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Multics STATPAC user handbook--Part 1
A guide with examples for editing and correcting a STATPAC dataset.

By

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CONTENTS

INTRODUCTION

This handbook is designed to be used by persons with a basic knowledge of the Multics system or another computer operating system. Much computer 'jargon' is used and most of the text will not be understood by someone unfamiliar with computer terminology and operations.

The structure of the handbook is progressive -- it is intended to be followed from beginning to end. Each new topic builds on information previously explained or referenced. The examples are from actual computer runs.

This handbook discusses and shows examples of programs that allow you to print data ('lookst'), compute minimum, maximum, and mean values for each variable ('genstat' - 'bastat'), check values of qualified data ('genstat' - 'dsplmt'), delete samples or change data values, sample numbers, or variable identifiers ('edstat'), and create a preliminary publication listing ('d0039'). Also explained are the programs necessary to create a sample locality plot. These programs include 'rmultp' which allows you to resolve multiple samples at the same site; 'geocon' which converts latitude/longitude to utm coordinates required for plotting and adds corner reference points to your data for ease of overlay; 'a462' which is the actual program to create a tape for the plotter; and 'poi' - the plotter operator instructions.

The STATPAC system and its supporting programs allow for many kinds of statistical procedures. It is possible to make contour maps and plots based on the concentrations of elements. Other programs available are Fisher-K statistics, percentile routines, histograms, correlation analysis, regression analysis, analysis of variance, and ermode and qmode factor analysis.

Pages 2-16 of this handbook are available on the Multics system by typing
dp >uml>statpac>doc>statpac.runoff
This information was written by George VanTrump,Jr., Jack B. Fife, and Alfred T. Miesch as an introduction to the STATPAC system. Some of the information contained therein is no longer current, but the general information provided is useful. This document is included here for completeness.

Throughout this handbook the parts that are underlined are the things the user types.

U.S. Geological Survey

Geologic Division

Branches of Regional Geochemistry and Exploration Research

Denver, Colorado

USER'S GUIDE

TO THE

STATPAC SYSTEM

THE STATPAC SYSTEM

by

George VanTrump, Jr., Jack B. Fife, Alfred T. Miesch

Date: March 20, 1983

The STATPAC System

CONTENTS

The STATPAC System

ABSTRACT

STATPAC is an acronym for STATistical PACkage. The STATPAC computer programs are integrated into the STATPAC system for the statistical reduction of geochemical data. The principal advantage of the system is the flexibility and freedom of choice afforded the user in the manner of statistical treatment of data. These programs provide for most types of statistical reduction normally used in geochemistry and petrology, but bridges to other program systems for statistical processing and automatic plotting are also available.

INTRODUCTION

The STATPAC System (VanTrump and Miesch, 1977) is an integrated set of computer programs designed specifically for the reduction and statistical analysis of geochemical data. All of the programs, except a few that are used for initial data entry, read binary files stored on a magnetic device which contain data sets written in a STATPAC format (See Appendix C). The same format is used for all output binary files written by the programs. The programs may be appropriate for any data that can be logically cast into a two-dimensional matrix wherein the rows represent items (observations) and the columns represent attributes (variables) measured for each item. In geochemical work, the items or observations are samples of rocks or other material, and the attributes or variables are measured concentrations of chemical constituents. The concentrations are numeric values usually in percent or parts per million and can be qualified in some manner. Examples of qualified data are "less than 0.01 percent", "not detected", and "greater than 10 percent". In order to provide for these situations, six different qualifying codes are allowed and are as follows:

Code	Meaning
L	Less than lower limit of analytical determination
N	Not detected
T	Trace amount present
G	Greater than upper limit of analytical determination
H	No data because of analytical interference
B	Blank -- no analysis performed

The STATPAC programs are classified into two catagories, pseudo-interactive (batch oriented, Appendix A) and interactive (Appendix B). The pseudo-interactive programs require that the user have the program control parameters located in a separate file and organized as described in the documentation for the program being executed. These also require the user to execute a special "ec" (exec_com) with each program. This "ec", initiated by the "exec" abbrev, handles the necessary data files for the program. The interactive programs prompt the user for the necessary data files and

control parameters directly. Generally these programs are self documenting and take advantage of the extended features of MULTICS FORTRAN residing on the U.S. Geological Honeywell computer. All programs assume that the binary input files are in STATPAC format.

The STATPAC programs are resident on the Denver, Reston, and Menlo Park MULTICS computers and are available to any registered MULTICS user. Documentation on the pseudo-interactive programs is located in the directory:

```
>uml>statpac>documentation
```

Abstracts of the interactive programs and instructions for their use are in the above directory.

The source code for the programs is available on a limited basis from the authors and is located in the following directory:

```
>uml>statpac>source
```

The object code resides in the directory:

```
>uml>statpac>object
```

These directories are located in the same area for all three MULTICS sites.

Some supplementary STATPAC programs are described in the segment:

```
>uml>statpac>doc>atm.abstracts
```

ACKNOWLEDGMENTS

The STATPAC system was developed through the part-time efforts of a large number of U.S. Geological Survey personnel. Special recognition is made of the outstanding contributions to STATPAC by R. N. Eicher, D. S. Handwerker, G. I. Selner, and F. B. Sower. Other programmers who contributed significantly to STATPAC are W. L. Anderson, W. A. Buehrer, Alan Popiel, M. R. Roberts, and Robert Terrazas.

RUN PREPARATION

To use the STATPAC programs, the following preparatory work must be done prior to execution:

1. The object library of the STATPAC must be added to your search rules with the following command:

```
asr >uml>statpac>object
```

This command will add the STATPAC library to your search rules for the duration of a process. If a "new_proc" command is issued, the STATPAC library will be dropped from your search rules; the command will have to be re-issued. Users who are going to use the STATPAC often will probably want to place this command in their start_up.ec.

2. To execute a psuedo-interactive program, the following abbreviation must be created:

```
.ab exec ec >uml>statpac>data_bases>pgmproc
```

This will cause the word "exec", at the beginning of a line, to expand into the above abbreviation and then execute the pgmproc "ec" (exec_com) located in the STATPAC object library.

To execute a specific program, the following command must be entered as shown below; it is assumed that the program control file has been made prior to the execution of this command:

```
exec xxxxx a1 a2 a3
```

where xxxxx is the program name and a1, a2, and a3 are arguments defined as follows:

a1 = y or n, y if the program reads an input binary file. Otherwise n for no input file.
a2 = y or n, y if the program writes an output binary file. Otherwise n for no output file.
a3 = y or n, same as a1 but used only when 2nd input file is required.

In the above, a1 applies to an input binary file, a2 output, and a3 secondary input. All binary files are assumed to be in STATPAC format. If the programs described in "atm.abstracts" are being executed, then a1, a2 and a3 must be used according to their definitions given in "atm.abstracts".

When the pgmproc "ec" is involked for those programs which are not described in "atm.abstracts", it will prompt you for the following:

a. Do you want output on TTY? If yes is answered, the output from the program executed will be listed on your terminal. If no, a printer file will be created in your area. NOTE: Most of the printer output from the pseudo-interactive programs is formatted for 133 characters per line. If your TTY allows fewer than 133 characters, output printed on the TTY may be difficult or impossible to read. The recommended answer in this situation is no.

b. What is program control file name? The name of file that contains the program control records as required by the program's documentation is entered here.

c. What is input binary file name? This question appears only if a1 equals y. The input binary file name is entered here.

d. What is output binary file name? This question appears only if a2 equals y. The output binary file name is entered here.

e. What is 2nd input binary file name? This question appears only if a3 equals y. The second input binary file name is entered here.

f. Do you want your printer file queued? This question appears only after successful execution of the program and if you requested that printer files be stored in your area. If yes is answered, the printer file is queued in queue 4 for printing on the line printer and will be deleted automatically after printing. DO NOT delete the output file after you requested it to be printed. If your answer is no, the printer file will remain in your area awaiting your disposition.

During execution of the pgmproc "ec", if a file has been requested for input and the file name you entered does not exist, the "ec" will so indicate and request that you re-enter the file name. If a file has been requested for output and the file name you entered already exists, the "ec" will ask if you want to overwrite the existing file. If yes, the "ec" proceeds. If no, the "ec" will ask you to re-enter the file name.

Several examples of the "exec" command follow:

a. Execution of Card Entry, d0092; this program creates a binary STATPAC output file but the input data are contained in the program control file. Thus, there is no binary STATPAC input file.

```
exec d0092 n y
```

b. Execution of Publication Listing, d0039; this program reads a binary input file, but does not create a binary output file.

```
exec d0039 y
```

3. To execute an interactive program, type the name of program as a command. The program executed will prompt for the necessary data files and the program control parameters.

REFERENCES

VanTrump, George, Jr., and Miesch, A.T., 1977, The U.S. Geological Survey RASS-STATPAC System for management and statistical reduction of Geochemical Data: Computers and Geosciences, v. 3, no. 3, p. 475-488.

Appendix A - Pseudo-Interactive Programs

Number	Title
a230	Card Input - Object Time Format
a458	X-Y Conversion
a462	Plot STATPAC
a470	Geochemical Summary
a472	Retrieval
b607	Canonical Correlation Analysis
b624	X-Y Printer Plot
b850	Cosine Theta Matrix
b851	Modified Correlation Analysis
c539	STATPAC Data Modifications
d0010	Fisher-K Analysis
d0026	Average Replicate Samples
d0035	Analysis of Variance Preparation
d0036	Graphical Analysis
d0038	Analysis of Variance
d0039	Publication Listing
d0060	Discriminant Analysis
d0065	Card Exit
d0066	Standard Error of Replicate Samples
d0070	Z-Matrix Search
d0092	Card Entry
d0094	Regression Analysis - Stepforward
d0096	Factor Analysis - R and Q Mode
d0097	Factor Analysis - Q Mode
d0101	Correlation Analysis
d0136	Correlation Analysis - Spearman-Kendall Rank

Appendix B - Interactive Programs

Name	Title or Description
bastat	Computes basic statistics
boundary	Creates pgm control file containing lower bounds
condeg	Converts dec degs to degs, mins, & secs vice versa
creates	Creates pgm control file for pseudo-interactive pgms
edstat	Editor for STATPAC binary files
entries	Creates STATPAC binary file from data entered from TTY
genlevels	Generates AOV level records
genstat	General data utility & reduction program
geocon	Converts geodetics to UTM coordinates
gridm	Grids a STATPAC data set
header	Creates header record in pgm control file from bin file
icp	Converts icp data stored in a character file to a Statpac file.
listp	Creates a standard publication listing of a data set.
logs	Converts data from raw to logs
lookst	Reviews STATPAC data sets
probplot	Plots probability vs. cumm freq on Tektronixs
publst	Creates open file pub listing
rem	Relative Element Magnitude
rfm	Relative Fraction Magnitude
smerge	Merges two data sets into one
sortg	Sorts a data set
strsed	Displays data on Tektronixs

Appendix C - STATPAC Data Set

A STATPAC data set is defined as a two-dimensional data matrix with a data set identifier, row and column identifiers, row indices and a location for each row (sample). This data set is contained in a binary file (or segment) residing on a magnetic device with the first record a header record and the second through last data records in a specific format (written by subroutine "putlst" and read by subroutine "getlst". See Appendix E). Several data sets may reside in one file.

The two-dimensional data matrix consists of N rows and M columns. Each row (sample) contains the measurements of an entity (such as a rock or soil sample) and each column (element) contains the measurement of the same property (such as pH or copper content) for all rows.

Each element of the data matrix is made up of a number and a code which can be used in various combinations to represent numeric values, such 3.75, or qualified values, such as <3.75 (3.75 L). If the value has a non-blank associated code, it is considered to be a qualified value. The codes acceptable to STATPAC are shown in the Introduction section, page 1.

A data set identifier (Data Set ID) is associated with each data set. This identifier is up to eight alphanumeric characters and is used to identify one data set from another when multiple data sets have been stored in one file.

An identifier can be associated with each row and with each column of the data matrix. These identifiers consist of up to eight alphanumeric characters to aid in identifying the columns of the printed output, 16 alphanumeric characters (the first 8 primary and last 8 secondary) for association with rows. Only the primary row identifiers are displayed in printed output. The primary identifier could be the field number for that sample and the secondary the laboratory number.

A geographic location can be associated with each row (or sample). This location is generally the latitude/longitude location from where the sample was taken.

A numerical index ranging from 1 to N is assigned to each row of the data matrix. These indices are provided by the programs for referencing purposes. An index is implied for each column for referencing purposes.

The header record consists of a data set identifier, the number of rows N, the number of columns M, and the column identifiers.

Each data record consists of the row index, row identifier, location and the data elements for that row of the data matrix.

Appendix D - Program Control File

Each pseudo-interactive STATPAC program requires certain information necessary to process a given data set. Generally the program requires the STATPAC data set identifier (Data Set ID) of the data to be used, the necessary program options, the number of rows and/or columns in the data matrix to be selected, and other information, depending on the program. These data are contained in records of the program control file. Each record, including blanks, may be up to 80 ASCII characters in length. A header record is always required; additional records may be required to define the control parameters.

Program control files are usually prepared using the interactive program "creates" and frequently contain the following records at the beginning of the file in the order indicated:

1. Header record - mandatory
2. Column selector record(s) - optional
3. Row selector record(s) - optional
4. Column identifier record(s) - optional

These records are formatted as follows:

1. Header record

Position	Format	Entry	Definitions
1-30	7A4,A2	Title	Up to 30 characters of alphanumeric information used to title the printed output of the program from the selected data set.
31-38	2A4	Input ID	Up to 8 characters of alphanumeric information by which the input data set is identified. This ID must be unique to the data set desired within a given file. If not, then the first data set encountered in the file with the specified ID will be used.
39-43	I5	Input N*	The number of rows in the input data set (right justified, N ≤ 99,999).
44-46	I3	Input M*	The number of columns in the input data set (right justified, M ≤ 199).
47-55	9I1	Opt(1-9)	See individual program documentations for explanation of these options.
56	I1	Opt(10)=	0 or blank. Does not read a column identifier record. The program uses the column identifiers contained in the

			input data set. 1 Reads new column identifiers for ALL columns in the output data set. A column identifier record must be provided.
57-64	2A4	Output ID	Up to 8 characters of alphanumeric information used to identify the output data set. This ID must be unique to the output data set within the output file.
65-69	I5	Output N	The number of rows in the output data set (right justified).
70-72	I3	Output M	The number of columns in the output data set (right justified).
73-77	I5	PRSN	The number of pairs of row indices needed to select the desired rows of the input data set. If blank, all rows are included. If not blank, this number must be right justified and row selector record(s) must be provided.
78-80	I3	PRSM	The number of pairs of column indices needed to select the desired columns of the input data set. If blank, all columns are included. If not blank, this number must be right justified and column selector record(s) must be provided.

---

* If both the Input N and Input M are zero or blank, the programs obtain these values from the input data set and check only the Input ID with the ID of the input data set.

---

2. Column selector record(s) (used only if PRSM is not zero or blank)

These records permit the user to select the desired columns from the input data set. The columns are selected in pairs, forming an increasing sequence within a pair but not necessarily between pairs. Each pair specifies the beginning column (first index of the pair) through the last column (second index of the pair) to be selected. The number entered in the field PRSM specifies the number of pairs to be given. The pairs are entered 10 per record on as many records as necessary to define PRSM pairs. The second index may be zero, indicating that the "pair" consists of a single column. The first index of the first pair is entered in positions 1-3; the second in positions 4-6. The second pair is entered in positions 7-12. This is repeated until 13 pairs have been entered in the first record. The 14th pair is

entered in the second record in positions 1-6. All numbers are righ justified in their respective 3-position fields.

3. Row selector record(s) (used only if PRSN is not zero or blank)

These records permit the user to select the desired rows from th input data set. The rows are selected in pairs, forming an increasin sequence within a pair and increasing sequence between pairs. Each pai specifies the beginning row (first index of the pair) through the las row (second index of the pair) to be selected. The number entered i the field PRSN specifies the number of pairs to be given. The pairs ar entered 8 per record on as many records as necessary to define PRS pairs. The second index may be zero, indicating that the "pair consists of a single row. The first index of the first pair is entere in positions 1-5; the second in positions 6-10. The second pair i entered in positions 11-20. This is repeated until 8 pairs have bee entered in the first record. The 9th pair is entered in the secon record in positions 1-10. All numbers are right justified in thei respective 5-position fields.

4. Column identifier record(s) (used only if Opt(10)=1)

These records permit the user to associate an 8-characte alphanumeric identifier with each column in the output data set. Th identifiers are entered 10 per card on as many records as necessary t define Output M columns. The first is entered in positions 1-8; th second in positions 8-16. This is repeated until 10 identifiers hav been entered in the first record. The 11th is entered in the secon record in positions 1-8. The identifiers may be entered in upper c lower case and right or left justified in their respective fields.

Appendix E - Read/Write a STATPAC Data Set

This appendix is provided for those who wish to read and write STATPAC data files in their own FORTRAN programs. Each STATPAC file contains 2 types of records: 1) a header record providing a data set ID, matrix size, and column identifiers and 2) data records. The sequence of each record is as follows:

1. Header Record:

ID = Data Set identifier, 2 words for a total of 8 characters, integer.
N = Number of rows in the matrix, integer.
M = Number of columns in the matrix, integer.
KOLID = "M" column identifiers with each identifier consisting of two words for a total of 8 characters per identifier.

2. Data Record:

IUNIT = Input unit when reading, output unit when writing, integer.
NR = Row number, 1 word, integer.
IRID = Row identifier, 4 words for a total of 16 characters, integer.
LOC = Location, 2 words (latitude-longitude in degrees, minutes, seconds), integer, each word formatted as DDDMMSS with DDD-degrees, MM-minutes, and SS-seconds.
X = "M" data values, real, 1 word per value.
IA = Qualifying codes, 1 code per word, left justified.

The header record is written and read with simple FORTRAN statements. The data records are written and read by calling, respectively, subroutines PUTLST and GETLST, which reside in the STATPAC directory. Examples are as follows:

```
C     Writing a Statpac data file.

        DIMENSION ID(2),KOLID(M,2),IRID(4),LOC(2),X(M),IA(M)
          . .
        IUNIT=output unit
          . .
        WRITE (IUNIT) ID,N,M,(KOLID(I,1),KOLID(I,2),I=1,M)
          . .
        DO 10 I=1,N
          . .
   10   CALL PUTLST (IUNIT,I,IRID,LOC,X,IA,M)
          . .
        END


C     Reading a Statpac data file.

        DIMENSION ID(2),KOLID(M,2),IRID(4),LOC(2),X(M),IA(M)
```

```
      .  .
      IUNIT=input unit
      .  .
      READ (IUNIT,END=100) ID,N,M,(KOLID(I,1),KOLID(I,2),I=1,M)
      .  .
      DO 10 I=1,N
      .  .
 10   CALL GETLST (IUNIT,NR,IRID,LOC,X,IA,M,$100)
      .  .
100   STOP
      END
```

GENERAL INFORMATION

When you are first registered on Multics you will be registered under the Branch of Exploration Geochemistry (BEG) Project_id Gxgeneral. You will be added to other Project_ids as the need arises. We will set up your area with a "start_up.ec" and the necessary segments that you need to execute the STATPAC series of programs.

If you need help when you are online you can type 'whom' to see who else is on the system at that time. If you see "GVantrump.Cmptappl", for example, listed there you can send mail in the following manner:

mail * GVantrump Cmptappl

Input:

you type your message here in response to the "input:" prompt. You can type as many lines as you need to explain your problem or give your phone number. When you are finished and want to send the message you need to type a '.' (a period) on a line by itself and then the message is sent.

.

If there is no one that you can ask for help in the list of persons currently logged on, you can ask the system for a user's default Project_id by using the following command:

dfp WSpeckman

The system will respond with

"WSpeckman.Cmptappl"

and you can send mail as illustrated above. The mail you send will be read whenever that person logs onto the Multics computer.

The backspace key is not used to correct typing errors. Two special characters are used. The '#' is used to delete one character. Two '#' would delete the last two characters typed. The symbol '@' is used to delete the entire typed line. These symbols are sometimes used in the examples to illustrate how error correction looks to the terminal user. The notation "↵" is used to indicate a carriage return.

STATPAC DATA FILES

STATPAC files are binary files. They can be addressed ONLY through special programs written for that purpose. You cannot use a text editor ('teco' or 'qedx') to access them and you cannot 'dprint' or 'print' a file as such. Each STATPAC file contains at least one dataset. When you access your data through a program you have to tell the program the dataset identifier. The program does not know that there is only one dataset.

A file name can be a maximum of 32 characters while a dataset name can be only 8 characters. The file name can be the same as the dataset name if only 8 characters are used for the file name. There can be no imbedded blanks in the dataset identifier (ID) or file name.

Every STATPAC program that is prefixed by 'A', 'B', or 'D' followed by numbers needs a program control file. The program control file is a character file that is made by you by using the program 'creates' or by using a text editor. (Special programs have been developed to create a program control file for some STATPAC programs. These are discussed and used in the examples where appropriate.) The program control file is what the program reads as it is executing, to find out which options you have selected.

STATPAC files are not the same as RASS files. Raw data from our laboratories are entered into the RASS data base. Retrievals are made from the RASS data base and STATPAC files are created at this time. The RASS computer group takes care of these procedures. RASS files are not ASCII files; you cannot print them. STATPAC programs cannot be executed using a RASS file for input.

STATPAC files are created in one of three ways: (1) a retrieval from the RASS data base; (2) user enters the data by typing it into a program designed to create a STATPAC file ('edstat' can be used for this purpose); or (3) a data tape is created by an outside source (according to our tape specifications) and is processed through a conversion program to create a STATPAC file.

NAMING CONVENTIONS FOR FILES AND DATASET IDENTIFIERS

Use only the characters 'a' thru 'z', '0' thru '9', '.' (period), '-' (hyphen), and '_' (underscore) in the names of files. A space (or blank) cannot be used.

Name your files so the names are meaningful to you. You should develop a naming scheme so you can easily list files by group and tell exactly what they are simply by looking at the name. For example:

```
denver.original
denver.corr1
denver.corr2
denver.sorted
denver.sort.corr3
denver.for-open-file
denver.for-maps
```

DISK STRUCTURE AND FILE STORAGE

When a person is first registered on Multics, he is given a default project. When he logs in he is located at his Person_id under that Project_id. In BEG we speak of this as the public disk structure. BEG has several different Project_ids and a person may be registered under any number of them, depending on which Branch projects he works under. Some of the BEG Project_ids are Fswild, Blmwild, Deg2, Amrapgx, Gxgeneral. The pathname to a person under a project on the public disk is as follows:

>udd>Blmwild>JDoe

JDoe can have as many sub-directories as he wishes under his Person_id or he may choose to have none.

Persons in BEG also have another structure to remember and we speak of that as the private disk structure. BEG has five private disk packs and each person registered on Multics is assigned to one of those disks. They are:

Omrmtr
Omrmtr1
Omrmtr2
Omrmtr3
Omrmtr4

The structure of the private disks is by Person_id not Project_id. The path name to JDoe's area on the private disk Omrmtr3 would be as follows:

>pp>Omrmtr3>JDoe

Under JDoe on Omrmtr3 there could be several different sub-directories or there may be none. This structure is set up in BEG because persons need to store data off-line where it will not be charged for storage by Information Systems Division (ISD). Any files that are not being used daily should be stored on the private disk and not on the public disk. It is your responsibility as a user to make sure your areas are structured the way you want them and to keep files that aren't being used out of the public area.

To copy files you must be in the desired destination directory. For JDoe to copy files from his public area to his sub-directory Blmwild on Omrmtr3 for storage, he would do the following:

```
cwd  (puts him in >udd>Blmwild>JDoe)
ls   (list shows filea  fileb  filec )
attach_lv Omrmtr3 (system returns message when mounted)
cwd >pp>Omrmtr3>JDoe>Blmwild
cp >udd>Blmwild>JDoe>(filea fileb filec)
pwd  (print working directory)
ls  (lists files in directory for verficiation of copy)
cwd  (moves back to >udd>Blmwild>JDoe)
detach_lv Omrmtr3  (detach disk immediately)
dl filea fileb filec   (deletes these files from public disk)
```

For JDoe to copy files from Omrmtr3 to his public area he would do the following:

```
cwd >pp>Omrmtr3>JDoe>Blmwild
ls   (shows files in sub-directory Blmwild stored on disk Omrmtr3)
cwd  (moves working directory back to >udd>Blmwild>JDoe)
attach_lv Omrmtr3
cp >pp>Omrmtr3>JDoe>Blmwild>(filea filec)
pwd (print working directory)
ls  (to make sure copied correct files to public area)
detach_lv Omrmtr3
```

Files that are copied to public area from private disk remain on the private disk. It is a copy, not a move.

DATA MANIPULATION

The first step in dealing with computer data files is to "clean up" the data. This involves:
(1) spot checking a listing of the data values
(2) checking the qualified values
(3) checking the upper and lower limits for consistency
(4) doing a point plot to check the accuracy of the sample locations

The examples used here will trace a file through the above steps.

The first step is to request a STATPAC retrieval of the desired data from RASS. When you receive the file it will be named in the following manner: stat356.z9
You should rename it to something meaningful to you using the following command.

rn stat356.z9 denver.original

Once you have a STATPAC file, the first thing to do is take a quick look at it using the program 'lookst'. See the following examples.

'lookst' Program

'lookst' is used to review the data in a STATPAC file. You can use 'lookst' to find the name of the dataset ID and what variables are contained in the dataset. You can print data values, latitude and longitude, and row identifiers (row_ids).

Examples of all these follow:

```
lookst

Enter Input Statpac File Name = denver.original

How many data sets in this file do you want to skip ? 0

Data Set ID   = -seds     -
No of Rows    =    50
No of Columns=    36

Do you want to print Input Column IDs ? y
  LATITUDE      LONGITUD      S-FE%         S-MG%         S-CA%
  S-TI%         S-MN          S-AG          S-AS          S-AU
  S-B           S-BA          S-BE          S-BI          S-CD
  S-CO          S-CR          S-CU          S-LA          S-MO
  S-NB          S-NI          S-PB          S-SB          S-SC
  S-SN          S-SR          S-V           S-W           S-Y
  S-ZN          S-ZR          S-TH          AA-CU-P       AA-PB-P
  AA-ZN-P

Do you want to print the data for this data set ? n

What do you want next ?
      next  -  read next DS
      skip  -  skip DSs from here & list
      new   -  list DS in a new file
      stop  -  exit from pgm

stop

STOP
r 06/27/83  1339.8 mdt Mon $0.13 $0.49
```

```
lookst

Enter Input Statpac File Name = denver.original

How many data sets in this file do you want to skip ? 0

Data Set ID   = -seds     -
No of Rows    =    50
No of Columns=    36

Do you want to print Input Column IDs ? n

Do you want to print the data for this data set ? y

Do you want selected rows ? y

How many row pairs ? 2

Row selector pairs :
From-To (xxx,xxx) ? 1,1
From-To (xxx,xxx) ? 49,50

Do you want selected columns ? y

How many columns pairs(-1 = RowID, 0 = Lat/Long) ? 3

Column selector pairs :
From-To (xxx,xxx) ? 3,4
From-To (xxx,xxx) ? 11,12
From-To (xxx,xxx) ? 21,22

Do you want Lat-Long used from data in lieu of header record ? y

Do you want to print the selected column IDs ? y

Selected Column IDs :
  S-FE%         S-MG%         S-B           S-BA          S-NB
  S-NI

DATA:

Row No =    1  Row ID = DEN001   EGV857  Location =  38* 42' 15"  105* 10' 14"
  3.00000E+00   1.00000E+00   3.00000E+01   3.00000E+02   1.00000E+01N
  2.00000E+01

Row No =   49  Row ID = DEN049   EGV901  Location =  38* 43'  9"  105* 11' 53"
  3.00000E+00   1.00000E+00   5.00000E+01   5.00000E+02   1.00000E+01
  1.50000E+01

Row No =   50  Row ID = DEN050   EGV902  Location =  38* 42' 51"  105* 12' 38"
  3.00000E+00   7.00000E-01   3.00000E+01   5.00000E+02   1.00000E+01
  1.00000E+01

What do you want next ?
      next  -  read next DS
      skip  -  skip DSs from here & list
      new   -  list DS in a new file
      stop  -  exit from pgm

stop

STOP
r 06/27/83  1339.8 mdt Mon $0.09 $0.58
```

```
lookst

Enter Input Statpac File Name = denver.original

How many data sets in this file do you want to skip ? 0

Data Set ID   = -seds     -
No of Rows    =    50
No of Columns=    36

Do you want to print Input Column IDs ? n

Do you want to print the data for this data set ? y

Do you want selected rows ? n

Do you want selected columns ? y

How many columns pairs(-1 = RowID, 0 = Lat/Long) ? -1

RowNo Row ID     RowNo Row ID     RowNo Row ID     RowNo Row ID     RowNo Row ID
    1 DEN001         2 DEN002         3 DEN003         4 DEN004         5 DEN005
    6 DEN006         7 DEN007         8 DEN008         9 DEN009        10 DEN010
   11 DEN011        12 DEN012        13 DNE013        14 DEN104        15 DEN015
   16 DEN016        17 DEN017        18 DEN018        19 DEN019        20 DEN020
   21 DNN021        22 DEN022        23 DEN023        24 DEN024        25 DEN025
   26 DEN026        27 DEN027        28 DEN028        29 DEN029        30 DEN030
   31 DEN031        32 DEN032        33 DEN033        34 DEN034        35 DEN035
   36 DEN036        37 DEN037        38 DEN038        39 DEN039        40 DEN040
   41 D3N041        42 DEN042        43 DEN043        44 DEN044        45 DEN045
   46 DEN046        47 DEN047        48 DEN048        49 DEN049        50 DEN050

What do you want next ?
      next  -  read next DS
      skip  -  skip DSs from here & list
      new   -  list DS in a new file
      stop  -  exit from pgm

stop

STOP
r 06/27/83  1339.8 mdt Mon $0.04 $0.62
```

```
lookst

Enter Input Statpac File Name = denver.original

How many data sets in this file do you want to skip ? 0

Data Set ID  = -seds     -
No of Rows   =     50
No of Columns=     36

Do you want to print Input Column IDs ? n

Do you want to print the data for this data set ? y

Do you want selected rows ? y

How many row pairs ? 1

Row selector pairs :
From-To (xxx,xxx) ? 1,5

Do you want selected columns ? y

How many columns pairs(-1 = RowID, 0 = Lat/Long) ? 0

Do you want Lat-Long used from data in lieu of header record ? y

   Row     * * *  Row ID  * * *     Latitude     Longitude
    No     Primary     Secondary     Dg Mn Sc      Dg Mn Sc
     1     DEN001        EGV857     38 42 15     105 10 14
     2     DEN002        EGV858     38 42 16     105 10 18
     3     DEN003        EGV861     38 42 21     105 10 14
     4     DEN004        EGV868     38 44 14     105 11 45
     5     DEN005        EGV869     38 44  5     105 11 50

What do you want next ?
      next  -  read next DS
      skip  -  skip DSs from here & list
      new   -  list DS in a new file
      stop  -  exit from pgm

stop

STOP
r 06/27/83  1339.8 mdt Mon $0.02 $0.65
```

'd0039' Program

The next step is to get a listing of the data. Since it is a binary file you CANNOT 'dprint' the file. One of the quickest listing programs is 'd0039'. To make the program control file (header card file) for 'd0039' execute the program 'head39':

```
ls

Segments = 1, Lengths = 3.

r w     3  denver.original

r 06/27/83  1344.8 mdt Mon $0.01 $0.25

head39

What is the input file name? : denver.original

Enter output card file name : d39den

title for listing (30 char) : denver sediments

Do you want row numbers printed?  : y

Do you want lat.-long. in deg.,min.,sec.  ? :y

STOP
r 06/27/83  1344.8 mdt Mon $0.06 $0.32
```

If your data has x- and y-coordinates instead of latitude and longitude, answer the question "do you want lat.-long. in deg.,min.,sec.?" with 'no'.

To execute the program 'd0039':

```
exec d0039 y                                          'y' means yes, there is an input binary file.

Do you want printer output on TTY     ? no            The desired output from 'd0039' is the printer file.

What is program control file name     ? d39den

What is input binary file name        ? denver.original

STOP

Do you want your printer file queued ? no
r 06/27/83  1345.1 mdt Mon $0.92 $1.24                Don't send to the printer automatically.

ls -ft 2

Segments = 3, Lengths = 12.                           Lists the first 2 files in directory.

r w     8  d0039.!BBBJMzXccMxNbp.list
r w     1  d39den                                     Printer files always have this form.

r 06/27/83  1345.1 mdt Mon $0.00 $1.24

                                                      Rename printer file and 'dprint' it yourself so that if you don't receive the printout, you can 'dprint' it again without re-executing the program.
rn d0039.*.list d0039.denver
r 06/27/83  1345.1 mdt Mon $0.01 $1.25

ls -ft 2

Segments = 3, Lengths = 12.

r w     8  d0039.denver                               Clean up the area as you work. Delete files when they are no longer needed for execution or backup.
r w     1  d39den

r 06/27/83  1345.1 mdt Mon $0.00 $1.25

dp d0039.denver
1 request signalled, 0 already in printer queue 4
r 06/27/83  1345.1 mdt Mon $0.03 $1.28
```

The following four pages are the output from the above execution of the program 'd0039'. Errors have been circled.

DATE 12/ 1/81

denver sediments

ROWNO	SAMPLE	LATITUDE	LONGITUD	S-FE%	S-MG%	S-CA%	S-TI%	S-MN	S-AG	S-AS	S-AU
1	DEN001	38 42 15N	105 10 14W	3.0000	1.0000	1.5000	0.5000	500.0000	0.5000N	200.0000	10.0000N
2	DEN002	38 42 16N	105 10 18W	3.0000	1.0000	1.5000	0.5000	300.0000	0.5000N	200.0000	10.0000N
3	DEN003	38 42 21N	105 10 14W	2.0000	1.0000	1.0000	0.3000	300.0000	0.5000N	200.0000	10.0000N
4	DEN004	38 44 14N	105 11 45W	2.0000	0.7000	1.5000	0.3000	500.0000	0.5000N	200.0000	10.0000N
5	DEN005	38 44 05N	105 11 50W	2.0000	0.5000	1.0000	0.3000	300.0000	0.5000N	200.0000	10.0000N
6	DEN006	38 44 12N	105 11 54W	5.0000	1.0000	2.0000	0.5000	700.0000	0.5000N	200.0000	10.0000N
7	DEN007	38 44 05N	105 10 45W	1.5000	0.5000	1.5000	0.3000	300.0000	0.5000N	200.0000	10.0000N
8	DEN008	38 42 58N	105 10 11W	1.5000	0.5000	0.7000	0.3000	700.0000	0.5000N	200.0000	10.0000N
9	DEN009	38 42 36N	105 11 55W	5.0000	1.0000	2.0000	0.7000	500.0000	0.5000N	200.0000	10.0000N
10	DEN010	38 42 33N	105 11 53W	5.0000	0.7000	1.5000	0.5000	1000.0000	0.5000N	200.0000	10.0000N
11	DEN011	38 42 07N	105 11 43W	5.0000	1.5000	2.0000	0.7000	700.0000	0.5000N	200.0000	10.0000N
12	DEN012	38 42 08N	105 11 38W	5.0000	1.5000	2.0000	0.7000	300.0000	0.5000N	200.0000	10.0000N
13	DNE013	38 42 23N	105 11 34W	3.0000	1.5000	3.0000	0.7000	500.0000	0.5000N	200.0000	10.0000N
14	DEN104	38 42 28N	105 12 45W	3.0000	1.0000	2.0000	0.7000	300.0000	0.5000N	200.0000	10.0000N
15	DEN015	38 43 02N	105 13 02W	3.0000	0.7000	2.0000	0.5000	300.0000	0.5000N	200.0000	10.0000N
16	DEN016	38 42 51N	105 13 06W	3.0000	0.5000	1.5000	0.5000	700.0000	0.5000N	200.0000	10.0000N
17	DEN017	38 42 35N	105 10 50W	3.0000	1.0000	2.0000	0.5000	700.0000	0.5000N	200.0000	10.0000N
18	DEN018	38 43 02N	105 11 08W	7.0000	1.5000	3.0000	0.7000	700.0000	0.5000N	200.0000	10.0000N
19	DEN019	38 43 36N	105 11 31W	3.0000	0.7000	2.0000	0.5000	1500.0000	0.5000N	200.0000	10.0000N
20	DEN020	38 42 54N	105 14 09W	3.0000	0.7000	2.0000	0.7000	500.0000	0.5000N	200.0000	10.0000N
21	DNN021	38 35 07N	105 16 54W	1.5000	0.5000	2.0000	0.5000	300.0000	0.5000N	200.0000	10.0000N
22	DEN022	38 43 09N	105 11 53W	3.0000	1.0000	0.7000	0.3000	500.0000	0.5000N	200.0000	10.0000N
23	DEN023	38 42 51N	105 12 38W	3.0000	0.7000	2.0000	0.7000	700.0000	0.5000N	200.0000	10.0000N
24	DEN024	38 43 33N	105 11 35W	3.0000	1.5000	2.0000	0.7000	500.0000	0.5000N	200.0000	10.0000N
25	DEN025	38 44 34N	105 11 56W	2.0000	0.7000	1.5000	0.5000	1000.0000	0.5000N	200.0000	10.0000N
26	DEN026	38 44 38N	105 12 08W	5.0000	1.5000	2.0000	0.7000	700.0000	0.5000N	200.0000	10.0000N
27	DEN027	37 44 29N	105 12 25W	5.0000	1.5000	2.0000	0.7000	700.0000	0.5000N	200.0000	10.0000N
28	DEN028	38 42 15N	105 10 14W	3.0000	1.0000	1.5000	0.5000	500.0000	0.5000N	200.0000	10.0000N
29	DEN029	38 42 16N	105 10 18W	3.0000	1.0000	1.5000	0.5000	300.0000	0.5000N	200.0000	10.0000N
30	DEN030	38 42 21N	105 10 14W	2.0000	1.0000	1.0000	0.3000	300.0000	0.5000N	200.0000	10.0000N
31	DEN031	38 44 14N	105 11 45W	2.0000	0.7000	1.5000	0.3000	500.0000	0.2000	200.0000	10.0000N
32	DEN032	38 44 05N	105 11 50W	2.0000	0.5000	1.0000	0.3000	300.0000	0.5000N	200.0000	10.0000N
33	DEN033	38 44 12N	105 11 54W	5.0000	1.0000	2.0000	0.5000	700.0000	0.5000N	200.0000	10.0000N
34	DEN034	38 44 05N	105 10 45W	1.5000	0.5000	1.5000	0.3000	300.0000	0.5000N	200.0000	10.0000N
35	DEN035	38 42 58N	105 10 11W	1.5000	0.5000	0.7000	0.3000	700.0000	0.5000N	200.0000	10.0000N
36	DEN036	38 42 36N	105 11 55W	50.0000	1.0000	2.0000	0.7000	500.0000	0.5000N	200.0000	10.0000N
37	DEN037	38 42 33N	105 11 53W	5.0000	0.7000	1.5000	0.5000	1000.0000	0.5000N	200.0000	10.0000N
38	DEN038	38 42 07N	105 11 43W	5.0000	1.5000	2.0000	0.7000	700.0000	0.5000N	200.0000	10.0000N
39	DEN039	38 42 08N	105 11 38W	5.0000	1.5000	2.0000	0.5500	300.0000	0.5000N	200.0000	10.0000N
40	DEN040	38 42 23N	105 11 34W	3.0000	1.5000	3.0000	0.7000	500.0000	0.5000N	200.0000	10.0000N
41	D3N041	38 42 28N	105 12 45W	3.0000	1.0000	2.0000	0.7000	300.0000	0.5000N	200.0000	10.0000N
42	DEN042	38 43 02N	105 13 02W	3.0000	0.7000	2.0000	0.5000	300.0000	0.5000N	200.0000	10.0000N
43	DEN043	38 42 51N	105 13 06W	3.0000	0.5000	1.5000	0.5000	700.0000	0.5000N	200.0000	10.0000N
44	DEN044	38 42 35N	105 10 50W	3.0000	1.0000	2.0000	0.5000	700.0000	0.5000N	200.0000	10.0000N
45	DEN045	38 43 02N	105 11 08W	7.0000	1.5000	3.0000	0.7000	700.0000	0.5000N	200.0000	10.0000N
46	DEN046	38 43 36N	105 11 31W	3.0000	0.7000	2.0000	0.5000	1500.0000	0.5000N	200.0000	10.0000N
47	DEN047	38 42 54N	105 14 09W	3.0000	0.7000	2.0000	0.7000	500.0000	0.5000N	200.0000	10.0000N
48	DEN048	38 35 07N	105 16 54W	1.5000	0.5000	2.0000	0.5000	300.0000	0.5000N	200.0000	10.0000N
49	DEN049	38 43 09N	105 11 53W	3.0000	1.0000	0.7000	0.3000	500.0000	0.5000N	200.0000	10.0000N
50	DEN050	38 42 51N	105 12 38W	3.0000	0.7000	2.0000	0.7000	700.0000	0.5000N	200.0000	10.0000N

denver sediments-continued

ROWNO	SAMPLE	S-B	S-BA	S-BE	S-BI	S-CD	S-CO	S-CR	S-CU	S-LA	S-MO
1	DEN001	30.0000	300.0000	1.5000	10.0000N	20.0000	10.0000	15.0000	20.0000	100.0000	5.0000N
2	DEN002	15.0000	700.0000	1.5000	10.0000N	20.0000	10.0000	20.0000	15.0000	100.0000	5.0000N
3	DEN003	15.0000	300.0000	1.5000	10.0000N	20.0000	7.0000	30.0000	20.0000	100.0000	5.0000N
4	DEN004	20.0000	300.0000	2.0000	10.0000N	20.0000	7.0000	15.0000	15.0000	100.0000	5.0000L
5	DEN005	10.0000	300.0000	2.0000	10.0000N	20.0000	7.0000	10.0000	15.0000	150.0000	5.0000N
6	DEN006	10.0000N	300.0000	1.5000	20.0000	20.0000	10.0000	50.0000	20.0000	100.0000	5.0000N
7	DEN007	30.0000	300.0000	2.0000	10.0000N	20.0000	7.0000	15.0000	15.0000	70.0000	5.0000N
8	DEN008	50.0000	300.0000	2.0000	10.0000N	20.0000	7.0000	10.0000	20.0000	200.0000	5.0000N
9	DEN009	20.0000	1000.0000	1.5000	10.0000N	20.0000	7.0000	50.0000	20.0000	100.0000	5.0000
10	DEN010	20.0000	700.0000	2.0000	10.0000N	20.0000	7.0000	20.0000	20.0000	100.0000	5.0000N
11	DEN011	20.0000	1000.0000	1.5000	10.0000N	20.0000	10.0000	20.0000	20.0000	70.0000	5.0000N
12	DEN012	15.0000	1500.0000	1.5000	10.0000N	20.0000	10.0000	20.0000	20.0000	70.0000	5.0000N
13	DNE013	15.0000	1000.0000	2.0000	10.0000N	20.0000	10.0000	70.0000	30.0000	70.0000	5.0000N
14	DEN104	20.0000	1000.0000	2.0000	10.0000N	20.0000	10.0000	30.0000	15.0000	70.0000	5.0000N
15	DEN015	10.0000	500.0000	1.5000	10.0000N	20.0000	10.0000	15.0000	15.0000	70.0000	5.0000N
16	DEN016	15.0000	500.0000	1.5000	10.0000N	20.0000	7.0000	20.0000	15.0000	70.0000	5.0000N
17	DEN017	10.0000	500.0000	1.5000	10.0000	20.0000	7.0000	15.0000	70.0000	100.0000	5.0000N
18	DEN018	10.0000	500.0000	1.5000	20.0000	20.0000	10.0000	15.0000	70.0000	100.0000	5.0000N
19	DEN019	20.0000	300.0000	1.5000	20.0000	20.0000	7.0000	15.0000	50.0000	50.0000	5.0000L
20	DEN020	15.0000	500.0000	1.5000	10.0000	20.0000	7.0000	15.0000	10.0000	50.0000	5.0000N
21	DNN021	5.0000N	500.0000	1.5000	10.0000	20.0000	7.0000	15.0000	7.0000	30.0000	5.0000N
22	DEN022	50.0000	500.0000	1.5000	20.0000	20.0000	10.0000	20.0000	30.0000	70.0000	15.0000
23	DEN023	30.0000	500.0000	1.5000	10.0000	20.0000	10.0000	30.0000	15.0000	70.0000	5.0000
24	DEN024	30.0000	500.0000	1.5000	10.0000	20.0000	10.0000	30.0000	30.0000	150.0000	7.0000
25	DEN025	50.0000	300.0000	1.5000	10.0000N	20.0000	10.0000	15.0000	15.0000	100.0000	5.0000N
26	DEN026	20.0000	300.0000	1.5000	10.0000N	20.0000	10.0000	30.0000	20.0000	70.0000	5.0000N
27	DEN027	20.0000	300.0000	1.5000	10.0000N	20.0000	10.0000	20.0000	20.0000	100.0000	5.0000N
28	DEN028	30.0000	300.0000	1.5000	10.0000N	20.0000	10.0000	15.0000	20.0000	100.0000	5.0000N
29	DEN029	15.0000	700.0000	1.5000	10.0000N	20.0000	10.0000	20.0000	15.0000	100.0000	5.0000N
30	DEN030	15.0000	300.0000	1.5000	10.0000N	20.0000	7.0000	30.0000	20.0000	100.0000	5.0000N
31	DEN031	20.0000	300.0000	2.0000	10.0000N	20.0000	7.0000	15.0000	15.0000	100.0000	5.0000L
32	DEN032	10.0000	300.0000	2.0000	10.0000N	20.0000	7.0000	10.0000	15.0000	150.0000	5.0000N
33	DEN033	10.0000L	300.0000	1.5000	20.0000	20.0000	10.0000	50.0000	20.0000	100.0000	5.0000N
34	DEN034	30.0000	300.0000	2.0000	10.0000N	20.0000	7.0000	15.0000	15.0000	70.0000	5.0000N
35	DEN035	50.0000	300.0000	2.0000	10.0000N	20.0000	7.0000	10.0000	20.0000	200.0000	5.0000N
36	DEN036	20.0000	1000.0000	1.5000	10.0000N	20.0000	7.0000	50.0000	20.0000	100.0000	5.0000
37	DEN037	20.0000	700.0000	2.0000	10.0000N	20.0000	7.0000	20.0000	20.0000	100.0000	5.0000N
38	DEN038	20.0000	1000.0000	1.5000	10.0000N	20.0000	10.0000	20.0000	20.0000	70.0000	5.0000N
39	DEN039	15.0000	1500.0000	1.5000	10.0000N	20.0000	10.0000	20.0000	20.0000	70.0000	5.0000N
40	DEN040	15.0000	1000.0000	2.0000	10.0000N	20.0000	10.0000	70.0000	30.0000	70.0000	10.0000N
41	D3N041	20.0000	1000.0000	2.0000	10.0000N	20.0000	10.0000	30.0000	15.0000	70.0000	10.0000N
42	DEN042	10.0000	500.0000	1.5000	10.0000N	20.0000	10.0000	15.0000	0.0000B	70.0000	10.0000N
43	DEN043	15.0000	500.0000	1.5000	10.0000N	20.0000	7.0000	20.0000	0.0000B	70.0000	5.0000N
44	DEN044	10.0000	500.0000	1.5000	10.0000	20.0000	7.0000	15.0000	0.0000B	100.0000	5.0000N
45	DEN045	10.0000	500.0000	1.5000	20.0000	20.0000	10.0000	15.0000	70.0000	100.0000	5.0000N
46	DEN046	20.0000	300.0000	1.5000	20.0000	20.0000	7.0000	15.0000	50.0000	50.0000	5.0000L
47	DEN047	15.0000	500.0000	1.5000	10.0000	20.0000	7.0000	15.0000	10.0000	50.0000	5.0000N
48	DEN048	10.0000N	500.0000	1.5000	10.0000	20.0000	7.0000	15.0000	7.0000	30.0000	5.0000N
49	DEN049	50.0000	500.0000	1.5000	20.0000	20.0000	10.0000	20.0000	30.0000	70.0000	15.0000
50	DEN050	30.0000	500.0000	1.5000	10.0000	20.0000	10.0000	30.0000	15.0000	70.0000	5.0000

denver sediments-continued

ROWNO	SAMPLE	S-NB	S-NI	S-PB	S-SB	S-SC	S-SN	S-SR	S-V	S-W	S-Y
1	DEN001	10.0000N	20.0000	70.0000	100.0000N	10.0000	10.0000	300.0000	70.0000	50.0000L	30.0000
2	DEN002	10.0000N	15.0000	50.0000	100.0000N	7.0000	10.0000	500.0000	70.0000	50.0000L	20.0000
3	DEN003	10.0000N	10.0000	70.0000	100.0000N	7.0000	10.0000	300.0000	50.0000	50.0000L	20.0000
4	DEN004	10.0000N	15.0000	50.0000	100.0000N	7.0000	10.0000	300.0000	50.0000	50.0000L	30.0000
5	DEN005	10.0000N	10.0000	30.0000	100.0000N	7.0000	10.0000	200.0000	50.0000	50.0000L	20.0000
6	DEN006	10.0000N	20.0000	50.0000	100.0000N	10.0000	10.0000	300.0000	70.0000	50.0000L	30.0000
7	DEN007	10.0000N	10.0000	30.0000	100.0000N	7.0000	10.0000	300.0000	50.0000	50.0000L	20.0000
8	DEN008	10.0000N	10.0000	150.0000	100.0000N	7.0000	10.0000	200.0000	50.0000	50.0000L	20.0000
9	DEN009	10.0000N	20.0000	50.0000	100.0000N	10.0000	10.0000	300.0000	70.0000	50.0000L	30.0000
10	DEN010	10.0000N	10.0000	50.0000	100.0000N	7.0000	10.0000	300.0000	100.0000	50.0000L	30.0000
11	DEN011	10.0000N	20.0000	50.0000	100.0000N	10.0000	10.0000	700.0000	100.0000	50.0000L	30.0000
12	DEN012	10.0000N	20.0000	50.0000	100.0000N	7.0000	10.0000	500.0000	100.0000	50.0000L	30.0000
13	DNE013	10.0000N	30.0000	30.0000	100.0000N	10.0000	10.0000	500.0000	70.0000	50.0000L	30.0000
14	DEN104	10.0000N	15.0000	30.0000	100.0000N	10.0000	10.0000	500.0000	70.0000	50.0000L	30.0000
15	DEN015	10.0000N	10.0000	30.0000	100.0000N	10.0000	10.0000	500.0000	70.0000	50.0000L	30.0000
16	DEN016	10.0000	10.0000	30.0000	100.0000N	7.0000	10.0000	300.0000	70.0000	50.0000L	30.0000
17	DEN017	10.0000	10.0000	50.0000	100.0000N	7.0000	10.0000	300.0000	50.0000	50.0000L	20.0000
18	DEN018	20.0000	20.0000	70.0000	100.0000N	10.0000	10.0000	300.0000	70.0000	50.0000L	30.0000
19	DEN019	10.0000N	15.0000	70.0000	100.0000N	7.0000	10.0000	150.0000	70.0000	50.0000L	30.0000
20	DEN020	10.0000	10.0000	30.0000	100.0000N	7.0000	10.0000	300.0000	70.0000	50.0000L	30.0000
21	DNN021	10.0000N	10.0000	30.0000	100.0000N	7.0000	10.0000	500.0000	50.0000	50.0000L	30.0000
22	DEN022	10.0000	15.0000	30.0000	100.0000N	7.0000	10.0000	200.0000	50.0000	50.0000L	20.0000
23	DEN023	10.0000	10.0000	30.0000	100.0000N	10.0000	10.0000	300.0000	70.0000	50.0000L	50.0000
24	DEN024	10.0000	15.0000	70.0000	100.0000N	15.0000	10.0000	300.0000	70.0000	50.0000L	50.0000
25	DEN025	10.0000N	15.0000	50.0000	100.0000N	10.0000	10.0000	300.0000	50.0000	50.0000L	30.0000
26	DEN026	10.0000N	20.0000	30.0000	100.0000N	10.0000	10.0000	300.0000	70.0000	50.0000L	30.0000
27	DEN027	10.0000N	30.0000	50.0000	100.0000N	10.0000	10.0000	300.0000	70.0000	50.0000L	50.0000
28	DEN028	10.0000N	20.0000	70.0000	100.0000N	10.0000	10.0000	300.0000	70.0000	50.0000L	30.0000
29	DEN029	10.0000N	15.0000	50.0000	100.0000N	7.0000	10.0000	500.0000	70.0000	50.0000L	20.0000
30	DEN030	10.0000N	10.0000	70.0000	100.0000N	7.0000	10.0000	300.0000	50.0000	50.0000L	20.0000
31	DEN031	10.0000N	15.0000	50.0000	100.0000N	7.0000	10.0000	300.0000	50.0000	50.0000L	30.0000
32	DEN032	10.0000N	10.0000	30.0000	100.0000N	7.0000	10.0000	200.0000	50.0000	50.0000L	20.0000
33	DEN033	10.0000N	20.0000	50.0000	100.0000N	10.0000	10.0000	300.0000	70.0000	50.0000L	30.0000
34	DEN034	10.0000N	10.0000	30.0000	100.0000N	7.0000	10.0000	300.0000	50.0000	50.0000L	20.0000
35	DEN035	10.0000N	10.0000	150.0000	100.0000N	7.0000	10.0000	200.0000	50.0000	50.0000L	20.0000
36	DEN036	10.0000N	20.0000	50.0000	100.0000N	10.0000	10.0000	300.0000	70.0000	50.0000L	30.0000
37	DEN037	10.0000N	10.0000	50.0000	100.0000N	7.0000	10.0000	300.0000	100.0000	50.0000L	30.0000
38	DEN038	10.0000N	20.0000	50.0000	100.0000N	10.0000	10.0000	700.0000	100.0000	50.0000L	30.0000
39	DEN039	10.0000N	20.0000	50.0000	100.0000N	7.0000	10.0000	500.0000	100.0000	50.0000L	30.0000
40	DEN040	10.0000N	30.0000	30.0000	100.0000N	10.0000	10.0000	500.0000	70.0000	50.0000L	30.0000
41	D3N041	10.0000N	15.0000	30.0000	100.0000N	10.0000	10.0000	500.0000	70.0000	50.0000L	30.0000
42	DEN042	10.0000N	10.0000	30.0000	100.0000N	10.0000	10.0000	500.0000	70.0000	50.0000L	30.0000
43	DEN043	10.0000	10.0000	30.0000	100.0000N	7.0000	10.0000	300.0000	70.0000	50.0000L	30.0000
44	DEN044	10.0000	10.0000	50.0000	100.0000N	7.0000	10.0000	300.0000	50.0000	50.0000L	20.0000
45	DEN045	20.0000	20.0000	70.0000	100.0000N	10.0000	10.0000	300.0000	70.0000	50.0000L	30.0000
46	DEN046	10.0000N	15.0000	70.0000	100.0000N	7.0000	10.0000	150.0000	70.0000	50.0000L	30.0000
47	DEN047	10.0000	10.0000	30.0000	100.0000N	7.0000	10.0000	300.0000	70.0000	50.0000L	30.0000
48	DEN048	10.0000N	10.0000	30.0000	100.0000N	7.0000	10.0000	500.0000	50.0000	50.0000L	30.0000
49	DEN049	10.0000	15.0000	30.0000	100.0000N	7.0000	10.0000	200.0000	50.0000	50.0000L	20.0000
50	DEN050	10.0000	10.0000	30.0000	100.0000N	10.0000	10.0000	300.0000	70.0000	50.0000L	50.0000

denver sediments-continued

ROWNO	SAMPLE	S-ZN	S-ZR	S-TH	AA-CU-P	AA-PB-P	AA-ZN-P
1	DEN001	200.0000	200.0000	100.0000N	11.0000	27.0000	42.0000
2	DEN002	200.0000	300.0000	100.0000N	15.0000	40.0000	41.0000
3	DEN003	200.0000	500.0000	100.0000N	12.0000	47.0000	46.0000
4	DEN004	200.0000	300.0000	100.0000N	14.0000	33.0000	59.0000
5	DEN005	200.0000	300.0000	100.0000N	14.0000	18.0000	53.0000
6	DEN006	200.0000	300.0000	100.0000N	17.0000	24.0000	56.0000
7	DEN007	200.0000	300.0000	100.0000N	14.0000	30.0000	53.0000
8	DEN008	200.0000	150.0000	100.0000N	31.0000	270.0000	98.0000
9	DEN009	200.0000	500.0000	100.0000N	10.0000	20.0000	66.0000
10	DEN010	200.0000	200.0000	100.0000N	14.0000	27.0000	53.0000
11	DEN011	200.0000	300.0000	100.0000N	11.0000	25.0000	57.0000
12	DEN012	200.0000	300.0000	100.0000N	11.0000	24.0000	43.0000
13	DNE013	200.0000	300.0000	100.0000N	18.0000	17.0000	51.0000
14	DEN104	200.0000	300.0000	100.0000N	6.0000	11.0000	42.0000
15	DEN015	200.0000	500.0000	100.0000N	6.0000	9.0000	38.0000
16	DEN016	200.0000	500.0000	100.0000N	10.0000	16.0000	59.0000
17	DEN017	200.0000	300.0000	100.0000N	24.0000	40.0000	51.0000
18	DEN018	200.0000	300.0000	100.0000N	30.0000	44.0000	67.0000
19	DEN019	200.0000	500.0000	100.0000N	22.0000	66.0000	81.0000
20	DEN020	200.0000	300.0000	100.0000N	6.0000	9.0000	44.0000
21	DNN021	200.0000	300.0000	100.0000N	3.0000	5.0000	24.0000
22	DEN022	200.0000	100.0000	100.0000N	19.0000	21.0000	55.0000
23	DEN023	200.0000	700.0000	100.0000N	8.0000	16.0000	56.0000
24	DEN024	200.0000	500.0000	100.0000N	21.0000	35.0000	72.0000
25	DEN025	200.0000	300.0000	100.0000N	16.0000	22.0000	2.0000
26	DEN026	200.0000	300.0000	100.0000N	15.0000	15.0000	68.0000
27	DEN027	200.0000	700.0000	100.0000N	12.0000	18.0000	58.0000
28	DEN028	200.0000	200.0000	100.0000N	11.0000	27.0000	42.0000
29	DEN029	200.0000	300.0000	100.0000N	15.0000	40.0000	41.0000
30	DEN030	200.0000	500.0000	100.0000N	12.0000	47.0000	46.0000
31	DEN031	200.0000	300.0000	100.0000N	14.0000	33.0000	59.0000
32	DEN032	200.0000	300.0000	100.0000N	14.0000	18.0000	53.0000
33	DEN033	200.0000	300.0000	100.0000N	17.0000	24.0000	56.0000
34	DEN034	200.0000	300.0000	100.0000N	14.0000	30.0000	53.0000
35	DEN035	200.0000	150.0000	100.0000N	31.0000	270.0000	98.0000
36	DEN036	200.0000	500.0000	100.0000N	10.0000	20.0000	66.0000
37	DEN037	200.0000	200.0000	100.0000N	14.0000	27.0000	53.0000
38	DEN038	200.0000	300.0000	100.0000N	11.0000	25.0000	57.0000
39	DEN039	200.0000	300.0000	100.0000N	11.0000	24.0000	43.0000
40	DEN040	200.0000	300.0000	100.0000N	18.0000	17.0000	51.0000
41	D3N041	200.0000	300.0000	100.0000N	6.0000	11.0000	42.0000
42	DEN042	200.0000	500.0000	100.0000N	6.0000	9.0000	38.0000
43	DEN043	200.0000	500.0000	100.0000N	10.0000	16.0000	59.0000
44	DEN044	200.0000	300.0000	100.0000N	24.0000	40.0000	51.0000
45	DEN045	200.0000	300.0000	100.0000N	30.0000	44.0000	67.0000
46	DEN046	200.0000	500.0000	100.0000N	22.0000	66.0000	81.0000
47	DEN047	200.0000	300.0000	100.0000N	6.0000	9.0000	44.0000
48	DEN048	200.0000	300.0000	100.0000N	3.0000	5.0000	24.0000
49	DEN049	200.0000	100.0000	100.0000N	19.0000	21.0000	55.0000
50	DEN050	200.0000	700.0000	100.0000N	8.0000	16.0000	56.0000

'genstat' Program

When you first type 'genstat' in a terminal session the terminal responds with the date of the version of the program. The first time you use 'genstat' and any time thereafter that the date changes, type 'helpmd' to get a complete listing of available 'genstat' commands.

In 'genstat' the first command (excluding 'helpmd' or 'help') always has to be 'infile'. Logically the next command should be 'inds'. You can use the form: 'inds=(1)' if you don't know the name of the dataset. This means 'genstat' selects the first dataset in the file. You may use the 'browse' command. This will give you the dataset ID and number of rows and columns of each dataset contained in the input file.

If you are just looking at the data of the input dataset and not changing any data, you can proceed with appropriate commands after 'infile' and 'inds' commands have been given. If you are planning to alter the data in some form the next commands should be 'outfil' and 'outds' to set up a new file. Always give the output file a unique name-- NEVER try to write over your input file. Once you have set up the 'outfil' and 'outds' you may continue with a 'sort', 'retrie', 'transf', 'srow', 'scol', etc.

'dsplmt' and 'bastat' in program 'genstat'

The following examples show how to enter 'genstat' and use the two commands 'dsplmt' and 'bastat'. When you first enter 'genstat' type 'helpmd' to get the complete list of commands available. The first commands you issue in 'genstat' are 'infile' and 'inds'. If you don't know the name of the dataset you can type 'inds=(1)' and 'genstat' will read the first dataset.

'dsplmt' command

This command is used to check lower limits and minimum values for consistency. Every element that has qualified values is printed here. When more than one line is used per element it means there are discrepancies in the values of a qualifier.

In the example for denver.original
Var. 8 S-AG shows 49 values of .5N but there is 1 value of .2
Var. 11 S-BE shows 2 values of 10N and 1 value of 5N.
Var. 20 S-MO shows 36 values of 5N and 3 values of 10N.

These inconsistencies need to be corrected. The routines to do this are available in 'edstat' and 'genstat' (see Corrections section).

*** in the listing given by 'dsplmt' indicates that all the samples for this variable are qualified.

'bastat' command

This command gives you a quick look at ranges of data. Use the information to check the minimum and maximum values for each variable and the number of qualified values.

In this example Var. 8 S-AG shows 1 value of .2 and 49 values of N. Var. 18 S-CU shows 3 values of B, which means there are 3 samples that show no results for S-CU.

*** in the listing given by 'bastat' indicates that all samples for this variable are qualified or that only one sample has an unqualified value.

genstat

Genstat Program: Version 7, Dated 04-20-83

Enter Command: infile=denver.original

Enter Command: inds=(1)
Data Set (seds) with 50 rows & 36 columns will be used for input.

Enter Command: dsplmt

D.S. ID = seds File = denver.original Date 6/27/83

Var	Var ID	No	Minimum	L No	L Limit	N No	N Limit	G No	G Limit
8	S-AG	1	0.20000			49	0.50000		
10	S-AU	0	**********			50	10.00000		
11	S-B	8	10.00000	1	10.00000	2	10.00000		
						1	5.00000		
14	S-BI	9	10.00000			33	10.00000		
20	S-MO	4	5.00000	4	5.00000	36	5.00000		
						3	10.00000		
21	S-NB	11	10.00000			37	10.00000		
24	S-SB	0	**********			50	100.00000		
29	S-W	0	**********	50	50.00000				
33	S-TH	0	**********			50	100.00000		

Enter Command: bastat

D.S. ID = seds File = denver.original Date 6/27/83

Univariate Statistics

Var	Column	Minimum	Maximum	Mean	Deviation	Valid	B	L	N	G	Other
1	LATITUDE	37.74139	38.74389	38.69228	0.140059	50	0	0	0	0	0
2	LONGITUD	105.1697	105.2817	105.1986	0.023248	50	0	0	0	0	0
3	S-FE%	1.500000	50.00000	4.220000	6.747759	50	0	0	0	0	0
4	S-MG%	0.500000	1.500000	0.932000	0.355390	50	0	0	0	0	0
5	S-CA%	0.700000	3.000000	1.766000	0.558281	50	0	0	0	0	0
6	S-TI%	0.300000	0.700000	0.525000	0.154606	50	0	0	0	0	0
7	S-MN	300.0000	1500.000	570.0000	277.9297	50	0	0	0	0	0
8	S-AG	0.200000	0.200000	0.200000	***	1	0	0	49	0	0
9	S-AS	200.0000	200.0000	200.0000	***	50	0	0	0	0	0
10	S-AU	***	***	***	***	0	0	0	50	0	0
11	S-B	10.00000	50.00000	21.73913	11.70078	46	0	1	3	0	0
12	S-BA	300.0000	1500.000	560.0000	311.0220	50	0	0	0	0	0
13	S-BE	1.500000	2.000000	1.640000	0.226779	50	0	0	0	0	0
14	S-BI	10.00000	20.00000	14.70588	5.144958	17	0	0	33	0	0
15	S-CD	20.00000	20.00000	20.00000	***	50	0	0	0	0	0
16	S-CO	7.000000	10.00000	8.560000	1.514016	50	0	0	0	0	0
17	S-CR	10.00000	70.00000	23.30000	14.09190	50	0	0	0	0	0
18	S-CU	7.000000	70.00000	22.95745	14.96512	47	3	0	0	0	0
19	S-LA	30.00000	200.0000	88.80000	34.44250	50	0	0	0	0	0
20	S-MO	5.000000	15.00000	8.142857	4.740906	7	0	4	39	0	0
21	S-NB	10.00000	20.00000	11.53846	3.755338	13	0	0	37	0	0
22	S-NI	10.00000	30.00000	15.00000	5.624291	50	0	0	0	0	0
23	S-PB	30.00000	150.0000	49.20000	25.54228	50	0	0	0	0	0
24	S-SB	***	***	***	***	0	0	0	50	0	0
25	S-SC	7.000000	15.00000	8.420000	1.762304	50	0	0	0	0	0
26	S-SN	10.00000	10.00000	10.00000	***	50	0	0	0	0	0
27	S-SR	150.0000	700.0000	346.0000	127.7114	50	0	0	0	0	0
28	S-V	50.00000	100.0000	66.80000	15.44444	50	0	0	0	0	0
29	S-W	***	***	***	***	0	0	50	0	0	0
30	S-Y	20.00000	50.00000	28.80000	7.730142	50	0	0	0	0	0
31	S-ZN	200.0000	200.0000	200.0000	***	50	0	0	0	0	0
32	S-ZR	100.0000	700.0000	346.0000	141.3636	50	0	0	0	0	0
33	S-TH	***	***	***	***	0	0	0	50	0	0
34	AA-CU-P	3.000000	31.00000	14.32000	6.993992	50	0	0	0	0	0
35	AA-PB-P	5.000000	270.0000	35.36000	50.29292	50	0	0	0	0	0
36	AA-ZN-P	2.000000	98.00000	53.40000	16.38317	50	0	0	0	0	0

Enter Command: q

STOP
r 06/27/83 1345.2 mdt Mon $0.24 $1.52

The samples are retrieved from RASS into your STATPAC file in tag number order. If you want your listing in order by field number, you should sort the data using the 'sort' command in 'genstat'. Then use the output from this sort as the input file for programs 'head39', 'd0039', and corrections and manipulations thereafter.

```
genstat

Genstat Program:  Version 7,  Dated 04-20-83

Enter Command: infile=denver.original

Enter Command: inds=(1)
     Data Set (seds    ) with    50 rows &  36 columns will be used for inpu

Enter Command: outfile=denver.sorted

Enter Command: outds=seds

Enter Command: sort

How do you want to sort ?
     1 Primary Row ID.
     2 Secondary Row ID.
     3 Variables (max 9).
     4 Subfields within Primary & Secondary Row ID (16 chars).
Enter no. : 1

Ascending/descending ? asc
    50 records sorted.
D S (seds    ),    50 rows &  36 cols written on output file,  1th D.S.

Enter Command: q

STOP
r 06/27/83  1347.2 mdt Mon $0.30 $0.68
```

```
genstat

Enter Command: infile=denver.original

Enter Command: inds=seds
     Data Set (seds    ) with    50 rows &  36 columns will be used for input.

Enter Command: outfile=denver.sorted.coords

Enter Command: outds=seds

Enter Command: sort

How do you want to sort ?
     1 Primary Row ID.
     2 Secondary Row ID.
     3 Variables (max 9).
     4 Subfields within Primary & Secondary Row ID (16 chars).
Enter no. : 3

Enter no of vars to be sorted (max 9) : 2

Enter Var No's, a neg Var No indicates descending order for that Var,
     otherwise ascending order.
Var No  1 : 1
Var No  2 : 2
    50 records sorted.
D S (seds    ),    50 rows &  36 cols written on output file,  1th D.S.

Enter Command: q

STOP
r 06/27/83  1347.2 mdt Mon $0.14 $0.82
```

'rmultp' Program

The program 'rmultp' is used to composite multiple sample sites. If your data has more than 1 sample per site, you need to process the dataset through 'rmultp'.

The first step is to sort your data on the coordinates. Use the 'sort' command in 'genstat' for this (see page 39). Then proceed with program 'rmultp'.

```
rmultp
Rmultp removes multiplicities from STATPAC datasets
The data must have been previously sorted on the coordinates
before running RMULTP.  Type (y) if the data has been sorted: y

enter input filename:  denver.sorted.coords

enter output filename: denver.mult

enter opcode (low,avg,high): hi
Rmultp found lat/long in cols    1    2    Are these ok?
(if not, enter values; otherwise hit return at next prompt)

Enter latitude & longitude col. numbers:
Please print the file "multp.info" after this program
Rmultp wrote     27 records on denver.mult

STOP
r 06/27/83  1351.6 mdt Mon $0.69 $0.97
```

'geocon' Program

'geocon' is the first step in getting a sample locality plot for a dataset that has latitude/longitude coordinates. You do not use 'geocon' on a file with x- and y-coordinates.

If your file has x- and y-coordinates you can make a map that has a border drawn around it or you can make a map with corner reference points. In neither case do you execute the program 'geocon'. To create a map with a border around it, you need to consult the documentation for 'a462' and use a text editor to edit the output from the program 'site'. If you want a map with corner reference points you need to determine x- and y-values for 4 corner points and then use "edstat" to insert 4 rows into your dataset. You can then use the program "site".

When you execute the program 'geocon' notice that it prints the number of rows and columns and the column_ids. When 'geocon' asks for the column numbers of utmy and utmx coordinates, it needs NEW column numbers, enter numbers beyond the last existing column.

If you have latitude/longitude coordinates, normally you want corner reference points to use for aligning the map with a base map. The next section of 'geocon' adds these reference points to your dataset. NOTICE it asks for longitude before latitude.

Normally we use central meridian rather than average longitude in making these plots, so answer 'no' to that question. If you have points that are more than 3 1/2 degrees from the central meridian, 'geocon' will eliminate the point from the output file.

The map scale you enter at the prompt determines the number of utms/inch along left & bottom edges that the program computes. These are the numbers you need to make the program control card for 'a462' (by using the program 'site').

'geocon' always puts the 4 reference points as the FIRST 4 rows in the output file. 'geocon' tells you how many records it wrote in the output file. If this number is not equal to the input number of rows plus 4, there are some points in the file that fall outside the corner points you entered or there are points that are more than 3 1/2 minutes from the central meridian. To find out which points these are print the file 'geocon.list'. This file is created by the program and it will give you the row numbers of the points in the input dataset that were deleted and the reason they were deleted.

```
geocon
 you are entering geocon.  this program converts the geodetic (lat/long)
 cooordinates (in a statpac file) to utm and outputs them in a new file.
* * N O T E * *  Temporarily, reference points will be required.

enter input (statpac) filename:   denver.mult

enter output (statpac) filename:  denver.site-plot

enter code (geo-utm=1,utm-geo=2): 1

enter dataset id (=< 8 chars): seds
     filename       dataset id  no. rows  no. cols.
 denver.mult          seds            27         36
                              column ids
 LATITUDE LONGITUD S-FE%     S-MG%     S-CA%     S-TI%     S-MN      S-AG
 S-AS     S-AU     S-B       S-BA      S-BE      S-BI      S-CD      S-CO
 S-CR     S-CU     S-LA      S-MO      S-NB      S-NI      S-PB      S-SB
 S-SC     S-SN     S-SR      S-V       S-W       S-Y       S-ZN      S-ZR
 S-TH     AA-CU-P  AA-PB-P   AA-ZN-P

enter col. no. of latitude(in input file):   1

enter col. no. of longitude(in input file):  2

enter col. no. of utmy coordinate(output):   37

enter col. no. of utmx coordinate(output):   38

***Enter coordinates in degrees, min. & sec.(ie:45 30 15)***


For corner point 1 enter longitude: 105 00 00

                   enter latitude:  38 00 00

For corner point 2 enter longitude: 105 00 00

                   enter latitude:  39 00 00

For corner point 3 enter longitude: 107 00 00

                   enter latitude:  38 00 00

For corner point 4 enter longitude: 107 00 00

                   enter latitude:  39 00 00


 central meridian = 105.00

enter 'y' to use avg. longitude as central meridian n

enter map scale (scale=24000 for 1/24000):  250000
 corner utm x:          500000          500000          324392          326805
 corner utm y:         4205609         4316569         4207497         4318471
 differences between corner points (in meters of utm)
             left y          right y         bottom x          top x
             110974           110960           175608           173195
 no. utms/inch along left & bottom edges:     6350.00    6350.00
```

```
The range of transverse mercator values computed was:
      XMIN           XMAX           YMIN           YMAX
   324392.0000    500000.0000  4205609.0000  4318471.0000
 geocon wrote     30 records on the output file

another run on a new file(y/n)? no

STOP
r 06/27/83  1351.7 mdt Mon $0.16 $1.13

ls

Segments = 9, Lengths = 24.

r w     2  denver.site-plot
r w     1  geocon.list
r w     1  multp.info
r w     2  denver.mult
r w     3  denver.sorted.coords
r w     3  denver.sorted
r w     8  d0039.denver
r w     1  d39den
r w     3  denver.original

r 06/27/83  1351.7 mdt Mon $0.01 $1.14

pr geocon.list

                    geocon.list          06/27/83  1351.7 mdt Mon


Geocon.list lists the row number,coordinates & error code
for each sample excluded from the output file.  The codes
and their meanings are given below:
*1* - data point over +/-3.5 deg. from central meridian.
*2* - data outside window (corner points).
GEOCON operated on file denver.mult          dataset id: seds
  Row    Longitude     Latitude     Code
    1    105 12 25     37 44 29     *2*
 geocon wrote     30 records on the output file


r 06/27/83  1351.7 mdt Mon $0.01 $1.15

dl geocon.list
r 06/27/83  1351.7 mdt Mon $0.00 $1.16
```

'site' Program

The program 'site' creates a program control card file for input to 'a462'. The information you need to respond to the prompts of 'site' is found in the 'geocon' run. The minimum and maximum x- and y-values are printed by 'geocon' near the end of the program. It is helpful if the numbers you type in as the minimum and maximum are actually a little smaller and larger, respectively, than the exact numbers given. These numbers have no effect on the placement of the corner reference points. The scale factor is the number given in 'geocon' as the number utms/inch along left & botton edges.

The sample locality map can have a + only, circle only, square only, or triangle only to indicate the sample or have either field number or row number printed at the sample location. If you want to print the row number, remember the numbers will start with 5 unless you re-order the rows to put the reference points at the end of the file.

There is a printed example of the file that the program 'site' creates.

```
site
if you want to see the choices type  y :y
Type of plot desired:
(1) + only
(2) circle only
(3) square only
(4) triangle only
(5) row number
(6) z value
(7) grouping records
(8) use existing control file as model
(9) several passes through same file (e.g. different elements on same map)
(10) primary row id (field number)

Enter number                                          :1

Enter the input file name                             : denver.site-plot
Enter output card file name                           : hcrd_denver

Enter the  min. x value                               :324300
Enter the  max. x value                               :510000
Enter the  min. y value                               :4176000
Enter the  max. y value                               :4320000
Enter scale factor (from geocon or scale*.0254)       :6350
Enter column of x values                              :38
Enter column of y values                              :37
Enter first row to be plotted (not ref. pts)          :5
Enter last row to be plotted (not ref. pts)           :30
Enter row no. of first ref. pt                        :1
Enter row no. of last ref. pt                         :4

Plot title is maximum of 80 characters, including spaces
1st 48 char of title=x-axis title, next 32 = plot title
12345678901234567890123456789012345678901234567890123456789012345678901234567890
        1         2         3         4         5         6         7         8
enter plot title:
Denver sample sites
If you want Y-axis title, type y                      :n

STOP
r 06/27/83  1355.4 mdt Mon $0.09 $0.33
```

```
pr hcrd_denver

                    hcrd_denver          06/27/83  1355.4 mdt Mon

      324300.0000000       510000.0000000      4176000.0000000      4320000.0000000
          75.0000000                                                        0.05
                                                          999
        6350.0000000         6350.0000000
                               seds        30 38 0                              1
 38     37      0
    5    30
                               seds        30 38          1                     1
 38     37
    1     4
END
Denver sample sites


r 06/27/83  1355.4 mdt Mon $0.02 $0.35
```

'a462' Program

'a462' is used to create sample locality plots, element maps, and x-y plots to scale. The only example in this handbook is for a sample locality plot.

We suggest that until you are familiar with 'a462' you make a null run before creating a plot tape. The first example of 'a462' is a null run. When the program prompts "<<Pltsys: Plot tape:" answer with a carriage return for a null run. While 'a462' is running, it prints a lot of information. You should look at this information. Notice the numbers given after "PLOT AREA SIZE" and make sure they are reasonable. You should notice the 2 lines that say "50 pts plotted out of a possible 50 pts" and "4 pts plotted out of a possible 4 pts". If all points are not plotting, there is a problem.

The second example is the same file re-run through 'a462' creating a plot tape. In this run (not a null run) when the program prompts "<<Pltsys: Plot tape:" answer with a unique identifier such as pltws1, pltxs2, pltq1, etc. The terminal will come back with a message from the operator telling you the actual number of the tape they are using for your plot. You need to know this number. Since the operator has to physically mount a tape, this response is not immediate. If you are doing only one plot (as you will be for a sample locality map) answer 'yes' to the question "Done with the tape in this process?"

Use 'plt' as the first three characters of your identifier unless you have a tape or tapes assigned to you that reside at the computer center. If you have tapes assigned to you and want to use one of those, type in that tape number.

Some persons have found it convenient to have a few tapes assigned to them that reside at the computer center. This works well for plotting because you control when that tape is over-written. If you plot 10 maps on one tape and one of them does not turn out well because of a plotter-operator error (no ink, for instance); you do not need to re-execute 'a462'. You need only to send in another 'poi' asking that the 'xth' file of tape 'nnnn' be plotted. The procedure to have a tape assigned to you is to execute the program 'tpms'. Examples of this program are on the following two pages. Be sure to release the tapes when you no longer have use for them on a regular basis. We are charged $1 per month per tape for each tape assigned. Do not assign and release tapes repeatedly in a short period of time.

Since you answered that you did not want printer output on tne terminal, the program created a file in the form "a462.!bBBldksdf.list". You need to rename this file so that if your map is not what you expect, this file can be examined. If your map is acceptable, login and delete this file.

```
tpms

ACTION? (Enter "help" for list of valid commands) help

THE FOLLOWING ARE VALID TMS COMMANDS:


COMMAND    DESCRIPTION

   a       request tape reel assignment
   u       request tape reel unassignment
   ld      list descriptions of all reels assigned to user
   l       list all reel numbers assigned to user
   c       change record for an assigned tape reel
           NOTE:  A USER MAY CHANGE THE RECORD ONLY
                  OF TAPES ASSIGNED TO THEM
   r       restore unassigned tape to assigned status
           if it has not yet been released by the monthly
           billing routines.
           NOTE:  A USER MAY RESTORE ONLY TAPES ASSIGNED
                  TO THEM
   lr      list information about a specific reel number
   h or    list and explain valid commands
   help
   q       quit (exit from "tpms" program)

For more details on the Tape Management System (TMS), please
enter "q" then enter "help tpms".

ACTION? (Enter "help" for list of valid commands) a

Do you wish to use Cmptappl as the project?  yes
Enter up to 45 characters of remarks describing the tape
for plotting
How many reels to be assigned using this description?      1

the following 1 reels were assigned


1554

Do you wish to assign any more tapes?  no

ACTION? (Enter "help" for list of valid commands) la

THE FOLLOWING TAPES ARE ASSIGNED TO WSpeckman

REEL:  1554   PROJECT:  Cmptappl
REMARKS:  for plotting
LOCATION:  Denver   DATE ASSIGNED:  06/27/83   ACCOUNT NO:  933088800


ACTION? (Enter "help" for list of valid commands) q

Please contact your tape librarian if you have any further questions.
r 06/27/83  1355.5 mdt Mon $0.50 $0.85
```

```
tpms

ACTION? (Enter "help" for list of valid commands) u
Enter reel number to be unassigned      1554

Do you wish to unassign any more tapes?                 no

ACTION? (Enter "help" for list of valid commands) q

Please contact your tape librarian if you have any further questions.
r 06/27/83  1403.5 mdt Mon $0.11 $0.47
```

```
exec a462 y

Do you want printer output on TTY     ?   yes

What is program control file name     ?   hcrd_denver

What is input binary file name        ?   denver.site-plot

<<Pltsys: Calcomp device type-(tape or null):   null

<<Pltsys: Plot tape : 2
1A462  PLOT STATPAC - U S G S STATPAC (05/27/82)          DATE    6/27/83


 PAPER SIZE:
     X-DIMENSION = 32.74 IN.  BY  Y-DIMENSION = 25.68 IN.

 PLOT AREA SIZE:
     X-DIMENSION = 29.24 IN.  BY  Y-DIMENSION = 22.68 IN.

PAPER SIZE:      X-DIM = 32.74 BY Y-DIM = 25.68
PLOT AREA SIZE: X-DIM = 29.24 BY Y-DIM = 22.68

 X-SCALE FACTOR IN UNITS/IN.= 6.3500000E+03
 Y-SCALE FACTOR IN UNITS/IN.= 6.3500000E+03

 THE FOLLOWING PLOT IS FOR   0.3243000E+06.GE. X .LE.  0.5100000E+06
                             0.4176000E+07.GE. Y .LE.  0.4320000E+07

 INITIAL POINT SIZE                  =     0.050

 TITLE SIZE - MAIN                   =     0.46

 TITLE SIZE - AXES                   =     0.31


 Z-COORDINATE MULTIPLIER             =     1.00

 LENGTH OF MAJOR TICK                =     0.010

 DIST BETWEEN MAJOR TICKS(X-AXIS)    = 185700.00

 NO OF MINOR DIV/MAJOR DIV(X-AXIS) =     1

 FORMAT OF BORDER ANNOT(X-AXIS)      =     (F12.3)

 DIST BETWEEN MAJOR TICKS(Y-AXIS)    = 144000.00

 NO OF MINOR DIV/MAJOR DIV(Y-AXIS) =     1

 FORMAT OF BORDER ANNOT(Y-AXIS)      =     (F12.3)

 TYPE OF BORDER LABELLING            =   999
1A462  PLOT STATPAC - U S G S STATPAC (05/27/82)          DATE    6/27/83
```

```
      TITLE                          INPUT ID        N      M  ***** OPTIONS ****
                                    -seds    -      30     38  0  0 0 0 0 0  0 0

 X IS COL 38 (utmx     )
 Y IS COL 37 (utmy     )

 NUMBER OF SELECTED OBSERVATION PAIRS=      1

 SELECTED OBSERVATION PAIRS
      5-   30

 POINT SIZE     =  0.050

 POSTING ANGLE =     0.0

    26 Pts plotted out of a possible    26 pts.
1A462  PLOT STATPAC - U S G S STATPAC (05/27/82)                    DATE   6/27

      TITLE                          INPUT ID        N      M  ***** OPTIONS ****
                                    -seds    -      30     38  0  0 0 0 0 0  0 0

 X IS COL 38 (utmx     )
 Y IS COL 37 (utmy     )

 NUMBER OF SELECTED OBSERVATION PAIRS=      1

 SELECTED OBSERVATION PAIRS
      1-    4

 POINT SIZE     =  0.050

 POSTING ANGLE =     0.0

     4 Pts plotted out of a possible     4 pts.

<<Pltsys: Done with the tape in this process?  yes
     10       0      31      31      31       0       0       5       0       0       0

STOP
r 06/27/83  1403.8 mdt Mon $0.40 $0.87
```

```
exec a462 y

Do you want printer output on TTY     ?   no

What is program control file name     ?   hcrd_denver

What is input binary file name        ?   denver.site-plot

<<Pltsys: Calcomp device type-(tape or null):     tape

<<Pltsys: Plot tape :     pltws1
Tape pltws1,9track,blk=2800 will be mounted with a write ring.

********
From Operator: tape plt017
********
Tape pltws1,9track,blk=2800 mounted on drive tape_04 with a write ring.

PAPER SIZE:      X-DIM = 32.74 BY Y-DIM = 25.68
PLOT AREA SIZE: X-DIM = 29.24 BY Y-DIM = 22.68

    26 Pts plotted out of a possible    26 pts.

     4 Pts plotted out of a possible     4 pts.

<<Pltsys:  Done with the tape in this process?    yes
     10        0      31      31      31       0       0       5       0       0       0

STOP

Do you want your printer file queued ?   no
r 06/27/83   1420.1 mst Mon   $1.76   $3.90


ls

Segments = 7, Lengths = 20.

r w     1  a462.!BBJLZxkdWDWfF.list
r w     1  hcrd_denver
r w     2  denver.site-plot
r w     2  denver.mult
r w     3  denver.sorted.coords
r w     8  d0039.denver
r w     3  denver.original


r 06/27/83  1423.8 mst Mon   $0.09   $3.99


rn a462.*.list a462.site
r 06/27/83 1425.2 mst Mon $0.05   $4.04
```

'poi' Program

The program 'poi' means 'plot operator instructions'. Every time you execute 'a462' and make a plot tape you need to run 'poi' to tell the operators at ISD which tape is yours and what to do with it. Use your own name or Person_id and a current account number.

```
poi

Plot Operator Instructions (06/22/81)
  queues via pool_print & notifies operator of plot request.

Person_id                          :  JOHN DOE
USGS account no (9-digits)         : 9330-99999
Mail plot to
 (Bldg-53,Denver-West,Golden)      : bldg-53
Phone Number                       : 1111
Plot tape number(e.g. plt001)      : plt017
Paper type (mylar or vellum)       : mylar
Paper weight(heavy-42" wide
          or light-54" wide)       : heavy
Pen size (fine to coarse-
                2, 3, or 4)        : 2
Starting pen position(inches)
  Position of lwr lf corner
Enter as no pair(e.g. 1,1)         : 1,1

No. of plots                       : 1
For each plot, enter x & y dimensions and est. plot time :
Plot  1   x-dim(inch)              : 30
          y-dim(inch)              : 23
          time(minutes)            : 40
Tapes are usually returned to library when plotting is finished.
To have tape held, indicate in special instructions.
If tape was not made on Denver Multics or requires a special cassette
    indicate in special instructons

Any special instructions (yes or no):no
pool_print:  poi.instruct pooled as >pool_dir>!BBBJLcxGkkkmKj.poi.instruct
1 request signalled, 0 alrady in printer queue 1
There's no need to send the operator a message that you queued a plot reque
This program does it automatically.
r 06/27/83  1435.1 mst Mon  $0.93  $4.97
```

CORRECTIONS

There are many kinds of corrections that may need to be made to data in a dataset. Some of the corrections are made in 'genstat' and others in 'edstat'. These two programs are explained more fully below.

It is helpful to do another 'bastat', 'dsplmt' and 'd0039' after you have completed all corrections.

'edstat' corrections

This program is used primarily to correct data in STATPAC binary files. 'edstat' has many operators, but the most commonly used ones are replace row_ids, change column_ids, correct data values, and insert or delete rows. When you type 'edstat' it responds with the date of the version you are using. As soon as you have entered the input file and input dataset ID, type 'helplong' to get a complete listing of 'edstat' operations. Keep this to use as a reference until you notice that the revision date of the program has changed and then type 'helplong' again to get a current version of the commands.

Use the listing you receive from the 'helplong' command in 'edstat' to help understand the examples given here.

'genstat' corrections

One of the most helpful functions in 'genstat' is the 'retrie' operation. This allows you to find out which rows contain the data that have errors. Once you have typed 'retrie' you are in the 'retrie' routine and need to use 'retrie' commands. To set up the retrieval criteria, you need to use the 'set' command and then enter conditions using the syntax shown in the example. Bracket a particular data value when setting up retrieval criteria rather than using the '.eq.' operator. That is, use two conditions, one greater and one less than the actual value. Once the retrieval conditions are established you need to define the relationship between them. There are several choices for running the retrieval, these are explained in the list of 'genstat' commands.

The 'replac' operator in 'genstat' is used to replace qualified values with other qualified or unqualified values. Once you have typed 'replac' you need to use the 'replac' series of commands. To set up the replacements, use the command 'set' . The example shows the syntax used to enter the column, -existing qualifying code, data value, and, optionally, qualifying code. If you do not put in the last item, the optional qualifying code, the data values will be changed and left unqualified. You need to enter the 'copy' command when you get back to 'genstat' command level. If you do not explicitly say 'copy', 'genstat' does not manipulate the data and create an output file. You know that you have data in the output file when you see the message: "xx rows and yy cols written in output file."

The 'replac' command in 'genstat' is used in this example to standardize the qualified values for variables 11 and 20. The information from 'dsplmt' was used.

```
genstat

Genstat Program:  Version 7.  Dated 04-20-83

Enter Command: infile=denver.original

Enter Command: inds=seds
     Data Set (seds    ) with    50 rows &  36 columns will be used for input.

Enter Command: outfile=denver.corr1

Enter Command: outds=seds

Enter Command: replac

Enter replace command: help

Legal Commands are as follows:
       list    elis    add     rese    help    set

Enter replace command: set

Enter col,code,value<,code>: 11,n,10,n

Enter col,code,value<,code>: 20,n,5,n

Enter col,code,value<,code>: ↵

Enter replace command: list

Var No     B            L             N            G            T            H
  11                                 10.0000N
  20                                  5.0000N

Enter replace command: ↵

Enter Command: copy
D S (seds    ),    50 rows &  36 cols written on output file,  1th D.S.

Enter Command: q

STOP
r 06/27/83  1432.6 mdt Mon $0.27 $0.61
```

The 'retrie' command in 'genstat' is used in this example to find out which sample has the value of .2 in variable 8 that the 'bastat' and 'dsplmt' showed existed.

```
genstat

Enter Command: infile=denver.original

Enter Command: inds=seds
     Data Set (seds    ) with    50 rows &  36 columns will be used for inpu

Enter Command: retrie

Enter retrieval command: help

Legal commands are as follows:
       help   reset  set    list   review add    edit   relati q
quit   run    runcpy runrid bastat castat dsplmt

Enter retrieval command: set

Enter condition: v8.lt..21

Enter condition: v8.gt..19

Enter condition:↵

Enter retrieval command: relati

Enter logical relation between conditions.

Relation: 1.and.2

Enter retrieval command: runrid
   31 DEN031

     1 samples met the above criteria.

Enter retrieval command:↵

Enter Command: q

STOP
r 06/27/83  1432.7 mdt Mon $0.14 $0.75
```

The 'retrie' command in 'genstat' is used in this example to find out which sample has a latitude of 37. The file "geocon.list" printed one sample at 37 that was outside the window (given as 38 - 39). The 'bastat' also indicated that the minimum value was less than 38.

```
genstat

Enter Command: infile=denver.original

Enter Command: inds=seds
     Data Set (seds    ) with    50 rows &  36 columns will be used for inp

Enter Command: retrie

Enter retrieval command: set

Enter condition: v1.lt.38

Enter condition: ↵

Enter retrieval command: relati

Enter logical relation between conditions.

Relation: 1

Enter retrieval command: runrid
   27 DEN027

     1 samples met the above criteria.

Enter retrieval command: ↵

Enter Command: q

STOP
r 06/27/83  1432.7 mdt Mon $0.11 $0.86
```

The 'r' command in 'edstat' was used in this example to replace values of 0.0B in variable 18. These values of 0.0B were indicated in the 'bastat' listing and were evident on the 'd0039' listing.
NOTE: The output file from the 'genstat' 'replac' command run is used as the input file to this program.

edstat
Edstat edits statpac binary files. For a description of current commands, type help when prompted by "COMMAND:".
Version of 6-24-82 [see >uml>statpac>doc>edstat.info]

Enter input filename(return=>newfile): denver.corr1

Enter input dataset name: seds

COMMAND: help
The following commands are entered after the prompt
message COMMAND: (either number or alphabetic codes)
the codes & corresponding operations are:
 0. ("q") - quit and close files
 1. ("rh") - replace selected column header names
 2. ("rf") - replace selected field numbers (sample ids)
 3. ("rd") - change dataset name and/or column count
 4. ("lh") - print header information
 5. ("l") - (or "ls")print selected data (by rows/columns)
 6. ("i") - insert selected data (by rows)
 7. ("d") - delete selected data (by rows)
 8. ("r") - replace selected data (by rows)
10. ("nd") - find new dataset in file
11. ("tr") - transformation generator
12. ("s") - save data on output file (also "wr")
13. ("lr") - list row ids & row numbers
14. ("rv") - replace data with new value if criteria are true
15. ("fr") - find row numbers of specified row ids
16. ("ba") - bastat (basic statistics)
17. ("nf") - read new file
18. ("cp") - copy subset of current file to a new file
 help => print brief help message.
 help long => print help file.(>uml>statpac>doc>helped.info)

COMMAND: r
SELECT ROWS: 42-44

replace data in row 42 (DEN042 EGV894)
data: 17x,10
replace data in row 43 (DEN043 EGV895)
data: 17x,30
replace data in row 44 (DEN044 EGV896)
data: 17x,20

```
COMMAND: s
SELECT OPERATION(a,r,n,q,help): help
The file handling operations available are:
a - Append current (updated) scratch file to an existing file.
    (requires an INPUT filename & OUTPUT dataset id)
r - Replace a dataset (in a multidataset file) with the current
    updated version.  The output file MUST have a different name
    from the input filename.  The required parameters are:
    filename & dataset id(both INPUT & OUTPUT)
n - Create a newfile.  Filename & dataset id are required
q - Quit from this routine without taking any action
SELECT OPERATION(a,r,n,q,help): n
Enter new output dataset id:seds
Enter new output filename: denver.corr2
EDSTAT has written    50 rows &  36 columns
in dataset -seds     - on output file denver.corr2

COMMAND: q
 leaving edstat

STOP
r 06/27/83  1437.7 mdt Mon $0.94 $1.40
```

The 'rv' command in 'edstat' is used in this example to replace an unqualified value of .2 in variable 8. Notice that it is best to use ranges rather than exact values when setting up statements for the 'rv' command. This example also shows how to change primary row_ids. These row_ids were noticed in the d0039 listing. NOTE: field number is the primary row_id and tag number is the secondary row_id.

The output file from the previous 'edstat' run is used as the input file in this example.

```
edstat
Edstat edits statpac binary files.  For a description of
current commands, type help when prompted by "COMMAND:".
Version of 6-24-82 [see >uml>statpac>doc>edstat.info]

Enter input filename(return=>newfile): denver.corr2

Enter input dataset name: seds

COMMAND: rv


Enter command string: v8,r1-r50,if(x.be.(.91,.21))x=.51

COMMAND: rf
SELECT ROWS: 13-14,21,41

replace row id(primary,secondary or both?): primary
row    13(DNE013    EGV884 ):DEN013
row    14(DEN104    EGV885 ):DEN014
row    21(DNN021    EGV900 ):DEN021
row    41(D3N041    EGV885 ):DEN041

COMMAND: q
           ********** WARNING **********
You have edited your data without giving a save command.
Do you still wish to perform the above 'q ' command (y/n)? n
SELECT OPERATION(a,r,n,q,help): n
Enter new output dataset id:seds
Enter new output filename:  denver.corr3
EDSTAT has written     50 rows &  36 columns
in dataset -seds     - on output file denver.corr3
 leaving edstat

STOP
r 06/28/83  0754.2 mst Tue $0.06 $0.12
```

The 'r' command in 'edstat' is used in this example to show how to make a correction for latitude using degrees, minutes, and seconds. This is explained in the 'helplong' printout. NOTE: new version date and the "latest change" statement.

```
edstat

Enter input filename(return=>newfile): denver.corr3

Enter input dataset name: seds


COMMAND: r
SELECT ROWS: 27


replace data in row   27   (DEN027    EGV906 )
data: c38 44 29

COMMAND: s
SELECT OPERATION(a,r,n,q,help): n
Enter new output dataset id:seds
Enter new output filename:  denver.corr4
EDSTAT has written     50 rows &  36 columns
in dataset -seds     - on output file denver.corr4

COMMAND: q
 leaving edstat

STOP
r 06/28/83  0754.2 mst Tue $0.03 $0.15
```

NOTE: If you had wanted to change the value for longitude and not latitude, when the program prompted DATA: you would type:

```
1x,c105 05 22
```

The '1x' tells the program to skip one column.

genstat

Genstat Program: Version 7, Dated 04-20-83

Enter Command: infile=denver.corr4

Enter Command: inds=seds
Data Set (seds) with 50 rows & 36 columns will be used for input.

Enter Command: bastat

D.S. ID = seds File = denver.corr4 Date 6/28/

Univariate Statistics

Var	Column	Minimum	Maximum	Mean	Deviation	Valid	B	L	N	G	Othe
1	LATITUDE	38.58528	38.74389	38.71228	0.028367	50	0	0	0	0	0
2	LONGITUD	105.1697	105.2817	105.1986	0.023248	50	0	0	0	0	0
3	S-FE%	1.500000	50.00000	4.220000	6.747759	50	0	0	0	0	0
4	S-MG%	0.500000	1.500000	0.932000	0.355390	50	0	0	0	0	0
5	S-CA%	0.700000	3.000000	1.766000	0.558281	50	0	0	0	0	0
6	S-TI%	0.300000	0.700000	0.525000	0.154606	50	0	0	0	0	0
7	S-MN	300.0000	1500.000	570.0000	277.9297	50	0	0	0	0	0
8	S-AG	0.200000	0.200000	0.200000	***	1	0	0	49	0	0
9	S-AS	200.0000	200.0000	200.0000	***	50	0	0	0	0	0
10	S-AU	***	***	***	***	0	0	0	50	0	0
11	S-B	10.00000	50.00000	21.73913	11.70078	46	0	1	3	0	0
12	S-BA	300.0000	1500.000	560.0000	311.0220	50	0	0	0	0	0
13	S-BE	1.500000	2.000000	1.640000	0.226779	50	0	0	0	0	0
14	S-BI	10.00000	20.00000	14.70588	5.144958	17	0	0	33	0	0
15	S-CD	20.00000	20.00000	20.00000	***	50	0	0	0	0	0
16	S-CO	7.000000	10.00000	8.560000	1.514016	50	0	0	0	0	0
17	S-CR	10.00000	70.00000	23.30000	14.09190	50	0	0	0	0	0
18	S-CU	7.000000	70.00000	22.78000	14.65702	50	0	0	0	0	0
19	S-LA	30.00000	200.0000	88.80000	34.44250	50	0	0	0	0	0
20	S-MO	5.000000	15.00000	8.142857	4.740906	7	0	4	39	0	0
21	S-NB	10.00000	20.00000	11.53846	3.755338	13	0	0	37	0	0
22	S-NI	10.00000	30.00000	15.00000	5.624291	50	0	0	0	0	0
23	S-PB	30.00000	150.0000	49.20000	25.54228	50	0	0	0	0	0
24	S-SB	***	***	***	***	0	0	0	50	0	0
25	S-SC	7.000000	15.00000	8.420000	1.762304	50	0	0	0	0	0
26	S-SN	10.00000	10.00000	10.00000	***	50	0	0	0	0	0
27	S-SR	150.0000	700.0000	346.0000	127.7114	50	0	0	0	0	0
28	S-V	50.00000	100.0000	66.80000	15.44444	50	0	0	0	0	0
29	S-W	***	***	***	***	0	0	50	0	0	0
30	S-Y	20.00000	50.00000	28.80000	7.730142	50	0	0	0	0	0
31	S-ZN	200.0000	200.0000	200.0000	***	50	0	0	0	0	0
32	S-ZR	100.0000	700.0000	346.0000	141.3636	50	0	0	0	0	0
33	S-TH	***	***	***	***	0	0	0	50	0	0
34	AA-CU-P	3.000000	31.00000	14.32000	6.993992	50	0	0	0	0	0
35	AA-PB-P	5.000000	270.0000	35.36000	50.29292	50	0	0	0	0	0
36	AA-ZN-P	2.000000	98.00000	53.40000	16.38317	50	0	0	0	0	0

```
Enter Command: dsplmt

D.S. ID = seds                File = denver.corr4                    Date  6/28/8

Var  Var ID    No    Minimum          L                N                G
                                   No   Limit       No   Limit       No   Limit
  8  S-AG       1      0.20000                      49    0.50000
 10  S-AU       0*************                      50   10.00000
 11  S-B        8     10.00000     1   10.00000      3   10.00000
 14  S-BI       9     10.00000                      33   10.00000
 20  S-MO       4      5.00000     4    5.00000      39    5.00000
 21  S-NB      11     10.00000                      37   10.00000
 24  S-SB       0*************                      50  100.00000
 29  S-W        0*************    50   50.00000
 33  S-TH       0*************                      50  100.00000

Enter Command: q

STOP
r 06/28/83  0758.1 mdt Tue $0.07 $0.13
```

References Cited

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Vantrump, George, Jr., and Miesch, A. T., 1977, The U.S. Geological Survey RASS-STATPAC System for Management and Statistical reduction of geochemical data: Computers and Geosciences v. 3, p. 475-488.