT,6HION *D,6HEG*   ,9*1H /                      TER  420
00156    43*          END                                                             TER  430
```

END OF COMPILATION: NO DIAGNOSTICS.

@FOR,S FILTER,FILTER
HVH 080-05/14-10:05 (O,)

SUBROUTINE FILTER   ENTRY POINT 000777

STORAGE USED: CODE(1) 001013; DATA(0) 002133; BLANK COMMON(2) 000000

COMMON BLOCKS:

0003   TRAN1   001750
0004   TAPEV   013724
0005   UNITS   000007
0006   PLSYM   000001

EXTERNAL REFERENCES (BLOCK, NAME)

0007   TAPE
0010   PLOTT
0011   QUIK3V
0012   NWDU$
0013   NIO2$
0014   NIO1$
0015   NERR3$

STORAGE ASSIGNMENT (BLOCK, TYPE, RELATIVE LOCATION, NAME)

0001	000022 124G	0001	000400 130L	0001	000432 150L	0001	000122 160G	0001	000516 160L
0001	000143 166G	0001	000533 170L	0001	000540 190L	0001	000070 20L	0001	000625 200L
0001	000633 210L	0001	000220 216G	0001	000647 220L	0001	000717 230L	0001	000251 231G
0001	000740 240L	0001	000274 241G	0000	001630 250F	0000	001666 260F	0000	001700 270F
0001	000375 274G	0000	001705 280F	0000	001717 290F	0001	000117 30L	0000	001720 300F
0001	000402 302G	0000	001751 310F	0000	001765 320F	0000	002023 330F	0000	002030 340F
0001	000551 342G	0000	002034 350F	0000	002055 360F	0001	000131 50L	0001	000215 70L
0001	000243 90L	0003 R 000000 A	0000 R 000034 ACDX	0000 R 000050 ACDY	0000 R 000130 ARAY
0000 R 000064 BCDY	0000 R 000100 CCDY	0004 R 013560 DUM	0000 R 000114 ECDY	0000 I 001570 I
0000 I 001600 IEND	0000 I 001627 IER	0000 I 001575 IERR	0000 I 001571 IFILE	0005 000006 IFOR
0000 I 001610 II	0000 I 001623 IK	0000 I 001625 IKR	0000 I 001603 IMAX	0000 002106 INJP$
0005 I 000005 IPLOT	0000 I 001606 IPT	0000 I 001626 IR	0006 I 000000 ISYM	0000 I 001601 IT
0000 I 001605 ITT	0000 I 001573 I28	0000 I 001572 I56	0000 I 001616 J	0000 I 001607 K
0000 I 001604 KC	0000 I 001622 KC1	0000 I 001577 KKM	0000 I 001624 KR	0000 I 001617 K1
0000 I 001620 K2	0000 I 001602 M	0000 I 001621 MJ	0000 I 001611 MN	0005 000000 N01
0005 I 000001 N02	0005 000002 N03	0005 I 000003 N04	0005 I 000004 NFILES	0000 I 001576 NREC
0004 R 012430 SU	0000 R 001613 SUMU	0000 R 001614 SUMV	0000 R 001615 SUMW	0000 R 001612 SUMZ
0004 R 012740 SV	0004 R 013250 SW	0004 R 012120 SZ	0004 R 011610 T	0004 R 002342 U
0004 R 004704 V	0004 R 007246 W	0000 R 001574 WMID	0000 R 000000 WW	0004 R 000000 Z

00101	1*	.	SUBROUTINE FILTER	FIL	10
00101	2*	C		FIL	20
00101	3*	C * * * * *	*	* FIL	30

```
00101     4*    C      *  SUBROUTINE FILTER APPLIES THE LOW PASS FILTER TO .1 SECOND     * FIL    40
00101     5*    C      *  VELOCITY DATA CREATED FROM THE .1 SECOND TAER DATA- RANGE,     * FIL    50
00101     6*    C      *  AZIMUTH AND ELEVATION, AND CREATES ONE SECOND VELOCITY DATA    * FIL    60
00101     7*    C      *  ON UNIT ND4.                                                   * FIL    70
00101     8*    C      *           *           *          *       *                 *   * FIL    80
00101     9*    C      *  NUMBER OF WEIGHTS USED - 55 (27 VALUES W/MIRROR IMAGE AND      * FIL    90
00101    10*    C      *  A MIDPOINT.)                                                   * FIL   100
00101    11*    C      *           *           *       *,   *                 *         * FIL   110
00101    12*    C      *  .1 SECOND VELOCITY DATA IS WRITTEN IN 1000 WORD PHYSICAL       * FIL   120
00101    13*    C      *  RECORDS, ONE SECOND VELOCITY DATA IS WRITTEN IN 800 WORD       * FIL   130
00101    14*    C      *  PHYSICAL RECORDS.                                             * FIL   140
00101    15*    C      *           *           *       *       *                 *      * FIL   150
00101    16*    C      *  FORMAT FOR  .1 SECOND DATA IS OF THE FORM                      * FIL   160
00101    17*    C      *  Z(1),U(1),V(1),W(1),Z(2),U(2),V(2),W(2),Z(3),...OR A(4,250)    * FIL   170
00101    18*    C      *  THE ONE SECOND DATA IS OF THE SAME FORM EXCEPT THERE ARE 200   * FIL   180
00101    19*    C      *  VALUES OF EACH COMPONENT, OR  A(4,200)                         * FIL   190
00101    20*    C      *           *           *       *       *                 *      * FIL   200
00101    21*    C      *  PROCESSING OF EACH FILE BEGINS BY STORING 1250 WORDS INTO      * FIL   210
00101    22*    C      *  THE WORKING ARRAYS (READING FIVE (5) 1000 WORD RECORDS) AND    * FIL   220
00101    23*    C      *  FROM THERE ON READING FOUR (4) RECORDS SO AS TO ALWAYS HAVE    * FIL   230
00101    24*    C      *  1250 WORDS IN THE WORKING ARRAYS AT ONE TIME.                  * FIL   240
00101    25*    C      *           *           *       *       *                 *        FIL   250
00101    26*    C                                                                         FIL   260
00101    27*    C      ** PLOT OPTIONS **                                                 FIL   270
00101    28*    C      IPLOT = 0  - NO PLOTS                                              FIL · 280
00101    29*    C            = 1  - TAER DATA ONLY                                        FIL   290
00101    30*    C            = 2  - ONE SEC VEL ONLY                                      FIL   300
00101    31*    C            = 3  - BOTH 1 AND 2                                          FIL   310
00101    32*    C                                                                         FIL   320
00101    33*    C                                                                         FIL   330
00103    34*           DIMENSION WW(28), ACDX(12), ACDY(12), BCDY(12), CCDY(12), ECDY(12)FIL   340
00103    35*          1, ARAY(800)                                                        FIL   350
00103    36*    C                                                                         FIL   360
00104    37*           COMMON /TRAN1/ A(1000)                                             FIL   370
00105    38*           COMMON /TAPEV/ Z(1250),U(1250),V(1250),W(1250),T(200),SZ(200),SU(2FIL   380
00105    39*          100),SV(200),SW(200),DUM(100)                                       FIL   390
00106    40*           COMMON /UNITS/ ND1,ND2,ND3,ND4,NFILES,IPLOT,IFOR                   FIL   400
00107    41*           COMMON /PLSYM/ ISYM                                                FIL   410
00110    42*           DATA (WW(I),I=1,28)/.07365641,.07166239,.06841465,.06404076,.05868FIL   420
00110    43*          1300,.05253129,.04579480,.03869666,.03146420,.02431932,.01746935,.0FIL   430
00110    44*          21109891,.00536330,.00038320,-.00375800,-.00701636,-.00938586,-.010FIL   440
00110    45*          389632,-.01160975,-.01161294,-.01101528,-.00993790,-.00850874,-.006FIL   450
00110    46*          485550,-.00509943,-.00335008,-.00170115,.07432916/                  FIL   460
00110    47*    C                                                                         FIL   470
00112    48*           WRITE (6,250) NFILES,ND2,ND4,IPLOT                                 FIL   480
00120    49*           IFILE=1                                                            FIL   490
00120    50*    C                                                                         FIL   500
00120    51*    C      WRITE THE WEIGHT ARRAY                                             FIL   510
00121    52*           WRITE (6,260)                                                      FIL   520
00123    53*           DO 10 I=1,28                                                       FIL   530
00126    54*           I56=56-I                                                           FIL   540
00127    55*           I28=28-I                                                           FIL   550
00130    56*           IF (I28.EQ.0) I28=28                                              FIL   560
00132    57*       10  WRITE (6,270) I,I56,WW(I28)                                        FIL   570
00140    58*           WMID=WW(28)                                                        FIL   580
00140    59*    C                                                                         FIL   590
```

```
00140    60*   C      ** REWIND ONLY **                               FIL  600
00141    61*          CALL TAPE (ND2,5,0,DUM,IERR)                    FIL  610
00142    62*          CALL TAPE (ND4,5,0,DUM,IERR)                    FIL  620
00142    63*   C                                                      FIL  630
00142    64*   C                                                      FIL  640
00143    65*       20 NREC=0                                          FIL  650
00144    66*          WRITE (6,280) IFILE                             FIL  660
00147    67*          IF (IPLOT.GE.2) CALL PLOTT (1)                  FIL  670
00151    68*          KKM=1000                                        FIL  680
00152    69*          IEND=0                                          FIL  690
00153    70*          IT=-1                                           FIL  700
00154    71*          M=0                                             FIL  710
00155    72*          IMAX=5                                          FIL  720
00155    73*   C                                                      FIL  730
00156    74*       30 KC=0                                            FIL  740
00157    75*          DO 40 ITT=1,200                                 FIL  750
00152    76*          IT=IT+1                                         FIL  760
00163    77*       40 T(ITT)=FLOAT(IT)                                FIL  770
00165    78*       50 DO 80 I=1,IMAX                                  FIL  780
00165    79*   C                                                      FIL  790
00170    80*          CALL TAPE (ND2,2,1000,A,IERR)                   FIL  800
00171    81*          IF (IERR-2) 70,60,230                           FIL  810
00174    82*       60 IEND=1                                          FIL  820
00175    83*          IPT=250*I                                       FIL  830
00176    84*          IF (IMAX.EQ.5) IPT=1000                         FIL  840
00200    85*          KKM=IPT-50                                      FIL  850
00201    86*          WRITE (6,290)                                   FIL  860
00203    87*          WRITE (6,300) ND2,IPT,KKM,IEND,KC,IMAX          FIL  870
00213    88*          GO TO 90                                        FIL  880
00214    89*       70 K=-3                                            FIL  890
00215    90*          DO 80 II=1,250                                  FIL  900
00220    91*          K=K+4                                           FIL  910
00221    92*          M=M+1                                           FIL  920
00222    93*          Z(M)=A(K)                                       FIL  930
00223    94*          U(M)=A(K+1)                                     FIL  940
00224    95*          V(M)=A(K+2)                                     FIL  950
00225    96*       80 W(M)=A(K+3)                                     FIL  960
00225    97*   C                                                      FIL  970
00225    98*   C      FILTER DATA                                     FIL  980
00230    99*       90 DO 110 I=1,KKM,10                               FIL  990
00233   100*          MN=I+27                                         FIL 1000
00234   101*          SUMZ=Z(MN)*WMID                                 FIL 1010
00235   102*          SUMU=U(MN)*WMID                                 FIL 1020
00236   103*          SUMV=V(MN)*WMID                                 FIL 1030
00237   104*          SUMW=W(MN)*WMID                                 FIL 1040
00240   105*          DO 100 J=1,27                                   FIL 1050
00243   106*          K1=MN-J                                         FIL 1060
00244   107*          K2=MN+J                                         FIL 1070
00245   108*          SUMZ=SUMZ+WW(J)*(Z(K1)+Z(K2))                   FIL 1080
00246   109*          SUMU=SUMU+WW(J)*(U(K1)+U(K2))                   FIL 1090
00247   110*          SUMV=SUMV+WW(J)*(V(K1)+V(K2))                   FIL 1100
00250   111*      100 SUMW=SUMW+WW(J)*(W(K1)+W(K2))                   FIL 1110
00252   112*          KC=KC+1                                         FIL 1120
00253   113*          SZ(KC)=SUMZ                                     FIL 1130
00254   114*          SU(KC)=SUMU                                     FIL 1140
00255   115*          SV(KC)=SUMV                                     FIL 1150
```

```
00256    116*         SW(KC)=SUMW                                                    FIL 1160
00257    117*         MJ=4*KC-3                                                      FIL 1170
00260    118*         ARAY(MJ)=SZ(KC)                                                FIL 1180
00261    119*         ARAY(MJ+1)=SU(KC)                                              FIL 1190
00262    120*         ARAY(MJ+2)=SV(KC)                                              FIL 1200
00263    121*     110 ARAY(MJ+3)=SW(KC)                                              FIL 1210
00265    122*         IF (IEND.EQ.0) GO TO 130                                       FIL 1220
00267    123*         KC1=4*KC+1                                                     FIL 1230
00270    124*         WRITE (6,310) KC1                                              FIL 1240
00273    125*         DO 120 MJ=KC1,800                                              FIL 1250
00276    126*     120 ARAY(MJ)=0.                                                    FIL 1260
00300    127*         GO TO 150                                                      FIL 1270
00300    128*  C                                                                     FIL 1280
00300    129*  C        *          *           *          *,    *                *      * FIL 1290
00300    130*  C        * CARRY OVER THE LAST 250 POINTS AND RETURN TO READ NEXT 1000  * FIL 1300
00300    131*  C        * POINTS.        *          *     *      *               *      * FIL 1310
00300    132*  C        *          *           *          *    *          *             * FIL 1320
00300    133*  C                                                                     FIL 1330
00301    134*     130 DO 140 I=1,250                                                 FIL 1340
00304    135*         M=I+1000                                                       FIL 1350
00305    136*         Z(I)=Z(M)                                                      FIL 1360
00306    137*         U(I)=U(M)                                                      FIL 1370
00307    138*         V(I)=V(M)                                                      FIL 1380
00310    139*     140 W(I)=W(M)                                                      FIL 1390
00312    140*         M=250                                                          FIL 1400
00313    141*         IMAX=4                                                         FIL 1410
00314    142*         IF (KC.LT.200) GO TO 50                                        FIL 1420
00314    143*  C                                                                     FIL 1430
00316    144*     150 NREC=NREC+1                                                    FIL 1440
00317    145*         IF (IPLOT.LT.2) GO TO 160                                      FIL 1450
00321    146*         CALL QUIK3V (-2,ISYM,ACDX,ACDY,-KC,T,SZ)                       FIL 1460
00322    147*         CALL QUIK3V (+2,ISYM,ACDX,FCDY,-KC,T,SW)                       FIL 1470
00323    148*         CALL QUIK3V (-2,ISYM,ACDX,BCDY,-KC,T,SU)                       FIL 1480
00324    149*         CALL QUIK3V (+2,ISYM,ACDX,CCDY,-KC,T,SV)                       FIL 1490
00325    150*     160 K1=1                                                           FIL 1500
00326    151*         IK=1                                                           FIL 1510
00327    152*         IF (KC.GT.100) GO TO 170                                       FIL 1520
00331    153*         K2=KC/2                                                        FIL 1530
00332    154*         KR=K2                                                          FIL 1540
00333    155*         GO TO 180                                                      FIL 1550
00334    156*     170 IK=2                                                           FIL 1560
00335    157*         K2=50                                                          FIL 1570
00336    158*         KR=50                                                          FIL 1580
00337    159*     180 WRITE (6,320)                                                  FIL 1590
00341    160*         DO 190 I=K1,K2                                                 FIL 1600
00344    161*         IKR=I+KR                                                       FIL 1610
00345    162*     190 WRITE (6,330) I,SZ(I),SU(I),SV(I),SW(I),T(I),IKR,SZ(IKR),SU(IKR),SFIL 1620
00345    163*        1V(IKR),SW(IKR),T(IKR)                                          FIL 1630
00364    164*         IF (IK.EQ.1) GO TO 200                                         FIL 1640
00366    165*         K1=101                                                         FIL 1650
00367    166*         K2=(KC-100)/2+100                                              FIL 1660
00370    167*         KR=K2-100                                                      FIL 1670
00371    168*         IK=1                                                           FIL 1680
00372    169*         IF (K2-K1) 210,180,180                                         FIL 1690
00375    170*     200 IR=MOD(KC,2)                                                   FIL 1700
00375    171*         IF (IR.EQ.0) GO TO 220                                         FIL 1710
```

```
00400   172*        210 WRITE (6,340) KC,SZ(KC),SU(KC),SV(KC),SW(KC),T(KC)                    FIL 1720
00410   173*        220 CALL TAPE (ND4,1,800,ARAY,IER)                                          FIL 1730
00411   174*            IF (IEND.EQ.0) GO TO 30                                                 FIL 1740
00411   175*    C                                                                               FIL 1750
00413   176*            CALL TAPE (ND4,6,0,DUM,IERR)                                            FIL 1760
00414   177*            IF (IPLOT.GE.2) CALL PLOTT (4)                                          FIL 1770
00416   178*            WRITE (6,350) IFILE,NREC,ND4                                            FIL 1780
00423   179*            IF (IFILE.EQ.NFILES) GO TO 240                                          FIL 1790
00425   180*            IFILE=IFILE+1                                                           FIL 1800
00426   181*            GO TO 20                                                                FIL 1810
00426   182*    C                                                                               FIL 1820
00427   183*        230 WRITE (6,360) ND2,IERR,NREC,IFILE                                       FIL 1830
00435   184*            IF (IPLOT.GE.2) CALL PLOTT (4)                                          FIL 1840
00435   185*    C                                                                               FIL 1850
00437   186*        240 CALL TAPE (ND2,5,0,DUM,IERR)                                            FIL 1860
00440   187*            CALL TAPE (ND4,5,0,DUM,IERR)                                            FIL 1870
00441   188*            RETURN                                                                  FIL 1880
00441   189*    C                                                                               FIL 1890
00442   190*            DATA ACDY/6HALTITU,6HDE *M/,6HSEC*   ,9*1H /                            FIL 1900
00444   191*            DATA ACDX/6HTIME (,6HSEC)   ,10*1H /                                    FIL 1910
00446   192*            DATA BCDY/6HZONAL ,6H*M/SEC,6H*     ,9*1H /                             FIL 1920
00450   193*            DATA CCDY/6HMERIDI,6HCNAL *,6HM/SEC*,9*1H /                             FIL 1930
00452   194*            DATA ECDY/6HRISE R,6HATE *M,6H/SEC* ,9*1H /                             FIL 1940
00452   195*    C                                                                               FIL 1950
00454   196*        250 FORMAT (/1H1,50HNUMBER FILES OF .1 SEC VELOCITY DATA TO PROCESS ISFIL 1960
00454   197*           1I3/15H INPUT UNIT IS I2,16H OUTPUT UNIT IS I2/67H PLOTTING-(0,NONEFIL 1970
00454   198*           2),(1,TAER),(2,1 SEC VEL),(3,BOTH 1 AND 2)  IPLOT =I2)                   FIL 1980
00455   199*        260 FORMAT (//26H WEIGHTS FOR MARTIN-GRAHAM/6X,15HLOW-PASS FILTER/)          FIL 1990
00456   200*        270 FORMAT (2H (I2,1H,I2,3H) =F16.8)                                         FIL 2000
00457   201*        280 FORMAT (/1H1,43HBEGIN PROCESSING .1 SEC VELOCITY DATA FILE I2/)          FIL 2010
00460   202*        290 FORMAT (/1H1)                                                           FIL 2020
00461   203*        300 FORMAT (21H ** END OF FILE UNIT I2,3H **/15H THE REMAINING I5,50H FIL 2030
00461   204*           1POINTS WILL BE USED TO ESTABLISH THE LAST RECORD./5H KKM=I5,6H IENFIL 2040
00461   205*           2D=I2,4H KC=I4,6H IMAX=I2)                                               FIL 2050
00462   206*        310 FORMAT (11H LOCATIONS I4,46H THROUGH 800 OF LAST RECORD FILLED WITFIL 2060
00462   207*           1H ZEROS.)                                                               FIL 2070
00463   208*        320 FORMAT (/1H1,48X,27HONE  SECOND  VELOCITY  DATA//2(2X,2HKC,6X,8HALFIL 2080
00463   209*           1TITUDE,6X,5HZONAL,4X,10HMERIDIONAL,2X9HRISE RATE,2X,4HTIME,5X)/2(1FIL 2090
00463   210*           22X3H(M)8X7H(M/SEC)4X7H(M/SEC)5X7H(M/SEC)2X5H(SEC)5X)/)                  FIL 2100
00464   211*        330 FORMAT (2(I4,2X,4F11.2,F10.1,5Y))                                       FIL 2110
00465   212*        340 FORMAT (65X,I4,2X,4F11.2,F10.1)                                         FIL 2120
00466   213*        350 FORMAT (50H END OF ONE SECOND VELOCITY CALCULATIONS FOR FILE I3/7XFIL 2130
00466   214*           1I4,30H RECORDS WERE WRITTEN ON UNIT I2)                                 FIL 2140
00467   215*        360 FORMAT (/36H1** REDUNDANCY ON INPUT/OUTPUT UNIT I2,3H **/6H IERR=IFIL 2150
00467   216*           12,6H NREC=I4,7H IFILE=I3)                                               FIL 2160
00470   217*            END                                                                     FIL 2170


        END OF COMPILATION:        NO  DIAGNOSTICS.
```

aMAP,IS TARSYM,TARWON
MAP 17M1-05/14-10:05 -(,0)

    1.   LIB SYS$*MSFC$

ADDRESS LIMITS   001000 035531   040000 076667
STARTING ADDRESS   034306

WORDS DECIMAL   14682 IBANK   15800 DBANK

            SEGMENT MAIN   001000 035531   040000 076667

NEXP6$/FOR57   1   001000 001172   2   040000 040051 ·
ALOG$/FOR51   1   001173 001310   2   040052 040112
CSIG6V/SC4020   1   001311 001601   0   040113 040152
                                                 2   BLANK$COMMON
CERMRK/SC4020   1   001602 001631   0   040153 040166
                                                 2   BLANK$COMMON
CLABLV/SC4020   1   001632 002676   0   040167 040275
                                                 2   BLANK$COMMON
CYMODV/SC4020   1   002677 002725   0   040276 040303
                                                 2   BLANK$COMMON
CACCBY/SC4020   1   002726 002747   0   040304 040314
                                                 2   BLANK$COMMON
CXMODV/SC4020   1   002750 002776   0   040315 040322
                                                 2   · BLANK$COMMON
CONCAT/MSFC   1   002777 003150   0   040323 040344
SETINT/SC4020   1   003151 003203   0   040345 040352
                                                 2   BLANK$COMMON
CHOLLV/SC4020   1   003204 003265   0   040353 040367
                                                 2   BLANK$COMMON
CNONLN/SC4020   1   003266 003674   0   040370 040437
                                                 2   BLANK$COMMON
CLINRV/SC4020   1   003675 004552   0   040440 040533
                        3   GGG   2   PLANK$COMMON
CYSCLV/SC4020   1   004553 004755   0   040534 040561
                        3   GGG   2   BLANK$COMMON
CXSCLV/SC4020   1   004756 005160   0   040562 040607
                        3   GGG   2   BLANK$COMMON
CERNLV/SC4020   1   005161 005335   0   040610 040622
                                                 2   BLANK$COMMON
CERRLN/SC4020   1   005336 005452   0   040623 040637
                                                 2   BLANK$COMMON
CSETCV/SC4020   1   005453 005513   0   040640 040650
                                                 2   BLANK$COMMON

NEXP5$/FOR57	1	005514 005577	2	040651 040660	
CSETMV/SC4020	1	005600 005656	0	040661 040675	
			2	BLANK$COMMON	
CFRAM/SC4020	1	005657 006076	0	040676 040763	
	3	GGG	2	BLANK$COMMON	
CXAXIS/SC4020	1	006077 006302	0	040764 041017	
			2	BLANK$COMMON	
VCHARV/SC4020	1	006303 006546	0	041020 041037	
RITE2V/SC4020	1	006547 006777	0	041040 041066	
BPLOTK/SC4020	1	007000 007060	0	041067 041445	
			2	BLANK$COMMON	
CCAMRA/SC4020	1	007061 007135	0	041446 041457	
	3	GGG	2	BLANK$COMMON	
TABL1V/SC4020			0	041460 042000	
NBDCV$/FOR57	1	007136 007271	2	042001 042040	
NFTV$/FOR	1	007272 007314			
NCNVT$/FOR57	1	007315 007547	2	042041 042130	
NBFOO$/FOR			2	042131 044332	
NININS/MSFC55	1	007550 010001	2	044333 044354	
NINPT$/FOR57	1	010002 010661	2	044355 044377	
NCLOS$/MSFC57	1	010662 011025	2	044400 044424	
NRBLK$/MSFC55	1	011026 011114	0	044425 044426	
NFTCH$/FOR57	1	011115 011414	2	044427 044464	
NSWTC$/FOR	1	011415 011436			
NBSBL$/FOR	1	011437 011474			
NUPDA$/FOR	1	011475 011530			
NWBLK$/MSFC57	1	011531 011720	0	044465 044467	
NCBO$/MSFC	1	011721 012004	2	044470 044500	
CPLOTV/SC4020	1	012005 012160	0	044501 044540	
	3	GGG	2	BLANK$COMMON	
CLINEV/SC4020	1	012161 012544	0	044541 044617	
			2	BLANK$COMMON	
YSCLV1/SC4020	1	012545 012655	0	044620 044627	
	3	GGG	2	BLANK$COMMON	
XSCLV1/SC4020	1	012656 012765	0	044630 044637	
	3	GGG	2	BLANK$COMMON	
CAPLOT/SC4020	1	012766 013233	0	044640 044712	
	3	GGG	2	BLANK$COMMON	
CAPRNV/SC4020	1	013234 013316	0	044713 044731	
			2	BLANK$COMMON	
CPRNTV/SC4020	1	013317 013711	0	044732 044765	
	3	GGG	2	BLANK$COMMON	
CGRD1V/SC4020	1	013712 014620	0	044766 045100	
	3	GGG	2	BLANK$COMMON	
CDXOYV/SC4020	1	014621 015412	0	045101 045157	
			2	BLANK$COMMON	
CBRITV/SC4020	1	015413 015514	0	045160 045173	
	3	GGG	2	BLANK$COMMON	
CMARGN/SC4020	1	015515 015576	0	045174 045236	
			2	BLANK$COMMON	
CNBLNK/SC4020	1	015577 015650	0	045237 045253	
			2	BLANK$COMMON	
BMOV/MSFC			0	045254 045330	
CIDENT/SC4020	1	015651 017016	0	045331 045514	
	3	GGG	2	BLANK$COMMON	
FBU$/MSFC55					

```
NOTIN$/MSFC55              1    017017 017347     2    045515 045525
NOUT$/FOR57               1    017350 020324     2    045526 045556
NFMT$/FOR57               1    020325 021231     2    045557 045575
NIOER$/MSFC57            1    021232 021410     2    045576 045720
NFCHK$/MSFC57            1    021411 022226     2    045721 046075
                                                  4    046076 046147
NTAB$/MSFC55                                      2    046150 046236
NIBUF$/FOR52             1    022227 022270
H$MONITOR/MSFC55        1    022271 023373     2    046237 047013
SQRT$/FOR55              1    023374 023433     2    047014 047025
ATAN$/FOR57              1    023434 023635     2    047026 047057
SINCOS$/FOR57           1    023636 023767     2    047060 047101
NRWND$/FOR50            1    023770 024047     2    047102 047113
NWEF$/MSFC55            1    024050 024306     2    047114 047134
NFINP$/FOR57            1    024307 024630     2    047135 047221
NFOUT$/FOR52            1    024631 025127     2    047222 047243
OPEN/CSC                1    025130 025706     0    047244 053237
WRTPED/CSC              1    025707 027052     0    053240 053376
GGG (COMMON BLOCK)                                   053377 053532
COUIKL/SC4020           1    027053 027464     0    053533 053615
                        3    GGG               2    BLANK$COMMON
CSCRND/SC4020           1    027465 027745     0    053616 053647
                                                 2    BLANK$COMMON
IDENT/SC4020            1    027746 030650     0    053650 055311
NERR$/FOR57             1    030651 031205     2    055312 055466
NIER$/FOR52             1    031206 031270     2    055467 055616
NOBUF$/FOR51            1    031271 031330
CQUIKV/SC4020           1    031331 031523     0    055617 055646
                                                 2    BLANK$COMMON
EDIT1 (COMMON BLOCK)                                 055647 055651
PLSYM (COMMON BLOCK)                                 055652 055652
UNITS (COMMON BLOCK)                                 055653 055661
TAPEV (COMMON BLOCK)                                 055662 071605
TRAN1 (COMMON BLOCK)                                 071606 073555
BLANK$COMMON (COMMON BLOCK)
FILTER                  1    031524 032536     0    073556 075710
                        3    TRAN1             2    BLANK$COMMON
                        5    UNITS             4    TAPEV
                                               6    PLSYM
PLOTT                   1    032537 032775     0    075711 076034
                        3    TAPEV             2    BLANK$COMMON
                                               4    PLSYM
OUTPUT                  1    032776 033406     0    076035 076074
                        3    TRAN1             2    BLANK$COMMON
                                               4    UNITS
CALCOF                  1    033407 034305     0    076075 076330
                        3    TAPEV             2    BLANK$COMMON
                                               4    EDIT1
MAIN                    1    034305 035531     0    076331 076667
                        3    TAPEV             2    BLANK$COMMON
                        5    TRAN1             4    EDIT1
                                               6    UNITS
```

Appendix C

SAMPLE DATA CASE

The following values were assigned to input variables to obtain
a sample case:

ISKIP = 0
NDI = 0
NFILES = 1
NWPREC = 600
ND3 = 0
ITRAN = 1
ND2 = 0
IFILTR = 1
ND4 = 0
IPLOT = 3
IFOR = 1
IEDIT = 2
NREC = 1

For a discription of these input variables, see the Input Guide, Section 4.
The resulting printed output and selected graphic examples of edited 0.1-second
TAER data and 1-second velocity component output is presented herein.

PRINTED OUTPUT OF
SAMPLE CASE

SKIP 0 FILES FROM TAPE 8 BEFORE PROCESSING
NUMBER OF FILES TO BE PROCESSED IS   1
NUMBER OF WORDS PER PHYSICAL RECORD IS   500
ITRAN = 1-OUTPUT .1 SECOND VELOCITY DATA(PUVW) ON UNIT   9
IFILTR= 1-OUTPUT ONE SECOND VELOCITY DATA ON UNIT   11
PLOTTING-(0,NONE),(1,TAER),(2,1 SEC VEL),(3,BOTH 1 AND 2)   IFLOT = 3
IFOR= 1
IEDIT = 2 FOR PROCESSING FILE 1 OUTPUT DATA ON UNIT 10

                                              TAPE TIME ERROR T(938) =   119.60 DRT =   .20

END OF RECORD   1 FILE   1

END OF RECORD   2 FILE   1

END OF RECORD   3 FILE   1

END OF RECORD   4 FILE   1

END OF RECORD   5 FILE   1

END OF RECORD   6 FILE   1

END OF RECORD   7 FILE   1

END OF RECORD   8 FILE   1

                                              TAPE TIME ERROR T(419) =   267.80 DRT =   .20
                                              TAPE TIME ERROR T(483) =   274.30 DRT =   .20
                                              TAPE TIME ERROR T(488) =   274.90 DRT =   .20

END OF RECORD   9 FILE   1

END OF RECORD 10 FILE   1

END OF RECORD 11 FILE   1

END OF RECORD 12 FILE   1

END OF RECORD 13 FILE   1

END OF RECORD 14 FILE 1

END OF RECORD 15 FILE 1

END OF RECORD 16 FILE 1

END OF RECORD 17 FILE 1

END OF RECORD 18 FILE 1

END OF RECORD 19 FILE 1

END OF RECORD 20 FILE 1

END OF RECORD 21 FILE 1

END OF RECORD 22 FILE 1

END OF RECORD 23 FILE 1

END OF RECORD 24 FILE 1

END OF RECORD 25 FILE 1

END OF RECORD 26 FILE 1

END OF RECORD 27 FILE 1

END OF RECORD 28 FILE 1

END OF RECORD 29 FILE 1

END OF RECORD 30 FILE 1

END OF RECORD 31 FILE 1

END OF RECORD 32 FILE 1

END OF RECORD 33 FILE 1

END OF RECORD 34 FILE 1

END OF RECORD 35 FILE 1

END OF RECORD 36 FILE 1

TAPE TIME ERROR T(541) =   980.30   DRT =   .20

TAPE TIME ERROR T(554) =   981.70   DRT =   .20

TAPE TIME ERROR T(812) =   1007.60   DRT =   .20

END OF RECORD 37 FILE 1

END OF RECORD 38 FILE 1

END OF RECORD 39 FILE 1

END OF RECORD 40 FILE 1

END OF RECORD 41 FILE 1

END OF RECORD 42 FILE 1

END OF RECORD 43 FILE 1

END OF RECORD 44 FILE 1

TAPE TIME ERROR T(113) =   1137.80   DRT =   .20

END OF RECORD 45 FILE 1

END OF RECORD 46 FILE 1

END OF RECORD 47 FILE 1

END OF RECORD 48 FILE 1

END OF RECORD 49 FILE 1

END OF RECORD 50 FILE 1

END OF RECORD 51 FILE 1

END OF RECORD 52 FILE 1

END OF RECORD 53 FILE 1

END OF RECORD 54 FILE 1

END OF RECORD 55 FILE 1

END OF RECORD 56 FILE 1

END OF RECORD 57 FILE 1

END OF RECORD 58 FILE 1

END OF RECORD 59 FILE 1

END OF RECORD 60 FILE 1

END OF RECORD 61 FILE 1

END OF RECORD 62 FILE 1

END OF RECORD 53 FILE 1

END OF RECORD 64 FILE 1

TAPE TIME ERROR T(365) =   1663.10 ORT =   -.20

END OF RECORD 65 FILE 1

END OF RECORD 66 FILE 1

END OF RECORD 57 FILE 1

END OF RECORD 58 FILE 1

END OF RECORD 69 FILE 1

END OF RECORD 70 FILE 1

END OF RECORD 71 FILE 1

END OF RECORD 72 FILE 1

```
                                                          TAPE TIME ERROR T( 147) =     1841.00  DRT =          .20
KCOUNT=     1
RANGE=  26976.56250 Y=  26513.82568 TIME=      1821.00 DIF0 =      457.73682
AZ   =     60.71320 X=     60.52231 TIME=      1821.00 DIF10=        .19089
KOUNT=     2
RANGE=  26974.60937 Y=  26518.13232 TIME=      1821.10 DIF0 =      456.47705
AZ   =     60.70533 X=     60.52231 TIME=      1821.10 DIF10=        .18402
KOUNT=     3
RANGE=  26974.60937 Y=  26517.24316 TIME=      1821.20 DIF0 =      457.36621
AZ   =     60.70015 X=     60.52231 TIME=      1821.20 DIF10=        .17784
KOUNT=     4
RANGE=  26980.46875 Y=  26516.56445 TIME=      1821.30 DIF0 =      463.90430
AZ   =     60.69328 X=     60.52230 TIME=      1821.30 DIF10=        .17098
KOUNT=     5
RANGE=  26984.37500 Y=  26515.66602 TIME=      1821.40 DIF0 =      463.70898
AZ   =     60.69122 X=     60.52230 TIME=      1821.40 DIF10=        .16892
KOUNT=     6
RANGE=  26978.51562 Y=  26514.94141 TIME=      1821.50 DIF0 =      463.57422
AZ   =     60.69054 X=     60.52230 TIME=      1821.50 DIF10=        .16824
KCOUNT=     7
RANGE=  26986.32812 Y=  26513.94580 TIME=      1821.60 DIF0 =      472.38232
AZ   =     60.68916 X=     60.52230 TIME=      1821.60 DIF10=        .16687
KOUNT=     8
RANGE=  26982.42187 Y=  26513.05225 TIME=      1821.70 DIF0 =      469.36963
AZ   =     60.68348 X=     60.52230 TIME=      1821.70 DIF10=        .16618

                                                          TAPE TIME ERROR T( 210) =     1847.40  DRT =         8.50
KOUNT=     9
RANGE=  26988.28125 Y=  26512.39062 TIME=      1821.80 DIF0 =      475.89062
AZ   =     60.68779 X=     60.52229 TIME=      1821.80 DIF10=        .16550
KOUNT=    10
RANGE=  26988.28125 Y=  26511.53955 TIME=      1821.90 DIF0 =      476.74170
AZ   =     60.68642 X=     60.52229 TIME=      1821.90 DIF10=        .16413

                                                          TAPE TIME ERROR T( 808) =     1915.60  DRT =          .20
PRINTOUT OF .1 SEC TAER DATA
        1826.40 26470.70    60.52    22.91           1825.50 26458.75     60.52    22.91          1826.60 26476.56    60.52    22.91
```

1826.70	26474.61	60.52	22.91	1826.80	26476.55	60.52	22.91	1826.90	26476.56	60.52	22.91
1827.00	26482.42	60.52	22.91	1827.10	26480.47	60.52	22.91	1827.20	26484.37	60.52	22.91
1827.30	26484.37	60.52	22.91	1827.40	26486.33	60.52	22.91	1827.50	26484.37	60.52	22.91
1827.60	26490.23	60.52	22.91	1827.70	26488.28	60.52	22.91	1827.80	26490.23	60.52	22.91
1827.90	26490.23	60.52	22.91	1828.00	26492.19	60.52	22.91	1828.10	26492.19	60.52	22.91
1828.20	26498.05	60.52	22.91	1828.30	26500.00	60.52	22.91	1828.40	26503.91	60.52	22.91
1828.50	26503.91	50.52	22.91	1828.60	26503.91	60.52	22.91	1828.70	26505.86	60.52	22.91
1828.80	26507.91	60.52	22.91	1828.90	26507.81	60.52	22.91	1829.00	26511.72	60.52	22.91
1829.10	26513.67	60.52	22.91	1829.20	26513.67	60.52	22.91	1829.30	26517.58	60.52	22.91
1829.40	26517.58	60.52	22.91	1829.50	26519.53	60.52	22.91	1829.60	26519.53	60.52	22.91
1829.70	26523.44	60.52	22.91	1829.80	26521.48	60.52	22.91	1829.90	26525.39	60.52	22.91
1830.00	26529.30	60.52	22.91	1830.10	26533.20	60.52	22.91	1830.20	26533.20	60.52	22.91
1830.30	26535.16	60.52	22.91	1830.40	26535.16	60.52	22.91	1830.50	26539.06	60.52	22.91
1830.60	26537.11	60.52	22.91	1830.70	26544.92	60.52	22.91	1830.80	26542.97	60.52	22.91
1830.90	26546.87	60.52	22.91	1831.00	26542.97	60.52	22.91	1831.10	26548.83	60.52	22.91
1831.20	26548.83	60.52	22.91	1831.30	26550.78	60.52	22.91	1831.40	26550.78	60.52	22.91
1831.50	26552.73	60.52	22.91	1831.60	26552.73	60.52	22.91	1831.70	26554.69	60.52	22.91
1831.80	26558.59	60.52	22.91	1831.90	26560.55	60.52	22.91	1832.00	26562.50	60.52	22.91
1832.10	26562.50	60.52	22.91	1832.20	26566.41	60.52	22.91	1832.30	26564.45	60.52	22.91
1832.40	26570.31	60.52	22.91	1832.50	26568.36	60.52	22.91	1832.60	26572.27	60.52	22.91
1832.70	26570.31	60.52	22.91	1832.80	26574.22	60.52	22.91	1832.90	26576.17	60.52	22.91
1833.00	26580.08	60.52	22.91	1833.10	26576.17	60.52	22.91	1833.20	26583.98	60.52	22.91
1833.30	26582.03	60.52	22.91	1833.40	26585.94	60.52	22.91	1833.50	26583.98	60.52	22.91
1833.60	26589.84	60.52	22.91	1833.70	26589.84	60.52	22.91	1833.80	26593.75	60.52	22.91
1833.90	26595.70	60.52	22.91	1834.00	26597.66	60.52	22.91	1834.10	26599.61	60.52	22.91
1834.20	26601.56	60.52	22.91	1834.30	26597.66	60.52	22.91	1834.40	26605.47	60.52	22.91
1834.50	26605.47	60.52	22.91	1834.60	26607.42	60.52	22.91	1834.70	26609.37	60.52	22.91
1834.80	26607.42	60.52	22.91	1834.90	26611.33	60.52	22.91	1835.00	26615.23	60.52	22.91
1835.10	26613.28	60.52	22.91	1835.20	26615.23	60.52	22.91	1835.30	26617.19	60.52	22.91
1835.40	26619.14	60.52	22.91	1835.50	26623.05	60.52	22.91	1835.60	26623.05	60.52	22.91
1835.70	26626.95	60.52	22.91	1835.80	26630.86	60.52	22.91	1835.90	26634.77	60.52	22.91
1836.00	26630.86	60.52	22.91	1836.10	26632.81	60.52	22.91	1836.20	26632.81	60.52	22.91
1836.30	26636.72	60.52	22.91	1836.40	26635.72	60.52	22.91	1836.50	26640.62	60.52	22.91
1836.60	26638.67	60.52	22.91	1836.70	26640.62	60.52	22.91	1836.80	26638.67	60.52	22.91
1836.90	26646.48	60.52	22.91	1837.00	26642.58	60.52	22.91	1837.10	26648.44	60.52	22.91
1837.20	26646.48	60.52	22.91	1837.30	26650.39	60.52	22.91	1837.40	26652.34	60.52	22.91
1837.50	26652.34	60.52	22.91	1837.60	26652.34	60.52	22.91	1837.70	26652.34	60.52	22.91
1837.80	26652.34	60.52	22.91	1837.90	26650.39	60.52	22.91	1838.00	26648.44	60.52	22.91
1838.10	26646.48	60.52	22.91	1838.20	26644.53	60.52	22.91	1838.30	26642.58	60.52	22.91
1838.40	26640.62	60.52	22.91	1838.50	26638.67	60.52	22.91	1838.60	26636.72	60.52	22.91
1838.70	26634.77	60.52	22.91	1838.80	26632.81	60.52	22.91	1838.90	26630.86	60.52	22.91
1839.00	26628.91	60.52	22.91	1839.10	26626.95	60.52	22.91	1839.20	26625.00	60.52	22.91
1839.30	26623.05	60.52	22.91	1839.40	26621.09	60.52	22.91	1839.50	26619.14	60.52	22.91
1839.60	26617.19	60.52	22.91	1839.70	26615.23	60.52	22.91	1839.80	26613.28	60.52	22.91
1839.90	26611.33	60.52	22.91	1840.00	26609.37	60.52	22.91	1840.10	26607.42	60.52	22.91
1840.20	26605.47	60.52	22.91	1840.30	26603.52	60.52	22.91	1840.40	26601.56	60.52	22.91
1840.50	26599.61	60.52	22.91	1840.60	26597.66	60.52	22.91	1840.70	26595.70	60.52	22.91
1840.80	26593.75	60.52	22.91	1840.90	26591.80	60.52	22.91	1841.00	26589.84	60.52	22.91
1841.20	26583.98	60.52	22.91	1841.30	26580.08	60.52	22.91	1841.40	26576.17	60.52	22.91
1841.50	26572.27	60.52	22.91	1841.60	26568.36	60.52	22.91	1841.70	26564.45	60.52	22.91
1841.80	26562.50	60.52	22.91	1841.90	26558.59	60.52	22.91	1842.00	26554.69	60.52	22.91
1842.10	26552.73	60.52	22.91	1842.20	26550.78	60.52	22.91	1842.30	26546.87	60.52	22.91
1842.40	26546.87	60.52	22.91	1842.50	26544.92	60.52	22.91	1842.60	26544.92	60.52	22.91
1842.70	26544.92	60.52	22.91	1842.80	26542.97	60.52	22.91	1842.90	26542.97	60.52	22.91
1843.00	26542.97	60.52	22.91	1843.10	26542.97	60.52	22.91	1843.20	26542.97	60.52	22.91
1843.30	26542.97	60.52	22.91	1843.40	26542.97	60.52	22.91	1843.50	26542.97	60.52	22.91

1843.60	26542.97	60.52	22.91	1843.70	26541.02	60.52	22.91	1843.80	26541.02	60.52	22.91
1843.90	26541.02	60.52	22.91	1844.00	26541.02	60.52	22.91	1844.10	26541.02	60.52	22.91
1844.20	26541.02	60.52	22.91	1844.30	26541.02	60.52	22.91	1844.40	26539.06	60.52	22.91
1844.50	26539.06	60.52	22.91	1844.60	26539.06	60.52	22.91	1844.70	26539.06	60.52	22.91
1844.80	26539.06	60.52	22.91	1844.90	26537.11	60.52	22.91	1845.00	26537.11	60.52	22.91
1845.10	26537.11	60.52	22.91	1845.20	26537.11	60.52	22.91	1845.30	26535.16	60.52	22.91
1845.40	26535.16	60.52	22.91	1845.50	26535.16	60.52	22.91	1845.60	26533.20	60.52	22.91
1845.70	26533.20	60.52	22.91	1845.80	26533.20	60.52	22.91	1845.90	26531.25	60.52	22.91
1846.00	26531.25	60.52	22.91	1846.10	26531.25	60.52	22.91	1846.20	26529.30	60.52	22.91
1846.30	26529.30	60.52	22.91	1846.40	26529.30	60.52	22.91	1846.50	26527.34	60.52	22.91
1846.60	26527.34	60.52	22.91	1846.70	26525.39	60.52	22.91	1846.80	26525.39	60.52	22.91
1846.90	26523.44	60.52	22.91	1847.00	26523.44	60.52	22.91	1847.10	26521.48	60.52	22.91
1847.20	26521.48	60.52	22.91	1847.30	26521.48	60.52	22.91	1847.40	*********************************
1855.90	26976.56	60.71	22.81	1856.00	26974.61	60.71	22.81	1856.10	26974.61	60.70	22.81
1856.20	26980.47	60.69	22.81	1856.30	26984.37	60.69	22.81	1856.40	26978.52	60.69	22.81
1856.50	26986.33	60.69	22.81	1856.60	26982.42	60.69	22.81	1856.70	26988.28	60.69	22.81
1856.80	26988.28	60.69	22.81	1856.90	26990.23	60.68	22.81	1857.00	26992.19	60.68	22.81
1857.10	26992.19	60.68	22.81	1857.20	26996.09	60.68	22.81	1857.30	26998.05	60.68	22.81
1857.40	27001.95	60.67	22.81	1857.50	27001.95	60.67	22.81	1857.60	27005.86	60.67	22.81
1857.70	27003.91	60.67	22.81	1857.80	27009.77	60.67	22.81	1857.90	27009.77	60.67	22.81
1858.00	27013.67	60.67	22.81	1858.10	27009.77	60.67	22.81	1858.20	27013.67	60.67	22.81
1858.30	27015.62	60.67	22.81	1858.40	27017.58	60.67	22.81	1858.50	27015.62	60.67	22.81
1858.60	27019.53	60.67	22.81	1858.70	27017.58	60.67	22.81	1858.80	27023.44	60.67	22.81
1858.90	27021.48	60.67	22.81	1859.00	27025.39	60.67	22.81	1859.10	27025.39	60.67	22.81
1859.20	27027.34	60.67	22.81	1859.30	27031.25	60.67	22.81	1859.40	27033.20	60.67	22.81
1859.50	27037.11	60.67	22.81	1859.60	27037.11	60.67	22.80	1859.70	27039.06	60.67	22.80
1859.80	27041.02	60.67	22.80								

PRINTOUT OF .1 SEC VEL DATA

9461.50	21.42	12.11	10.62	9464.31	21.42	12.11	10.31	9463.56	.00	.00	.00
9464.31	7.14	4.04	3.75	9464.31	21.42	12.11	10.31	9466.37	14.28	8.07	7.19
9465.75	7.14	4.04	3.44	9467.06	14.28	8.07	6.56	9467.06	7.14	4.04	3.75
9467.81	.00	.00	.00	9467.06	14.28	8.07	6.56	9469.12	14.28	8.07	7.19
9468.50	.00	.00	.00	9469.12	7.14	4.04	3.13	9469.12	7.14	4.04	4.06
9469.94	7.14	4.04	4.06	9469.94	21.41	12.11	10.62	9472.06	28.56	16.14	14.06
9472.75	21.42	12.11	10.31	9474.12	14.28	8.07	6.88	9474.12	.00	.00	.00
9474.12	7.14	4.04	3.44	9474.81	14.28	8.07	7.19	9475.56	7.14	4.04	3.75
9475.56	14.28	8.07	6.88	9476.94	21.42	12.11	10.31	9477.62	7.14	4.04	3.44
9477.62	14.28	8.07	7.19	9479.06	14.28	8.07	7.19	9479.06	7.14	4.04	3.44
9479.75	7.14	4.04	3.44	9479.75	14.28	8.07	7.19	9481.19	7.14	4.04	3.13
9480.37	7.14	4.04	3.13	9481.81	28.56	16.14	14.37	9483.25	28.56	16.14	13.75
9484.56	14.28	8.07	6.55	9484.56	7.14	4.04	3.75	9485.31	7.14	4.04	3.75
9485.31	14.28	8.07	7.19	9486.75	7.14	4.04	3.44	9486.00	21.42	12.11	10.31
9488.81	21.42	12.11	10.62	9488.12	7.14	4.04	3.44	9489.50	.00	.00	.00
9488.12	7.14	4.04	3.44	9490.19	21.42	12.11	10.31	9490.19	7.14	4.04	3.44
9490.87	7.14	4.04	3.44	9490.87	7.14	4.04	3.75	9491.62	7.14	4.04	3.75
9491.62	7.14	4.04	3.75	9492.37	21.42	12.11	10.94	9493.81	21.42	12.11	10.62
9494.50	14.28	8.07	6.56	9495.12	7.14	4.04	3.13	9495.12	14.28	8.07	7.19
9496.56	7.14	4.04	3.44	9495.81	14.28	8.07	7.19	9498.00	14.28	8.07	7.19
9497.25	7.14	4.04	3.44	9498.69	7.14	4.04	3.75	9498.00	7.14	4.04	3.44
9499.37	21.42	12.11	10.31	9500.06	21.42	12.11	10.31	9501.44	.00	.00	.00
9500.06	14.28	8.07	6.88	9502.81	21.42	12.11	10.31	9502.12	7.14	4.04	3.75
9503.55	7.14	4.04	3.44	9502.81	14.28	8.07	6.88	9504.94	21.42	12.11	10.62
9504.94	14.28	8.07	7.19	9506.37	21.42	12.11	10.62	9507.06	14.28	8.07	6.88
9507.75	14.28	8.07	6.88	9508.44	14.28	8.07	7.19	9509.19	-7.14	-4.04	-3.44
9507.75	14.28	8.07	6.88	9510.56	28.56	16.14	14.06	9510.56	7.14	4.04	3.44
9511.25	14.28	8.07	7.19	9512.00	.00	.00	.00	9511.25	7.14	4.04	3.44

9512.69	28.56	16.14	14.06	9514.06	7.14	4.03	3.44	9513.37	.00	.00	.00
9514.06	14.28	8.07	7.19	9514.81	14.28	8.07	7.19	9515.50	21.42	12.11	10.31
9516.87	14.28	8.07	6.88	9516.87	14.28	8.07	7.19	9518.31	28.56	16.14	14.06
9519.69	28.55	16.14	14.06	9521.12	.00	.00	.00	9519.69	-7.14	-4.04	-3.44
9520.44	7.14	4.03	3.75	9520.44	14.28	8.07	6.88	9521.81	14.28	8.07	6.88
9521.81	14.28	8.07	6.88	9523.19	7.14	4.04	3.44	9522.50	.00	.00	.00
9523.19	.00	.00	.00	9522.50	21.42	12.11	10.62	9525.31	14.28	8.07	6.88
9523.87	7.14	4.03	3.44	9526.00	14.28	8.07	7.19	9525.31	7.14	4.04	3.75
9526.75	21.42	12.11	10.62	9527.44	7.14	4.04	3.44	9527.44	.00	.00	.00
9527.44	.00	.00	.00	9527.44	.00	.00	.00	9527.44	-7.14	-4.04	-3.44
9526.75	-14.28	-8.07	-7.19	9526.00	-14.28	-8.07	-7.19	9525.31	-14.28	-8.07	-7.19
9524.56	-14.28	-8.07	-7.19	9523.87	-14.28	-8.07	-6.88	9523.19	-14.28	-8.07	-6.88
9522.50	-14.28	-8.07	-6.88	9521.81	-14.28	-8.07	-6.88	9521.12	-14.28	-8.07	-6.88
9520.44	-14.28	-8.07	-7.19	9519.69	-14.28	-8.07	-7.19	9519.00	-14.28	-8.07	-6.88
9518.31	-14.28	-8.07	-7.19	9517.56	-14.28	-8.07	-7.19	9516.87	-14.28	-8.07	-6.88
9516.19	-14.28	-8.07	-6.88	9515.50	-14.28	-8.07	-6.88	9514.81	-14.28	-8.07	-7.19
9514.06	-14.28	-8.07	-7.19	9513.37	-14.28	-8.07	-6.88	9512.69	-14.28	-8.07	-6.88
9512.00	-14.28	-8.07	-7.19	9511.25	-14.28	-8.07	-7.19	9510.56	-14.28	-8.07	-6.88
9509.87	-14.28	-8.07	-6.88	9509.19	-14.28	-8.07	-7.19	9508.44	-14.28	-8.07	-7.19
9507.75	-14.28	-8.07	-6.88	9507.06	-14.28	-8.07	-6.88	9506.37	-14.28	-8.07	-6.88
9505.69	-14.28	-8.07	-7.19	9504.94	-28.56	-16.14	-14.37	9502.81	-35.70	-20.18	-17.50
9501.44	-28.56	-16.14	-13.75	9500.06	-28.55	-16.14	-13.75	9498.69	-28.56	-16.14	-14.06
9497.25	-28.56	-16.14	-14.37	9495.81	-21.42	-12.11	-10.62	9495.12	-21.42	-12.11	-10.00
9493.81	-28.56	-16.14	-13.75	9492.37	-21.42	-12.11	-10.94	9491.62	-14.28	-8.07	-7.50
9490.87	-21.42	-12.11	-10.62	9489.50	-14.28	-8.07	-6.88	9489.50	-7.14	-4.04	-3.44
9488.81	-7.14	-4.04	-3.44	9488.81	.00	.00	.00	9488.81	-7.14	-4.04	-3.44
9488.12	-7.14	-4.04	-3.44	9488.12	.00	.00	.00	9488.12	.00	.00	.00
9488.12	.00	.00	.00	9488.12	.00	.00	.00	9488.12	.00	.00	.00
9488.12	.00	.00	.00	9488.12	.00	.00	.00	9488.12	-7.14	-4.04	-3.44
9487.44	-7.14	-4.04	-3.44	9487.44	.00	.00	.00	9487.44	.00	.00	.00
9487.44	.00	.00	.00	9487.44	.00	.00	.00	9487.44	.00	.00	.00
9487.44	-7.14	-4.04	-3.44	9486.75	-7.14	-4.04	-3.44	9486.75	.00	.00	.00
9486.75	.00	.00	.00	9485.75	.00	.00	.00	9486.75	-7.14	-4.03	-3.75
9486.00	-7.14	-4.03	-3.75	9486.00	.00	.00	.00	9486.00	.00	.00	.00
9486.00	-7.14	-4.04	-3.44	9485.31	-7.14	-4.04	-3.44	9485.31	.00	.00	.00
9485.31	-7.14	-4.04	-3.75	9484.56	-7.14	-4.04	-3.75	9484.56	.00	.00	.00
9484.56	-7.14	-4.04	-3.13	9483.94	-7.14	-4.04	-3.13	9483.94	.00	.00	.00
9483.94	-7.14	-4.04	-3.44	9483.25	-7.14	-4.04	-3.44	9483.25	.00	.00	.00
9483.25	-7.14	-4.04	-3.44	9482.56	-7.14	-4.04	-3.44	9482.56	-7.14	-4.04	-3.75
9481.81	-7.14	-4.04	-3.75	9481.81	-7.14	-4.04	-3.13	9481.19	-7.14	-4.04	-3.13
9481.19	-7.14	-4.03	-4.06	9480.37	-7.14	-4.03	-4.06	9480.37	.00	.00	.00
************************************				************************************				************************************			
9603.37	-19.80	18.53	-3.44	9603.37	8.82	34.59	10.31	9605.44	27.13	35.51	17.50
9606.87	-9.82	.73	-3.44	9604.75	5.16	7.58	3.44	9607.56	13.32	12.16	4.69
9605.69	6.83	6.96	.63	9607.69	19.47	15.61	10.00	9607.69	4.33	10.23	2.50
9608.19	10.82	15.44	5.94	9608.87	2.49	12.33	3.44	9608.87	8.98	17.53	6.88
9610.25	17.97	19.46	9.06	9610.69	18.63	18.28	9.38	9612.12	11.64	12.79	6.88
9612.06	12.98	10.41	6.88	9613.50	6.32	6.67	2.19	9612.50	13.48	10.70	5.63
9614.62	20.29	12.97	11.87	9614.87	13.64	9.23	6.88	9616.00	-.16	1.47	-1.25
9614.62	-.67	1.19	.00	9616.00	21.30	13.53	9.06	9616.44	14.81	8.32	5.63
9617.12	-.67	1.19	.00	9616.44	6.43	5.21	3.44	9617.81	7.66	4.30	1.88
9616.81	14.81	8.32	5.63	9618.94	13.14	8.95	8.44	9618.50	6.99	5.49	1.88
9619.31	15.32	8.61	4.06	9619.31	7.15	4.02	3.75	9620.06	20.80	13.25	10.31
9621.37	21.30	13.53	9.06	9621.87	21.30	13.53	9.38	9623.25	13.48	10.70	5.31
9622.94	6.99	5.49	2.19	9623.69	15.32	8.61	4.38	9623.81	23.32	14.67	3.44
9624.37	8.00	6.06	-.63								

END OF RECORD 73 FILE 1

PRINTOUT OF .1 SEC TAER DATA

1859.90	27044.92	60.67	22.80	1860.00	27042.97	60.67	22.80	1860.10	27044.92	60.67	22.80
1860.20	27046.87	60.67	22.80	1860.30	27050.78	60.67	22.80	1860.40	27048.83	60.67	22.80
1860.50	27050.78	60.67	22.80	1860.60	27052.73	60.66	22.80	1860.70	27056.64	60.66	22.80
1860.80	27056.64	60.66	22.80	1860.90	27060.55	60.66	22.80	1861.00	27062.50	60.66	22.79
1861.10	27068.36	60.66	22.79	1861.20	27068.36	60.66	22.79	1861.30	27070.31	60.66	22.79
1861.40	27070.31	60.66	22.79	1861.50	27072.27	60.66	22.79	1861.60	27072.27	60.66	22.79
1861.70	27076.17	60.66	22.79	1861.80	27078.12	60.66	22.79	1861.90	27082.03	60.66	22.79
1862.00	27082.03	60.66	22.79	1862.10	27080.08	60.66	22.79	1862.20	27083.98	60.66	22.79
1862.30	27083.98	60.66	22.79	1862.40	27087.89	60.66	22.79	1862.50	27089.84	60.66	22.79
1862.60	27093.75	60.66	22.79	1862.70	27093.75	60.66	22.79	1862.80	27095.70	60.66	22.79
1862.90	27095.70	60.67	22.79	1863.00	27099.61	60.67	22.79	1863.10	27097.66	60.67	22.79
1863.20	27103.52	60.67	22.79	1863.30	27101.55	60.67	22.79	1863.40	27105.47	60.67	22.79
1863.50	27103.52	60.67	22.79	1863.60	27107.42	60.67	22.79	1863.70	27109.37	60.67	22.79
1863.80	27111.33	60.67	22.79	1863.90	27109.37	60.67	22.79	1864.00	27115.23	60.67	22.79
1864.10	27113.28	60.67	22.79	1864.20	27117.19	60.67	22.78	1864.30	27119.14	60.67	22.78
1864.40	27121.09	60.67	22.78	1864.50	27125.00	60.67	22.78	1864.60	27128.91	60.67	22.78
1864.70	27128.91	60.67	22.78	1864.80	27130.86	60.67	22.78	1864.90	27132.81	60.68	22.78
1865.00	27132.81	60.68	22.78	1865.10	27138.67	60.68	22.78	1865.20	27136.72	60.68	22.78
1865.30	27138.67	60.68	22.78	1865.40	27140.62	60.68	22.78	1865.50	27144.53	60.68	22.78
1865.60	27142.58	60.68	22.78	1865.70	27144.53	60.68	22.78	1865.80	27144.53	60.68	22.77
1865.90	27152.34	60.68	22.77	1866.00	27152.34	60.68	22.77	1866.10	27156.25	60.68	22.77
1866.20	27154.30	60.68	22.77	1866.30	27160.16	60.69	22.77	1866.40	27160.16	60.69	22.77
1866.50	27162.11	60.69	22.77	1866.60	27164.05	60.69	22.77	1866.70	27166.02	60.69	22.77
1866.80	27166.02	60.69	22.77	1866.90	27169.92	60.69	22.77	1867.00	27169.92	60.69	22.77
1867.10	27171.87	60.69	22.77	1867.20	27171.87	60.70	22.77	1867.30	27173.83	60.70	22.77
1867.40	27175.78	60.70	22.77	1867.50	27175.78	60.70	22.77	1867.60	27175.78	60.70	22.77
1867.70	27177.73	60.70	22.77	1867.80	27179.69	60.70	22.77	1867.90	27179.69	60.70	22.77
1868.00	27185.55	60.70	22.77	1868.10	27187.50	60.70	22.77	1868.20	27191.41	60.70	22.77
1868.30	27189.45	60.70	22.77	1868.40	27195.31	60.70	22.77	1868.50	27195.31	60.70	22.77
1868.60	27197.27	60.70	22.77	1868.70	27197.27	60.70	22.77	1868.80	27203.12	60.70	22.77
1868.90	27199.22	60.70	22.77	1869.00	27205.08	60.70	22.77	1869.10	27205.08	60.70	22.77
1869.20	27208.98	60.70	22.77	1869.30	27208.98	60.70	22.77	1869.40	27210.94	60.70	22.77
1869.50	27212.89	60.70	22.77	1869.60	27214.84	60.70	22.77	1869.70	27218.75	60.70	22.77
1869.80	27220.70	60.70	22.76	1869.90	27226.56	60.70	22.76	1870.00	27226.56	60.70	22.76
1870.10	27226.56	60.70	22.76	1870.20	27228.52	60.70	22.76	1870.30	27232.42	60.70	22.76
1870.40	27232.42	60.70	22.76	1870.50	27234.37	60.70	22.76	1870.60	27236.33	60.70	22.76
1870.70	27238.28	60.70	22.76	1870.80	27238.28	60.70	22.76	1870.90	27240.23	60.70	22.76
1871.00	27240.23	60.70	22.76	1871.10	27246.09	60.70	22.76	1871.20	27246.09	60.70	22.76
1871.30	27246.09	60.70	22.76	1871.40	27248.05	60.70	22.76	1871.50	27248.05	60.70	22.76
1871.60	27251.95	60.71	22.76	1871.70	27253.91	60.71	22.76	1871.80	27253.91	60.71	22.76
1871.90	27253.91	60.71	22.75	1872.00	27259.77	60.71	22.75	1872.10	27257.81	60.71	22.75
1872.20	27261.72	60.71	22.75	1872.30	27261.72	60.71	22.75	1872.40	27265.62	60.71	22.75
1872.50	27263.67	60.71	22.75	1872.60	27269.53	60.71	22.75	1872.70	27267.58	60.71	22.75
1872.80	27273.44	60.71	22.75	1872.90	27271.48	60.71	22.75	1873.00	27277.34	60.71	22.75
1873.10	27277.34	60.71	22.75	1873.20	27279.30	60.71	22.75	1873.30	27283.20	60.71	22.75
1873.40	27285.16	60.71	22.75	1873.50	27287.11	60.71	22.75	1873.60	27291.02	60.71	22.75
1873.70	27291.02	60.71	22.75	1873.80	27294.92	60.71	22.75	1873.90	27292.97	60.71	22.75
1874.00	27296.87	60.71	22.75	1874.10	27296.87	60.71	22.75	1874.20	27300.78	60.71	22.75
1874.30	27302.73	60.71	22.75	1874.40	27302.73	60.71	22.75	1874.50	27304.69	60.71	22.75
1874.60	27304.69	60.71	22.75	1874.70	27306.64	60.71	22.74	1874.80	27310.55	60.71	22.74
1874.90	27314.45	60.71	22.74	1875.00	27314.45	60.71	22.74	1875.10	27320.31	60.71	22.74
1875.20	27320.31	60.72	22.74	1875.30	27320.31	60.72	22.74	1875.40	27322.27	60.72	22.74

1875.50	27326.17	60.72	22.74	1875.60	27324.22	60.72	22.74	1875.70	27330.08	60.72	22.74
1875.80	27328.12	60.72	22.74	1875.90	27332.03	60.72	22.74	1876.00	27330.08	60.72	22.74
1876.10	27333.98	60.73	22.74	1876.20	27330.08	60.73	22.74	1876.30	27333.98	60.73	22.74
1876.40	27335.94	60.73	22.74	1876.50	27341.80	60.73	22.74	1876.60	27341.80	60.73	22.74
1876.70	27343.75	60.73	22.74	1876.80	27343.75	60.73	22.74	1876.90	27345.70	60.73	22.74
1877.00	27351.56	60.73	22.74	1877.10	27351.56	60.73	22.74	1877.20	27355.47	60.73	22.74
1877.30	27351.56	60.73	22.74	1877.40	27355.47	60.73	22.74	1877.50	27357.42	60.73	22.74
1877.60	27363.28	60.73	22.74	1877.70	27361.33	60.73	22.74	1877.80	27363.28	60.73	22.74
1877.90	27361.33	60.73	22.74	1878.00	27367.19	60.73	22.73	1878.10	27367.19	60.73	22.73
1878.20	27375.00	60.73	22.73	1878.30	27375.00	60.73	22.73	1878.40	27378.91	60.73	22.73
1878.50	27376.95	60.73	22.73	1878.60	27382.81	60.73	22.73	1878.70	27382.81	60.73	22.73
1878.80	27386.72	60.73	22.73	1878.90	27386.72	60.73	22.73	1879.00	27386.72	60.73	22.73
1879.10	27390.62	60.73	22.73	1879.20	27392.58	60.73	22.73	1879.30	27392.58	60.73	22.73
1879.40	27394.53	60.73	22.73	1879.50	27396.48	60.73	22.73	1879.60	27400.39	60.73	22.72
1879.70	27402.34	60.73	22.72	1879.80	27402.34	60.73	22.72	1879.90	27404.30	60.73	22.72
1880.00	27404.30	60.73	22.72	1880.10	27410.16	60.73	22.72	1880.20	27408.20	60.73	22.72
1880.30	27412.11	60.73	22.72	1880.40	27410.16	60.73	22.72	1880.50	27414.06	60.73	22.72
1880.60	27414.06	60.73	22.72	1880.70	27417.97	60.73	22.72	1880.80	27416.02	60.73	22.72
1880.90	27419.92	60.73	22.72	1881.00	27419.92	60.73	22.72	1881.10	27425.78	60.73	22.72
1881.20	27423.83	60.74	22.72	1881.30	27427.73	60.74	22.72	1881.40	27425.78	60.74	22.72
1881.50	27431.64	60.74	22.72	1881.60	27433.59	60.74	22.72	1881.70	27435.55	60.74	22.72
1881.80	27437.50	60.74	22.72	1881.90	27443.36	60.74	22.72	1882.00	27443.36	60.74	22.72
1882.10	27445.31	60.74	22.72	1882.20	27447.27	60.74	22.72	1882.30	27449.22	60.74	22.72
1882.40	27451.17	60.74	22.72	1882.50	27451.17	60.74	22.72	1882.60	27453.12	60.74	22.72
1882.70	27453.12	60.74	22.71	1882.80	27458.98	60.74	22.71	1882.90	27458.98	60.74	22.71
1883.00	27460.94	60.74	22.71	1883.10	27458.98	60.74	22.71	1883.20	27466.80	50.74	22.71
1883.30	27464.84	60.74	22.71	1883.40	27472.66	60.74	22.71	1883.50	27468.75	60.74	22.71
1883.60	27470.70	60.74	22.71	1883.70	27474.61	60.74	22.70	1883.80	27478.52	60.74	22.70
1883.90	27478.52	60.74	22.70	1884.00	27482.42	60.74	22.70	1884.10	27480.47	60.74	22.70
1884.20	27482.42	60.74	22.70	1884.30	27484.37	60.74	22.70	1884.40	27488.28	60.75	22.70
1884.50	27488.28	60.75	22.70	1884.60	27490.23	60.75	22.70	1884.70	27492.19	60.75	22.70
1884.80	27490.23	60.75	22.70								

PRINTOUT OF .1 SEC VEL DATA

9623.69	.50	.28	-1.25	9624.12	16.49	7.70	2.81	9624.25	24.98	9.35	6.56
9625.44	9.00	1.93	2.50	9624.75	.50	.28	-1.25	9625.19	12.14	13.08	5.63
9625.87	20.30	17.67	6.56	9626.50	15.82	8.89	3.13	9626.50	14.81	8.33	5.31
9627.56	22.47	12.63	7.19	9627.94	29.13	16.37	12.19	9630.00	21.97	12.35	9.06
9629.75	7.66	4.30	2.19	9630.44	7.15	4.02	3.44	9630.44	7.16	4.02	3.75
9631.19	7.66	4.30	2.50	9630.94	15.32	8.61	4.38	9632.06	21.97	12.35	9.06
9632.75	21.97	12.35	8.75	9633.81	14.82	8.33	5.31	9633.81	-6.65	-3.74	-4.69
9632.87	7.66	4.30	2.19	9634.25	14.31	8.04	6.88	9634.25	14.31	8.04	6.88
9635.62	21.46	12.06	10.31	9636.31	21.47	12.06	10.62	9637.75	15.32	8.61	4.69
9637.25	8.67	4.87	-.63	9637.62	10.84	-.18	.63	9637.37	15.99	7.42	4.38
9638.50	5.65	7.88	2.19	9637.81	14.98	6.85	6.88	9639.87	16.16	5.94	5.31
9638.87	9.00	1.92	2.19	9640.31	9.00	1.92	2.19	9639.31	9.00	1.92	2.19
9640.75	22.91	9.68	10.62	9541.44	15.65	5.66	6.88	9642.12	1.50	-3.86	1.56
9641.75	16.82	4.75	5.63	9643.25	16.66	6.22	4.06	9642.56	9.00	1.92	2.19
9643.69	22.64	11.15	9.06	9644.37	14.98	6.85	6.88	9645.06	22.64	11.15	9.38
9646.25	29.13	16.36	12.81	9647.62	15.99	7.42	4.06	9647.06	9.34	3.68	-.63
9647.50	16.83	4.74	5.63	9648.19	8.50	1.63	3.44	9648.19	21.98	12.34	9.06
9650.00	16.83	4.74	5.63	9649.31	1.34	-2.39	.00	9650.00	16.00	7.41	4.06
9650.12	23.82	10.24	7.81	9651.56	7.83	2.82	3.44	9550.81	2.69	-.06	-5.31
9690.50	13.05	4.19	-8.75	9649.06	32.64	16.87	4.06	9651.31	30.98	14.26	11.25
9651.31	17.50	3.54	5.63	9652.44	9.63	.72	2.19	9651.75	16.33	4.45	6.88
9653.81	24.83	6.08	10.31	9653.81	9.84	-.76	3.44	9654.50	15.66	5.65	6.88
9655.19	15.33	4.45	6.88	9655.87	9.17	.43	3.44	9655.87	16.33	4.45	7.19

9657.31	17.00	3.26	7.19	9657.31	9.17	.43	3.44	9658.00	8.50	1.63	3.44
9658.00	9.17	.43	3.44	9658.69	16.33	4.45	6.88	9659.37	9.17	.43	3.44
9659.37	.67	-1.20	.00	9659.37	6.49	5.21	3.44	9660.06	14.99	6.84	7.19
9660.81	7.83	2.82	3.75	9660.81	21.48	12.05	10.62	9662.94	28.63	16.07	14.06
9663.62	22.82	9.66	10.31	9665.00	7.83	2.82	3.44	9664.31	13.64	9.23	6.88
9666.37	21.47	12.05	10.31	9666.37	7.16	4.02	3.44	9667.06	7.16	4.02	3.44
9667.05	21.48	12.05	10.31	9669.12	7.16	4.02	3.44	9667.75	7.66	4.30	2.50
9669.62	21.98	12.33	9.38	9669.62	14.32	8.04	6.88	9671.00	14.82	8.32	5.31
9670.69	8.68	4.87	-.94	9670.81	15.84	8.89	3.13	9671.31	16.51	7.69	3.13
9671.44	24.17	11.99	4.69	9672.25	22.83	14.39	4.69	9672.37	29.99	18.40	8.44
9673.94	23.16	11.42	7.81	9673.94	1.18	-.91	-1.56	9673.62	8.18	4.59	.63
9674.06	22.49	12.62	7.81	9675.19	15.33	8.60	4.06	9674.87	8.17	4.59	.94
9675.37	15.33	8.60	4.69	9675.81	15.50	7.12	5.63	9676.50	7.33	2.53	4.69
9676.75	7.67	4.30	1.88	9676.87	8.85	3.39	.63	9676.87	23.33	9.94	9.38
9678.75	23.16	11.42	8.13	9678.50	1.69	-.63	-3.13	9678.12	9.69	.71	1.88
9678.87	9.68	.70	2.50	9678.62	16.84	4.72	5.94	9680.06	24.17	7.25	10.31
9680.69	8.51	1.62	3.13	9680.69	1.18	-.91	-1.25	9680.44	23.33	9.94	9.06
9682.50	17.52	3.52	5.31	9681.50	9.01	1.90	2.19	9682.94	14.32	8.03	7.19
9682.94	15.67	5.63	7.19	9684.37	7.83	2.82	3.44	9683.62	15.50	7.12	5.31
9685.44	16.01	7.40	4.38	9684.50	14.83	8.32	5.63	9686.56	14.32	8.03	6.88
9685.87	14.32	8.03	6.88	9687.94	21.48	12.05	10.31	9687.94	7.16	4.02	3.44
9688.62	21.99	12.33	9.06	9689.75	21.99	12.33	9.38	9690.50	14.83	8.32	5.31
9690.81	21.99	12.33	8.75	9692.25	14.83	8.32	5.94	9692.00	14.83	8.32	5.63
9693.37	7.67	4.30	1.88	9692.37	7.67	4.30	2.19	9693.81	14.32	8.03	7.19
9693.81	14.32	8.03	6.56	9695.12	22.50	12.62	7.50	9695.31	8.85	3.38	.94
9695.31	8.34	3.10	2.19	9695.75	8.69	4.87	-.63	9695.19	9.70	5.44	-3.13
9695.12	25.04	14.05	.94	9695.37	32.37	16.57	5.63	9696.25	16.01	7.40	4.38
9696.25	22.16	10.85	10.62	9698.37	22.83	9.64	10.62	9698.37	1.86	-2.12	-1.88
9698.00	9.02	1.90	1.88	9698.75	23.51	3.44	10.62	9700.12	10.53	-2.00	3.44
9699.44	17.70	2.02	6.88	9701.50	17.02	3.22	6.56	9700.75	10.87	-.23	1.25
9701.75	9.69	.69	2.50	9701.25	8.68	.12	4.38	9702.62	2.02	-3.61	.00
9701.25	1.35	-2.41	.00	9702.62	22.83	9.64	10.31	9703.31	30.00	13.65	13.75
9705.37	22.16	10.84	10.31	9705.37	7.67	4.30	2.19	9705.81	7.67	4.30	2.19
9705.81	7.67	4.30	2.50	9706.31	29.16	16.34	12.81	9708.37	21.49	12.04	10.31
9708.37	14.33	8.03	6.88	9709.75	.51	.29	-1.56	9708.06	.51	.29	-1.56
9709.44	21.49	12.04	10.31	9710.12	30.34	15.42	11.25	9711.69	16.18	5.90	5.63
9711.25	.17	-1.49	1.25	9711.94	.51	.29	-1.25	9711.00	16.36	9.17	1.56
9712.25	24.38	15.24	.94	9711.19	31.03	18.97	5.63	9713.37	29.50	18.12	9.69
9713.12	16.53	7.68	2.81	9713.94	8.86	3.38	.63	9713.25	14.16	9.52	5.94
9715.12	22.00	12.33	9.38	9715.12	14.32	8.03	6.88	9716.50	14.32	8.03	6.88
9716.50	.51	.29	-1.56	9716.19	14.84	8.32	5.31	9717.56	21.49	12.05	10.31
9718.25	7.16	4.01	3.44	9718.25	7.67	4.30	2.19	9718.69	14.84	8.31	5.63
9719.37	22.00	12.33	9.38	9720.56	22.51	12.62	7.50	9720.87	7.67	4.30	1.56
9720.87	7.16	4.01	3.75	9721.62	7.67	4.30	2.50	9721.37	22.00	12.33	9.06
9723.44	14.32	8.03	6.56	9722.69	7.16	4.01	3.44	9724.12	8.35	3.09	2.50
9723.19	11.05	-1.73	2.19	9724.56	15.51	7.11	5.31	9724.25	13.48	10.73	5.31
9725.62	8.52	1.60	3.44	9724.94	9.03	1.88	2.19	9726.06	16.19	5.90	5.63
9726.06	22.84	9.63	10.31	9728.12	15.68	5.61	7.19	9727.50	8.52	1.60	3.44
9728.81	10.54	-2.02	3.13	9728.12	15.51	7.11	5.94	9730.00	27.14	19.96	12.81
9730.69	15.00	6.82	7.19	9731.44	15.52	7.11	5.63	9731.81	30.35	15.42	10.62
9733.56	23.19	11.40	7.81	9733.37	8.18	4.59	.63	9733.69	15.35	8.60	4.06
9734.19	14.84	8.31	6.25	9734.94	14.84	8.32	5.31	9735.25	8.35	3.09	1.56
9735.25	8.35	3.09	2.19	9735.69	9.72	5.44	-3.44	9734.56	25.58	14.33	-.63
9735.56	24.55	13.76	2.19	9735.00	8.69	4.87	-.94	9735.37	.51	.29	-1.56
9734.69	22.01	12.33	9.38	9737.25	22.52	12.61	7.81	9736.25	22.00	12.33	9.06
9739.06	14.33	8.03	6.88	9737.62	-5.98	-4.94	-5.00	9738.06	23.70	11.69	6.25

9738.87	29.68	16.63	10.94	9740.25	15.01	6.82	6.88	9740.25	15.69	5.61	6.88
9741.62	9.03	1.88	2.50	9740.75	2.54	-3.34	-1.25	9741.37	17.04	3.19	6.88
9742.12	24.21	7.20	10.62	9743.50	17.04	3.19	6.88	9743.50	9.88	-.83	3.13
9744.12	16.36	4.39	6.38	9744.87	1.52	-3.92	1.25	9744.37	9.20	.38	3.44
9745.56	24.38	10.47	6.56								

END OF RECORD 74 FILE 1

PRINTOUT OF .1 SEC TAER DATA

1884.90	27494.14	60.75	22.70	1885.00	27496.09	60.75	22.70	1885.10	27500.00	60.75	22.70
1885.20	27500.00	60.75	22.70	1885.30	27503.91	60.75	22.70	1885.40	27503.91	60.75	22.70
1885.50	27509.77	60.75	22.70	1885.60	27507.81	60.75	22.70	1885.70	27511.72	60.75	22.70
1885.80	27509.77	60.76	22.70	1885.90	27513.67	60.76	22.70	1886.00	27515.62	60.76	22.70
1886.10	27513.67	60.76	22.70	1886.20	27515.62	60.76	22.70	1886.30	27521.48	60.76	22.70
1886.40	27521.48	60.76	22.70	1886.50	27519.53	60.76	22.70	1886.60	27523.44	60.76	22.70
1886.70	27529.30	60.76	22.70	1886.80	27533.20	60.76	22.70	1886.90	27533.20	60.76	22.70
1887.00	27537.11	60.76	22.70	1887.10	27533.20	60.76	22.70	1887.20	27541.02	60.76	22.70
1887.30	27539.06	60.76	22.70	1887.40	27544.92	60.76	22.70	1887.50	27542.97	60.76	22.69
1887.60	27546.87	60.76	22.69	1887.70	27548.83	60.76	22.69	1887.80	27552.73	60.76	22.69
1887.90	27548.83	60.76	22.69	1888.00	27550.78	60.76	22.69	1888.10	27552.73	60.76	22.69
1888.20	27558.59	60.76	22.69	1888.30	27558.59	60.76	22.69	1888.40	27564.45	60.76	22.69
1888.50	27564.45	60.76	22.69	1888.60	27568.36	60.76	22.69	1888.70	27568.36	60.76	22.69
1888.80	27568.36	60.76	22.68	1888.90	27570.31	60.76	22.68	1889.00	27570.31	60.76	22.68
1889.10	27574.22	60.76	22.68	1889.20	27576.17	60.76	22.68	1889.30	27573.12	60.76	22.68
1889.40	27578.12	60.76	22.68	1889.50	27578.12	60.76	22.68	1889.60	27580.08	60.76	22.68
1889.70	27582.03	60.76	22.68	1889.80	27583.98	60.76	22.68	1889.90	27587.89	60.76	22.68
1890.00	27587.89	60.76	22.68	1890.10	27591.80	60.76	22.68	1890.20	27591.80	60.76	22.68
1890.30	27595.70	60.76	22.68	1890.40	27597.66	60.76	22.68	1890.50	27601.56	60.76	22.68
1890.60	27601.56	60.76	22.68	1890.70	27601.56	60.76	22.68	1890.80	27605.47	60.76	22.68
1890.90	27605.47	60.76	22.68	1891.00	27607.42	60.76	22.68	1891.10	27609.37	60.76	22.68
1891.20	27611.33	60.76	22.68	1891.30	27611.33	60.76	22.68	1891.40	27615.23	60.76	22.67
1891.50	27613.28	60.76	22.67	1891.60	27619.14	60.76	22.67	1891.70	27617.19	60.76	22.67
1891.80	27625.00	60.76	22.67	1891.90	27626.95	60.76	22.67	1892.00	27630.86	60.76	22.67
1892.10	27630.86	60.76	22.67	1892.20	27634.77	60.76	22.67	1892.30	27634.77	60.76	22.67
1892.40	27634.77	60.76	22.67	1892.50	27636.72	60.76	22.67	1892.60	27640.62	60.76	22.67
1892.70	27640.62	60.76	22.67	1892.80	27638.67	60.76	22.67	1892.90	27642.58	60.76	22.67
1893.00	27646.48	60.76	22.67	1893.10	27648.44	60.76	22.67	1893.20	27646.48	60.76	22.67
1893.30	27652.34	60.76	22.67	1893.40	27652.34	60.76	22.67	1893.50	27658.20	60.76	22.67
1893.60	27658.20	60.76	22.67	1893.70	27660.16	60.76	22.67	1893.80	27656.25	60.76	22.67
1893.90	27662.11	60.77	22.67	1894.00	27662.11	60.77	22.66	1894.10	27667.97	60.77	22.66
1894.20	27666.02	60.77	22.66	1894.30	27666.02	60.77	22.66	1894.40	27669.92	60.77	22.66
1894.50	27671.87	60.77	22.66	1894.60	27671.87	60.77	22.66	1894.70	27673.83	60.77	22.66
1894.80	27677.73	60.77	22.66	1894.90	27675.78	60.77	22.66	1895.00	27679.69	60.77	22.66
1895.10	27679.69	60.77	22.66	1895.20	27685.55	60.77	22.66	1895.30	27685.55	60.77	22.66
1895.40	27691.41	60.77	22.66	1895.50	27689.45	60.77	22.66	1895.60	27693.36	60.77	22.66
1895.70	27695.31	60.77	22.66	1895.80	27697.27	60.77	22.66	1895.90	27699.22	60.77	22.66
1896.00	27701.17	60.77	22.66	1896.10	27701.17	60.77	22.66	1896.20	27705.08	60.77	22.65
1896.30	27707.03	60.77	22.65	1896.40	27705.08	60.77	22.65	1896.50	27708.98	60.77	22.65
1896.60	27708.98	60.77	22.65	1896.70	27710.94	60.77	22.65	1896.80	27712.89	60.77	22.65
1896.90	27716.80	60.77	22.65	1897.00	27720.70	60.77	22.65	1897.10	27726.56	60.77	22.65
1897.20	27724.61	60.77	22.65	1897.30	27730.47	60.77	22.65	1897.40	27728.52	60.77	22.65
1897.50	27732.42	60.77	22.65	1897.60	27730.47	60.77	22.65	1897.70	27734.38	60.77	22.65
1897.80	27734.38	60.77	22.65	1897.90	27738.28	60.77	22.65	1898.00	27736.33	60.77	22.65
1898.10	27740.23	60.77	22.65	1898.20	27740.23	60.77	22.65	1898.30	27742.19	60.77	22.65
1898.40	27744.14	60.77	22.65	1898.50	27746.09	60.77	22.65	1898.60	27748.05	60.77	22.65
1898.70	27750.00	60.77	22.65	1898.80	27750.00	60.77	22.65	1898.90	27751.95	60.77	22.65

1899.00	27755.86	60.77	22.65	1899.10	27753.91	60.77	22.65	1899.20	27759.77	60.77	22.65
1899.30	27761.72	60.77	22.64	1899.40	27761.72	60.77	22.64	1899.50	27761.72	60.77	22.64
1899.60	27767.58	60.77	22.64	1899.70	27765.62	60.77	22.64	1899.80	27771.48	60.77	22.64
1899.90	27769.53	60.77	22.64	1900.00	27771.48	60.77	22.64	1900.10	27773.44	60.77	22.64
1900.20	27775.39	60.77	22.64	1900.30	27779.30	60.77	22.64	1900.40	27783.20	60.77	22.64
1900.50	27787.11	60.77	22.64	1900.60	27783.20	60.77	22.64	1900.70	27789.06	60.77	22.64
1900.80	27787.11	60.77	22.64	1900.90	27791.02	60.77	22.64	1901.00	27791.02	60.77	22.63
1901.10	27794.92	60.77	22.63	1901.20	27796.87	60.77	22.63	1901.30	27796.87	60.77	22.63
1901.40	27798.83	60.77	22.63	1901.50	27800.78	60.77	22.63	1901.60	27802.73	60.77	22.63
1901.70	27804.69	60.77	22.63	1901.80	27806.64	60.77	22.63	1901.90	27808.59	60.77	22.63
1902.00	27812.50	60.77	22.63	1902.10	27814.45	60.77	22.63	1902.20	27816.41	60.77	22.63
1902.30	27816.41	60.77	22.63	1902.40	27820.31	60.77	22.63	1902.50	27816.41	60.77	22.63
1902.60	27822.27	60.77	22.63	1902.70	27822.27	60.77	22.63	1902.80	27826.17	60.77	22.63
1902.90	27822.27	60.77	22.63	1903.00	27826.12	60.77	22.63	1903.10	27826.17	60.77	22.63
1903.20	27830.08	60.77	22.63	1903.30	27832.03	60.77	22.63	1903.40	27833.98	60.77	22.63
1903.50	27833.98	60.77	22.63	1903.60	27835.94	60.77	22.63	1903.70	27841.80	60.77	22.63
1903.80	27841.80	60.77	22.63	1903.90	27843.75	60.77	22.63	1904.00	27847.66	60.77	22.63
1904.10	27849.61	60.77	22.63	1904.20	27849.61	60.77	22.63	1904.30	27853.52	60.77	22.63
1904.40	27853.52	60.77	22.63	1904.50	27857.42	60.77	22.63	1904.60	27853.52	60.77	22.63
1904.70	27857.42	60.77	22.63	1904.80	27859.37	60.77	22.63	1904.90	27861.33	60.77	22.62
1905.00	27863.28	60.77	22.62	1905.10	27861.33	60.77	22.62	1905.20	27867.19	60.77	22.62
1905.30	27865.23	60.77	22.62	1905.40	27873.05	60.77	22.62	1905.50	27875.00	60.77	22.62
1905.60	27878.91	60.77	22.62	1905.70	27876.95	60.77	22.62	1905.80	27880.86	60.77	22.62
1905.90	27880.86	60.77	22.62	1906.00	27884.77	60.77	22.62	1906.10	27884.77	60.77	22.62
1906.20	27886.72	60.77	22.62	1906.30	27886.72	60.77	22.62	1906.40	27888.67	60.77	22.62
1906.50	27890.62	60.77	22.62	1906.60	27892.58	60.77	22.62	1906.70	27894.53	60.76	22.62
1906.80	27892.58	60.76	22.62	1906.90	27896.48	60.76	22.62	1907.00	27892.58	60.76	22.62
1907.10	27900.39	60.76	22.61	1907.20	27900.39	60.76	22.62	1907.30	27902.34	60.77	22.62
1907.40	27904.30	60.76	22.61	1907.50	27904.30	60.76	22.61	1907.60	27906.25	60.76	22.61
1907.70	27910.16	60.76	22.61	1907.80	27912.11	60.76	22.61	1907.90	27914.06	60.76	22.61
1908.00	27914.06	60.76	22.61	1908.10	27912.11	60.76	22.61	1908.20	27917.97	60.76	22.61
1908.30	27919.92	60.76	22.61	1908.40	27919.92	60.76	22.61	1908.50	27919.92	60.76	22.61
1908.60	27927.73	60.76	22.61	1908.70	27923.83	60.76	22.61	1908.80	27929.69	60.76	22.61
1908.90	27929.69	60.76	22.61	1909.00	27933.59	60.75	22.61	1909.10	27931.64	60.75	22.61
1909.20	27935.55	60.75	22.61	1909.30	27939.45	60.75	22.61	1909.40	27941.41	60.75	22.61
1909.50	27941.41	60.75	22.61	1909.60	27945.31	60.75	22.61	1909.70	27947.27	60.75	22.61
1909.80	27947.27	60.75	22.60								

PRINTOUT OF .1 SEC VEL DATA

9745.69	23.88	10.19	7.31	9747.12	16.37	4.39	7.19	9747.12	15.17	5.32	3.44
9748.81	13.82	7.74	8.44	9748.81	22.18	10.83	10.31	9750.87	15.01	6.81	6.88
9750.19	7.17	4.01	3.44	9751.56	7.85	2.80	3.44	9750.87	7.84	2.30	3.44
9752.25	21.50	12.04	10.62	9753.00	.00	.00	.00	9752.25	.00	.00	.00
9753.00	29.17	16.33	12.81	9754.81	22.01	12.32	9.06	9754.81	-6.65	-3.73	-5.00
9753.81	7.68	4.30	1.56	9755.12	36.34	20.35	15.94	9757.00	37.36	20.92	13.44
9757.81	15.87	8.83	2.50	9757.50	14.84	8.31	5.63	9758.94	1.02	.57	-2.50
9757.00	15.87	8.88	2.50	9759.44	22.52	12.61	7.50	9758.50	15.87	8.88	3.13
9760.06	16.89	9.46	.00	9758.50	9.22	5.16	-2.19	9759.62	22.52	12.61	7.81
9760.06	22.52	12.61	7.50	9761.12	1.02	.57	-2.81	9759.50	-5.63	-3.15	-7.50
9759.62	16.89	9.46	.00	9759.50	30.71	17.20	8.13	9761.25	22.52	12.61	7.50
9761.00	22.01	12.32	9.38	9763.12	21.50	12.04	10.62	9763.12	14.33	8.02	6.88
9764.50	14.33	8.02	6.88	9764.50	.51	.29	-1.56	9764.19	7.68	4.30	1.88
9764.87	7.17	4.01	3.44	9764.87	14.33	8.03	6.88	9766.25	21.50	12.04	10.31
9766.94	14.33	8.02	7.19	9767.69	5.64	7.94	2.50	9767.44	1.19	-.93	-1.25
9767.44	9.89	-.85	3.44	9768.12	14.84	8.31	5.63	9768.56	14.85	8.31	5.63
9769.25	21.50	12.04	10.31	9770.62	14.33	8.02	6.88	9770.62	15.53	7.10	5.31
9771.69	15.53	7.10	5.31	9771.69	14.33	8.02	7.19	9773.12	21.50	12.04	10.31

9773.75	21.50	12.04	10.00	9775.12	15.53	7.10	5.94	9774.94	1.19	-.93	-.94
9774.94	15.36	8.60	4.06	9775.75	14.85	8.31	5.31	9776.00	7.17	4.01	3.13
9776.37	15.87	8.89	2.50	9776.50	16.39	9.17	1.88	9776.75	9.73	5.45	-2.81
9775.94	16.90	9.46	.00	9776.75	8.19	4.59	.63	9776.06	14.85	8.31	5.31
9777.81	14.84	8.31	5.31	9777.12	22.53	12.61	7.50	9779.31	37.89	21.21	11.87
9779.50	23.04	12.90	6.25	9780.56	15.36	8.60	4.06	9780.31	13.31	7.45	10.00
9782.56	14.85	8.31	5.31	9781.37	2.56	1.44	-7.19	9781.12	8.19	4.59	.63
9781.50	22.02	12.33	9.06	9782.94	14.85	8.31	5.94	9782.69	-6.65	-3.73	-4.69
9782.00	7.68	4.30	1.88	9783.06	29.87	15.12	12.19	9784.44	22.19	10.82	10.31
9785.12	.68	-1.22	.00	9784.44	15.70	5.59	6.88	9786.50	23.38	9.89	9.06
9786.25	24.75	7.45	9.06	9788.31	24.23	7.16	10.31	9788.31	9.90	-.86	3.75
9789.06	-5.12	-7.67	-3.44	9787.62	7.85	2.79	3.44	9789.75	23.38	9.89	9.38
9789.50	23.38	9.89	9.06	9791.56	15.02	6.80	6.56	9790.81	-5.97	-4.94	-5.00
9790.56	16.05	7.38	4.38	9791.69	22.02	12.32	9.06	9792.37	7.68	4.30	1.88
9792.06	7.68	4.30	1.88	9792.75	21.51	12.04	10.62	9794.19	7.17	4.01	3.75
9793.50	7.68	4.30	2.19	9794.62	14.85	8.31	5.63	9794.62	21.51	12.04	10.31
9796.69	22.02	12.32	8.75	9796.37	22.02	12.32	9.06	9798.50	14.34	8.02	6.88
9797.75	7.17	4.01	3.44	9799.19	21.51	12.04	10.31	9799.81	14.85	8.31	5.63
9800.31	16.79	9.17	1.56	9800.12	17.94	10.04	-3.13	9799.69	9.74	5.45	-3.44
9799.44	15.37	8.60	4.38	9800.56	23.58	13.19	5.00	9800.44	2.06	1.15	-5.63
9799.44	8.20	4.59	.63	9800.56	15.37	8.60	4.38	9800.31	7.68	4.30	1.88
9800.94	14.85	8.31	5.31	9801.37	22.02	12.32	8.75	9802.69	29.71	16.62	10.94
9803.56	37.39	20.92	13.75	9805.44	15.37	8.60	4.38	9804.44	14.85	8.31	5.31
9806.50	14.34	8.02	6.88	9805.81	7.68	4.30	1.88	9806.87	7.68	4.30	2.19
9806.25	7.17	4.01	3.75	9807.62	14.34	8.02	6.88	9807.62	14.34	8.02	6.88
9809.00	7.17	4.01	3.44	9808.31	7.85	2.79	3.44	9809.69	14.85	8.31	5.31
9809.37	7.00	5.52	2.19	9810.12	15.02	6.80	6.88	9810.75	14.34	8.03	6.56
9811.44	13.65	9.25	7.19	9812.19	14.34	8.03	6.88	9812.81	7.17	4.01	3.13
9812.81	7.17	4.01	3.44	9813.50	21.51	12.04	10.62	9814.94	7.85	2.79	3.44
9814.19	14.34	8.02	6.88	9816.31	29.19	16.34	12.81	9816.75	8.37	3.08	2.19
9816.75	-.68	1.22	.00	9816.75	21.51	12.04	10.31	9818.81	14.34	8.03	6.88
9818.12	14.17	9.54	5.31	9819.87	15.37	8.60	4.06	9818.94	-.04	.06	.00
9819.87	16.05	7.38	4.06	9819.75	18.15	9.46	-1.56	9819.56	22.02	12.32	9.06
9821.56	27.48	16.99	15.63	9822.69	29.20	16.34	12.50	9824.06	.00	.00	.00
9822.69	6.48	5.24	3.44	9824.75	15.37	8.60	4.38	9823.56	11.46	4.81	-6.25
9823.50	19.66	9.39	-5.94	9822.37	17.26	11.27	-2.81	9822.94	23.92	14.99	1.88
9822.75	9.40	3.65	-.94	9822.75	7.17	4.01	3.44	9823.44	13.65	9.25	6.88
9824.12	14.86	8.31	5.63	9824.56	14.86	8.31	5.63	9825.25	14.34	8.02	7.19
9826.00	14.34	8.02	6.88	9826.62	22.20	10.81	10.31	9826.06	21.51	12.04	10.31
9828.69	13.65	9.25	6.56	9829.37	7.86	2.79	3.44	9829.37	15.03	6.80	7.19
9830.81	.00	.00	.00	9829.37	6.48	5.24	3.13	9831.44	20.83	13.27	10.31
9831.44	14.34	8.02	7.19	9832.87	.00	.00	.00	9831.44	7.17	4.01	3.75
9833.62	15.03	6.80	7.19	9832.87	7.17	4.01	3.13	9834.25	21.51	12.04	10.31
9834.94	15.03	6.80	7.19	9835.69	6.48	5.24	3.75	9835.69	6.48	5.24	3.44
9836.37	28.68	16.05	14.06	9838.50	22.20	10.81	10.62	9838.50	7.86	2.78	3.44
9839.19	20.83	13.27	10.31	9840.56	20.82	13.27	10.31	9841.25	7.17	4.01	3.44
9841.25	14.86	8.31	5.31	9842.31	14.86	8.31	5.31	9842.31	14.34	8.03	6.56
9843.62	.00	.00	.00	9842.31	.00	.00	.00	9843.62	23.06	12.91	6.25
9843.56	16.41	9.18	1.56	9843.94	16.41	9.18	1.25	9843.81	2.06	1.16	-5.63
9842.81	16.41	9.18	1.25	9844.06	17.44	9.76	-1.56	9842.50	23.06	12.91	5.94
9845.25	35.85	20.06	17.50	9846.00	21.51	12.04	10.62	9847.37	7.69	4.30	1.88
9846.37	7.69	4.30	1.88	9847.75	14.34	8.03	6.88	9847.75	13.65	9.25	7.19
9849.19	13.65	9.25	7.19	9849.19	6.48	5.24	3.44	9849.87	6.48	5.24	3.44
9849.87	6.48	5.24	3.44	9850.56	14.17	9.54	5.31	9850.94	14.86	8.32	5.63
9851.69	13.65	9.26	7.19	9852.37	-.69	1.23	.00	9851.69	6.48	5.24	3.44
9853.06	-.69	1.23	.00	9851.69	15.89	8.89	2.81	9853.62	29.72	16.63	10.94

9853.87	8.72	.03	4.69	9854.56	14.69	9.83	4.06	9854.69	5.97	9.80	-.94
9854.37	7.69	4.30	1.88	9855.06	21.51	12.04	10.62	9856.50	21.86	13.85	7.81
9856.62	14.69	9.84	4.06	9357.31	7.69	4.30	2.19	9857.06	-7.34	-2.50	-4.69
9856.37	13.65	9.26	6.88	9858.44	28.00	17.29	13.75	9859.12	5.80	6.47	3.44
9859.12	-1.55	3.98	-1.56	9858.81	27.30	18.52	13.75	9861.87	12.96	10.49	6.88
9860.19	5.62	7.99	2.19	9862.31	20.65	14.80	9.06	9862.00	12.10	13.24	5.31
9863.37	4.24	10.46	2.19	9862.44	5.45	9.52	.63	9863.50	27.65	20.33	10.94
9864.62	20.65	14.80	9.06	9865.31	5.79	6.48	3.44	9865.31	13.48	10.78	5.31
9866.37	22.20	15.67	5.00	9866.31	8.39	7.93	-3.13	9865.75	3.38	7.93	-3.75
9865.56	1.21	3.91	-7.19								

END OF RECORD 75 FILE   1

PRINTOUT OF .1 SEC TAER DATA

1909.90	27949.22	60.75	22.60	1910.00	27947.27	60.75	22.60	1910.10	27955.08	60.75	22.60
1910.20	27953.12	60.74	22.60	1910.30	27957.03	60.74	22.60	1910.40	27957.03	60.74	22.60
1910.50	27958.98	60.74	22.60	1910.60	27958.98	60.74	22.60	1910.70	27960.94	60.74	22.60
1910.80	27962.89	60.74	22.60	1910.90	27964.84	60.74	22.60	1911.00	27968.75	60.74	22.60
1911.10	27972.66	60.74	22.60	1911.20	27974.61	60.74	22.60	1911.30	27974.61	60.74	22.60
1911.40	27974.61	60.74	22.60	1911.50	27974.61	60.74	22.60	1911.60	27978.52	60.74	22.60
1911.70	27974.51	60.74	22.60	1911.80	27980.47	60.74	22.60	1911.90	27980.47	60.74	22.60
1912.00	27982.42	60.74	22.60	1912.10	27984.37	60.74	22.60	1912.20	27986.33	60.74	22.60
1912.30	27988.28	60.74	22.60	1912.40	27988.28	60.74	22.60	1912.50	27990.23	60.74	22.60
1912.60	27990.23	60.74	22.60	1912.70	27994.14	60.74	22.60	1912.80	27998.05	60.74	22.60
1912.90	28001.95	60.74	22.60	1913.00	27998.05	60.74	22.60	1913.10	28005.86	60.74	22.60
1913.20	28003.91	60.74	22.60	1913.30	28007.81	60.74	22.60	1913.40	28007.81	60.74	22.60
1913.50	28013.67	60.74	22.60	1913.60	28011.72	60.74	22.60	1913.70	28015.62	60.74	22.60
1913.80	28013.67	60.74	22.60	1913.90	28019.53	60.74	22.60	1914.00	28017.58	60.74	22.60
1914.10	28021.48	60.74	22.60	1914.20	28019.53	60.74	22.60	1914.30	28025.39	60.74	22.60
1914.40	28029.30	60.74	22.60	1914.50	28029.30	60.74	22.60	1914.60	28029.30	60.74	22.60
1914.70	28029.30	60.74	22.59	1914.80	28037.11	60.74	22.59	1914.90	28033.20	60.73	22.59
1915.00	28037.11	60.73	22.59	1915.10	28037.11	60.73	22.59	1915.20	28042.97	60.73	22.59
1915.30	28039.06	60.73	22.59	1915.40	28044.92	60.73	22.59	1915.50	28044.92	60.73	22.59
1915.60	28048.83	60.73	22.59	1915.80	28048.83	60.73	22.59	1915.90	28050.78	60.73	22.59
1916.00	28052.73	60.73	22.59	1916.10	28052.73	60.73	22.59	1916.20	28054.69	60.73	22.59
1916.30	28058.59	60.73	22.59	1916.40	28060.55	60.73	22.59	1916.50	28064.45	60.73	22.59
1916.60	28060.55	60.73	22.59	1916.70	28068.36	60.73	22.59	1916.80	28068.36	60.73	22.59
1916.90	28070.31	60.73	22.59	1917.00	28070.31	60.73	22.59	1917.10	28074.22	60.73	22.59
1917.20	28072.27	60.73	22.59	1917.30	28076.17	60.73	22.59	1917.40	28078.12	60.73	22.59
1917.50	28078.12	60.73	22.59	1917.60	28080.08	60.73	22.59	1917.70	28083.98	60.73	22.59
1917.80	28083.98	60.73	22.58	1917.90	28083.98	60.73	22.58	1918.00	28089.84	60.73	22.58
1918.10	28087.89	60.73	22.58	1918.20	28091.80	60.73	22.58	1918.30	28091.80	60.73	22.58
1918.40	28097.66	60.73	22.58	1918.50	28095.70	60.73	22.58	1918.60	28099.61	60.73	22.58
1918.70	28099.61	60.72	22.58	1918.80	28105.47	60.72	22.58	1918.90	28101.56	60.72	22.58
1919.00	28105.47	60.72	22.58	1919.10	28105.47	60.72	22.58	1919.20	28107.42	60.72	22.58
1919.30	28111.73	60.72	22.58	1919.40	28111.33	60.72	22.58	1919.50	28113.28	60.72	22.58
1919.60	28113.28	60.72	22.58	1919.70	28115.23	60.72	22.58	1919.80	28115.23	60.71	22.58
1919.90	28119.14	60.71	22.58	1920.00	28119.14	60.71	22.58	1920.10	28125.00	60.71	22.58
1920.20	28126.95	60.71	22.58	1920.30	28128.91	60.71	22.58	1920.40	28128.91	60.71	22.58
1920.50	28130.86	60.71	22.58	1920.60	28128.91	60.71	22.58	1920.70	28132.81	60.71	22.57
1920.80	28132.81	60.71	22.57	1920.90	28136.72	60.71	22.57	1921.00	28136.72	60.71	22.57
1921.10	28138.67	60.71	22.57	1921.20	28138.67	60.71	22.57	1921.30	28140.62	60.71	22.57
1921.40	28144.53	60.71	22.57	1921.50	28142.58	60.71	22.57	1921.60	28146.48	60.71	22.57
1921.70	28146.48	60.71	22.57	1921.80	28148.44	60.71	22.57	1921.90	28148.44	60.71	22.57
1922.00	28156.25	60.71	22.57	1922.10	28154.30	60.71	22.57	1922.20	28160.16	60.71	22.57
1922.30	28159.20	60.71	22.57	1922.40	28162.11	60.71	22.57	1922.50	28162.11	60.71	22.57

1922.60	28164.06	60.71	22.57	1922.70	28167.97	60.71	22.57	1922.80	28169.92	60.71	22.57
1922.90	28169.92	60.71	22.57	1923.00	28169.92	60.71	22.57	1923.10	28171.87	60.71	22.57
1923.20	28175.78	60.71	22.57	1923.30	28177.73	60.71	22.57	1923.40	28175.78	60.71	22.57
1923.50	28177.73	60.71	22.57	1923.60	28177.73	60.71	22.57	1923.70	28183.59	60.71	22.57
1923.80	28185.55	60.71	22.57	1923.90	28191.41	60.71	22.56	1924.00	28189.45	60.71	22.56
1924.10	28193.36	60.70	22.56	1924.20	28193.36	60.70	22.56	1924.30	28197.27	60.70	22.56
1924.40	28197.27	60.70	22.56	1924.50	28201.17	60.70	22.56	1924.60	28199.22	60.70	22.56
1924.70	28201.17	60.70	22.56	1924.80	28201.17	60.70	22.56	1924.90	28205.08	60.70	22.56
1925.00	28207.03	60.70	22.56	1925.10	28208.98	60.70	22.56	1925.20	28208.98	60.70	22.56
1925.30	28208.98	60.70	22.56	1925.40	28210.94	60.70	22.56	1925.50	28210.94	60.70	22.56
1925.60	28216.80	60.70	22.56	1925.70	28214.84	60.70	22.56	1925.80	28220.70	60.70	22.56
1925.90	28220.70	60.70	22.56	1926.00	28222.66	60.70	22.56	1926.10	28222.66	60.70	22.56
1926.20	28226.56	60.70	22.56	1926.30	28226.56	60.70	22.56	1926.40	28230.47	60.70	22.56
1926.50	28228.52	60.70	22.56	1926.60	28232.42	60.70	22.56	1926.70	28232.42	60.70	22.56
1926.80	28236.33	60.70	22.56	1926.90	28236.33	60.70	22.56	1927.00	28238.28	60.70	22.56
1927.10	28238.28	60.70	22.56	1927.20	28242.19	60.70	22.56	1927.30	28242.19	60.70	22.56
1927.40	28246.09	60.70	22.56	1927.50	28250.00	60.70	22.56	1927.60	28251.95	60.70	22.56
1927.70	28253.91	60.70	22.56	1927.90	28251.95	60.70	22.56	1927.90	28253.91	60.70	22.56
1928.00	28255.86	60.70	22.56	1928.10	28261.72	60.70	22.56	1928.20	28255.86	60.70	22.56
1928.30	28261.72	60.70	22.56	1928.40	28261.72	60.70	22.56	1928.50	28267.58	60.70	22.55
1928.60	28265.62	60.69	22.55	1928.70	28269.53	60.69	22.55	1928.80	28269.53	60.69	22.55
1928.90	28269.53	60.69	22.55	1929.00	28273.44	60.69	22.55	1929.10	28273.44	60.69	22.55
1929.20	28273.44	60.69	22.55	1929.30	28273.44	60.69	22.55	1929.40	28281.25	60.69	22.55
1929.50	28283.20	60.69	22.55	1929.60	28283.20	60.69	22.55	1929.70	28285.16	60.69	22.55
1929.80	28289.06	60.69	22.55	1929.90	28289.06	60.69	22.55	1930.00	28291.02	60.69	22.55
1930.10	28291.92	60.69	22.55	1930.20	28294.92	60.69	22.55	1930.30	28294.92	60.69	22.55
1930.40	28296.87	60.69	22.55	1930.50	28294.92	60.69	22.55	1930.60	28300.78	60.69	22.55
1930.70	28300.78	60.69	22.55	1930.80	28302.73	60.69	22.55	1930.90	28302.73	60.69	22.55
1931.00	28306.64	60.69	22.54	1931.10	28308.59	60.69	22.55	1931.20	28306.64	60.69	22.54
1931.30	28312.50	60.69	22.54	1931.40	28314.45	60.69	22.54	1931.50	28316.41	60.69	22.54
1931.60	28316.41	60.69	22.54	1931.70	28322.27	60.69	22.54	1931.80	28320.31	60.69	22.54
1931.90	28324.22	60.69	22.54	1932.00	28322.27	60.69	22.54	1932.10	28330.08	60.69	22.54
1932.20	28328.12	60.69	22.55	1932.30	28330.08	60.69	22.55	1932.40	28328.12	60.68	22.54
1932.50	28333.98	60.68	22.54	1932.60	28330.08	60.68	22.54	1932.70	28333.98	60.68	22.54
1932.80	28330.08	60.68	22.54	1932.90	28341.80	60.68	22.54	1933.00	28343.75	60.68	22.54
1933.10	28345.70	60.68	22.54	1933.20	28343.75	60.68	22.54	1933.30	28347.66	60.68	22.54
1933.40	28349.61	60.68	22.54	1933.50	28349.61	60.67	22.54	1933.60	28355.47	60.67	22.54
1933.70	28355.47	60.67	22.54	1933.80	28355.47	60.67	22.54	1933.90	28355.47	60.67	22.54
1934.00	28363.28	60.67	22.54	1934.10	28361.33	60.67	22.54	1934.20	28367.19	60.67	22.54
1934.30	28363.28	60.67	22.54	1934.40	28367.19	60.67	22.54	1934.50	28367.19	60.67	22.54
1934.60	28369.14	60.67	22.54	1934.70	28371.09	60.67	22.53	1934.80	28376.95	60.67	22.53
1934.90	28376.95	60.67	22.53								

PRINTOUT OF .1 SEC VEL DATA

9864.31	22.20	15.67	4.69	9866.50	21.17	15.09	7.50	9865.81	6.48	5.25	3.44
9867.19	13.65	9.26	6.88	9867.19	6.31	6.77	1.88	9867.56	7.00	5.54	1.88
9867.56	7.86	2.79	3.44	9868.25	13.65	9.27	6.88	9868.94	12.96	10.50	6.88
9869.62	21.51	12.05	10.62	9871.06	28.68	16.07	14.06	9872.44	21.51	12.05	10.31
9873.12	7.17	4.02	3.44	9873.12	.00	.00	.00	9873.12	.00	.00	.00
9873.12	14.34	8.03	6.88	9874.50	-.69	1.23	.00	9873.12	7.69	4.31	2.50
9875.00	22.03	12.34	9.38	9875.00	6.48	5.25	3.44	9875.69	14.34	8.03	6.88
9876.37	14.34	8.03	6.56	9877.00	14.34	8.03	6.56	9877.69	7.17	4.02	3.44
9877.69	7.17	4.02	3.44	9878.37	7.17	4.02	3.44	9878.37	14.34	8.03	6.88
9879.75	28.68	16.07	13.75	9881.12	28.68	16.07	14.06	9882.56	.00	.00	.00
9881.12	14.34	8.03	6.56	9883.87	21.51	12.05	10.31	9883.19	7.17	4.02	3.75
9884.62	14.34	8.03	7.19	9884.62	21.51	12.05	10.00	9886.62	14.34	8.03	6.56
9885.94	7.17	4.02	3.75	9887.37	8.33	3.07	2.50	9886.44	14.17	9.55	5.63

9888.50	12.96	10.50	6.88	9887.81	7.00	5.54	1.88	9888.87	6.30	6.78	1.88
9888.19	13.47	10.79	5.63	9890.00	34.99	22.85	15.94	9891.37	12.96	10.50	6.88
9891.37	-2.08	3.70	.00	9891.37	-1.56	3.99	-1.25	9891.12	28.33	19.12	11.25
9893.62	13.99	11.09	4.06	9891.94	-.35	3.05	-3.13	9893.00	12.44	10.22	8.44
9893.62	20.64	14.81	9.06	9894.81	8.03	6.13	-.63	9893.50	7.17	4.02	3.44
9895.50	21.34	13.58	8.44	9895.19	14.17	9.56	5.31	9896.56	15.38	8.62	4.06
9896.00	8.21	4.60	.94	9896.75	14.86	8.33	5.63	9897.12	8.21	4.60	.63
9896.87	7.69	4.31	2.19	9897.56	22.03	12.35	8.75	9898.62	21.86	13.87	7.50
9899.06	21.86	13.87	7.50	9900.12	.52	.29	-1.56	9898.75	14.86	8.33	5.63
9901.25	29.20	16.36	12.50	9901.25	7.17	4.02	3.75	9902.00	7.17	4.02	3.75
9902.00	14.34	8.04	6.56	9903.31	7.17	4.02	3.44	9902.69	7.17	4.02	3.44
9904.00	21.51	12.06	10.31	9904.75	7.69	4.31	2.50	9904.50	7.69	4.31	1.88
9905.12	21.51	12.06	10.00	9906.50	15.55	7.09	5.63	9906.25	-.17	1.53	-1.56
9906.19	20.65	14.82	8.75	9908.00	14.16	9.56	5.94	9907.37	6.99	5.55	2.19
9908.44	14.17	9.57	5.31	9908.44	20.64	14.82	8.75	9910.19	13.30	12.33	4.06
9909.25	5.95	9.84	-.63	9910.06	13.12	13.86	2.50	9909.75	20.47	16.36	7.50
9911.56	6.54	8.61	-.94	9909.56	-2.26	5.24	-1.25	9911.31	12.78	12.05	5.94
9910.75	5.82	7.08	.63	9911.44	20.12	14.54	10.62	9912.87	12.95	10.52	7.19
9912.87	5.61	8.03	1.88	9913.25	5.61	8.03	1.88	9913.25	5.78	6.50	3.13
9913.87	6.30	6.79	1.88	9913.62	13.47	10.81	5.31	9914.94	13.65	9.28	6.56
9914.94	20.81	13.30	10.62	9917.06	27.98	17.32	14.06	9917.75	14.34	8.04	6.88
9918.44	7.17	4.02	3.44	9918.44	7.17	4.02	3.44	9919.12	.00	.00	.00
9918.44	8.21	4.60	.63	9919.25	15.38	8.62	4.06	9919.25	14.34	8.04	6.88
9920.62	14.86	8.33	5.63	9920.37	7.69	4.31	2.50	9921.12	7.17	4.02	3.75
9921.12	7.17	4.02	3.13	9921.75	21.51	12.06	10.00	9923.12	7.17	4.02	3.44
9922.44	7.17	4.02	3.13	9923.75	14.86	8.33	5.63	9923.56	7.69	4.31	2.50
9924.25	7.17	4.02	3.44	9924.25	28.68	16.08	13.75	9927.00	21.51	12.06	10.31
9926.31	14.34	8.04	7.19	9928.44	14.34	8.04	7.19	9927.75	7.17	4.02	3.44
9929.12	14.34	8.04	6.33	9929.12	7.17	4.02	3.44	9929.81	21.51	12.06	10.00
9931.12	22.03	12.35	8.75	9931.56	7.69	4.31	2.19	9931.56	.52	.29	-1.56
9931.25	8.21	4.60	.63	9931.69	21.85	13.89	7.50	9932.75	21.85	13.89	7.81
9933.25	1.04	.58	-2.50	9932.25	1.04	.58	-3.13	9932.62	4.21	10.52	1.88
9932.62	20.46	16.37	7.19	9934.06	32.85	13.53	7.81	9934.19	26.76	23.17	9.69
9936.00	10.50	17.32	4.38	9935.06	4.90	9.28	2.19	9936.44	10.85	14.25	8.88
9936.44	12.07	13.31	5.63	9937.56	12.77	12.06	5.63	9937.56	12.94	10.53	6.88
9938.94	5.78	6.51	3.44	9938.25	-.17	1.54	-1.56	9938.62	6.99	5.56	1.88
9938.62	13.64	9.29	6.88	9940.00	21.50	12.07	10.31	9940.69	14.86	8.34	5.63
9941.12	6.99	5.56	2.19	9941.12	-.70	1.24	.00	9941.12	7.17	4.02	3.75
9941.87	7.17	4.02	3.75	9941.87	22.03	12.36	8.75	9943.62	15.90	8.92	2.19
9942.31	14.86	8.34	5.31	9944.69	20.99	11.78	11.87	9944.69	7.17	4.02	3.13
9945.31	7.69	4.32	1.88	9945.06	15.38	8.63	4.38	9946.19	15.38	8.63	4.38
9945.94	14.86	8.34	5.31	9947.25	7.17	4.02	3.44	9946.62	8.21	4.61	.63
9947.37	15.38	8.63	3.75	9947.37	14.34	8.05	6.88	9948.75	14.34	8.05	6.88
9948.75	7.17	4.02	3.44	9949.44	7.17	4.02	3.44	9949.44	14.34	8.05	7.19
9950.87	14.34	8.05	7.19	9950.87	14.34	8.05	6.88	9952.25	28.68	16.09	13.75
9953.62	21.51	12.07	10.31	9954.31	11.73	6.58	14.06	9956.44	.52	.29	-1.25
9954.06	3.83	.51	-8.44	9954.75	13.64	9.29	6.56	9955.37	27.28	18.58	14.06
9957.56	-.18	1.54	-1.25	9955.12	-.18	1.54	-1.56	9957.25	20.81	13.31	10.62
9957.25	20.63	14.86	8.75	9959.00	12.06	13.32	5.31	9958.31	6.99	5.56	1.88
9959.37	12.76	12.08	5.31	9959.37	-4.37	9.01	-1.25	9959.12	13.11	13.91	2.50
9959.87	13.11	13.91	2.50	9959.62	-1.58	4.03	-1.25	9959.62	-.70	1.25	.00
9959.62	27.97	17.34	14.06	9962.44	35.14	21.37	17.50	9963.12	7.69	4.32	1.88
9962.81	7.69	4.32	1.88	9963.50	21.50	12.07	10.31	9964.87	13.64	9.30	6.88
9964.87	6.47	5.27	3.44	9965.56	7.69	4.32	1.88	9965.25	14.86	8.34	5.31
9966.62	14.86	8.34	5.94	9966.44	7.69	4.32	2.50	9967.12	.00	.00	.00
9966.44	13.29	7.46	9.69	9969.06	22.55	12.66	7.19	9967.87	10.83	6.08	-6.56

9967.75	9.26	5.20	-2.19	9967.44	15.38	8.64	3.75	9968.50	21.51	12.08	10.31
9969.50	.00	.00	.00	9968.50	14.86	8.34	5.63	9970.62	28.67	15.10	14.06
9971.31	14.34	8.05	6.88	9972.00	7.17	4.02	3.44	9972.00	21.51	12.08	10.31
9974.06	14.34	8.05	6.38	9973.37	7.17	4.03	3.44	9974.75	7.17	4.03	3.44
9974.06	21.51	12.08	10.31	9976.81	20.98	11.78	11.56	9976.37	-.52	-.29	1.25
9977.06	.34	1.84	-2.81	9975.81	14.68	9.89	4.06	9977.87	6.47	5.27	3.75
9976.56	-1.58	4.04	-.94	9977.69	-1.58	4.04	-1.25	9976.31	26.57	19.85	13.44
9980.37	43.08	31.93	23.75	9981.06	13.46	10.84	5.63	9981.50	-.88	2.79	-1.25
9980.81	5.59	8.06	2.19	9981.94	19.75	17.66	7.50	9982.31	5.59	8.07	1.88
9982.31	21.15	15.16	7.50	9983.81	21.15	15.17	7.50	9983.81	-.18	1.54	-1.25
9983.56	.34	1.84	-2.81	9983.25	27.79	18.90	12.19	9986.00	21.33	13.62	8.75
9985.00	14.86	8.35	5.63	9987.12	8.21	4.62	.63	9985.12	1.39	2.43	-5.94
9985.94	14.68	9.89	4.06	9985.94	7.17	4.03	3.44	9986.62	14.86	8.35	5.31
9987.00	29.20	16.40	12.19	9989.06	21.51	12.08	10.31	9989.06	7.17	4.03	3.44
9989.75	7.69	4.32	2.19								

END OF RECORD 76 FILE   1

END OF RECORD 77 FILE   1

END OF RECORD 78 FILE   1

END OF RECORD 79 FILE   1

END OF RECORD 80 FILE   1

TAPE TIME ERROR T(809) =   2115.80 DRT =   .20

END OF RECORD 81 FILE   1

END OF RECORD 82 FILE   1

END OF RECORD 83 FILE   1

END OF RECORD 84 FILE   1

END OF RECORD 85 FILE   1

END OF RECORD 86 FILE   1

END OF RECORD 87 FILE   1

END OF RECORD 88 FILE   1

END OF RECORD 89 FILE   1

END OF RECORD 90 FILE   1

END OF RECORD 91 FILE   1

END OF RECORD 92 FILE   1

END OF RECORD 93 FILE 1

END OF RECORD 94 FILE   1

END OF RECORD 95 FILE   1

END OF RECORD 96 FILE   1

END OF RECORD 97 FILE   1

END OF RECORD 98 FILE   1

END OF RECORD 99 FILE   1

END OF RECORD100 FILE   1

PROCESSING OF FILE NUMBER   1 OF INPUT TAPE IS COMPLETE.
THE REMAINING   5 RECORDS WERE NOT USED.
THE NUMBER OF RECORDS CREATED ON OUTPUT TAPE(S) IS   100

NUMBER FILES OF .1 SEC VELOCITY DATA TO PROCESS IS 1
INPUT UNIT IS 9 OUTPUT UNIT IS 11
PLOTTING-(0,NONE),(1,TAER),(2,1 SEC VEL),(3,BOTH 1 AND 2)   IPLOT = 3

WEIGHTS FOR MARTIN-GRAHAM
     LOW-PASS FILTER

(1,55) =   -.17011500-02
(2,54) =   -.33500800-02
(3,53) =   -.50994300-02
(4,52) =   -.68555000-02
(5,51) =   -.85087400-02
(6,50) =   -.99379000-02
(7,49) =   -.11015290-01
(8,48) =   -.11512940-01
(9,47) =   -.11609350-01
(10,46) =   -.10396320-01
(11,45) =   -.93958599-02
(12,44) =   -.70163600-02
(13,43) =   -.37580000-02
(14,42) =   .38329000-03
(15,41) =   .53633000-02
(16,40) =   .11098910-01
(17,39) =   .17469350-01
(18,38) =   .24319320-01
(19,37) =   .31464200-01
(20,36) =   .38696660-01
(21,35) =   .45794800-01
(22,34) =   .52531290-01
(23,33) =   .58683000-01
(24,32) =   .64049760-01
(25,31) =   .68418650-01
(26,30) =   .71662390-01
(27,29) =   .73656410-01
(28,28) =   .74329160-01

BEGIN PROCESSING .1 SEC VELOCITY DATA FILE   1

ONE SECOND VELOCITY DATA

KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)	KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)
1	149.93	.59	6.66	3.09	.0	51	411.61	-3.57	9.43	5.07	50.0
2	152.72	.14	2.63	3.59	1.0	52	416.57	-.90	10.47	5.01	51.0
3	158.59	-2.97	3.38	7.64	2.0	53	421.70	.42	5.82	5.12	52.0
4	165.85	-5.04	7.85	5.92	3.0	54	426.73	.40	3.16	5.15	53.0
5	170.31	-1.36	9.60	3.65	4.0	55	432.32	-1.98	6.10	5.93	54.0
6	174.35	1.20	4.90	4.60	5.0	56	438.13	-2.50	10.95	5.59	55.0
7	179.25	-1.88	2.75	4.95	6.0	57	443.54	-.31	8.69	5.30	56.0
8	184.06	-4.01	5.53	4.69	7.0	58	448.80	.54	3.23	5.30	57.0
9	188.80	-3.36	8.40	4.92	8.0	59	454.44	-1.23	3.78	6.03	58.0
10	194.00	-.15	7.37	5.48	9.0	60	460.45	-4.27	7.44	5.74	59.0
11	199.90	.19	3.79	6.45	10.0	61	465.86	-3.13	9.79	5.23	60.0
12	206.59	-3.22	4.46	6.52	11.0	62	471.07	.99	8.00	5.16	61.0
13	212.16	-5.23	7.51	4.59	12.0	63	476.10	1.69	3.98	4.95	62.0
14	216.36	-.47	9.30	4.14	13.0	64	481.10	-2.18	3.95	5.15	63.0
15	220.71	3.33	6.53	4.60	14.0	65	486.49	-3.47	7.89	5.60	64.0
16	225.77	-.42	4.37	5.68	15.0	66	492.05	1.07	10.56	5.29	65.0
17	231.92	-4.39	4.98	6.20	16.0	67	497.01	1.59	6.74	4.79	66.0
18	237.41	-3.03	7.79	4.70	17.0	68	502.02	-1.84	2.33	5.28	67.0
19	241.85	.75	8.85	4.60	18.0	69	507.33	-2.67	4.89	5.23	68.0
20	247.09	.46	4.97	5.85	19.0	70	512.55	-1.57	9.04	5.27	69.0
21	253.10	-2.66	3.25	5.87	20.0	71	517.95	.29	9.32	5.56	70.0
22	258.47	-3.84	6.55	4.86	21.0	72	523.75	.75	5.20	5.97	71.0
23	263.06	-2.52	9.15	4.57	22.0	73	529.49	.41	2.86	5.39	72.0
24	268.02	.55	7.51	5.32	23.0	74	534.73	-1.93	5.11	5.26	73.0
25	273.35	-.03	3.71	5.18	24.0	75	540.14	-1.71	8.95	5.40	74.0
26	278.37	-3.10	3.77	4.98	25.0	76	545.36	1.82	8.20	5.11	75.0
27	283.59	-4.67	7.10	5.44	26.0	77	550.49	1.05	3.31	5.14	76.0
28	289.01	-1.45	9.98	5.44	27.0	78	555.60	-1.40	2.75	5.13	77.0
29	294.69	1.42	7.48	5.90	28.0	79	560.88	-2.41	7.01	5.39	78.0
30	300.45	.26	4.16	5.45	29.0	80	566.15	-.28	10.04	5.16	79.0
31	305.57	-2.85	4.66	4.97	30.0	81	571.55	2.42	7.43	5.68	80.0
32	310.74	-4.05	7.75	5.47	31.0	82	577.00	1.58	2.79	4.96	81.0
33	316.32	-.06	9.57	5.53	32.0	83	581.70	-.54	3.19	4.88	82.0
34	321.72	.96	6.27	5.29	33.0	84	587.19	-1.86	7.16	5.88	83.0
35	326.93	-1.84	3.79	5.16	34.0	85	592.80	.61	9.67	5.21	84.0
36	332.12	-4.15	5.70	5.33	35.0	86	597.83	1.93	6.73	4.97	85.0
37	337.75	-2.44	9.77	5.78	36.0	87	602.77	.46	2.48	5.02	86.0
38	343.18	.69	9.27	4.99	37.0	88	608.22	-.83	3.39	5.87	87.0
39	348.31	-.76	4.57	5.61	38.0	89	613.96	-2.14	7.60	5.33	88.0
40	354.35	-3.01	3.60	6.11	39.0	90	619.04	1.65	10.65	5.17	89.0
41	359.94	-3.62	6.64	5.04	40.0	91	624.66	3.44	6.56	5.95	90.0
42	364.81	-.23	10.23	4.92	41.0	92	630.55	.92	1.86	5.71	91.0
43	369.80	2.20	9.46	4.95	42.0	93	635.00	-1.52	4.80	5.15	92.0
44	374.59	-.61	5.01	4.70	43.0	94	640.89	-1.68	8.39	4.82	93.0
45	379.60	-3.41	4.05	5.53	44.0	95	645.98	1.49	8.25	5.39	94.0
46	385.42	-3.07	8.23	5.69	45.0	96	651.36	2.86	5.09	5.20	95.0
47	390.50	-.39	10.34	4.68	46.0	97	656.43	1.69	3.51	5.01	96.0
48	395.58	.15	6.67	5.56	47.0	98	661.31	-1.19	5.86	4.77	97.0
49	401.15	-.50	7.49	5.36	48.0	99	666.36	-.94	9.25	5.57	98.0
50	406.38	-2.80	4.84	5.25	49.0	100	672.46	1.26	8.07	6.26	99.0

ONE SECOND VELOCITY DATA

KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)	KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)
101	678.22	1.32	3.18	5.24	100.0	151	943.07	-2.02	4.83	5.50	150.0
102	683.27	-.27	2.95	5.01	101.0	152	948.36	-1.13	8.83	5.04	151.0
103	688.16	-2.65	6.12	4.77	102.0	153	953.50	.77	7.64	5.55	152.0
104	693.32	.13	9.59	5.80	103.0	154	959.50	1.23	3.30	6.14	153.0
105	699.35	3.44	7.82	5.76	104.0	155	965.16	-.75	3.23	5.10	154.0
106	704.46	1.24	3.39	4.76	105.0	156	970.02	-2.82	6.62	4.90	155.0
107	709.65	-1.57	2.72	5.71	106.0	157	975.15	.78	10.28	5.32	156.0
108	715.39	-2.69	6.60	5.50	107.0	158	980.53	3.04	7.42	5.35	157.0
109	720.66	.53	9.18	5.28	108.0	159	985.51	.79	1.91	4.56	158.0
110	726.10	1.98	5.63	5.46	109.0	160	990.15	-1.15	3.30	5.03	159.0
111	731.27	-.25	2.28	4.86	110.0	161	995.57	-2.74	7.09	5.51	160.0
112	735.99	-2.33	2.41	4.72	111.0	162	1000.91	-.49	8.81	5.20	161.0
113	741.00	-2.01	7.30	5.37	112.0	163	1006.27	1.74	5.99	5.60	162.0
114	746.53	2.57	10.25	5.40	113.0	164	1011.76	.16	2.14	5.19	163.0
115	751.53	2.20	0.07	4.70	114.0	165	1016.64	-2.47	3.69	4.89	164.0
116	756.47	-.35	1.71	5.43	115.0	166	1022.07	-.77	8.81	5.97	165.0
117	762.07	-2.04	3.19	5.41	116.0	167	1027.94	2.57	10.03	5.50	166.0
118	767.21	-2.57	7.51	5.25	117.0	168	1033.15	.79	5.28	5.13	167.0
119	773.03	.84	8.57	6.19	118.0	169	1038.22	-1.08	2.91	4.81	168.0
120	778.79	1.52	4.55	5.16	119.0	170	1042.65	-1.59	4.22	4.23	169.0
121	783.75	-.37	1.91	5.05	120.0	171	1047.40	-.44	7.50	5.37	170.0
122	789.21	-3.09	3.36	5.84	121.0	172	1052.96	.66	8.32	5.54	171.0
123	795.22	-1.37	7.41	5.92	122.0	173	1058.52	.42	4.71	5.67	172.0
124	800.57	2.73	8.19	4.77	123.0	174	1064.22	-.13	4.30	5.65	173.0
125	805.41	1.29	2.84	5.29	124.0	175	1069.78	-.10	6.74	5.42	174.0
126	811.03	-.53	1.33	5.53	125.0	176	1075.04	1.25	8.81	5.27	175.0
127	815.96	-1.69	5.29	4.54	126.0	177	1080.75	-.21	7.06	6.11	176.0
128	820.67	-.11	9.93	4.95	127.0	178	1086.59	-.80	4.06	5.22	177.0
129	825.77	2.43	7.00	5.26	128.0	179	1091.35	-1.07	3.34	4.79	178.0
130	831.39	.48	2.09	5.87	129.0	180	1096.85	.04	7.04	6.07	179.0
131	836.91	-2.24	1.88	4.98	130.0	181	1102.73	2.32	10.89	5.50	180.0
132	841.69	-2.94	5.68	4.92	131.0	182	1108.12	.83	6.57	5.50	181.0
133	847.01	1.12	9.98	5.55	132.0	183	1113.64	.66	2.61	5.42	182.0
134	852.42	3.38	7.95	5.28	133.0	184	1119.11	.02	4.51	5.65	183.0
135	857.84	.83	2.46	5.62	134.0	185	1124.76	-.43	9.12	5.40	184.0
136	863.37	-2.26	3.09	5.37	135.0	186	1129.92	.24	10.26	5.28	185.0
137	868.77	-2.87	6.96	5.47	136.0	187	1135.64	.65	6.44	5.97	186.0
138	874.06	.56	9.65	4.91	137.0	188	1141.25	1.25	3.56	5.14	187.0
139	878.67	1.15	5.38	4.60	138.0	189	1146.46	.88	6.18	5.56	188.0
140	883.75	.39	2.61	5.57	139.0	190	1152.08	.50	10.53	5.34	189.0
141	889.58	-1.05	4.65	5.95	140.0	191	1157.15	-1.08	8.86	5.16	190.0
142	895.55	-1.66	8.24	5.89	141.0	192	1162.79	1.27	6.37	5.90	191.0
143	901.09	1.86	9.98	5.10	142.0	193	1168.62	3.65	5.00	5.81	192.0
144	905.96	2.07	5.54	4.64	143.0	194	1174.61	.64	7.15	6.10	193.0
145	910.82	.42	1.95	5.42	144.0	195	1180.25	-1.60	11.10	5.17	194.0
146	916.60	-2.55	4.72	5.92	145.0	196	1185.70	.19	10.77	6.03	195.0
147	922.11	-3.57	8.23	4.98	146.0	197	1191.78	2.26	6.40	5.57	196.0
148	926.90	2.10	8.31	4.89	147.0	198	1196.72	1.57	3.94	4.90	197.0
149	932.10	3.09	5.18	5.44	148.0	199	1202.34	-.74	7.93	6.11	198.0
150	937.57	-.48	2.63	5.46	149.0	200	1207.92	-2.09	10.81	4.92	199.0

ONE SECOND VELOCITY DATA

KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)	KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)
1	1213.00	.88	9.09	5.64	200.0	51	1485.34	2.14	.86	5.19	250.0
2	1218.73	4.25	6.25	5.33	201.0	52	1490.73	.34	2.75	5.67	251.0
3	1223.72	2.47	5.22	5.13	202.0	53	1496.53	-.95	7.07	5.74	252.0
4	1229.47	-1.09	7.75	6.13	203.0	54	1501.93	2.02	7.42	5.05	253.0
5	1235.57	-2.07	10.35	6.08	204.0	55	1506.84	4.06	3.36	4.92	254.0
6	1241.73	2.99	9.55	6.01	205.0	56	1511.93	2.28	.96	5.30	255.0
7	1247.03	5.34	6.15	4.63	206.0	57	1517.73	-.83	3.37	6.32	256.0
8	1252.00	.82	4.62	5.72	207.0	58	1523.95	.59	7.56	5.55	257.0
9	1257.94	-1.66	7.21	5.66	208.0	59	1528.36	3.12	6.14	3.60	258.0
10	1263.25	-.14	8.63	5.36	209.0	60	1532.33	2.20	2.11	4.73	259.0
11	1268.88	4.37	8.52	5.56	210.0	61	1538.04	.38	.85	6.55	260.0
12	1273.91	5.55	6.64	4.69	211.0	62	1544.76	.19	4.76	6.47	261.0
13	1279.00	2.33	4.87	5.60	212.0	63	1550.24	3.70	8.50	4.51	262.0
14	1284.64	-.38	6.11	5.42	213.0	64	1554.78	4.28	5.46	5.11	263.0
15	1290.14	1.12	9.10	5.81	214.0	65	1560.49	1.44	1.22	5.88	264.0
16	1296.01	5.74	10.20	5.64	215.0	66	1565.80	1.26	.76	4.89	265.0
17	1301.36	4.43	6.36	5.33	216.0	67	1570.83	1.10	5.92	5.41	266.0
18	1306.99	.84	3.85	5.85	217.0	68	1576.61	2.74	8.87	5.81	267.0
19	1312.64	.44	6.43	5.37	218.0	69	1581.93	4.04	4.39	4.82	268.0
20	1318.04	3.75	9.91	5.66	219.0	70	1586.72	2.56	1.13	5.09	269.0
21	1323.88	5.95	8.18	5.81	220.0	71	1592.33	-.22	3.22	5.95	270.0
22	1329.24	3.81	3.59	4.85	221.0	72	1598.10	.42	7.42	5.44	271.0
23	1333.84	1.49	3.30	4.60	222.0	73	1603.16	4.56	8.36	4.82	272.0
24	1338.79	.34	6.67	5.30	223.0	74	1608.18	3.72	4.13	5.40	273.0
25	1344.21	4.52	9.89	5.43	224.0	75	1613.88	1.46	.84	5.78	274.0
26	1349.61	5.90	7.19	5.40	225.0	76	1619.62	.51	3.85	5.77	275.0
27	1355.13	3.69	2.67	5.57	226.0	77	1625.34	1.28	7.95	5.53	276.0
28	1360.51	2.41	2.63	5.22	227.0	78	1630.65	3.27	6.75	5.09	277.0
29	1365.96	2.07	6.68	5.88	228.0	79	1635.66	3.02	2.58	5.05	278.0
30	1372.05	4.81	9.75	6.02	229.0	80	1640.92	2.37	.73	5.62	279.0
31	1377.86	4.74	5.97	5.68	230.0	81	1647.02	1.74	4.64	6.35	280.0
32	1383.34	2.61	1.16	5.09	231.0	82	1652.69	1.50	9.02	4.71	281.0
33	1388.00	1.42	2.71	4.61	232.0	83	1657.05	2.91	6.08	4.58	282.0
34	1393.36	2.91	8.65	6.06	233.0	84	1662.13	3.15	1.55	5.44	283.0
35	1399.31	4.44	9.20	5.40	234.0	85	1667.47	2.36	1.39	5.18	284.0
36	1404.11	3.74	4.49	4.53	235.0	86	1672.81	2.16	6.28	5.66	285.0
37	1409.00	2.85	1.55	5.29	236.0	87	1678.65	2.62	8.55	5.79	286.0
38	1414.52	.64	3.66	5.66	237.0	88	1684.22	2.70	3.88	5.34	287.0
39	1420.33	2.28	8.14	6.00	238.0	89	1689.46	1.48	-.14	5.21	288.0
40	1426.22	4.59	7.75	5.52	239.0	90	1694.72	.58	2.00	5.38	289.0
41	1431.11	3.03	3.29	4.51	240.0	91	1700.24	3.11	9.21	5.61	290.0
42	1436.08	2.00	.55	5.73	241.0	92	1705.87	3.97	8.20	5.64	291.0
43	1442.25	.45	3.23	6.26	242.0	93	1711.47	2.63	2.34	5.53	292.0
44	1448.20	2.47	7.94	5.69	243.0	94	1716.83	1.57	.83	5.14	293.0
45	1453.54	4.30	8.54	4.84	244.0	95	1721.71	-1.11	3.37	4.75	294.0
46	1458.05	2.89	2.26	4.59	245.0	96	1726.89	2.03	9.09	5.73	295.0
47	1463.56	1.58	1.77	6.49	246.0	97	1732.80	5.93	8.40	5.79	296.0
48	1470.19	-.12	5.73	6.19	247.0	98	1738.14	2.63	2.04	4.96	297.0
49	1475.49	2.72	8.90	4.65	248.0	99	1743.30	.85	.52	5.54	298.0
50	1480.23	4.05	5.08	4.98	249.0	100	1749.05	.52	4.73	5.83	299.0

ONE   SECOND   VELOCITY   DATA

KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)	KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)
101	1754.70	2.61	8.89	5.44	300.0	151	2025.12	4.10	3.49	5.35	350.0
102	1759.97	4.61	6.80	5.13	301.0	152	2030.43	1.99	1.09	5.44	351.0
103	1765.03	2.92	2.32	5.06	302.0	153	2035.92	1.61	3.87	5.35	352.0
104	1770.24	.67	2.25	5.51	303.0	154	2041.14	4.10	7.53	5.27	353.0
105	1776.02	-1.42	5.11	5.85	304.0	155	2046.75	6.08	5.69	5.88	354.0
106	1781.53	2.31	8.26	5.04	305.0	156	2052.45	4.27	2.69	5.44	355.0
107	1786.37	5.60	6.83	4.87	306.0	157	2057.81	2.75	1.94	5.35	356.0
108	1791.48	3.09	1.78	5.35	307.0	158	2063.05	4.75	3.47	4.99	357.0
109	1796.98	.49	1.17	5.54	308.0	159	2067.95	7.18	5.26	5.02	358.0
110	1802.44	.34	6.64	5.29	309.0	160	2073.29	5.58	4.09	5.59	359.0
111	1807.64	3.32	8.75	5.31	310.0	161	2078.89	3.34	2.13	5.46	360.0
112	1813.20	4.80	4.41	5.60	311.0	162	2084.14	2.75	2.06	5.07	361.0
113	1818.59	2.09	1.19	5.31	312.0	163	2089.53	3.53	5.72	6.05	362.0
114	1824.20	.33	3.52	5.96	313.0	164	2096.10	6.01	8.06	6.52	363.0
115	1829.96	1.04	7.58	5.27	314.0	165	2101.39	5.52	4.71	3.93	364.0
116	1834.88	2.86	7.19	4.90	315.0	166	2104.97	2.72	1.75	4.02	365.0
117	1840.16	4.59	4.28	5.58	316.0	167	2110.18	3.58	2.58	6.23	366.0
118	1845.76	4.52	2.31	5.56	317.0	168	2116.55	7.94	5.81	6.09	367.0
119	1851.27	1.85	3.03	5.44	318.0	169	2121.89	6.87	5.03	4.64	368.0
120	1856.56	.51	6.82	5.19	319.0	170	2126.49	2.60	1.90	4.87	369.0
121	1861.71	3.24	7.41	5.15	320.0	171	2131.90	2.63	1.80	5.83	370.0
122	1866.88	5.99	4.80	5.17	321.0	172	2137.82	6.35	4.63	6.05	371.0
123	1872.23	3.78	2.03	5.72	322.0	173	2143.90	6.14	6.04	5.94	372.0
124	1878.40	.13	3.42	6.39	323.0	174	2149.28	3.19	4.23	4.73	373.0
125	1884.47	2.63	8.18	5.43	324.0	175	2153.95	2.54	2.04	5.00	374.0
126	1889.23	6.45	3.05	4.53	325.0	176	2159.39	2.87	1.82	5.80	375.0
127	1894.31	4.95	3.84	5.59	326.0	177	2165.29	5.00	3.66	5.83	376.0
128	1899.95	1.47	1.62	5.51	327.0	178	2170.77	6.26	4.60	5.02	377.0
129	1905.43	.78	5.45	5.54	328.0	179	2175.58	4.03	2.95	4.94	378.0
130	1910.92	4.15	8.66	5.34	329.0	180	2181.02	2.66	1.95	5.74	379.0
131	1916.00	5.52	5.49	4.96	330.0	181	2186.30	3.11	2.29	4.62	380.0
132	1921.18	3.06	1.37	5.34	331.0	182	2190.98	5.14	3.75	5.10	381.0
133	1926.40	1.61	2.28	5.09	332.0	183	2196.45	5.92	4.26	5.67	382.0
134	1931.62	2.06	7.18	5.52	333.0	184	2202.14	3.84	2.15	5.72	383.0
135	1937.35	4.88	8.43	5.74	334.0	185	2207.80	2.04	1.44	5.50	384.0
136	1942.70	5.18	4.37	4.93	335.0	186	2213.00	4.35	2.94	5.05	385.0
137	1947.44	2.53	.97	4.87	336.0	187	2218.15	6.65	5.00	5.25	386.0
138	1952.78	1.70	1.84	5.82	337.0	188	2223.43	5.34	3.82	5.23	387.0
139	1958.70	3.19	7.38	5.82	338.0	189	2228.61	2.49	1.79	5.08	388.0
140	1964.42	3.85	8.05	5.63	339.0	190	2233.58	1.98	1.36	4.98	389.0
141	1969.89	2.99	3.15	5.15	340.0	191	2238.96	4.75	3.07	5.84	390.0
142	1974.73	2.73	1.49	4.70	341.0	192	2244.80	7.51	5.68	5.56	391.0
143	1979.84	2.30	1.23	5.63	342.0	193	2249.79	5.47	3.77	4.71	392.0
144	1985.69	3.77	4.40	5.84	343.0	194	2255.43	3.02	-.04	7.05	393.0
145	1991.36	5.10	6.94	5.00	344.0	195	2263.02	3.81	.90	6.86	394.0
146	1997.05	3.80	3.67	5.84	345.0	196	2267.94	5.26	3.94	3.52	395.0
147	2002.92	2.51	1.45	5.82	346.0	197	2271.93	6.13	4.73	4.90	396.0
148	2008.54	2.48	1.67	5.39	347.0	198	2277.11	4.15	3.09	4.74	397.0
149	2013.80	5.23	3.95	5.30	348.0	199	2281.57	2.99	2.46	4.87	398.0
150	2019.45	6.27	5.50	5.80	349.0	200	2287.54	3.47	4.53	6.80	399.0

ONE SECOND VELOCITY DATA

KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)	KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)
1	2294.24	4.04	6.48	6.31	400.0	51	2559.43	2.50	1.70	4.87	450.0
2	2299.79	4.05	5.74	4.78	401.0	52	2564.46	4.39	3.22	5.17	451.0
3	2304.20	4.65	4.12	4.33	402.0	53	2569.53	5.85	4.97	4.88	452.0
4	2308.77	2.79	1.30	5.05	403.0	54	2574.26	4.00	3.51	4.66	453.0
5	2314.69	3.79	2.27	6.76	404.0	55	2579.16	1.47	.67	5.16	454.0
6	2321.57	7.31	5.44	6.46	405.0	56	2584.32	2.17	2.79	5.02	455.0
7	2326.96	6.19	4.49	4.44	406.0	57	2589.12	4.12	7.24	4.83	456.0
8	2331.45	5.48	3.38	4.95	407.0	58	2594.37	5.22	6.15	5.57	457.0
9	2336.85	3.30	1.44	5.65	408.0	59	2599.87	3.58	2.27	5.38	458.0
10	2342.48	4.71	3.10	5.48	409.0	60	2605.46	1.77	1.13	6.00	459.0
11	2347.75	7.05	5.27	5.10	410.0	61	2611.54	2.83	2.07	5.79	460.0
12	2352.59	5.46	4.05	4.55	411.0	62	2616.63	5.42	4.09	4.42	461.0
13	2357.24	3.71	2.68	5.05	412.0	63	2621.04	5.25	3.82	4.75	462.0
14	2362.65	4.29	3.00	5.55	413.0	64	2626.42	3.29	1.26	5.90	463.0
15	2368.20	7.55	5.49	5.54	414.0	65	2632.36	3.04	.89	5.72	464.0
16	2373.72	7.61	5.83	5.44	415.0	66	2637.69	4.61	3.16	5.02	465.0
17	2378.89	4.54	3.04	4.93	416.0	67	2642.71	5.11	3.87	5.15	466.0
18	2384.01	3.44	.46	5.61	417.0	68	2648.06	4.13	3.08	5.53	467.0
19	2390.14	5.74	2.65	6.39	418.0	69	2653.64	2.41	1.62	5.46	468.0
20	2396.26	8.62	6.50	5.67	419.0	70	2658.85	2.78	1.74	5.08	469.0
21	2401.38	6.00	4.65	4.77	420.0	71	2663.94	5.48	3.99	5.04	470.0
22	2406.34	3.25	1.35	5.23	421.0	72	2668.90	3.71	2.90	4.95	471.0
23	2411.84	4.57	1.61	5.59	422.0	73	2673.93	2.94	1.49	5.09	472.0
24	2417.30	7.34	4.90	5.23	423.0	74	2679.00	3.94	1.47	5.05	473.0
25	2422.46	7.29	5.64	5.11	424.0	75	2684.12	4.05	2.43	5.29	474.0
26	2427.62	4.09	3.13	5.20	425.0	76	2689.58	5.31	4.01	5.31	475.0
27	2432.73	3.57	1.21	5.07	426.0	77	2694.33	3.11	2.32	4.37	476.0
28	2438.00	5.38	2.22	5.57	427.0	78	2699.14	1.44	1.06	5.57	477.0
29	2443.59	7.19	5.17	5.27	428.0	79	2705.32	3.19	2.21	6.31	478.0
30	2448.45	5.93	4.58	4.73	429.0	80	2711.09	5.76	4.10	5.25	479.0
31	2453.72	3.48	2.39	6.00	430.0	81	2716.26	5.69	4.18	5.19	480.0
32	2460.06	3.46	1.65	6.28	431.0	82	2721.18	2.55	1.89	4.57	481.0
33	2465.99	4.74	2.75	5.57	432.0	83	2725.76	.66	.49	4.92	482.0
34	2471.24	6.36	4.76	4.93	433.0	84	2731.06	1.99	1.32	5.47	483.0
35	2476.09	5.34	4.07	4.85	434.0	85	2736.18	6.38	4.57	4.79	484.0
36	2481.12	4.22	2.05	5.20	435.0	86	2741.10	5.51	4.06	5.23	485.0
37	2486.18	3.78	1.18	4.73	436.0	87	2746.51	2.40	1.74	5.36	486.0
38	2490.67	5.55	3.63	4.50	437.0	88	2751.59	1.27	.90	4.93	487.0
39	2495.37	6.52	4.93	4.88	438.0	89	2756.78	2.36	1.74	5.56	488.0
40	2500.54	5.43	3.99	5.48	439.0	90	2762.55	5.08	3.84	5.71	489.0
41	2506.17	3.47	2.54	5.70	440.0	91	2767.84	3.78	2.87	4.94	490.0
42	2511.78	2.83	2.07	5.51	441.0	92	2773.03	2.89	2.11	5.70	491.0
43	2517.16	6.24	4.61	5.26	442.0	93	2778.98	1.42	1.00	5.80	492.0
44	2522.28	6.31	4.70	4.98	443.0	94	2784.24	2.61	1.92	4.83	493.0
45	2527.25	4.58	2.51	5.05	444.0	95	2789.11	6.58	5.05	4.95	494.0
46	2532.39	4.33	.89	5.25	445.0	96	2793.95	4.05	3.18	4.72	495.0
47	2537.73	4.22	2.10	5.39	446.0	97	2798.95	.94	.68	5.47	496.0
48	2543.16	5.82	4.68	5.54	447.0	98	2804.74	2.12	1.54	5.85	497.0
49	2548.90	5.74	4.25	5.85	448.0	99	2810.26	4.84	3.57	5.10	498.0
50	2554.49	3.30	2.45	5.19	449.0	100	2814.90	5.43	3.83	4.48	499.0

ONE   SECOND   VELOCITY   DATA

KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)	KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)
101	2819.76	4.00	2.76	5.39	500.0	151	3085.75	4.65	3.83	5.21	550.0
102	2825.22	1.99	1.32	5.26	501.0	152	3091.33	3.47	-.77	5.63	551.0
103	2830.33	2.03	1.53	5.32	502.0	153	3096.21	3.96	-3.94	4.09	552.0
104	2836.12	4.77	3.55	5.95	503.0	154	3100.42	3.40	-1.42	4.81	553.0
105	2841.36	4.04	2.89	4.47	504.0	155	3105.93	5.27	4.30	6.00	554.0
106	2846.05	2.92	2.44	5.41	505.0	156	3111.83	4.85	4.18	5.59	555.0
107	2852.21	2.28	1.54	6.43	506.0	157	3117.00	3.55	-.81	4.86	556.0
108	2858.14	2.89	1.55	5.34	507.0	158	3121.90	3.26	-3.04	5.05	557.0
109	2863.15	5.59	3.51	4.82	508.0	159	3127.07	2.13	-.04	5.23	558.0
110	2868.01	5.24	.77	4.94	509.0	160	3132.43	4.08	3.95	5.59	559.0
111	2873.06	3.87	-1.50	5.06	510.0	161	3138.35	4.99	2.35	6.02	560.0
112	2877.96	2.74	.55	4.80	511.0	162	3143.84	4.76	-1.81	4.71	561.0
113	2882.92	3.93	3.27	5.23	512.0	163	3148.17	2.69	-1.78	4.58	562.0
114	2888.35	5.14	4.15	5.31	513.0	164	3153.85	2.31	1.60	6.55	563.0
115	2893.19	3.03	.77	4.57	514.0	165	3159.79	3.97	3.38	4.69	564.0
116	2898.14	1.91	-2.17	5.47	515.0	166	3163.64	2.57	2.10	3.93	565.0
117	2904.08	4.33	.69	6.25	516.0	167	3168.95	3.21	-.56	6.65	566.0
118	2910.25	7.39	3.84	5.81	517.0	168	3175.56	3.44	-1.09	5.85	567.0
119	2915.43	5.22	1.44	4.64	518.0	169	3180.64	3.11	2.16	4.81	568.0
120	2919.95	2.13	-1.63	4.72	519.0	170	3185.93	3.16	3.13	5.69	569.0
121	2925.37	2.00	-1.69	6.10	520.0	171	3191.32	3.60	-.28	4.82	570.0
122	2931.67	3.28	1.25	6.16	521.0	172	3195.73	3.79	-3.02	4.34	571.0
123	2937.01	5.53	3.79	4.51	522.0	173	3200.50	1.80	-.75	5.19	572.0
124	2941.33	5.56	1.27	4.65	523.0	174	3205.75	3.34	3.16	5.29	573.0
125	2946.57	3.13	-2.24	5.66	524.0	175	3211.12	4.16	3.53	5.47	574.0
126	2952.21	1.98	-1.21	5.59	525.0	176	3216.56	2.87	-.24	5.37	575.0
127	2957.63	5.25	3.24	5.10	526.0	177	3222.06	2.25	-3.09	5.77	576.0
128	2962.38	6.08	2.44	4.69	527.0	178	3228.01	3.16	.78	5.79	577.0
129	2967.55	3.76	-2.42	5.53	528.0	179	3232.92	3.96	4.01	4.03	578.0
130	2972.91	3.15	-2.65	5.12	529.0	180	3236.99	2.78	.40	4.64	579.0
131	2978.31	4.29	1.15	5.93	530.0	181	3242.58	2.10	-3.95	6.24	580.0
132	2984.40	5.43	3.84	5.82	531.0	182	3248.70	2.82	-1.25	5.80	581.0
133	2989.70	4.81	2.13	5.06	532.0	183	3254.33	4.85	3.72	5.62	582.0
134	2995.04	4.59	-1.70	5.63	533.0	184	3259.79	3.99	3.45	5.01	583.0
135	3000.65	2.63	-3.10	5.56	534.0	185	3264.35	2.67	-.47	4.40	584.0
136	3006.35	3.56	1.13	5.85	535.0	186	3269.12	2.07	-3.34	5.30	585.0
137	3012.10	7.10	5.47	5.43	536.0	187	3274.63	1.75	-.27	5.44	586.0
138	3017.26	5.59	1.49	5.07	537.0	188	3279.88	3.47	3.32	5.20	587.0
139	3022.30	3.26	-3.23	4.91	538.0	189	3285.21	4.47	.59	5.38	588.0
140	3027.10	2.35	-1.97	4.89	539.0	190	3290.45	3.62	-3.13	5.02	589.0
141	3032.42	3.55	2.25	5.76	540.0	191	3295.32	2.81	-.92	4.88	590.0
142	3038.30	5.06	3.84	5.78	541.0	192	3300.76	3.48	2.92	6.12	591.0
143	3043.59	4.92	-.34	4.78	542.0	193	3306.93	2.88	2.75	5.82	592.0
144	3048.21	3.98	-2.90	4.73	543.0	194	3312.23	3.17	-.90	5.00	593.0
145	3053.49	3.43	.30	5.77	544.0	195	3317.37	3.52	-4.09	5.34	594.0
146	3059.10	3.89	3.53	5.14	545.0	196	3322.44	1.30	-1.91	4.74	595.0
147	3064.11	4.44	1.30	5.22	546.0	197	3327.29	3.06	3.14	5.15	596.0
148	3069.70	4.15	-3.60	5.83	547.0	198	3332.63	4.69	3.55	5.26	597.0
149	3075.50	3.32	-2.16	5.69	548.0	199	3337.65	3.71	-1.89	4.92	598.0
150	3080.84	5.05	3.74	4.92	549.0	200	3342.63	2.34	-4.28	5.02	599.0

ONE   SECOND   VELOCITY   DATA

KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)	KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)
1	3347.75	1.78	.02	5.23	600.0	51	3609.04	2.75	-4.89	5.53	650.0
2	3353.30	3.09	3.28	5.86	601.0	52	3614.31	1.75	-1.65	5.07	651.0
3	3358.88	2.73	1.06	4.96	602.0	53	3619.47	2.19	1.03	5.32	652.0
4	3363.24	2.64	-3.69	4.22	603.0	54	3624.70	4.03	-.94	4.97	653.0
5	3368.24	2.49	-3.12	5.89	604.0	55	3629.50	3.95	-5.58	4.81	654.0
6	3374.50	4.05	2.45	6.27	605.0	56	3634.57	1.91	-4.88	5.27	655.0
7	3380.24	4.50	4.04	5.18	606.0	57	3639.77	1.14	-.52	5.09	656.0
8	3385.20	2.55	-.03	4.94	607.0	58	3645.01	4.44	1.48	5.40	657.0
9	3390.41	2.36	-3.30	5.40	608.0	59	3650.36	6.41	-2.29	5.10	658.0
10	3395.71	1.81	-1.21	5.13	609.0	60	3655.23	3.70	-5.79	4.88	659.0
11	3400.99	2.40	2.45	5.48	610.0	61	3660.52	1.18	-2.95	5.66	660.0
12	3406.19	3.26	2.40	4.46	611.0	62	3666.25	1.71	.71	5.68	661.0
13	3409.80	3.33	-1.82	3.26	612.0	63	3671.74	4.29	.26	5.25	662.0
14	3413.94	2.84	-3.43	5.42	613.0	64	3676.72	4.76	-4.74	4.92	663.0
15	3420.47	2.84	.85	7.16	614.0	65	3681.99	2.87	-5.67	5.49	664.0
16	3427.04	3.65	3.56	5.42	615.0	66	3687.10	.38	-1.63	4.60	665.0
17	3431.18	3.96	.59	3.41	616.0	67	3691.64	2.55	1.45	4.94	666.0
18	3435.28	4.31	-4.09	5.22	617.0	68	3697.17	5.64	-.59	5.75	667.0
19	3441.28	2.61	-3.47	6.18	618.0	69	3702.45	4.86	-4.60	4.81	668.0
20	3446.96	1.94	1.50	5.30	619.0	70	3707.29	1.64	-4.42	5.09	669.0
21	3452.36	4.41	3.44	5.61	620.0	71	3712.58	1.23	-.29	5.33	670.0
22	3458.05	6.22	-.43	5.62	621.0	72	3717.88	4.62	1.84	5.25	671.0
23	3463.45	4.25	-4.41	5.12	622.0	73	3723.05	4.28	-2.91	5.07	672.0
24	3468.15	2.02	-2.12	4.44	623.0	74	3728.04	1.69	-5.88	4.90	673.0
25	3472.83	3.07	2.65	5.07	624.0	75	3733.06	.84	-3.36	5.25	674.0
26	3477.94	4.36	1.55	4.85	625.0	76	3738.55	2.71	.30	5.61	675.0
27	3482.59	4.82	-3.83	4.79	626.0	77	3743.82	3.65	-.05	4.98	676.0
28	3487.94	2.42	-4.75	5.86	627.0	78	3748.93	3.44	-4.06	5.37	677.0
29	3493.83	2.17	.58	5.81	628.0	79	3754.43	1.73	-5.90	5.34	678.0
30	3499.66	4.71	7.42	5.87	629.0	80	3759.44	.48	-2.94	4.82	679.0
31	3505.16	5.27	-1.11	5.04	630.0	81	3764.40	3.08	.78	5.15	680.0
32	3510.01	4.58	-4.35	4.81	631.0	82	3769.58	5.19	-.51	5.06	681.0
33	3514.72	.91	-2.58	4.66	632.0	83	3774.45	3.42	-5.73	4.69	682.0
34	3519.75	1.29	1.07	5.51	633.0	84	3779.33	.94	-6.30	5.28	683.0
35	3525.38	5.04	.46	5.30	634.0	85	3785.01	1.87	.02	5.87	684.0
36	3530.14	4.78	-3.29	4.52	635.0	86	3790.46	3.57	2.01	4.92	685.0
37	3535.19	2.58	-3.75	5.76	636.0	87	3795.14	4.06	-2.73	4.66	686.0
38	3541.32	2.01	-1.92	6.20	637.0	88	3800.01	3.23	-5.50	5.07	687.0
39	3547.30	4.53	2.27	5.72	638.0	89	3805.36	.17	-4.24	5.65	688.0
40	3552.55	5.52	-.14	4.68	639.0	90	3811.12	1.10	-.52	5.70	689.0
41	3556.84	3.97	-3.88	4.19	640.0	91	3816.36	4.10	.14	4.60	690.0
42	3561.11	1.37	-4.14	4.30	641.0	92	3820.72	3.93	-4.10	4.58	691.0
43	3565.75	1.19	-.75	5.16	642.0	93	3825.89	2.58	-6.03	5.55	692.0
44	3571.37	4.00	1.13	5.93	643.0	94	3831.33	.21	-3.34	5.23	693.0
45	3577.14	4.46	-2.66	5.43	644.0	95	3836.52	1.66	1.01	5.24	694.0
46	3582.39	4.11	-4.11	5.24	645.0	96	3841.67	4.49	-.40	4.87	695.0
47	3587.66	1.79	-3.30	5.18	646.0	97	3846.19	3.81	-4.62	4.47	696.0
48	3592.69	2.19	.29	5.03	647.0	98	3851.17	1.12	-4.55	5.52	697.0
49	3597.84	4.92	1.59	5.30	648.0	99	3856.86	.44	-1.11	5.71	698.0
50	3603.36	4.01	-3.59	5.70	649.0	100	3862.35	3.21	1.11	5.29	699.0

ONE   SECOND   VELOCITY   DATA

KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)	KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)
101	3867.61	4.25	-2.37	5.31	700.0	151	4127.44	1.66	.82	5.65	750.0
102	3872.87	2.93	-4.89	5.13	701.0	152	4132.78	3.47	-2.09	4.79	751.0
103	3878.04	.12	-3.26	5.38	702.0	153	4137.24	3.82	-5.94	4.54	752.0
104	3883.76	.80	.41	5.87	703.0	154	4142.38	1.35	-4.65	5.77	753.0
105	3889.16	4.03	.30	4.64	704.0	155	4148.27	.15	-1.05	5.70	754.0
106	3893.21	2.73	-4.48	3.86	705.0	156	4153.61	2.67	-.65	5.13	755.0
107	3897.67	1.02	-5.22	5.09	706.0	157	4158.77	5.33	-3.63	5.22	756.0
108	3903.04	1.06	-1.66	5.49	707.0	158	4164.01	3.58	-5.56	5.30	757.0
109	3908.64	3.99	2.92	5.61	708.0	159	4169.45	.32	-4.63	5.55	758.0
110	3914.03	4.13	-.09	5.27	709.0	160	4174.98	2.07	-.86	5.52	759.0
111	3919.42	3.06	-4.67	5.54	710.0	161	4180.66	5.05	.48	5.89	760.0
112	3924.32	2.39	-3.71	5.15	711.0	162	4185.18	4.52	-4.28	5.04	761.0
113	3929.83	.71	-1.01	5.14	712.0	163	4191.16	2.33	-6.89	5.26	762.0
114	3935.26	2.44	1.65	5.47	713.0	164	4196.52	.68	-3.14	5.06	763.0
115	3940.41	3.57	-1.10	5.02	714.0	165	4201.09	1.49	.71	4.25	764.0
116	3945.78	2.54	-4.94	5.73	715.0	166	4205.68	4.34	-.69	5.12	765.0
117	3951.35	.71	-4.07	5.15	716.0	167	4210.83	4.29	-5.48	4.92	766.0
118	3956.31	1.19	.11	5.03	717.0	168	4215.65	1.46	-5.77	4.84	767.0
119	3961.67	3.17	1.44	5.53	718.0	169	4220.52	-.01	-2.21	4.94	768.0
120	3966.85	3.60	-2.95	4.80	719.0	170	4225.66	3.23	.33	5.36	769.0
121	3971.41	2.65	-5.22	4.54	720.0	171	4231.11	6.03	-1.71	5.51	770.0
122	3976.53	.47	-2.60	5.90	721.0	172	4236.73	3.79	-5.36	5.72	771.0
123	3982.91	3.33	1.97	6.28	722.0	173	4242.34	.98	-3.94	5.45	772.0
124	3987.97	6.06	.80	3.78	723.0	174	4247.69	1.61	-.12	5.21	773.0
125	3991.74	3.97	-4.45	4.54	724.0	175	4252.51	4.00	-.83	4.40	774.0
126	3997.34	1.74	-4.39	6.02	725.0	176	4257.01	4.58	-5.03	4.91	775.0
127	4002.83	1.01	-.74	4.89	726.0	177	4262.40	2.68	-5.99	5.67	776.0
128	4007.53	2.95	.68	4.75	727.0	178	4267.99	.58	-3.28	5.53	777.0
129	4012.52	4.34	-2.30	5.28	728.0	179	4273.42	2.33	.04	5.21	778.0
130	4018.12	3.16	-5.14	5.73	729.0	180	4278.12	4.66	-1.71	4.25	779.0
131	4023.52	1.29	-3.57	5.04	730.0	181	4282.51	4.20	-6.22	4.77	780.0
132	4028.66	2.87	1.54	5.63	731.0	182	4287.50	1.76	-6.16	4.95	781.0
133	4034.68	4.87	1.29	6.00	732.0	183	4292.56	2.71	-1.19	5.39	782.0
134	4039.94	4.66	-4.03	4.61	733.0	184	4298.52	6.62	1.47	6.30	783.0
135	4044.67	2.90	-5.19	5.23	734.0	185	4304.55	5.87	-2.74	5.55	784.0
136	4050.41	.93	-2.36	5.97	735.0	186	4309.77	3.32	-6.43	5.15	785.0
137	4056.20	2.30	.96	5.35	736.0	187	4315.28	2.70	-4.89	5.92	786.0
138	4060.93	3.93	-.77	4.03	737.0	188	4321.16	2.43	-.92	5.51	787.0
139	4065.02	3.53	-5.35	4.77	738.0	189	4325.74	4.16	-.56	3.85	788.0
140	4070.48	2.43	-5.03	5.78	739.0	190	4329.80	6.27	-4.71	4.80	789.0
141	4075.93	1.31	-1.07	5.10	740.0	191	4335.29	4.70	-6.03	5.85	790.0
142	4081.13	3.10	1.09	5.49	741.0	192	4340.99	2.55	-2.39	5.54	791.0
143	4086.46	4.83	-1.98	4.88	742.0	193	4346.42	5.58	.96	5.30	792.0
144	4091.16	3.34	-5.51	4.79	743.0	194	4351.41	6.91	-1.40	4.60	793.0
145	4096.52	1.15	-4.38	6.02	744.0	195	4355.97	5.87	-4.89	4.73	794.0
146	4102.69	1.46	.19	5.84	745.0	196	4361.03	3.07	-5.05	5.25	795.0
147	4107.53	3.91	1.06	3.95	746.0	197	4366.04	1.85	-1.13	4.60	796.0
148	4111.55	4.57	-4.12	4.50	747.0	198	4370.60	6.62	1.47	4.94	797.0
149	4116.70	2.33	-6.26	5.50	748.0	199	4376.33	8.03	-2.68	6.21	798.0
150	4122.01	.39	-2.46	5.16	749.0	200	4382.23	4.06	-5.10	5.44	799.0

ONE SECOND VELOCITY DATA

KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)	KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)
1	4387.36	2.05	-2.49	5.06	800.0	51	4643.28	2.88	-3.40	4.93	850.0
2	4392.39	4.82	.68	4.71	801.0	52	4648.39	2.13	.88	5.45	851.0
3	4396.76	6.26	-1.46	4.33	802.0	53	4654.23	5.54	4.08	5.96	852.0
4	4401.54	4.97	-5.77	5.23	803.0	54	4659.69	6.05	1.02	4.80	853.0
5	4407.07	5.14	-4.04	5.87	804.0	55	4664.33	3.38	-3.83	4.92	854.0
6	4413.29	6.02	1.33	6.30	805.0	56	4669.80	1.64	-2.10	5.80	855.0
7	4418.97	6.24	2.19	4.90	806.0	57	4675.37	1.90	1.56	5.10	856.0
8	4423.44	6.49	-2.80	4.46	807.0	58	4679.93	4.85	2.02	4.23	857.0
9	4428.28	4.98	-5.68	5.14	808.0	59	4684.64	6.39	-.94	5.53	858.0
10	4433.54	2.45	-3.52	5.43	809.0	60	4690.74	3.53	-2.81	6.22	859.0
11	4438.94	5.24	1.28	4.87	810.0	61	4696.29	1.45	-.64	4.78	860.0
12	4443.38	7.73	1.24	4.61	811.0	62	4700.76	2.73	2.42	4.36	861.0
13	4448.67	6.70	-3.55	5.86	812.0	63	4705.36	3.27	1.43	5.01	862.0
14	4454.27	4.29	-4.81	5.03	813.0	64	4710.67	3.13	-3.06	5.32	863.0
15	4459.05	2.15	-1.85	4.91	814.0	65	4715.74	2.11	-3.13	4.99	864.0
16	4464.41	4.99	1.54	5.48	815.0	66	4721.15	3.34	1.67	5.89	865.0
17	4469.50	7.21	-.21	4.76	816.0	67	4727.08	4.65	3.60	5.56	866.0
18	4474.33	6.43	-4.31	4.99	817.0	68	4731.78	2.81	.40	4.08	867.0
19	4479.58	3.41	-4.47	5.52	818.0	69	4736.06	1.31	-3.23	4.96	868.0
20	4485.24	2.41	.51	5.55	819.0	70	4741.90	.96	-2.02	6.34	869.0
21	4490.30	5.34	2.03	4.56	820.0	71	4747.58	2.70	1.54	4.58	870.0
22	4494.77	7.07	-2.54	4.71	821.0	72	4751.41	3.51	2.64	3.77	871.0
23	4499.92	5.85	-4.03	5.50	822.0	73	4756.13	3.06	-.06	5.78	872.0
24	4505.45	2.62	-1.67	5.49	823.0	74	4762.35	2.16	-2.70	6.15	873.0
25	4510.76	4.44	1.26	5.06	824.0	75	4768.01	2.37	-.08	5.10	874.0
26	4515.60	7.31	.19	4.71	825.0	76	4772.79	3.65	2.71	4.76	875.0
27	4520.32	5.72	-3.76	4.78	826.0	77	4777.81	2.50	1.89	5.23	876.0
28	4525.16	3.38	-3.55	4.93	827.0	78	4783.10	1.66	-1.70	5.22	877.0
29	4530.23	3.70	.20	5.10	828.0	79	4788.07	1.47	-3.19	4.71	878.0
30	4535.50	6.51	2.13	5.44	829.0	80	4792.65	2.02	.35	4.54	879.0
31	4540.78	6.93	-1.23	4.95	830.0	81	4797.44	4.38	3.28	5.29	880.0
32	4545.50	5.37	-4.26	4.72	831.0	82	4803.26	3.34	2.45	5.98	881.0
33	4550.45	2.47	-2.79	5.06	832.0	83	4808.80	1.04	-1.38	5.07	882.0
34	4555.49	3.02	.91	5.19	833.0	84	4813.77	1.40	-2.63	5.11	883.0
35	4561.28	7.92	2.62	6.31	834.0	85	4819.10	3.41	1.18	5.37	884.0
36	4567.30	7.50	-2.21	5.33	835.0	86	4824.11	3.07	2.58	4.71	885.0
37	4572.11	3.50	-4.93	4.70	836.0	87	4828.83	.55	-.43	4.74	886.0
38	4576.88	1.49	-1.41	4.65	837.0	88	4833.42	.32	-2.90	4.56	887.0
39	4581.39	3.70	2.27	4.60	838.0	89	4838.72	3.12	.13	6.31	888.0
40	4586.50	7.50	1.16	5.86	839.0	90	4845.46	5.73	4.30	6.44	889.0
41	4592.60	6.89	-3.06	5.85	840.0	91	4850.69	4.26	1.81	4.22	890.0
42	4598.00	2.99	-3.42	4.95	841.0	92	4855.08	2.51	-2.59	5.01	891.0
43	4602.64	2.37	.77	4.44	842.0	93	4860.57	1.22	-1.81	5.63	892.0
44	4607.20	3.97	2.40	4.71	843.0	94	4865.90	2.02	1.55	5.04	893.0
45	4611.90	4.65	-1.87	4.75	844.0	95	4870.66	4.00	3.11	4.44	894.0
46	4617.22	6.19	-2.55	6.15	845.0	96	4875.06	4.39	2.01	4.64	895.0
47	4623.83	4.86	.80	6.48	846.0	97	4880.40	4.21	-1.41	5.96	896.0
48	4629.38	2.73	2.43	4.65	847.0	98	4886.35	3.11	-.80	5.64	897.0
49	4633.80	3.89	1.18	4.47	848.0	99	4891.38	3.36	2.41	4.45	898.0
50	4638.41	4.86	-3.14	4.76	849.0	100	4895.82	2.97	2.24	4.70	899.0

ONE SECOND VELOCITY DATA

KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)	KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)
101	4900.91	2.65	-.22	5.44	900.0	151	5154.93	4.00	1.02	4.44	950.0
102	4906.59	3.96	-1.01	5.82	901.0	152	5159.23	3.58	-1.03	4.41	951.0
103	4912.12	4.90	1.86	5.12	902.0	153	5164.48	5.53	1.93	6.33	952.0
104	4917.00	4.41	3.33	4.73	903.0	154	5171.30	5.89	3.87	6.47	953.0
105	4921.88	3.28	1.15	4.96	904.0	155	5176.37	3.33	2.36	3.79	954.0
106	4926.54	3.11	-1.75	4.36	905.0	156	5180.04	1.43	.03	4.10	955.0
107	4931.17	3.87	-.18	5.38	906.0	157	5184.74	3.32	.25	5.18	956.0
108	4937.43	5.59	3.73	6.65	907.0	158	5190.41	6.17	3.56	6.22	957.0
109	4943.43	4.83	3.22	5.16	908.0	159	5196.75	5.52	3.44	5.98	958.0
110	4948.00	3.41	-1.08	4.19	909.0	160	5201.82	4.23	-.87	4.39	959.0
111	4952.01	2.15	-2.68	3.93	910.0	161	5206.18	2.49	-2.42	4.67	960.0
112	4956.40	3.25	1.36	5.15	911.0	162	5211.41	3.42	1.55	5.72	961.0
113	4962.27	6.41	4.44	6.11	912.0	163	5217.37	6.26	4.67	6.00	962.0
114	4967.77	5.48	3.57	4.82	913.0	164	5222.91	5.22	2.45	4.85	963.0
115	4972.29	2.13	.79	4.50	914.0	165	5227.23	3.43	-1.85	4.11	964.0
116	4976.97	.96	-.92	4.90	915.0	166	5231.70	2.48	-1.54	5.02	965.0
117	4982.25	4.48	1.99	5.59	916.0	167	5237.27	5.04	3.22	5.84	966.0
118	4987.84	7.23	4.54	5.46	917.0	168	5242.79	6.33	4.19	5.02	967.0
119	4993.11	5.29	1.08	5.10	918.0	169	5247.48	4.31	-.17	4.53	968.0
120	4998.06	2.77	-1.80	4.87	919.0	170	5252.13	2.54	-1.93	4.85	969.0
121	5003.07	2.59	.49	5.24	920.0	171	5257.27	3.84	1.86	5.39	970.0
122	5008.51	5.84	3.87	5.46	921.0	172	5262.88	7.53	5.30	5.64	971.0
123	5013.57	5.82	3.73	4.61	922.0	173	5268.17	5.76	2.91	4.86	972.0
124	5017.95	2.81	1.78	4.40	923.0	174	5272.90	3.03	-1.41	4.90	973.0
125	5022.69	1.76	.47	5.13	924.0	175	5278.19	3.31	-.73	5.57	974.0
126	5028.01	3.51	1.62	5.28	925.0	176	5283.49	6.16	3.45	4.87	975.0
127	5033.31	5.64	3.58	5.51	926.0	177	5288.14	5.81	4.12	4.69	976.0
128	5039.07	5.83	1.35	5.86	927.0	178	5293.15	2.68	1.72	5.26	977.0
129	5044.47	3.52	-1.27	4.74	928.0	179	5298.36	2.93	-.11	5.21	978.0
130	5048.85	1.74	.09	4.35	929.0	180	5303.83	6.53	2.11	5.73	979.0
131	5053.45	4.73	2.99	4.95	930.0	181	5309.35	7.43	4.67	5.07	980.0
132	5058.80	5.79	3.29	5.73	931.0	182	5314.03	4.43	2.88	4.61	981.0
133	5064.46	3.51	2.20	5.23	932.0	183	5319.04	3.36	-.59	5.41	982.0
134	5068.98	2.14	1.53	4.05	933.0	184	5324.23	2.62	-1.57	4.86	983.0
135	5073.36	3.32	1.95	4.96	934.0	185	5329.21	6.45	3.46	5.33	984.0
136	5078.68	4.34	2.71	5.44	935.0	186	5334.67	6.86	4.79	5.21	985.0
137	5084.10	4.05	2.77	5.39	936.0	187	5339.41	1.86	.84	4.53	986.0
138	5089.23	2.85	1.78	4.85	937.0	188	5344.26	3.17	-.76	5.11	987.0
139	5094.23	2.60	1.09	5.41	938.0	189	5349.33	5.87	1.29	4.97	988.0
140	5099.94	4.41	2.52	5.57	939.0	190	5354.57	7.68	4.99	5.54	989.0
141	5104.45	4.63	3.14	3.44	940.0	191	5359.98	6.18	3.48	4.92	990.0
142	5107.88	4.35	1.00	4.18	941.0	192	5364.61	3.84	-.76	4.63	991.0
143	5113.42	3.81	-.66	6.63	942.0	193	5369.70	3.21	-.80	5.57	992.0
144	5120.20	4.13	1.67	6.46	943.0	194	5375.46	5.24	3.01	5.71	993.0
145	5125.65	5.30	3.61	4.34	944.0	195	5380.43	7.60	5.20	4.04	994.0
146	5129.41	4.23	2.77	3.70	945.0	196	5383.88	4.95	2.64	3.55	995.0
147	5133.91	2.58	1.30	5.38	946.0	197	5388.53	2.55	-1.23	5.78	996.0
148	5139.64	3.10	.96	5.68	947.0	198	5394.66	4.02	.31	6.11	997.0
149	5145.06	4.80	2.58	5.28	948.0	199	5400.38	7.33	4.62	5.18	998.0
150	5150.23	5.02	3.46	4.97	949.0	200	5404.76	6.08	4.03	3.70	999.0

ONE SECOND VELOCITY DATA

KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)	KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)
1	5408.47	2.87	1.70	4.24	1000.0	51	5666.57	4.93	2.89	4.91	1050.0
2	5413.39	3.63	1.15	5.89	1001.0	52	5671.34	2.06	.74	4.84	1051.0
3	5419.91	6.67	3.01	6.74	1002.0	53	5676.61	3.96	5.47	5.69	1052.0
4	5425.79	6.30	4.15	4.59	1003.0	54	5682.46	6.05	9.20	5.78	1053.0
5	5429.37	5.23	2.54	3.32	1004.0	55	5687.74	4.56	4.41	4.70	1054.0
6	5433.75	6.59	.65	5.53	1005.0	56	5692.34	3.35	1.03	4.91	1055.0
7	5439.62	5.88	1.15	5.80	1006.0	57	5697.73	3.19	2.93	5.63	1056.0
8	5445.04	5.23	3.15	5.03	1007.0	58	5703.09	4.00	7.02	5.08	1057.0
9	5449.86	5.35	3.47	4.77	1008.0	59	5708.20	5.17	6.68	5.25	1058.0
10	5454.77	6.12	3.77	5.10	1009.0	60	5713.44	4.61	2.73	5.06	1059.0
11	5460.15	4.74	2.90	5.70	1010.0	61	5718.35	3.91	1.73	4.97	1060.0
12	5465.94	3.06	1.88	5.73	1011.0	62	5723.88	4.57	4.39	6.11	1061.0
13	5471.14	6.10	3.75	4.51	1012.0	63	5730.02	4.56	7.24	5.62	1062.0
14	5475.25	7.42	4.63	4.20	1013.0	64	5734.47	3.62	4.85	3.40	1063.0
15	5480.30	4.25	2.38	5.93	1014.0	65	5738.06	3.29	2.03	4.64	1064.0
16	5486.38	2.26	.79	5.74	1015.0	66	5744.26	4.08	2.18	7.20	1065.0
17	5491.39	5.51	3.17	4.48	1016.0	67	5750.75	5.70	3.82	5.16	1066.0
18	5496.18	7.47	4.57	5.34	1017.0	68	5754.95	4.93	4.93	3.99	1067.0
19	5501.63	4.71	2.55	5.25	1018.0	69	5759.70	4.24	3.95	5.62	1068.0
20	5506.51	2.54	1.55	4.60	1019.0	70	5765.77	4.57	2.51	6.12	1069.0
21	5511.44	4.43	2.94	5.40	1020.0	71	5771.48	3.26	2.02	5.16	1070.0
22	5516.94	7.06	4.30	5.29	1021.0	72	5776.26	4.02	4.34	4.70	1071.0
23	5521.78	6.12	3.76	4.52	1022.0	73	5781.27	5.93	5.47	5.37	1072.0
24	5526.29	3.77	2.24	4.66	1023.0	74	5786.63	4.85	3.14	5.09	1073.0
25	5531.29	2.89	1.28	5.33	1024.0	75	5791.56	2.76	1.57	5.00	1074.0
26	5536.93	5.60	4.55	5.81	1025.0	76	5796.67	3.52	2.16	5.07	1075.0
27	5542.68	5.96	7.19	5.44	1026.0	77	5801.56	6.43	3.98	4.76	1076.0
28	5547.64	3.84	4.13	4.56	1027.0	78	5806.37	5.88	3.63	4.93	1077.0
29	5552.18	2.12	.80	4.62	1028.0	79	5811.55	2.61	1.61	5.39	1078.0
30	5557.16	3.15	3.72	5.49	1029.0	80	5816.82	2.90	1.79	5.02	1079.0
31	5562.95	6.27	7.37	5.76	1030.0	81	5821.74	5.78	3.57	5.00	1080.0
32	5568.22	6.21	5.06	4.83	1031.0	82	5826.84	6.87	4.24	5.13	1081.0
33	5572.92	2.75	1.38	4.79	1032.0	83	5831.79	4.28	2.67	4.89	1082.0
34	5577.88	2.78	1.36	5.13	1033.0	84	5837.21	1.29	.77	6.12	1083.0
35	5583.14	6.32	4.83	5.31	1034.0	85	5843.62	4.14	2.42	6.24	1084.0
36	5588.29	5.42	5.63	4.89	1035.0	86	5849.16	8.18	5.27	4.91	1085.0
37	5593.09	3.33	2.94	4.95	1036.0	87	5853.93	6.25	3.42	4.84	1086.0
38	5598.34	4.10	2.01	5.48	1037.0	88	5859.02	3.68	-.39	5.15	1087.0
39	5604.05	4.99	4.62	5.91	1038.0	89	5863.85	3.22	-.18	4.65	1088.0
40	5609.94	4.12	6.28	5.62	1039.0	90	5868.88	6.46	3.77	5.54	1089.0
41	5614.89	4.82	4.63	4.40	1040.0	91	5874.49	7.61	4.73	5.24	1090.0
42	5619.38	4.91	2.66	4.96	1041.0	92	5878.98	4.33	2.72	3.95	1091.0
43	5625.10	3.09	1.60	6.28	1042.0	93	5883.40	2.89	1.66	5.33	1092.0
44	5631.12	3.69	4.54	5.40	1043.0	94	5889.49	4.94	3.04	6.31	1093.0
45	5635.67	6.23	7.20	4.06	1044.0	95	5895.16	6.77	4.89	4.85	1094.0
46	5640.11	6.17	4.37	5.06	1045.0	96	5899.59	5.41	4.07	4.46	1095.0
47	5645.76	3.21	1.22	6.01	1046.0	97	5904.72	3.73	2.35	5.87	1096.0
48	5651.52	2.21	2.37	5.26	1047.0	98	5911.03	4.10	2.38	6.51	1097.0
49	5656.42	4.18	6.59	4.81	1048.0	99	5917.10	6.31	4.64	5.37	1098.0
50	5661.47	6.72	7.09	5.20	1049.0	100	5921.80	6.12	5.00	4.32	1099.0

ONE SECOND VELOCITY DATA

KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)	KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)
101	5926.31	4.67	3.22	4.96	1100.0	151	6193.18	7.98	2.26	4.18	1150.0
102	5931.80	3.92	2.30	5.82	1101.0	152	6197.69	4.84	-.51	5.02	1151.0
103	5937.36	4.55	2.79	5.13	1102.0	153	6203.07	4.01	1.71	5.66	1152.0
104	5942.27	7.02	4.34	4.94	1103.0	154	6208.94	7.67	5.13	5.95	1153.0
105	5947.47	6.43	4.00	5.23	1104.0	155	6214.25	7.75	4.84	4.44	1154.0
106	5952.37	3.80	2.34	4.54	1105.0	156	6218.30	5.25	1.62	4.23	1155.0
107	5957.16	3.19	1.97	5.36	1106.0	157	6223.51	4.21	.03	6.25	1156.0
108	5963.06	6.67	4.12	6.13	1107.0	158	6230.18	7.48	4.04	6.65	1157.0
109	5968.74	8.94	5.52	5.08	1108.0	159	6236.14	7.32	5.10	5.11	1158.0
110	5973.56	5.29	3.27	4.87	1109.0	160	6240.60	5.68	1.95	4.15	1159.0
111	5978.88	2.17	1.34	5.81	1110.0	161	6245.09	6.57	.23	5.03	1160.0
112	5984.98	5.17	3.20	6.13	1111.0	162	6250.74	5.44	1.46	6.24	1161.0
113	5990.72	8.50	5.25	5.32	1112.0	163	6257.08	5.50	3.99	5.97	1162.0
114	5995.89	5.98	3.74	5.07	1113.0	164	6262.25	6.96	4.15	4.45	1163.0
115	6000.84	3.05	1.88	4.90	1114.0	165	6266.61	7.32	1.11	4.75	1164.0
116	6006.05	4.76	2.59	5.78	1115.0	166	6272.14	5.52	-.68	6.08	1165.0
117	6012.24	7.39	4.40	6.20	1116.0	167	6278.18	5.65	2.69	5.68	1166.0
118	6017.83	6.93	3.75	5.03	1117.0	168	6283.46	7.22	5.15	5.12	1167.0
119	6022.93	6.79	.95	5.32	1118.0	169	6288.89	6.45	1.42	5.79	1168.0
120	6028.22	5.70	.17	5.26	1119.0	170	6294.63	4.74	-1.27	5.46	1169.0
121	6033.61	4.40	2.12	5.51	1120.0	171	6299.86	4.74	1.83	5.09	1170.0
122	6038.88	7.24	4.71	4.88	1121.0	172	6304.92	7.41	4.97	5.15	1171.0
123	6043.88	7.62	5.18	5.50	1122.0	173	6310.11	6.57	4.16	5.14	1172.0
124	6049.85	5.30	2.29	6.08	1123.0	174	6315.24	3.71	1.47	5.21	1173.0
125	6055.38	4.34	-.45	5.06	1124.0	175	6320.75	3.52	.12	5.82	1174.0
126	6060.51	6.58	2.79	5.46	1125.0	176	6326.69	6.89	3.43	5.94	1175.0
127	6066.22	8.42	5.95	5.69	1126.0	177	6332.46	8.22	4.94	5.39	1176.0
128	6071.22	6.18	2.97	4.25	1127.0	178	6337.08	5.60	-.01	3.93	1177.0
129	6075.41	5.06	-.27	4.79	1128.0	179	6341.19	4.32	-1.52	5.02	1178.0
130	6081.48	7.63	2.15	6.97	1129.0	180	6347.68	5.35	2.21	7.43	1179.0
131	6087.90	8.08	5.07	5.29	1130.0	181	6354.55	6.84	4.67	5.68	1180.0
132	6092.20	5.79	3.92	3.95	1131.0	182	6359.03	5.42	3.40	3.92	1181.0
133	6096.92	6.99	1.48	5.60	1132.0	183	6363.54	5.87	.23	5.27	1182.0
134	6102.74	6.80	.56	5.65	1133.0	184	6369.24	5.93	-.46	5.83	1183.0
135	6108.13	5.11	2.59	5.56	1134.0	185	6374.96	5.05	2.54	5.55	1184.0
136	6114.09	7.26	4.95	6.03	1135.0	186	6380.23	5.14	3.92	5.11	1185.0
137	6119.56	7.73	4.74	4.70	1136.0	187	6385.49	6.59	1.84	5.52	1186.0
138	6123.94	4.52	.95	4.41	1137.0	188	6391.28	6.44	-1.08	5.88	1187.0
139	6128.32	4.31	.70	5.37	1138.0	189	6397.07	4.26	.38	5.65	1188.0
140	6134.59	7.94	4.91	5.95	1139.0	190	6402.31	4.98	3.62	4.66	1189.0
141	6140.40	3.42	4.21	5.63	1140.0	191	6406.59	5.69	4.00	4.38	1190.0
142	6145.82	5.23	-.41	5.17	1141.0	192	6411.83	5.73	1.06	6.09	1191.0
143	6150.80	4.07	-.25	4.96	1142.0	193	6418.09	4.79	-1.51	5.99	1192.0
144	6156.27	7.31	4.08	6.09	1143.0	194	6423.35	3.96	.95	4.65	1193.0
145	6162.39	7.54	5.06	5.42	1144.0	195	6427.82	4.99	4.17	4.58	1194.0
146	6166.45	5.28	3.71	3.26	1145.0	196	6432.96	7.07	3.30	5.72	1195.0
147	6170.62	5.13	1.90	5.52	1146.0	197	6439.03	5.91	-1.28	6.23	1196.0
148	6177.01	5.67	1.37	6.67	1147.0	198	6445.07	3.19	-1.07	5.73	1197.0
149	6183.21	6.27	3.58	5.76	1148.0	199	6450.25	4.40	2.99	4.62	1198.0
150	6188.66	6.96	4.44	5.07	1149.0	200	6454.66	6.17	4.06	4.42	1199.0

ONE SECOND VELOCITY DATA

KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)	KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)
1	6459.51	5.94	1.08	5.41	1200.0	51	6724.71	5.83	3.42	3.45	1250.0
2	6465.28	4.72	-.82	5.85	1201.0	52	6729.13	7.35	3.38	5.75	1251.0
3	6470.88	4.23	1.35	5.33	1202.0	53	6735.54	7.24	3.38	6.35	1252.0
4	6476.14	6.30	4.33	5.26	1203.0	54	6740.90	7.34	4.65	4.44	1253.0
5	6481.48	6.85	3.96	5.33	1204.0	55	6745.22	8.38	5.03	4.61	1254.0
6	6486.50	4.77	-.18	4.67	1205.0	56	6750.39	5.90	1.54	5.63	1255.0
7	6491.25	3.38	-.49	5.17	1206.0	57	6756.13	5.53	1.42	5.69	1256.0
8	6497.04	5.73	3.50	6.05	1207.0	58	6761.57	8.67	5.23	5.12	1257.0
9	6502.59	6.95	4.75	5.01	1208.0	59	6766.31	8.07	5.25	4.44	1258.0
10	6507.71	4.86	1.28	5.49	1209.0	60	6770.84	5.93	3.13	4.85	1259.0
11	6513.44	3.25	-1.24	5.74	1210.0	61	6776.19	6.92	2.82	5.83	1260.0
12	6519.16	5.54	2.36	5.75	1211.0	62	6782.03	7.27	3.93	5.66	1261.0
13	6524.52	7.86	5.20	4.61	1212.0	63	6787.55	7.18	4.84	5.62	1262.0
14	6528.30	5.53	3.64	3.56	1213.0	64	6793.21	9.77	3.57	5.37	1263.0
15	6532.88	4.32	1.08	5.74	1214.0	65	6797.89	8.00	.46	4.18	1264.0
16	6539.21	5.19	.31	6.51	1215.0	66	6802.63	6.15	2.33	5.71	1265.0
17	6545.38	6.61	3.09	5.71	1216.0	67	6809.05	8.89	5.87	6.56	1266.0
18	6550.55	5.86	4.06	4.70	1217.0	68	6814.70	7.81	5.12	4.52	1267.0
19	6555.22	5.78	3.34	4.95	1218.0	69	6818.71	5.29	2.54	4.16	1268.0
20	6560.87	6.61	2.19	6.17	1219.0	70	6824.00	8.38	2.59	6.39	1269.0
21	6566.71	5.48	1.93	5.11	1220.0	71	6830.18	8.68	4.09	5.18	1270.0
22	6571.63	4.88	3.05	5.64	1221.0	72	6834.17	7.48	4.63	3.44	1271.0
23	6579.02	6.07	3.81	8.67	1222.0	73	6838.54	9.15	2.54	5.46	1272.0
24	6586.58	6.43	3.89	5.33	1223.0	74	6844.32	6.66	.32	5.64	1273.0
25	6599.45	4.94	2.97	1.31	1224.0	75	6849.64	6.30	3.03	5.26	1274.0
26	6591.50	6.20	3.76	3.69	1225.0	76	6855.17	9.66	6.09	5.73	1275.0
27	6596.94	8.63	5.24	6.72	1226.0	77	6860.68	7.73	5.06	5.10	1276.0
28	6603.46	6.20	3.77	5.61	1227.0	78	6865.44	5.89	2.16	4.68	1277.0
29	6608.36	3.13	1.91	4.95	1228.0	79	6870.56	7.38	.91	5.77	1278.0
30	6614.49	5.71	3.25	7.10	1229.0	80	6876.74	7.24	2.89	6.20	1279.0
31	6621.03	7.73	5.22	5.26	1230.0	81	6882.24	7.97	5.33	4.60	1280.0
32	6624.79	6.48	5.84	2.92	1231.0	82	6886.26	9.36	3.98	3.83	1281.0
33	6628.52	5.63	4.81	5.07	1232.0	83	6890.38	5.98	.47	4.55	1282.0
34	6634.63	4.83	2.30	6.55	1233.0	84	6895.64	5.68	1.99	6.61	1283.0
35	6640.65	5.29	3.72	5.33	1234.0	85	6901.99	9.38	5.99	6.13	1284.0
36	6645.73	8.41	6.33	5.15	1235.0	86	6907.21	8.91	3.57	4.32	1285.0
37	6651.10	7.40	5.05	5.36	1236.0	87	6911.25	5.44	-1.03	4.25	1286.0
38	6656.07	3.72	2.13	4.67	1237.0	88	6916.35	6.15	1.01	5.97	1287.0
39	6661.13	5.29	3.15	5.69	1238.0	89	6922.58	8.67	5.04	5.38	1288.0
40	6667.15	8.97	5.50	6.00	1239.0	90	6927.68	7.60	5.27	4.29	1289.0
41	6672.73	7.21	4.70	5.22	1240.0	91	6931.85	7.38	3.73	4.46	1290.0
42	6677.80	6.65	2.91	4.91	1241.0	92	6936.73	6.97	-.02	5.11	1291.0
43	6682.52	6.78	1.43	4.70	1242.0	93	6941.78	5.92	.40	4.97	1292.0
44	6687.68	6.25	2.84	5.71	1243.0	94	6946.83	7.59	4.81	5.11	1293.0
45	6693.47	7.86	5.09	5.53	1244.0	95	6951.95	8.14	5.63	5.15	1294.0
46	6698.73	8.84	5.43	5.10	1245.0	96	6957.11	6.15	2.14	5.10	1295.0
47	6703.77	5.14	2.99	4.94	1246.0	97	6962.21	5.73	-.49	5.26	1296.0
48	6708.77	4.07	2.34	5.29	1247.0	98	6967.78	8.03	3.10	5.80	1297.0
49	6714.77	8.93	5.41	6.49	1248.0	99	6973.40	7.71	5.25	5.22	1298.0
50	6720.79	8.21	5.02	4.98	1249.0	100	6978.17	6.50	3.91	4.55	1299.0

ONE SECOND VELOCITY DATA

KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)	KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)
101	6983.20	7.90	1.98	5.68	1300.0	151	7234.54	4.82	2.89	3.01	1350.0
102	6989.10	6.43	.66	5.68	1301.0	152	7238.59	7.42	4.45	5.63	1351.0
103	6994.18	6.21	3.32	4.52	1302.0	153	7245.10	9.42	5.66	6.41	1352.0
104	6998.63	8.16	5.51	4.58	1303.0	154	7250.14	7.31	4.39	3.76	1353.0
105	7003.52	6.47	3.04	5.18	1304.0	155	7253.90	7.34	4.41	4.35	1354.0
106	7008.84	5.15	.15	5.47	1305.0	156	7259.09	7.17	4.30	5.72	1355.0
107	7014.48	7.38	2.78	5.69	1306.0	157	7264.86	6.79	4.08	5.76	1356.0
108	7019.93	7.94	5.21	5.08	1307.0	158	7270.54	9.20	5.52	5.53	1357.0
109	7024.38	6.62	3.82	3.89	1308.0	159	7275.62	8.55	5.12	4.47	1358.0
110	7028.33	6.71	1.50	4.47	1309.0	160	7279.60	5.59	3.28	3.88	1359.0
111	7033.64	6.75	1.41	5.91	1310.0	161	7284.19	6.50	3.93	5.54	1360.0
112	7039.37	6.47	3.86	5.27	1311.0	162	7290.12	7.67	5.70	5.79	1361.0
113	7044.23	7.21	4.39	4.74	1312.0	163	7295.28	7.77	6.06	4.64	1362.0
114	7049.30	8.95	2.00	5.38	1313.0	164	7299.85	8.64	5.39	4.56	1363.0
115	7054.73	6.48	-.09	5.36	1314.0	165	7304.23	6.73	3.82	4.24	1364.0
116	7060.06	5.18	2.24	5.41	1315.0	166	7308.82	7.40	4.65	5.21	1365.0
117	7065.52	7.86	5.38	5.34	1316.0	167	7314.56	9.38	6.34	5.84	1366.0
118	7070.36	7.79	4.64	4.25	1317.0	168	7319.61	7.46	4.97	4.12	1367.0
119	7074.16	6.06	.32	3.69	1318.0	169	7323.37	6.27	3.51	3.95	1368.0
120	7078.51	5.93	.07	5.23	1319.0	170	7328.21	7.22	4.14	5.65	1369.0
121	7084.33	7.93	4.81	6.00	1320.0	171	7334.12	8.27	6.55	5.85	1370.0
122	7089.80	8.05	5.09	4.87	1321.0	172	7339.62	9.25	7.50	5.09	1371.0
123	7094.50	7.69	1.14	4.86	1322.0	173	7343.99	7.52	4.76	3.68	1372.0
124	7099.80	6.66	-.24	5.70	1323.0	174	7347.80	4.82	2.56	4.60	1373.0
125	7105.76	5.00	2.03	6.07	1324.0	175	7353.77	7.92	5.41	7.04	1374.0
126	7111.45	6.98	4.90	5.07	1325.0	176	7360.36	9.35	7.54	5.55	1375.0
127	7115.86	8.78	4.37	3.91	1326.0	177	7364.76	8.00	5.86	3.55	1376.0
128	7119.77	6.66	.30	4.25	1327.0	178	7368.37	6.72	3.68	4.04	1377.0
129	7124.74	4.14	-.42	5.74	1328.0	179	7373.31	5.44	3.62	5.88	1378.0
130	7130.90	7.69	4.77	6.19	1329.0	180	7379.65	8.51	7.65	6.39	1379.0
131	7136.62	9.33	5.87	5.11	1330.0	181	7385.35	9.05	7.70	4.77	1380.0
132	7140.95	5.42	2.18	3.55	1331.0	182	7389.37	6.24	3.79	3.51	1381.0
133	7144.47	5.60	.58	4.12	1332.0	183	7393.11	6.29	3.50	4.43	1382.0
134	7150.01	8.54	3.46	6.65	1333.0	184	7398.46	7.29	6.43	5.90	1383.0
135	7156.15	7.76	4.86	4.96	1334.0	185	7403.98	7.05	7.79	4.87	1384.0
136	7160.03	5.90	3.65	3.42	1335.0	186	7408.38	8.31	6.32	4.35	1385.0
137	7164.93	5.29	2.36	4.83	1336.0	187	7413.21	6.62	3.53	5.25	1386.0
138	7169.74	6.12	2.42	6.36	1337.0	188	7418.52	5.79	3.42	5.30	1387.0
139	7175.87	7.42	4.13	5.41	1338.0	189	7423.85	8.95	7.41	5.31	1388.0
140	7180.36	8.08	5.05	3.94	1339.0	190	7428.71	7.05	6.59	4.36	1389.0
141	7184.76	6.09	3.62	5.04	1340.0	191	7433.11	5.88	3.85	4.82	1390.0
142	7190.07	4.26	2.23	5.30	1341.0	192	7438.83	6.59	3.67	6.47	1391.0
143	7195.13	7.72	4.41	4.89	1342.0	193	7445.13	5.10	5.05	5.80	1392.0
144	7200.10	8.59	5.20	5.17	1343.0	194	7450.36	6.60	8.51	4.84	1393.0
145	7205.41	5.36	3.23	5.20	1344.0	195	7454.85	8.38	7.39	3.98	1394.0
146	7210.09	5.89	3.54	4.33	1345.0	196	7458.36	5.38	2.87	3.39	1395.0
147	7214.87	7.28	4.37	5.52	1346.0	197	7462.69	5.91	3.29	5.69	1396.0
148	7220.87	7.02	4.22	5.99	1347.0	198	7469.17	8.21	7.04	6.47	1397.0
149	7226.38	8.12	4.88	5.10	1348.0	199	7474.48	6.22	7.69	4.05	1398.0
150	7231.11	7.08	4.25	4.20	1349.0	200	7478.07	5.49	4.90	3.66	1399.0

ONE   SECOND   VELOCITY   DATA

KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)	KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)
1	7482.59	6.05	3.18	5.37	1400.0	51	7731.50	6.54	4.22	6.02	1450.0
2	7488.15	5.82	4.69	5.40	1401.0	52	7736.56	6.34	4.55	3.99	1451.0
3	7493.31	7.09	7.41	5.12	1402.0	53	7739.99	6.98	4.71	3.46	1452.0
4	7498.65	8.11	6.56	5.41	1403.0	54	7744.33	5.46	3.29	5.16	1453.0
5	7503.69	5.22	2.79	4.61	1404.0	55	7749.59	4.23	2.50	5.12	1454.0
6	7508.35	4.81	4.22	5.11	1405.0	56	7754.71	8.23	5.11	5.31	1455.0
7	7513.85	6.78	8.72	5.46	1406.0	57	7760.19	8.48	5.34	5.47	1456.0
8	7518.57	6.29	7.41	3.89	1407.0	58	7765.18	3.82	2.34	4.45	1457.0
9	7522.27	6.71	4.38	4.18	1408.0	59	7769.79	4.43	2.67	5.20	1458.0
10	7527.69	6.76	3.56	6.45	1409.0	60	7775.62	9.24	5.62	6.11	1459.0
11	7534.16	5.06	5.34	5.97	1410.0	61	7780.96	6.90	4.19	4.16	1460.0
12	7539.36	5.97	8.10	4.67	1411.0	62	7784.31	4.52	2.74	3.34	1461.0
13	7543.82	7.63	6.62	4.24	1412.0	63	7789.04	6.58	4.00	6.29	1462.0
14	7547.73	5.50	2.92	3.71	1413.0	64	7795.90	6.21	3.80	6.72	1463.0
15	7551.91	5.76	4.29	4.90	1414.0	65	7801.65	7.14	4.43	4.83	1464.0
16	7557.42	8.13	8.18	5.91	1415.0	66	7806.17	8.35	5.12	4.39	1465.0
17	7563.30	5.85	5.80	5.72	1416.0	67	7810.58	5.42	1.71	4.59	1466.0
18	7568.75	5.21	2.90	5.09	1417.0	68	7815.85	4.53	-.01	6.07	1467.0
19	7573.57	6.32	4.76	4.67	1418.0	69	7822.30	8.49	4.29	6.24	1468.0
20	7578.48	5.45	7.54	5.36	1419.0	70	7827.40	8.34	5.57	3.81	1469.0
21	7584.47	6.87	7.51	6.43	1420.0	71	7830.38	4.89	2.58	2.70	1470.0
22	7590.47	7.05	4.49	4.97	1421.0	72	7834.07	4.80	1.53	5.19	1471.0
23	7593.92	4.62	2.38	2.43	1422.0	73	7840.68	7.21	3.73	7.40	1472.0
24	7597.01	6.31	6.44	4.51	1423.0	74	7847.19	7.10	4.52	4.98	1473.0
25	7602.95	7.25	9.01	6.73	1424.0	75	7850.70	5.55	3.45	2.75	1474.0
26	7608.93	5.06	4.64	4.70	1425.0	76	7854.23	6.78	3.32	4.70	1475.0
27	7612.57	4.94	2.29	3.21	1426.0	77	7859.79	7.08	3.20	5.86	1476.0
28	7616.67	7.08	4.71	5.24	1427.0	78	7865.17	5.36	3.07	4.99	1477.0
29	7622.37	6.67	7.25	5.39	1428.0	79	7870.42	6.71	4.29	5.68	1478.0
30	7627.01	5.53	6.82	4.47	1429.0	80	7875.98	6.67	3.89	5.02	1479.0
31	7632.36	7.11	5.17	6.13	1430.0	81	7880.33	4.62	2.04	4.01	1480.0
32	7638.05	4.95	2.73	4.79	1431.0	82	7884.72	6.95	3.70	4.91	1481.0
33	7642.53	4.77	3.96	4.95	1432.0	83	7889.79	8.51	5.33	4.92	1482.0
34	7648.44	8.37	8.49	6.34	1433.0	84	7894.31	5.85	3.44	4.14	1483.0
35	7653.54	7.07	7.02	3.67	1434.0	85	7898.59	3.52	.61	4.88	1484.0
36	7656.37	4.22	2.67	2.60	1435.0	86	7904.47	6.97	2.78	6.59	1485.0
37	7660.32	5.81	3.41	5.58	1436.0	87	7910.55	8.60	5.20	4.93	1486.0
38	7666.53	7.35	6.54	5.86	1437.0	88	7914.23	6.09	3.94	2.95	1487.0
39	7671.19	5.53	6.67	3.93	1438.0	89	7917.86	6.78	3.52	4.76	1488.0
40	7675.77	5.97	4.76	5.52	1439.0	90	7923.70	5.84	2.16	6.48	1489.0
41	7681.63	5.74	3.08	5.57	1440.0	91	7929.70	4.84	2.27	5.28	1490.0
42	7686.52	5.37	4.22	4.48	1441.0	92	7934.50	7.93	5.08	4.57	1491.0
43	7691.23	8.86	7.11	4.93	1442.0	93	7938.87	8.81	5.18	4.23	1492.0
44	7696.09	7.92	5.56	4.73	1443.0	94	7943.28	5.05	1.39	4.72	1493.0
45	7700.71	3.77	2.16	4.73	1444.0	95	7948.46	4.12	1.16	5.59	1494.0
46	7706.11	5.92	3.70	6.23	1445.0	96	7954.15	8.52	5.12	5.55	1495.0
47	7712.56	8.43	7.01	6.07	1446.0	97	7959.34	8.51	5.26	4.63	1496.0
48	7717.37	5.94	5.48	3.56	1447.0	98	7963.30	4.80	2.54	3.84	1497.0
49	7720.64	4.21	2.65	3.67	1448.0	99	7967.82	5.70	1.77	5.28	1498.0
50	7725.38	5.34	3.05	5.71	1449.0	100	7973.86	7.19	3.00	6.58	1499.0

ONE SECOND VELOCITY DATA

KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)	KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)
101	7980.33	6.68	4.19	5.93	1500.0	151	8229.19	10.19	5.66	5.51	1550.0
102	7985.15	7.31	4.08	3.74	1501.0	152	8233.79	9.56	.98	3.59	1551.0
103	7988.50	6.55	1.68	3.46	1502.0	153	8236.70	8.46	-2.72	2.83	1552.0
104	7992.64	4.57	.98	4.85	1503.0	154	8240.70	9.67	-.30	5.38	1553.0
105	7998.17	7.24	4.39	6.15	1504.0	155	8246.93	8.33	3.35	6.59	1554.0
106	8004.37	8.96	5.60	5.83	1505.0	156	8253.30	8.49	1.98	6.08	1555.0
107	8009.01	5.18	3.18	3.32	1506.0	157	8258.96	11.69	-.88	5.01	1556.0
108	8012.14	2.94	1.49	3.93	1507.0	158	8263.01	9.11	-1.47	3.46	1557.0
109	8017.88	6.85	3.75	7.17	1508.0	159	8267.06	7.09	1.88	5.10	1558.0
110	8024.66	8.68	5.50	5.40	1509.0	160	8272.94	9.63	4.05	6.06	1559.0
111	8028.20	5.47	3.24	2.20	1510.0	161	8278.12	10.72	.45	4.32	1560.0
112	8030.82	5.14	1.34	3.91	1511.0	162	8282.41	10.77	-2.26	4.76	1561.0
113	8036.56	6.78	2.59	7.18	1512.0	163	8287.78	8.74	.71	5.72	1562.0
114	8043.40	6.76	4.01	5.64	1513.0	164	8293.34	7.01	3.58	5.31	1563.0
115	8047.63	6.69	4.18	3.50	1514.0	165	8298.58	9.38	3.39	5.33	1564.0
116	8051.76	5.77	3.53	5.01	1515.0	166	8303.83	12.38	-.11	4.84	1565.0
117	8057.05	4.28	2.46	5.12	1516.0	167	8307.94	9.94	-1.80	3.58	1566.0
118	8061.95	5.39	3.17	4.97	1517.0	168	8312.02	8.11	3.17	5.13	1567.0
119	8067.59	6.78	4.41	6.31	1518.0	169	8318.27	9.55	5.56	6.74	1568.0
120	8073.68	7.54	3.51	5.21	1519.0	170	8324.29	10.57	1.30	5.09	1569.0
121	8077.44	5.27	-.12	2.75	1520.0	171	8328.78	11.73	-.63	4.09	1570.0
122	8080.98	5.88	1.35	5.11	1521.0	172	8332.53	7.82	.63	3.50	1571.0
123	8087.43	8.39	5.04	6.95	1522.0	173	8336.67	7.38	4.07	5.33	1572.0
124	8093.26	6.92	4.59	4.31	1523.0	174	8343.23	10.99	4.94	7.08	1573.0
125	8096.41	4.99	2.00	2.70	1524.0	175	8349.26	9.83	-.34	4.55	1574.0
126	8100.33	5.55	.73	5.73	1525.0	176	8353.01	9.17	-2.05	3.68	1575.0
127	8107.47	8.15	3.40	7.56	1526.0	177	8357.68	9.57	2.44	5.65	1576.0
128	8113.38	7.16	4.07	3.96	1527.0	178	8363.53	8.91	5.25	5.65	1577.0
129	8116.40	7.46	2.23	2.82	1528.0	179	8368.82	11.06	3.52	4.99	1578.0
130	8119.86	8.90	.61	4.26	1529.0	180	8373.49	10.68	-.82	4.29	1579.0
131	8125.06	7.19	1.22	6.12	1530.0	181	8377.83	7.52	-.98	5.01	1580.0
132	8131.58	7.96	4.25	6.48	1531.0	182	8384.04	9.68	5.20	6.96	1581.0
133	8137.53	8.37	5.23	5.34	1532.0	183	8390.20	10.17	4.42	4.97	1582.0
134	8142.21	5.39	1.02	3.93	1533.0	184	8394.60	11.79	.29	4.39	1583.0
135	8145.77	6.52	-.88	3.90	1534.0	185	8399.12	10.47	.98	4.24	1584.0
136	8151.07	10.01	3.38	6.56	1535.0	186	8402.84	6.92	3.38	3.63	1585.0
137	8157.39	7.95	4.70	5.18	1536.0	187	8407.41	11.05	5.79	5.59	1586.0
138	8161.19	6.96	2.26	3.15	1537.0	188	8412.93	11.85	2.58	4.89	1587.0
139	8165.27	8.74	-.33	5.36	1538.0	189	8417.11	10.78	-.39	4.02	1588.0
140	8171.37	7.97	.02	6.20	1539.0	190	8422.11	10.06	1.75	6.14	1589.0
141	8176.89	8.24	3.37	4.70	1540.0	191	8428.73	7.87	4.18	6.62	1590.0
142	8181.35	9.32	4.30	4.54	1541.0	192	8434.89	10.60	5.35	5.74	1591.0
143	8186.11	7.85	-.01	4.87	1542.0	193	8440.11	11.73	1.79	4.57	1592.0
144	8191.27	7.25	-2.74	5.77	1543.0	194	8444.02	9.76	-.34	3.49	1593.0
145	8197.84	11.09	2.73	6.97	1544.0	195	8447.85	10.09	3.78	4.41	1594.0
146	8203.81	9.65	5.19	4.47	1545.0	196	8452.68	10.11	6.10	5.06	1595.0
147	8207.04	6.94	1.74	2.68	1546.0	197	8457.73	11.56	3.29	4.99	1596.0
148	8210.38	8.91	-1.40	4.43	1547.0	198	8462.25	10.47	-.35	3.81	1597.0
149	8216.02	8.82	-1.75	6.63	1548.0	199	8465.75	8.56	1.86	3.76	1598.0
150	8222.95	8.62	3.11	6.84	1549.0	200	8470.56	10.82	6.67	5.70	1599.0

ONE SECOND VELOCITY DATA

KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)	KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)
1	8476.13	10.43	4.17	5.12	1600.0	51	8727.50	12.97	4.70	4.81	1650.0
2	8480.96	11.80	-.18	4.95	1601.0	52	8731.82	12.51	1.79	4.02	1651.0
3	8486.26	10.44	-.15	5.47	1602.0	53	8736.15	11.82	3.74	4.99	1652.0
4	8491.77	8.39	3.81	5.71	1603.0	54	8741.87	12.10	7.31	6.16	1653.0
5	8497.70	11.22	6.09	5.86	1604.0	55	8747.79	11.16	6.86	5.46	1654.0
6	8502.98	11.47	1.67	4.56	1605.0	56	8752.81	11.79	2.93	4.50	1655.0
7	8507.18	10.72	-.30	4.09	1606.0	57	8756.79	11.56	1.51	3.78	1656.0
8	8511.34	8.85	2.14	4.24	1607.0	58	8761.29	12.22	6.22	5.41	1657.0
9	8516.04	9.86	5.70	5.42	1608.0	59	8767.03	11.22	7.27	5.60	1658.0
10	8522.16	12.98	4.38	6.38	1609.0	60	8772.23	11.66	4.06	4.92	1659.0
11	8527.79	11.28	-.29	4.70	1610.0	61	8776.93	11.63	1.24	4.53	1660.0
12	8532.07	10.24	1.27	4.33	1611.0	62	8781.56	11.24	3.64	4.99	1661.0
13	8536.94	10.02	4.16	5.38	1612.0	63	8787.05	12.01	7.25	5.81	1662.0
14	8542.69	11.19	6.03	6.09	1613.0	64	8792.83	12.33	6.92	5.63	1663.0
15	8549.61	12.60	3.63	5.45	1614.0	65	8797.95	11.79	2.62	4.44	1664.0
16	8553.22	11.22	-.58	4.04	1615.0	66	8802.06	11.27	1.78	4.27	1665.0
17	8557.51	11.18	2.89	4.83	1616.0	67	8807.05	11.72	5.88	5.53	1666.0
18	8562.78	10.25	6.49	5.39	1617.0	68	8812.36	11.12	6.37	5.01	1667.0
19	8568.00	10.35	4.75	4.97	1618.0	69	8817.21	12.49	3.65	4.70	1668.0
20	8572.35	9.48	.96	3.71	1619.0	70	8821.58	11.26	.93	4.10	1669.0
21	8575.95	9.66	1.72	3.94	1620.0	71	8825.99	11.11	3.81	4.97	1670.0
22	8580.86	11.68	5.70	5.87	1621.0	72	8831.44	11.32	6.86	5.73	1671.0
23	8587.20	12.81	5.95	6.49	1622.0	73	8837.32	12.68	5.39	5.83	1672.0
24	8593.23	12.57	2.99	5.21	1623.0	74	8842.75	12.16	1.10	4.77	1673.0
25	8597.51	10.27	-.43	3.71	1624.0	75	8847.24	10.84	2.68	4.69	1674.0
26	8601.76	11.19	3.92	5.01	1625.0	76	8852.48	11.07	6.77	5.62	1675.0
27	8607.21	10.91	7.10	5.62	1626.0	77	8857.91	12.20	6.11	5.22	1676.0
28	8612.97	11.92	6.84	5.93	1627.0	78	8862.82	13.40	2.37	4.58	1677.0
29	8618.61	12.05	2.34	4.99	1628.0	79	8867.13	11.78	1.19	4.22	1678.0
30	8622.87	10.30	.78	4.00	1629.0	80	8871.74	11.20	5.40	5.12	1679.0
31	8527.64	11.57	6.23	5.69	1630.0	81	8877.08	12.04	7.62	5.42	1680.0
32	8633.80	12.96	6.95	6.36	1631.0	82	8882.39	13.61	4.37	5.04	1681.0
33	8639.85	13.08	3.50	5.44	1632.0	83	8887.04	12.26	1.35	4.29	1682.0
34	8644.43	9.80	.66	3.80	1633.0	84	8891.21	10.36	3.80	4.34	1683.0
35	8648.09	8.28	3.57	3.85	1634.0	85	8896.33	12.14	7.65	6.07	1684.0
36	8652.51	9.85	6.38	5.05	1635.0	86	8902.85	13.30	7.42	6.38	1685.0
37	8658.08	11.74	6.59	5.83	1636.0	87	8908.37	12.63	2.63	4.61	1686.0
38	8663.49	11.36	2.56	4.79	1637.0	88	8912.59	11.80	1.87	4.20	1687.0
39	8668.12	11.90	1.97	4.86	1638.0	89	8917.27	11.27	5.55	5.22	1688.0
40	8673.62	12.64	6.05	6.05	1639.0	90	8922.82	12.17	7.53	5.39	1689.0
41	8679.83	11.87	7.40	6.19	1640.0	91	8927.21	11.66	3.91	3.38	1690.0
42	8685.61	12.12	3.96	5.18	1641.0	92	8930.61	12.75	.99	3.94	1691.0
43	8689.85	13.14	1.85	3.36	1642.0	93	8935.32	11.78	3.81	5.30	1692.0
44	8692.75	12.23	4.99	2.86	1643.0	94	8940.95	11.38	7.22	5.90	1693.0
45	8696.35	11.89	7.73	4.60	1644.0	95	8946.95	12.69	6.02	6.04	1694.0
46	8701.57	11.78	7.22	5.36	1645.0	96	8952.87	13.76	2.71	5.72	1695.0
47	8706.54	11.37	3.49	4.66	1646.0	97	8958.16	11.45	1.82	4.83	1696.0
48	8711.26	11.77	2.22	4.89	1647.0	98	8962.85	10.27	5.27	4.71	1697.0
49	8716.45	11.39	5.56	5.49	1648.0	99	8967.33	11.94	7.49	4.14	1698.0
50	8722.16	12.08	7.38	5.76	1649.0	100	8971.31	13.79	4.26	4.19	1699.0

ONE SECOND VELOCITY DATA

KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)	KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)
101	8975.87	12.75	1.42	4.72	1700.0	151	9225.53	12.96	5.97	6.06	1750.0
102	8980.53	10.55	4.47	4.74	1701.0	152	9231.37	13.82	8.29	5.35	1751.0
103	8985.69	11.70	7.27	5.65	1702.0	153	9235.79	12.52	7.20	3.60	1752.0
104	8991.55	14.17	4.81	5.91	1703.0	154	9239.24	11.89	4.74	3.75	1753.0
105	8997.11	13.23	2.05	4.90	1704.0	155	9243.69	12.32	4.93	5.16	1754.0
106	9001.43	9.88	3.51	4.03	1705.0	156	9249.42	13.05	7.56	6.13	1755.0
107	9005.76	11.10	6.61	4.72	1706.0	157	9255.53	13.61	7.25	5.87	1756.0
108	9010.64	13.35	5.57	4.92	1707.0	158	9260.86	12.55	4.14	4.74	1757.0
109	9015.60	14.20	2.66	4.87	1708.0	159	9265.28	11.26	3.90	4.30	1758.0
110	9020.18	11.18	2.01	4.33	1709.0	160	9269.79	11.86	6.55	4.81	1759.0
111	9024.74	10.25	5.16	5.07	1710.0	161	9274.78	13.05	7.92	5.14	1760.0
112	9030.46	12.44	7.57	6.19	1711.0	162	9279.95	13.64	6.53	5.14	1761.0
113	9036.70	13.99	4.49	5.91	1712.0	163	9284.94	12.64	3.38	4.85	1762.0
114	9041.71	11.77	.44	4.14	1713.0	164	9289.89	12.17	4.22	5.18	1763.0
115	9045.74	10.89	3.67	4.35	1714.0	165	9295.30	12.87	7.28	5.57	1764.0
116	9050.89	11.82	7.48	5.80	1715.0	166	9300.48	12.80	7.80	4.57	1765.0
117	9056.85	12.67	7.50	5.77	1716.0	167	9304.57	11.89	5.06	3.86	1766.0
118	9061.76	12.80	3.26	3.94	1717.0	168	9308.72	11.52	2.99	4.60	1767.0
119	9065.23	11.56	1.35	3.55	1718.0	169	9313.99	12.52	5.57	5.88	1768.0
120	9069.68	11.78	5.97	5.43	1719.0	170	9319.93	12.60	7.63	5.62	1769.0
121	9075.56	12.04	7.76	6.06	1720.0	171	9324.79	12.65	5.63	4.14	1770.0
122	9081.31	12.34	4.27	5.38	1721.0	172	9328.82	12.77	3.39	4.33	1771.0
123	9086.39	12.81	1.76	4.80	1722.0	173	9333.76	12.43	5.07	5.53	1772.0
124	9090.97	11.79	4.31	4.44	1723.0	174	9339.51	13.04	7.63	5.61	1773.0
125	9095.48	12.16	7.61	4.64	1724.0	175	9344.53	13.65	6.44	4.46	1774.0
126	9100.16	12.24	7.11	4.68	1725.0	176	9348.77	12.85	2.78	4.21	1775.0
127	9104.80	11.87	3.74	4.64	1726.0	177	9353.31	11.77	3.25	4.97	1776.0
128	9109.44	11.34	2.90	4.73	1727.0	178	9358.86	12.23	6.87	6.03	1777.0
129	9114.52	11.58	6.24	5.61	1728.0	179	9364.88	12.86	7.96	5.63	1778.0
130	9120.55	12.69	7.43	6.18	1729.0	180	9369.69	13.29	4.82	4.13	1779.0
131	9126.32	12.78	3.71	5.21	1730.0	181	9373.73	12.67	1.84	4.32	1780.0
132	9130.99	11.44	1.81	4.38	1731.0	182	9378.71	12.65	4.96	5.49	1781.0
133	9135.80	11.72	5.51	5.47	1732.0	183	9384.17	13.42	8.32	5.17	1782.0
134	9141.66	13.20	8.32	5.77	1733.0	184	9388.79	13.72	6.50	4.17	1783.0
135	9146.71	12.87	6.67	4.34	1734.0	185	9392.89	13.25	2.28	4.18	1784.0
136	9150.60	11.43	2.61	3.48	1735.0	186	9397.41	11.97	2.99	4.89	1785.0
137	9153.98	10.82	3.45	3.64	1736.0	187	9402.87	12.59	7.13	6.12	1786.0
138	9158.65	13.89	8.22	5.74	1737.0	188	9409.10	14.30	8.25	5.79	1787.0
139	9164.69	13.48	8.18	5.79	1738.0	189	9413.81	14.65	4.57	3.63	1788.0
140	9169.67	11.07	5.05	4.30	1739.0	190	9417.05	12.18	1.68	3.27	1789.0
141	9174.01	11.30	3.25	4.63	1740.0	191	9421.09	11.69	5.38	5.02	1790.0
142	9179.30	12.43	5.41	5.92	1741.0	192	9426.86	13.41	8.40	6.24	1791.0
143	9185.43	13.04	7.70	6.09	1742.0	193	9432.96	13.60	5.41	5.70	1792.0
144	9190.92	13.69	6.55	4.74	1743.0	194	9438.17	12.65	2.82	4.75	1793.0
145	9195.14	12.18	3.48	4.01	1744.0	195	9442.85	10.72	4.93	4.85	1794.0
146	9199.61	11.55	4.42	5.22	1745.0	196	9448.26	12.10	7.41	6.12	1795.0
147	9205.65	13.07	7.25	6.47	1746.0	197	9454.75	13.29	7.52	6.56	1796.0
148	9211.66	12.58	7.55	5.13	1747.0	198	9460.88	11.60	6.56	5.67	1797.0
149	9215.94	12.69	6.66	3.75	1748.0	199	9466.31	10.91	6.17	5.35	1798.0
150	9219.98	12.71	4.73	4.75	1749.0	200	9471.73	11.51	6.51	5.69	1799.0

ONE SECOND VELOCITY DATA

KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)	KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)
1	9477.86	13.26	7.50	6.50	1800.0	51	9759.91	16.05	9.17	3.15	1850.0
2	9484.35	12.89	7.28	6.28	1801.0	52	9763.69	13.05	7.27	4.79	1851.0
3	9490.29	11.28	6.38	5.57	1802.0	53	9769.36	12.88	6.63	5.97	1852.0
4	9495.80	11.64	6.58	5.73	1803.0	54	9774.69	15.04	8.03	4.46	1853.0
5	9502.00	13.25	7.49	6.48	1804.0	55	9778.54	15.71	9.19	3.66	1854.0
6	9508.49	13.16	7.44	6.47	1805.0	56	9782.84	14.75	6.69	4.99	1855.0
7	9514.95	13.15	7.44	6.48	1806.0	57	9788.06	13.27	4.25	5.38	1856.0
8	9521.62	13.53	7.67	6.67	1807.0	58	9793.62	13.87	6.88	5.48	1857.0
9	9526.87	5.51	3.11	2.70	1808.0	59	9798.38	15.71	9.19	4.02	1858.0
10	9525.56	-10.62	-6.00	-5.22	1809.0	60	9802.18	16.12	9.05	4.06	1859.0
11	9518.45	-15.50	-8.76	-7.62	1810.0	61	9807.03	12.97	7.21	5.55	1860.0
12	9510.98	-16.68	-9.43	-8.20	1811.0	62	9812.81	11.73	6.49	5.96	1861.0
13	9500.67	-24.19	-13.67	-11.89	1812.0	63	9818.66	14.66	8.18	5.20	1862.0
14	9490.28	-14.66	-8.29	-7.20	1813.0	64	9822.48	15.87	8.93	2.80	1863.0
15	9487.04	-.60	-.34	-.27	1814.0	65	9825.69	13.74	7.68	4.21	1864.0
16	9487.06	-1.11	-.63	-.56	1815.0	66	9831.27	12.01	6.69	6.75	1865.0
17	42357.32	32561.64	32563.00	32563.80	1816.0	67	9838.05	13.29	7.46	6.14	1866.0
18	-43918.14	-52894.59	-52892.12	-52891.01	1817.0	68	9843.08	15.19	8.50	4.06	1867.0
19	-212210.84	-219650.07	-219643.12	-219647.98	1818.0	69	9847.03	13.54	8.15	4.32	1868.0
20	-85772.64	-94471.15	-94465.06	-94474.52	1819.0	70	9851.61	10.80	6.76	4.49	1869.0
21	44065.00	34130.45	34129.50	34124.68	1820.0	71	9855.99	11.71	8.10	4.69	1870.0
22	9618.36	11.53	6.95	4.75	1821.0	72	9861.13	12.84	11.43	5.00	1871.0
23	9622.72	14.13	8.46	4.09	1822.0	73	9865.24	13.09	11.24	3.39	1872.0
24	9626.90	14.95	8.94	4.54	1823.0	74	9868.94	11.82	7.75	4.37	1873.0
25	9631.95	13.84	8.10	5.31	1824.0	75	9874.07	11.20	6.21	5.71	1874.0
26	9636.81	12.36	5.78	4.39	1825.0	76	9880.18	13.59	7.28	6.51	1875.0
27	9641.51	14.12	5.29	5.28	1826.0	77	9885.74	13.35	8.98	6.17	1876.0
28	9646.83	16.06	6.66	4.90	1827.0	78	9891.97	11.84	9.70	4.45	1877.0
29	9651.03	16.58	5.63	3.71	1828.0	79	9896.26	13.51	8.65	4.44	1878.0
30	9655.14	13.93	2.91	4.88	1829.0	80	9901.13	13.63	7.08	5.35	1879.0
31	9660.92	12.21	4.80	6.47	1830.0	81	9906.39	12.34	8.63	4.63	1880.0
32	9667.42	15.18	8.81	6.15	1831.0	82	9910.43	11.06	10.95	3.81	1881.0
33	9672.58	16.26	9.34	4.12	1832.0	83	9914.68	10.88	8.93	4.70	1882.0
34	9676.22	13.67	5.88	3.52	1833.0	84	9919.56	11.53	6.33	5.09	1883.0
35	9680.08	12.79	3.77	4.49	1834.0	85	9925.03	12.84	6.43	5.79	1884.0
36	9685.66	15.01	7.22	6.49	1835.0	86	9930.56	13.81	8.73	4.94	1885.0
37	9691.91	15.40	9.31	5.43	1836.0	87	9934.88	12.30	11.28	4.09	1886.0
38	9696.20	15.42	6.60	3.56	1837.0	88	9939.28	10.86	8.91	4.62	1887.0
39	9700.18	14.10	3.27	4.87	1838.0	89	9943.74	11.93	6.36	4.44	1888.0
40	9705.71	13.47	5.50	5.69	1839.0	90	9948.75	13.56	6.95	5.70	1889.0
41	9710.86	16.01	9.24	4.61	1840.0	91	9954.51	12.09	8.45	5.39	1890.0
42	9715.40	15.47	9.08	4.74	1841.0	92	9959.35	10.97	10.19	4.51	1891.0
43	9720.32	12.24	6.41	4.91	1842.0	93	9963.84	12.14	8.36	4.49	1892.0
44	9725.44	13.54	5.35	5.59	1843.0	94	9968.34	13.42	6.71	4.58	1893.0
45	9731.21	16.25	7.64	5.33	1844.0	95	9973.39	12.47	7.57	5.60	1894.0
46	9735.38	15.56	8.87	3.21	1845.0	96	9979.07	12.05	10.38	5.36	1895.0
47	9738.91	15.01	5.84	4.51	1846.0	97	9983.87	13.63	10.56	4.41	1896.0
48	9744.52	14.43	3.63	6.31	1847.0	98	9988.23	12.22	6.98	4.50	1897.0
49	9750.92	13.65	6.20	6.29	1848.0	99	9993.30	11.45	6.07	5.75	1898.0
50	9756.40	15.50	9.04	4.36	1849.0	100	9999.31	13.97	7.86	5.91	1899.0

ONE SECOND VELOCITY DATA

KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)	KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)
101	10004.63	14.32	9.23	4.68	1900.0	151	10249.93	12.91	13.47	3.53	1950.0
102	10009.04	11.99	7.97	4.40	1901.0	152	10253.00	14.30	10.58	2.83	1951.0
103	10013.56	11.77	6.59	4.78	1902.0	153	10256.63	12.13	6.66	4.79	1952.0
104	10018.70	13.00	7.12	5.34	1903.0	154	10262.43	11.80	8.57	6.54	1953.0
105	10023.95	13.99	9.30	4.84	1904.0	155	10269.26	12.09	12.63	6.77	1954.0
106	10028.41	13.65	9.97	4.40	1905.0	156	10275.05	13.14	11.56	4.58	1955.0
107	10033.09	11.67	7.26	5.02	1906.0	157	10278.80	14.16	8.05	3.32	1956.0
108	10038.55	12.56	6.83	5.87	1907.0	158	10282.30	11.88	6.85	4.09	1957.0
109	10044.46	14.31	7.95	5.62	1908.0	159	10287.30	11.50	10.99	5.70	1958.0
110	10049.22	14.54	9.24	3.91	1909.0	160	10293.07	12.35	12.95	5.59	1959.0
111	10052.94	13.28	7.92	3.99	1910.0	161	10298.13	13.57	9.61	4.52	1960.0
112	10057.44	11.27	6.62	4.87	1911.0	162	10302.31	12.96	6.93	4.02	1961.0
113	10062.80	12.10	7.66	5.94	1912.0	163	10306.63	11.22	9.51	4.88	1962.0
114	10068.86	12.51	10.43	5.83	1913.0	164	10312.34	11.40	12.67	6.21	1963.0
115	10074.17	13.46	10.43	4.93	1914.0	165	10317.62	12.64	10.25	3.94	1964.0
116	10079.06	13.24	7.71	4.89	1915.0	166	10320.69	13.28	7.59	2.76	1965.0
117	10084.04	12.20	6.71	5.04	1916.0	167	10324.42	11.54	8.14	5.10	1966.0
118	10089.03	13.53	7.33	5.11	1917.0	168	10330.64	11.33	12.04	6.87	1967.0
119	10094.24	14.46	8.63	5.06	1918.0	169	10337.25	12.25	13.17	6.07	1968.0
120	10098.90	13.91	9.76	4.20	1919.0	170	10342.37	12.84	9.32	4.22	1969.0
121	10102.57	11.72	7.50	3.54	1920.0	171	10346.43	12.64	7.23	4.37	1970.0
122	10106.85	12.00	6.43	5.28	1921.0	172	10351.40	10.18	10.26	5.42	1971.0
123	10112.91	13.48	9.86	6.12	1922.0	173	10356.42	10.98	13.09	4.11	1972.0
124	10117.88	13.83	12.02	3.65	1923.0	174	10359.72	13.34	11.90	3.08	1973.0
125	10121.12	13.15	9.41	3.70	1924.0	175	10363.67	13.00	8.73	4.90	1974.0
126	10125.94	12.49	6.81	5.62	1925.0	176	10369.08	10.73	7.66	5.60	1975.0
127	10131.77	13.19	7.03	5.93	1926.0	177	10374.74	10.05	11.60	5.85	1976.0
128	10137.60	13.14	9.50	5.49	1927.0	178	10380.80	12.74	13.49	6.06	1977.0
129	10142.50	13.11	11.75	4.49	1928.0	179	10386.46	13.37	10.33	5.17	1978.0
130	10146.82	12.03	8.64	4.25	1929.0	180	10390.89	11.83	8.13	3.57	1979.0
131	10151.19	11.68	5.97	4.57	1930.0	181	10394.01	10.80	9.67	3.32	1980.0
132	10156.27	12.66	9.64	5.72	1931.0	182	10398.48	11.47	12.96	5.66	1981.0
133	10162.21	12.78	13.11	5.71	1932.0	183	10404.73	13.46	11.88	6.40	1982.0
134	10167.39	13.43	10.99	4.81	1933.0	184	10410.67	13.28	8.23	5.33	1983.0
135	10172.09	12.76	7.24	4.57	1934.0	185	10415.28	10.43	8.35	3.94	1984.0
136	10176.46	11.87	7.28	4.23	1935.0	186	10419.35	10.35	11.97	4.84	1985.0
137	10180.66	12.35	11.50	4.29	1936.0	187	10425.10	12.43	13.67	5.90	1986.0
138	10185.39	13.70	12.56	5.15	1937.0	188	10429.92	13.80	10.90	3.72	1987.0
139	10190.85	12.86	8.28	5.69	1938.0	189	10433.39	13.02	7.52	3.79	1988.0
140	10196.30	11.85	6.75	4.87	1939.0	190	10438.13	10.42	9.28	5.79	1989.0
141	10200.63	12.73	3.95	4.07	1940.0	191	10444.40	10.86	13.64	6.10	1990.0
142	10204.95	12.79	12.25	4.72	1941.0	192	10449.32	14.08	13.21	3.46	1991.0
143	10210.13	13.65	11.55	5.50	1942.0	193	10452.08	13.41	8.59	3.03	1992.0
144	10215.41	12.53	7.65	5.01	1943.0	194	10456.38	10.20	8.12	5.49	1993.0
145	10220.50	11.52	6.77	5.16	1944.0	195	10462.64	10.88	12.24	6.87	1994.0
146	10225.39	13.16	11.68	4.43	1945.0	196	10469.81	12.03	12.23	7.12	1995.0
147	10229.38	14.00	12.78	3.91	1946.0	197	10476.01	13.31	10.33	4.95	1996.0
148	10234.24	13.34	8.69	5.93	1947.0	198	10479.27	13.68	9.18	1.81	1997.0
149	10240.36	11.69	6.42	5.80	1948.0	199	10481.08	11.26	8.71	2.68	1998.0
150	10245.68	10.86	10.09	4.94	1949.0	200	10485.77	11.50	12.42	6.72	1999.0

ONE SECOND VELOCITY DATA

KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)	KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)
1	10493.25	12.69	12.99	7.28	2000.0	51	10737.52	14.47	11.60	4.85	2050.0
2	10499.20	12.13	9.69	4.58	2001.0	52	10742.21	12.85	8.48	4.72	2051.0
3	10503.14	11.15	8.44	3.80	2002.0	53	10747.33	12.74	10.05	5.62	2052.0
4	10507.77	10.56	10.67	5.55	2003.0	54	10753.04	13.31	14.35	5.32	2053.0
5	10513.48	12.81	13.18	5.32	2004.0	55	10757.25	15.47	12.87	3.36	2054.0
6	10517.93	14.70	10.97	3.67	2005.0	56	10760.82	14.64	8.85	4.20	2055.0
7	10521.60	12.32	8.29	4.08	2006.0	57	10765.73	11.58	9.39	5.32	2056.0
8	10526.34	10.04	10.10	5.34	2007.0	58	10771.02	12.57	13.31	5.24	2057.0
9	10531.99	11.85	13.42	5.77	2008.0	59	10775.97	14.50	13.51	4.44	2058.0
10	10537.40	13.89	12.58	4.85	2009.0	60	10780.04	15.54	10.65	4.14	2059.0
11	10541.76	14.54	8.98	4.01	2010.0	61	10784.89	13.53	8.51	5.62	2060.0
12	10545.65	12.05	7.36	4.03	2011.0	62	10791.02	11.39	10.13	6.45	2061.0
13	10550.38	10.59	11.36	5.76	2012.0	63	10797.29	12.45	13.70	5.90	2062.0
14	10557.16	13.03	14.22	7.20	2013.0	64	10802.28	14.09	12.81	4.05	2063.0
15	10563.03	13.71	11.45	4.04	2014.0	65	10805.99	15.38	9.60	3.69	2064.0
16	10565.87	12.66	9.43	2.57	2015.0	66	10809.99	13.54	8.61	4.47	2065.0
17	10569.61	11.39	9.38	5.07	2016.0	67	10814.91	11.54	11.74	5.11	2066.0
18	10575.25	11.96	12.93	5.75	2017.0	68	10819.67	13.59	14.11	4.28	2067.0
19	10580.85	14.82	12.39	5.45	2018.0	69	10824.06	15.68	12.23	5.00	2068.0
20	10585.88	14.02	8.58	4.51	2019.0	70	10829.93	13.70	9.19	6.10	2069.0
21	10590.20	11.61	9.35	4.43	2020.0	71	10835.14	10.26	10.30	4.22	2070.0
22	10595.09	11.91	12.47	5.31	2021.0	72	10838.99	13.23	14.58	3.85	2071.0
23	10600.31	13.01	13.52	4.79	2022.0	73	10843.32	16.32	13.07	4.83	2072.0
24	10604.67	13.55	9.87	4.19	2023.0	74	10848.51	13.67	8.45	5.60	2073.0
25	10609.08	13.45	7.49	4.83	2024.0	75	10854.46	12.07	8.97	6.13	2074.0
26	10614.54	12.15	9.80	5.95	2025.0	76	10860.43	12.67	12.54	5.72	2075.0
27	10620.48	12.16	13.87	5.75	2026.0	77	10865.69	14.82	14.18	4.85	2076.0
28	10625.56	14.24	12.06	4.19	2027.0	78	10870.59	15.32	12.10	5.29	2077.0
29	10628.96	13.71	7.52	3.00	2028.0	79	10876.10	14.05	10.68	5.21	2078.0
30	10632.47	12.33	7.95	4.37	2029.0	80	10880.30	13.28	12.29	3.40	2079.0
31	10637.90	11.68	12.58	6.23	2030.0	81	10884.44	13.25	12.69	5.77	2080.0
32	10644.14	11.81	13.89	6.08	2031.0	82	10891.77	14.93	12.83	7.89	2081.0
33	10649.95	13.65	10.34	5.34	2032.0	83	10898.00	14.80	10.52	4.08	2082.0
34	10654.75	13.32	7.65	4.40	2033.0	84	10901.13	12.82	9.47	3.40	2083.0
35	10659.21	11.92	9.72	4.78	2034.0	85	10906.04	13.51	14.03	5.98	2084.0
36	10664.32	12.88	13.65	5.11	2035.0	86	10911.12	14.84	14.71	3.61	2085.0
37	10668.78	14.55	12.28	3.77	2036.0	87	10914.16	14.37	11.52	3.50	2086.0
38	10672.50	14.13	8.24	4.04	2037.0	88	10919.10	12.50	9.76	6.08	2087.0
39	10677.31	12.32	8.16	5.66	2038.0	89	10925.21	13.30	11.70	5.80	2088.0
40	10683.33	11.75	11.95	6.00	2039.0	90	10930.79	15.05	14.80	5.33	2089.0
41	10688.88	13.39	13.50	4.95	2040.0	91	10935.35	14.18	12.32	3.75	2090.0
42	10693.31	13.63	10.36	4.20	2041.0	92	10938.92	13.17	8.61	3.89	2091.0
43	10697.80	12.91	8.24	4.87	2042.0	93	10943.86	12.66	9.67	5.94	2092.0
44	10703.16	11.84	10.80	5.71	2043.0	94	10949.80	13.73	13.75	5.37	2093.0
45	10708.57	12.49	14.57	4.70	2044.0	95	10954.33	15.52	14.40	4.06	2094.0
46	10712.33	14.93	13.10	3.13	2045.0	96	10958.92	15.24	11.93	5.35	2095.0
47	10715.89	14.81	8.64	4.51	2046.0	97	10964.45	12.84	9.47	5.27	2096.0
48	10721.31	12.60	8.51	5.89	2047.0	98	10969.32	12.84	11.08	4.83	2097.0
49	10727.06	12.06	12.57	5.53	2048.0	99	10974.05	14.81	14.59	4.23	2098.0
50	10732.40	14.39	14.07	5.25	2049.0	100	10977.70	15.51	13.12	3.56	2099.0

ONE SECOND VELOCITY DATA

KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)	KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)
101	10982.42	14.65	9.29	6.20	2100.0	151	11230.91	14.72	9.56	3.35	2150.0
102	10989.50	12.84	9.70	7.42	2101.0	152	11234.18	12.79	11.41	3.59	2151.0
103	10996.57	13.33	13.87	6.33	2102.0	153	11238.42	13.63	14.91	4.74	2152.0
104	11001.21	15.39	15.60	2.85	2103.0	154	11243.16	14.52	13.38	4.55	2153.0
105	11003.49	15.60	12.02	2.65	2104.0	155	11247.30	14.55	9.90	3.73	2154.0
106	11007.20	14.27	7.98	4.52	2105.0	156	11251.05	13.02	10.68	4.13	2155.0
107	11012.02	13.91	9.79	5.28	2106.0	157	11256.14	13.11	13.31	6.12	2156.0
108	11018.42	13.93	14.24	7.55	2107.0	158	11262.56	14.06	13.67	6.21	2157.0
109	11025.91	15.23	14.24	6.58	2108.0	159	11268.05	14.73	12.45	4.84	2158.0
110	11030.84	15.96	10.35	3.52	2109.0	160	11272.32	14.07	9.52	3.64	2159.0
111	11033.98	14.18	9.08	3.33	2110.0	161	11275.63	12.09	9.45	3.52	2160.0
112	11038.27	14.29	12.95	5.18	2111.0	162	11280.32	12.14	14.06	5.97	2161.0
113	11043.89	15.56	14.68	5.86	2112.0	163	11286.90	13.14	14.94	6.60	2162.0
114	11049.58	15.43	12.09	5.38	2113.0	164	11292.74	13.74	11.54	4.88	2163.0
115	11054.46	14.07	9.76	4.28	2114.0	165	11297.05	12.71	9.11	4.20	2164.0
116	11058.41	14.49	9.89	4.11	2115.0	166	11301.77	12.52	11.92	5.25	2165.0
117	11063.40	15.92	12.49	5.80	2116.0	167	11306.77	13.57	14.49	4.30	2166.0
118	11068.89	16.03	13.74	4.64	2117.0	168	11310.29	14.91	12.31	3.17	2167.0
119	11072.68	14.73	10.58	3.51	2118.0	169	11313.99	14.03	10.13	4.43	2168.0
120	11077.12	13.55	8.30	5.61	2119.0	170	11319.17	11.22	11.54	5.94	2169.0
121	11083.41	14.77	12.07	6.29	2120.0	171	11325.48	11.64	14.78	6.19	2170.0
122	11088.57	16.36	14.70	3.75	2121.0	172	11330.88	14.54	14.07	4.45	2171.0
123	11091.71	16.51	12.62	3.36	2122.0	173	11334.89	14.49	10.58	4.04	2172.0
124	11096.40	13.76	9.00	5.84	2123.0	174	11339.50	11.98	9.08	5.21	2173.0
125	11102.58	13.06	10.12	6.17	2124.0	175	11344.87	11.71	12.04	5.28	2174.0
126	11108.71	15.17	13.97	6.18	2125.0	176	11349.87	13.33	14.76	4.74	2175.0
127	11114.41	16.39	13.27	4.79	2126.0	177	11354.51	14.80	12.54	4.60	2176.0
128	11118.18	16.00	10.45	3.26	2127.0	178	11359.01	13.82	9.91	4.29	2177.0
129	11122.08	13.89	8.80	4.77	2128.0	179	11363.34	12.02	11.20	4.71	2178.0
130	11127.15	14.00	12.20	4.91	2129.0	180	11368.58	12.27	14.70	5.41	2179.0
131	11131.87	14.79	13.96	4.91	2130.0	181	11373.46	14.43	14.31	4.41	2180.0
132	11137.47	14.94	10.93	5.98	2131.0	182	11377.95	14.92	10.06	4.96	2181.0
133	11142.76	14.13	9.10	4.26	2132.0	183	11383.47	12.12	8.57	5.76	2182.0
134	11146.23	13.95	11.25	3.10	2133.0	184	11388.69	11.25	12.09	4.53	2183.0
135	11149.69	15.21	14.45	4.18	2134.0	185	11392.53	12.95	15.41	3.29	2184.0
136	11155.02	15.66	12.69	6.36	2135.0	186	11395.96	13.55	12.73	3.92	2185.0
137	11161.39	14.19	8.81	5.75	2136.0	187	11400.51	12.78	8.75	4.99	2186.0
138	11166.14	13.25	9.97	4.28	2137.0	188	11405.68	12.07	10.87	5.30	2187.0
139	11170.87	14.66	13.14	5.10	2138.0	189	11411.51	11.78	13.41	6.40	2188.0
140	11175.81	15.14	13.24	4.62	2139.0	190	11417.51	12.74	12.62	4.99	2189.0
141	11180.28	14.82	11.80	4.42	2140.0	191	11421.35	14.08	10.72	3.21	2190.0
142	11184.51	13.64	9.28	3.96	2141.0	192	11425.02	12.45	7.77	4.43	2191.0
143	11188.50	13.26	9.87	4.59	2142.0	193	11430.00	10.78	11.35	5.19	2192.0
144	11194.18	14.62	12.97	6.64	2143.0	194	11435.15	11.64	15.79	5.19	2193.0
145	11200.73	15.77	13.75	5.89	2144.0	195	11440.34	13.02	13.17	5.11	2194.0
146	11205.35	15.29	10.86	3.42	2145.0	196	11445.46	13.15	9.88	5.06	2195.0
147	11208.41	14.18	9.32	3.30	2146.0	197	11450.28	12.15	8.80	4.57	2196.0
148	11212.85	12.65	13.01	5.81	2147.0	198	11454.92	11.87	12.46	4.85	2197.0
149	11219.79	13.11	14.40	7.52	2148.0	199	11460.10	12.25	14.13	5.51	2198.0
150	11226.60	15.98	11.67	5.59	2149.0	200	11465.46	12.62	11.41	5.08	2199.0

ONE SECOND VELOCITY DATA

KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)	KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)
1	11470.40	11.68	9.59	4.75	2200.0	51	11708.08	13.27	9.27	3.64	2250.0
2	11474.39	11.25	11.35	3.05	2201.0	52	11711.89	11.99	7.51	4.05	2251.0
3	11477.04	11.89	14.70	2.85	2202.0	53	11716.46	13.07	10.56	5.12	2252.0
4	11481.22	12.31	12.46	5.65	2203.0	54	11721.82	13.11	11.93	5.33	2253.0
5	11487.50	12.21	8.44	6.22	2204.0	55	11726.63	13.08	9.67	4.03	2254.0
6	11493.30	11.25	9.03	5.72	2205.0	56	11730.21	12.35	7.68	3.68	2255.0
7	11499.18	10.58	11.72	5.90	2206.0	57	11734.80	13.42	8.56	5.62	2256.0
8	11504.39	11.78	13.44	4.14	2207.0	58	11741.11	13.38	11.22	6.60	2257.0
9	11507.33	14.00	12.11	2.17	2208.0	59	11747.28	11.53	10.71	5.49	2258.0
10	11509.90	12.44	8.76	3.38	2209.0	60	11751.65	12.91	8.87	3.01	2259.0
11	11514.43	9.75	10.59	5.63	2210.0	61	11753.66	12.69	7.80	1.84	2260.0
12	11520.71	10.75	13.30	6.70	2211.0	62	11757.00	12.87	9.33	5.02	2261.0
13	11527.63	13.03	11.92	6.97	2212.0	63	11763.04	12.86	11.42	6.50	2262.0
14	11534.11	12.61	9.74	5.63	2213.0	64	11769.26	12.78	10.51	5.76	2263.0
15	11538.77	11.56	8.79	4.03	2214.0	65	11774.54	12.37	8.12	4.88	2264.0
16	11543.08	11.50	11.53	4.93	2215.0	66	11779.18	11.98	7.42	4.62	2265.0
17	11547.99	11.56	13.76	4.17	2216.0	67	11783.92	13.50	9.71	4.56	2266.0
18	11551.06	13.37	12.11	2.49	2217.0	68	11787.77	14.41	11.63	3.34	2267.0
19	11554.23	13.37	9.07	4.33	2218.0	69	11791.48	13.80	10.14	4.42	2268.0
20	11559.58	11.34	8.71	5.95	2219.0	70	11796.58	11.83	7.43	5.51	2269.0
21	11565.70	11.47	12.38	6.11	2220.0	71	11801.69	11.44	6.88	4.60	2270.0
22	11571.21	13.79	13.31	4.60	2221.0	72	11806.22	13.78	9.00	4.67	2271.0
23	11574.94	14.03	10.47	3.20	2222.0	73	11811.11	15.03	11.21	5.10	2272.0
24	11578.12	11.32	8.67	3.37	2223.0	74	11816.13	13.43	9.91	4.61	2273.0
25	11582.17	12.01	10.53	4.93	2224.0	75	11820.16	11.56	7.24	3.76	2274.0
26	11588.08	12.84	13.36	6.60	2225.0	76	11824.37	13.17	8.32	4.94	2275.0
27	11594.06	12.80	11.88	4.68	2226.0	77	11830.24	14.57	10.41	6.58	2276.0
28	11597.38	13.58	9.43	2.53	2227.0	78	11836.52	12.80	9.43	5.60	2277.0
29	11600.56	11.57	10.57	4.35	2228.0	79	11841.35	12.20	7.98	4.20	2278.0
30	11606.24	11.03	13.00	6.67	2229.0	80	11845.45	12.65	7.70	4.36	2279.0
31	11612.97	12.93	12.89	6.50	2230.0	81	11850.37	13.30	7.75	5.14	2280.0
32	11618.69	14.24	10.58	4.67	2231.0	82	11854.95	14.75	9.15	3.77	2281.0
33	11622.48	12.91	8.12	3.37	2232.0	83	11858.08	13.42	8.82	2.86	2282.0
34	11626.48	11.66	9.68	5.10	2233.0	84	11861.61	11.52	7.09	4.50	2283.0
35	11632.66	12.85	13.28	6.59	2234.0	85	11867.01	13.47	8.17	6.15	2284.0
36	11638.18	14.22	13.28	4.21	2235.0	86	11873.56	14.69	8.99	6.56	2285.0
37	11641.69	14.58	10.09	3.45	2236.0	87	11879.33	13.21	8.08	4.71	2286.0
38	11646.06	12.09	8.18	5.31	2237.0	88	11882.95	13.65	8.35	2.71	2287.0
39	11651.64	11.41	12.94	5.44	2238.0	89	11885.50	14.68	8.98	3.17	2288.0
40	11656.40	13.84	14.57	3.99	2239.0	90	11889.74	14.04	8.60	5.00	2289.0
41	11659.97	15.14	10.68	3.60	2240.0	91	11895.16	13.59	8.42	5.62	2290.0
42	11664.24	13.79	8.43	4.96	2241.0	92	11900.79	13.21	7.96	5.71	2291.0
43	11669.53	12.01	9.14	5.42	2242.0	93	11906.51	13.14	6.81	5.64	2292.0
44	11675.00	12.02	11.91	5.64	2243.0	94	11911.98	13.86	6.42	5.30	2293.0
45	11680.57	14.06	11.71	5.05	2244.0	95	11916.74	15.32	7.82	4.08	2294.0
46	11684.58	14.44	9.50	3.15	2245.0	96	11920.49	16.37	9.09	3.74	2295.0
47	11687.76	13.01	8.01	3.75	2246.0	97	11924.38	13.97	6.63	3.90	2296.0
48	11692.69	13.59	8.82	5.98	2247.0	98	11927.96	12.41	5.76	3.25	2297.0
49	11698.97	13.63	11.16	6.16	2248.0	99	11931.42	14.13	8.45	4.17	2298.0
50	11704.29	13.68	11.69	4.33	2249.0	100	11936.64	15.13	9.22	5.97	2299.0

ONE SECOND VELOCITY DATA

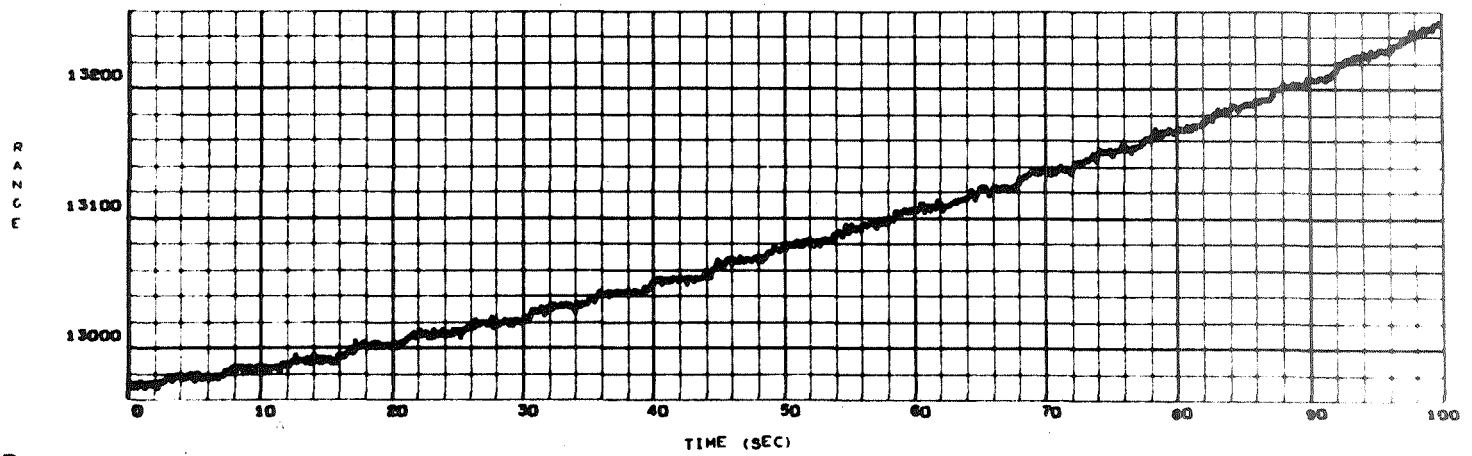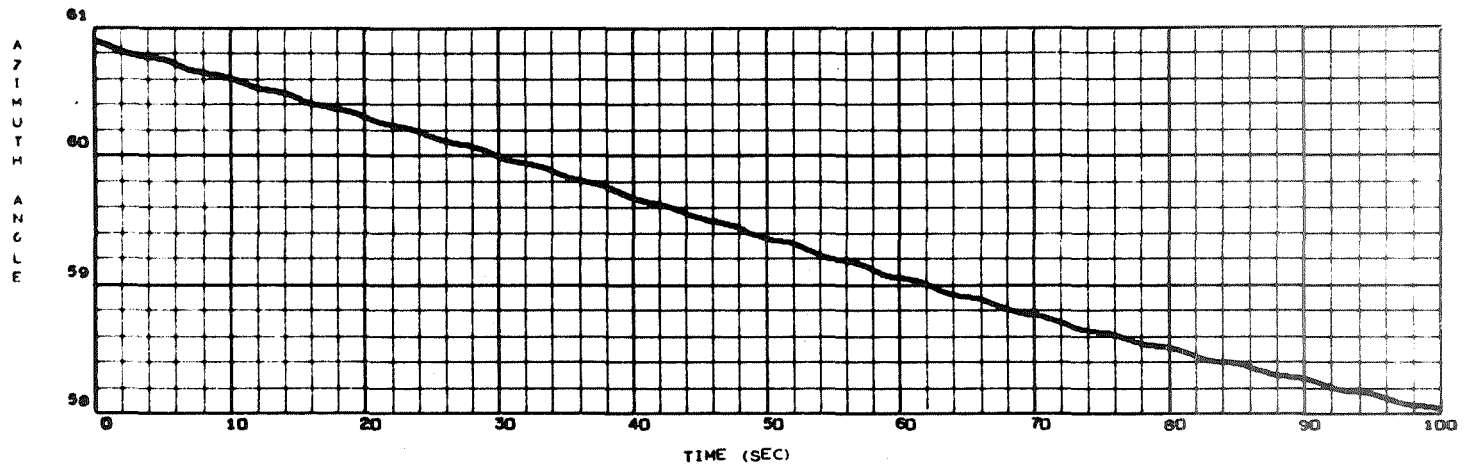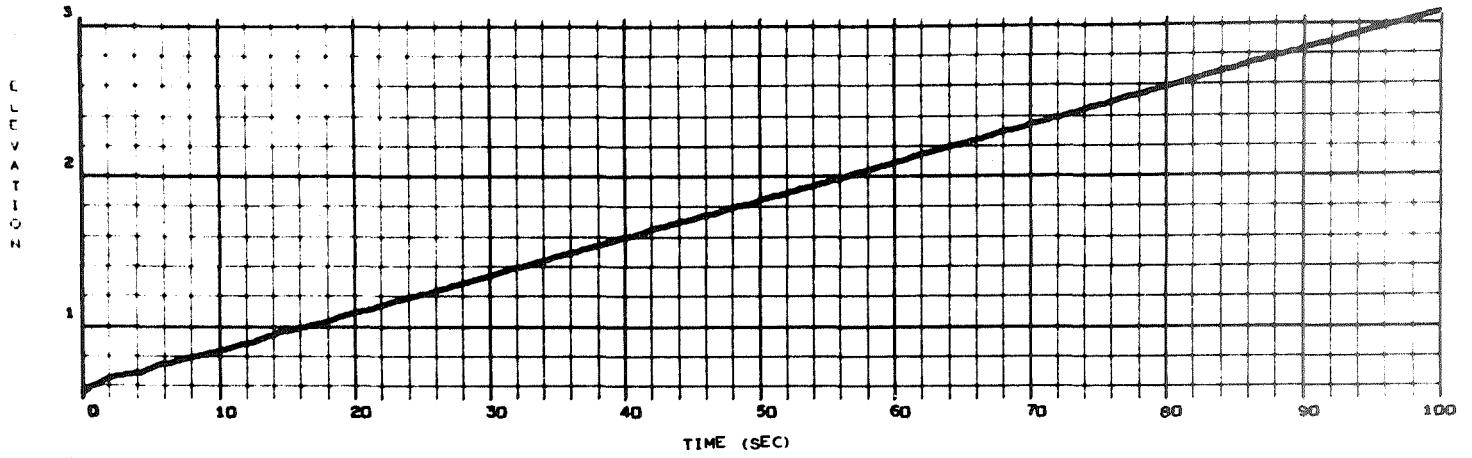| KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)	KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)
101	11942.81	13.86	8.35	6.17	2300.0	151	12175.81	17.43	8.93	4.11	2350.0
102	11948.61	12.87	7.21	5.23	2301.0	152	12179.34	18.36	4.51	3.50	2351.0
103	11953.16	13.34	7.43	3.87	2302.0	153	12183.51	16.24	3.07	4.87	2352.0
104	11956.67	14.63	9.01	3.50	2303.0	154	12188.81	14.77	6.80	5.37	2353.0
105	11960.70	15.39	9.46	4.51	2304.0	155	12193.51	16.80	9.21	3.78	2354.0
106	11965.45	13.71	7.42	4.88	2305.0	156	12196.64	18.68	8.07	3.21	2355.0
107	11970.14	13.04	5.98	4.41	2306.0	157	12200.96	17.21	4.28	5.37	2356.0
108	11974.59	14.61	7.79	4.77	2307.0	158	12206.55	15.19	4.23	5.49	2357.0
109	11979.55	15.41	9.31	4.81	2308.0	159	12212.06	15.22	7.89	5.87	2358.0
110	11983.77	15.55	9.51	3.65	2309.0	160	12218.11	16.85	9.49	5.65	2359.0
111	11987.43	13.29	7.39	4.15	2310.0	161	12222.35	18.73	6.48	2.91	2360.0
112	11992.42	12.96	5.99	5.77	2311.0	162	12224.94	17.05	2.95	2.97	2361.0
113	11998.78	14.95	9.01	6.71	2312.0	163	12229.32	15.29	4.67	5.79	2362.0
114	12004.99	15.07	9.41	5.24	2313.0	164	12235.56	16.88	8.40	6.09	2363.0
115	12008.97	14.42	8.54	2.96	2314.0	165	12240.77	18.29	7.60	4.28	2364.0
116	12011.98	13.20	6.10	3.63	2315.0	166	12244.68	17.68	4.39	3.96	2365.0
117	12016.66	14.47	6.83	5.59	2316.0	167	12248.79	16.22	3.57	3.97	2366.0
118	12022.65	15.56	9.36	6.10	2317.0	168	12252.41	15.41	5.16	3.53	2367.0
119	12028.12	14.62	8.82	4.47	2318.0	169	12256.70	16.89	8.43	5.46	2368.0
120	12031.41	15.06	6.26	2.35	2319.0	170	12263.05	18.08	8.06	6.64	2369.0
121	12034.22	15.52	5.79	4.09	2320.0	171	12268.79	17.55	4.54	4.50	2370.0
122	12039.63	15.81	8.41	6.08	2321.0	172	12272.19	15.79	2.97	2.83	2371.0
123	12045.19	16.15	10.23	4.88	2322.0	173	12275.59	15.52	5.26	4.40	2372.0
124	12049.91	14.46	8.28	4.94	2323.0	174	12281.06	16.88	8.01	6.13	2373.0
125	12055.15	14.13	5.53	5.27	2324.0	175	12286.93	17.19	6.60	5.28	2374.0
126	12060.10	15.71	6.32	4.77	2325.0	176	12291.65	16.53	3.16	4.13	2375.0
127	12064.49	16.40	9.45	3.76	2326.0	177	12295.04	16.33	3.95	2.71	2376.0
128	12067.85	16.42	8.88	2.84	2327.0	178	12297.85	17.53	7.61	3.47	2377.0
129	12070.97	15.56	7.04	4.22	2328.0	179	12302.66	17.05	7.66	5.88	2378.0
130	12076.06	14.57	5.32	5.63	2329.0	180	12308.45	16.93	5.07	5.26	2379.0
131	12081.83	14.76	6.61	5.86	2330.0	181	12313.07	16.62	3.65	4.29	2380.0
132	12087.84	16.35	8.73	6.07	2331.0	182	12317.60	16.06	5.28	4.97	2381.0
133	12093.52	17.15	8.60	5.01	2332.0	183	12322.84	16.94	6.83	5.07	2382.0
134	12097.93	15.70	6.13	4.82	2333.0	184	12327.95	17.99	7.65	3.34	2383.0
135	12101.59	14.33	5.48	3.24	2334.0	185	12330.37	18.11	5.57	3.94	2384.0
136	12104.83	15.71	9.75	3.71	2335.0	186	12335.36	15.91	3.04	5.81	2385.0
137	12109.62	16.75	9.95	5.81	2336.0	187	12341.59	14.87	4.97	6.56	2386.0
138	12115.39	16.50	6.32	5.09	2337.0	188	12348.16	16.19	7.39	6.19	2387.0
139	12119.72	16.25	3.92	4.18	2338.0	189	12353.04	18.63	7.17	3.36	2388.0
140	12124.63	15.35	6.87	5.73	2339.0	190	12355.66	18.03	3.66	2.62	2389.0
141	12130.70	14.62	9.03	5.97	2340.0	191	12359.27	15.26	3.44	4.77	2390.0
142	12135.92	16.72	7.66	4.45	2341.0	192	12364.87	15.46	7.32	6.06	2391.0
143	12139.74	17.75	4.40	3.36	2342.0	193	12370.78	17.70	7.93	5.62	2392.0
144	12142.99	15.65	4.55	3.22	2343.0	194	12375.93	18.58	5.20	4.62	2393.0
145	12146.21	15.74	9.43	3.39	2344.0	195	12379.83	17.38	3.98	3.21	2394.0
146	12150.27	16.69	9.60	4.92	2345.0	196	12382.69	16.01	4.15	3.04	2395.0
147	12155.91	17.92	7.21	5.94	2346.0	197	12386.93	15.41	5.01	5.68	2396.0
148	12161.15	15.73	3.81	4.38	2347.0	198	12393.71	16.79	7.78	7.41	2397.0
149	12165.36	14.24	4.87	4.56	2348.0	199	12400.57	17.61	5.40	5.92	2398.0
150	12170.67	16.15	8.72	5.77	2349.0	200	12405.35	17.52	3.65	3.74	2399.0

** END OF FILE UNIT 9 **
THE REMAINING 1000 POINTS WILL BE USED TC ESTABLISH THE LAST RECORD.
KKM= 950 IEND= 1 KC=   0 IMAX= 4
LOCATIONS   381 THROUGH 800 OF LAST RECORD FILLED WITH ZEROS.
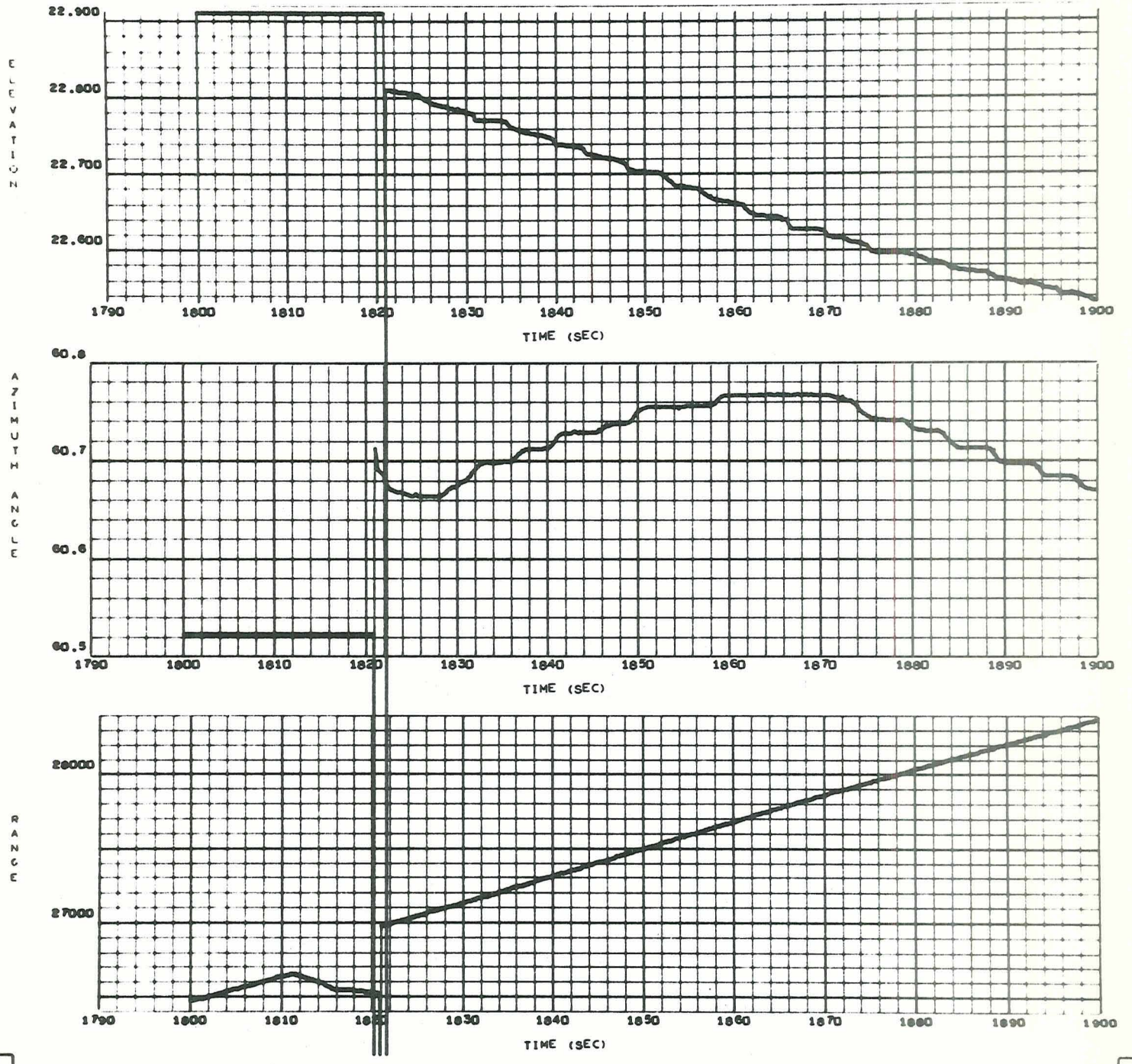
ONE   SECOND   VELOCITY   DATA

KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)	KC	ALTITUDE (M)	ZONAL (M/SEC)	MERIDIONAL (M/SEC)	RISE RATE (M/SEC)	TIME (SEC)
1	12408.72	15.74	4.78	3.49	2400.0	48	12625.35	14.80	6.83	5.69	2447.0
2	12413.00	15.81	6.91	5.00	2401.0	49	12631.57	16.75	8.69	6.57	2448.0
3	12418.14	17.85	5.92	4.83	2402.0	50	12637.78	18.49	7.09	5.42	2449.0
4	12422.26	17.15	2.58	3.74	2403.0	51	12642.03	17.32	4.27	3.29	2450.0
5	12426.53	16.59	4.05	4.96	2404.0	52	12645.38	16.67	4.01	3.83	2451.0
6	12432.07	15.43	7.43	5.93	2405.0	53	12649.93	16.76	5.97	5.12	2452.0
7	12437.55	16.06	7.05	4.59	2406.0	54	12655.18	17.52	7.63	5.24	2453.0
8	12441.21	18.49	5.67	3.10	2407.0	55	12660.13	18.13	5.95	4.63	2454.0
9	12444.80	17.01	3.80	4.47	2408.0	56	12664.65	16.80	3.36	4.53	2455.0
10	12450.13	14.88	4.17	5.77	2409.0	57	12669.27	15.14	4.96	4.64	2456.0
11	12455.82	15.59	7.12	5.57	2410.0	58	12673.56	16.84	7.69	3.74	2457.0
12	12461.12	17.01	6.44	5.07	2411.0	59	12677.07	18.60	7.44	3.66	2458.0
13	12466.11	18.90	4.28	4.66	2412.0	60	12681.39	16.93	4.55	5.09	2459.0
14	12469.61	17.48	3.51	2.24	2413.0	61	12686.80	16.38	3.43	5.27	2460.0
15	12471.51	15.14	5.87	2.44	2414.0	62	12691.38	16.48	6.26	3.97	2461.0
16	12475.74	15.44	9.31	6.03	2415.0	63	12695.45	16.96	7.94	4.52	2462.0
17	12482.56	16.95	6.68	7.03	2416.0	64	12700.54	18.71	5.79	5.35	2463.0
18	12489.09	17.84	3.76	5.71	2417.0	65	12705.47	18.41	3.51	4.38	2464.0
19	12493.68	16.59	2.84	3.68	2418.0	66	12709.71	16.12	4.19	4.24	2465.0
20	12497.12	15.65	5.98	3.46	2419.0	67	12713.99	15.58	6.87	4.05	2466.0
21	12500.72	16.47	8.11	3.64	2420.0	68	12717.56	17.66	8.12	3.38	2467.0
22	12504.50	18.46	6.38	4.17	2421.0	69	12721.51	19.53	4.74	4.68	2468.0
23	12509.15	17.61	3.28	4.39	2422.0	70	12726.59	17.85	2.37	5.19	2469.0
24	12514.07	14.46	3.11	5.11	2423.0	71	12731.59	15.59	5.12	4.91	2470.0
25	12519.70	14.98	7.66	6.13	2424.0	72	12736.80	15.16	7.54	5.61	2471.0
26	12525.64	17.53	8.77	5.23	2425.0	73	12742.43	17.29	7.85	5.37	2472.0
27	12529.81	19.48	4.56	3.47	2426.0	74	12746.82	19.55	5.25	3.23	2473.0
28	12533.18	16.61	2.17	3.44	2427.0	75	12749.41	17.31	3.06	2.55	2474.0
29	12536.89	15.17	4.44	4.11	2428.0	76	12753.01	15.17	5.06	4.89	2475.0
30	12541.64	15.87	8.15	5.50	2429.0	77	12759.00	16.80	7.91	6.86	2476.0
31	12547.61	16.98	7.52	6.10	2430.0	78	12766.27	18.09	6.90	7.21	2477.0
32	12553.51	18.57	3.81	5.73	2431.0	79	12772.24	17.58	3.71	4.26	2478.0
33	12558.82	16.98	3.14	4.59	2432.0	80	12775.22	17.43	3.40	2.49	2479.0
34	12562.46	14.96	6.26	2.91	2433.0	81	12778.75	17.34	6.28	4.86	2480.0
35	12565.86	16.71	9.05	4.61	2434.0	82	12784.07	16.70	7.94	5.08	2481.0
36	12571.59	18.20	6.87	6.16	2435.0	83	12788.51	18.23	7.17	4.03	2482.0
37	12576.99	17.15	2.62	4.45	2436.0	84	12792.58	18.85	4.50	4.25	2483.0
38	12580.98	16.17	3.26	4.00	2437.0	85	12796.88	16.17	3.09	4.37	2484.0
39	12585.27	16.86	7.34	4.39	2438.0	86	12801.62	16.10	6.13	5.30	2485.0
40	12589.44	17.56	9.39	3.99	2439.0	87	12807.03	17.74	8.50	5.06	2486.0
41	12593.63	17.41	5.98	4.62	2440.0	88	12811.36	18.13	5.41	3.86	2487.0
42	12598.95	17.02	2.82	5.92	2441.0	89	12815.61	18.79	.66	4.86	2488.0
43	12605.05	15.76	4.30	6.11	2442.0	90	12820.61	16.46	2.95	4.70	2489.0
44	12610.99	14.61	7.20	5.55	2443.0	91	12824.98	16.56	8.86	4.38	2490.0
45	12615.67	17.23	8.21	3.57	2444.0	92	12829.86	18.55	9.57	5.09	2491.0
46	12618.10	19.44	3.94	1.95	2445.0	93	12834.43	17.41	5.08	4.01	2492.0
47	12620.61	16.97	2.71	3.56	2446.0	94	12838.62	17.69	2.12	4.80	2493.0
						95	12844.20	17.37	4.35	6.01	2494.0

END OF ONE SECOND VELOCITY CALCULATIONS FOR FILE   1
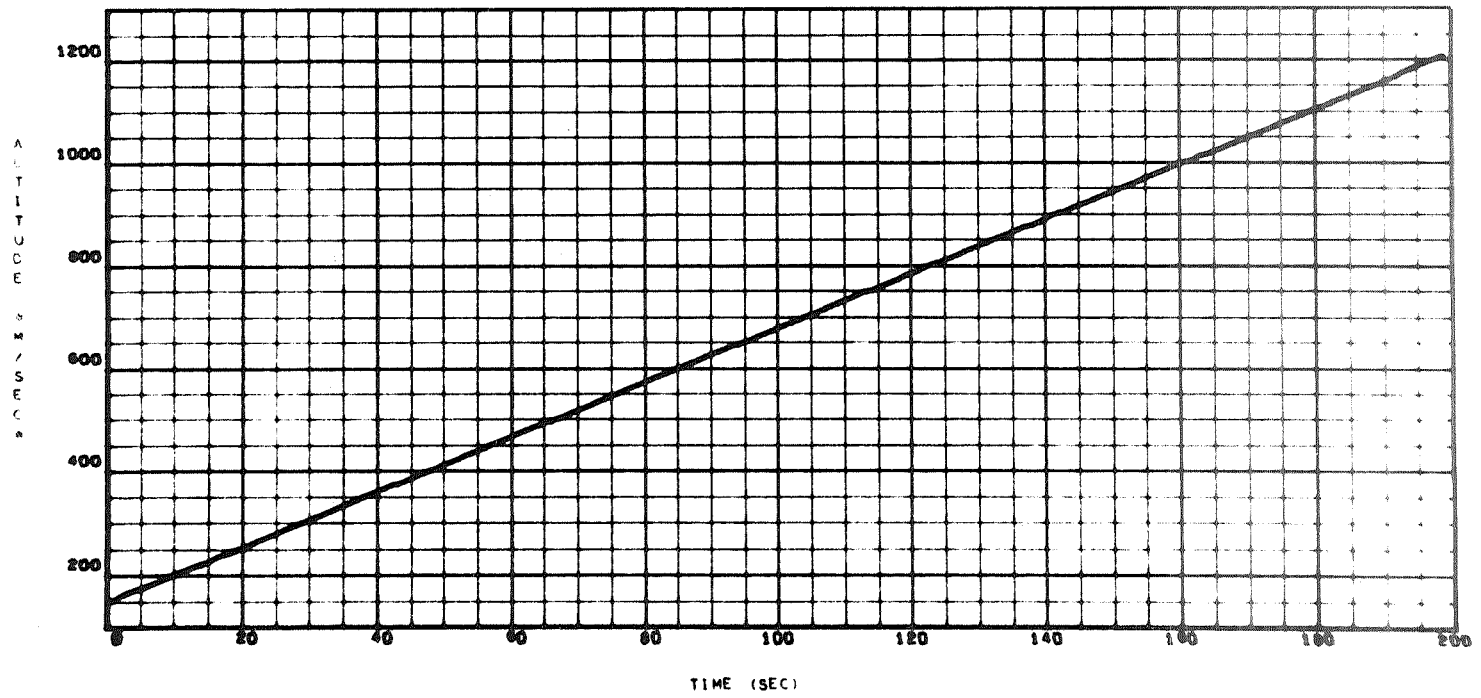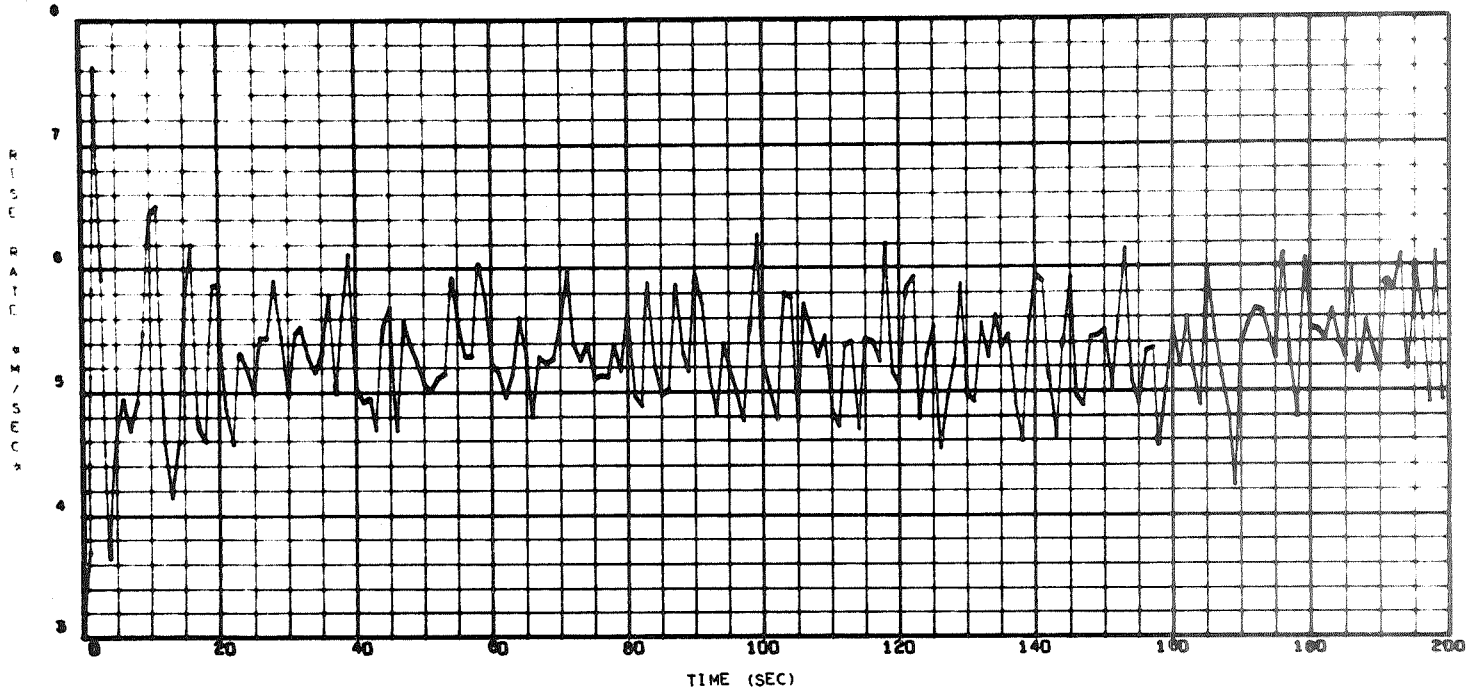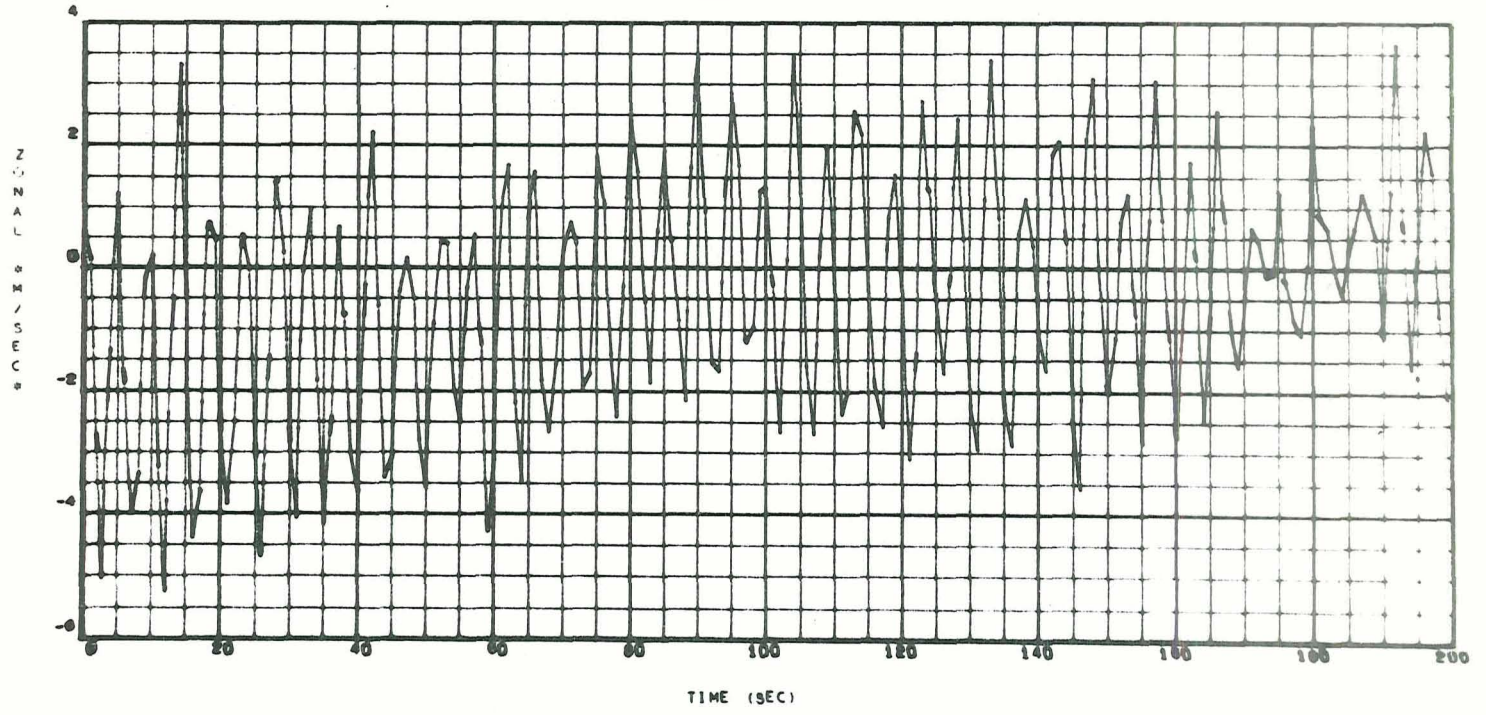   13 RECORDS WERE WRITTEN ON UNIT 11
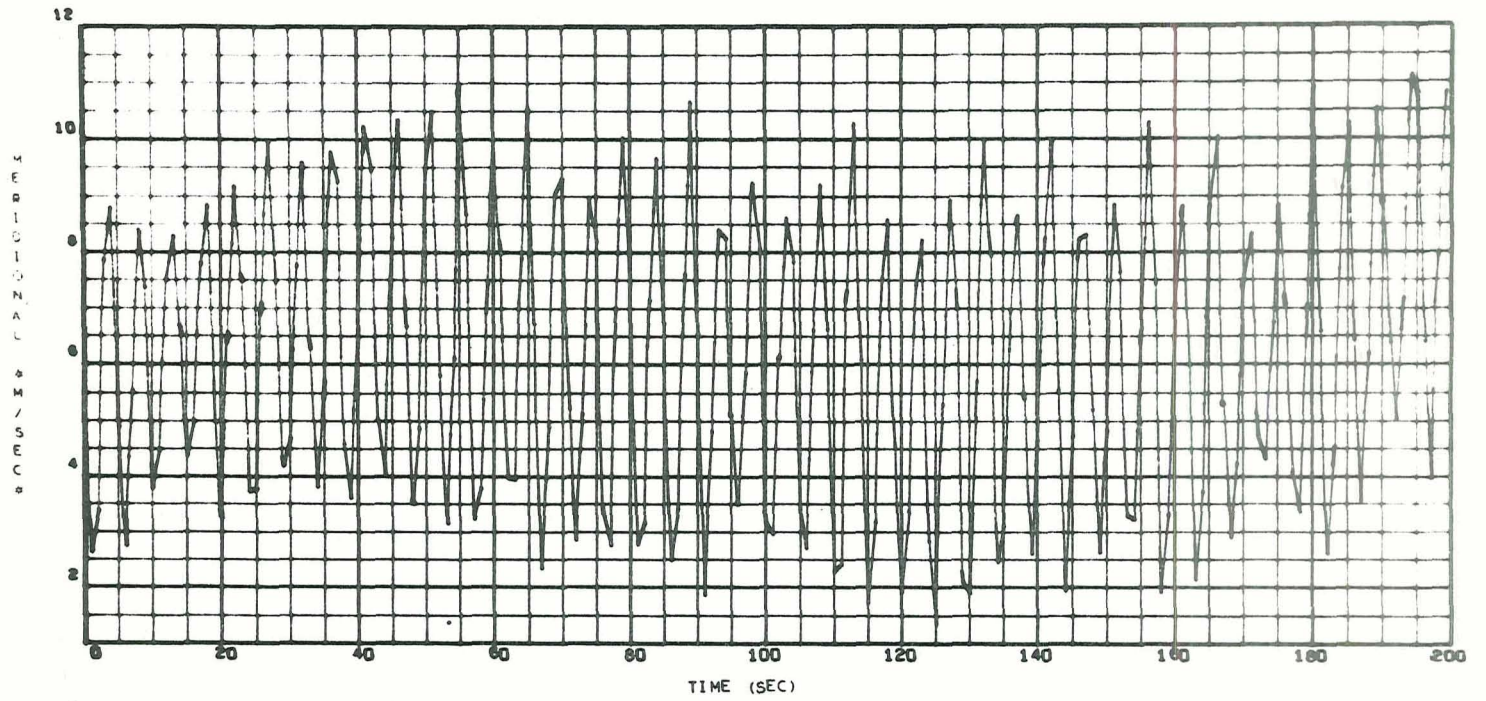
EDITED TAER DATA PLOT OUTPUT

ONE-SECOND VELOCITY DATA PLOT OUTPUT

TIME (SEC)

TIME (SEC)

TIME (SEC)

TIME (SEC)

TIME (SEC)

TIME (SEC)