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Geological Survey

Remote-Site Data Entry for the Gospel-Hump Wilderness Area, Idaho: Experimental Use of a Microcomputer on RASS (Rock Analysis Storage System) Data

by

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CONTENTS

Introduction

This report presents the results of an experiment designed to test the feasibility of using microcomputers in a geologic fieldwork environment. A microcomputer was used to enter field data (e.g., sample number, location, sample type, etc.) and chemical data on stream-sediment and rock samples into the Rock Analysis Storage System (RASS). Data were entered and edited on a microcomputer and then transmitted by a commercial telephone line to the Honeywell MULTICS computer at the U.S. Geological Survey (USGS) in Denver, Colorado.

Usually, field information on collected samples is coded by the geologist onto a form and submitted for keypunching. Concurrently, latitude and longitude or UTM (Universal Transverse Mercator) coordinates of sample locations are determined by hand in the field or via a digitizing system at the end of a field season. Samples are either analyzed in the field in a mobile lab or sent off to a permanent lab, and the results are then sent to be keypunched. Because of multiple handling, errors enter into the RASS data sets, and the geologist must spend time correcting them. In order to reduce or eliminate errors and to streamline the system of data entry, this experiment was planned to use a microcomputer to assist in data entry and editing. Besides reducing errors, this scheme provides a means of determining geochemically anomalous areas while the geologist is still in the field and can immediately resample and study these areas.

To test this method of remote-site data entry, all the field data on samples collected in the Gospel-Hump Wilderness Area, Idaho, during the summer of 1980 were entered into an Apple II microcomputer. Nine sets of field data, each containing information on 24 samples and their accompanying chemical analyses, were successfully transmitted to the Denver MULTICS by a commercial telephone line. The remaining field-data sets await the arrival of the chemical

analyses before being transmitted. Statpak-compatible data sets were created for the data transmitted to MULTICS. Statpak is the statistical package used to manipulate RASS data that have been converted to binary form (see Appendix G). These data sets, after being manipulated by Statpak, are used to determine geochemically anomalous areas. The chemical analyses necessary to meet this objective must be done at a mobile lab or arrangements must be made to have a carefully selected suite of samples analyzed and the results returned while the geologist is still in the field. Although a shortage of funds for computer usage precluded the completion of this aspect of the experiment during the 1980 field season, the data were transmitted to Denver from a "simulated" field environment (Reston, Va.) after funds became available. Thus, in October 1980, data sets were available to be worked on using Statpak. In contrast, workers who collected samples in another wilderness area during the summer of 1979 did not have a usable data set until May 1980.

Microcomputer System Configuration

The microcomputer chosen for this experiment was Apple Computer, Inc.'s Apple II computer. This computer has 48K RAM (Random-Access Memory) and supports the following languages: Integer Basic, floating point Basic (Applesoft), Pascal, and FORTRAN. All programs for the Apple II included in this paper are written in floating point Basic. The Apple II was equipped with the following peripheral equipment: a graphics printer (IDS440 Paper Tiger), an acoustics modem (Novations' The Cat), a graphics input-digitizing tablet, a color monitor, and two 5 1/4-inch floppy-disk drives.

The Apple II performed the tasks (see Appendix A for task flow charts) of asking for particular information about a sample, digitizing the latitude and longitude of a sample location, checking for mis-entered data, creating a RASS III record (see Appendices B and C), and transmitting a completed

data set to MULTICS. Additionally, the Apple II was programmed to serve as a RASS III record editor, printing an archival RASS form (see Appendix D) and entering and editing chemical-analysis data.

Computer Program Description

The programs presented here (see Appendix E) were tailored for use by the Gospel-Hump Wilderness Team, using the field form found in Appendix F. The programs need not be modified to suit other wilderness or roadless areas applications because a program is currently being written for general usage by any project entering data into RASS.

The underlying principle in the design of these programs was ease of use by the geologist. The program designers assumed that the person entering the data had no prior computer experience. The Gospel-Hump Wilderness Team was given a 15-minute presentation on the use of the computer. Posters were mounted above the computer to describe step-by-step procedures for a cold start (the computer needs to be turned on) and a warm start (the computer is already on). The rest of the instructions were carried out by the personnel on the project simply by responding to prompts from the Apple. Tasks other than data entry were carried out by one of four trained personnel because of the slightly more complicated nature of the hardware and the small amount of time needed to perform these functions. This problem will be eliminated when the general program is written, and all functions will be done by the user.

The data-entry program is able to detect errors. If a smaller or larger number of characters is entered than the program expects, the user is warned by both audible and visual means that an error exists, and the same question is asked again. Also, if a choice of possible responses is given by the computer, and the user responds with a character not on that list, then the computer gives an audible (2-second monotone) and visual warning and repeats

the question.

The transmission of data is done totally under program control by the microcomputer. This transmission involves the microcomputer communicating commands to MULTICS to enter into a text editor. The microcomputer reads a record into its memory and transmits that record into the text editor's buffer on MULTICS. After the whole data set is completed, the microcomputer tells MULTICS to write the data to a pre-named segment and quit the editor. The time needed to transmit one data set of 24 records is 3 minutes, including a necessary delay between each record to allow MULTICS to absorb the data. This transmission time will be reduced greatly when the MULTICS front-end processor is able to accept data at 30 characters per second with no time delay between records.

Results

Ninety-four hours and 25 minutes were spent entering data on 552 samples into the Apple II in the field. The average time spent on the computer per sample was 10.26 minutes. This time includes all functions of entering field data, such as initial entry, digitizing locations, and printing of archival RASS forms, as well as time spent transmitting data to the Denver MULTICS, entering the nine sets of chemical analyses, and training.

Recommendations for Future Experiments

Future uses of microcomputers in geologic field investigations may be enhanced by improvements in both hardware and software. A generalized program for use by any projects using RASS is needed and is currently being written.

It would be desirable to have a better storage and retrieval system for field data other than geochemical data (e.g., structural data) than the present system of handwritten field notebooks. This desire for a new system does not

imply that field notebooks are obsolete but rather that the ultimate storage of data should be on the computer so that they are easily retrievable. This system should be able to retrieve information on the basis of field number and/or latitude-longitude; this retrieved information could then be plotted, analyzed statistically, or listed independent of support from a larger computer.

Programs already available that perform tasks such as stereonet plotting and statistics can be modified easily to run on the Apple. A Basic version of the Geologic Retrieval and Synopsis Program (GRASP), called micro-GRASP (R. Bowen, personal communication), has been implemented on a 32K Tektronix 4052. This version of GRASP could be modified and possibly expanded to run on the Apple.

Because modern microcomputers have large memories (e.g., Apple III has 128K RAM memory), they could be used to run complex statistical programs on geochemical data while the user is in the field without the need to communicate with MULTICS. This independence of the microcomputer would permit greater flexibility in its field location.

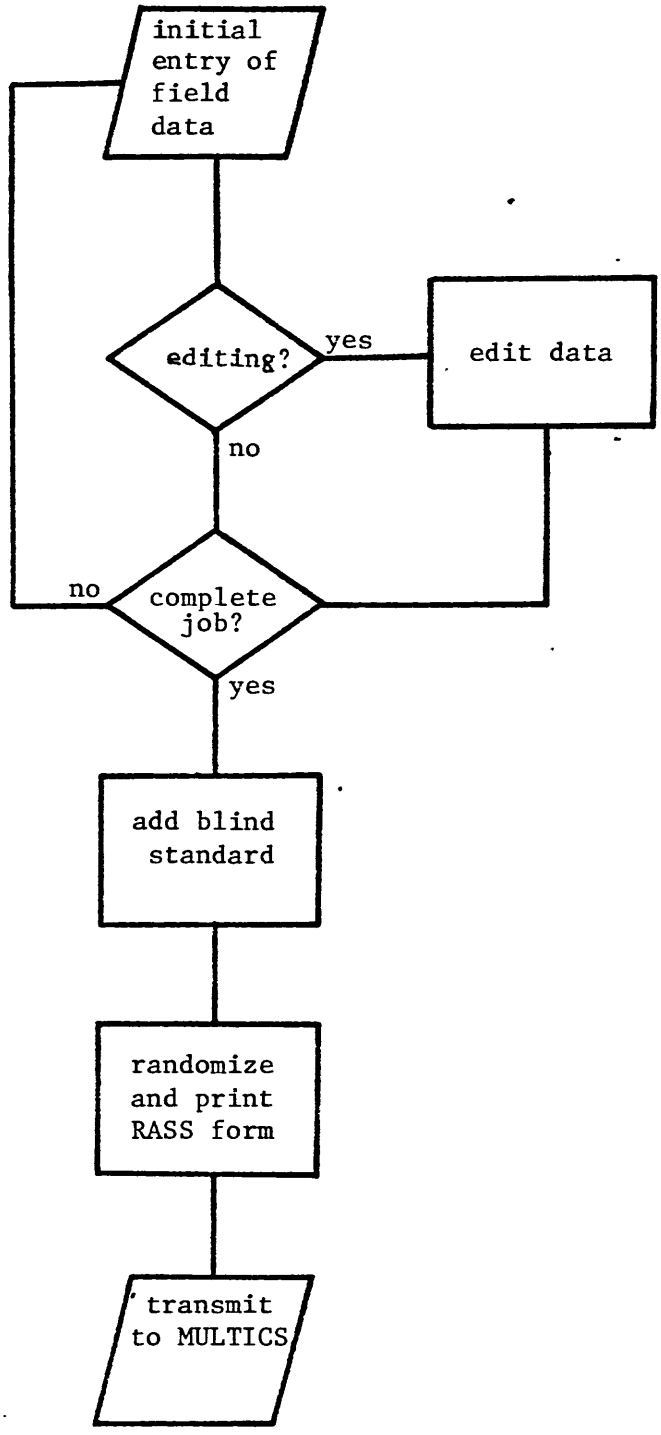
The microcomputer makes data more readily accessible to the field geologist. It may be set up anywhere an electrical outlet exists and possibly could be run by a generator. Probably in the future, microcomputers will not need to communicate via telephone lines with a large host computer to do complex statistical analysis. The microcomputer has proved to be efficient in terms of reducing data-entry errors and the time spent prior to final analysis. It may eventually be the most useful data-processing device to become available to the field geologist.

Acknowledgments

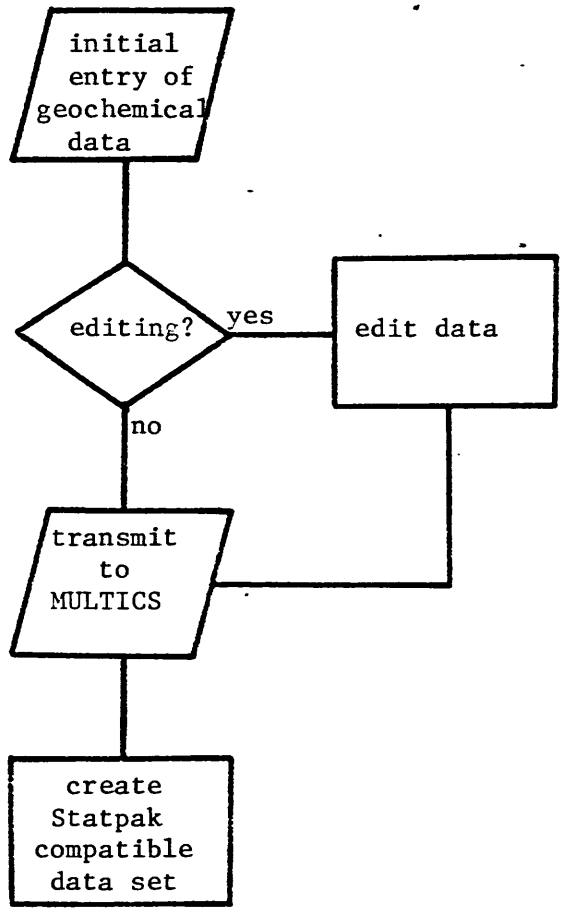
I wish to acknowledge the support of Gus Goudarzi and William Greenwood in this experiment. The field tests would not have been conducted successfully without the cooperation of the entire Gospel-Hump Wilderness Area Team, especially Karen Lund, Gary Simms, and Bert Coxe. Jeffrey Schuyler provided able assistance in data entry and programming, as well as in the field.

Appendix A : Task flow charts

Field Data



Geochemical Data



Appendix B: RASS III record for
Gospel-Hump Wilderness Area, Idaho,
summer 1980

Column Number	Field Identity	Data Type
1-8	field number of sample	alphanumeric
9-14	tag number (for lab)	alphanumeric
15-16	state	alphabetic
17-21	county	alphabetic
22-24	degrees-latitude	numeric
25-26	minutes-latitude	numeric
27-28	seconds-latitude	numeric
29-31	degrees-longitude	numeric
32-33	minutes-longitude	numeric
34-35	seconds-longitude	numeric
36	sample source	alphabetic
37	sample type	alphabetic
38-39	known age	alphabetic
40-41	youngest age	alphabetic
42-43	oldest age	alphabetic
44	material class	alphabetic
45-65	material codes	alphabetic
66-68	sample treatment	alphabetic
69-83	rock name	alphabetic
84-97	free coding	alphanumeric
98-99	deposit type	alphabetic
100	oxidation state	alphabetic
101-102	alteration type	alphabetic
103-111	not used	
112-115	elevation	numeric
116-179	comments	alphanumeric

Appendix C: Geochemical records for samples taken in Gospel-Hump Wilderness Area, Idaho, summer 1980

-Data for each sample are contained in 3 records.
-Records 2 and 3 each start with an "!".
-Each of the elemental values is followed by a qualifier, if needed, or a blank if there is no qualifier.

Column Number	Field Identity	Data Type
RECORD # 1		
1-8	field number	alphanumeric
9-14	tag number	alphanumeric
RECORD # 2		
1	"!"	———
2-9	Fe% + qualifier	numeric + alphabetic
10-17	Mg% + qualifier	numeric + alphabetic
18-25	Ca% + qualifier	numeric + alphabetic
26-33	Ti% + qualifier	numeric + alphabetic
34-41	Mn% + qualifier	numeric + alphabetic
42-49	Ag ppm + qualifier	numeric + alphabetic
50-57	As ppm + qualifier	numeric + alphabetic
58-65	Au ppm + qualifier	numeric + alphabetic
66-73	B ppm + qualifier	numeric + alphabetic
74-81	Ba ppm + qualifier	numeric + alphabetic
82-89	Be ppm + qualifier	numeric + alphabetic
90-97	Bi ppm + qualifier	numeric + alphabetic
98-105	Cd ppm + qualifier	numeric + alphabetic
106-113	Co ppm + qualifier	numeric + alphabetic
114-121	Cr ppm + qualifier	numeric + alphabetic

Column Number	Field Identity	Data Type
RECORD # 3		
1	"!"	____
2-9	Cu ppm + qualifier	numeric + alphabetic
10-17	La ppm + qualifier	numeric + alphabetic
18-25	Mo ppm + qualifier	numeric + alphabetic
26-33	Nb ppm + qualifier	numeric + alphabetic
34-41	Ni ppm + qualifier	numeric + alphabetic
42-49	Pb ppm + qualifier	numeric + alphabetic
50-57	Sb ppm + qualifier	numeric + alphabetic
58-65	Sc ppm + qualifier	numeric + alphabetic
66-73	Sn ppm + qualifier	numeric + alphabetic
74-81	Sr ppm + qualifier	numeric + alphabetic
82-89	V ppm + qualifier	numeric + alphabetic
90-97	W ppm + qualifier	numeric + alphabetic
98-105	Y ppm + qualifier	numeric + alphabetic
106-113	Zn ppm + qualifier	numeric + alphabetic
114-121	Zr ppm + qualifier	numeric + alphabetic
122-129	Th ppm + qualifier	numeric + alphabetic

Appendix D: Archival RASS form

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RASS III

FIELD NO.	TAG NO.	ST	CNTY	LAT D	LAT M	LAT S	LONG D	LONG M	LONG S	SS	ST	SM	MATERIAL CODES 10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
0BB032SF	LGA047	ID	IDAHO	45	51	27	115	47	46	N	B	F	S	D					S	T												
0BB035TF	LGA048	ID	IDAHO	45	50	51	115	51	56	N	B	F	S	D					S	T												
0BB036SF	LGA049	ID	IDAHO	45	50	51	115	51	56	N	B	F	S	D					S	T												
0BB034SF	LGA050	ID	IDAHO	45	51	1	115	51	39	N	B	F	S	D					S	T												
0BB035TF	LGA051	ID	IDAHO	45	50	51	115	51	56	N	B	F	S	D					S	T												
0BB025SF	LGA052	ID	IDAHO	45	51	56	115	48	11	N	B	F	S	D					S	T												
0BB043SF	LGA053	ID	IDAHO	45	45	54	115	45	22	N	B	F	S	D					S	T												
0BB045SF	LGA054	ID	IDAHO	45	46	24	115	45	58	N	B	F	S	D					S	T												
0BB032SF	LGA055	ID	IDAHO	45	51	27	115	47	46	N	B	F	S	D					S	T												
0BB026SF	LGA056	ID	IDAHO	45	49	12	115	49	34	N	B	F	S	D					S	T												
0BB027SF	LGA057	ID	IDAHO	45	47	51	115	46	12	N	B	F	S	D					S	T												
0BB042SF	LGA058	ID	IDAHO	45	45	21	115	45	25	N	B	F	S	D					S	T												
0BB040SF	LGA059	ID	IDAHO	45	52	15	115	50	13	N	B	F	S	D					S	T												
0BB029SF	LGA060	ID	IDAHO	45	48	26	115	48	2	N	B	F	S	D					S	T												
0BB048SF	LGA061	ID	IDAHO	45	46	49	115	45	42	N	B	F	S	D					S	T												
0BB035SF	LGA062	ID	IDAHO	45	50	51	115	51	56	N	B	F	S	D					S	T												
0BB023SF	LGA063	ID	IDAHO	45	50	0	115	48	28	N	B	F	S	D					S	T												
0BB033SF	LGA064	ID	IDAHO	45	50	0	115	51	27	N	B	F	S	D					S	T												
0BB028SF	LGA065	ID	IDAHO	45	47	35	115	45	21	N	B	F	S	D					S	T												
0BB037SF	LGA066	ID	IDAHO	45	51	38	115	51	19	N	B	F	S	D					S	T												
0BB038SF	LGA067	ID	IDAHO	45	52	1	115	50	52	N	B	F	S	D					S	T												
0BB024SF	LGA068	ID	IDAHO	45	50	28	115	48	29	N	B	F	S	D					S	T												
0BB031SF	LGA069	ID	IDAHO	45	51	50	115	47	18	N	B	F	S	D					S	T												

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RASS III

FIELD NO.	TAG NO.	GEOL. AGE			SMF TRT	FORMATION NAME	FREE CODING										MIN. OR MAT			ELEV-ATION
		K	O P	Y P			1	2	3	4	5	6	7	8	9	10	DT	OX	AT	
080328F	LCA047				S		B	2	A	B	D	A	A							4400
080351F	LCA048				S		B	2	B	A	C	B	B							3520
080365F	LCA049				S		B	2	B	A	C	B	B							3520
080349F	LCA050				S		B	2	A	C	A	A	C							3600
080351F	LCA051				S		B	2	C	A	C	B	B							3520
080325F	LCA052				S		B	2	A	B	A	A	B							3860
080439F	LCA053				S		B	2	A	A	A	A	C							4280
080459F	LCA054				S		B	2	A	B	A	A	A							4170
080328F	LCA055				S		B	2	M	B	D	A	A							4400
080269F	LCA056				S		B	2	A	A	A	B	A							2720
080279F	LCA057				S		B	2	A	C	A	A	A							3000
080429F	LCA058				S		B	2	A	A	A	B	C							4380
080409F	LCA059				S		B	2	A	B	C	A	A							4080
080293F	LCA060				S		B	2	A	A	A	A	B							2720
080498F	LCA061				S		B	2	A	B	A	A	A							3790
080359F	LCA062				S		B	2	B	A	C	B	B							3520
080235F	LCA063				S		B	2	A	A	A	A	A							3300
080339F	LCA064				S		B	2	A	B	D	B	B							2080
080285F	LCA065				S		B	2	A	A	A	A	A							3100
080375F	LCA066				S		B	2	A	B	D	B	A							4080
080[illegible]F	LCA067				S		B	2	A	B	C	A	B							4080
080249F	LCA068				S		B	2	A	B	A	A	A							3420
080315F	LCA069				S		B	2	A	A	D	B	B							4620

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PASS III

FIELD NO.	TAG NO.	STREAM NO.	COMMENTS
0B0328F	LGA047		
0B0351F	LGA048		
0B0366F	LGA049		
0B0345F	LGA050		
0B0357F	LGA051		
0B0259F	LGA052		
0B0439F	LGA053		
0B0455F	LGA054		
0B0323F	LGA055		
0B02a9F	LGA056		
0B0279F	LGA057		
0B0429F	LGA058		
0B0409F	LGA059		
0B0299F	LGA060		
0B0489F	LGA061		
0B0359F	LGA062		
0B0239F	LGA063		
0B0339F	LGA064		
0B0289F	LGA065		
0B0379F	LGA066		
0B0389F	LGA067		
0B0249F	LGA068		
0B0319F	LGA069		

QUAD-CONTROL

```
1  REM  ************************************************************************
2  REM  QUADRANGLE CONTROL PROGRAM
3  REM  THIS PROGRAM MUST BE RUN PRIOR TO ANY DATA ENTRY.
4  REM  IT CREATES THE FILE FOR QUAD IDENTIFIERS AND LAT-LONG OF CONTROL POINTS.
5  REM  ************************************************************************
40 D$ =  CHR$ (4)
60 N = 1
100  INPUT "ENTER 4 CHARACTER QUADRANGLE DESIGNATION : ";Q$
105  IF  LEN (Q$) <  > 4 THEN  GOTO 100
110  INPUT "ENTER LATITUDE OF UPPER LEFT CONTROL POINT IN DEGREES, MINUTES AND SECON
     DS... ENTER DEGREES ONLY : ";D1
120  INPUT "ENTER MINUTES : ";M1
130  INPUT "ENTER SECONDS : ";S1
135 U1 = D1 + ((M1 + (S1 / 60)) / 60)
140  INPUT "ENTER LONGITUDE OF UPPER LEFT CONTROL POINT...ENTER DEGREES ONLY : ";D2
150  INPUT "ENTER MINUTES : ";M2
160  INPUT "ENTER SECONDS : ";S2
165 U2 = D2 + ((M2 + (S2 / 60)) / 60)
170  INPUT "ENTER LATITUDE OF LOWER RIGHT CONTROL POINT... ENTER DEGREES ONLY : ";D3

180  INPUT "ENTER MINUTES : ";M3
190  INPUT "ENTER SECONDS : ";S3
195 L1 = D3 + ((M3 + (S3 / 60)) / 60)
200  INPUT "ENTER LONGITUDE OF LOWER RIGHT CONTROL POINT...ENTER DEGREES ONLY : ";D4

210  INPUT "ENTER MINUTES : ";M4
220  INPUT "ENTER SECONDS : ";S4
225 L2 = D4 + ((M4 + (S4 / 60)) / 60)
228  PRINT D$;"OPEN QUADCTL,L20"
230  PRINT D$;"WRITE QUADCTL,R";N: PRINT Q$
240  PRINT D$;"WRITE QUADCTL,R";N + 1: PRINT U1
250  PRINT D$;"WRITE QUADCTL,R";N + 2: PRINT U2
260  PRINT D$;"WRITE QUADCTL,R";N + 3: PRINT L1
270  PRINT D$;"WRITE QUADCTL,R";N + 4: PRINT L2
275  PRINT D$;"CLOSE QUADCTL"
278 N = N + 5
280  INPUT "DO YOU HAVE ANY MORE QUADS ? ";A$
290  IF A$ = "Y" THEN  GOTO 100
300  IF A$ <  > "N" THEN  GOTO 280
320  PRINT D$;"LOCK QUADCTL"
330  END
```

QUAD-LOOK

```
1  REM  ************************************************************************
2  REM  THIS PROGRAM ALLOWS THE USER TO LOOK AT THE QUADRANGLE CONTROL FILE
3  REM  TO SEE IF ALL THAT WAS ENTERED WAS CORRECT.
4  REM  ************************************************************************
100 D$ =  CHR$ (4)
105 I = 1
110  PRINT D$;"OPEN QUADCTL,L10,D1"
130  PRINT D$;"READ QUADCTL,R";I: INPUT Q$
140  PRINT D$;"READ QUADCTL,R";I + 1: INPUT UT
150  PRINT D$;"READ QUADCTL,R";I + 2: INPUT UG
160  PRINT D$;"READ QUADCTL,R";I + 3: INPUT LT
170  PRINT D$;"READ QUADCTL,R";I + 4: INPUT LG
175  PRINT D$;"CLOSE QUADCTL"
180  PRINT "I = ";I: PRINT "QUAD = ";Q$
190  PRINT "UT = ";UT: PRINT "UG = ";UG: PRINT "LT = ";LT: PRINT "LG = ";LG
200 I = I + 5
210  INPUT "MORE? ";X$
220  GOTO 110
```

QUAD-EDIT

```
1  REM  ************************************************************************
2  REM  QUADRANGLE CONTROL FILE EDIT PROGRAM
3  REM  THIS PROGRAM ALLOWS THE USER TO EDIT ANY MISTAKES MADE IN QUAD-CONTROL
4  REM  ************************************************************************
100 D$ =  CHR$ (4)
105  INPUT "ENTER 4 CHARACTER IDENTIFIER OF QUAD YOU WISH TO EDIT:  ";C$
107  PRINT "  "
110  INPUT "ENTER LAT. OR LONG. YOU WISH TO CHANGE  IN DECIMAL DEGREES:  ";Z
115  PRINT "  "
116  PRINT "ENTER NUMBER OF ITEM YOU WISH TO CHANGE:  ": PRINT "  ": PRINT "(1)  LAT
      OF UPPER LEFT CONTROL POINT": PRINT "(2)  LONG OF UPPER LEFT CONTROL POINT"
118  PRINT "(3)  LAT OF LOWER RIGHT CONTROL POINT": PRINT "(4)  LONG OF LOWER RIGHT
     CONTROL POINT": INPUT LX
140  FOR I = 1 TO 200 STEP 5
145  PRINT D$;"OPEN QUADCTL,L20"
150  PRINT D$;"READ QUADCTL,R";I
160  INPUT A$
170  IF A$ = C$ THEN  GOTO 193
171  PRINT D$;"CLOSE QUADCTL"
175  PRINT "I= ";I: PRINT A$
190  NEXT I
193  PRINT "  ": PRINT "QUAD = "A$
195  PRINT D$;"CLOSE QUADCTL": PRINT D$;"UNLOCK QUADCTL": PRINT D$;"OPEN QUADCTL,L20
     "
200  PRINT D$;"WRITE QUADCTL,R";I + LX
210  PRINT Z
220  PRINT D$;"CLOSE QUADCTL"
221  PRINT D$;"LOCK QUADCTL"
225  PRINT "  ": PRINT "RECORD =  "I
228  PRINT "  "
230  INPUT "WOULD YOU LIKE TO DO ANOTHER?";H$
235  IF H$ = "Y" THEN  GOTO 105
240  IF H$ <  > "N" THEN  GOTO 230
245  END
```

DRIVER

```
1  REM  ********************************************************************
2  REM  DRIVER PROGRAM FOR RASS III DATA ENTRY SYSTEM
3  REM  THIS IS THE FIRST PROGRAM TO BE RUN FOR THE DATA ENTRY-EDITTING FUNCTIONS
4  REM  ********************************************************************
5 D$ =  CHR$ (4)
9  HOME : PRINT : PRINT
10  PRINT "WELCOME TO THE USGS RASS III DATA ENTRY SYSTEM": PRINT : PRINT : PRINT
11  PRINT "THE FOLLOWING OPERATIONS ARE AVAILABLE :": PRINT : PRINT "     1 : INITIA
     L ENTRY OF DATA": PRINT
12  PRINT "     2 : EDITTING OF DATA": PRINT : PRINT "     3 : LAT-LONG CALCULATION"
     : PRINT : PRINT "     4 : END OF SESSION"
14  PRINT : PRINT : INPUT "ENTER OPERATION NUMBER : ";A
20  IF A > 1 THEN  GOTO 30
22  PRINT D$;"RUN FIELD7,D1"
30  IF A > 2 THEN  GOTO 40
32  PRINT D$;"RUN EDIT1,D1"
40  IF A > 3 THEN  GOTO 50
42  PRINT D$;"RUN LAT-LONG,D1"
50  IF A > 4 THEN  GOTO 70
52  END
70  PRINT "YOU HAVE ENTERED AN INCORRECT OPERATION NUMBER."
71  GOTO 9
```

FIELD7

```
1  REM  ************************************************************************
2  REM  RASS III DATA ENTRY PROGRAM
3  REM  ************************************************************************
30 AA$ = "********************************"
35 DI = 1
40  HOME
50  DIM RD(30)
55 B$ = " ":BB$ = B$ + B$:BC$ = BB$ + BB$ + B$
60 D$ = "": REM  CTRL-D
65  INPUT "ENTER DATA FILE NAME : ";NAME$
70  INPUT "IS THIS A NEW FILE(Y OR N)? ";F$
71  IF F$ = "Y" THEN NSAMPL% = 1: PRINT D$;"OPEN"NAME$",L190,D2": PRINT D$;"WRITE"NA
    ME$",R1": PRINT NSAMPL%: PRINT D$;"CLOSE"NAME$: GOTO 80
72  IF F$ < > "N" THEN  GOTO 70
73  PRINT D$;"OPEN"NAME$",L190,D2"
74  PRINT D$;"READ"NAME$",R1"
75  INPUT NSAMPL%
79  PRINT D$;"CLOSE"NAME$
80  PRINT D$;"UNLOCK"NAME$
81  INPUT "ENTER INITIALS OF FIRST AND LAST NAME : ";INI$
82  IF  LEN (INI$) = 2 THEN  GOTO 85
83  PRINT "ENTER 2 INITIALS": GOTO 81
85 SA$ = "ID"
86 COUNTY$ = "IDAHO"
87 YR$ = "0"
90  IF NSAMPL% < = 22 THEN  GOTO 100
95  PRINT "THE NUMBER OF SAMPLES HAS EXCEEDED 22.  YOU ARE NOW FINISHED WITH THIS DA
    TA SET."
96  GOTO 1500
100 NSAMPL% = NSAMPL% + 1
110  INPUT "ENTER SAMPLE NUMBER : ";FLDNO$
120  IF  LEN (FLDNO$) < = 5 THEN  GOTO 140
130  PRINT "SAMPLE NUMBER IS GREATER THAN 5 CHARACTERS : ";FLDNO$: GOTO 110
140  IF  LEN (FLDNO$) > = 4 THEN  GOTO 160
150  PRINT "SAMPLE NUMBER IS LESS THAN 4 CHARACTERS : ";FLDNO$: GOTO 110
160  IF  LEN (FLDNO$) = 4 THEN FLDNO$ = FLDNO$ + B$
170  INPUT "ENTER SAMPLE TYPE (A OR B) : ";TYPE$
180  IF TYPE$ = "A" OR TYPE$ = "B" THEN  GOTO 200
190  GOSUB 5000: GOTO 170
200  INPUT "ENTER SAMPLE SOURCE : ";SOURCE$
210  IF SOURCE$ = "A" OR SOURCE$ = "C" OR SOURCE$ = "F" OR SOURCE$ = "J" OR SOURCE$ =
    "N" OR SOURCE$ = "Z" THEN  GOTO 350
215  GOSUB 5000
220  PRINT "SAMPLE SOURCE=";SOURCE$;" IS THAT WHAT YOU REALLY WANT"
230  INPUT ANSWER$
240  IF ANSWER$ = "Y" THEN  GOTO 350
250  IF ANSWER$ = "N" THEN  GOTO 200
260  PRINT "PLEASE ANSWER YES(Y) OR NO(N)": GOTO 230
350  INPUT "ENTER MATERIAL CLASS : ";MCLASS$
360  IF MCLASS$ = "A" OR MCLASS$ = "B" OR MCLASS$ = "C" OR MCLASS$ = "F" OR MCLASS$ =
    "H" OR MCLASS$ = "J" THEN  GOTO 420
365  GOSUB 5000
370  PRINT "MATERIAL CLASS= ";MCLASS$;" IS THAT WHAT YOU REALLY WANT?"
380  INPUT ANSWER$
390  IF ANSWER$ = "Y" THEN  GOTO 420
400  IF ANSWER$ = "N" THEN  GOTO 350
```

FIELD7 (cont.)

```
410  PRINT "PLEASE ANSWER YES(Y) OR NO(N)": GOTO 350
420  GOTO 421
421  IF MCLASS$ = "A" THEN  GOTO 2000
425  IF MCLASS$ = "B" THEN  GOTO 2200
430  IF MCLASS$ = "C" THEN  GOTO 2400
435  IF MCLASS$ = "F" THEN  GOTO 2600
440  IF MCLASS$ = "H" THEN  GOTO 2800
445  IF MCLASS$ = "J" THEN  GOTO 3000
530  INPUT "ENTER THE QUADRANGLE NAME (FC 1-2) : ";QN$
535  IF  LEN (QN$) = 2 THEN  GOTO 540
536  GOSUB 5000: PRINT "QUAD NAME MUST BE 2 CHARACTERS": PRINT AA$: PRINT : GOTO 530

540  PRINT "ENTER (FC 3)": PRINT "     A) PRIMARY": PRINT "     B) RESAMPLE": PRINT
     "     C) REPLICATE SAMPLE": INPUT FU$
545  IF FU$ = "A" OR FU$ = "B" OR FU$ = "C" THEN  GOTO 600
546  GOSUB 5000: GOTO 540
600 FC$ = QN$ + FU$ + FV$ + FW$ + FX$ + FY$ + FZ$ + BC$ + B$
610  IF MCLASS$ = "F" OR MCLASS$ = "J" THEN  GOTO 660
620 SN$ = BC$ + BB$ + BB$: GOTO 670
660  INPUT "ENTER STREAM NUMBER : ";SN$
662  IF  LEN (SN$) <  = 9 THEN  GOTO 665
663  GOSUB 5000: PRINT "STREAM CODE MUST BE < OR = 9 CHARACTERS": PRINT AA$: PRINT :
      GOTO 660
665  IF  LEN (SN$) = 9 THEN  GOTO 670
666 TP = 9 -  LEN (SN$)
667  FOR I = 1 TO TP:SN$ = SN$ + B$: NEXT I
670  INPUT "ENTER ELEVATION : ";EL$
672  IF  LEN (EL$) <  = 4 THEN  GOTO 675
673  GOSUB 5000: PRINT "ELEVATION MUST BE < OR = 4 CHARACTERS": PRINT AA$: PRINT : GOTO
     670
675  IF  LEN (EL$) = 4 THEN  GOTO 680
676 TP = 4 -  LEN (EL$)
677  FOR I = 1 TO TP:EL$ = EL$ + B$: NEXT I
680  INPUT "ENTER ANY COMMENTS (LENGTH <64 CHARACTERS) : ";CMT$
681  IF  LEN (CMT$) > 64 THEN  GOTO 700
682  IF  LEN (CMT$) = 64 THEN  GOTO 800
683 TP = 64 -  LEN (CMT$)
684  FOR I = 1 TO TP:CMT$ = CMT$ + B$: NEXT I
685  GOTO 800
690  IF  LEN (CMT$) <  = 64 THEN  GOTO 800
700  GOSUB 5000: PRINT "YOUR COMMENTS FIELD IS TOO LONG": PRINT "LENGTH = "; LEN (CM
     T$): PRINT AA$: PRINT : GOTO 680
800  PRINT AA$: PRINT "DIGITIZE LATITUDE AND LONGITUDE OF SAMPLE": PRINT AA$
805  IF DI = 1 THEN  GOTO 829
810  INPUT "IS THIS SAMPLE ON THE SAME QUADRANGLE SECTION AS THE LAST ONE? ";ANS$
820  IF ANS$ = "Y" THEN  GOTO 1030
825  IF ANS$ = "N" THEN  GOTO 830
826  PRINT AA$: PRINT "ENTER Y OR N": PRINT AA$: GOTO 810
829 DI = 2
830  INPUT "ENTER 4 CHARACTER QUAD IDENTIFIER : ";QI$
840  IF  LEN (QI$) = 4 THEN  GOTO 855
950  PRINT "YOUR QUAD IDENTIFIER IS INCORRECT : ";QI$: GOTO 830
855  PRINT D$;"OPEN QUADCTL,L20,D1"
860  FOR I = 1 TO 200 STEP 5
870  PRINT D$;"READ QUADCTL,R";I
```

FIELD7 (cont.)

```
880  INPUT QL$: IF QL$ = QI$ THEN  GOTO 920
890  NEXT I
900  PRINT D$;"CLOSE QUADCTL"
910  PRINT "THE QUAD IDENTIFIER YOU ENTERED IS NOT IN THE CONTROL FILE : ";QI$: GOTO
     830
920  PRINT D$;"READ QUADCTL,R";I + 1: INPUT UTDEG
930  PRINT D$;"READ QUADCTL,R";I + 2: INPUT UGDEG
940  PRINT D$;"READ QUADCTL,R";I + 3: INPUT LTDEG
950  PRINT D$;"READ QUADCTL,R";I + 4: INPUT LGDEG
960  PRINT D$;"CLOSE QUADCTL"
970  PRINT D$;"PR#5": PRINT "TEXT 1": PRINT D$;"PR#0"
980  PRINT D$;"IN#5": PRINT "PLACE PEN ON UPPER LEFT CONTROL POINT"
990  INPUT XU,YU,Z: IF Z < > 2 THEN  GOTO 990
1000  PRINT "PLACE PEN ON LOWER RIGHT CONTROL POINT"
1010  INPUT XL,YL,Z: IF Z < > 2 THEN  GOTO 1010
1020 XM =  ABS (UGDEG - LGDEG) /  ABS (XU - XL):YM =  ABS (UTDEG - LTDEG) /  ABS (YU
      - YL)
1030  IF ANS$ < > "Y" THEN  GOTO 1035
1031  PRINT D$;"IN#5"
1035  PRINT "PLACE PEN ON SAMPLE LOCATION"
1040  INPUT XS,YS,Z: IF Z < > 2 THEN  GOTO 1040
1050 GS = UGDEG + (XU - XS) * XM
1060 DG% =  INT (GS)
1070 R = (GS - DG%) * 60
1080 MG% =  INT (R)
1090 R = (R - MG%) * 60
1100 SG% =  INT (R)
1110 TS = UTDEG + (YU - YS) * YM
1120 DT% =  INT (TS)
1130 R = (TS - DT%) * 60
1140 MT% =  INT (R)
1150 R = (R - MT%) * 60
1160 ST% =  INT (R)
1170  PRINT D$;"IN#0"
1180 DG$ =  STR$ (DG%):MG$ =  STR$ (MG%):SG$ =  STR$ (SG%)
1185  IF  LEN (MG$) = 1 THEN MG$ = B$ + MG$
1186  IF  LEN (SG$) = 1 THEN SG$ = B$ + SG$
1190 DT$ = B$ +  STR$ (DT%):MT$ =  STR$ (MT%):TS$ =  STR$ (ST%)
1195  IF  LEN (MT$) = 1 THEN MT$ = B$ + MT$
1196  IF  LEN (TS$) = 1 THEN TS$ = B$ + TS$
1400 RE$ = YR$ + INI$ + FLDNO$ + B$ + BC$ + SA$ + COUNTY$ + DT$ + MT$ + TS$ + DG$ +
     MG$ + SG$ + SOURCE$ + TYPE$ + AGE$ + YPAGE$ + OPAGE$ + MCLASS$ + MD$ + PT$ + CT
     $ + RB$ + FC$ + DP$ + OS$ + ALT$ + SN$ + EL$ + CMT$
1410  PRINT D$;"OPEN"NAME$",L190,D2"
1420  PRINT D$;"WRITE"NAME$",R"NSAMPL%
1430  PRINT RE$
1440  PRINT D$;"WRITE"NAME$",R1"
1450  PRINT NSAMPL%
1460  PRINT D$;"CLOSE"NAME$
1470  INPUT "DO YOU WANT TO DO ANY MORE INPUTTING NOW? (Y OR N) : ";ANS$
1480  IF ANS$ = "Y" THEN  GOTO 90
1490  IF ANS$ < > "N" THEN  GOTO 1470
1500  PRINT D$;"LOCK"NAME$
1510  PRINT D$;"RUN DRIVER,D1"
```

FIELD7 (cont.)

```
2000  INPUT "ENTER IGNEOUS ROCK NAME (MC 10-11) : ";NM$
2005  IF  LEN (NM$) = 2 THEN  GOTO 2010
2006  GOSUB 5000: PRINT AA$: PRINT "IGNEOUS NAME MUST HAVE 2 CHARACTERS": PRINT AA$:
      GOTO 2000
2010  INPUT "ENTER IGNEOUS FORM (MC 12-13) FROM FIELD FORM : ";FR$
2015  IF FR$ = "IR" OR FR$ = "EX" OR FR$ = "DK" OR FR$ = "SI" THEN  GOTO 2020
2016  GOSUB 5000: GOTO 2010
2020  PRINT "ENTER GRAIN SIZE": PRINT "     A : APHANITIC": PRINT "     F : FINE-GRA
     INED <1MM": PRINT "     M : MEDIUM-GRAINED >1MM <5MM": PRINT "     C : COARSE-G
     RAINED >5MM <2CM": PRINT "     P : PEGMATITIC >2CM": PRINT "     B : UNKNOWN"
2021  INPUT GS$
2025  IF GS$ = "A" OR GS$ = "F" OR GS$ = "M" OR GS$ = "C" OR GS$ = "P" THEN  GOTO 20
     30
2026  IF GS$ < > "B" THEN  GOTO 2028
2027 GS$ = " ": GOTO 2030
2028  GOSUB 5000: GOTO 2020
2030  PRINT "ENTER TEXTURE (MC 15) : ": PRINT "     P: PORPHYRITIC": PRINT "     N:
     NON-MASSIVE": PRINT "     M: MASSIVE": INPUT TX$
2035  IF TX$ = "P" OR TX$ = "N" OR TX$ = "M" THEN  GOTO 2040
2036  GOSUB 5000: PRINT "TEXTURE MUST HAVE 1 CHARACTER": PRINT AA$: PRINT : GOTO 203
     0
2040 MD$ = NM$ + FR$ + GS$ + TX$ + BC$ + BC$ + BC$
2045  GOSUB 4000
2050  IF  LEN (MD$) = 21 THEN  GOTO 530
2060  GOSUB 5000: PRINT "MAT. CODE = ";MD$: PRINT AA$: PRINT : GOTO 2000
2200  INPUT "ENTER THE METAMORPHIC GRADE (MC 10-11) FROM FIELD FORM : ";GM$
2205  IF GM$ = "LG" OR GM$ = "MG" OR GM$ = "HG" THEN  GOTO 2210
2206  GOSUB 5000: GOTO 2200
2210  PRINT "ENTER THE ORIGINAL ROCK (MC 13) :": PRINT "     I: IGNEOUS": PRINT "
       S: SEDIMENTARY": PRINT "     M: MIXED ROCKS": PRINT "     U: UNKNOWN": INPUT
     RO$
2215  IF RO$ = "I" OR RO$ = "S" OR RO$ = "M" OR RO$ = "U" THEN  GOTO 2220
2216  GOSUB 5000: GOTO 2210
2220  PRINT "ENTER METAMORRPHIC STRUCTURE (MC 14) :": PRINT "     S: SCHISTOSE": PRINT
     "     G: GNEISSIC": PRINT "     M: MASSIVE": INPUT MS$
2225  IF MS$ = "S" OR MS$ = "G" OR MS$ = "M" THEN  GOTO 2230
2226  GOSUB 5000: GOTO 2220
2230 MD$ = GM$ + B$ + RO$ + MS$ + B$ + BC$ + BC$ + BC$
2235  GOSUB 4000
2240  IF  LEN (MD$) = 21 THEN  GOTO 530
2250  GOSUB 5000: PRINT "MAT. CODE = ";MD$: PRINT AA$: PRINT : GOTO 2200
2400  INPUT "ENTER SEDIMENTARY ROCK NAME (MC 10-11) : ";NM$
2405  IF  LEN (NM$) = 2 THEN  GOTO 2410
2406  GOSUB 5000: GOTO 2400
2410 MD$ = NM$ + BB$ + BB$ + BC$ + BC$ + BC$
2415  GOSUB 4000
2420  IF  LEN (MD$) = 21 THEN  GOTO 530
2430  GOSUB 5000: PRINT "MAT. CODE = ";MD$: GOTO 2400
2600  PRINT "ENTER TYPE OF UNCONSOLIDATED MATERIAL (MC 10-11) :": PRINT "     GR: GR
     AVEL": PRINT "     SD: SAND": PRINT "     ST: SILT": PRINT "     CL: CLAY": PRINT
     "     MU: MUD": INPUT NM$
2605  IF NM$ = "GR" OR NM$ = "SD" OR NM$ = "ST" OR NM$ = "CL" OR NM$ = "MU" THEN  GOTO
     2610
2606  GOSUB 5000: GOTO 2600
```

FIELD7 (cont.)

```
2610  PRINT "ENTER ENVIRONMENT OF DEPOSITION (MC 16-17) :": PRINT "     TA: TALUS OR
      COLLIVIUM": PRINT "     ST: STREAM DEPOSIT": PRINT "     GL: GLACIAL DEPOSIT":
      PRINT "     OC: OTHER CONTINENTAL TYPES": INPUT ED$
2611  IF ED$ = "TA" OR ED$ = "ST" OR ED$ = "GL" OR ED$ = "OC" THEN  GOTO 2614
2612  GOSUB 5000: GOTO 2610
2614  GOSUB 4500
2615  PRINT "ENTER STREAM WIDTH (FC 6)": PRINT "     A) <1M": PRINT "     B) 1-3M": PRINT
     "     C) 3-10M": PRINT "     D) >10M": INPUT FX$
2616  IF FX$ = "A" OR FX$ = "B" OR FX$ = "C" OR FX$ = "D" THEN  GOTO 2620
2617  GOSUB 5000: GOTO 2615
2620  PRINT "ENTER STREAM PROFILE (FC 7)": PRINT "     A) FALLS": PRINT "     B) FEW
      FALLS": PRINT "     C) QUIET": PRINT "     D) STAGNANT": PRINT "     E) DRY": INPUT
     FY$
2621  IF FY$ = "A" OR FY$ = "B" OR FY$ = "C" OR FY$ = "D" OR FY$ = "E" THEN  GOTO 26
     25
2622  GOSUB 5000: GOTO 2620
2625  IF  LEN (FV$ + FW$ + FX$ + FY$) = 4 THEN  GOTO 2627:
2626  GOSUB 5000: GOTO 2614
2627 PT$ = "S ":AGE$ = "  ":YPAGE$ = "  ":OPAGE$ = "  ":CT$ = " ":RB$ = BC$ + BC$ +
     BC$:DP$ = "  ":OS$ = " ":ALT$ = "  ":FZ$ = " "
2630 MD$ = NM$ + BB$ + BB$ + ED$ + BB$ + B$ + BC$ + BC$
2640  IF  LEN (MD$) = 21 THEN  GOTO 530
2650  GOSUB 5000: PRINT "MAT. CODE = ";MD$: PRINT AA$: PRINT : GOTO 2600
2800 MD$ = "M" + BC$ + BC$ + BC$ + BC$
2805 AGE$ = "  ":YPAGE$ = "  ":OPAGE$ = "  ":PT$ = "S "
2810  GOSUB 4500
2820  GOTO 530
3000  PRINT "ENTER TYPE OF FLUID (MC 10-11) :": PRINT "     WA: WATER": PRINT "
     MW: MINE WATER": INPUT NM$
3001  IF NM$ = "WA" OR NM$ = "MW" THEN  GOTO 3005
3002  GOSUB 5000: GOTO 3000
3005 AGE$ = "  ":YPAGE$ = "  ":OPAGE$ = "  ":CT$ = "C"
3006 PT$ = "  ":RB$ = BC$ + BC$ + BC$:DP$ = "  ":OS$ = " ":ALT$ = "  ":FV$ = B$:FW$ =
     B$:FX$ = B$:FY$ = B$:FZ$ = B$
3010 MD$ = NM$ + "C" + B$ + BB$ + BC$ + BC$ + BC$
3030  IF  LEN (MD$) = 21 THEN  GOTO 530
3040  GOSUB 5000: PRINT "MAT. CODE = ";MD$: PRINT AA$: PRINT : GOTO 3000
4000  PRINT "ENTER AGE": PRINT "     Y : PRECAMBRIAN": PRINT "     K : CRETACEOUS": PRINT
     "     TR : PERMO-TRIASSIC": PRINT "     T : TERTIARY": PRINT "     Q : QUATERNAR
     Y": INPUT AGE$
4005  IF AGE$ = "Y" OR AGE$ = "K" OR AGE$ = "TR" OR AGE$ = "T" OR AGE$ = "Q" THEN  GOTO
     4010
4006  GOSUB 5000: GOTO 4000
4010  IF  LEN (AGE$) = 2 THEN  GOTO 4090
4020 TP = 2 -  LEN (AGE$)
4030  FOR I = 1 TO TP:AGE$ = AGE$ + B$: NEXT I
4090 YPAGE$ = "  "
4100 OPAGE$ = "  "
4200  PRINT "ENTER AMOUNT OF OUTCROP THE SAMPLE REPRESENTS (FC 8)": PRINT "     A) M
     AJOR": PRINT "     B) LESSER": PRINT "     C) VERY MINOR": PRINT "     D) MINER
     ALIZED"
```

FIELD7 (cont.)

```
4201  INPUT FZ$
4202  IF FZ$ = "A" OR FZ$ = "B" OR FZ$ = "C" OR FZ$ = "D" THEN  GOTO 4205
4203  GOSUB 5000: GOTO 4200
4205 DP$ = "  ":ALT$ = "  "
4230  INPUT "DO YOU WANT TO ENTER AN ALTERATION TYPE? (Y OR N) ";ANS$: IF ANS$ = "N"
      THEN  GOTO 4270
4235  IF ANS$ < > "Y" THEN  GOTO 4230
4240  PRINT "ENTER ALTERATION TYPE": PRINT "     PL : PROPYLITIC": PRINT "     AR :
     ARGILLITIC": PRINT "     SI : SILICEOUS": PRINT "     SE : SERICITIC": PRINT "
        FP : ALKALIC (FELDSPATHIC)": PRINT "     ZZ : YES (OTHER)"
4250  INPUT ALT$
4255  IF ALT$ = "PL" OR ALT$ = "AR" OR ALT$ = "SI" OR ALT$ = "SE" OR ALT$ = "FP" OR
     ALT$ = "ZZ" THEN  GOTO 4270
4256  GOSUB 5000: GOTO 4240
4270  PRINT "ENTER OXIDATION STATE": PRINT "     O : OXIDIZED": PRINT "     P : PART
     IALLY OXIDIZED": PRINT "     U : UNOXIDIZED"
4280  INPUT OS$
4285  IF OS$ = "O" OR OS$ = "P" OR OS$ = "U" THEN  GOTO 4300
4286  GOSUB 5000: GOTO 4270
4300  INPUT "DO YOU WANT TO ENTER A DEPOSIT TYPE? (Y OR N)";ANS$: IF ANS$ = "N" THEN
      GOTO 4330
4305  IF ANS$ < > "Y" THEN  GOTO 4300
4310  INPUT "ENTER DEPOSIT TYPE : ";DP$
4320  IF  LEN (DP$) = 2 GOTO 4330:
4325  GOSUB 5000: PRINT "USE 2 CHARACTERS": PRINT AA$: PRINT : GOTO 4310
4330  INPUT "ENTER FORMATION NAME : ";RB$
4331  IF  LEN (RB$) < = 15 THEN  GOTO 4333
4332  GOSUB 5000: PRINT "FORMATION NAME MUST BE < OR = 15 CHARACTERS": PRINT AA$: PRINT
     : GOTO 4330
4333  IF  LEN (RB$) = 15 THEN  GOTO 4335
4334 TP = 15 -  LEN (RB$)
4335  FOR I = 1 TO TP:RB$ = RB$ + B$: NEXT I
4336 PT$ = "  ":CT$ = " ":FV$ = " ":FW$ = " ":FX$ = " ":FY$ = " ":SN$ = BC$ + BB$ +
     BB$
4360  RETURN
4500  PRINT "ENTER ORGANIC CONTENT (FC 4)": PRINT "     A) LITTLE OR NONE = LIGHT CO
     LOR": PRINT "     B) MIXED = GRAY COLOR": PRINT "     C) HIGH = BLACK COLOR": INPUT
     FV$
4505  IF FV$ = "A" OR FV$ = "B" OR FV$ = "C" THEN  GOTO 4510
4506  GOSUB 5000: GOTO 4500
4510  PRINT "INPUT OXIDATION COATING (FC 5)": PRINT "     A) NONE": PRINT "     B) B
     LACK": PRINT "     C) BROWN": PRINT "     D) RUSTY": PRINT "     E) ENTERED ON
     FIELD FORM": INPUT FW$
4515  IF FW$ = "A" OR FW$ = "B" OR FW$ = "C" OR FW$ = "D" OR FW$ = "E" THEN  GOTO 45
     20
4516  GOSUB 5000: GOTO 4510
4520  RETURN
5000  PRINT : PRINT AA$: PRINT "YOU HAVE ENTERED SOMETHING WRONG": PRINT AA$: PRINT

5010 X =  - 16336: FOR IZ = 1 TO 75:Z =  PEEK (X) -  PEEK (X) +  PEEK (X) -  PEEK (X
     ) +  PEEK (X) -  PEEK (X) +  PEEK (X): NEXT IZ
5020  RETURN
```

EDIT1

```
1  REM  ************************************************************************
2  REM  RASS III DATA EDITTING PROGRAM
3  REM  ************************************************************************
90  HOME
100 D$ =  CHR$ (4)
110  INPUT "ENTER NAME OF DATA FILE TO BE EDITTED : ";NAME$
120  INPUT "DO YOU HAVE A PARTICULAR RECORD YOU WANT TO EDIT? ";ANS$
130  IF ANS$ = "N" THEN  GOTO 330
140  IF ANS$ = "Y" THEN  GOTO 160
150  PRINT "PLEASE ANSWER Y OR N": GOTO 120
160  INPUT "ENTER THE RECORD NUMBER : ";RN
170  PRINT D$;"OPEN"NAME$",L190,D2": PRINT D$;"READ"NAME$",R"RN + 1
180  INPUT A$
185  PRINT D$;"CLOSE"NAME$
190  GOSUB 2000
200  PRINT "ENTER NUMBER OF ITEM YOU WANT TO CHANGE"
210  INPUT "     ENTER A ZERO FOR NO CHANGE : ";NC
220  IF NC = 0 THEN  GOTO 295
225  IF NC <  = 23 THEN  GOTO 230
226  PRINT "THERE ARE ONLY 22 ITEMS": GOTO 200
230  GOSUB 3000
250  INPUT "DO YOU WANT TO MAKE ANY MORE CHANGES? ";ANS$
260  IF ANS$ = "N" THEN  GOTO 285
270  IF ANS$ = "Y" THEN  GOTO 190
280  PRINT "PLEASE ANSWER Y OR N": GOTO 250
285  PRINT D$;"UNLOCK"NAME$
290  PRINT D$;"OPEN"NAME$",L190,D2": PRINT D$;"WRITE"NAME$",R"RN + 1: PRINT A$: PRINT
     D$;"CLOSE"NAME$
291  PRINT D$;"LOCK"NAME$
295  INPUT "DO YOU WANT TO EDIT ANOTHER SAMPLE? ";ANS$
300  IF ANS$ = "Y" THEN  GOTO 160
310  IF ANS$ = "N" THEN  GOTO 550
320  PRINT "PLEASE ANSWER Y OR N": GOTO 290
330  INPUT "DO YOU WANT TO PAGE THRU EACH SAMPLE, ONE AT A TIME? ";ANS$
340  IF ANS$ = "N" THEN  GOTO 550
350  IF ANS$ = "Y" THEN  GOTO 365
360  PRINT "PLEASE ANSWER Y OR N": GOTO 330
365  PRINT D$;"OPEN"NAME$",L190,D2": PRINT D$;"READ"NAME$",R1": INPUT ZX: PRINT D$;"
     CLOSE"NAME$
370  FOR I = 2 TO ZX
380  PRINT D$;"OPEN"NAME$",L190,D2": PRINT D$;"READ"NAME$",R"I
390  INPUT A$
395  PRINT D$;"CLOSE"NAME$
396 RN = I - 1
400  GOSUB 2000
410  PRINT "ENTER NUMBER OF THE ITEM YOU WANT TO CHANGE"
420  INPUT "     ENTER A ZERO FOR NO CHANGE : ";NC
430  IF NC = 0 THEN  GOTO 540
440  IF NC <  = 24 THEN  GOTO 460
450  PRINT "THERE ARE ONLY 23 ITEMS": GOTO 410
460  GOSUB 3000
490  INPUT "DO YOU WANT TO MAKE ANY MORE CHANGES TO THIS SAMPLE? ";ANS$
500  IF ANS$ = "Y" THEN  GOTO 400
```

EDIT1 (cont.)

```
510  IF ANS$ = "N" THEN  GOTO 525
520  PRINT "PLEASE ENTER Y OR N": GOTO 490
525  PRINT D$;"UNLOCK"NAME$
530  PRINT D$;"OPEN"NAME$",L190,D2": PRINT D$;"WRITE"NAME$",R";I: PRINT A$: PRINT D$
     ;"CLOSE"NAME$
535  PRINT D$;"LOCK"NAME$
540  NEXT I
550  PRINT D$;"CLOSE"NAME$
555  INPUT "DO YOU WANT TO EDIT ANOTHER FILE? ";ANS$
556  IF ANS$ = "Y" THEN  GOTO 90
557  IF ANS$ = "N" THEN  GOTO 560
558  PRINT "ENTER Y OR N": GOTO 555
560  PRINT D$;"RUN DRIVER,D1"
2000  PRINT : PRINT
2005  PRINT "          RECORD NO. ";RN: PRINT : PRINT
2010  PRINT "1) SAMPLE NUMBER : "; MID$ (A$,1,8)
2020  PRINT "2) TAG NUMBER : "; MID$ (A$,9,6);" 3) STATE : "; MID$ (A$,15,2)
2030  PRINT "4) COUNTY : "; MID$ (A$,17,5)
2040  PRINT "5) LAT. DEG : "; MID$ (A$,22,3);" MIN : "; MID$ (A$,25,2);" SEC : "; MID$
     (A$,27,2)
2050  PRINT "6) LONG. DEG : "; MID$ (A$,29,3);" MIN : "; MID$ (A$,32,2);" SEC : "; MID$
     (A$,34,2)
2060  PRINT "7) SOURCE : "; MID$ (A$,36,1);" 8) TYPE : "; MID$ (A$,37,1);" 9) AGE :
     "; MID$ (A$,39,2)
2070  PRINT "10) YP AGE : "; MID$ (A$,40,2);" 11) OP AGE : "; MID$ (A$,42,2)
2080  PRINT "12) MAT CLASS : "; MID$ (A$,44,1)
2085  PRINT "13) MAT CODES : "; MID$ (A$,45,21)
2090  PRINT "14) PHYS TR : "; MID$ (A$,66,2);" 15) CHEM TR : "; MID$ (A$,68,1)
2100  PRINT "16) FORMATION NAME : "; MID$ (A$,69,15)
2110  PRINT "17) FREE CODING : "; MID$ (A$,84,14)
2120  PRINT "18) DEP TYPE : "; MID$ (A$,98,2);" 19) OXID ST : "; MID$ (A$,100,1)
2130  PRINT "20) ALT : "; MID$ (A$,101,2);" 21) STREAM NO : "; MID$ (A$,103,9)
2140  PRINT "22) ELEVATION : "; MID$ (A$,112,4)
2150  PRINT "23) COMMENTS : "; MID$ (A$,116,64)
2200  RETURN
3000  IF NC > 1 THEN  GOTO 3070
3020  INPUT "ENTER NEW SAMPLE NUMBER : ";XC$
3030  IF  LEN (XC$) = 8 THEN  GOTO 3050
3040  PRINT "SAMPLE NUMBER MUST BE 8 CHARACTER": GOTO 3020
3050 RP$ =  RIGHT$ (A$,171):A$ = XC$ + RP$
3060  RETURN
3070  IF NC > 2 THEN  GOTO 3130
3080  INPUT "ENTER NEW TAG NUMBER : ";XC$
3090  IF  LEN (XC$) = 6 THEN  GOTO 3110
3100  PRINT "TAG NUMBER MUST BE 6 CHARACTERS": GOTO 3080
3110 LP$ =  LEFT$ (A$,8):RP$ =  RIGHT$ (A$,165):A$ = LP$ + XC$ + RP$
3120  RETURN
3130  IF NC > 3 THEN  GOTO 3190
3140  INPUT "ENTER NEW STATE : ";XC$
3150  IF  LEN (XC$) = 2 THEN  GOTO 3170
3160  PRINT "STATE MUST BE 2 CHARACTERS": GOTO 3140
3170 A$ =  LEFT$ (A$,14) + XC$ +  RIGHT$ (A$,163)
3180  RETURN
3190  IF NC > 4 THEN  GOTO 3250
3200  INPUT "ENTER COUNTY : ";XC$
```

EDIT1 (cont.)

```
3210  IF  LEN (XC$) = 5 THEN  GOTO 3230
3220  PRINT "COUNTY MUST BE 5 CHARACTERS": GOTO 3200
3230 LP$ =  LEFT$ (A$,16):RP$ =  RIGHT$ (A$,158):A$ = LP$ + XC$ + RP$
3240  RETURN
3250  IF NC > 5 THEN  GOTO 3320
3260  INPUT "ENTER LATITUDE DEGREES : ";XC$: INPUT "ENTER MINUTES : ";XD$: INPUT "EN
     TER SECONDS : ";XE$
3270  IF  LEN (XC$) <  > 2 THEN  PRINT "DEGREES MUST HAVE 2 CHARACTERS"
3275  IF  LEN (XC$) <  > 2 THEN  GOTO 3260
3276 XC$ = " " + XC$
3280  IF  LEN (XD$) <  > 2 THEN  PRINT "MINUTES MUST BE 2 CHARACTERS"
3285  IF  LEN (XD$) <  > 2 THEN  GOTO 3260
3290  IF  LEN (XE$) <  > 2 THEN  PRINT "SECONDS MUST BE 2 CHARACTERS"
3295  IF  LEN (XE$) <  > 2 THEN  GOTO 3260
3300 LP$ =  LEFT$ (A$,21):RP$ =  RIGHT$ (A$,151):A$ = LP$ + XC$ + XD$ + XE$ + RP$
3310  RETURN
3320  IF NC > 6 THEN  GOTO 3390
3330  INPUT "ENTER LONGITUDE DEGREES : ";XC$: INPUT "ENTER MINUTES : ";XD$: INPUT "E
     NTER SECONDS : ";XE$
3340  IF  LEN (XC$) <  > 3 THEN  PRINT "DEGREES MUST HAVE 3 CHARACTERS"
3345  IF  LEN (XC$) <  > 3 THEN  GOTO 3330
3350  IF  LEN (XD$) <  > 2 THEN  PRINT "MINUTES MUST HAVE 2 CHARACTERS"
3355  IF  LEN (XD$) <  > 2 THEN  GOTO 3330
3360  IF  LEN (XE$) <  > 2 THEN  PRINT "SECONDS MUST HAVE 2 CHARACTERS"
3365  IF  LEN (XE$) <  > 2 THEN  GOTO 3330
3370 LP$ =  LEFT$ (A$,28):RP$ =  RIGHT$ (A$,144):A$ = LP$ + XC$ + XD$ + XE$ + RP$
3380  RETURN
3390  IF NC > 7 THEN  GOTO 3550
3400  INPUT "ENTER SAMPLE SOURCE : ";XC$
3410  IF  LEN (XC$) = 1 THEN  GOTO 3430
3420  PRINT "SAMPLE SOURCE MUST HAVE 1 CHARACTER": GOTO 3400
3430 LP$ =  LEFT$ (A$,35):RP$ =  RIGHT$ (A$,143):A$ = LP$ + XC$ + RP$
3440  RETURN
3550  IF NC > 8 THEN  GOTO 3610
3560  INPUT "ENTER SAMPLE TYPE : ";XC$
3570  IF  LEN (XC$) = 1 THEN  GOTO 3590
3580  PRINT "SAMPLE TYPE MUST HAVE 1 CHARACTER": GOTO 3560
3590 LP$ =  LEFT$ (A$,36):RP$ =  RIGHT$ (A$,142):A$ = LP$ + XC$ + RP$
3600  RETURN
3610  IF NC > 9 THEN  GOTO 3670
3620  PRINT "ENTER AGE": INPUT "ENTER A PERIOD (.) IF BLANK : ";XC$
3621  IF XC$ <  > "." THEN  GOTO 3630
3622 XC$ = "  ": GOTO 3650
3630  IF  LEN (XC$) = 2 THEN  GOTO 3650
3640  PRINT "AGE MUST HAVE 2 CHARACTERS": GOTO 3620
3650 LP$ =  LEFT$ (A$,37):RP$ =  RIGHT$ (A$,140):A$ = LP$ + XC$ + RP$
3660  RETURN
3670  IF NC > 10 THEN  GOTO 3730
3680  PRINT "ENTER YOUNGEST POSSIBLE AGE": INPUT "ENTER A PERIOD (.) IF BLANK : ";XC
     $
3681  IF XC$ <  > "." THEN  GOTO 3690
3682 XC$ = "  ": GOTO 3710
3690  IF  LEN (XC$) = 2 THEN  GOTO 3710
3700  PRINT "YOUNGEST POSSIBLE AGE MUST HAVE 2 CHARACTERS": GOTO 3670
```

EDIT1 (cont.)

```
3710 LP$ =  LEFT$ (A$,39):RP$ =  RIGHT$ (A$,138):A$ = LP$ + XC$ + RP$
3720  RETURN
3730  IF NC > 11 THEN  GOTO 3790
3740  PRINT "ENTER OLDEST POSSIBLE AGE": INPUT "ENTER A PERIOD (.) IF BLANK : ";XC$
3741  IF XC$ < > "." THEN  GOTO 3750
3742 XC$ = "  ": GOTO 3770
3750  IF  LEN (XC$) = 2 THEN  GOTO 3770
3760  PRINT "OLDEST POSSIBLE AGE MUST HAVE 2 CHARACTERS": GOTO 3740
3770 LP$ =  LEFT$ (A$,41):RP$ =  RIGHT$ (A$,136):A$ = LP$ + XC$ + RP$
3780  RETURN
3790  IF NC > 12 THEN  GOTO 3900
3800  INPUT "ENTER MATERIAL CLASS : ";XC$
3810  IF  LEN (XC$) = 1 THEN  GOTO 3830
3820  PRINT "MATERIAL CLASS MUST HAVE 1 CHARACTER": GOTO 3800
3830 LP$ =  LEFT$ (A$,43):RP$ =  RIGHT$ (A$,135):A$ = LP$ + XC$ + RP$
3840  INPUT "ENTER MATERIAL CODES (21 CHARACTERS) : ";XD$
3850  IF  LEN (XD$) = 21 THEN  GOTO 3870
3860  PRINT "MATERIAL CODES MUST HAVE 21 CHARACTERS": GOTO 3840
3870 LP$ =  LEFT$ (A$,44):RP$ =  RIGHT$ (A$,114):A$ = LP$ + XD$ + RP$
3880  RETURN
3900  IF NC = 13 THEN  GOTO 3840
3910  IF NC > 14 THEN  GOTO 3970
3920  PRINT "ENTER PHYSICAL TREATMENT": INPUT "ENTER A PERIOD (.) IF BLANK : ";XC$
3921  IF XC$ < > "." THEN  GOTO 3930
3922 XC$ = "  ": GOTO 3950
3930  IF  LEN (XC$) = 2 THEN  GOTO 3950
3940  PRINT "PHYSICAL TREATMENT MUST HAVE 2 CHARACTERS": GOTO 3920
3950 LP$ =  LEFT$ (A$,65):RP$ =  RIGHT$ (A$,112):A$ = LP$ + XC$ + RP$
3960  RETURN
3970  IF NC > 15 THEN  GOTO 4030
3980  PRINT "ENTER CHEMICAL TREATMENT": INPUT "ENTER A PERIOD (.) IF BLANK : ";XC$
3981  IF XC$ < > "." THEN  GOTO 3990
3982 XC$ = " ": GOTO 4010
3990  IF  LEN (XC$) = 1 THEN  GOTO 4010
4000  PRINT "CHEMICAL TREATMENT MUST HAVE 1 CHARACTER": GOTO 3980
4010 LP$ =  LEFT$ (A$,67):RP$ =  RIGHT$ (A$,111):A$ = LP$ + XC$ + RP$
4020  RETURN
4030  IF NC > 16 THEN  GOTO 4090
4040  INPUT "ENTER FORMATION NAME : ";XC$
4050  IF  LEN (XC$) = 15 THEN  GOTO 4070
4060  PRINT "FORMATION NAME MUST HAVE 15 CHARACTERS": GOTO 4040
4070 LP$ =  LEFT$ (A$,68):RP$ =  RIGHT$ (A$,96):A$ = LP$ + XC$ + RP$
4080  RETURN
4090  IF NC > 17 THEN  GOTO 4150
4100  INPUT "ENTER FREE CODING (14 CHARACTERS) : ";XC$
4110  IF  LEN (XC$) = 14 THEN  GOTO 4130
4120  PRINT "FREE CODING MUST HAVE 14 CHARACTERS": GOTO 4100
4130 LP$ =  LEFT$ (A$,83):RP$ =  RIGHT$ (A$,82):A$ = LP$ + XC$ + RP$
4140  RETURN
4150  IF NC > 18 THEN  GOTO 4220
```

EDIT1 (cont.)

```
4160  PRINT "ENTER DEPOSIT TYPE": INPUT "ENTER A PERIOD (.) IF BLANK : ";XC$
4161  IF XC$ < > "." THEN  GOTO 4170
4162 XC$ = "  ": GOTO 4200
4170  IF  LEN (XC$) = 2 THEN  GOTO 4200
4180  PRINT "DEPOSIT TYPE MUST HAVE 2 CHARACTERS": GOTO 4160
4200 LP$ =  LEFT$ (A$,97):RP$ =  RIGHT$ (A$,80):A$ = LP$ + XC$ + RP$
4210  RETURN
4220  IF NC > 19 THEN  GOTO 4280
4230  INPUT "ENTER OXIDATION STATE : ";XC$
4240  IF  LEN (XC$) = 1 THEN  GOTO 4260
4250  PRINT "OXIDATION STATE MUST HAVE 1 CHARACTERS": GOTO 4230
4260 LP$ =  LEFT$ (A$,99):RP$ =  RIGHT$ (A$,79):A$ = LP$ + XC$ + RP$
4270  RETURN
4280  IF NC > 20 THEN  GOTO 4340
4290  PRINT "ENTER ALTERATION TYPE": INPUT "ENTER A PERIOD (.) IF BLANK : ";XC$
4291  IF XC$ < > "." THEN  GOTO 4300
4292 XC$ = "  ": GOTO 4320
4300  IF  LEN (XC$) = 2 THEN  GOTO 4320
4310  PRINT "ALTERATION TYPE MUST HAVE 2 CHARACTERS": GOTO 4290
4320 LP$ =  LEFT$ (A$,100):RP$ =  RIGHT$ (A$,77):A$ = LP$ + XC$ + RP$
4330  RETURN
4340  IF NC > 21 THEN  GOTO 4400
4350  PRINT "ENTER STREAM NUMBER": INPUT "ENTER A PERIOD (.) IF BLANK : ";XC$
4351  IF XC$ < > "." THEN  GOTO 4360
4352 XC$ = "         ": GOTO 4380
4360  IF  LEN (XC$) = 9 THEN  GOTO 4380
4370  PRINT "STREAM NUMBER MUST HAVE 9 CHARACTERS": GOTO 4350
4380 LP$ =  LEFT$ (A$,102):RP$ =  RIGHT$ (A$,63):A$ = LP$ + XC$ + RP$
4390  RETURN
4400  IF NC > 22 THEN  GOTO 4460
4410  INPUT "ENTER ELEVATION : ";XC$
4420  IF  LEN (XC$) = 4 THEN  GOTO 4440
4430  PRINT "ELEVATION MUST HAVE 4 CHARACTERS": GOTO 4410
4440 LP$ =  LEFT$ (A$,111):RP$ =  RIGHT$ (A$,64):A$ = LP$ + XC$ + RP$
4450  RETURN
4460  INPUT "ENTER COMMENTS : ";XC$
4470  IF  LEN (XC$) < = 64 THEN  GOTO 4490
4480  PRINT "COMMENTS FIELD CANNOT HAVE MORE THAN 64 CHARACTERS": GOTO 4460
4490  IF  LEN (XC$) = 64 THEN  GOTO 4520
4500 TP = 64 -  LEN (XC$):B$ = " "
4510  FOR I = 1 TO TP:XC$ = XC$ + B$: NEXT I
4520 LP$ =  LEFT$ (A$,115):A$ = LP$ + XC$
4530  RETURN
```

LAT-LONG

```
1  REM  ************************************************************************
2  REM  PROGRAM TO CALCULATE AND PRINT ON SCREEN LATITUDE AND LONGITUDE OF
3  REM   SAMPLE LOCATION.
4  REM  ************************************************************************
100 D$ = "": REM  CTRL-D
105  HOME
110  INPUT "ENTER 4 CHARACTER QUAD INDENTIFIER : ";Q$
120  IF  LEN (Q$) <  > 4 THEN  GOTO 110
130  PRINT D$;"OPEN QUADCTL,L20,D1"
140  FOR I = 1 TO 200 STEP 5
150  PRINT D$;"READ QUADCTL,R";I
160  INPUT N$: IF N$ = Q$ THEN  GOTO 190
170  NEXT I
175  PRINT D$;"CLOSE QUADCTL"
180  PRINT "THE QUAD IDENTIFIER YOU ENTERED IS NOT IN THE CONTROL FILE...": GOTO 110

190  PRINT D$;"READ QUADCTL,R";I + 1: INPUT UTDEG
200  PRINT D$;"READ QUADCTL,R";I + 2: INPUT UGDEG
210  PRINT D$;"READ QUADCTL,R";I + 3: INPUT LTDEG
220  PRINT D$;"READ QUADCTL,R";I + 4: INPUT LGDEG
230  PRINT D$;"CLOSE QUADCTL"
235  PRINT D$;"PR#5": PRINT "TEXT 1": PRINT D$;"PR#0"
240  PRINT D$;"IN#5": PRINT "PLACE PEN ON UPPER LEFT CONTROL POINT "
250  INPUT XU,YU,Z: IF Z <  > 2 THEN  GOTO 250
260  PRINT "PLACE PEN ON LOWER RIGHT CONTROL POINT "
270  INPUT XL,YL,Z: IF Z <  > 2 THEN  GOTO 270
275 XM =  ABS (UGDEG - LGDEG) /  ABS (XU - XL):YM =  ABS (UTDEG - LTDEG) /  ABS (YU -
    YL)
280  PRINT "PLACE PEN ON SAMPLE LOCATION"
290  INPUT XS,YS,Z: IF Z <  > 2 THEN  GOTO 290
300 GS = UGDEG + (XU - XS) * XM
301 DG% =  INT (GS)
302 R = (GS - DG%) * 60
303 MG% =  INT (R)
304 R = (R - MG%) * 60
305 SG% =  INT (R)
310 TS = UTDEG + (YU - YS) * YM
311 DT% =  INT (TS)
312 R = (TS - DT%) * 60
313 MT% =  INT (R)
314 R = (R - MT%) * 60
315 ST% =  INT (R)
320  PRINT "LONGITUDE = ";DG%;" DEG  ";MG%;" MIN  ";SG%;" SEC"
330  PRINT "LATITUDE = ";DT%;" DEG  ";MT%;" MIN  ";ST%;" SEC"
340  PRINT D$;"IN#0"
350  INPUT "DO YOU WANT ANY MORE? ";A$
360  IF A$ <  > "Y" THEN  PRINT D$;"RUN DRIVER,D1"
370  INPUT "IS THIS ON THE SAME QUAD SECTION? ";A$
380  IF A$ <  > "Y" THEN  GOTO 400
390  PRINT D$;"IN#5": GOTO 280
400  IF A$ = "N" THEN  GOTO 110
410  PRINT "ENTER Y OR N": GOTO 370
```

OPR1

```
1  REM  ********************************************************************************
2  REM  PRINT AND RANDOMIZING PROGRAM
3  REM  THIS PROGRAM PRINTS A RASS III ARCHIVAL FORM
4  REM  ********************************************************************************
10 D$ =  CHR$ (4):B$ = " "
12 Z$ = "0"
15  DIM RD(23),RE$(23)
16  HOME
20  INPUT "ENTER NAME OF DATA FILE : ";NAME$
21  INPUT "ENTER STARTING TAG NUMBER : ";LS$
22  IF  LEN (LS$) = 6 THEN  GOTO 25
23  PRINT "RE-ENTER STARTING TAG NUMBER": GOTO 21
25  PRINT D$;"UNLOCK"NAME$",D2"
26  PRINT "DO YOU WANT TO RANDOMIZE": INPUT "YOUR SAMPLE SET? ";AN$
27  IF AN$ = "Y" THEN  GOTO 30
28  IF AN$ = "N" THEN  GOTO 105
29  PRINT "ENTER Y OR N": GOTO 26
30  FOR I = 1 TO 23
35  PRINT D$;"OPEN"NAME$",L190,D2": PRINT D$;"READ"NAME$",R";I + 1: INPUT X$: PRINT
     D$;"CLOSE"NAME$
40 N =  INT ( RND (10) * 100)
45  IF N > 23 OR N = 0 THEN  GOTO 40: IF I = 1 THEN  GOTO 70
50  FOR J = 1 TO I - 1
55  IF N = RD(J) THEN  GOTO 40
60  NEXT J
65 RD(I) = N
70 RE$(N) = X$
75  NEXT I
78 LI$ =  RIGHT$ (LS$,3):LJ$ =  LEFT$ (LS$,3):NU =  VAL (LI$)
80  FOR I = 1 TO 23
81 LI$ =  STR$ (NU)
82  IF NU < 10 THEN  GOTO 85
83  IF NU >  = 100 THEN  GOTO 86
84 LS$ = LJ$ + Z$ + LI$: GOTO 87
85 LS$ = LJ$ + Z$ + Z$ + LI$: GOTO 87
86 LS$ = LJ$ + LI$
87 RE$(I) =  LEFT$ (RE$(I),8) + LS$ +  RIGHT$ (RE$(I),165)
88 NU = NU + 1
89  NEXT I
92  PRINT D$;"OPEN"NAME$",L190,D2"
94  FOR I = 1 TO 23
96  PRINT D$;"WRITE"NAME$",R";I: PRINT RE$(I)
98  NEXT I
100  PRINT D$;"CLOSE"NAME$
105  GOSUB 6000
106  PRINT D$;"LOCK"NAME$
110 ETX$ =  CHR$ (3):SX$ =  CHR$ (2):ES$ = ETX$ + SX$
120 CR$ =  CHR$ (13):LF$ =  CHR$ (10):VT$ =  CHR$ (11):I$ =  CHR$ (9)
```

OPR1 (cont.)

```
130 PA$ =  CHR$ (28):PB$ =  CHR$ (29):PC$ =  CHR$ (30):EM$ =  CHR$ (1):PD$ =  CHR$ (
    31)
140 SF$ = ETX$ +  CHR$ (0) + ES$:SP$ = ETX$ +  CHR$ (0) +  CHR$ (0) +  CHR$ (0) +  CHR$
    (0) +  CHR$ (0) + ES$
300 L$ = ETX$ +  CHR$ (127) + ES$
310 UA$ =  CHR$ (95) +  CHR$ (95):UB$ = UA$ + UA$ + UA$ + UA$ + UA$
320 U$ = UB$ + UB$ + UB$ + UB$ + UB$:U$ = U$ + UB$ + UB$ + UB$ + UB$ + UA$ + UA$ +  CHR$
    (95)
330 B$ = " ":BA$ = B$ + B$:BB$ = BA$ + BA$:BC$ = BB$ + BB$ + BA$:BD$ = BA$ + B$:BE$ =
    BB$ + B$
340 LB$ = L$ + B$:MC$ = B$ + LB$ + LB$ + LB$ + LB$ + LB$ + LB$ + LB$ + LB$ + LB$ + L
    B$ + LB$ + LB$ + LB$ + LB$ + LB$ + LB$ + LB$ + LB$ + LB$
500  PRINT D$;"PR#1": PRINT I$;"K"
520 PN = 1: GOSUB 2050
580  PRINT PA$: PRINT VT$;
590  GOSUB 2000
600  PRINT L$;"FIELD";L$;"TAG";L$;"ST";L$;"CNTY";L$;" LAT  ";L$;" LONG ";L$;"S";L$;"
    S";L$;"M";L$; TAB( 49);"MATERIAL CODES       ";L$;VT$
610  GOSUB 2000
620  PRINT L$; TAB( 7);L$; TAB( 11);L$; TAB( 14);L$; TAB( 19);L$;UA$;UA$;UA$;L$;UA$;
    UA$;UA$;L$; TAB( 35);L$; TAB( 37);L$; TAB( 39);L$;UB$;UB$;UB$;L$;VT$
625  GOSUB 2200
629 OB$ = "1" + L$:TB$ = "2" + L$
630  PRINT L$;" NO. ";L$;"NO.";L$;BA$;L$;BB$;L$;BA$;L$;BA$;L$;B$;L$;BA$;L$;BA$;L$;B$
    ;L$;"S";L$;"T";L$;"C";L$;OB$;OB$;OB$;OB$;OB$;OB$;OB$;OB$;OB$;OB$;TB$;TB$;TB$;TB
    $;TB$;TB$;TB$;TB$;TB$;"2";SF$;L$;VT$
635  GOSUB 2200
639 RB$ = "3" + L$:FB$ = "4" + L$:VB$ = "5" + L$
640  PRINT L$;BB$;B$;L$;BA$;B$;L$;BA$;L$;BB$;L$;" D";L$;" M";L$;"S";L$;" D";L$;" M";
    L$;"S";L$;B$;L$;B$;L$;B$;L$;"0";L$;OB$;TB$;RB$;FB$;VB$;"6";L$;"7";L$;"8";L$;"9"
    ;L$;"0";L$;OB$;TB$;RB$;FB$;VB$;"6";L$;"7";L$;"8";L$;"9";SF$;L$;VT$
650  PRINT PC$: FOR I = 1 TO 2: PRINT U$;VT$: NEXT I
655  PRINT PA$
665  FOR J = 1 TO 23
670  GOSUB 2200
700  GOSUB 4000
740  GOSUB 2100
750  PRINT PD$;B$;FL$;BD$;LAB$;PC$;B$;STE$;BA$;CNTY$;B$;DT$;B$;MT$;PD$;B$;SLT$;B$;PC
    $;DG$;B$;MC$;B$;PD$;SG$;SF$;PA$;SS$;SF$;SMT$;SF$;ML$;SF$;MP$;VT$
800  PRINT PA$: GOSUB 2100
810  PRINT PC$: PRINT U$;VT$: PRINT PA$
815  NEXT J
820 NS = 15: GOSUB 5500
850 PN = 2: GOSUB 2050
855  PRINT PA$:
860  GOSUB 2300
870  GOSUB 2350
880  PRINT "FIELD";B$;"TAG";BA$;"GEOL";BA$;"SMP";BD$;"FORMATION";BE$;BB$;"FREE";BE$;
    B$;"MIN. OR";B$;"ELEV-";VT$
890  GOSUB 2300
900  GOSUB 2350
```

OPR1 (cont.)

```
910  PRINT B$;"NO.";BA$;"NO.";BA$;"AGE";BD$;"TRT";BE$;"NAME";B$;BC$;"CODING";BE$;"ALT
     MAT";B$;"ATION";VT$
920  GOSUB 2350
930  PRINT BE$;BB$;UA$;UA$;UA$; CHR$ (95);BC$;BE$;BB$;UB$;UB$;UA$; CHR$ (95);VT$
933 HJ$ =  CHR$ (127) +  CHR$ (0) +  CHR$ (0) +  CHR$ (0) +  CHR$ (0) +  CHR$ (0) +
     CHR$ (0)
934 HL$ =  CHR$ (127) +  CHR$ (0) +  CHR$ (0) +  CHR$ (0) +  CHR$ (0) +  CHR$ (0) +
     CHR$ (0) +  CHR$ (0)
935 CF$ = ETX$ + HL$ + HL$ + HL$ + HJ$ + HJ$ + HJ$ + HJ$ + HJ$ + HJ$ + HL$ +  CHR$ (
    127) + ES$
940  GOSUB 2400
950  GOSUB 2450
960  PRINT BE$;BE$;"K";B$;"O";BA$;"Y";BC$;BE$;BB$;PC$;B$;"1";B$;"2";BA$;"3";B$;"4";B
    $;"5";B$;"6";B$;"7";B$;"8";B$;"9";B$;"1";PA$;BA$;"D";B$;"O";BA$;"A";VT$
965  GOSUB 2400: GOSUB 2450
970  PRINT BC$;BA$;"P";BA$;"P";BC$;BE$;BB$;PC$;BC$;BC$;"0";PA$;BA$;"T";B$;"X";BA$;"T
    ";VT$
975  GOSUB 2450
980  PRINT PC$: FOR I = 1 TO 2: PRINT U$;VT$: NEXT I: PRINT PA$
1008  FOR I = 1 TO 23
1010  GOSUB 2400: GOSUB 2450
1015  GOSUB 4500
1020  PRINT PD$;B$;FL$;BD$;LAB$;B$;PC$;GK$;BA$;GY$;BA$;GL$;BA$;TM$;B$;PB$;GN$;PC$;BB
    $;SF$;FC$;BA$;PB$;TD$;B$;SF$;OX$;BA$;TL$;BA$;EV$;VT$
1030  PRINT PA$: GOSUB 2450: PRINT PC$: PRINT U$;VT$: PRINT PA$
1035  NEXT I
1040 NS = 20: GOSUB 5500
1500 PN = 3: GOSUB 2050
1510  PRINT PA$
1520  GOSUB 2500: GOSUB 2550
1530  PRINT "FIELD";B$;"TAG";"STREAM NO.";BC$;BB$;BB$;"COMMENTS";VT$
1540  GOSUB 2500: GOSUB 2550
1550  PRINT B$;"NO.";BA$;"NO.";VT$
1560  GOSUB 2550
1570  PRINT PC$: FOR I = 1 TO 2: PRINT U$;VT$: NEXT I: PRINT PA$
1690  FOR I = 1 TO 23
1700  GOSUB 2500: GOSUB 2550
1705  GOSUB 5000
1710  PRINT PD$;B$;FL$;BD$;LAB$;PC$;BB$;WN$;BD$;NT$;VT$
1720  PRINT PA$: GOSUB 2550
1730  PRINT PC$: PRINT U$;VT$: PRINT PA$
1740  NEXT I
1900  PRINT D$;"PR#0"
1910  END
2000  PRINT L$; TAB( 7);L$; TAB( 11);L$; TAB( 14);L$; TAB( 19);L$; TAB( 26);L$; TAB(
    33);L$; TAB( 35);L$; TAB( 37);L$; TAB( 39);L$; TAB( 70);L$;VT$
2010  RETURN
2050  PRINT PA$
2055  PRINT "JOB NO. :";UB$;UA$; TAB( 52);"PAGE ";EM$;PN;B$;SX$;" OF ";EM$;"3";SX$
2060  PRINT LF$;LF$; TAB( 29);EM$;"RASS III";SX$;LF$;LF$
2065  PRINT PC$
2070  FOR I = 1 TO 2
```

OPR1 (cont.)

```
2075  PRINT U$;VT$
2080  NEXT I
2085  RETURN
2100  PRINT L$; TAB( 7);L$; TAB( 11);L$; TAB( 14);L$; TAB( 19);L$;BA$;L$;BA$;L$;B$;L
      $;BA$;L$;BA$;L$;B$;L$;B$;L$;B$;L$;B$;L$;MC$;SF$;L$;CR$
2110  RETURN
2200  PRINT L$; TAB( 7);L$; TAB( 11);L$; TAB( 14);L$; TAB( 19);L$;BA$;L$;BA$;L$;B$;L
      $;BA$;L$;BA$;L$;B$;L$;B$;L$;B$;L$;B$;L$;MC$;SF$;L$;VT$
2210  RETURN
2300  PRINT L$;BE$;L$;BD$;L$;BD$;BB$;L$;BD$;L$;BC$;BE$;L$;BC$;BB$;L$;BE$;BD$;L$;BE$;
      L$;VT$
2310  RETURN
2350  PRINT L$;BE$;L$;BD$;L$;BD$;BB$;L$;BD$;L$;BC$;BE$;L$;BC$;BB$;L$;BE$;BD$;L$;BE$;
      L$;CR$
2360  RETURN
2400  PRINT L$;BE$;L$;BD$;L$;BA$;L$;BA$;L$;BA$;L$;BD$;L$;BC$;BD$;BA$;CF$;BD$;L$;B$;L
      $;BD$;L$;BE$;L$;VT$
2410  RETURN
2450  PRINT L$;BE$;L$;BD$;L$;BA$;L$;BA$;L$;BA$;L$;BD$;L$;BC$;BD$;BA$;CF$;BD$;L$;B$;L
      $;BD$;L$;BE$;L$;CR$
2460  RETURN
2500  PRINT L$;BE$;L$;BD$;L$;BC$;L$;BC$;BC$;BC$;BC$;BB$;L$;VT$
2510  RETURN
2550  PRINT L$;BE$;L$;BD$;L$;BC$;L$;BC$;BC$;BC$;BC$;BB$;L$;CR$
2560  RETURN
4000  FL$ =  LEFT$ (RE$(J),8):LAB$ =  MID$ (RE$(J),9,6):STE$ =  MID$ (RE$(J),15,2):CN
      TY$ =  MID$ (RE$(J),17,5):DT$ =  MID$ (RE$(J),22,3):MT$ =  MID$ (RE$(J),25,2)
4010  SLT$ =  MID$ (RE$(J),27,2):DG$ =  MID$ (RE$(J),29,3):MC$ =  MID$ (RE$(J),32,2):
      SG$ =  MID$ (RE$(J),34,2):SS$ =  MID$ (RE$(J),36,1):SMT$ =  MID$ (RE$(J),37,1)
4020  ML$ =  MID$ (RE$(J),44,1):MP$ =  MID$ (RE$(J),45,1) + SF$ +  MID$ (RE$(J),46,1)
       + SF$ +  MID$ (RE$(J),47,1) + SF$ +  MID$ (RE$(J),48,1) + SF$ +  MID$ (RE$(J),
      49,1) + SF$ +  MID$ (RE$(J),50,1) + SF$ +  MID$ (RE$(J),51,1) + SF$
4030  MP$ = MP$ +  MID$ (RE$(J),52,1) + SF$ +  MID$ (RE$(J),53,1) + SF$ +  MID$ (RE$(
      J),54,1) + SF$ +  MID$ (RE$(J),55,1) + SF$ +  MID$ (RE$(J),56,1) + SF$ +  MID$
      (RE$(J),57,1) + SF$ +  MID$ (RE$(J),58,1) + SF$ +  MID$ (RE$(J),59,1) + SF$
4040  MP$ = MP$ +  MID$ (RE$(J),60,1) + SF$ +  MID$ (RE$(J),61,1) + SF$ +  MID$ (RE$(
      J),62,1) + SF$ +  MID$ (RE$(J),63,1) + SF$ +  MID$ (RE$(J),64,1) + SF$ +  MID$
      (RE$(J),65,1)
4050  RETURN
4500  FL$ =  LEFT$ (RE$(I),8):LAB$ =  MID$ (RE$(I),9,6):GK$ =  MID$ (RE$(I),38,2):GY$
       =  MID$ (RE$(I),40,2):GL$ =  MID$ (RE$(I),42,2):TM$ =  MID$ (RE$(I),66,3)
4510  GN$ =  MID$ (RE$(I),69,15):FC$ =  MID$ (RE$(I),84,1) + B$ +  MID$ (RE$(I),85,1)
       + BA$ +  MID$ (RE$(I),86,1) + B$ +  MID$ (RE$(I),87,1) + B$ +  MID$ (RE$(I),88
      ,1) + B$ +  MID$ (RE$(I),89,1) + B$ +  MID$ (RE$(I),90,1) + B$
4520  FC$ = FC$ +  MID$ (RE$(I),91,1) + B$ +  MID$ (RE$(I),92,1) + B$ +  MID$ (RE$(I)
      ,93,1)
4530  TD$ =  MID$ (RE$(I),93,2):DX$ =  MID$ (RE$(I),100,1):TL$ =  MID$ (RE$(I),101,2)
      :EV$ =  MID$ (RE$(I),112,4)
4550  RETURN
```

OPR1 (cont.)

```
5000 FL$ = LEFT$ (RE$(I),8):LAB$ = MID$ (RE$(I),9,6):WN$ = MID$ (RE$(I),103,9):NT
     $ = MID$ (RE$(I),116,64)
5010  RETURN
5500  FOR G = 1 TO NS: PRINT LF$: NEXT G
5510  RETURN
6000  PRINT D$;"OPEN"NAME$",L190,D2"
6010  FOR I = 1 TO 23
6020  PRINT D$;"READ"NAME$",R"I
6030  INPUT RE$(I)
6040  NEXT I
6050  RETURN
```

BLIND STANDARD

```
1  REM  ************************************************************************
2  REM  BLIND STANDARD PROGRAM
3  REM  THIS PROGRAM CREATES A RASS III RECORD FOR A BLIND STANDARD THAT IS
4  REM  ENTERED WITH EACH JOB.
5  REM  ************************************************************************
80  DIM RE$(23)
90 C1$ = "C1":C2$ = "C2":SF$ = "F1"
100 D$ =  CHR$ (4)
105  INPUT "ENTER DATA SET NAME : ";NA$
110  PRINT "ENTER TYPE OF SAMPLE SET": PRINT "     1 : STREAM": PRINT "     2 : ROCK
     ": INPUT TY
120  IF TY = 1 THEN  GOTO 160
130  IF TY = 2 THEN  GOTO 600
150  PRINT "YOU ENTERED SOMETHING WRONG": GOTO 110
160  PRINT "ROLL DIE FOR BLIND STANDARD": PRINT "FOR STREAM CONCENTRATE 1"
170  INPUT "INPUT NUMBER : ";R1
175  IF R1 <  = 0 OR R1 > 6 THEN  GOTO 160
180  PRINT "ROLL DIE FOR STREAM CONCENTRATE 2": INPUT "INPUT NUMBER : ";R2
185  IF R2 <  = 0 OR R2 > 6 THEN  GOTO 180
190  PRINT "ROLL DIE FOR STREAM FINES": INPUT "INPUT NUMBER : ";R3
195  IF R3 <  = 0 OR R3 > 6 THEN  GOTO 190
200 N1$ = NA$ + C1$:N2$ = NA$ + C2$:N3$ = NA$ + SF$
205  PRINT "N1$= ";N1$: PRINT "N2$= ";N2$: PRINT "N3$= ";N3$
210  PRINT D$;"OPEN"NA$",L190,D2"
220  PRINT D$;"READ"NA$",R1"
230  INPUT NS
240  FOR I = 2 TO NS
250  PRINT D$;"READ"NA$",R";I
260  INPUT RE$(I - 1)
270  NEXT I
280 RE$(NS) = RE$(NS - 1)
281 FU$ =  CHR$ (67 + R1)
282 RE$(NS) =  LEFT$ (RE$(NS),85) + FU$ +  RIGHT$ (RE$(NS),93)
285 NS = NS + 1
290  PRINT D$;"CLOSE"NA$
300  PRINT D$;"OPEN"N1$",L190,D2"
310  PRINT D$;"WRITE"N1$",R1"
320  PRINT NS
330  FOR I = 2 TO NS
335 RE$(I - 1) =  LEFT$ (RE$(I - 1),7) + "M" +  MID$ (RE$(I - 1),9,58) + "M" +  RIGHT$
     (RE$(I - 1),112)
340  PRINT D$;"WRITE"N1$",R";I
350  PRINT RE$(I - 1)
360  NEXT I
370  PRINT D$;"CLOSE"N1$
374 FU$ =  CHR$ (67 + R2)
375 RE$(NS - 1) =  LEFT$ (RE$(NS - 1),85) + FU$ +  RIGHT$ (RE$(NS - 1),93)
380  PRINT D$;"OPEN"N2$",L190,D2"
390  PRINT D$;"WRITE"N2$",R1"
400  PRINT NS
410  FOR I = 2 TO NS
415 RE$(I - 1) =  LEFT$ (RE$(I - 1),7) + "N" +  MID$ (RE$(I - 1),9,58) + "Z" +  RIGHT$
     (RE$(I - 1),112)
420  PRINT D$;"WRITE"N2$",R";I
```

BLIND STANDARD (cont.)

```
430  PRINT RE$(I - 1)
440  NEXT I
450  PRINT D$;"CLOSE"N2$
460 FU$ =  CHR$ (73 + R3)
465 RE$(NS - 1) =  LEFT$ (RE$(NS - 1),85) + FU$ +  RIGHT$ (RE$(NS - 1),93)
470  PRINT D$;"OPEN"N3$",L190,D2"
480  PRINT D$;"WRITE"N3$",R1"
490  PRINT NS
500  FOR I = 2 TO NS
505 RE$(I - 1) =  LEFT$ (RE$(I - 1),7) + "F" +  MID$ (RE$(I - 1),9,58) + " " +  RIGHT$
    (RE$(I - 1),112)
510  PRINT D$;"WRITE"N3$",R";I
520  PRINT RE$(I - 1)
530  NEXT I
540  PRINT D$;"CLOSE"N3$
550  PRINT D$;"LOCK"N1$
551  PRINT D$;"LOCK"N2$
552  PRINT D$;"LOCK"N3$
560  END
600  PRINT "ROLL DIE FOR BLIND STANDARD": PRINT "FOR ROCK SAMPLE"
610  INPUT "INPUT NUMBER : ";R4
620  IF R4 <  = 0 OR R4 > 6 THEN  GOTO 600
630  INPUT "ENTER DATA FILE NAME : ";NA$
635  PRINT D$;"UNLOCK"NA$",D2"
640  PRINT D$;"OPEN"NA$",L190,D2"
650  PRINT D$;"READ"NA$",R1
660  INPUT NS
680  PRINT D$;"READ"NA$",R";NS
690  INPUT RE$(1)
695  PRINT D$;"CLOSE"NA$
700 NS = NS + 1
710 FU$ =  CHR$ (73 + R4)
720 RE$(2) =  LEFT$ (RE$(1),85) + FU$ +  RIGHT$ (RE$(1),93)
725  PRINT D$;"OPEN"NA$",L190,D2"
730  PRINT D$;"WRITE"NA$",R1"
740  PRINT NS
750  PRINT D$;"WRITE"NA$",R";NS
760  PRINT RE$(2)
770  PRINT D$;"CLOSE"NA$
780  PRINT D$;"LOCK"NA$
800  END
```

GOMULTICS2

```
1  REM  ********************************************************************************
2  REM  PROGRAM TO ENTER FIELD DATA INTO MULTICS
3  REM  ********************************************************************************
100 D$ =  CHR$ (4)
150  INPUT "ENTER NAME OF MULTICS FILE : ";MU$
200  INPUT "ENTER NAME OF DATA FILE : ";NAME$
210  PRINT D$;"OPEN"NAME$",L190,D2"
220  PRINT D$;"PR#2"
230  POKE 1914,6
240  PRINT "EDM ";MU$: GOSUB 1000
250  FOR K = 1 TO 23
260  PRINT D$;"READ"NAME$",R";K
270  INPUT X$
280  PRINT X$: GOSUB 1000
290  NEXT K
300  PRINT ".": GOSUB 1000
310  PRINT "W": GOSUB 1000
320  PRINT "Q": GOSUB 1000
330  PRINT D$;"CLOSE"NAME$
350  END
1000  FOR L = 1 TO 500: NEXT L
1010  RETURN
```

CHEM-ENTRY3

```
1  REM  ************************************************************************
2  REM  PROGRAM TO ENTRY CHEMISTRY DATA
3  REM  CHECK STATEMENTS 161-167 FOR CORRECTNESS OF MINIMUM DETECTABLE LIMITS
4  REM  IF THESE ARE NOT CORRECT THEY MUST BE CHANGED.
5  REM  ************************************************************************
100  DIM CM$(31),CS$(31),CC(31),CF(31)
105 Z = 1
110 D$ =  CHR$ (4):B$ = " "
120  DATA  "FE%","MG%","CA%","TI%","MN","AG"
130  DATA  "AS","AU","B","BA","BE","BI"
140  DATA  "CD","CO","CR","CU","LA","MO"
150  DATA  "NB","NI","PB","SB","SC","SN"
160  DATA   "SR","V","W","Y","ZN",            "ZR","TH"
161  DATA  .1,.05,.1,.005,20.,1.,500.,20.,20.,50.
162  DATA  2.,20.,50.,10.,20.,10.,50.,10.,50.,10.
163  DATA  20.,200.,10.,20.,200.,20.,100.,20.,500.,20.,200.
165  DATA  .05,.02,.05,.002,10.,.5,200.,10.,10.,20.
166  DATA  1.,10.,20.,5.,10.,5.,20.,5.,20.,5.
167  DATA  10.,100.,5.,10.,100.,10.,50.,10.,200.,10.,100.
180  INPUT "ENTER TYPE OF SAMPLES : 1 FOR CONCENTRATES, 2 FOR FINES OR ROCK : ";TS$
185  IF TS$ = "1" OR TS$ = "2" THEN  GOTO 200
187  PRINT "ENTER 1 OR 2": GOTO 180
200  INPUT "ENTER DATA SET NAME : ";NA$
220  FOR J = 1 TO 31
222  READ CS$(J)
224  NEXT J
226  FOR J = 1 TO 31
228  READ CC(J)
230  NEXT J
232  FOR J = 1 TO 31
234  READ CF(J)
236  NEXT J
250  FOR K = 1 TO 23
260  INPUT "ENTER FIELD NO. : ";FL$
265  IF  LEN (FL$) = 8 THEN  GOTO 275
270  PRINT "YOU HAVE ENTERED SOMETHING WRONG"
271  GOTO 260
275  INPUT "ENTER TAG NO. : ";TN$
280  IF  LEN (TN$) = 6 THEN  GOTO 300
290  PRINT "YOU HAVE ENTERED SOMETHING WRONG": GOTO 275
300  INPUT "INSUFFICIENT SAMPLE? ";AN$
301  IF AN$ = "Y" THEN  GOTO 304
302  IF AN$ = "N" THEN  GOTO 306
303  PRINT "ENTER Y OR N": GOTO 300
304  GOSUB 1000
305  GOTO 540
306  FOR I = 1 TO 31
308  PRINT "ELEMENT : ";CS$(I)
310  INPUT "QUALIFIER ? ";AN$
320  IF AN$ = "Y" THEN  GOTO 350
330  IF AN$ = "N" THEN  GOTO 430
```

CHEM-ENTRY3 (cont.)

```
340  PRINT "ENTER Y OR N": GOTO 310
350  INPUT "ENTER QUALIFIER : ";QL$
355  IF QL$ = "N" OR QL$ = "L" THEN  GOTO 364
358  IF QL$ = "G" THEN  GOTO 370
360  IF QL$ = "B" THEN  GOTO 380
362  PRINT "YOU HAVE ENTERED SOMETHING WRONG": GOTO 310
364  IF TS$ = "2" THEN  GOTO 368
366 CM$(I) =  STR$ (CC(I)): GOTO 400
368 CM$(I) =  STR$ (CF(I)): GOTO 400
370  INPUT "ENTER MAXIMUM VALUE : ";CM$(I)
375  GOTO 400
380 CM$(I) = "0.0"
400 R = 7 -  LEN (CM$(I))
405  FOR M = 1 TO R
410 CM$(I) = B$ + CM$(I)
415  NEXT M
420  GOTO 470
430  PRINT "ENTER VALUE FOR ";CS$(I)
431 QL$ = " "
435  INPUT CM$(I)
440  IF  LEN (CM$(I)) = 7 THEN  GOTO 465
445  IF  LEN (CM$(I)) < 7 THEN  GOTO 400
450  PRINT "YOU HAVE ENTERED SOMETHING WRONG": GOTO 430
465 CM$(I) = CM$(I) + B$: GOTO 480
470 CM$(I) = CM$(I) + QL$
480  NEXT I
500 RA$ = FL$ + TN$
501 RB$ = "!" + CM$(16)
505 RE$ = "!" + CM$(1)
510  FOR L = 2 TO 15
520 RE$ = RE$ + CM$(L)
525 RB$ = RB$ + CM$(15 + L)
530  NEXT L
535 RB$ = RB$ + CM$(31)
540  PRINT D$;"OPEN"NA$",L150,D2"
550  PRINT D$;"WRITE"NA$",R";Z
560  PRINT RA$
565  PRINT D$;"WRITE"NA$",R";Z + 1
566  PRINT RE$
567  PRINT D$;"WRITE"NA$",R";Z + 2
568  PRINT RB$
570  PRINT D$;"CLOSE"NA$
575 Z = Z + 3
580  NEXT K
590  PRINT D$;"LOCK"NA$
600  END
1000 IS$ = "      0.B"
1010 RA$ = FL$ + TN$
1020 RB$ = "!" + IS$
1030 RE$ = "!" + IS$
1040  FOR M = 1 TO 14
1050 RB$ = RB$ + IS$
1060 RE$ = RE$ + IS$
1070  NEXT M
1080 RB$ = RB$ + IS$
1090  RETURN
```

CHEM-EDIT2

```
1  REM  ************************************************************************
2  REM  PROGRAM TO EDIT CHEMISTRY DATA
3  REM  ************************************************************************
100 D$ =  CHR$ (4):B$ = " "
105 Z = 1
110  DIM CM$(31)
200  INPUT "ENTER DATA SET NAME : ";NA$
210  PRINT D$;"UNLOCK"NA$",D2"
220  FOR I = 1 TO 23
230  PRINT D$;"OPEN"NA$",L150,D2"
240  PRINT D$;"READ"NA$",R";Z
250  INPUT RA$
251  PRINT D$;"READ"NA$",R";Z + 1
252  INPUT RE$
253  PRINT D$;"READ"NA$",R";Z + 2
254  INPUT RB$
255  PRINT D$;"CLOSE"NA$
260 FL$ =  LEFT$ (RA$,8)
270 TN$ =  MID$ (RA$,9,6)
275 C1 = 2
280  FOR J = 1 TO 15
300 CM$(J) =  MID$ (RE$,C1,8)
305 CM$(J + 15) =  MID$ (RB$,C1,8)
310 C1 = C1 + 8
320  NEXT J
325 CM$(31) =  MID$ (RB$,C1,8)
330  PRINT "FIELD NO. : ";FL$
340  PRINT "TAG NO. : ";TN$
350  PRINT "1) FE% : ";CM$(1);" 2) MG% : ";CM$(2)
360  PRINT "3) CA% :  ";CM$(3);"  4) TI% :  ";CM$(4)
```

CHEM-EDIT2 (cont.)

```
370  PRINT "5) MN :  ";CM$(5);"  6) AG : ";CM$(6)
380  PRINT "7) AS :  ";CM$(7);"  8) AU : ";CM$(8)
390  PRINT "9)  B :  ";CM$(9);" 10) BA : ";CM$(10)
400  PRINT "11) BE : ";CM$(11);" 12) BI : ";CM$(12)
410  PRINT "13) CD : ";CM$(13);" 14) CO : ";CM$(14)
420  PRINT "15) CR : ";CM$(15);" 16) CU : ";CM$(16)
430  PRINT "17) LA : ";CM$(17);" 18) MO : ";CM$(18)
440  PRINT "19) NB : ";CM$(19);" 20) NI : ";CM$(20)
450  PRINT "21) PB : ";CM$(21);" 22) SB : ";CM$(22)
460  PRINT "23) SC : ";CM$(23);" 24) SN : ";CM$(24)
470  PRINT "25) SR : ";CM$(25);"  26) V : ";CM$(26)
480  PRINT "27)  W : ";CM$(27);" 28)  Y : ";CM$(28)
490  PRINT "29) ZN : ";CM$(29);" 30) ZR : ";CM$(30)
495  PRINT "31) TH : ";CM$(31)
500  PRINT "ENTER NUMBER OF ELEMENT YOU WANT TO CHANGE"
510  INPUT "ENTER A 0 IF YOU WANT NO CHANGE : ";X
515  IF X <  = 31 THEN  GOTO 520
516  PRINT "YOU HAVE ENTERED SOMETHING WRONG": GOTO 500
520  IF X = 0 THEN  GOTO 760
530  INPUT "ENTER CHANGED VALUE : ";CN$
540  IF  LEN (CN$) = 7 THEN  GOTO 610
550  IF  LEN (CN$) < 7 THEN  GOTO 570
560  PRINT "YOU HAVE ENTERED SOMETHING WRONG": GOTO 530
570 R = 7 -  LEN (CN$)
580  FOR K = 1 TO R
590 CN$ = B$ + CN$
600  NEXT K
610  INPUT "QUALIFIER ? ";AN$
615 QL$ = " "
620  IF AN$ = "Y" THEN  GOTO 650
630  IF AN$ = "N" THEN  GOTO 680
640  PRINT "ENTER Y OR N": GOTO 610
650  INPUT "ENTER QUALIFIER : ";QL$
660  IF  LEN (QL$) = 1 THEN  GOTO 680
670  PRINT "YOU HAVE ENTERED SOMETHING WRONG": GOTO 650
680 CN$ = CN$ + QL$
684  IF X > 15 THEN  GOTO 700
686 S1 = 1 + ((X - 1) * 8)
688  IF S1 > 1 THEN  GOTO 692
690 RE$ = "!" + CN$ +  RIGHT$ (RE$,112): GOTO 720
692 S2 = 121 - (S1 + 8)
693  IF S2 > 0 THEN  GOTO 696
694 RE$ =  LEFT$ (RE$,113) + CN$: GOTO 720
695  IF S1 > 1 THEN  GOTO 700
696 RE$ =  LEFT$ (RE$,S1) + CN$ +  RIGHT$ (RE$,S2)
698  GOTO 720
700 S1 = 1 + ((X - 16) * 8)
702  IF S1 > 1 THEN  GOTO 706
704 RB$ = "!" + CN$ +  RIGHT$ (RB$,120): GOTO 720
705  IF S2 > 0 THEN  GOTO 710
706 S2 = 129 - (S1 + 8)
708  IF S2 > 0 THEN  GOTO 712
710 RB$ =  LEFT$ (RB$,121) + CN$: GOTO 720
712 RB$ =  LEFT$ (RB$,S1) + CN$ +  RIGHT$ (RB$,S2)
720  INPUT "ANYMORE CHANGES ? ";AN$
730  IF AN$ = "Y" THEN  GOTO 260
740  IF AN$ = "N" THEN  GOTO 760
750  PRINT "ENTER Y OR N": GOTO 720
```

CHEM-EDIT2 (cont.)

```
760  INPUT "CHANGE FIELD OR TAG NO.? ";AN$
762  IF AN$ = "Y" THEN  GOTO 767
763  IF AN$ = "N" AND X = 0 THEN  GOTO 800
764  IF AN$ = "N" THEN  GOTO 768
766  PRINT "ENTER Y OR N": GOTO 760
767  GOSUB 1000
768  IF X = 0 THEN  GOTO 800
769  PRINT D$;"OPEN"NA$",L150,D2"
770  PRINT D$;"WRITE"NA$",R";Z + 1
780  PRINT RE$
790  PRINT D$;"WRITE"NA$",R";Z + 2
795  PRINT RB$
796  PRINT D$;"CLOSE"NA$
800 Z = Z + 3
805  NEXT I
810  PRINT D$;"LOCK"NA$
820  END
1000  INPUT "CHANGE FIELD NO.? ";AN$
1010  IF AN$ = "Y" THEN  GOTO 1040
1020  IF AN$ = "N" THEN  GOTO 1070
1030  PRINT "ENTER Y OR N": GOTO 1000
1040  INPUT "ENTER FIELD NO. : ";FL$
1050  IF  LEN (FL$) = 8 THEN  GOTO 1070
1060  PRINT "LENGTH MUST BE 8. TRY AGAIN.": GOTO 1040
1070  INPUT "CHANGE TAG NO.? ";AN$
1080  IF AN$ = "Y" THEN  GOTO 1110
1090  IF AN$ = "N" THEN  GOTO 1140
1100  PRINT "ENTER Y OR N": GOTO 1070
1110  INPUT "ENTER TAG NO. : ";TN$
1120  IF  LEN (TN$) = 6 THEN  GOTO 1140
1130  PRINT "LENGTH MUST BE 6. TRY AGAIN": GOTO 1110
1140 RA$ = FL$ + TN$
1150  PRINT D$;"OPEN"NA$",L150,D2"
1160  PRINT D$;"WRITE"NA$",R";Z
1170  PRINT RA$
1180  PRINT D$;"CLOSE"NA$
1190  RETURN
```

GOMULT-CHEM

```
1  REM  ********************************************************************************
2  REM  PROGRAM TO LOAD CHEMISTRY DATA INTO MULTICS
3  REM  ********************************************************************************
100 D$ =  CHR$ (4)
150  INPUT "ENTER 8 CHARACTER DATA SET DESCRIPTION * ";DS$
160 F LEN (DS$) <  = 8 THEN  GOTO 200
170  PRINT "LENGTH MUST BE < OR = 8. TRY AGAIN"
180  GOTO 150
200  INPUT "ENTER NAME OF DATA FILE : ";NA$
210  INPUT "ENTER NAME OF MULTICS FILE : ";SG$
220  PRINT D$;"OPEN"NA$",L150,D2"
230  PRINT D$;"PR#2"
240  POKE 1914,6
250  PRINT "EDM ";SG$: GOSUB 1000
255  PRINT DS$
260  FOR K = 1 TO 69
270  PRINT D$;"READ"NA$",R";K
280  INPUT X$
290  PRINT X$: GOSUB 1000
300  NEXT K
310  PRINT ".": GOSUB 1000
320  PRINT "W": GOSUB 1000
330  PRINT "Q": GOSUB 1000
340  PRINT D$;"CLOSE"NA$
350  END
1000  FOR L = 1 TO 500: NEXT L
1010  RETURN
```

Appendix F : Gospel - Hump Wilderness Area Field Form

GOSPEL HUMP FIELD FORM

STATION [_ _ _ _ _ _ _] PG ____ of ____ DATE _____ QUAD [_ _]

*LAT [_ _ ° _ _ ' _ _ "] *LONG [_ _ ° _ _ ' _ _ "] MAP UNIT _____

LOC _____ PHOTOS _____

PURPOSE: GEOL GX-RX GX-GRID GX-SS GX-W ELEV [_ _ _ _] FT

STRUCTURE:

BEDDING _____

FOL _____ w LIN _____

FOLD AXIS _____ w AXIAL PLANE _____

JOINTS:

PRIMARY/EXTENSION _____

SHEAR _____ SLICKS _____

FAULT: _____ RRDE TYPE _____

DIKES: _____

TEXT:

GOSPEL HUMP FIELD FORM

*SAMPLE NO [_ _ _ _ _ _ _ _ _ _ _ _] Pg_____of_____ TAG NO_____

PURPOSE: GX-RX GX-GRID HAND SPEC CHEM AGE _____

*SAMPLE SOURCE: A)OC A)RUBBLE C)FLT F)MINE J)DUMP N)STREAM Z)OTHER

*SAMPLE TYPE: A)SINGLE (GRAB) B)COMPOSITE

*AGE: Y)pc K)CRETACEOUS T)TERTIARY

*MAT CLASS: A)IG RK B)MET RK C)SED RK F)UNCONSOL H)SOIL J)WATER

*FC 1-2 QUAD [_ _] *FC3 A)PRIM B)RESAMP C)REPL SAMP

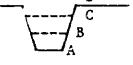
UNCONSOLIDATED SAMPLES

*FC4 ORG CONT: A)LIT/NO=LIGHT B)MIXED=GRAY C)HIGH=BLACK

*FC5 OX COAT: A)NONE B)BLACK C)BROWN D)RUSTY E)_____

*FC6 STREAM WIDTH: A)<1m B)1-3m C)3-10m D)>10m SORTING_____

*FC7 PROFILE: A)FALLS B)FEW FALLS C)QUIET D)STAG E)DRY LOCATION: _____



WATER SAMPLES

PH[_ _ _ _] CONDUCTIVITY [_ _ _ _ _ _ _ _] TEMP_____°C

ROCK SAMPLES

*FC8 A)MAJOR B)LESSER C)V MINOR D)MINERALIZED

*MC10-11 MET GRADE: LG)LOW MG)MED HG)HIGH

*MC12-13 FORM(IG): IR)INTRU EX)EXTRU DK)DIKE SI)SILL

*ALTER: PL)PROP AR)ARG SI)SILIC SE)SER FP)ALK ZE)YES

*OXIDATION: O)OXIDIZED P)PARTIALLY OXIDIZED U)UNOXIDIZED

DESCRIPTIVE ROCK NAME_____ FM NAME_____

COLOR_____ TEXTURE_____

GRAIN SIZE_____

MIN % Q_____ FLDSPR_____ PLAG_____ KSPR_____

MAF_____

MAF: BIO HBL PX OTHERS: MUSC PY_____

REMARKS:

S-826

Appendix G : Program to
create Statpak data set

```
      dimension kolid(31,2),irid(4),loc(2),x(31),ia(31),nm(31)
      integer blank
      character*32 dname,cname,oname
      character*4 id(2)
      equivalence(oname,id)
      data nm/'FE% ','MG% ','CA% ','TI% ','MN  ','AG  ','AS  ','AU  ',
     1'B   ','BA  ','BE  ','BI  ','CD  ','CO  ','CR  ','CU  ','LA  ',
     2'MO  ','NB  ','NI  ','PB  ','SB  ','SC  ','SN  ','SR  ','V   ',
     3'W   ','Y   ','ZN  ','ZR  ','TH  '/
      data blank/'    '/
      n=23
      m=31
      do 10 i=1,31
      kolid(i,1)=nm(i)
      kolid(i,2)=blank
10    continue
      write(6,20)
20    format(' enter name of file containing lat-longs : ')
      read(5,25) dname
25    format(a32)
      write(6,30)
30    format(' enter name of file containing chemistry : ')
      read(5,25) cname
      write(6,35)
35    format(' enter name of output file : ')
      read(5,25) oname
      call assoc(10,dname,'si  ')
      call assoc(11,cname,'si  ')
      call assoc(12,oname,'seq ')
      write(12) id,n,m,(kolid(i,1),kolid(i,2),i=1,m)
      do 100 i=1,23
      read(10,40) (irid(j),j=1,4),(loc(k),k=1,2)
40    format(3a4,a2,7x,2i7)
      read(11,50) (x(l),ia(l),l=1,31)
50    format(/1x,15(f7.0,a1)/1x,16(f7.0,a1))
      call putlst(12,i,irid,loc,x,ia,m)
100   continue
      call closer(10)
      call closer(11)
      call closer(12)
      stop
      end
```