An Earthquake Strong-Motion Data Catalog

for Personal Computers

SMCAT

User Manual
(Version 3)

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Preface and Description of SMCAT

The Digitized Strong Motion Data Archival Program was developed by the National Geophysical Data Center (NGDC) to foster earthquake engineering and research on a global scale. The principal functions of the program are to collect, maintain, and disseminate significant digitized strong motion recordings. The database is currently the largest public domain holding of strong motion data in the world.

SMCAT3 is a data inventory package for IBM PCs. It contains a comprehensive database which summarizes the characteristics of each accelerogram. The catalog describes only those records included on the Earthquake Strong Motion CD-ROM Collection. The catalog contains 31 parameters which document information on the trigger events, recording sites, and peak recorded motions, for each strong motion component record included on the CDs. The catalog is accessed by a front-end software system which provides search, sort, display**,** and retrieval capabilities.

SMCAT3 allows users to search the database for records suitable for specific applications, display the results of the search, output the results to an TEXT (ASCII), DBASE, or LOTUS file. The user specifies the output file name prefix and the software adds the extensions.

SMCAT3 also allows users to retrieve files from the CDs. N*OTE: To retrieve files from the CDs, the user must export the results of the search to a TEXT file.* All TEXT files are automatically given a ".TXT" extension by the software.

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INTRODUCTION

Before You Begin

Before loading the SMCAT software and accessing the data on the CD-ROMs, verify that your computer meets the following requirements:

- Must be 100% IBM PC-compatible computer
- Operating system must be DOS version 6.0 or later
- Approximately 8 megabytes of hard disk space are required to install and run the software. Additional hard disk space is required to retrieve files from the CDs. The amount of hard disk space varies depending on the number of files, ranging from a few megabytes to hundreds of megabytes.
- 350 kilobytes of memory must be available
  (RAM that is not being used by any other RAM resident (TSR) software)
- Must have a CD-ROM drive

Also note the following points:

- SMCAT can only operate off of a hard drive (the software **cannot** operate off of a diskette drive)

The following conventions will be used throughout this manual:

- All commands or values that should be typed into the computer by the user will appear in upper-case, bold lettering (e.g.)
- All keystrokes are denoted by square brackets (e.g. 0[ENTER]). This indicates that the user should press the key given in the square brackets.

Transporting and Copying SMCAT

SMCAT is a public domain software and information package. The contents of this package along with its documentation can be copied and distributed freely. NGDC does request that NGDC and WDC-A are given proper credit for developing the material.

When copying and transporting SMCAT, the user must insure that ALL of the original file modules are transferred.

Loading the Software

The file "SMINSTAL.EXE" in the SOFTWARE/SMCAT3 directory is a self-extracting zip file containing the SMCAT3 software.

1. Select the hard drive that you would like the software loaded onto (e.g. C: or D:) and create a directory on your hard drive called SMCAT3

2. Copy the SMINSTAL.EXE file to the SMCAT3 directory

3. At the DOS prompt of the SMCAT3 directory type the command SMINSTAL

4. After the files have unzipped, delete the file SMINSTAL.EXE

5. The following files should now be in the SMCAT3 directory:

   TEMPNDX.NTX
   CATALOG3.DBF
   S3FILES.BAT
   XPORTMAO.EXE
   GETDATA.EXE
   S3CHK.EXE
   S3MAIN.EXE
   S3LOGO.EXE
   S3SRCH.EXE
   CHKCD.BAT
   SMCAT.BAT
   XINFILES.DBF
   XCOUNTRY.DBF
   CHKCD.EXE
   XINFILES.TXT

6. To run the software type **SMCAT** [ENTER] at the DOS prompt.

7. If an error occurs while loading, see the troubleshooting guide for possible solution

About the SMCAT Catalog Database

Introduction

The SMCAT catalog is a listing of parameters which describe the strong motion records archived by NGDC / WDC-A. Each entry in the database describes a single-component strong motion recording. The catalog parameters include information on the triggering event, recording station, peak recorded values, and archive locations. All of this information is contained in a single file called CATALOG3.DBF.

Format

The catalog is formatted in dBase III+. It is divided into vertical columns and horizontal rows with the columns representing different parameters and the rows representing individual component records. Each record contains 31 parameters. The structure of the database is shown below. See the section entitled "Description of Catalog Parameters" for more detailed descriptions of the catalog fields.

Field	Field Name	Type	Width
1	EQDATE	Numeric	6
2	EQTIME	Numeric	8
3	EPILAT	Numeric	7
4	EPILONG	Numeric	8
5	EQNAME	Character	30
6	DEPTH	Numeric	3
7	INT	Numeric	2
8	MAG	Numeric	4
9	MAGTYPE	Character	2
10	COMPONENT	Character	7
11	STATION	Character	45
12	STATE	Character	2
13	COUNTRY	Numeric	5
14	STRUCTURE	Character	2
15	EPIDIST	Numeric	3
16	INSTRUMENT	Character	7
17	FLOOR	Numeric	2
18	SITE_GEOL	Character	30
19	SITE_COEFF	Character	2
20	STALAT	Numeric	7
21	STALONG	Numeric	8
22	UNC_ACCEL	Numeric	7
23	COR_ACCEL	Numeric	7
24	MAX_VEL	Numeric	7
25	MAX_DISP	Numeric	6
26	UNC_TAPE	Character	7
27	UNC_FILE	Numeric	4
28	COR_TAPE	Character	7
29	COR_FILE	Numeric	4
30	RES_TAPE	Character	7
31	RES_FILE	Numeric	4

About the SMCAT Software System

Description

The SMCAT program is a tool for accessing the catalog database and CD-ROMs. The program provides search, sort, and display capabilities for the catalog; and file retrieval capabilities for the CD-ROMs. The software can be used to accomplish the following functions:

- Searching the catalog for specific records of interest
- Retrieving specific records (files) of interest from the Earthquake Strong Motion CD-ROM
- Viewing the catalog entries on your monitor
- Listing catalog entries on your printer
- Producing subset files of the original catalog file
- Exporting the catalog database or catalog subsets to Lotus or text file formats

A variety of menus and windows help guide the user through the program with ease.

Features

SMCAT is designed for optimal speed and versatility. Several built-in features help to attain these objectives including the following:

- Windowing
- Pop-up menus
- Enhanced error messages
- Quick search and retrieval functions
- Multiple output options including monitor, printer, and disk files
- Help windows
- Versatile program flow

The following sections will guide the user through each part of the program and define the options. A tutorial is offered in this manual which walks the first time user through a typical search, sort, and retrieval session. Skip now to this section if you would like to follow this procedure.

Tutorial: Sample Search Routine

The following sample search routine is intended to help first time users become better acquainted with SMCAT. The instructions are designed to guide the user step-by-step through a typical search routine. Before beginning, make sure that the software has already been loaded and that you are in the subdirectory that contains the SMCAT software.

In this example, you will be using the SMCAT software to locate catalog entries for all of the component records that were produced from events greater than a magnitude 6 and were recorded at free field sites located within 10 kilometers of the epicenter; and retrieve the records from the CD-ROMs.

BEGIN PROGRAM

1. To begin the program, type the following at the DOS prompt:

   SMCAT [ENTER].

2. If the software is operating properly, the main menu will appear after the logo screen.

SELECT A DATABASE

3. The search will be conducted on the CATALOG3 file which is the most current database containing catalog parameters. By default, SMCAT automatically selects CATALOG3 when the program begins thus there is no need to choose the "SELECT DATABASE" option in the main menu.

SEARCH A DATABASE

4. Since the database is already selected, the next step is to tell the computer what to search for in this file. Use the [UP CURSOR] or [DOWN CURSOR] keys to position the lightbar selector over the "SEARCH DATABASE" option in the main menu and press [ENTER].

5. When the item is selected, the main menu will disappear from the work window and the search menu will appear. The search menu is used to select the criteria for the search routine. At this point we need to look back at our search objective. The first objective is to find events with a magnitude greater than 6. To enter this information into the computer use the [DOWN CURSOR] key to position the lightbar over the "MAGNITUDE" option and press [ENTER].

6. A small window will appear to the right prompting the user for a range of magnitudes. Enter "**6**" in the minimum magnitude prompt and press [ENTER]. Since there is no upper limit, the maximum magnitude should be entered as a large value such as "**9.9**". Press [ENTER] to enter the value and leave the menu.

7. You will now be returned to the Search Menu. Notice the arrowhead next to "MAGNITUDE"? This indicates that you have correctly entered the values for this field. The arrowhead will appear every time you select a search field.

8. The next part of the search is to locate all free field sites. Use the [DOWN CURSOR] key to position the lightbar over "STRUCTURE TYPE" and press [ENTER]. A menu appears to the right showing several different recording environments. Using the [DOWN CURSOR] key position the highlighted bar on "**FREE FIELD**" and press [ENTER].

9. Our third search objective is to locate all records produced within 10 kilometers of the epicenter. Using the [DOWN CURSOR] key position the highlighted bar over "EPICENTRAL DISTANCE" and press [ENTER].

10. A window will appear to the right prompting the user for a range of epicentral distances. For a minimum value enter a "**1**" and press [ENTER]. Do not use "0" because "0" indicates an unknown value in the catalog. For a maximum value enter a "**10**" and press [ENTER].

11. Since all of the search objectives have been entered, you are now ready to leave the parameter menu and begin the search routine. If any errors have been made, use the [UP CURSOR] and [DOWN CURSOR] keys to move the selector bar over the appropriate item and press [ENTER] to view the values that you entered. Make any appropriate changes before continuing. Press [END] to leave the menu and begin the search.

12. The search will automatically begin. Depending upon the speed of your PC, the search will take from several seconds to a few minutes to complete.

13. When the search is complete, a window will appear that displays the total number of records selected. Press [ENTER] to return to the main menu.

SELECT OUTPUT OPTIONS

14. Now that all of the catalog entries have been selected that meet our search criteria, it is time to display these entries. In this tutorial, we will display the records on the monitor. To do this, position the selector bar over "SELECT OUTPUT OPTIONS" and press [ENTER]. A menu will appear that gives the option of sending your output to the screen, printer or a disk file. Position the selector bar over "SCREEN" and press [ENTER].

15. Next a menu will appear that gives you the option of sorting or not sorting. Sorting will produce a listing that is easier to read. In this demonstration we will be sorting chronologically by date and time, alphabetically by station name and component. Position the selector bar over "SORT OUTPUT" and press [ENTER].

16. Once you've entered the sorting option a menu will appear that will allow you to choose the fields to sort. You can choose up to 9 fields to sort.

17. Since we would like SMCAT to sort the list chronologically first, position the lighted bar over "EVENT DATE & TIME" and press [ENTER]. Notice that the number "1" and an arrowhead appears next to the field name. This indicates that this is the first field to be sorted.

18. Next, we would like to sort alphabetically by station name. Using the [UP CURSOR] and [DOWN CURSOR] keys position the selector bar over "STATION NAME" and press [ENTER]. A number 2 and an arrowhead will appear next to the station field, letting you know that this field will be sorted second.

19. Finally, position the selector bar over "COMPONENT" and press [ENTER]. An arrowhead and the number 3 will appear next to the field name. This field will be sorted third.

20. We are now finished with this menu. If a mistake was made, press the [DEL] key to erase your selections and begin again from step 17. Press the [END] key to leave this menu. A message will appear on the screen to let you know that the program is sorting the data.

21. When SMCAT is finished sorting the data, another menu will appear that displays field names. From this menu, we will select the fields that we want to view in the output.

22. A window to the right of the menu displays how many characters are in the field that lighted bar is currently over and also keeps track of the total characters from the selected fields. Keeping track of the amount of characters selected is not important if you are just viewing the data on the screen but if you choose the printer option it is convenient to know whether the selected fields will fit across the width of your printer.

23. To select the fields, position the selector bar over "EVENT DATE AND TIME". Notice that this field has 16 characters. Press [ENTER].

24. Press the [DOWN CURSOR] key until the bar is over "MAGNITUDE" and press [ENTER]. The magnitude field is 5 characters long and the total of the fields selected is 21.

25. Position the bar over "STATION NAME", and press [ENTER]. Position the bar over "STRUCTURE/FLOOR#", and press [ENTER]. Place the bar over "COMPONENT" and press [ENTER]. Place the bar over "PEAK ACCELERATION" and press [ENTER] and finally over "EPICENTER DISTANCE" and press [ENTER]. We are now finished selecting the fields to view so press [END] and you will be returned to the main menu.

DISPLAY DATA

26. Now we will view the data. Choose "DISPLAY DATA" by pressing [ENTER]. This is the SMCAT browse window. The screen will display the first 16 records of the output. You can move through the list by using the [UP CURSOR], [DOWN CURSOR], [PG UP] and [PG DOWN] keys. The window can display up to 76 characters across the screen. Notice that not all of the fields we selected for displaying are shown in the window. To view the remaining fields use the [RIGHT CURSOR] key to shift the window to the right. To move the window back to the left, press the [LEFT CURSOR] key.

27. To simultaneously display all of the fields for a specific record, first position the selector bar over the record of interest and press [ENTER]. This mode divides the fields into four groups for display. To exit this mode press [ESC].

28. After you are finished viewing the records in the browse window, press [ESC] to return to the main menu.

SELECT DBASEIII+ OUTPUT FILE OPTION

29. Next we will save our search results in a disk file. This is useful for storing the results for redisplaying and re-searching at a later time. To create a disk file, move the selector in the main menu to "SELECT OUTPUT OPTIONS" and press [ENTER].

30. In the output options menu move the cursor to the "DISK FILE" option and press [ENTER]. A new menu will be displayed which shows three types of data file formats. Using the [UP CURSOR] and [DOWN CURSOR] keys position the selector bar over "DBASEIII FILE". The Lotus option is used for exporting the catalog records to another file format. ***The text option, described in the next section, is used to retrieve files from the CDs***.

31. After a file format is selected, another window will appear with the prompt "What do you want to name your file?". Type in "MYFIRST" (or any name you wish to call it) and press [ENTER].

32. Another menu will appear that will give you the option of sorting or not sorting. Since you have already sorted the data, sorting is not necessary. Position the selector bar over "DON'T SORT" and press [ENTER]. A message will appear that tells you the program is creating the file.

33. When the file is created, a message will appear that indicates that the process is complete. Press [ENTER] and you will be back in the main menu. To access this file at a later date, choose the "SELECT DATABASE" main menu option. Under this option select the "OTHER PREVIOUSLY CREATED FILE" option and finally select the "MYFIRST" data file.

34. The sample search routine is now complete. In this routine we first entered the search criteria and ran a search. Next we selected our output choices and displayed the selected records in the browse window. Finally, the search results were saved in a disk file for future use.

SELECT TEXT OUTPUT FILE OPTION AND RETRIEVE FILES FROM THE CD-ROMS

35. We will now save our search results in a text file and retrieve the files from the CDs. To create a disk file, move the selector in the main menu to "SELECT OUTPUT OPTIONS" and press [ENTER].

36. In the output options menu move the cursor to the "DISK FILE" option and press [ENTER]. Using the [UP CURSOR] and [DOWN CURSOR] keys position the selector bar over "EXPORT TO TEXT FILE". ***The text option must be selected to retrieve files from the CD-ROMS***.

37. After a file format is selected, another window will appear with the prompt "What do you want to name your file?". Type in "MYFIRST" (or any name you wish to call it) and press [ENTER].

38. Another menu will appear that will give you the option of sorting or not sorting. Since you have already sorted the data, sorting is not necessary. Position the selector bar over "DON'T SORT" and press [ENTER].

39. When the file is created, a message will appear that indicates that the process is complete. Press [ENTER] and you will be back in the main menu. To retrieve these records from the CD, position the lighted bar over "Quit and Return to DOS" and press [ENTER].

40. Listed below are the questions that will now appear on your screen followed by the information you must enter to retrieve the files from the CDs:

    Do you want to copy data from your CD-ROM to your hard drive (Y/N):
    Type "**Y**" and press [ENTER]
    (enter "N" to terminate the process).

    Type CD-ROM drive letter:
    Type "**L**" and press [ENTER]
    (if L is your CD-ROM drive).

    Type path name for copying data files to:
    Type "**D:\DATA**" and press [ENTER]
    (or whatever pathname you wish to copy the data to).
    NOTE: Do not type the last slash.

    Type the output filename you used in your SMCAT search:
    Type "**MYFIRST.TXT**" and press [ENTER]
    (or whatever file name you used in your SMCAT search in item 37 above).
    NOTE: You must use type the ***.TXT*** *extension.*

Enter a number below according to type of record data you want extracted:

1. Uncorrected (raw)
2. Corrected (filtered)
3. Response (includes Fourier spectra)
4. Uncorrected and Corrected
5. Corrected and Response
6. Uncorrected and Response
7. Uncorrected, Corrected and Response

Enter the type of record data to be extracted:

Type "**7**" and press [ENTER]
(or whatever number is associated with the type of records you want to retrieve from the CDs).

41. A summary of the information you just entered and the following question will be displayed next:

Is the above information correct (Y/N)? Type QUIT to Abort

Enter "**Y**" and press [ENTER] to begin file retrieval
(enter "N" to re-enter the information or "QUIT" to abort the process).

42. After the above information is entered, the software will prompt you to insert the correct CD-ROM volume:

Insert CD-ROM Volume 1
Press any key to continue

If you have inserted the wrong CD-ROM Volume number, the same prompt will reappear until you have inserted the correct CD-ROM Volume.

43. When the correct CD Volume is inserted, the selected files will be copied to your hard drive. To terminate this process, type [CONTROL-C].

QUIT

44. When you are ready to leave the program position the lighted bar over "Quit and Return to DOS" and press [ENTER]. Refer to the section entitled "Using the SMCAT Software" to help you generate your own search on SMCAT.

USING THE SMCAT SOFTWARE

Running SMCAT

The software can be executed in three steps.

1. Make sure you are on the correct drive which contains the program. If not, change to the correct drive by typing the drive letter, followed by a colon and the [ENTER] key (e.g. C:[ENTER]).

2. Next, move into the subdirectory where the files are located. The subdirectory will be called "SMCAT3", unless another name was selected in the installation routine. Move into the subdirectory by typing the following:

   CD\directory_name [ENTER]

   where directory_name is the name of the subdirectory where the program is located. (NOTE that the slash used here is a "back slash \"; do not mistake this with a "forward slash /".)

3. Now you can execute the program by typing

   SMCAT [ENTER]

   The program should now execute and the SMCAT logo screen should appear on your monitor. **If this screen does not appear refer to the chapter on troubleshooting (Appendix B).**

The SMCAT Windowing Feature

SMCAT utilizes a system of screen windows for user interaction with the program. There are five types of windows that appear on every screen. A sixth window, called a help window appears only on demand. Each window differs in size and function.

Screen Status Window

This small window appears in the upper right corner of the screen between a set of square brackets. This window indicates the process currently displayed in the work window.

Work Window

The large white box that fills most of the screen is the work window. All menus, prompts, and instructions will appear in the work window.

Menu Windows

There are over 50 different menu windows or prompt windows that can appear. Each window serves a separate function such as selecting program options or prompting for user input. All menu windows are of the pop-up type. Use the [UP CURSOR] and [DOWN CURSOR] keys to move the light bar to the various choices and press [ENTER] to select an option. Menu windows and prompt windows appear inside the work window.

File Status Window

This small window appears in the lower right corner of the work window. The name of the data file in use and the total number of records contained in that file are displayed in the file status window.

Key Option Window

The long rectangular box at the bottom of the screen is the key option window. This window displays all of the keys that can be used to manipulate menus that appear in the work window.

Help Windows

Help windows can be accessed by pressing the [F1] key. These windows can only be called when the "F1 - Help" option appears in the key option window. The help windows give a basic description of menu options and routine functions. Use the [UP CURSOR], [DOWN CURSOR], [PAGE UP], and [PAGE DOWN] keys to move about in the help window. Press [ESCAPE] to exit the help window.

Main Menu

The main menu is the central control point of the SMCAT program. From here, the user can branch into any of the four different program facilities. There are five different functions that can be selected in the main menu:

1. Select Database
2. Search Database
3. Select Output Options
4. Display Data
5. Quit and Return to DOS

Each function is displayed as an option in the main menu. To select an option, use the [UP CURSOR] and [DOWN CURSOR] keys to move the lightbar selector to the desired option and press [ENTER] to select it. When an option is selected, the main menu will disappear from the work area and a new menu or display screen will appear. The screen status window will indicate the current function displayed in the work area. After a routine is completed or terminated, program control is returned to the main menu.

In general, the user would follow a logical order in selecting options in the main menu. This order would be to first select a database. The next item of the sequence would be to search the database. When the search is complete, the user would select output options and finally display the data. In the next few pages you will find that it is not always necessary to follow this order to run a search. There are a few features built into the design of SMCAT that allows the user to skip certain functions thus resulting in a more efficient use of the software.

Selecting a Data Base

General Description

This option allows the user to select a database file to be used in SMCAT. There are two types of files that can be selected. The first type of file is the CATALOG3 file. This file is the original updated catalog database compiled by NGDC/WDC-A. Typically, most searches are run on this file. The other type of file is a subset file of CATALOG3 that can be created using SMCAT. If SMCAT has not been run previously, then there should not be any of these additional files. The smaller subsets are useful for faster and better organized searches. See the section on selecting output options for more information on these files.

How to Use

Before choosing the "SELECT DATABASE" main menu option, check the file status window or the name of the file currently in use. If the file name displayed is the file you want, then you do not need to choose the select database option.

The select database mode contains a menu with two options:

1. SMCAT Catalog File
2. Another Previously Created File

Use the [UP CURSOR] or [DOWN CURSOR] keys to position the lightbar to the desired selection and press [ENTER]. If the "SMCAT Catalog File" option was selected then the program will immediately return to the main menu. The file status window should show "CATALOG3" as the file currently in use.

If the "Another Previously Created File" option was selected, then a second window will appear in the work area. This menu displays all of the additional files that can be used by SMCAT. Use the [UP CURSOR] and [DOWN CURSOR] keys to move the lightbar selector to the desired file name and press [ENTER] to select it. If not all of the available files appear in the menu then use the [DOWN CURSOR] key to position the lightbar to the last option displayed in the menu, then continue to press the [DOWN CURSOR] key to view the remaining file names.

Once a file has been selected, then the program will return to the main menu. The file status window should show the name of the newly selected file.

Running a Search

General Description

This option provides search capabilities for the user. Within this mode the user selects a set of search criteria. The search criteria are specified by the user through a series of menus and pop-up windows. After the search parameters are entered, the program will then search through the catalog and locate all of the records that meet the specified conditions.

Specifying Search Parameters

In the main menu, use the [UP CURSOR] and [DOWN CURSOR] keys to position the selector bar over the "SEARCH DATABASE" option and press [ENTER]. The search parameter menu should be displayed in the work area. From this menu, the user can select up to five search fields. Use the [UP CURSOR] and [DOWN CURSOR] keys to position the selector bar over one of the parameter options that you want to use in the search. Press [ENTER] to select the option. A small window will appear to the right of the parameter menu prompting for a range of values or a specific name.

After making a selection, a arrowhead will appear next to the specified field in the parameter menu. This indicates that this parameter will be included in the search. To remove a selection from the parameter menu, use the [UP CURSOR] and [DOWN CURSOR] keys to position the selector over the desired field and press [DEL]. The arrow head will disappear indicating that the parameter is no longer selected.

Entering Ranges or Values

Range or value windows appear in the space to the right of the parameter menu. In these windows, the user enters a range of values to satisfy the search criteria. **Descriptions for each search field, and detailed directions for entering values are given on the following pages**.

After all parameters have been selected, press the [END] key to leave the parameter menu and begin the search process.

Search Mode

When the search has begun, a window will appear in the work area indicating the input file being searched and how many records are in that file. The search mode requires no user interaction. Depending on the speed of your PC, the search process will take from several seconds to several minutes to complete.

During the search mode the computer is locating all of the catalog entries that meet the conditions specified in the parameter menu. The entries that meet those conditions are copied from the catalog into a temporary file. There are three separate modes in the search process.

The first mode, called the optimizing mode, analyzes the search parameters and tries to find a way to speed up the search process. If a search cannot be optimized, then the message "CAN'T OPTIMIZE" will appear. The search mode will pass through two more phases called "Search Phase 1" and "Search Phase 2" before finishing. When complete, the window will display the total number of records selected.

Terminating a Search

During most of the search mode, the keyboard is disabled to increase the processing speed. The search can at times, be terminated by pressing [ALT]-[C] several times. If this has no effect, then reboot the computer.

No Records Selected

If this message should appear at the end of your search, you may want to re-execute the search using a different set of parameters. The range that you specified may be too narrow or may not fall within the scope of the catalog. Try to begin your searches with a very broad range; then check your results. If your output is too large then narrow your search accordingly.

Description of Search Parameters

EVENT DATE

Description:	Event date is the calendar date of the occurrence of the recorded earthquake.
Entering Values:	The user is asked to enter a range of dates for the triggering events. Six blanks are displayed. Enter all dates as digits. In the first three blanks enter the day, month, and year of the starting date. In the last three blanks enter the day, month and year of the ending date. Press [ENTER] after entering each value.
Units:	Coordinated Universal Time (UTC).
Range of Acceptable Values:	The earliest date is March 11, 1933. The latest date is Jan 17, 1994.
Error Messages:	*Minimum value is larger than maximum value*. The beginning date is larger than the ending date. Re-enter the dates in proper order. *Value out of Range* The dates entered are before March 11, 1933.
Hints:	When searching for a single event, specify a beginning value that is one or two days before the earthquake and an ending value that is one or two days after the earthquake.

EVENT NAME

Description:	Event names are usually the name of the city or region in which the earthquake occurred or caused the most damage.
Entering Values:	The user may enter a name up to fifteen characters long. Press [ENTER] after entering the name.
Range of Acceptable Values:	Some names give only a relative location in a state or country (e.g. "SOUTHERN CALIFORNIA EARTHQUAKE"). Note that names of events may vary widely.
Error Messages:	No error messages.
Hints:	Enter only a unique portion of the event name into the blank. Since the computer will try to make an exact match with the string that you entered to what is in the database, it is advisable to enter as small a string as possible. For example, if one were to search for the San Fernando Earthquake the key word **FERNANDO** would be typed into the computer. Portions of the name can also be entered, such as **FERN**. It is not recommended that the words EARTHQUAKE or AFTERSHOCK, etc, be entered. In general, the best way to search for a specific event is not by its name, since event names vary or may represent multiple events. It is recommended that the user locate a specific event either by its date of occurrence or by its coordinates.

EVENT COORDINATES

Description: Event coordinates are the epicentral latitude and longitude of the triggering event.

Entering Values: The user must specify a coordinate range box by entering the northernmost latitude, southernmost latitude, westernmost longitude, and easternmost longitude. In the first blank enter a latitude value for the northernmost latitude and press [ENTER]. In the adjacent blank enter a "N" for north latitude or a "S" for south latitude and press [ENTER]. In the third blank, enter a latitude value for the southernmost latitude and press [ENTER]. In the adjacent blank enter a "N" for north latitude or a "S" for south latitude value and press [ENTER]. In the fifth blank, enter a longitude for the westernmost longitude and press [ENTER]. In the adjacent blank enter a "W" for west longitude or an "E" for east longitude and press [ENTER]. In the seventh box enter longitude for the easternmost longitude and press [ENTER]. In the last blank enter a "W" for west longitude or an "E" for east longitude.

Units: Coordinate units are in decimal degrees.

Range of Acceptable Values: Latitude: 0 - 90 North and 0 - 90 South
Longitude: 0 - 180 West and 0 - 180 East

Error Messages: *North (N) or South (S) Latitudes or East (E) or West (W) Longitudes Not Specified or Incorrect*. "N" or "S" was not specified for latitude values or "E" or "W" was not specified for longitude values. See "Entering Values" above for more information.

Latitude Values Out of Range
Latitude values must be between 0 and 90 degrees.
Make sure the values you entered are in this range.

Longitude Values Out of Range
Longitude Values must be between 0 and 180 degrees.
Make sure the values you entered are in this range.

MAGNITUDES

Description: Only one magnitude is given in the catalog for each earthquake. This magnitude can be given as M_L, M_S, M_B, M_{JMA} , or $M_{unspecified}$. When entering a range of magnitude values for searching, a magnitude scale CANNOT be specified.

Entering Values: The user must specify a range of magnitudes. First enter the minimum magnitude value and press [ENTER]. Then enter a maximum magnitude value and press [ENTER].

Units: Magnitudes may be M_L, M_S, M_B, M_{JMA} , or $M_{unspecified}$.

Range of Acceptable Values: 0 - 9.9

Error Messages *Minimum value is larger than maximum value*
The minimum magnitude is larger than the maximum magnitude. Re-enter the magnitudes in proper order.

MAXIMUM INTENSITY

Description: This field gives the maximum felt intensity for the event.

Entering Values: Enter values as digits not Roman numerals. First enter the minimum intensity value and press [ENTER]. Then enter the maximum intensity value and press [ENTER].

Units: Modified Mercalli (MM)

Range of Acceptable Values: 0 - 12

Error Messages: *Value out of Range*
Numbers entered must be in the range of zero to twelve. Recheck your numbers and make sure they are in this range.

Minimum value is larger than maximum value
The minimum intensity is larger than the maximum intensity. Re-enter the intensities in proper order.

FOCAL DEPTH

Description: This field gives the focal depth of the earthquake.

Entering Values: Enter the minimum value and press [ENTER]. Next type in the maximum value and press [ENTER].

Units: Kilometers (KM)

Range of Acceptable Values: 0-999

Error Messages: *Minimum value is larger than maximum value*
The minimum depth is larger than the maximum depth. Re-enter the focal depths in proper order.

COUNTRY/STATE

Description: This field contains the country and state where the recording station is located. States can be selected *only* if the United States is chosen from the country menu.

Entering Values: A pop-up menu is used to select countries. The user can scroll through the country selections by using the [UP CURSOR] and [DOWN CURSOR] keys. To view all of the countries use the [DOWN CURSOR] key to move the selector bar to the bottom of the menu. Then continue to press [DOWN CURSOR] until you reach the end of the menu. When the desired country is under the selector bar press [ENTER].

If the United States is selected, another window will appear to the right of the country window asking for the state code. Enter a two letter state code. See below for a listing of state codes included in the catalog. If all states are needed then leave the prompt blank and press [ENTER].

Units: STATE CODES:

AK	Alaska
AR	Arkansas
CA	California
HI	Hawaii
ME	Maine
MO	Missouri
MS	Mississippi
MT	Montana
NH	New Hampshire
NV	Nevada
NY	New York
OR	Oregon
SC	South Carolina
TN	Tennessee
VT	Vermont
WA	Washington

Error Messages: No error Messages.

STATION COORDINATES

Description: Station coordinates are the latitude and longitude of the recording station.

Entering Values: The user must specify a coordinate range box by entering the northernmost latitude, southernmost latitude, westernmost longitude, and easternmost longitude. In the first blank enter a latitude value for the northernmost latitude and press [ENTER]. In the adjacent blank enter a "N" for North latitude or a "S" for South Latitude and press [ENTER]. In the third blank, enter a latitude value for the southernmost latitude and press [ENTER]. In the adjacent blank enter a "N" for north latitude or a "S" for south latitude value and press [ENTER]. In the fifth blank, enter a longitude for the westernmost longitude and press [ENTER]. In the adjacent blank enter a "W" for west longitude or an "E" for east longitude and press [ENTER]. In the seventh blank enter longitude for the easternmost longitude and press [ENTER]. In the last blank enter a "W" for West longitude or an "E" for East longitude and press [ENTER].

Units: Coordinate units are in decimal degrees.

Range of Acceptable Values: Latitude: 0 - 90 North and 0 - 90 South
Longitude: 0 - 180 West and 0 - 180 East

Error Messages:

North (N) or South (S) Latitudes or East (E) or West (W) Longitudes Not Specified or Incorrect

"N" or "S" was not specified for latitude values or "E" or "W" was not specified for longitude values. See "Entering Values" above for more information.

Latitude Values Out of Range

Latitude values must be between 0 and 90 degrees.
Make sure the values you entered are in this range.

Longitude Values Out of Range

Longitude Values must be between 0 and 180 degrees.
Make sure the values you entered are in this range.

STRUCTURE TYPE

Description: The SMCAT Catalog includes a field that describes, in general, the type of recording environment an instrument is installed in. This can be a structural environment, such as a building or a dam, or a free field environment.

Entering Values: In the structure type menu, use the [UP CURSOR] and [DOWN CURSOR] keys to move the light bar to the desired selection and press [ENTER].

If "BUILDING" structure type was selected then a window will appear prompting the user for a range of floor number. If you don't want to specify a range of floor numbers, then press [ESCAPE]. Otherwise, enter the lowest floor number and press [ENTER]. Next, enter the highest floor number and press [ENTER].

Units:

Building. Includes any type of concrete, masonry, steel or wood-framed structures such as houses, office buildings, warehouses, garages, and sheds.

Dam. Includes both concrete and earth fill dams, reservoirs and dikes. All instruments that are associated with a dam site are in this category. This includes instruments that are not only installed on the dam but at a free field location located some distance away from the actual dam.

Bridge. Includes any type of structural span.

Utility. Locations defined as utilities include: electrical power generation and transmission components, water storage (except reservoirs), treatment and distribution systems, sewage treatment plants, nuclear power generation facilities, water irrigation facilities, and petroleum product production, storage, and distribution facilities.

Free Field. This includes only instruments located in the free field. Locations denoted as free field in this catalog are housed only inside some type of light protective shelter which will not influence the instrument recordings by soil-structure interactions. Instruments installed in small structures which may affect a recording or where the affect is unknown, are designated either as a building or as miscellaneous.

Miscellaneous. Any type of instrument location that does not fall into one of the above categories, is considered miscellaneous. This includes tunnels, pipelines, towers and special instrument mountings designed for the analysis of independent structural components.

Range of Acceptable Values: Floor Numbers have a range of -9 to 99

Error Messages:

Minimum value is larger than maximum value
The minimum floor number is larger than the maximum floor number. Re-enter the numbers in proper order.

SITE GEOLOGY

Description: The SMCAT Catalog includes a field that classifies site geologies into four groups and assigns a corresponding coefficient: S1 = bedrock and hard rock, S2 = sedimentary and conglomerated rock, S3 = soil and glacial till, S4 = alluvium and unconsolidated deposits.

Entering Values: In the site geology menu, use the [UP CURSOR] and [DOWN CURSOR] keys to move the light bar to the desired selection and press [ENTER].

Units:
S1 = bedrock and hard rock
S2 = sedimentary and conglomerated rock
S3 = soil and glacial till
S4 = alluvium and unconsolidated deposits.

Error Messages: No error messages.

EPICENTRAL DISTANCE

Description: This field gives the distance between the earthquake epicenter and the recording station.

Entering Values: A range of distances must be specified. First, type in the minimum distance and press [ENTER], then type in the maximum distance and press [ENTER].

Units: Kilometers (KM)

Range of Acceptable Values: 0 - 999

Error Messages:
Minimum value is larger than maximum value
The minimum epicentral distance is larger than the maximum distance.
Re-enter the epicentral distances in proper order.

PEAK ACCELERATION

Description: Two types of peak accelerations, uncorrected and corrected, can be given for each record. Uncorrected accelerations are derived from raw digitized records that are usually minimally processed such as a base-line correction. Corrected accelerations are derived from filtered records. Not all records are available in uncorrected and corrected formats.

Entering Values: A range of peak accelerations must be specified. Enter the minimum peak acceleration and press [ENTER]. Next, enter the maximum peak value and press [ENTER]. When both values are entered, a menu will appear for the user to select the type of acceleration desired. Use the [UP CURSOR] and [DOWN CURSOR] keys to move the light bar to the appropriate selection and press [ENTER].

Units: Units are given in gals (cm/sec^2).

Range of Acceptable Values

0 - 3000.0

Error Messages:

Minimum value is larger than maximum value
The minimum peak acceleration is larger than the maximum acceleration.
Re-enter the peak accelerations in proper order.

Minimum value is too small
The minimum value cannot be less than zero.
Re-enter a number that is equal to or larger than zero.

Hints: Specifying both "UNCORRECTED" and "CORRECTED" accelerations will result in a slower search.

PEAK VELOCITY

Description: This field gives the maximum calculated velocity. Only corrected (filtered) records will have peak velocity values.

Entering Values: A range of velocities must be specified. Type in the minimum velocity and press [ENTER]. Next, type in the maximum velocity and press [ENTER].

Units: cm/sec

Range of Acceptable Values: 0 - 500

Error Messages:

Minimum value is larger than maximum value
The minimum peak velocity is larger than the maximum velocity.
Re-enter the peak velocities in proper order.

Minimum value is too small
The minimum value cannot be less than zero,.
Re-enter a number that is equal to or larger than zero.

PEAK DISPLACEMENT

Description:	This field gives the maximum calculated displacement for each record. Only corrected (filtered) records will have peak displacement values.
Entering Values:	A range of displacements must be specified. Enter the minimum number and press [ENTER]. Next type the maximum number and press [ENTER].
Units:	Centimeters (cm).
Range of Acceptable Values:	0.00 - 100.00
Error Messages:	*Minimum value is larger than maximum value* The minimum peak displacement is larger than the maximum displacement. Re-enter the peak displacements in proper order. *Minimum value is too small* The minimum value cannot be less than zero. Re-enter a number that is equal to or larger than zero.

ARCHIVE TAPE

Description:	This field contains the NGDC/WDC-A code numbers for the data set names
Entering Values:	Type in the data set code and press [ENTER].
Range of Acceptable Values:	See the file indexes (VL1INDEX.TXT, VL2INDEX.TXT, VL3INDEX.TXT) at the root directory of the CD-ROMs for a listing of data sets available on the CDs.
Error Messages:	No error messages.
Hints:	The data are organized on the CD-ROMs into data sets. A set is typically composed of all the records obtained for a specific event or collection of events from a certain region. Each set has an NGDC identification number that is related to the country and state, for instance USACA01 or ITA03.

Selecting Output Options

Description

This option allows the user to select where the search output is directed. The three possible options are the screen, printer, and output file. Other functions handled by this routine include sorting the data and specifying which fields are to be displayed on the monitor or printer.

Output Options

There are three different options available for directing the catalog output.

SCREEN - Data sent to the screen will be displayed in a convenient browse window which is designed for optimum viewing of the catalog entries. See the displaying data section for more information on the browse window.

PRINTER - Data is displayed on a printer in a columnar format. SMCAT will direct output *only* to printers installed at printer port LPT1. See the displaying data section for more information on printer output.

DISK FILE - SMCAT can create three types of files with your output: dBase file, text file, or LOTUS 123 file. Use this option to create subset files with your search results or to export the records to another file format. These dBASE subset files can be used as input for another search resulting in quicker and better organized searches.

The text file output option will produce a flat ASCII table. In this type of file, the field headings will not be displayed in the output file. Refer to the section entitled "About the SMCAT Catalog Database" to determine the name of each field. Text files are given a ".TXT" file name extension. ***NOTE: If you wish to retrieve files from the CDs, you must direct the search output to a ".TXT" file***.

The Lotus file output option will produce a 123-compatible spreadsheet. Field headings should appear in the top of each column in the Lotus file. Note that certain columns will need to have their widths adjusted in Lotus in order for the data to be displayed properly on the spreadsheet. The Lotus files are given a ".WKS" file name extension.

How to Use

In the main menu, use the [UP CURSOR] or [DOWN CURSOR] to position the lightbar selector over the "SELECT OUTPUT OPTIONS" selection and press [ENTER]. Under this routine, a small menu will appear with the three output options: screen, printer, and disk file. Again use the [UP CURSOR] and [DOWN CURSOR] keys to select the appropriate choice and press [ENTER].

If at any time you need to abort the selection mode, press [ESC]. All output options will be returned to their default settings.

Sorting

Once an output option is selected, a menu will appear prompting whether the database should be sorted. The sort option will sort - or organize - the output data file on a field or combination of fields selected by the user.

How to Use the Sort Mode

In the sort option menu use the [UP CURSOR] and [DOWN CURSOR] to position the selector bar over the "SORT OUTPUT" option and press [ENTER]. Another menu will appear displaying all of the sort fields. Up to nine fields can be selected. Fields will be sorted in the order that they are chosen. Use the [UP CURSOR] and [DOWN CURSOR] keys to move the selector bar over the first field of preference and press [ENTER]. The number "1" will appear with an arrowhead next to this field indicating that it is the first sort field. Continue to select as many fields as needed, up to nine, in the same manner.

To correct a mistake press the [DEL] key to clear all of the entries and reselect the fields. When all fields have been selected, press [END] and the program will begin sorting the records. Press [ESC] to abort the sort process.

Field Selection Menu

If the screen or printer was selected as an output choice, then a menu similar to the sort field menu will appear in the work area. From this menu the user will select all of the fields to be displayed in the output.

Using the Field Selection Menu

Use the [UP CURSOR] and [DOWN CURSOR] keys to position the selector bar over the desired fields and press [ENTER] to select. The widths of each field along with the accumulated widths of the selected fields is displayed in the window to the right of the menu. This will help the user determine whether all of the selected fields will fit across the width of a printer page. Each selected field will be marked with an arrowhead.

Press [END] to leave the menu and return to the main menu. Press [ESC] to exit the menu and cancel any selections made. Pressing [ESC] will result in all catalog fields being displayed in the output.

Displaying the Data

Description

This program mode will display catalog entries on your monitor or printer device. By default, records will be displayed on the screen unless the printer output option was selected in the "SELECT OUTPUT OPTIONS" mode. Records are displayed on the monitor in a convenient browse screen format. Records displayed at the printer device are listed in a columnar format.

How to Use

In the main menu, use the [UP CURSOR] and [DOWN CURSOR] to move the lightbar selector over the "DISPLAY DATA" option and press [ENTER].

At this point, the browse screen will appear or the records will begin listing out at your printer device.

Browse Screen Description

Catalog entries are displayed on the screen in a columnar format. The problem with this, however, is that monitors are too small to simultaneously display all of the fields and records in the database. The browse screen feature alleviates this problem by providing a movable window which will scan across the fields and records enabling the user to view any section of the table that may be of interest.

The browse screen for SMCAT Version 3 can be a little slow; however, there are special features and key strokes described below which enable faster manipulation of records displayed on the screen.

Using the Browse Window

The browse window starts out in a position located in the far upper-left corner of the table. Only a maximum of sixteen records can be simultaneously displayed in the browse window. In addition, only those fields that will fit within the dimensions of the window will be displayed. The lighted bar selector is a pointer that can be moved up, down, left, or right. The purpose of this pointer is to select records from the browse window for displaying in a full screen format.

To move the lightbar selector, use the [UP CURSOR] and [DOWN CURSOR] keys to position the lighted bar over the desired record. Once the bar is positioned, press [ENTER] to bring up the full screen display. This screen simultaneously displays all of the catalog fields for a single record. While in this screen, use the [UP CURSOR] and [DOWN CURSOR] keys to move to the next or previous records.

SMCAT will produce a hard copy of the information displayed in this window. Press [ALT]-[P] to generate a one page copy at your printer.

To exit the full screen display press [ESC].

Moving the Browse Window

There are several different ways to move the browse window throughout the table. First, the [UP CURSOR] and [DOWN CURSOR] keys will move the window or light bar selector up or down, one line at a time. The [PAGE UP] and [PAGE DOWN] keys will move the window up 16 lines or down 16 lines at a time. To view the fields off to the right of the window use the [RIGHT CURSOR] key. To move the window back to the left, use the [LEFT CURSOR] key.

To quickly locate a specific record, press [ALT]-[L]. A small window will appear in the center of the work area prompting the user for a record number. Enter the desired record number and press [ENTER]. The browse window will automatically shift to the specified record.

To exit the browse screen press [ESC].

Printer Output Description

Catalog entries will be displayed at the printer only if the printer output option was selected in the "Select Output Options" mode. The program will first print a small header giving the SMCAT logo, then will display the record in a columnar format. At the end of the listing, a short description of each field will be given.

Records can only be displayed on a printer connected to the LPT1 printer port of your computer. If a printer is not installed or improperly installed at this port then an error message will be displayed. Also, if the printer is off-line then a similar error message will appear.

The output mode will continue to list records until it reaches the end of the file. At this time, program control will return to the main menu. To terminate a listing press the [ESC] key.

USING THE SMCAT CATALOG DATABASE

Accessing the Catalog

The catalog can be accessed directly in dBaseIII+ or by using the SMCAT front-end software package. Accessing the database using the SMCAT software is described in the section entitled "Using the SMCAT Software".

In dbase, the catalog can be accessed by typing USE CATALOG3. The dbase BROWSE, LIST, DISPLAY,?,??, and @SAY commands can be used to display the contents of the database. Locating records of interest can be accomplished by using the INDEX, SORT, LOCATE, SEEK, FIND , and GO commands.

NOTE: DO NOT update or modify the catalog as this may critically alter the performance of the SMCAT software.

Description of the Catalog Parameters

The SMCAT Version 2 database contains 31 Fields of parameters for each strong motion component record maintained and distributed by NGDC/WDC-A. Each field varies in length and type. Each field is described in the following section.

Earthquake Date and Time

Description: Gives the date and time of occurrence for the triggering event.

Fields: EQDATE EQTIME

Format: EQDATE - Numeric integer, 6 characters long. First two characters give the year, second two give the month, and the last two give the day.
EQTIME - Numeric decimal, 8 characters long with one character after the decimal point. First two characters give the hour, the second two give the minutes, the last four give the seconds (in whole numbers and tenths).

Units: Coordinated Universal Time (UTC)

Range of Values:

Date:
- Minimum - 330311
- Maximum - Depends on the most current data available

Time:
- Minimum - 0
- Maximum - 235959.9

Zero usually indicates an unknown value.

Event Coordinates

Description: Gives the latitude and longitude for the epicenter of the triggering event.

Fields: EPILAT EPILONG

Format: EPILAT - Numeric decimal, 7 characters long with three characters after the decimal point.
EPILONG - Numeric decimal, 8 characters long with three characters after the decimal point.

Units: Decimal degrees (deg)

Range of Values: Latitude:
- Minimum - -90.0
- Maximum - 90.0
- Negative latitude indicates South

Longitude:
- Minimum - -180.0
- Maximum - 180.0
- Negative longitude indicates West

Zero indicates an unknown value

Event Name

Description: This field gives the name or region of the triggering event.

Fields: EQNAME

Format: EQNAME - Character string, 30 characters long

Focal Depth

Description: Gives the focal depth of the earthquake.

Fields: DEPTH

Format: DEPTH - Numeric integer, 3 characters long

Units: Kilometers (km)

Range of Values: Minimum - 0
Maximum - 999

Zero usually indicates an unknown value

Intensity

Description: Gives the maximum felt intensity for the triggering event.

Fields: INT

Format: INT - Numeric integer, 2 characters long

Units: Modified Mercalli (MM)

Range of Values: Minimum - 0
Maximum - 12

Zero usually indicates an unknown value

Magnitude

Description: Gives the magnitude and magnitude type of the triggering event. Magnitudes can be given in either M_L, M_S, M_B, M_{JMA} , or $M_{unspecified}$.

Fields: MAG MAGTYPE

Format: MAG - Numeric decimal, 3 characters long with one character after the decimal point
MAGTYPE - Character string, 2 characters long

Units: Units: are given in the MAGTYPE field. Symbols are defined as follows:
ML - Local
MS - Surface Wave
MB - Body Wave
MJ - JMA
M - Unspecified

Range of Values: Minimum - 0
Maximum - 9.9

Zero usually indicates an unknown value

Component

Description: Gives the directional component for a single channel of an accelerometer.

Fields: COMPONENT

Format: COMPONENT - Character string, 7 characters long

Units: Degrees (deg)
Also, the following letters are used to indicate direction:
N - North
S - South
E - East
W - West

Range of Values: Minimum - 0
Maximum - 360

Station

Description: Gives the name or location of the recording site.

Fields: STATION

Format: STATION - Character string, 45 characters long

Country and State

Description: Gives the country and state in which the recording station is located. Numeric codes are given for countries and two letter character codes are given for states.

Fields: COUNTRY STATE

Format: COUNTRY - Numeric integer, 5 characters long
STATE - Character string, 2 characters long

Range of Values:

Country codes are as follows:

90005 - Algeria
90007 - Argentina
90010 - Australia
90015 - Bulgaria
90025 - Canada
90033 - Chile
90040 - China
90042 - C.I.S.
90045 - El Salvador
90055 - Fiji Islands
90060 - Germany
90065 - Greece
90070 - India
90072 - Iran
90075 - Italy
90078 - Japan
90099 - Mexico
90105 - New Zealand
90110 - Nicaragua
90118 - Papua New Guinea
90122 - Peru
90124 - Portugal
90128 - Romania
90130 - Spain
90153 - Taiwan
90160 - Turkey
90167 - United States

State codes are as follows:

AK - Alaska
AR - Arkansas
CA - California
HI - Hawaii
ME - Maine
MO - Missouri
MS - Mississippi
MT - Montana
NH - New Hampshire
NV - Nevada
NY - New York
OR - Oregon
SC - South Carolina
TN - Tennessee
VT - Vermont
WA - Washington

Structure Type

Description: Gives the type of structural environment that the recording instrument is located in. Structural types are given in character codes.

Fields: STRUCTURE FLOOR

Format: STRUCTURE - Character string, 2 characters long
FLOOR - Numeric integer, 2 characters long

Structural codes are as follows:

B - Building
BR - Bridge
D - Dam or reservoir
F - Free field
M - Miscellaneous (includes towers, mines, tunnels, platforms and any other structure not included in the other classification).
U - Utilities (includes petroleum refineries).

A blank field indicates an unknown structure type.

Range of Values: Floor numbers:
Minimum: -9
Maximum: 99

Negative values indicate basement levels.
99 indicates a roof or penthouse location.
1 indicates the first floor or ground floor.
Floor 0 has no meaning.

Site Geology and Coefficient

Description: Gives the site geology that the station is located on and a coefficient associated with a set of site geologies. Site coefficient types are given in character codes.

Fields: COEF SITE_GEOL

Format: COEF - Character string, 2 characters long
SITE_GEOL - Character string, 30 characters long

Site Coefficient codes are as follows:

S1 - Bedrock and hard rock
S2 - Sedimentary and conglomerated rock
S3 - Soil and glacial till
S4 - Alluvium and unconsolidated sediments

A blank field indicates an unknown site geology.

NOTE: Searches are based on the selection of site coefficient, but the actual site geology description as well as the site coefficient is displayed in the browse and display screens.

Epicentral Distance

Description: Gives the distance between the earthquake epicenter and the recording station.

Fields: EPIDIST

Format: EPIDIST - Numeric integer, 3 characters long

Units: Kilometers (km)

Range of Values: Minimum - 0
Maximum - 999

Instrument

Description: Gives the type of recording accelerometer.

Fields: INSTRUMENT

Format: INSTRUMENT - Character string, 7 characters long

Station Coordinates

Description: Gives the latitude and longitude of the recording site.

Fields: STALAT STALONG

Format: STALAT - Numeric decimal, 7 characters long with three characters after the decimal point.
STALONG - Numeric decimal, 8 characters long with three characters after the decimal point.

Units: Decimal degrees (deg)

Range of Values: Latitude:
Minimum - -90.0
Maximum - 90.0
Negative latitude indicates South

Longitude:
Minimum - -180.0
Maximum - 180.0
Negative longitude indicates West

Zero indicates an unknown value

Peak Accelerations

Description: Gives the peak uncorrected and corrected acceleration values.

Fields: UNC_ACCEL COR_ACCEL

Format: UNC_ACCEL - Numeric decimal, 7 characters long with 1 character after the decimal point
COR_ACCEL - Numeric decimal, 7 characters long with 1 character after the decimal point

Units: Gals (cm/sec^2)

Range of Values: Uncorrected acceleration:
Minimum - 0
Maximum - 5000.0
Corrected acceleration:
Minimum - 0
Maximum - 5000.0
Zero indicates an unknown value

Peak Velocity

Description: Gives the peak calculated velocity.

Fields: MAX_VEL

Format: MAX_VEL - Numeric decimal, 7 characters with 2 characters after the decimal point.

Units: cm/sec

Range of Values: Minimum - 0
Maximum - 500.00
Zero indicates an unknown value or a value less than 0.01 cm/sec.

Peak Displacement

Description: Gives the peak calculated displacement.

Fields: MAX_DISP

Format: MAX_DISP - Numeric decimal, 6 characters long with 2 characters after the decimal point.

Units: cm

Range of Values: Minimum - 0
Maximum - 200.00
Zero indicates an unknown value or a value less than 0.01 cm.

Data Set Information

Description: The data set Fields serve two purposes. First they give the name of the data set where the records can be located on the CD-ROMs. Second they indicate what types of data are available for those records. Strong motion data on the CDs are organized into data sets that are named according to their geographic region.

Each record can have three data types, uncorrected, corrected, and response and Fourier spectra. A data set name and file number is given in the catalog for each data type. If a data set field is empty, then that data type is not available for the record.

Fields: UNC_TAPE UNC_FILE COR_TAPE COR_FILE RES_TAPE RES_FILE

Format:

UNC_TAPE -	Character string, 7 characters long
UNC_FILE -	Numeric integer, 4 characters long
COR_TAPE -	Character string, 7 characters long
COR_FILE -	Numeric integer, 4 characters long
RES_TAPE -	Character string, 7 characters long
RES_FILE -	Numeric integer, 4 characters long

References

Abrahamson, N.A., B.A. Bolt, R.B. Darragh, J. Penzien, and Y.B. Tsai. The Smart-1 Accelerograph Array (1980-1987): A Review, Earthquake Spectra, Vol.3, No. 2, May 1987, p. 263-287.

Ambraseys, N.N., and S.K. Sarma. "Large Earthquake Forces on Gravity Dam," Nature, Volume 219, No. 5161, 1968, pp. 1354-1356.

Anderson, J.G., P. Bodin, and J.N. Brune. Institute of Geophysics and Planetary Physics, Scripps Institute of Oceanography, University of California at San Diego, and J. Prince, and S.K. Singh, Instituto de Ingenieria, Universidad Nacional Autonoma de Mexico, Strong Ground Motion and Source Mechanism of the Mexico Earthquake of September 19, 1985 (MS=8.1), submitted to Science Magazine, 1985.

Anderson, J.G., J.N. Brune, J. Prince, and F.L. Vernon, III. Preliminary Report on the use of Digital Strong Motion Recorders in the Mexicali Valley, Baja California, Institute of Geophysics and Planetary Physics, Scripps Institute of Oceanogrpahy, University of California at San Diego, La Jolla, California, and Instituto de Ingenieria, Universidad Nacional Autonoma de Mexico, Mexico.

Anderson, J.G., J.N. Brune, P. Bodin, J. Prince, R. Quaas, M. Onate, D. Almora, and P. Perez. Preliminary Presentation of Accelerogram Data from the Guerrero Strong Motion Acclerograph Array. Michoacan-Guerrero, Mexico Earthquakes of 19 and 21 September 1985, Preliminary Report GAA-1A, Institute of Geophysics and Planetary Physics, University of California, San Diego, California, and Instituto de Ingenieria, Universidad Nacional Autonoma de Mexico, Mexico, 1985.

Anderson, J.G., R. Quaas, D. Almora, J.M. Velasco, E. Guevara, L.E. de Pavia, A. Gutierrez, and R. Vazquez. Guerrero, Mexico, Accelerograph Array: Summary of Data Collected in the Year 1985, Report GAA-2, Seismological Laboratory,University of Nevada, Reno, Nevada, and Instituto de Ingenieria, Universidad Nacional Autonoma de Mexico, Mexico, 1987.

Anderson, J.G., R. Quaas, D. Almora, J.M. Velasco, E. Guevara, L.E. de Pavia, A. Gutierrez, and R. Vazquez. Guerrero, Mexico, Accelerograph Array: Summary of Data Collected in the Year 1986, Report GAA-3, Seismological Laboratory, University of Nevada, Reno, Nevada, and Instituto de Ingenieria, Universidad Nacional Autonoma de Mexico, Mexico, 1987.

Anderson, J.G., R. Quaas, D. Almora, J.M. Velasco, R. Vasquez, P. Perez, E. Guevara, and L.E. de Pavia. Guerrero, Mexico, Accelerograph Array: Summary of Data: January to June 1987, Report GAA-5, Seismological Laboratory, University of Nevada, Reno, Nevada, and Instituto de Ingenieria, Universidad Nacional Autonoma de Mexico, Mexico, 1988.

Anderson, J.G., R. Castro, J.M. Velasco, E. Mena, G. Castro, B. Lopez, R. Quaas, S.K. Singh, D. Almora, R. Vasquez, C. Perez, and R. Mejia. Accelerograms from the Guerrero, Mexico, Strong Motion Array for the April 25, 1989 Earthquake (MS=6.9): A Preliminary, Report GAA-6, Seismological Laboratory, University of Nevada, Reno, Nevada, and Instituto de Ingenieria, Universidad Nacional Autonoma de Mexico, Mexico, 1989.

Anderson, J.G., and U.R. Vetter. Acceleration, Velocity, Displacement, and Pseudo-Velocity Response Spectra from Selected Accelerograms Recorded by the Guerrero Array, 1985-1988, Report GAA-7, Seismological Laboratory, University of Nevada, Reno, Nevada, 1989.

Anderson, J., R. Vasquez, J. Humphrey, R. Castro, C. Perez, R. Mejiia, R. Quaas, D. Almora, J.M. Velasco, P. Perez, and B. Lopez, Guerrero, Mexico, Accelerograph Array: Summary of Data: July to December, 1987, Report GAA-8, Seismological Laboratory, University of Nevada, Reno, Nevada, and Instituto de Ingenieria, Universidad Nacional Autonoma de Mexico, Mexico, 1990.

Anderson, J.G., R. Vasquez, J. Humphrey, R. Castro, S.K. Singh, C. Perez, R. Mejia, R. Quaas, D. Almora, J.M. Velasco, P. Perez, E. Nava, B. Lopez, G. Castro. Guerrero, Mexico, Accelerograph Array: Summary of Data: 1988, Report GAA-9, Seismological Laboratory, University of Nevada, Reno, Nevada, and Instituto de Ingenieria, Universidad Nacional Autonoma de Mexico, Mexico, 1990.

Anderson, J.G., J.R. Humphgrey, R. Vasquez, R. Castro, G. Castro, R. Quaas, D. Almora, J.M. Velasco, and C. Perez. Guerrero, Mexico Accelerograph Array: Summary of Data: January-December 1989, Report GAA-11, Seismological Laboratory, University of Nevada, Reno, Nevada, and Instituto de Ingenieria, Universidad Nacional Autonoma de Mexico, Mexico, 1991.

Anderson, J.G., Y. Lei, R. Vasquez, C. Perez, J. Humphrey, R. Quaas, D. Almora, J.M. Velasco, and G. Castro. Guerrero, Mexico Accelerograph Array: Summary of Data: January-December 1990, Report GAA-12, Seismological Laboratory, University of Nevada, Reno, Nevada, and Instituto de Ingenieria, Universidad Nacional Autonoma de Mexico, Mexico, 1991.

Anderson, J.G.,and R. Quaas, Guerrero, Mexico, Accelerogaph Network: Network Description, Report GAA-15, Seismological Laboratory, University of Nevada, Reno, Nevada, 1994.

Anderson, John G., Richard S. Simons. Mexicali Valley Accelerogram Data : 1978-1980, Institute of Geophysics & Planetary Physics, University of California, La Jolla, California, Report 82-1, 1982, 5 pp.

Azizov, G. et. al. Pap Earthquake 1984, Tashkent, January 1986, 136 p.

Bommer, J.J., and N.N. Ambraseys. Short Communication, The Spitak (Armenia, USSR) Earthquake of 7 December 1988: A Summary Engineering Seismology Report, Earthquake Engineering and Structural Dynamics, Vol. 18, 1989, p. 921-925.

Beavan, J., and K.H. Jacob. Processed Strong-Motion Data From Subduction Zones: Alaska, Report #1 in the Series 'Lamont-Processed Strong Motion Data,' Lamont-Doherty Geological Observatory of Columbia University, Palisades, New York, 1964, 1984, 249 pp.

Berardi, R., A. Berenzi, F. Capozza. Campania - Lucania Earthquake on 23 November 1980 Accelerometric Recordings of the Main Quake and Relating Processing, Ente Nazionale per l'Energia Elettrica, Udine, Italy, 1981, 22 pp.

Borcherdt, Roger D. The Coalinga Earthquake Sequence Commencing May 2, 1983 (Preliminary Report on Field Investigations and Data Collected as of May 12, 1983),U.S. Geological Survey, Open-File Report 83-511, 1983, 79 pp.

Brady, A.G., and P.N. Mork Loma Prieta, California, Earthquake October 18 (GMT) 1989, Processed Strong-Motion Records Volume I, U.S. Geological Survey, Open-File Report, 1990, p. 1-47.

Brady, A.G., and P.N. Mork. Loma Prieta, California Earthquake, October 18 (GMT), 1989, Processed Strong-Motion Records, Volume 1, U.S. Geological Survey Open-File Report 90-247, Menlo Park, California, 1990.

Brady, A.G., P.N. Mork, and J.P. Fletcher. Processed Accelerograms from Monticello Dam, Jenkinsville, South Carolina 27 August 1978, and Two Later Shocks, U.S. Geological Survey, Open-File Report 81-0448, 1981, p. 1-35.

Brady, A.G., P.N. Mork, and L.C. Seekins. Processed Strong-Motion Records, Whittier Narrows, California Earthquake October 1, 1987, Volume 1, USGS-NSMIN Stations Within 15 KM of the Epicenter, U.S. Geological Survey, Open-File Report 88-354, 1989, 154 pp.

Brady, A.G., P.N. Mork, and L.C. Seekins. Processed Strong-Motion Records, Whittier Narrows, California Earthquake October 1, 1987, Volume 2 Selected USGS-NSMIN Stations Between 11 and 31 KM from the Epicenter and the Santa Ana River Pipeline Bridge, U.S. Geological Survey, Open-File Report 89-122, 1989, p. 1-128.

Brady, A.G., P.N. Mork, L.C. Seekins, and J.C. Switzer. Processed Strong-Motion Records from the Imperial Wildlife Liquefaction Array, Imperial County, California, Recorded During the Superstition Hills Earthquakes, November 24, 1987, U.S. Geological Survey, Open-File Report 89-87, 1989, p. 1-33.

Brady, A.G., P.N. Mork, V. Perez, and L.D. Porter. Processed Data from the Gilroy Array and Coyote Creek Records, Coyote Lake, California Earthquake 6 August 1979, U.S. Geological Survey, Open-File Report 81-42, Menlo Park, California 94025, Preliminary Report 24, Office of Strong-Motion Studies, California Division of Mines and Geology, Sacramento, California, 1981, 171 pp. 1981.

Brady, A.G., V. Perez, and P.N. Mork. The Imperial Valley Earthquake, October 15, 1979, Digitization and Processing of Accelerograph Records, U.S. Geological Survey, Open-File Report 80-703, 1980, 309 pp.

Brady, A.G., and V. Perez. Strong-Motion Earthquake Accelerograms, Digitization and Analysis, Records from Lima, Peru: 1951 to 1974, U.S. Geological Survey, Open File Report 77-587, 1977, 25 pp.

Brady, A.G., and V. Perez. Processed Accelerograms From Coyote Dam, California, March 25, 1978, U.S. Geological Survey, Open-File Report 83-166, 1983, 82 pp.

Brady, A.G., P.L. Porcella, G.N. Bycroft, E.C. Etheredge, P.N. Mork, B. Silverstein, and A.F. Shakal, Strong-Motion Results from the Main Shock of April 24, 1984, U.S. Geological Survey, Menlo Park, California, and California Division of Mines and Geology, Sacramento, California.

Brady, A.G., C. Rojahn, V. Perez, P.G. Carydis, and J.G. Sbokos. Romanian and Greek Records, 1972-77, U.S. Geological Survey Open-File Report 78-1022, Menlo Park, California, 1978.

Brune, James N., Frank Vernon, Richard Simons, Jorge Prince, and Enrique Mena. Strong Motion Data Recorded in Mexico During the Main Shock, in the Imperial Valley, California Earthquake of October 15, 1979, U.S. Geological Survey, Professional Paper 1254, 1982, p. 319-349.

Butler, R., G.S. Stewart, and H. Kanamori. The July 27, 1976 Tangshan, China Earthquake--A Complex Sequence of Intraplate Events, Bulletin of the Seismological Society of America, Volume 69, No. 1, 1979, pp. 207-220.

Bycroft, G. Noel. El Centro, California Differential Ground Motion Array, U.S. Geological Survey, Open-File Report 80-919, 1980, p. 1-8.

California Division of Mines and Geology, Standard Tape Format for CSMIP Strong-Motion Data Tapes, California Division of Mines and Geology, Office of Strong Motion Studies, Sacramento, California, 1985.

California Institute of Technology, Strong-Motion Earthquake Accelerograms Digitized and Plotted Data, Volume I - Uncorrected Accelerograms, California Institute of Technology, Earthquake Engineering Research Laboratory, Pasadena, California, Parts A-Y, 1969.

California Institute of Technology, Strong-Motion Earthquake Accelerograms Digitized and Plotted Data, Volume II - Corrected Accelerograms and Integrated Ground Velocity and Displacement Curves, California Institute of Technology, Earthquake Engineering Research Laboratory, Pasadena, California, Parts A-Y, 1971.

California Institute of Technology, Analyses of Strong-Motion Earthquake Accelerograms, Volume III - Response Spectra, California Institute of Technology, Earthquake Engineering Research Laboratory, Pasadena, California, Parts A-Y, 1974.

California Institute of Technology, Analyses of Strong-Motion Earthquake Accelerograms, Volume IV - Fourier Amplitude Spectra, California Institute of Technology, Earthquake Engineering Research Laboratory, Pasadena, California, Parts A-Y, 1974.

California Institute of Technology, Strong Motion Earthquake Accelerograms Index Volume, EERL 76-02, California Institute of Technology, Earthquake Engineering Research Laboratory, Pasadena, California, 1976, 71 pp.

Campbell, K.W., S.T. Algermissen, E. Kausel, and L.M. Highland. Processed Strong-Motion Data for the Central Chile Aftershock of April 9, 1985: Nine Accelerograph Sites Owned by CHILECTRA, ENDESA, and the Department of Geology and Geophysics, University of Chile, U.S. Geological Survey Open-File Report 90-46, Denver, Colorado, 1990.

Campbell, K.W., S.T. Algermissen, Edgar Kausel, L.M. Highland. Processed Strong-Motion Data for the Central Chile Earthquake of March 3, 1985: Fifteen Accelerograph Sites Owned By CHILECTRA, ENDESA, and the Department of Geology and Geophysics, University of Chile, U.S. Geological Survey, Open-File Report 89-448, 1989, p. 2 - A-299.

Campbell, Kenneth W., and David M. Hampson. Processed Digital Recordings for Selected Earthquakes of the 1982 Enola, Arkansas, Swarm, U.S. Geological Survey, Open-File Report 89-444, 1989, 236 pp.

Campbell, K., and D. Hampson. Processed Digital Recordings for Selected Aftershocks of the October 15, 1979 Imperial Valley, California, Earthquake, U.S. Geological Survey Open-File Report 89-437, Denver, Colorado, 1989.

Carreno, E. J. Rueda, C.L. Casado, J. Galan, and J.A. Pelaez. Spanish National Strong Motion Network. Recordings of the Huelva Earthquake of 20 December, 1989, PAGEOPH, Volume 136, No. 4, 1991.

Carreno, E., J.B. Bravo, M.S. Venero, and J. Galan. Accelerogramas del Sismo de 7 de Noviembre de 1990, Servicio de Ingenieria Sismica, MOPT, IGN, 1991.

Carreno Herrero, E., C.L. Casado, J.M. Martinez Solares, J.A. Palaez Montilla, J.M. Tejedor Pecina, J.M. Rodriguez. Analisis de los Acelerogramas del Terremoto de 24 de Junio de 1984, Instituto Geografico Nacional, Facultad de Ciencias, Universidad de Granada, MOPU.

Celebi, M. Processed Chile Earthquake Records of 3 March 1985 and Aftershocks, U.S. Geological Survey, Open-File Report 87-195, 1988, p. 1 - A-21.

Chang, F.K. Analysis of Strong-Motion Data from the New Hampshire Earthquake of 18 January 1982, U.S. Nuclear Regulatory Commission, Washington, D.C., Report NUREG/CR-3327, 1983, p. 1-12.

Choy, George, and John Boatwright. Teleseismic and Near-Field Analysis of the Nahanni Earthquakes in the Northwest Territories, Canada, Bulletin of the Seismological Society of America, Vol 78, No. 5, 1988, p. 1627-1652.

Coffman, Jerry L., and Susan Godeaux. Catalog of Strong-Motion Accelerograph Records, World Data Center A for Solid Earth Geophysics, Report SE-38, 1985, 79 pp.

Commissione CNEN-ENEL per lo Studio dei Problemi Sismici Connessi con la Realizzazione di Impianti Nucleari (1976), Strong Motion Earthquake Accelerograms Digitized and Plotted Data Uncorrected Accelerograms Part 1-Accelerograms 028 through 064 Acelerograms from the Friuli, Italy, Earthquake of May 6, 1976 and Aftershocks, Rome, Italy, Vol I, 193 pp.

Commissione CNEN-ENEL per lo Studio dei Problemi Sismici Connessi con la Realizzazione di Impianti Nucleari (1977), Strong Motion Earthquake Accelerograms Digitized and Plotted Data Uncorrected Accelerograms Part 1-Accelerograms 065 through 119 Accelerograms from the Friuli, Italy, Earthquake of May 6, 1976 and Aftershocks, Rome, Italy, Vol I, p. 1-2.

Commissione CNEN-ENEL per lo Studio dei Problemi Sismici Connessi con la Realizzazione di Impianti Nucleari (1977), Strong Motion Earthquake Accelerograms Digitized and Plotted Data Uncorrected Accelerograms Part 1-Accelerograms 120 through 177 Accelerograms from the Friuli, Italy, Earthquake of May 6, 1976 and Aftershocks, Rome, Italy, Vol I, p. 13-110.

Commissione CNEN-ENEL per lo Studio dei Problemi Sismici Connessi con la Realizzazione di Impianti Nucleari (1980), Terremoto Campano Lucano del 23 Novembre 1980, Rome, Italy, 4 pp.

Committee for Digitized Strong-Motion Earthquake Accelerograms: Ohsaki, Y., Univeristy of Tokyo, Y. Osawa, University of Tokyo, M. Watabe, Building Research Institute, T. Tanaka, University of Tokyo, Y. Kitagawa, Building Research Institute, I. Sakamoto, Building Research Institute, H. Murata, Building Research Institute, K. Ishida, University of Tokyo, R. Iwasaki, University of Tokyo. Digitized Strong-Motion Earthquake Accelerograms in Japan 1972, Tokyo, Japan, 1972, 733 pp.

Crouse, C.B., Y.K. Vyas, and B.A. Schell. Ground Motions from Subduction Zone Earthquakes, Bulletin of the Seismological Society of America, Vol. 78, No. 1, 1988, p. 1-20.

Denham, D., and G.R. Small. Strong Motion Data Centre: Bureau of Mineral Resources, Canberra, Bulletin of the New Zealand Society for Earthquake Engineering, Vol 4, No 1, 1971, p. 1-5.

Strong Earthquake Motion Observation Center, Digital Data of the Strong-motion Earthquake Accelerograms in Matsushiro Earthquake Swarm Area, Report #1, Univerisity of Tokyo, April 1976, 157 pp.

Ergonay, O., E. Inan, N. Bayolke, and U. Kosan. Strong Motion Accelerograph Records of Turkey, Earthquake Research Department, Ministry of Public Works and Housing, Ankara, Turkey, 1985.

Etheredge E., and R. Porcella. Strong-Motion Data From the October 1, 1987 Whittier Narrows Earthquake, U.S. Geological Survey, Open-File Report 87-616, 1987, 64 pp.

Favier, E., H. Ferrieux, X. Goula, J. Messen, B. Mohammadioun and G. Mohammadioun. Etude des Repliques du Seisme du 10 Ocobre 1980 a El Asnam (Algerie) (Rapport Preliminaire), Institut de Protection et de Surete Nucleaire Departement de Surete Nucleaire, Rapport DSN 453, Algeria, 1981, 9 pp.

Fletcher, Jon B., Gerald Brady, and Thomas Hanks. Strong Motion Accelerograms of the Oroville, California Aftershocks : Data Processing and the Aftershock of 0350 August 6, 1975, Bulletin of the Seismological Society of America, Vol. 70, No. 1, 1980, p. 243-267.

Gupta, I.D., V. Rambabu, and R.G. Joshi. Strong Earthquake Ground Motion Data in EQINFOS for India: Part 1A, Report No. CE 93-03, Central Water and Power Research Station, Khadakwasla, Pune, India, and University of Southern California, Department of Civil Engineering, Los Angeles, California, 1993.

Harding, Samuel T., Wilbur Rinehart, William K. Cloud. The Parkfield, California Earthquake of June 27, 1966, U.S. Department of Commerce, Environmental Science Services Administration, 1966, 61 pp.

Herrmann, Robert B. Analysis of Strong Motion Data From the New Madrid Seismic Zone: 1975 -1976, Sponsored by the National Science Foundation Research Applied to National Needs (RANN) Grant Env 76-20875, Department of Earth and Atmospheric Sciences, Saint Louis University, Saint Louis, Missouri, 1977, p. 1-144.

Hoose, Seena N. The Morgan Hill, California Earthquake of April 24, 1984 (A Preliminary Report) Vol.I, U.S. Geological Survey, Open-File Report 84-498A, 1984, 148 pp.

Hudson, D.E., R.P. Maley, W.K. Cloud, B.J. Morrill, N.H. Scott, M.D. Trifunac. Strong-Motion Instrumental Data on the San Fernando Earthquake of February 9, 1971, Earthquake Engineering Research Laboratory, California Institute of Technology, 1971, 259 pp.

International Seismological Centre (1933-1987). Bulletin of the International Seismological Centre, Vols. 16-24.

Institute of Geophysics, Catalog of Strong Ground Motion Records from Tangshan Earthquake, 28 July 1976 to 13 December 1976, 1983 (not translated into English).

Instituto de Ingenieria, Sismo del 19 de Septiembre de 1985 en Las Costas de Guerrero-Michoacan, Mexico. Cinta #1: Acelerogramas en Las Ciudades de Mexico y Puebla, Universidad L Nacionai Autonoma de Mexico, 1986, 12 pp.

Iosif, T., and S. Iosif. The Vrancea Earthquake of March 4, 1977 - a Multiple Seismic Event and its Seismotectonic Implications, EP-1-1977, Bucharest, Romania, 1977.

Lee, V.W., M.D. Trifunac. Strong Earthquake Ground Motion Data in EQINFOS: Part 1, Report No. 87-01, University of Southern California, Department of Civil Engineering, Los Angeles, California, 1987.

Lee, V.W., M.D. Trifunac. EQINFOS (The Strong-Motion Earthquake Data Information System), Report No. 82-01, University of Southern California, Department of Civil Engineering, Los Angeles, California, 1982.

Leeds, D.J., editor, Earthquake in Romania, Earthquake Engineering Research Institute Newsletter, Volume 11, No. 3B, 1977, pp. 27-39.

Leeds, David J. Reconnaissance Report Imperial County, California, Earthquake October 15, 1979, Earthquake Engineering Research Institute, 1980, 194 pp.

Lungu, D., S. Demetriu, and T. Cornea. Frequency Bandwidth of Vrancea Earthquakes and the 1991 Edition of Seismic Code of Romania, Proceedings of the Tenth World Conference on Earthquake Engineering, Madrid, Spain, 1992.

Lungu, D. Recommended Lateral Force and Commentary: Romanian Versus American Seismic Design Practice, 1992.

Lungu, D., O. Coman, T. Cornea, S. Demetriu, and L. Muscalu. Structural Response Spectra to Different Frequency Bandwidth Earthquakes, 6th International Conference on Structural Safety and Reliability, Innsbruck, Austria, 1993.

Lungu, D., T. Cornea, I. Craifaleanu, and A. Aldea. Seismic Zonation of Romania Based on Uniform Hazard Response Ordinates, 5th International Conference on Seismic Zonation, Nice, France, 1995.

Lungu, D., A. Aldea, S. Demetriu, T. Cornea, and I. Craifaleanu. Uniform Hazard Response Spectra in Soft Soil Condition and EUROCODE 8, 7th Conference of the International Association for Civil Engineering Reliability and Risk Analysis, Paris, France, 1995.

Lungu, D., T. Cornea, I. Craifaleanu, and S. Demetriu. Probabilistic Seismic Hazard Analysis for Inelastic Structures on Soft Soils, Eleventh World Conference on Earthquake Engineering, Acapulco, Mexico, 1996.

Lungu, D., T. Cornea, and O. Coman. Probabilistic Hazard Analysis and Structural Response to the Vrancea Earthquakes in Romania, Part 1 of the report Experience database of Romanian facilities subjected to the last three Vrancea earthquakes prepared for the International Atomic Energy Agency, Vienna, Austria under contract No. 8223/EN with the Bucharest Office of Stevenson & Assoc., Cleveland, Ohio, USA, Bucharest, March, 1996.

Maley, R., A. Acosta, F. Ellis, E. Etheredge, L. Foote, D. Johnson, R. Porcella, M. Salsman, and J. Switzer. U.S. Geological Survey Strong-Motion Records from the Northern California (Loma Prieta) Earthquake of October 17, 1989, U.S. Geological Survey Open-File Report 89-568, Menlo Park, California, 1989.

Maley, R.P., and E.C. Etheredge. Strong-Motion Data From the Westmorland, California Earthquake of April 26, 1981, U.S. Geological Survey, Open File Report 81-1149, 1981, 18 pp.

Maley, R.P., and W.K. Cloud. Strong Motion Accelerograph Records in San Fernando, California, Earthquake of February 9, 1971, Geological and Geophysical Studies, Vol 3, 1973, p. 325-348.

McEvilly, T.V., H.J. Degenkolb, and D.M. Boore. Seismological Notes, Bulletin of the Seismological Society of America, Volume 68, 1978, pp. 256-262.

McJunkin, R.D., and J.T. Ragsdale. Compilation of Strong-Motion Records and Preliminary Data From the Imperial Valley Earthquake of 15 October 1979, California Division of Mines and Geology, Preliminary Report 26, 1980, 53 pp.

Mikoshiba, Tadashi, Makoto Miyamoto, and Shigeo Kinoshita. Digitized Data on NRCDP Strong-Motion Earthquake Records (4) - December 17, 1987 East Off Chiba Prefecture Earthquake, National Research Center for Disaster Prevention Science and Technology Agency, 144, 1990, p. 1-53.

Moinfar, A.A. The Romania Earthquake of March 1977, Technical Research and Standard Bureau Plan and Budget Organization-IRAN, Publication No. 77, Iran, 1978, 7 pp.

Mori, Ann Wildenstein, C.B. Crouse. Strong Motion Data From Japanese Earthquakes Containing Earthquake Source and Recording Site Data, Uncorrected Acceleration Records and Corrected Acceleration, Velocity and Displacement Records., World Data Center-A for Solid Earth Geophysics, Report SE-29, 1981, 44 pp.

Mork, P.N., and A.G. Brady. Processed Accelerogram From Monticello Dam, Jenkinsville, South Carolina, 16 October 1979, 0706 UTC, U.S. Geological Survey, Open-File Report 81-1214, 1981, p. 1-20.

Nenov, D. G. Georgiev, and I. Paskaleva (C.L.S.M.E.E.), and V.W. Lee and M.D. Trifunac (U.S.C.). Strong Earthquake Ground Motion Data in EQINFOS: Accelerograms Recorded in Bulgaria Between 1981 and 1987, Report No. CE 90-02, Bulgarian Academy of Sciences, Central Laboratory for Seismic Mechanics and Earthquake Engineering (C.L.S.M.E.E.) and University of Southern California, Department of Civil Engineering (U.S.C.), Sofia, Bulgaria and Los Angeles, California, 1990.

National Research Center for Disaster Prevention Science and Technology Agency, Strong-Motion Earthquake Records in Japan Index (Vol.1-Vol.26) Revised Edition, Japan, 1983, 111 pp.

Porcella, R.L. Recent Strong-Motion Records, Seismic Engineering Program Report, October-December 1976, Geological Survey Circular 736-D, U.S.Geological Survey, Arlington, Virginia, 1977.

Porcella, R.L., E.C. Etheredge, R.P. Maley, and A.V. Acosta. Accelerograms Recorded at USGS National Strong-Motion Network Stations during the MS=6.6 Northridge, California Earthquake of January 17, 1994, U.S. Geological Survey Open-File Report 94-141, Menlo Park, California, 1994.

Porcella, R.L., R.B. Matthiesen, R.D. McJunkin, J.T. Ragsdale. Compilation of Strong-Motion Records From the August 6, 1979 Coyote Lake Earthquake, California Division of Mines and Geology, Preliminary Report 79-385, 1979, 71 pp.

Porter, L.D. Compilation of Strong-Motion Records Recovered from the Santa Barbara Earthquake of 13 August 1978, Office of Strong-Motion Studies, California Division of Mines And Geology, Preliminary Report 22, 1978, 42 pp.

Porter, L.D., A.G. Brady, P.N. Mork, and V. Perez. Processed Data From the San Juan Bautista 101/156 Separation Bridge and the San Juan Bautista Freefield Records From the Coyote Lake Earthquake 6 August 1979, U.S. Geological Survey, Special Publication 64, 1983, 151 pp.

Ravara, A., and R. Teixeira Duarte. Analysis of the 1973-74 Acores Earthquakes, European Committee on Earthquake Engineering, 5th European Symposium on Earthquake Engineering, Lisbon, Portugal, 1975, p. 1-5.

Rojahn, C. Recent Strong-Motion Records, Seismic Engineering Program Report, January-April 1977, Geological Survey Circular, U.S. Geological Survey, Arlington, Virginia.

Shakal, A.F., R. Linares, M.J. Huang, D.L. Parke. Processed Strong Motion Data From the San Salvador Earthquake of October 10, 1986, Office of Strong Motion Studies, California Department of Conservation Division of Mines and Geology, OSMS 86-07, 1986, 113 pp.

Shakal, Anthony F., Moh-Jiann Huang, and Roberto Linares. The San Salvador Earthquake of October 10, 1986 - Processed Strong Motion Data, Earthquake Spectra, Vol 3, No 3, 1987, p. 465-482.

Shakal, A.F., M.J. Huang, C.E. Ventura, D.L. Parke, T.Q. Cao, R.W. Sherburne, and R. Blazquez. CSMIP Strong-Motion Records from the Whittier, California Earthquake of 1 October 1987, California Division of Mines and Geology, Office of Strong Motion Studies, OSMS 87-05, 1987, 21 pp.

Shishkevish, Soviet Strong-Motion and Vibration-and-Blast Seismographs, A report prepared for Defense Advanced Research Projects Agency, R-1652 ARPA, Rand, Santa Monica, California, 1975.

Silverstein, Barry. Processed Strong-Motion Records From Monasavu Dam, Fiji; Earthquakes of February 13, 14, and 23, 1983, U.S. Geological Survey, Open-File Report 85-375, 1985, 22 pp.

Silverstein, B. Processed Strong-Motion Records from the Coalinga, California, Aftershock on July 9, 1983 0740 UTC, U.S. Geological Survey, Open-File Report 85-584, 1985, 169 pp.

Silverstein, B., and A.G. Brady. Processed Strong-Motion Records from the Coalinga, California, Aftershock of July 22, 1983 0239 UTC, U.S. Geological Survey Open-File Report 85-250, Menlo Park, California, 1985.

Silverstein, B.L., A.G. Brady, and P.N. Mork. Processed strong-motion records from the southern Alaska earthquake of January 1, 1975, 0355 GMT, U.S. Geological Survey, Open-File Report 86-191, 1986, p. 1-11.

Silverstein, B.L., A.G. Brady, and P.N. Mork. Processed Strong-Motion Records Recorded on Bougainville Island, Papua New Guinea; Earthquakes of December 13, 1981 and March 18, 1983, U.S. Geological Survey, Open-File Report 86-264, 1986, p. 1-19.

Smith, Ron S., and A.J. McEwin. Earthquake accelerograms and attenuation of seismic waves at Oolong, New South Wales, BMR Journal of Australian Geology and Geophysics, Vol. 5, 1980, p. 63-67.

Stratta, James L., and Loring A. Wyllie, Jr. Reconnaissance Report Friuli, Italy Earthquakes of 1976, Earthquake Engineering Research Institute, 1979, 97 pp.

Strong Earthquake Motion Observation Center, Digital Data of the Strong-motion Earthquake Accelerograms in Matsushiro Earthquake Swarm Area, Report #1, Univerisity of Tokyo, April 1976, 1976, 157 pp.

Switzer, J., D. Johnson, R. Maley and R. Matthiesen. Western Hemisphere Strong-Motion Accelerograph Station List - 1980, U.S. Geological Survey, Open-File Report 81-664, 1981, 87 pp.

Trifunac, M.D., and V. Lee. Routine Computer Processing Of Strong-Motion Accelerograms, California Institute of Technology, Earthquake Engineering Research Laboratory, EERL 73-03, 1973, p. 1-146.

Trifunac, M.D., M.I. Todorovska, and V.W. Lee. Strong Earthquake Ground Motion Data in EQINFOS for India: Part 1B, Report No. CE 93-04, University of Roorkee, Department of Earthquake Engineering, Roorkee, India, and University of Southern California, Department of Civil Engineering, Los Angeles, California, 1993.

Turpen, C.D. Strong-Motion Records from the Mammoth Lakes Earthquakes of May 1980, California Division of Mines and Geology, Office of Strong Motion Studies, Preliminary Report 27, 1980, 42 pp.

U.S. Geological Survey . Processed Strong-Motion Records, Whittier Narrows, California Earthquake, October 1, 1987, U.S. Geological Survey Open-File Report 88-354, Menlo Park, California, 1988.

Weichert D.H., R.J. Wetmiller, R.B. Horner, P.S. Munro, and P.N. Mork. Strong Motion Records from the 23 Decemeber 1985, Ms 6.9 Nahanni, NWT, and some associated earthquakes., Geological Survey of Canada, Open-File Report 86-1-PGC, Geological Survey of Canada, Ottawa, Ontario, Canada, and U.S. Geological Survey, Menlo Park, California, 1986, 8 pp.

Wood, C., D. Copeland, and A. Viksne. Strong Motion Data, Loma Prieta Earthquake of October 17, 1989, San Justo Dam and Dike, San Luis Dam, O'Neill Forebay Dam, Martinez Dam, U.S. Department of the Interior, Bureau of Reclamation, Denver, Colorado, 1991.

Appendix A

Error Messages

1. *Bad or Damaged Input File Software Must be Reloaded*
   Software is unable to locate one or more program or data files that are crucial to program operation. Software must be reinstalled from the CD-ROM.

2. *Bad or Invalid Input File Make Another Selection*
   The file that has been selected as an input file could be damaged, incorrectly altered, or not produced by the SMCAT Version 3 software. Note that the input file selection menu will display any file that contains a .DBF extension whether it can be used by SMCAT or not. The software will test files only after they have been selected. SMCAT ***cannot*** read files created with the SMCAT Versions 1 or 2 software.

3. *Can't Locate Executable or Data File*
   One or more of the system files has been deleted or moved from the subdirectory. The software must be reloaded from the CD-ROM.

4. *General Failure*
   General failure messages are usually followed by an abrupt program termination. A general failure is usually caused by an error in the program code, insufficient disk space or damaged data files. When a general failure occurs, re-boot your computer and execute the program again. Contact NGDC/WDC-A if this problem persists.

5. *Latitude Values are Out of Range*
   Latitude values must be between 0 and 90 degrees. Make sure the values you entered are in this range.

6. *Longitude Values Out of Range*
   Longitude values must be between 0 and 180 degrees. Make sure the values you entered are in this range.

7. *Maximum Value is to Large*
   A number has been entered that exceeds the maximum limit expected for the specified field. See the section entitled "Running a Search" for acceptable values. The maximum limit can be found under the subheading of "Range of Acceptable Values."

8. *Minimum Value is Greater than Max Value*
   The minimum value entered is larger than the maximum value entered. Re-enter the values in the proper order.

9. *Minimum Value is to Small*
   A number has been entered that exceeds the minimum limit expected for the specified field. See the section entitled "Running a Search" for acceptable values. The minimum limit can be found under the subheading of "Range of Acceptable Values."

10. *No Input File Specified. Select File Before Search*
    An input file has not been selected before a search or display is executed. Return to the main menu and choose the "Select Database" option. Select the CATALOG3 file or another file as your input file.

11. *Northernmost Latitude is South of Southernmost Latitude*

Latitude values have been entered in the wrong order. Re-enter the values making sure that the northernmost latitude is entered in the "Northernmost Latitude" blank.

12. *North(N) or South(S) Latitude, or East(E) or West(W) Longitude Not Specified or Incorrect*
    The program was not able to determine whether the latitude or longitude values that you entered are North, South, East or West. An "N" or "S" must be entered to specify latitude values as North or South. An "E" or "W" must be entered to specify longitude values as East or West. The "N', "S", "E", and "W" indicators are entered in the small blank adjacent to the blank where the numeric coordinate values are entered. See the section entitled "Running a Search" for more information.

13. *Not Enough Disk Space for Sort*
    The amount of disk space available is insufficient for running a sort. The amount of free disk space required for a sort is roughly equal to twice the size of the file being sorted. In other words, to sort a file that is 15,000 bytes, there must be more than 30,000 bytes of free disk space available. To alleviate the problem, delete any extraneous or unnecessary files from your hard drive.

14. *Value Out of Range*
    Numbers entered must be in this fields range. Refer to the "Running a Search" section to find the specific range for this field.

15. *Westernmost Longitude is East of Easternmost Longitude*
    Longitude values have been entered in the wrong order. Re-enter the values making sure that the westernmost longitude is entered in the "Westernmost Longitude" blank.

Appendix B

Troubleshooting Guide

This guide will help identify solutions to the most common problems encountered in SMCAT. To use the guide, first locate in the left-hand column the closest description of the problem encountered. Next, read through the solutions in the adjacent column. If a problem cannot be reminded, contact NGDC/WDC-A for assistance.

PROBLEM	**SOLUTIONS**
Program will not execute.	"Bad Command or Filename" error displayed. Make sure you are in the correct directory that contains the SMCAT software. Check to insure that all of the files are properly loaded. Type **DIR** [ENTER] at the DOS prompt. Compare the file names with those listed in section "Loading the Software" on p 3. If any of the files are missing or the directory does not exist, then the software must be reinstalled.
Software will not install.	Make sure your PC matches all of the requirements specified in the section entitled "Before You Begin". Make sure you have copied the file SMINSTAL.EXE from the CD-ROM SOFTWARE/SMCAT3 directory to the SMCAT3 hard drive on your computer.
Program cannot locate the CATALOG3.DBF file.	File has been renamed, deleted, or not properly installed. Reinstall the entire software package from the CD-ROM.
Program "hangs" occasionally	Since SMCAT requires a substantial amount of available memory, it is probably running into conflicts with other memory resident software. The best solution to this problem is to try removing or un-installing some of these memory resident programs.
Screen is unreadable, difficult to read, or parts of the screen are missing.	First, try adjusting the contrast and brightness on your monitor. Try all possible combinations of adjustments. If this does not alleviate the problem, then the software is probably misinterpreting your video card/monitor combination. Contact NGDC for assistance.
Menus do not operate properly when [UP CURSOR] or [DOWN CURSOR] keys are used.	Check to make sure your [NUMBER LOCK] key is off.
Program execution is extremely slow.	Program execution will slow significantly when there is very little available memory. Try un-installing some memory resident software if it exists on your PC.

Appendix C

Organizations that have Contributed
Strong-Motion Records to NGDC / WDC-A

The following is a listiong of organizations that actively contribute or have contributed in the past digitized strong-motion data to NGDC / WDC-A.

Australia:	Bureau of Mineral Resources, Canberra, Australia
Chile:	Universidad de Chile, Santiago, Chile
C.I.S.:	Academy of Sciences, Institute of Physics of the Earth, Moscow, C.I.S.
Italy:	Comitato Nazionale per la Ricerca e per lo Sviluppo dell'Energia Nucleare e delle Energie Alternative, Rome, Italy Ente Nazional per l'Energia Elettrica, Rome, Italy
Japan:	Strong-Motion Accelerograph Committee, Tokyo, Japan National Center for Disaster Prevention, Japan
Mexico:	Universidad Nacional Autonoma, Mexico City, Mexico
New Zealand:	Department of Scientific and Industrial Research, Wellington, New Zealand
People's Republic of China:	State Seismological Bureau, Beijing, Peoples Republic of China
Peru:	Instituto Geofisico, Lima, Peru
Romania:	Institut Central de Fizica, Bucharest, Romania Institute of Civil Engineering, Bucharest, Romania
Spain:	Ministerio de Obras Publicas Y Urbanismo, Instituto Geografico Nacional, Servicio de Ingenieria Sismica, Madrid, Spain
Taiwan:	Institute of Earth Sciences, Taipei, Taiwan
Turkey:	General Directorate of Disaster Affairs, Earthquake Research Dept, Ankara, Turkey
United Kingdom:	Imperial College of Science and Technology, London, United Kingdom
United States:	California Division of Mines and Geology, Sacramento, California, U.S. EXXON Production Research Company, Houston, Texas, U.S. Lamont-Doherty Geophysical Observatory, Palisades, New York, U.S. St. Louis University, St. Louis, Missouri, U.S. Seismological Laboratory, University of Nevada, Reno, Nevada, U.S. United States Army Corps of Engineers, Vicksburg, Mississippi, U.S. United States Department of Interior, Bureau of Reclamation, Denver, Colorado, U.S. United States Geological Survey, Denver, Colorado, U.S. United States Geological Survey, Menlo Park, California, U.S. University of California, Berkeley, California, U.S.

University of California, San Diego, California, U.S.
United States Regulatory Commission, Washington, D.C.
University of Southern California, Dept of Civil Engineering, Los Angeles, California, U.S.