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GEOLOGICAL SURVEY

Developing a Working Area on the PRIME Minicomputer as a Tool for Stratigraphic Research Using the National Coal Resources Data System (NCRDS)

By

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INTRODUCTION

A working area is a National Coal Resources Data System (NCRDS) user's work space on the PRIME host computer. The working area concept using working data dictionary (WORKDICT) has been developed by NCRDS to allow users to enter coal geology data directly into NCRDS structured files in their work space to augment the ability of the individual geologists and coal scientists to utilize the Branch of Coal Resources PRIME mini-computers as a research tool. Individual user work areas may contain data files retrieved from the NCRDS and (or) data entered by the user that have not yet been added to the NCRDS master database. For the purpose of this report "data" refers to stratigraphic data in the U.S. Stratigraphic (USTRAT or WRKSTRAT) database format. Users can enter, update, and add stratigraphic units to data as needed using the programs described in this report with the following limitations:

Data developed in this way

1. Are the responsibility of the user.

2. Cannot be used with NCRDS master database files without substantial changes (described in this guide).

3. Are not part of the NCRDS master database. They must be written (posted) to the master database by the NCRDS staff if permanent storage is required.

Data in USTRAT (or WRKSTRAT) database format in a user's area can be used in all of the NCRDS software packages; e.g., rock units can be correlated using Stratigraphic Analysis Techniques System (STRATS) and bed names can be added to stratigraphic data files using the NCRDS database management system, Program to Analyze Coal Energy Resources (PACER). The user may utilize the Graphic Analysis of Resources using Numerical Evaluation Techniques (GARNET) system to generate contour plots at specified scales, calculate coal resource tonnages, edit data, and add interpretive point data. The user can generate formatted lists in PACER to create cross sections, fence diagrams, block diagrams, contour maps, and 3-D mesh and (or) contour perspectives with other NCRDS graphics packages.

The user should notify the NCRDS staff to post the work data to the NCRDS master database, USTRAT, when the final geologic interpretations are made and the data are complete. USTRAT is designed to organize and store consistent stratigraphic data for many users and for researchers and policy makers to use as a basis for analyzing available coal resources.

This paper is intended for the user who is working with stratigraphic data and who wishes to use the computer system as the research tool for which it was designed. This user's guide assumes that the investigator

1. Is familiar with one of the methods of NCRDS stratigraphic data entry (either by microcomputer terminals or filling out paper USTRAT forms).

2. Has worked with the NCRDS LSTRATUS data printout (fig. 34) and is familiar with the data fields.

3. Is familiar with operation of a terminal to access NCRDS data and software.

4. Has used the PRIME editor.

5. Has used the PACER software.

If the user is inexperienced in these areas, publications and training courses are readily available that will introduce these concepts and skills through the NCRDS staff.

This guide describes the following:

1. Commands to convert raw data from data coding devices (microcomputer terminals) to the database file structure (binary PACER files).

2. Data dictionary concepts and steps to convert from one dictionary to another.

3. Data changes using the UPDATE command in PACER (in part augments the PACER and GARNET User's Manual).

4. Steps for adding stratigraphic units to geologic records that are already formatted in the database structure.

The illustrations are computer terminal sessions with user commands underlined. <CR> indicates a single carriage return which is generated on most terminals by hitting the RETURN key. For further information refer to the the NCRDS User's Manual, the USTRAT Database Guide for entering Stratigraphic data into NCRDS (11/82), the USC_DICT or WORKDICT, and the PRIME User's Guide, all of which are in the Computer Users' Room, No. 1105, Branch of Coal Resources Western Section Headquarters, 875 Parfet St., Lakewood, Colo.; Room No. 4C239, Branch of Coal Resources Headquarters, National Center, Reston, Va.; or contact the NCRDS staff.

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GEOLOGIC APPLICATIONS, DATA ENTRY USING MICRO-COMPUTER TERMINALS

STEPS FOR PROCESSING NEW STRATIGRAPHIC DATA

The following is a general summary of steps to develop working files, which are described in detail in later sections.

1. Collect raw data in required format from data coding devices such as Sycor, Tektronix 4054, and IBM/PC.

2. Transmit raw data to individual user area on the PRIME minicomputer.

3. Check raw data file in editor on the PRIME to see if any transmission errors occurred. Fix obvious errors using PRIME editor.

4. Process raw data into database format (ADDREC) using the interactive option, PACER command UPDATE option 1, or the batch option outside of PACER called ADDABS.

   NOTE: USER MUST BE ATTACHED TO THE WORKDICT (working data dictionary; enter WRKSTRAT for 'DATABASE NAME').

5. Correct errors in ERROR file created in ADDABS.

6. Compare data in ERROR file with entries in WORKDICT and change to match dictionary entries where possible.

7. Add corrected data in ERROR file to output file from ADDABS and to WORKDICT using CORRABS.

8. Correct non-dictionary errors in data file using PACER UPDATE commands.

9. Add digitized latitude and longitude values using ADDLATLONG. Digitized values allow greater plotting accuracy (value may be added in UPDATE if neccessary).

10. Calculate -FROM -TO values using STRATTHK.

11. Check thickness values against total depth logged or calculate total depth logged using DEPTHCHK.

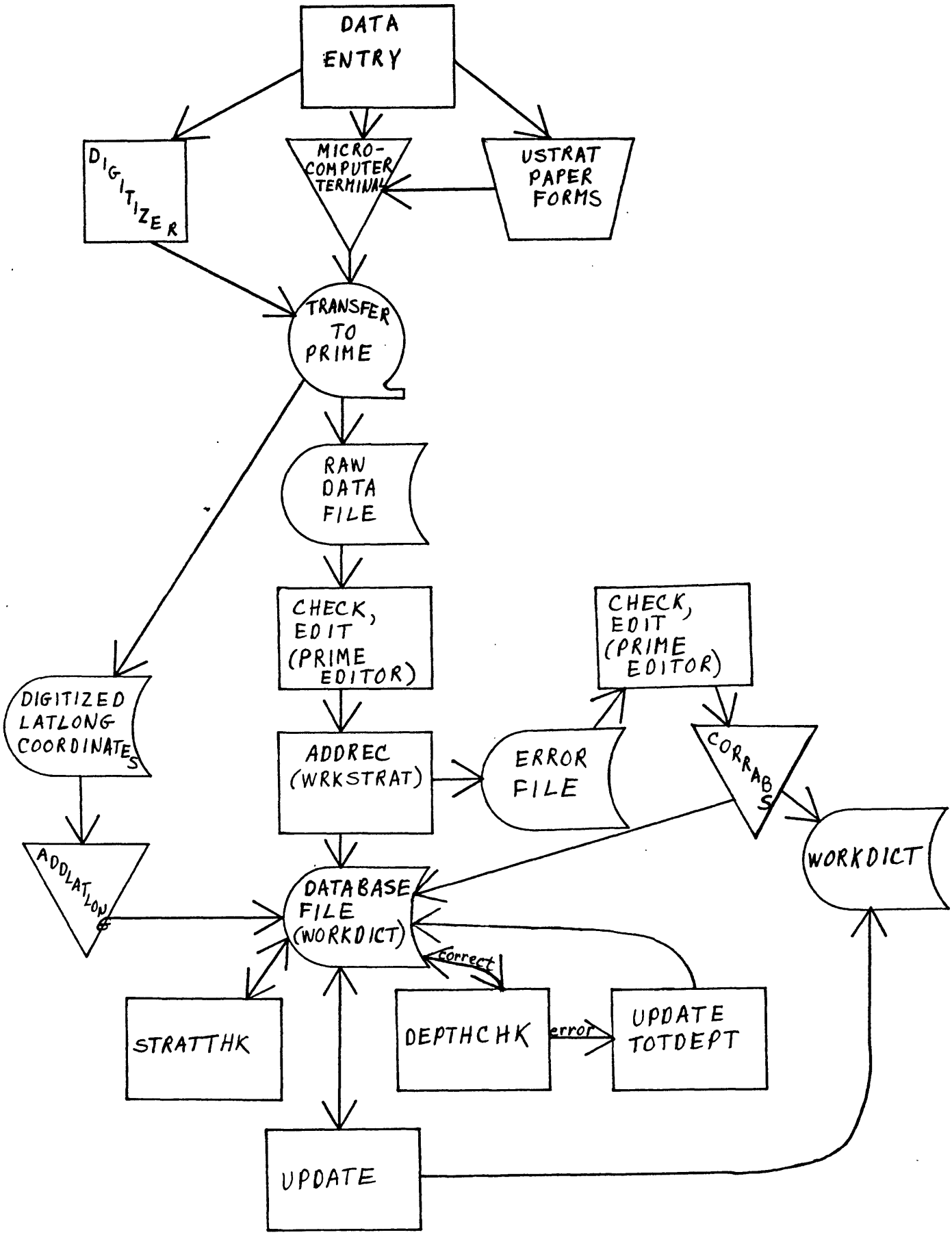

Figure 1.--Flow chart for processing new data in a user's working area.

Data Entry on the PRIME

Stratigraphic data are entered into the PACER Database Management System of NCRDS by a variety of methods and devices. The user may use NCRDS standard software for the IBM/PC, a Sycor terminal or a Tektronix digitizing table and terminal; or the user may obtain a standard format from the NCRDS and use any available device which will produce data in that format. Data collected are stored on magnetic medium and then transferred to the PRIME as a raw data file (fig. 2). The programs referred to as ADDREC (add record) in this paper convert raw data files into the binary data format used by the PACER system.

Data Retrieval

The user should find out what data in his/her area of study are already in NCRDS files on the PRIME before adding data to avoid duplication of effort. This can be done by searching the USTRAT database using PACER. Security procedures require that the initial data search be done by the NCRDS staff to identify all the data in a given area. Geologists who submit data to the NCRDS database files can arrange security of their data through the NCRDS staff. The user will only be able to retrieve public data and his/her own data when performing a data search in PACER. Contact the NCRDS staff for assistance.

The data retrieved by doing this search are stored in a file in the user's area. Any data retrieved from the NCRDS master database, USTRAT, are attached to the USC_DICT (master data dictionary). If a user wishes to add to and/or change data from the master database or combine those data with new data in his/her own working area, certain steps described in the guide need to be taken to attach the data to the WORKDICT (see Dictionary Items section and fig. 3). All data added or updated in a user's work area are processed with the WORKDICT. These data cannot be merged directly with data searched from the master database without potential errors in dictionary items.

```
CK, SLIST ADR24-54
124-54             SAYLE (7.5')                 MONTANA         POWDER RIVER          N GREAT PLAINS  POWDER RIVER
2USGS-BIEWICK L H    CHANDLER & ASSOC            4069. 4  767.     0.2170
3SUBBIT        0  0  0 451025000n105407500OW 1
4690202020     SESE17.0  8.0S 47.0E
5INDIAN GULLY 1, NG TO 200', IES 200' ON
6   1                            5        FORT UNION      ANDERSON ZONE        COAL
6   2                           21        FORT UNION                           SH        INBD
6   3                           14        FORT UNION      ANDERSON ZONE        COAL
6   4                          111        FORT UNION                           SH        INBD
6   5                            3        FORT UNION      CANYON               COAL
6   6                            3        FORT UNION                           SH
6   7                           13        FORT UNION      CANYON               COAL
6   8                            6        FORT UNION                           SH
6   9                            4        FORT UNION                           BENT      LITH UNC
6  10                            7        FORT UNION                           SH
6  11                           58        FORT UNION                           SS        BD
6  12                           10        FORT UNION                           SH        INBD
6  13                           20        FORT UNION                           SS        BD
6  14                            8        FORT UNION      COOK ZONE            COAL
6  15                            2        FORT UNION                           SH
6  16                            3        FORT UNION      COOK ZONE            COAL
6  17                            4        FORT UNION                           SH
OK,
```

Figure 2.--Raw data file transferred to the PRIME from Tektronix magnetic tape.

Dictionary Items

Data dictionary items in USTRAT listed in table 1 are those items for which the same entry is repeated so often that a great deal of space is saved on the PRIME by coding these field entries with a numeric pointer to a table of standard entries.

Table 1.--Dictionary items in USTRAT (or WRKSTRAT)

state	primary lithology
county	lithology modifier
coal field	color
formation	grain size
bed name	grain shape
estimated rank	mineralogy
quadrangle name and series	bedding
coal province	source of data
coal region	collector

There are two data dictionaries on the NCRDS system: USC_DICT and WORKDICT. The USC_DICT (master data dictionary) is the file which standardizes entries in all NCRDS database files for the alpha-numeric items defined above as dictionary items. A dictionary pointer value code is entered into the record to represent the alpha-numeric entry in the compacted database; e.g., the coal bed name "Dietz" is represented in a database record as 1954. These dictionary pointer values are assigned automatically during the process of adding the data to the database (ADDREC). If a new dictionary entry is made a new pointer is added to the dictionary; if all dictionary entries in the new data are already in the dictionary, no changes are made to the dictionary and the existing numeric pointers are assigned to the data. Only NCRDS staff can add new dictionary entries to USC_DICT.

The WORKDICT file was developed to allow users to update or add new data to meet their own project needs. This dictionary operates in a similar fashion to the USC_DICT except that the user can add new entries to this dictionary after checking with the copy of the WORKDICT available at both sites (Denver and Reston). As with any computerized system, it is advisable to be as consistent as possible in data entry for future efficient and satisfactory work with your data. These new entries are assigned new dictionary pointer values in the WORKDICT.

NOTE: THESE NEW POINTERS WILL NOT BE IN THE USC_DICT WHICH CONTROLS THE MASTER DATABASE FILES.

This is why data from the master database and from the user's work area are not compatible (for dictionary-type items). New data processed (ADDREC) in a user's area cannot be used with data pulled off the master database unless the user is aware of possible dictionary mismatches and is willing to reprocess the data from the master database using the WORKDICT (described in this guide) so that the pointer value codes can be adjusted to represent the alpha-numeric entry as it appears in the WORKDICT. Bad pointers and unexpected data in dictionary items may occur if a user is attached to the wrong dictionary. User changes to

dictionary items in data pulled off the master database will only be valid when the user is working with the WORKDICT file. However, if these changes to the users master database records are approved for use in the NCRDS master files these data will be reprocessed (ADDREC) through the standard database dictionary (USC_DICT) by NCRDS staff in order for them to become part of the NCRDS master database files (fig. 35).

In order to maintain the integrity of the original submitter's data only changes approved by the original submitter, or the person responsible for the data, will be made by NCRDS staff to the master database. Supply NCRDS staff with the file name when you are completely satisfied with the working data and want it transferred to the master files.

Choosing USTRAT or WRKSTRAT Database Format

The user has control over which dictionary the programs on the PRIME will use to assign records for the pointer codes stored in a file. The PACER software will attach the data to one of the dictionaries according to the response to the prompt 'ENTER DATABASE NAME', either USTRAT or WRKSTRAT. Entering USTRAT indicates the data in the input file have been processed using the USC_DICT file. WRKSTRAT must be entered when working with data that were processed (ADDREC) in a user's working area using the WORKDICT file.

Consider the following points when choosing the USTRAT or WRKSTRAT format:

1. Data from the master database are processed using the USC_DICT and USTRAT.

2. Data in a user's work area that were retrieved from the master database are still connected to USC_DICT.

3. New data entered in a user's working area are processed using the WORKDICT.

4. If a user wishes to use data from the master database together with new data, and/or add stratigraphic units or new dictionary items to the data in the file from the master database, the data from the master database will have to be reprocessed using the WORKDICT (fig. 3 and section on OUTDISK, Changing Dictionaries).

5. The user may leave data from the master database attached to USC_DICT only if he/she won't be adding new dictionary items or new data (adding stratigraphic units) to his/her working file.

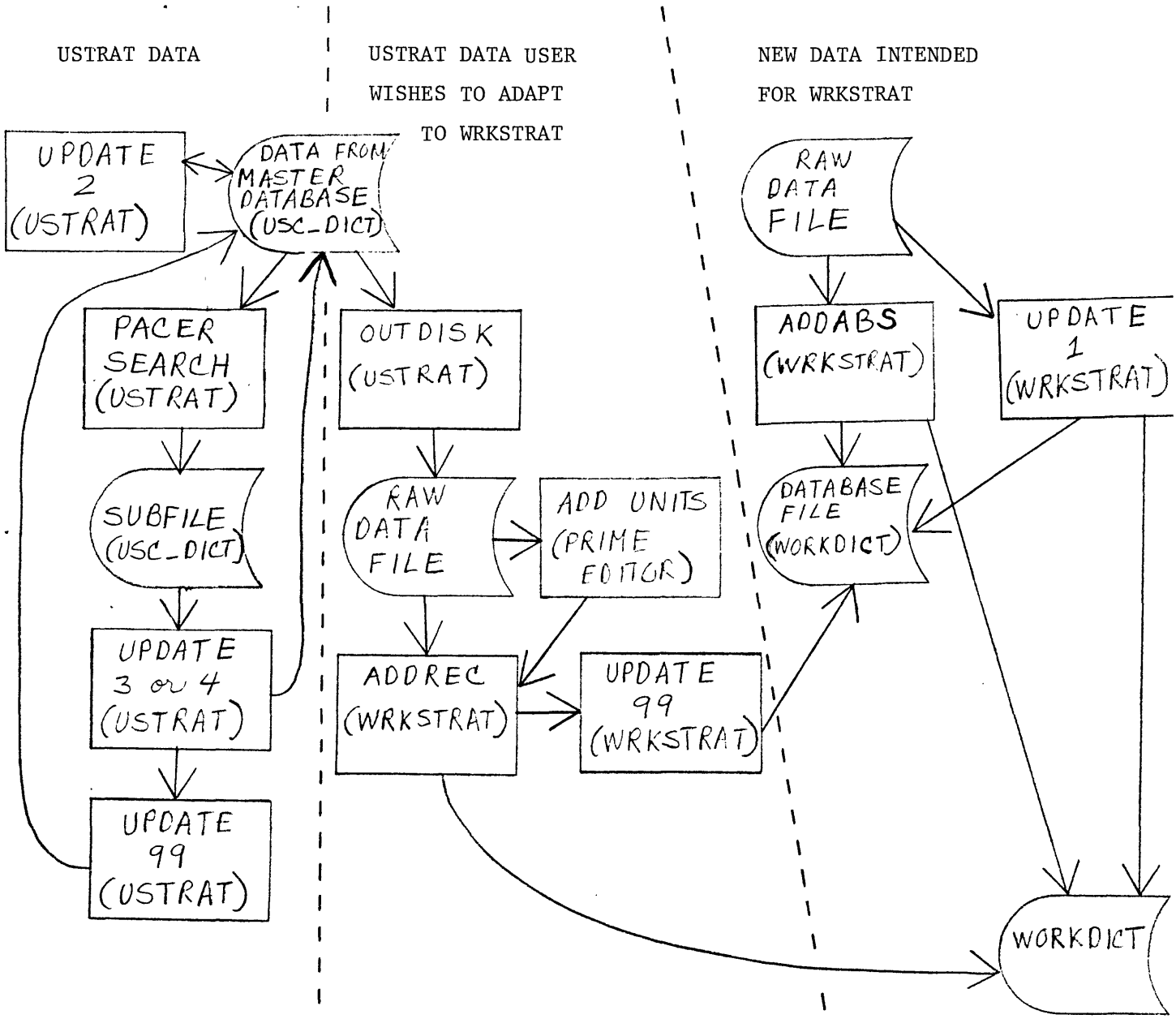

Figure 3.--Flow chart showing data related to USC_DICT or WORKDICT and steps required to use data in the WRKSTRAT environment.

The ADDREC Program ADDABS

As previously mentioned, raw data must be converted to database format to use PACER, GARNET and other NCRDS software packages. The ADDREC programs add raw data to the PACER storage and retrieval system and check them for errors in dictionary items (table 1).

ADDREC can be done interactively using the PACER command UPDATE option 1 (described later) or by using the program called ADDABS (a PRIME CPL program that runs the ADDREC in batch mode, fig. 4). The first prompt in the ADDABS program, 'ENTER CPL FILE NAME', refers to a name to store the two output products:

1. The system commands to run the program ADDREC in absentee mode (the PRIME system suffix ".CPL" is automatically added to the file name entered, fig. 5).

2. A record of the terminal session run in absentee mode (the PRIME system suffix ".COMO" is automatically added to the file name entered, fig. 5).

Whenever a user "ADDRECs" data, he/she is attached to the WORKDICT. Enter WRKSTRAT for the prompt 'ENTER DATABASE NAME' and 00 for the prompt 'ID'. 'INPUT' is the raw data file name. 'OUTPUT' can be any file name up to 32 characters (refer to PRIME User's Manual, p. 2-6, rules for naming files). Enter 0 in response to the prompt for 'KEY'. Normally you want to post the file being "ADDRECed" to your master file. If you prefer not to post the data to your master file at this time enter <CR> for the prompt 'ENTER MASTER FILE NAME TO BE POSTED:'. A message appears that the job 'was submitted to queue EVENING', indicating it has a low priority; but the actual priority depends on the number of jobs in batch queue, and the program may run immediately. By printing (SPOOL, SLIST, or DISP) the COMO file, the user can see if the program is completed (fig. 5). Another way to check the status of a batch job is to type STAT US. A list of batch jobs, along with the user's personids, will print on the terminal screen.

```
ADDABS
THIS IS A CPL PROGRAM WHICH BUILDS A CPL PROGRAM
THAT ALLOWS YOU TO RUN ABSENTEE ADDREC IN
A BATCH OR PHANTOM MODE

YOU MAY CALL YOUR ADDAB CPL PROGRAM ANYTHING YOU LIKE
THIS PROGRAM APPENDS .CPL TO YOUR OUTPUT FILE NAME

ENTER CPL FILE NAME: CHAND
ENTER DATABASE NAME: WRKSTRAT
ID: 00
INPUT: ADR24-54
OUTPUT: PAC24-54
KEY: 0
ENTER MASTER FILE NAME TO BE POSTED: <CR>
[JOB rev 19.4]
Your job, #00013, was submitted to queue EVENING.
Home=<BCRDEN>LBIEWICK>BROADUS>TEST
DO YOU WISH TO ENTER ANY MORE JOBS (Y OR N)?: N
OK,
```

Figure 4.--ADDABS - absentee ADDREC.

```
OK, SLIST CHAND.COMO
Time used: 00r 00m connect, 00r 02s CPU, 00m 00s I/O.
29 Nov 85 11:25:24 Friday
ENTER DATABASE NAME: WPKSTRAT
ID: CC
INPUT: ADR24-54
OUTPUT
OK,
```

Incomplete COMO file - ADR24-54 is being processed.

```
SLIST CHAND.COMO
Time used: 00r 00m connect, 00r 02s CPU, 00m 00s I/O.
29 Nov 85 11:25:24 Friday
ENTER DATABASE NAME: WPKSTRAT
ID: CC
INPUT: ADR24-54
OUTPUT: PAC24-54
KEY: C
    22 SAMPLES HAVE BEEN CONVERTED
MASTER FILE NAME:


OK,
```

Processing of file ADR24-54 completed.

```
SLIST CHAND.CPL
COMO CHAND.COMO
TIME
DATE
$DATA SEG PUBLIB>PACPP_PROGRAM_OBJECT>ADDABS
WPKSTRAT
CC
ADR24-54
PAC24-54
C

SEND
TIME
DATE
COMO -END
$RETURN
OK,
```

Figure 5.--ADDABS output files (.CPL and .COMO)

Key Numbers

When records are added to PACER files (ADDREC) the computer assigns a sequential number to each record; this number is called the record "key". Each individual stratigraphic unit in the system is identified by a key number. This controls the integrity of each record in each database. Key numbers can be used as a data item in PACER lists and in searches using the KEYS command where they are particularly useful to avoid searching entire data files (Krohn and others, 1981).

CORRABS (Correcting Errors)

Any errors in dictionary items encountered in the ADDABS program are stored in an ERROR file with the same name as the 'OUTPUT' file preceded by "ERROR." (fig. 6). The ERROR file signals the user that the data items contained in it were not located in the WORKDICT and therefore were not incorporated into the database file ('OUTPUT' file from ADDABS). The ERROR file should be checked against the WORKDICT by the user to determine whether the entries are indeed errors or need to be added to the WORKDICT. A listing of dictionary records for a particular field, e.g. lithology modifier, can be obtained using the NAMES command in PACER. For fields that contain a large number of entries, the user is advised to store the terminal session in a file by typing:

```
COMO "file name".COMO        ("file name" can be any name you choose,
                              see PRIME User's Guide, p. 2-6, rules
                              for naming files)
```

After all the records have printed on the terminal type: COMO -END (fig. 7). All the data that printed on the terminal are contained in the COMO file ("file name".COMO) which can be printed on the PRIME printer by typing: SPOOL "file name".COMO. Adjust your data to match the entries in the dictionary where possible. This is done by editing the error file using the PRIME editor (fig. 6). Items in the ERROR file are then added to the user's database file (the 'OUTPUT' file from ADDABS) using the CORRABS program (fig. 6). Any entries in the ERROR file that do not match those in the WORKDICT will become permanent records in the dictionary when CORRABS is used.

WARNING: LET THE PROGRAM RUN TO COMPLETION. NEVER BREAK OUT OF CORRABS; THE RESULT WILL BE ALTERATION OF YOUR DATA FILE.

Step 1 Examine ERROR file for data not found in WORKDICT (options: SLIST, SPOOL or DISP).

```
SLIST ERROR.PAC21-25
    654566          21WEBB RES. 1-31 INC-U.S.
OK,
```

Step 2 Edit data in ERROR file to match entry in WORKDICT using PRIMOS editor, ED.

```
ED ERROR.PAC21-25
EDIT
N
    654566          21WEBB RES. 1-31 INC-U.S.
M\. 1-31 INC-U.S.\OURCE\
    654566          21WEBB RESOURCE
FILE
ERROR.PAC21-25
OK,
```

Step 3 CORRABS - add data to database file.

```
CORRABS
ENTER DATABASE NAME: WRKSTRAT
ID: 00
INPUT: PAC21-25
DO YOU WANT TO POST THIS FILE TO THE MASTER FILE? N
OK,
```

Figure 6.--Editing and adding data in ERROR file to database file and to WORKDICT.

```
COMO STATE.COMO
OK, PACER
PRESS CARRIAGE RETURN23
ENTER DATABASE NAME: USTRAT (OR WRKSTRAT)


ENTER COMMAND: NAMES
WOULD YOU LIKE TO SEE MEANING OF TYPE CODES? Y
 IN EACH CATEGORY, THE ITEM NAMES, TYPE CODES, AND DESCRIPTIONS WILL BE
 LISTED. TYPE CODES:
         1 - INTEGER VALUES
         2 - FLOATING POINT VALUES
         3 - DICTIONARY STRINGS
         4 - SINGLE CHARACTER CODE
         5 - QUALIFIED NUMERIC VALUES
         6 - CHARACTER STRING VALUES
         7 - INTEGER ARRAY VALUES
         8 - FLOATING POINT ARRAY VALUES
  3
 WOULD YOU LIKE TO SEE THE POSSIBLE VALUES
 OF DICTIONARY TYPE ITEMS?
Y
ENTER THE LIST OF ITEM NAMES.

1. STATE
2. <CR>
 STATE    -
          NDE
          NORTH CAROLINA
          MICHIGAN
          GEORGIA
          RHODE ISLAND
          MISSISSIPPI
          ILLINOIS
          TENNESSEE
          MARYLAND
          MASSACHUSETTS
          HOLE NO 6001
          INDIANA
          VIRGINIA
          OHIO
          ALABAMA
          WEST VIRGINIA
          KENTUCKY
          PENNSYLVANIA
          MISSOURI
          NEBRASKA
          LOUISIANA
          TEXAS
          OKLAHOMA
          CALIFORNIA
          IDAHO
          ARIZONA

          ALASKA
          UTAH
          KANSAS
          NORTH DAKOTA
          NEVADA
          ARKANSAS
          WASHINGTON
          WYOMING
          MONTANA
          NEW MEXICO

          IOWA
          COLORADO

 WOULD YOU LIKE TO SEE THE POSSIBLE VALUES
 OF DICTIONARY TYPE ITEMS?
N

ENTER COMMAND: QUIT
OK, COMO -END
OK, SPOOL STATE.COMO
[SPOOL rev 19.4.5]
PRT001 spooled,  records:     1, name: STATE.COMO
OK,
```

Figure 7.--PACER NAMES command

Adding Latitude and Longitude Values

Latitude and longitude values are stored in a coordinate file generated by a variety of methods, one of which is digitizing points using the Tektronix digitizing table (fig. 8). Eight reference points are normally entered when digitizing coordinates from 7.5' quadrangles: the corner points and the four interior 2.5' points. The program POINTDATA will convert digitizer coordinate points to latitude/longitude coordinates (fig. 8). Use the PACER program to search the database for the records with the same pointids as those in the coordinate file (fig. 9). The program ADDLATLONG will add the latitude and longitude values to the output file retrieved in the PACER search (fig. 10). This file should be posted back to your data file using the UPDATE command in PACER (see section describing UPDATE 99). The ADDLATLONG program generates files in your area entitled POINTDATA.SCRATCH1 and one with the prefix ADDLATLONG.ERR. followed by the PACER file name. The POINTDATA.SCRATCH1 file contains programming information used to add the "latlongs". The ADDLATLONG.ERR. file will store data from either the PACER file or the output file from the POINTDATA program for which there was no match in the other file (fig. 10).

Step 1 examine digitized file

```
SLIST BALDYPKPTS
     6581.          3576.       45  7 30
     6581.          3576.       105 30  0
     6590.           359.       45  7 30
     6590.           359.       105 37 30
     2037.           345.       45 15  0
     2037.           345.       105 37 30
     2029.          3556.       45 15  0
     2029.          3556.       105 30  0
     5066.          2499.       45 10  0
     5066.          2499.       105 32 30
     5073.          1425.       45 10  0
     5073.          1425.       105 35  0
     3554.          1420.       45 12 30
     3554.          1420.       105 35  0
     3548.          2492.       45 12 30
     3548.          2492.       105 32 30
     2712.          2792.       21-6
     4291.          3346.       21-25
```

7.5' quadrangle reference points

data point IDs

Step 2

```
OK, POINTDATA
ENTER DIGITIZED POINT DATA FILE: BALDYPKPTS
ENTER OUTPUT FILE NAME: BALDYPTS
ENTER NUMBER OF REFERENCE POINTS: 8
ENTER DIGITIZED POINT DATA FILE: <CR>
**** STOP
```

Step 3

```
OK, SLIST BALDYPTS
21-6                45 13 52.7015 105 31 47.4704
21-25               45 11 16.4330 105 30 30.8236
OK,
```

Figure 8.--Converting digitizer coordinate points to latitude/longitude coordinates.

```
PACER
PRESS CARRIAGE RETURN23
ENTER DATABASE NAME: WRKSTRAT (OR USTRAT)


ENTER COMMAND:  COND
A.  QUAD EQ BALDY PEAK (7.5')
B.  <CR>


ENTER COMMAND:  LOGI
ENTER LOGIC:A


ENTER COMMAND:  SEAR
ENTER INPUT FILE NAME:  BALDYDATA
ENTER OUTPUT FILE NAME: B21ADDLL
 ALL     59 RECORDS OF BALDYDATA                                SEARCHED.
         59 RECORDS FOUND WHICH SATISFY THE REQUEST.
 THEY HAVE BEEN STORED IN B21ADDLL
DO YOU WANT TO SEARCH ANOTHER INPUT FILE? N


ENTER COMMAND:  QUIT


 THE FOLLOWING FILES HAVE BEEN ACCESSED
 OR CREATED DURING THIS SESSION:
    1      B21ADDLL

 USE PRIME'S DELETE COMMAND TO DELETE
 ANY UNWANTED FILES.
OK,
```

Figure 9.--PACER search for data to which latitude/longitude values are to be added.

```
ADDLATLONG
ENTER DATABASE NAME:USTRAT
ENTER COORDINATE FILE NAME (OUTPUT FROM POINTDATA): BALDYPTS
ENTER FILE TO BE UPDATED (PACER FILE): B21ADDLL

 THERE WERE      5 SAMPLES IN THE MASTER FILE FOR WHICH NO LATITUDE AND LONGTUDE
 WERE FOUND.
 THERE WERE      0 LATITUDE AND LONGTUDE FOR WHICH NO SAMPLE WAS FOUND IN THE
 MASTER FILE.
 A LIST OF THESE SAMPLES HAS BEEN STORED IN FILE: ADDLATLONG.ERR.B21ADDLL
OK,



SLIST ADDLATLONG.ERR.B21ADDLL
     KEY  POINTID              LATITUDE  LONGTUDE

   654035 21-12                       0         0
   654036 21-12                       0         0
   654037 21-12                       0         0
   654038 21-12                       0         0
   654039 21-12                       0         0


 POINTID           LATITUDE  LONGTUDE
OK,
```

Figure 10.--Program ADDLATLONG

STRATTHK (Calculating Depth Values)

The thickness values entered for rock units can be used to calculate depth values from the surface to the top and base of each unit. These values are referred to as -FROM -TO depth values. The program called STRATTHK calculates and adds -FROM -TO depth values to a data file containing thickness values for each unit. That data file can then be used to calculate such values as thicknesses of overburden and interburden intervals, and elevations for structure contour maps and correlation diagrams. The -FROM -TO depth and elevation values can be displayed on the NCRDS LSTRATUS data printout, a PACER list, and various graphic products.

In some cases the user may have chosen to enter -FROM -TO values rather than thickness for each unit. In this case the program calculates and adds the thickness value for each unit to the data record.

NOTE: WHEN RUNNING STRATTHK MAKE SURE THE DATA FILE CONTAINS EITHER THICKNESS VALUES OR -FROM -TO VALUES, NOT BOTH. ONE WILL INTERFERE WITH THE OTHER, POSSIBLY CHANGING THE ORIGINAL DATA.

To use this program type STRATTHK (fig. 11). You will be prompted for the 'INPUT FILE NAME'. Any errors encountered (e.g., unit numbers out of sequence) will show up on the terminal and can be corrected using UPDATE in PACER. STRATTHK will have to be rerun after the data are corrected. You can check the data file using the LIST command in PACER to list -FROM, -TO, and thickness (abbreviated THK in PACER, fig. 33). Use the UPDATE command option 4 in PACER to change either all -FROM -TO values or all thickness values to zero to avoid interference when rerunning STRATTHK.

NOTE: LET THE PROGRAM RUN TO COMPLETION. YOUR FILE WILL NOT BE RELIABLE IF YOU BREAK OUT OF STRATTHK.

DEPTHCHK (Calculating Total Depth)

DEPTHCHK is a program used to compare the value entered in the total depth field of a data point with the sum of all the thickness values entered for the rock units for that same point to help detect errors. This program will also calculate and fill in the total depth field if left blank. Type DEPTHCHK (fig. 12). You will be prompted for an 'INPUT FILE' and asked 'DO YOU WANT THE OUTPUT ON DISK?'. If you answer no (N), any errors encountered will be printed on the terminal. A yes (Y) response will put the error data in a file that can be printed on the PRIME printer using the SPOOL command or printed on the terminal by typing SLIST (or DISP) "file name". To correct the erroneous values use the UPDATE command in PACER (described later).

NOTE: LET THE PROGRAM RUN TO COMPLETION.
NEVER BREAK OUT OF DEPTHCHK.
YOUR FILE WILL NOT BE RELIABLE.

```
STRATTHK
ENTER INPUT FILE NAME: B21ADDLL
 UNIT NUMBERS ARE NOT IN SEQUENCE FOR SAMPLE 21-6
THIS RECORD AND THE REMAINDER OF THE RECORDS WITH THIS POINTID WILL BE SKIPPED.
```

Figure 11.--Program STRATTHK.

```
DEPTHCHK
ENTER INPUT FILE NAME: B21ADDLL
DO YOU WANT THE OUTPUT ON DISK? N

THICKNESS VALUES CAN BE SHOWN IN:
   1. INCHES
   2. DECIMAL FEET
   3. FEET AND INCHES
ENTER A '1','2', OR '3' DEPENDING UPON
HOW YOU WANT THE VALUES TO BE SHOWN.
2
 CURRENT DEPTH:      438.67
 CALCULATED DEPTH:     439.50
 POINTID: 21-6
 KEY:   654089


SOME OF YOUR TOTAL DEPTH VALUES WERE EQUAL TO 0.0.
THESE WERE UPDATED TO MATCH THE CALCULATED DEPTH.
PLEASE REMEMBER TO POST THESE RECORDS TO YOUR MASTER DATA FILE.
```

Figure 12.--Program DEPTHCHK.

STEPS FOR CONVERTING DATA FROM USC_DICT TO WORKDICT

The following is a general summary of steps to convert data retrieved from the NCRDS master database attached to USC_DICT to working data in the user's working area attached to WORKDICT.

1. Convert data retrieved from NCRDS master database to raw data format using the program OUTDISK. Enter USTRAT for 'DATABASE NAME'.

2. Convert data back to database format using ADDREC programs. Enter WRKSTRAT for 'DATABASE NAME'.

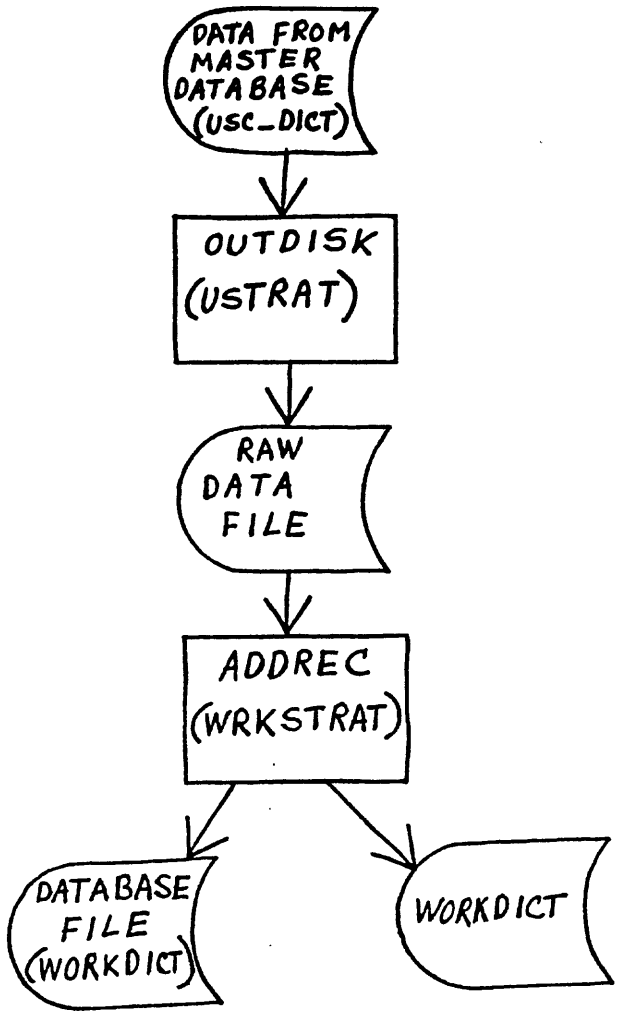

Figure 13.--Flow chart of data conversion from USC_DICT to WORKDICT.

OUTDISK (Changing Dictionaries)

The program OUTDISK converts database formatted files to raw data files for the purposes of:

1. Adding stratigraphic units to a database file (described later).

2. Changing dictionaries (reassigning new dictionary pointers during ADDREC).

The user will use this program to change dictionary pointer codes attached to USC_DICT to those in WORKDICT; this allows the user freedom to update and add data to his/her working area and to the WORKDICT as necessary for project goals.

NOTE: IN ORDER TO KEEP DATA IN THE MASTER DATABASE RELIABLE AND FREE OF DUPLICATES, PLEASE KEEP TRACK OF THE KEY NUMBERS OF ANY DATA FROM THE MASTER DATABASE THAT YOU, THE USER, HAVE CHANGED. WHEN THE TIME COMES FOR THE CORRECTED DATA TO BE POSTED BACK TO THE MASTER DATABASE, THE OLD, LESS RELIABLE DATA SHOULD BE DELETED. SUPPLY THE NCRDS STAFF WITH A LIST OF KEY NUMBERS (fig. 14).

When using OUTDISK to convert data searched from the master database to raw data, enter USTRAT to the prompt "ENTER DATABASE NAME" since the data was processed with the file USC_DICT (fig. 15). The output file (raw data file) will contain the dictionary entries as represented in USC_DICT. Use the ADDREC program, ADDABS, to reprocess the data. Enter WRKSTRAT to the prompt "ENTER DATABASE NAME" to adjust dictionary pointer codes to match the dictionary entries as they appear in WORKDICT (fig. 15). Follow the same steps here as those for processing new data. Use the LIST command in PACER to see if -FROM -TO values have been added (fig. 33). Latlongs should also be checked.

This program is also used when the data are finalized by the user's standards and ready to be posted to the master database by the NCRDS staff. In this case OUTDISK is used to convert the data from the user's working area attached to WORKDICT to a raw data file that will be reprocessed by the NCRDS staff to become part of the master database attached to USC_DICT. In this case enter WRKSTRAT to the prompt "ENTER DATABASE NAME" so that the dictionary entries in the raw data file will appear as represented in the WORKDICT (fig. 16). Supply the NCRDS staff with the file name of this raw data file for addition to the master database along with a list of keys to be deleted from the master database.

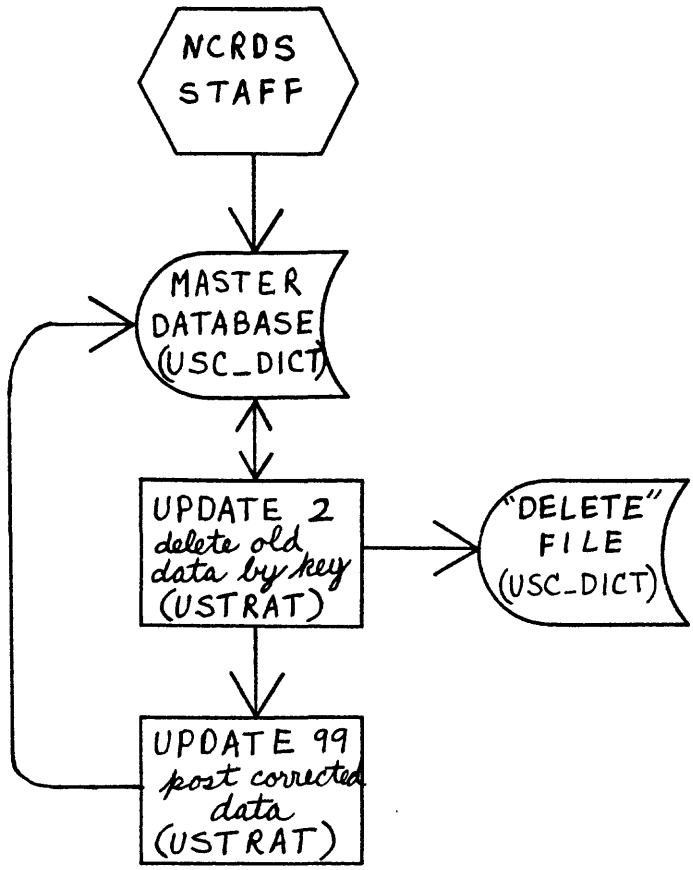

Figure 14.--Flow chart showing NCRDS deletion of old data from master database and replacement with improved data.

Step 1

```
OUTDISK
PRESS CARRIAGE RETURN23
ENTER DATABASE NAME: USTRAT
ENTER INPUT FILE NAME: SAYLE.MF
ENTER OUTPUT FILE NAME: SAYLE
OK,
```

Step 2

```
ADDABS
THIS IS A CPL PROGRAM WHICH BUILDS A CPL PROGRAM
THAT ALLOWS YOU TO RUN ABSENTEE ADDREC IN
A BATCH OR PHANTOM MODE

YOU MAY CALL YOUR ADDAB CPL PROGRAM ANYTHING YOU LIKE
THIS PROGRAM APPENDS .CPL TO YOUR OUTPUT FILE NAME

ENTER CPL FILE NAME: CHGDIC
ENTER DATABASE NAME: WRKSTRAT
ID: 00
INPUT: SAYLE
OUTPUT: SAYLE.WF
KEY: 0
ENTER MASTER FILE NAME TO BE POSTED: <CR>
[JOB rev 19.4]
Your job, #00016, was submitted to queue EVENING.
Home=<BCRDEN>LBIEWICK>BROADUS>TEST
DO YOU WISH TO ENTER ANY MORE JOBS (Y OR N)?: N
OK,
```

Figure 15.--Converting data from USC_DICT to WORKDICT.

```
OUTDISK
PRESS CARRIAGE RETURN23
ENTER DATABASE NAME: WRKSTRAT
ENTER INPUT FILE NAME: SAYLE.WF
ENTER OUTPUT FILE NAME: SAYLENEW
OK,
```

Figure 16.--Converting improved data file to raw data file to be added to master database.

STEPS FOR UPDATING

1. Search data from PACER file.

2. Update data.

NOTES FOR:

DICTIONARY ITEMS
-If connected to USC_DICT new values cannot be entered. Look at copy of USC_DICT for a synonym of your entry.

-If connected to WORKDICT, look at copy of WORK-DICT to see if a synonym already exists for your entry before entering a new item.

NON-DICTIONARY ITEMS
-There will be no conflicts with USC_DICT or WORKDICT.

THICKNESS VALUES
-Except for surface elevation, are stored in inches. New values must be entered in inches.

-If changes were made to thickness or -FROM -TO values, one or the other will have to be changed to 0.00, using UPDATE 4 (batch), and STRATTHK rerun.

LATLONGS
-Are stored in thousandths of seconds. Accuracy will be lost if updating these values to only the nearest second.

3. Post changed file back to main working file.

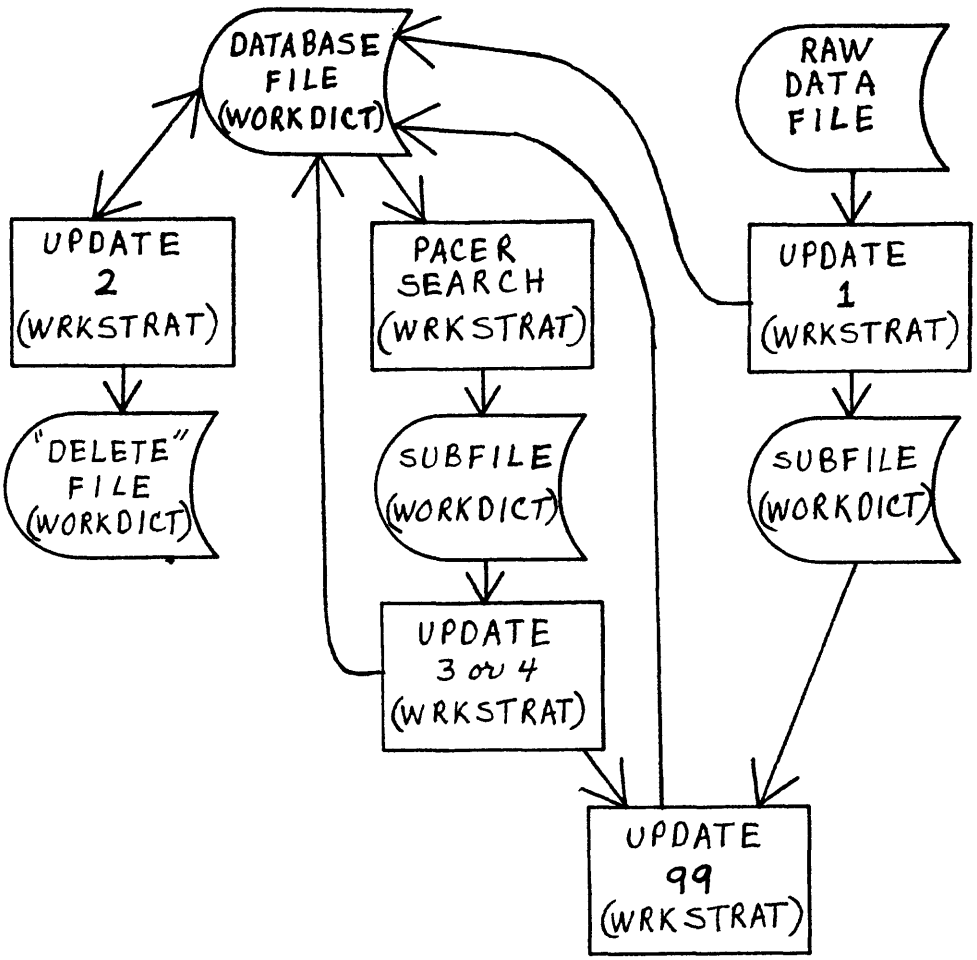

Figure 17.--Flow chart showing UPDATE procedures for data connected to WORKDICT.

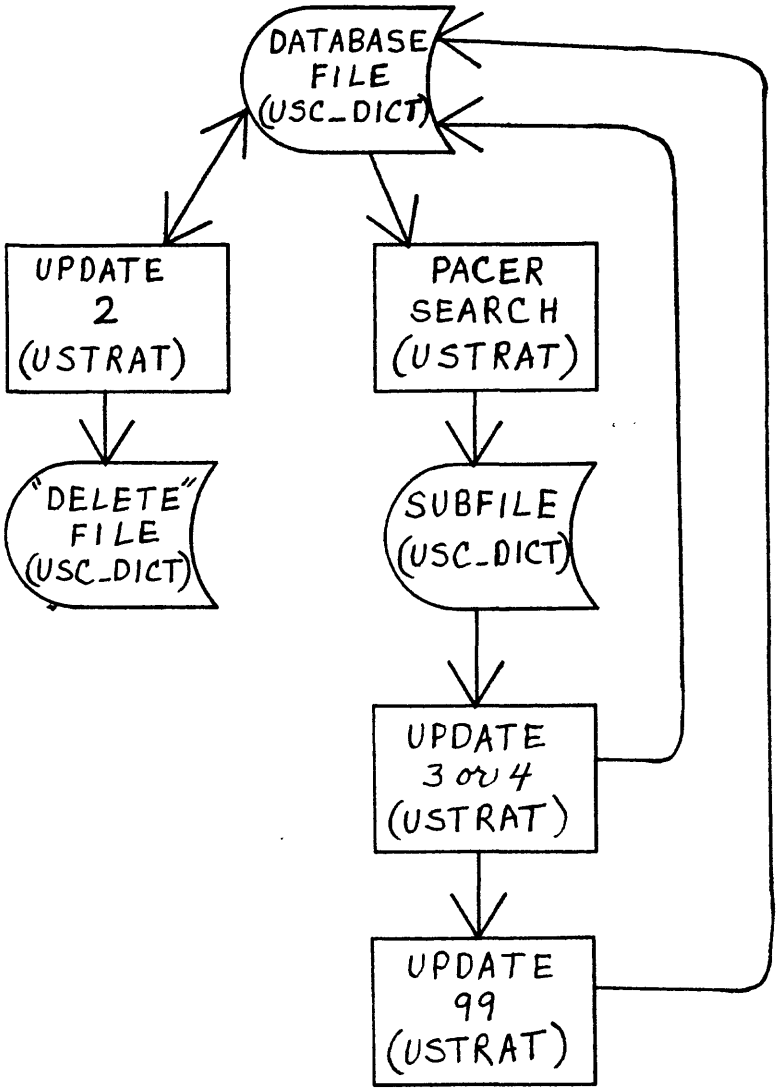

Figure 18.--Flow chart showing UPDATE procedures for data connected to USC_DICT.

PACER UPDATE

The UPDATE command in PACER allows users to change data in a subfile created by doing a PACER search. UPDATE changes made to a subfile are permanent and should be checked before posting back to your main working file. The UPDATE command will not allow users to post to the NCRDS master database. The data in your working area are not part of the NCRDS master database until you notify NCRDS staff and they post them.

In PACER the user controls the level of help he/she receives during a terminal session by the user's response given to the first prompt, 'PRESS CARRIAGE RETURN'. By pressing the carriage return as instructed, the user gets the most help available in PACER. Alternate choices are to enter either 23, 24, or 25 and then a carriage return. Help messages decrease with each increasing number. As a user becomes more acquainted with the PACER programs he/she may need fewer instructions on the terminal.

The user must respond to the prompt to enter the 'DATABASE NAME' with either USTRAT or WRKSTRAT (fig. 19). Enter the 'COMMAND' UPDATE (UPDA); only the first four letters of a command are required in PACER. Enter 00 for the 'DATA MANAGER ID NO'. The next prompt is for the 'UPDATE PROCEDURE'. There are five PACER UPDATE procedures available:

1. Raw data input (ADDREC).

2. Delete records.

3. Sequential review and revision of records.

4. Batch revision.

99. Posting to existing database files.

```
OK, PACER
PRESS CARRIAGE RETURN <CR>
 WELCOME TO THE NORDS PACER RETRIEVAL SYSTEM.
 AT THE CURRENT TIME THE FOLLOWING DATA BASES ARE AVAILABLE:

 USCOAL  - USGS COAL RESOURCES DATA

 USALYT  - COAL ANALYTICAL DATA FOR SELECTED AREAS

 USPEAT  - NOT AVAILABLE AT THIS TIME

 USCHEM  - USGS GEOCHEMICAL ANALYTICAL DATA

 USGEOL  - US GEOLOGICAL DATA

 BMALYT  - USBM STANDARD US COAL ANALYTICAL DATA

 USTRAT  - USGS STRATIGRAPHIC SEQUENCE DATA

 BMRESBAS- USBM SUMMARY RESERVE BASE AND AVG. ANAL.

 USPET   - USGS PETROGRAPHIC DATA FOR SELECT. AREAS

 ICHEM   - INT'L GEOCHEMICAL ANALYTICAL DATA

 BEFORE ANY OF THESE DATA BASES MAY BE ACCESSED,
 A DATA BASE FROM THE ABOVE LIST MUST BE SELECTED.

ENTER DATABASE NAME: *PKSTRAT (OR USTRAT)


ENTER COMMAND: UPDA
    This is 'update'.  It is designed to permit the user to add
 records to or delete records from the master file, or to change
 records or portions of records in a subfile of the master file.
 The five procedures used to update the master file are:
      1.  The addition of new records already written into a temporary
          file.  Unlike the other update procedures which operate on
          records in the master file format, this procedure operates
          on raw data records and converts these records to the
          master file format for insertion in to the master file.
      2.  The deletion, by key, of records already existing in the
          master file.
      3.  The sequential revision of records from a selected subfile
          (i.e. selected through a logical search) from the master file.
          This subfile may then be posted on to the master file after
          the desired revisions are completed.
      4.  The batch revision of a given data element which will be the
          same value for all records in the selected subfile.  When
          revision has been completed on any selected subfile, the user
          may then elect to post the revised subfile onto the master file
          or save the subfile for review and possible further revision by
          any of the 2-4 update procedures.
    Records deleted from the master file are saved in a special 'save
 deletion' file for future recovery if there should arise a need to
 reconstitute these records.
DATA MANAGER ID NO. (1-99): 00
UPDATE PROCEDURE (1-4):
```

Figure 19.--PACER UPDATE command.

UPDATE 1 ("ADDREC")

The UPDATE 1 procedure converts raw data to the database storage and retrieval system format as an interactive process. It is used for raw data that are in the NCRDS revised format (5/84) (fig. 2). For large files use the ADDABS program (ADDREC absentee). See NCRDS staff for assistance.

When converting raw data to a database formatted file with UPDATE 1 the user has the choice of displaying each record as it is converted to the PACER database format (fig. 20). This option will take more time and is not advisable for large amounts of data. Answer yes (Y) to the prompt, 'DO YOU WISH TO WRITE THIS FILE ONTO THE MASTER FILE?' The raw data should be checked prior to using this program so that data are ready to be added to your master file. A no (N) response means that there is an error in your file and the unique key numbers won't be recorded. The program prompts the user if there is an error with the prompt: 'AN ERROR WAS ENCOUNTERED AT LINE 'X'' (fig. 21). Correct the data file and rerun UPDATE 1. If no errors are encountered, post the file to the master file in your working area. If you don't post you will come up with duplicate keys in subsequent files that are "ADDRECed". To return to command level enter 0 to the prompt, 'UPDATE PROCEDURE'.

Whenever a user "ADDRECs" data he/she is attached to the WORKDICT. The user will be prompted to add any nonmatching dictionary entries. Check the WORKDICT in the users' room to see if a synonym already exists for your entry before entering a new item. Typographical errors are common reasons for not matching existing dictionary entries and should be checked closely.

```
OK, PACER
PRESS CARRIAGE RETURN <CR>
 WELCOME TO THE NCRDS PACER RETRIEVAL SYSTEM.
 AT THE CURRENT TIME THE FOLLOWING DATA BASES ARE AVAILABLE:

 USCOAL  - USGS COAL RESOURCES DATA

 USALYT  - COAL ANALYTICAL DATA FOR SELECTED AREAS

 USPEAT  - NOT AVAILABLE AT THIS TIME

 USCHEM  - USGS GEOCHEMICAL ANALYTICAL DATA

 USGEOL  - US GEOLOGICAL DATA

 BMALYT  - USBM STANDARD US COAL ANALYTICAL DATA

 USTRAT  - USGS STRATIGRAPHIC SEQUENCE DATA

 BMRESBAS- USBM SUMMARY RESERVE BASE AND AVG. ANAL.

 USPET   - USGS PETROGRAPHIC DATA FOR SELECT. AREAS

 ICHEM   - INT'L GEOCHEMICAL ANALYTICAL DATA

 BEFORE ANY OF THESE DATA BASES MAY BE ACCESSED,
 A DATA BASE FROM THE ABOVE LIST MUST BE SELECTED.

ENTER DATABASE NAME: WRKSTRAT


ENTER COMMAND: UPDA
    This is 'update'.  It is designed to permit the user to add
 records to or delete records from the master file, or to change
 records or portions of records in a subfile of the master file.
 The five procedures used to update the master file are:
      1.  The addition of new records already written into a temporary
          file.  Unlike the other update procedures which operate on
          records in the master file format, this procedure operates
          on raw data records and converts these records to the
          master file format for insertion in to the master file.
      2.  The deletion, by key, of records already existing in the
          master file.
      3.  The sequential revision of records from a selected subfile
          (i.e. selected through a logical search) from the master file.
          This subfile may then be posted on to the master file after
          the desired revisions are completed.
      4.  The batch revision of a given data element which will be the
          same value for all records in the selected subfile.  When
          revision has been completed on any selected subfile, the user
          may then elect to post the revised subfile onto the master file
          or save the subfile for review and possible further revision by
          any of the 2-4 update procedures.
    Records deleted from the master file are saved in a special 'save
 deletion' file for future recovery if there should arise a need to
 reconstitute these records.
DATA MANAGER ID NO. (1-99): 00
UPDATE PROCEDURE (1-4): 1
 THE ADD RECORD PROCEDURE IS DESIGNED TO READ A RAW DATA INPUT FILE AND CONVERT
 THE RECORDS TO THE RECORD STRUCTURE THAT IS COMPATIBLE WITH THE MASTER FILE
 OF "PACER", CHECKING FOR CORRECT DICTIONARY ENTRIES, AND PROMPTING THE DATA
 MANAGER TO REQUEST ADDITION OF THE NONMATCHING DICTIONARY ENTRIES TO THE
 DICTIONARY LIST OR TO CORRECT THE INPUT ENTRY SO THAT IT MATCHES A VALUE
 ALREADY IN THE DICTIONARY LIST.

 IF THE INPUT FILE DOES NOT CONTAIN RAW DATA, THE DATA MANAGER CAN EXIT THIS
 REVISION PROCEDURE TO SELECT A DIFFERENT PROCEDURE (3-5) BY ENTERING "QUIT",
 WHEN PROMPTED FOR A FILE NAME.


NAME OF RAW DATA INPUT FILE: ADR24-54
NAME OF TRANSLATED FILE FOR POSTING TO MASTER FILE: PAC24-54
ENTER BEGINNING KEY: 0
DO YOU WISH TO DISPLAY EACH RECORD IN THE INPUT FILE ON THE TERMINAL? N
    22 SAMPLES HAVE BEEN CONVERTED

 THE INPUT FILE IS NOW READY FOR POSTING ONTO
 THE MASTER FILE.  IF YOU WISH TO MAKE FURTHER CHANGES,
 TO THIS FILE BEFORE IT IS POSTED, SELECT THE SEQUENTIAL,
 BATCH, OR KEYED REVISION PROCEDURE AND SPECIFY THE NAME
 OF THIS FILE.
 FILE PAC24-54 HAS BEEN REVISED.
 DO YOU WISH TO WRITE
 THIS FILE ONTO THE MASTER FILE?Y
MASTER FILE NAME: BALDY

 UPDATE OPERATIONS HAVE BEEN COMPLETED.
 IF YOU WISH TO CONTINUE WITH THE UPDATE PROCEDURE, ENTER THE NUMBER (1-4).
 ENTERING A "0" FOR THE PROCEDURE PROMPT OR "QUIT" FOR THE FILE PROMPT WILL
 RETURN CONTROL TO THE SEARCH AND RETRIEVAL PORTION OF "PACER".

UPDATE PROCEDURE (1-4): 0
```

Figure 20.--UPDATE option 1 - raw data input.

```
PACER
PRESS CARRIAGE RETURN23
ENTER DATABASE NAME: WRKSTRAT


ENTER COMMAND:  UPDA
DATA MANAGER ID NO. (1-99): 00
UPDATE PROCEDURE (1-4): 1
NAME OF RAW DATA INPUT FILE: ADR21-42
NAME OF TRANSLATED FILE FOR POSTING TO MASTER FILE: T21-42
ENTER BEGINNING KEY: 0
DO YOU WISH TO DISPLAY EACH RECORD IN THE INPUT FILE ON THE TERMINAL? N
 AN ERROR WAS ENCOUNTERED AT LINE    2
     1 SAMPLES HAVE BEEN CONVERTED
```


Figure 21.--UPDATE option 1 - error encountered.

UPDATE 2 (Delete Data)

The UPDATE 2 procedure is used to delete records from a database file. Before using this program for the first time you must create a file to store the data you are deleting from your database. It must be given the file name DELETE. This file serves as a backup in case the user deletes data unintentionally. To create the DELETE file search one key number using the KEYS command in PACER (fig. 22). Enter DELETE for the 'OUTPUT FILE NAME'. Now you are ready to use the UPDATE option 2 to delete keys.

At the current time every record you delete will be printed on the terminal screen. It is best to use a CRT terminal for this procedure. Figure 22 was edited to show only the first and last records deleted. Every time you use UPDATE option 2, the data you delete will be added to the DELETE file; you should keep this file until you are finished working with the data.

Any records from the master database will only be deleted in your working file. These records still exist in the master database. Supply NCRDS staff with a list of key numbers to delete from the master database. If connected to USC_DICT a list of key numbers from the DELETE file will match the data as it appears in the master database.

A gap in key numbers when deleting units won't affect access to the data, but a gap in unit numbers will generate an error in STRATTHK. Use the formula command in UPDATE 4 (described in section on Adding Units, fig. 32) to adjust unit numbers that need to be decreased by the number of units that were deleted (e.g., unit-1 or unit-2); then convert -FROM -TO or thickness values to zero, using UPDATE 4 (batch), and rerun STRATTHK.

Step 1 creating DELETE file

```
PACER
PRESS CARRIAGE RETURN24
ENTER DATABASE NAME: UREGSTRAT (OR USTRAT)


ENTER COMMAND: KEYS
   1. 123657,1
   2. <CR>


ENTER COMMAND: SEAR
ENTER INPUT FILE NAME: BALDY
ENTER OUTPUT FILE NAME: DELETE
 ALL      1 RECORDS OF BALDY                                SEARCHED.
          1 RECORDS FOUND WHICH SATISFY THE REQUEST.
 THEY HAVE BEEN STORED IN DELETE
DO YOU WANT TO SEARCH ANOTHER INPUT FILE? N
```

Step 2 UPDATE 2

```
ENTER COMMAND: UPDA
DATA MANAGER ID NO. (1-99): 99
UPDATE PROCEDURE (1-4): 2
MASTER FILE NAME: BALDY
   1. 51000526,51000542
   2. 123657,123680
   3. <CR>

                              * * * * * * * * * *

 POINTID: 21-27               FILEPTR: NDE              HYDROCB:        0
 OWNRSHP: NDE                   STATE: MONTANA          GEOL: USGD-BIEWICK L H
  COUNTY: POWDER RIVER               DATE: 820611  COALPRV: N GREAT PLAINS
  REGION: POWDER RIVER                               FIELD: MOORHEAD
    QUAD: BALDY PEAK (7.5')                        ESTRANK: SUBBIT

  SOURCE: NDE                       SURF-ELV:    3667.0   ELVPREC:  9
 TOTDEPT:    1152.0          STRIKE:    0   DIP:    0    ANGLE:    0 DESCRIP/LOG: 102
 LATITUD:   450935 N         LLPREC:  0 PMERID: 20   WEAQUAL: 0
 LONGTUD:  1053336 W
 QUARTRS:    SW SE SW  SECTION:    2.0   TOWNSHIP:     8.0 S   RANGE:  50.0 E
 COMENT1: HB4

    UNIT:     1      UNITQUAL: U     DEPTH(IN)FROM:       0.0  TO:     684.0
   THICK:   684.0  FORMATN: FORT UNION          BED: OBELL ZONE
 LITHOGY: CL          LITHMOD:              COLOR:          GRNSIZE:
 GRNSHAP:             MINERAL:            BEDING:          CONTACT:
 FOSSILS:               F/J/C:               UC1:              UC2:        0.
 COMENT2:                                                      KEY:   123657

                              * * * * * * * * * *

                (ONLY FIRST AND LAST UNITS DELETED ARE SHOWN HERE)
                              * * * * * * * * * *

 POINTID: 24-54               FILEPTR: NDE              HYDROCB:        0
 OWNRSHP: NDE                   STATE: MONTANA          GEOL: USGS-BIEWICK L H
  COUNTY: POWDER RIVER               DATE: 690202  COALPRV: N GREAT PLAINS
  REGION: POWDER RIVER                               FIELD: MOORHEAD
    QUAD: SAYLE (7.5')                             ESTRANK: SUBBIT

  SOURCE: CHANDLER & ASSOC          SURF-ELV:    4089.0   ELVPREC:  4
 TOTDEPT:    4404.0          STRIKE:    0   DIP:    0    ANGLE:    0 DESCRIP/LOG: 217
 LATITUD:   451025 N         LLPREC:  1 PMERID: 20   WEAQUAL: 0
 LONGTUD:  1054035 W
 QUARTRS:       SE SE  SECTION:   17.0   TOWNSHIP:     8.0 S   RANGE:  47.0 E
 COMENT1: INDIAN GULLY 1, MG TO 200', IES 200' ON

    UNIT:    17      UNITQUAL:       DEPTH(IN)FROM:       0.0  TO:       0.0
   THICK:    48.0  FORMATN: FORT UNION          BED: NDE
 LITHOGY: SH          LITHMOD:              COLOR:          GRNSIZE:
 GRNSHAP:             MINERAL:            BEDING:          CONTACT:
 FOSSILS:               F/J/C:               UC1:              UC2:        0.
 COMENT2:                                                      KEY: 51000542

                              * * * * * * * * * *


     41 RECORDS HAVE BEEN DELETED
UPDATE PROCEDURE (1-4): 0


ENTER COMMAND: QUIT

 THE FOLLOWING FILES HAVE BEEN ACCESSED
 OR CREATED DURING THIS SESSION:
    1      DELETE

 USE PRIME'S DELETE COMMAND TO DELETE
```

Figure 22.--UPDATE option 2 - delete keys.

UPDATE 3 (Sequential Update)

The UPDATE 3 procedure allows the user to change data elements sequentially for each stratigraphic unit record for one or more whole or partial drill holes or vertical sections. Use PACER to search the units you wish to change (fig. 23). Any changes in the header record need only be made to unit 1 of that vertical sequence. Enter 'UPDATE PROCEDURE' 3. After the user has listed the 'DATA FILE TO BE REVISED', the program prompts for the 'DATA ELEMENT TO BE CHANGED'. Enter the abbreviated version of the data element you are changing. Refer to the USTRAT mask file in the PACER section of the NCRDS User's Manual; or use the LIST command in PACER as shown in figure 24.

NOTE: THICKNESS VALUES (EXCEPT FOR SURFACE ELEVATION) ARE STORED IN THE DATABASE IN INCHES; THEREFORE, CORRECTIONS MUST BE ENTERED IN INCHES (fig. 25). IF CHANGES TO THICKNESS, OR -FROM -TO VALUES ARE MADE, CONVERT ONE OR THE OTHER TO ZERO USING UPDATE 4 (BATCH) AND RERUN STRATTHK ON THE ENTIRE DRILL HOLE OR VERTICAL SEQUENCE TO RECALCULATE PROPER VALUES FOR THAT POINTID.

Latitude and longitude values are stored in thousandths of seconds for accuracy. Rarely should a user have to update these values; if done, however, be sure to enter 3 digits to the right of seconds.

After all the changes are made to a unit, answer no (N) to the prompt, 'DO YOU WISH TO CHANGE ANY MORE DATA BELONGING TO THIS RECORD?' The program will move to the next unit record to be changed.

Occasionally the user may enter a value or term that is not found in the WORKDICT. Check the WORKDICT in the users' room. Answering no (N) to the prompt 'DO YOU WISH TO ENTER THIS DATA IN THE DICTIONARY?' allows the user to reenter the 'NAME OF DATA ELEMENT TO BE CHANGED'. Answering yes (Y) to the prompt makes that data item a permanent entry in the WORKDICT.

NOTE: IF THE USER'S DATA ARE ATTACHED TO THE USC_DICT, THE PROGRAM WON'T ALLOW THE USER TO ADD A NEW ITEM TO THE DICTIONARY.

If a unit requires no changes type NEXT when prompted, 'NAME OF DATA ELEMENT TO BE CHANGED'. The program will skip this unit and go on to the next unit. When the end of file is reached, the program asks 'DO YOU WISH TO WRITE THIS FILE ONTO YOUR DATA FILE?' The novice should answer no (N) and check the data before writing them (posting) to their main working file. UPDATE option 99 (described later) is designed solely for posting to the main working file. If yes (Y) is entered the program prompts for the 'DATA FILE NAME' to post to. To avoid overwriting corrections, data files being changed should be posted back to the user's main working file before another file is searched for corrections.

NOTE: LET THE PROGRAM RUN TO COMPLETION. NEVER BREAK OUT OF POSTING OR TRY TO ACCESS A FILE THAT IS BEING POSTED OR POSTED TO IN BATCH MODE; INTERRUPTING POSTING WILL CHANGE YOUR DATA FILES.

```
OK, PACER
PRESS CARRIAGE RETURN 23 *
ENTER DATABASE NAME: WRKSTRAT (OR USTRAT)


ENTER COMMAND:  COND
A.  POINTID EQ 21-25
B.  UNIT EQ 1
C.  UNIT EQ 3
D.  <CR>


ENTER COMMAND:  LOGI
ENTER LOGIC:A*(B+C)


ENTER COMMAND:  SEAR
ENTER INPUT FILE NAME:  B21ADDLL
ENTER OUTPUT FILE NAME: U3.21-25
 ALL     59 RECORDS OF B21ADDLL                                  SEARCHED.
          2 RECORDS FOUND WHICH SATISFY THE REQUEST.
 THEY HAVE BEEN STORED IN U3.21-25
DO YOU WANT TO SEARCH ANOTHER INPUT FILE? N
```

*Entering 23, 24 or 25 controls the amount of information displayed during UPDATE commands: 23 displays record, 24 does not display record, 25 does not display record and abbreviates prompts.

Figure 23.--PACER search for data to be revised.

```
PACER
PRESS CARRIAGE RETURN23
ENTER DATABASE NAME: WRKSTRAT


ENTER COMMAND:  LIST
ENTER NAME OF FILE: BALDY
ENTER NUMBER OF LINES/PAGE: <CR>
AT EACH PAUSE IN THE LISTING, PRESS RETURN KEY
TO CONTINUE ,A TO ABORT.
SELECT C, F, OR R: C
WOULD YOU LIKE OUTPUT TO BE TO DISK? N
ENTER THE LIST OF ITEM NAMES.

1.  HELP
 HELP      IS UNRECOGNIZED. REENTER NAME.
WOULD YOU LIKE TO SEE A LIST OF THE ITEM NAMES? Y
 THE ORIGINAL ITEM NAMES ARE:
 POINTID FILEPTR HYDROCD OWNRSHP STATE   COUNTY  COLECTR COALPRV REGION  DATE
 CONFID  QUAD    FIELD   ESTRANK SURFELV ELVPREC TOTDEPT LOCSTR  LOCDIP  LOCANGL
 SOURCE  DSCPLOG LATITUD NS      LONGTUD EW      LLPREC  PMERID  QUARTR1 QUARTR2
 QUARTR3 QUARTR4 SECTION TWNSHIP TNS     RANGE   REW     WEAQUAL COMENT1 SAVE1
 UNIT    UNITQAL FROM    TO      THK     FORMATN BED     LITH    LITHMOD COLOR
 GRNSIZE GRNSHAP MINERAL BEDDING CONTACT FOSSILS FJC     WC1     WC2     COMENT2
 SECURE  LASTUPD

1. <CR>


ENTER COMMAND:  QUIT
OK.
```

Figure 24.--Abbreviated version of item names used in PACER.

```
ENTER COMMAND: LPDA
DATA MANAGER ID NO. (1-99): 00
UPDATE PROCEDURE (1-4): 3
DATA FILE TO BE REVISED: U3.21-25

                          * * * * * * * * * *

 POINTID: 21-25              FILEPTR: NDE              HYDROCD:        0
 OWNRSHP: NDE                  STATE: MONTANA          GEOL: LSGD-BIEWICK L F
  COUNTY: POWDER RIVER             DATE: 7DC11>  COALPRV: N GREAT PLAINS
  REGION: POWDER RIVER                             FIELD: MOOREHEAD
    QUAD: BALDY PEAK (7.5')                      ESTRANK: SUBBIT

  SOURCE: WEBB RES. 1-31 INC-U.S.   SURF-ELV:    3998.0   ELVPREC:  1
 TOTDEPT:       0.0        STRIKE:    0   DIP:    0    ANGLE:    0 DESCRIP/LOG: 217
 LATITUD:   451116 n       LLPREC:  0 PMERID: 20   WFACQUAL: 0
 LONGTUD:  1053030 w
 QUARTRS:       NE NE  SECTION:   31.0   TOWNSHIP:     7.0 S   RANGE:   51.0 E
 COMENT1: IEL AND C-BDC LOGS

    UNIT:     1      UNITQUAL:        DEPTH(IN)FROM:       0.0  TO:       0.0
   THICK:    2268.0  FORMATN: FORT UNION          BED: NDE
 LITHOGY: NR          LITHMOD:                COLOR:           GRNSIZE:
 GRNSHAP:             MINERAL:              BEDING:           CONTACT:
 FOSSILS:               F/J/C:                 WC1:               WC2:       0.
 COMENT2:                                                        KEY:   654566

                          * * * * * * * * * *


NAME OF DATA ELEMENT TO BE CHANGED: FIELD
ENTER DATA: MOOREHEAD
DO YOU WISH TO CHANGE ANY MORE DATA BELONGING TO THIS RECORD? Y
NAME OF DATA ELEMENT TO BE CHANGED: FORMATN
ENTER DATA: FT UNION

 THERE IS NO DICTIONARY MATCH FOR DATA NAME: FORMATN
 ALPHANUMERIC DATA: FT UNION
DO YOU WISH TO ENTER THIS DATA IN THE DICTIONARY? N
NAME OF DATA ELEMENT TO BE CHANGED: THK
ENTER DECIMAL VALUE: 2256.
DO YOU WISH TO CHANGE ANY MORE DATA BELONGING TO THIS RECORD? N

                          * * * * * * * * * *

 POINTID: 21-25              FILEPTR: NDE              HYDROCD:        0
 OWNRSHP: NDE                  STATE: MONTANA          GEOL: LSGD-BIEWICK L F
  COUNTY: POWDER RIVER             DATE: 7DC11>  COALPRV: N GREAT PLAINS
  REGION: POWDER RIVER                             FIELD: MOOREHEAD
    QUAD: BALDY PEAK (7.5')                      ESTRANK: SUBBIT

  SOURCE: WEBB RES. 1-31 INC-U.S.   SURF-ELV:    3998.0   ELVPREC:  1
 TOTDEPT:       0.0        STRIKE:    0   DIP:    0    ANGLE:    0 DESCRIP/LOG: 217
 LATITUD:   451116 n       LLPREC:  0 PMERID: 20   WFACQUAL: 0
 LONGTUD:  1053030 w
 QUARTRS:       NE NE  SECTION:   31.0   TOWNSHIP:     7.0 S   RANGE:   51.0 E
 COMENT1: IEL AND C-BDC LOGS

    UNIT:     1      UNITQUAL:        DEPTH(IN)FROM:       0.0  TO:       0.0
   THICK:     348.0  FORMATN: FORT UNION          BED: COAL
 LITHOGY: COAL        LITHMOD:                COLOR:           GRNSIZE:
 GRNSHAP:             MINERAL:              BEDING:           CONTACT:
 FOSSILS:               F/J/C:                 WC1:               WC2:       0.
 COMENT2:                                                        KEY:   654568

                          * * * * * * * * * *


NAME OF DATA ELEMENT TO BE CHANGED: NEXT

 YOU HAVE ENTERED "NEXT" WHICH LEAVES THE RECORD (KEY =  654568) UNREVISED.
 FILE U3.21-25 HAS BEEN REVISED.
 DO YOU WISH TO WRITE
 THIS FILE ONTO THE MASTER FILE?N
UPDATE PROCEDURE (1-4): 0


ENTER COMMAND: QUIT
```

Figure 25.--UPDATE option 3 - sequential review and revision of records.

UPDATE 4 (Batch Revision)

The UPDATE 4 procedure is used to change the same data element for every unit record in a subfile to a given value; for example, adding formation name or updating numeric items with an entered formula (example shown later in section on Adding Units). No display is produced for the records changed in batch revision because of the mass record revision capability of this UPDATE procedure (Krohn and others, 1981, see fig. 26). Again, the choice of adding the changed data to your data file is available. If the user desires to examine the records in this subfile before posting the data to his/her main working file, UPDATE 3, the LIST command in PACER, or the LSTRATUS program (fig. 34) could be used.

Step 1 PACER search for data to be revised

```
PACER
PRESS CARRIAGE RETURN23
ENTER DATABASE NAME: WRKSTRAT (OR USTRAT)


ENTER COMMAND:  COND
A.  FORMATN EQ NOE
B.  <CR>


ENTER COMMAND:  LOGI
ENTER LOGIC:A


ENTER COMMAND:  SEAR
ENTER INPUT FILE NAME:  B21ADDLL
ENTER OUTPUT FILE NAME: ADDFORM
 ALL     59 RECORDS OF B21ADDLL                                SEARCHED.
         29 RECORDS FOUND WHICH SATISFY THE REQUEST.
 THEY HAVE BEEN STORED IN ADDFORM
DO YOU WANT TO SEARCH ANOTHER INPUT FILE? N
```

Step 2 UPDATE 4

```
ENTER COMMAND:  UPDA
DATA MANAGER ID NO. (1-99): 00
UPDATE PROCEDURE (1-4): 4
DATA FILE TO BE REVISED: ADDFORM
NAME OF DATA ELEMENT TO BE CHANGED: FORMATN
ENTER VALUE: FORT UNION
DO YOU WISH TO CHANGE ANY MORE DATA BELONGING TO THIS FILE? N
 FILE ADDFORM  HAS BEEN REVISED.
 DO YOU WISH TO WRITE
 THIS FILE ONTO THE MASTER FILE?Y
MASTER FILE NAME: B21ADDLL

 UPDATE OPERATIONS HAVE BEEN COMPLETED.
 IF YOU WISH TO CONTINUE WITH THE UPDATE PROCEDURE, ENTER THE NUMBER (1-4).
 ENTERING A "Q" FOR THE PROCEDURE PROMPT OR "QUIT" FOR THE FILE PROMPT WILL
 RETURN CONTROL TO THE SEARCH AND RETRIEVAL PORTION OF "PACER".
```

Figure 26.--UPDATE option 4 - batch revision of records.

UPDATE 99 ("Posting")

UPDATE 99 is the UPDATE procedure that allows the user to write a subfile to his/her main working file. After verification of data in subfiles that have been processed, use UPDATE 99 to post these data to your main working file (fig. 27).

> AGAIN, LET THE PROGRAM RUN TO COMPLETION.
> YOU SHOULD NEVER BREAK OUT OF UPDATE OR
> THE FILES WILL BE UNRELIABLE.

To avoid overwriting one set of corrections with another, always work with one data file at a time. Data files being updated must be searched from the main file, corrected, and posted back to the main working file in the user's work area before another file is retrieved from the main file for corrections. Users can only post to files in their own working area, not to the master database.

During the previous UPDATE options 3 or 4, the user may post changes to his/her main working file. But if the user wishes to review corrections before posting to his/her main file, UPDATE 99 allows the corrections to be posted without having to be in UPDATE 3 or 4. In UPDATE 1 the user must post to the main working file in order to record the key numbers assigned to the unit records.

```
UPDATE PROCEDURE (1-4): 99
DATA FILE TO BE REVISED: B21ADDLL
MASTER FILE NAME: BALDY

 UPDATE OPERATIONS HAVE BEEN COMPLETED.
 IF YOU WISH TO CONTINUE WITH THE UPDATE PROCEDURE, ENTER THE NUMBER (1-4).
 ENTERING A "0" FOR THE PROCEDURE PROMPT OR "QUIT" FOR THE FILE PROMPT WILL
 RETURN CONTROL TO THE SEARCH AND RETRIEVAL PORTION OF "PACER".

UPDATE PROCEDURE (1-4): 0


ENTER COMMAND:  QUIT
```

Figure 27.-- UPDATE option 99 - posting.

STEPS FOR ADDING UNITS TO PACER FILES

1. Search entire drill hole or vertical sequence to which stratigraphic units need be added using PACER; e.g. by pointid or keys.

2. Convert either thickness or -FROM -TO values to zero using UPDATE 4 (batch) after checking said values.

3. Convert output file from PACER database to raw data format using OUTDISK program.

4. Insert new units in proper position in raw data file using PRIME editor.

5. Convert data to database format using either UPDATE 1 in PACER (for small files) or the PRIME CPL program, ADDABS (for large files).

6. Correct unit numbers by entering a formula in UPDATE 4.

7. Recalculate either thickness or -FROM -TO values using STRATTHK.

8. Check total depth with DEPTHCHK program and update total depth field if necessary.

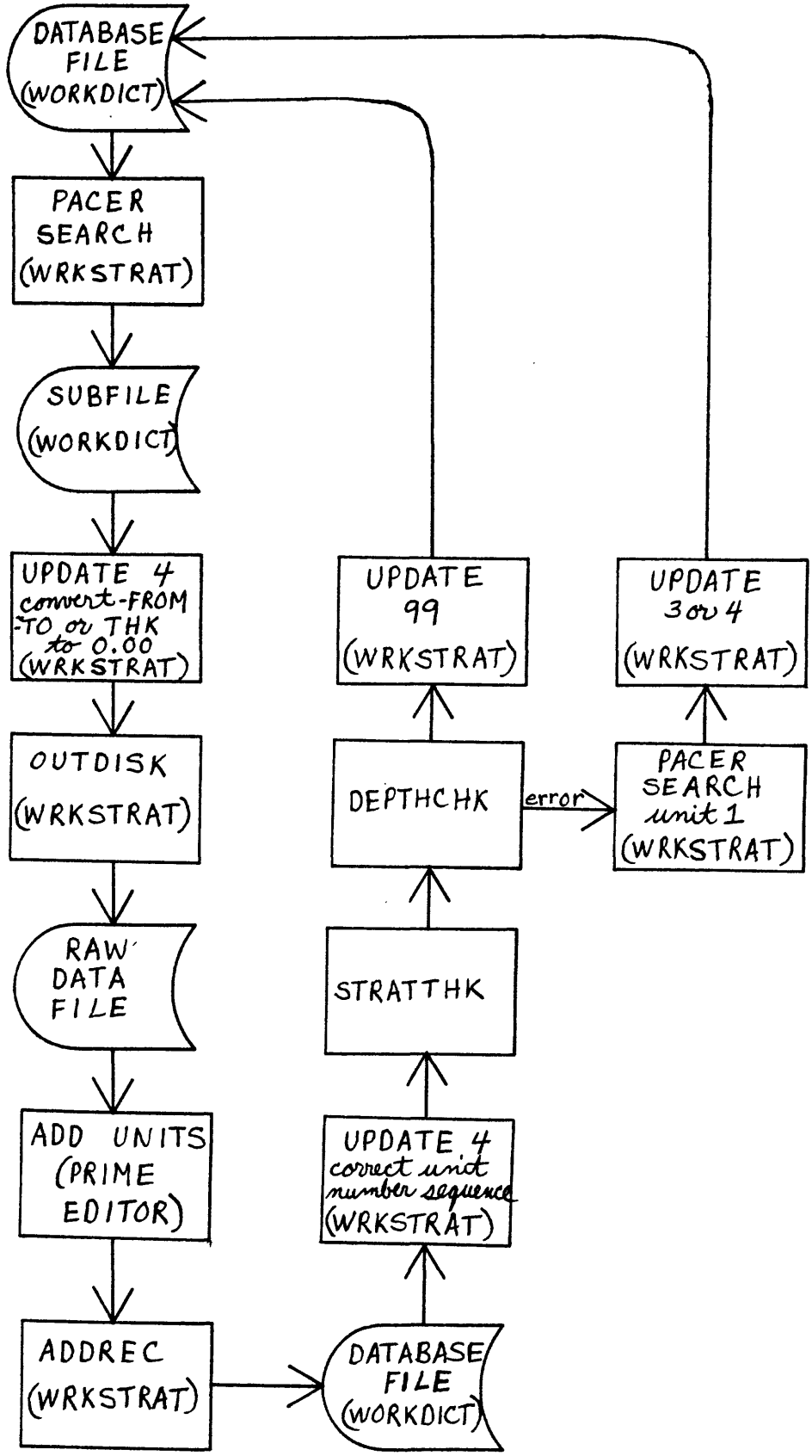

Figure 28.--Flow chart showing steps for adding units to PACER database files.

OUTDISK (Adding Units to PACER Files)

Each individual stratigraphic unit record in the NCRDS databases is identified by a unique sequential key number that is assigned to it when it is added to the system (ADDREC). Updating records by adding units requires that the data be converted back to raw data and reprocessed using the ADDREC programs to assign a new set of sequential key numbers.

NOTE: DATA TO WHICH YOU WISH TO ADD UNITS MUST BE ATTACHED TO THE WORKDICT.

STRATTHK will have to be rerun after adding units to or deleting units from a data file, so before running the program OUTDISK use the PACER LIST command to check -FROM -TO and thickness (THK) values, then use the UPDATE option 4 (batch update) to convert either all thickness or all -FROM -TO values to zero (fig. 29). The program OUTDISK converts database formatted files to raw data files (fig. 30). Insert new units in proper position in the output file from OUTDISK using the PRIME editor (fig. 31). Use either of the ADDREC programs, UPDATE 1 in PACER or the PRIME CPL program, ADDABS, to convert the data back to the database storage and retrieval system format. Unit numbers will no longer be in sequence. Adjust unit numbers by entering a formula in UPDATE 4 (fig. 32).

In the example of editing the raw data file (fig. 31) the user amplified unit 2 containing 81 feet of interbedded shale to show that the lower 21 feet of this unit is a bedded sandstone. The file now contains two unit 3's. In this case the second unit 3 and all subsequent unit numbers need to be increased by a value of 1. Only the units that need to be adjusted should be put into a subfile, corrected using the formula, unit+1, in UPDATE 4 (fig. 32), and posted back to the file that contains all the units.

Use the STRATTHK program to recalculate either thickness or -FROM -TO depth values, and the program DEPTHCHK to check the total depth field. To change the total depth field create a file containing only the unit 1, correct the total depth field using either UPDATE 3 or 4, and post this subfile back to the data file.

Thickness and -FROM -TO depth values can be checked using the LIST command in PACER (fig. 33). The NCRDS LSTRATUS program can be used to check the complete data file (fig. 34).

```
PACER
PRESS CARRIAGE RETURN24
ENTER DATABASE NAME: WRKSTRAT (OR USTRAT)


ENTER COMMAND:  UPDA
DATA MANAGER ID NO. (1-99): 00
UPDATE PROCEDURE (1-4): 4
DATA FILE TO BE REVISED: SA24-54C
NAME OF DATA ELEMENT TO BE CHANGED: FROM
ENTER DECIMAL VALUE: 0.00
DO YOU WISH TO CHANGE ANY MORE DATA BELONGING TO THIS FILE? Y
NAME OF DATA ELEMENT TO BE CHANGED: TO
ENTER DECIMAL VALUE: 0.00
DO YOU WISH TO CHANGE ANY MORE DATA BELONGING TO THIS FILE? N
 FILE SA24-54C HAS BEEN REVISED.
 DO YOU WISH TO WRITE
 THIS FILE ONTO THE MASTER FILE?N
UPDATE PROCEDURE (1-4): 0


ENTER COMMAND:  QUIT
OK,
```

Figure 29.--Converting -FROM -TO values to 0.00 using UPDATE 4.

```
OK, CUTDISK
PRESS CARRIAGE RETURN23
ENTER DATABASE NAME: WRKSTRAT
ENTER INPUT FILE NAME: SA24-54C
ENTER OUTPUT FILE NAME: RAW24-54C
OK, SLIST RAW24-54C
124-54              SAYLE (7.5')                    MONTANA          POWDER RIVER              N GREAT PLAINS  POWDER RIVER
2USGD-BIEWICK L H     CHANDLER & ASSOC                4089. 4   367.     0.2170
3SUBBIT          0  0  0 45102500On1054035000w 1
4690202020     SESE17.C  8.0S 47.0E
5INDIAN GULLY 1, BSG TO 200', IES 200' ON  654426
6    1           0  0.00       0  0.00      5  0.00FORT UNICN       ANDERSON ZONE       COAL
6    2           0  0.00       0  0.00     81  0.00FORT UNICN                           SH        INBD
6    3           0  0.00       0  0.00     14  0.00FORT UNION       ANDERSON ZONE       COAL
6    4           0  0.00       0  0.00    111  0.00FORT UNION                           SH        INBD
6    5           0  0.00       0  0.00      3  0.00FORT UNICN       CANYON              COAL
6    6           0  0.00       0  0.00      3  0.00FORT UNICN                           SH
6    7           0  0.00       0  0.00     18  0.00FORT UNICN       CANYON              COAL
6    8           0  0.00       0  0.00      8  0.00FORT UNICN                           SH
6    9           0  0.00       0  0.00      4  0.00FORT UNICN                           BENT      LITH UNC
6   10           0  0.00       0  0.00      7  0.00FORT UNICN                           SH
6   11           0  0.00       0  0.00     58  0.00FORT UNION                           SS        BD
6   12           0  0.00       0  0.00     18  0.00FORT UNICN                           SH        INBD
6   13           0  0.00       0  0.00     20  0.00FORT UNION                           SS        BD
6   14           0  0.00       0  0.00      8  0.00FORT UNION       COOK ZONE           COAL
6   15           0  0.00       0  0.00      2  0.00FORT UNICN                           SH
6   16           0  0.00       0  0.00      3  0.00FORT UNION       COOK ZONE           COAL
6   17           0  0.00       0  0.00      4  0.00FORT UNION                           SH

OK,
```

Figure 30.--OUTDISK - convert database file to raw data file.

```
ED RAW24-54C
EDIT
P8
.NULL.
124-54          SAYLE (7.5')                MONTANA          POWDER RIVER          N GREAT PLAINS  POWDER RIVER          MOORHEA
2USGS-BIEWICK L F    CHANDLER & ASSOC          4059. 4  367.    0.2170
3SUBBIT        0  0  0 4510250000n1054035000w 1
4690202020     SESE17.0  8.0S 47.0E
5INDIAN GULLY 1, BSG TO 200', IES 200' ON  654426
6   1          0  0.00       0  0.00      5  0.00PORT UNION       ANDERSON ZONE       COAL
6   2          0  0.00       0  0.00     81  0.00PORT UNION                           SH        INBD
C/81/60/
6   2          0  0.00       0  0.00     60  0.00PORT UNION                           SH        INBD
<CR>
INPUT
6   3          0  0.00       0  0.00     21  0.00PORT UNION                           SS        BD
<CR>
EDIT
T
P100
.NULL.
124-54          SAYLE (7.5')                MONTANA          POWDER RIVER          N GREAT PLAINS  POWDER RIVER          MOORHEA
2USGS-BIEWICK L F    CHANDLER & ASSOC          4059. 4  367.    0.2170
3SUBBIT        0  0  0 4510250000n1054035000w 1
4690202020     SESE17.0  8.0S 47.0E
5INDIAN GULLY 1, BSG TO 200', IES 200' ON  654426
6   1          0  0.00       0  0.00      5  0.00PORT UNION       ANDERSON ZONE       COAL
6   2          0  0.00       0  0.00     60  0.00PORT UNION                           SH        INBD
6   3          0  0.00       0  0.00     21  0.00PORT UNION                           SS        BD
6   3          0  0.00       0  0.00     14  0.00PORT UNION       ANDERSON ZONE       COAL
6   4          0  0.00       0  0.00    111  0.00PORT UNION                           SH        INBD
6   5          0  0.00       0  0.00      3  0.00PORT UNION       CANYON              COAL
6   6          0  0.00       0  0.00      3  0.00PORT UNION                           SH
6   7          0  0.00       0  0.00     15  0.00PORT UNION       CANYON              COAL
6   8          0  0.00       0  0.00      8  0.00PORT UNION                           SH
6   9          0  0.00       0  0.00      4  0.00PORT UNION                           RENT      LITH UNC
6  10          0  0.00       0  0.00      7  0.00PORT UNION                           SH
6  11          0  0.00       0  0.00     58  0.00PORT UNION                           SS        BD
6  12          0  0.00       0  0.00     15  0.00PORT UNION                           SH        INBD
6  13          0  0.00       0  0.00     20  0.00PORT UNION                           SS        BD
6  14          0  0.00       0  0.00      5  0.00PORT UNION       COOK ZONE           COAL
6  15          0  0.00       0  0.00      2  0.00PORT UNION                           SH
6  16          0  0.00       0  0.00      3  0.00PORT UNION       COOK ZONE           COAL
6  17          0  0.00       0  0.00      4  0.00PORT UNION                           SH

BOTTOM
FILE
RAW24-54C
```

Figure 31.--Adding units to raw data file using PRIME editor.

```
OK, ADDABS
THIS IS A CPL PROGRAM WHICH BUILDS A CPL PROGRAM
THAT ALLOWS YOU TO RUN ABSENTEE ADDREC IN
A BATCH OR PHANTOM MODE

YOU MAY CALL YOUR ADDAB CPL PROGRAM ANYTHING YOU LIKE
THIS PROGRAM APPENDS .CPL TO YOUR OUTPUT FILE NAME

ENTER CPL FILE NAME: ASSOC
ENTER DATABASE NAME: WRKSTRAT
ID: CC
INPUT: RAW24-54C
OUTPUT: REA24-54C
KEY: C
ENTER MASTER FILE NAME TO BE POSTED:<CR>
[JOB rev 19.4]
Your job, #0CC007, was submitted to queue EVENING.
Home=<SCREEN>LBIRWICK>RADIUS>TEST
DO YOU WISH TO ENTER ANY MORE JOBS (Y OR N)?: N


PACER
PRESS CARRIAGE RETURN24
ENTER DATABASE NAME: WRKSTRAT


ENTER COMMAND:  COND
A.  UNIT EQ 3
B.  LITH EQ COAL
C.  UNIT GT 3
D.


ENTER COMMAND:  LOGI
ENTER LOGIC:(A*B)+C


ENTER COMMAND:  SEAR
ENTER INPUT FILE NAME:  REA24-54C
ENTER OUTPUT FILE NAME: L24-54C
 ALL     18 RECORDS OF REA24-54C                              SEARCHED.
         15 RECORDS FOUND WHICH SATISFY THE REQUEST.
 THEY HAVE BEEN STORED IN L24-54C
DO YOU WANT TO SEARCH ANOTHER INPUT FILE? N


ENTER COMMAND:  LPDA
DATA MANAGER ID NO. (1-99): CC
UPDATE PROCEDURE (1-4): 4
DATA FILE TO BE REVISED: U24-54C
NAME OF DATA ELEMENT TO BE CHANGED: UNIT
ENTER VALUE: F
ENTER FORMULA: UNIT+1
DO YOU WISH TO CHANGE ANY MORE DATA BELONGING TO THIS FILE? N
 FILE U24-54C  HAS BEEN REVISED.
 DO YOU WISH TO WRITE
 THIS FILE ONTO THE MASTER FILE?Y
MASTER FILE NAME: REA24-54C

 UPDATE OPERATIONS HAVE BEEN COMPLETED.
 IF YOU WISH TO CONTINUE WITH THE UPDATE PROCEDURE, ENTER THE NUMBER (1-4).
 ENTERING A "C" FOR THE PROCEDURE PROMPT OR "QUIT" FOR THE FILE PROMPT WILL
 RETURN CONTROL TO THE SEARCH AND RETRIEVAL PORTION OF "PACER".

UPDATE PROCEDURE (1-4): C


ENTER COMMAND:  QUIT


 THE FOLLOWING FILES HAVE BEEN ACCESSED
 OR CREATED DURING THIS SESSION:
    1      U24-54C

 USE PRIME'S DELETE COMMAND TO DELETE
 ANY UNWANTED FILES.
OK,
```

Figure 32.--Reprocessing data and adjusting unit number sequence.

```
READY STRATTHK
ENTER INPUT FILE NAME: REA24-54C
READY PACER
PRESS CARRIAGE RETURN23
ENTER DATABASE NAME: USTRAT (or WRKSTRAT)


ENTER COMMAND:  LIST
ENTER NAME OF FILE: REA24-54C
ENTER NUMBER OF LINES/PAGE:
AT EACH PAUSE IN THE LISTING, PRESS RETURN KEY
TO CONTINUE ,A TO ABORT.
SELECT C, F, OR R: C
WOULD YOU LIKE OUTPUT TO BE TO DISK? N
ENTER THE LIST OF ITEM NAMES.

1.  POINTID
2.  UNIT
3.  THK
4.  FROM
5.  TO
6.
```

POINTID	UNIT	THK	FROM	TO
24-54	1	60.000	0.000	60.000
24-54	2	720.000	60.000	780.000
24-54	3	252.000	780.000	1032.000
24-54	4	168.000	1032.000	1200.000
24-54	5	1332.000	1200.000	2532.000
24-54	6	36.000	2532.000	2568.000
24-54	7	36.000	2568.000	2604.000
24-54	8	216.000	2604.000	2820.000
24-54	9	96.000	2820.000	2916.000
24-54	10	48.000	2916.000	2964.000
24-54	11	84.000	2964.000	3048.000
24-54	12	696.000	3048.000	3744.000
24-54	13	216.000	3744.000	3960.000
24-54	14	240.000	3960.000	4200.000
24-54	15	96.000	4200.000	4296.000
24-54	16	24.000	4296.000	4320.000
24-54	17	36.000	4320.000	4356.000
24-54	18	48.000	4356.000	4404.000

```
ENTER COMMAND:  QUIT
READY
```

Figure 33.--Recalculation and listing of -FROM -TO values.

```
OK, LSTRATUS

 Do you want BRIEF MODE? (Y or N) Default is N. Y

 ENTER STRAT FILE NAME: REA24-54C

 DICTIONARY CHOICE:
  1 WORKDICT (DEFAULT)
  2 USC_DICT
     WHICH? <CR>

 THICKNESS VALUES CAN BE SHOWN IN:
   1. INCHES
   2. DECIMAL FEET (DEFAULT)
   3. FEET AND INCHES
       WHICH? <CR>
    # OF DECIMAL PLACES(0-3,DEFAULT 2). <CR>

    DISPLAY 'TO' VALUE (DEFAULT N)? Y

 CUMULATIVE THICKNESS VALUES CAN BE SHOWN IN:
   1.  INCHES
   2.  DECIMAL FEET (DEFAULT)
       WHICH? <CR>
    # OF DECIMAL PLACES(0-3,DEFAULT 2). <CR>

    DISPLAY 'FROM - TO' VALUE (DEFAULT N)? Y
    # OF DECIMAL PLACES(0-2,DEFAULT 1). 0

    SKIP LINES FOR CLARITY (DEFAULT Y)? N

DO YOU WISH TO LIST ANOTHER FILE? N
OK, SLIST REA24-54C.LSTRAT
1

******************************************************************************************************************
DATA POINT ID: 24-54                                   GEOLOGIST: USGD-BIEWICK L H              DATE: 690202       CONFID:
QUAD & SERIES: SAYLE (7.5')                                SOURCE: CHANDLER & ASSOC                         PRIN MERIDIAN: 20
                                                       SURFACE
        STATE: MONTANA                                 ELEVATION: 4089.00             RANK: SUBBIT             QUARTERS:        SE SE
       COUNTY: POWDER RIVER                              ELVPREC:  4        LOCAL STRIKE/DIP/ANGLE:    0    0    0  SECTION:  17.0
                                                     TOTAL DEPTH
     PROVINCE: N GREAT PLAINS                          LOGGED  :    367.00        LATITUDE: 45 10 25 n            TOWNSHIP:   8.00S
                                                     DESCRIPTION
       REGION: POWDER RIVER                               LOG    : 217          LONGITUDE: 105 40 35 w              RANGE:  47.00E
        FIELD: MOORHEAD                              WEATHERING: 0                  LLPREC:  1
     COMMENT1: INDIAN GULLY 1, PSG TO 200', IES 200' ON
     HYDRO CD:    654426          FILEPOINTER:                            OWNERSHIP:
------------------------------------------------------------------------------------------------------------------
      US                                                                                                      C F
      NU     T                                                                                                C O .
      IA     H                                                                                                N S
UNIT  TL     K        FORMATION       REC NAME             LITHO    LITHMOD       COLOR     GRNSIZE  GR SHAPE MINERALOGY  BEDDING   T S FJC
------------------------------------------------------------------------------------------------------------------
  1           5.00 FORT UNION      ANDERSON ZONE        COAL
                        5.00 EL:    4089.-  4084. WC1:         WC2:    0.00 COM2:                                   KEY: 51000596
  2          60.00 FORT UNION                           SH       INBD
                       65.00 EL:    4084.-  4024. WC1:         WC2:    0.00 COM2:                                   KEY: 51000597
  3          21.00 FORT UNION                           SS       BC
                       86.00 EL:    4024.-  4003. WC1:         WC2:    0.00 COM2:                                   KEY: 51000598
  4          14.00 FORT UNION      ANDERSON ZONE        COAL
                      100.00 EL:    4003.-  3989. WC1:         WC2:    0.00 COM2:                                   KEY: 51000599
  5         111.00 FORT UNION                           SH       INBD
                      211.00 EL:    3989.-  3878. WC1:         WC2:    0.00 COM2:                                   KEY: 51000600
  6           3.00 FORT UNION      CANYON               COAL
                      214.00 EL:    3878.-  3875. WC1:         WC2:    0.00 COM2:                                   KEY: 51000601
  7           3.00 FORT UNION                           SH
                      217.00 EL:    3875.-  3872. WC1:         WC2:    0.00 COM2:                                   KEY: 51000602
  8          18.00 FORT UNION      CANYON               COAL
                      235.00 EL:    3872.-  3854. WC1:         WC2:    0.00 COM2:                                   KEY: 51000603
  9           8.00 FORT UNION                           SH
                      243.00 EL:    3854.-  3846. WC1:         WC2:    0.00 COM2:                                   KEY: 51000604
 10           4.00 FORT UNION                           BENT     LITH UNC
                      247.00 EL:    3846.-  3842. WC1:         WC2:    0.00 COM2: VY HIGH GAMMA, NOT DISTINC ON RESIST LOGKEY: 51000605
 11           7.00 FORT UNION                           SH
                      254.00 EL:    3842.-  3835. WC1:         WC2:    0.00 COM2:                                   KEY: 51000606
 12          58.00 FORT UNION                           SS       BC
                      312.00 EL:    3835.-  3777. WC1:         WC2:    0.00 COM2:                                   KEY: 51000607
 13          18.00 FORT UNION                           SH       INBD
                      330.00 EL:    3777.-  3759. WC1:         WC2:    0.00 COM2:                                   KEY: 51000608
 14          20.00 FORT UNION                           SS       BC
                      350.00 EL:    3759.-  3739. WC1:         WC2:    0.00 COM2:                                   KEY: 51000609
 15           8.00 FORT UNION      COOK ZONE            COAL
                      358.00 EL:    3739.-  3731. WC1:         WC2:    0.00 COM2:                                   KEY: 51000610
 16           2.00 FORT UNION                           SH
                      360.00 EL:    3731.-  3729. WC1:         WC2:    0.00 COM2:                                   KEY: 51000611
 17           3.00 FORT UNION      COOK ZONE            COAL
                      363.00 EL:    3729.-  3726. WC1:         WC2:    0.00 COM2:                                   KEY: 51000612
 18           4.00 FORT UNION                           SH
                      367.00 EL:    3726.-  3722. WC1:         WC2:    0.00 COM2:                                   KEY: 51000613
OK,
```

Figure 34.—LSTRATUS program and printout.

SUMMARY

The ability to revise data as a study progresses is a necessity for the geologist. Interactive data manipulation on the PRIME minicomputer allows the investigator to utilize the NCRDS software on the PRIME to generate tables and graphics that will aid in the interpretation of data in his/her study area. By generating computer products the geologist is accessing another tool for manipulation and display of scientific data. The user can go back and forth between generating products and adjusting data. When the final decisions are made and the data are complete by the user's standards, NCRDS staff will post the data to the master database making them permanent stratigraphic records in the National Coal Resources Data System (fig. 35).

APPENDIX I (Using the PRIME)

Use of the NCRDS PRIME system requires registering as a cooperator with the USGS. This is done by contacting the NCRDS site administrator in Denver, or the systems or database developer in Reston (see NCRDS reference personnel, p. 2 and 3). After meeting the requirements the user will be registered with a personid and password that must be supplied when logging onto the PRIME. Figure 36 is an example of a terminal session on the Denver PRIME. The user's password never prints on the terminal for protection.

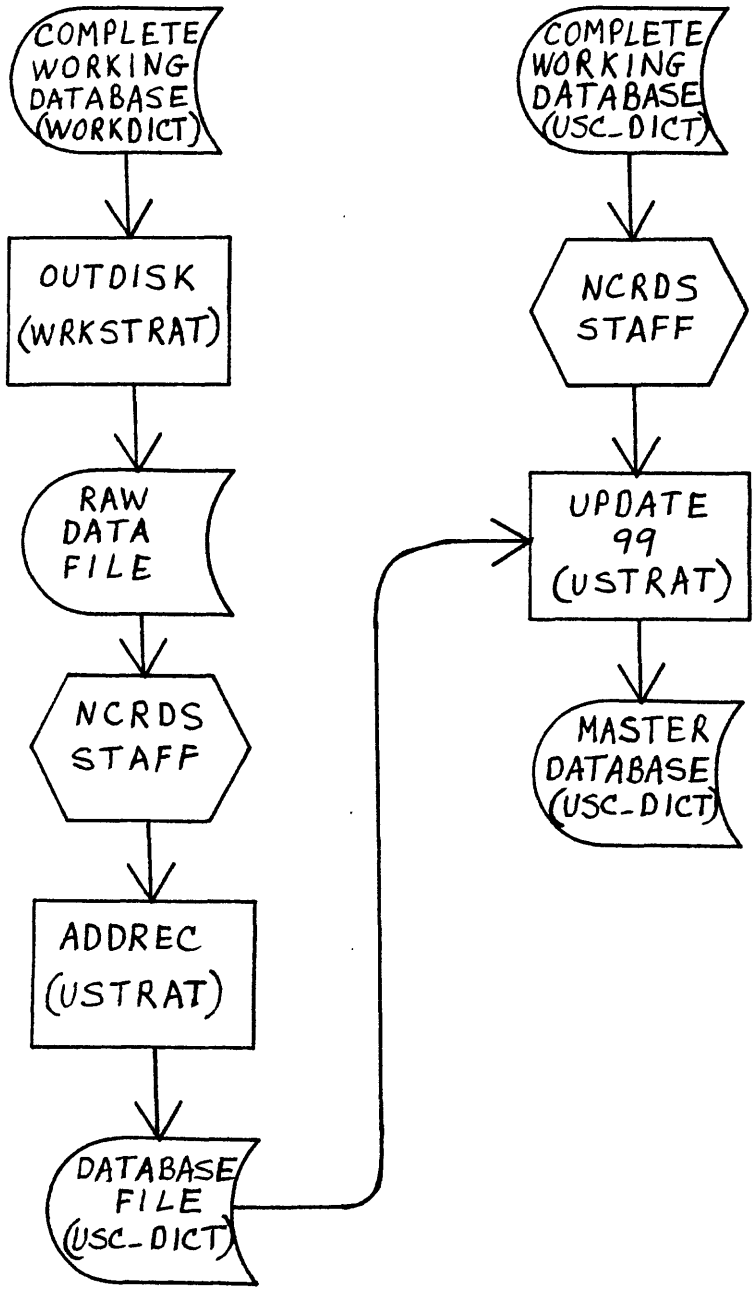

Figure 35.--Flow chart showing steps for adding data to the master database.

```
LOGIN LBIEWICK
Password?

LBIEWICK (user 16) logged in Friday, 29 Nov 85 11:20:44.
Welcome to PRIMOS version 19.4.5.USGS.
Last login Friday, 29 Nov 85 10:15:36.

**************************************************************************
*      Welcome to the Branch of Coal Resources Prime   (NODE GCOLKA)     *
*              located at 875 Parfet Street, Lakewood,  fts 776-7741     *
**************************************************************************
*  For the latest news, give the command:  NEWS                          *
**************************************************************************
**********************************************************
*  ATTENTION USERS:  PLEASE DELETE ANY UNNECESSARY FILES FROM YOUR  *
*                    USER AREAS.  WE NEED TO CONSERVE DISK SPACE.    *
*                    YOUR COOPERATION IS APPRECIATED.                *
**********************************************************
*  ATTENTION:  GUARSA (RESTON) IS EXPERIENCING AIR CONDITIONING     *
*              PROBLEMS AND MAY BE DOWN UNTIL MONDAY.               *
**********************************************************
Sorry, no new mail waiting for you.
OK,
```

Figure 36.--Terminal LOGIN session on the PRIME minicomputer in Denver.

GLOSSARY

ADDABS: add records (ADDREC) absentee in a batch or phantom mode

ADDLATLONG: program that adds digitized latitude and longitude values to USTRAT (or WRKSTRAT) data

ADDREC: add record to database; processes "raw" data into PACER database format

CORRABS: add new dictionary entries or data corrected to match dictionary absentee

CPL: "Command Procedure Language" - a high-level language that operates at PRIMOS command level (Patenaude, 1982)

<CR>: indicates a single carriage return which is generated on most terminals by hitting the RETURN key

CRT: Cathod Ray Tube (refers to a terminal with a screen)

DEPTHCHK: program that calculates total depth entered per pointid; checks summed value against existing TOTAL DEPTH LOGGED values

DISP: Primos command to display 20 lines of a file at a time on the terminal

ERROR file: resultant file from ADDABS listing mismatches with the dictionary

"file name": a name (called an objectname) supplied by the user for a file. May be up to 32 characters long. Refer to PRIME User's Guide, p. 2-6, rules for naming files

GARNET: Graphic Analysis of Resources using Numerical Evaluation Techniques - graphics and volumetrics software

LATLONGS: latitude/longitude coordinates

LSTRATUS: U.S. Stratigraphic Data printout

NCRDS: National Coal Resources Data System

PACER: Program to Analyze Coal Energy Resources - binary database storage and retrieval system

POST: write one file to another, usually larger, file

SPOOL: command to print on PRIME printer (never SPOOL a PACER file)

STAT US: status of users

STRATTHK: calculates -FROM -TO values from the thickness value (or reverse)

STRATS: Stratigraphic Analysis Techniques System - correlation diagrams

GLOSSARY--Continued

UPDATE: PACER interactive updating commands

USC_DICT: U.S. Coal Dictionary - NCRDS master dictionary

USTRAT: U.S. Stratigraphic Database. Also signals computer to assign alpha-numeric entries from USC_DICT to dictionary pointer value codes in data file

WORKDICT: Work Dictionary - NCRDS user updatable dictionary

WRKSTRAT: same as USTRAT except signals computer to assign alpha-numeric entries from WORKDICT to dictionary pointer value codes in data file

REFERENCES

Crowley, S. S., Medlin, A. L., and Smith, R. J., 1981, Guide for the Calculation of Coal Resources Using the Computer Program GARNET: U.S. Geological Survey Open-File Report 81-563, 34 p.

Dynamic Graphics, Inc., 1984, ISM Interactive Surface Modeling User's Guide.

Krohn, K. K., Carey, M. A., Carter, M. D., and Medlin, A. L., 1981, Guide to the use of PACER, the Data Retrieval and Update System for the National Coal Resources Data System (NCRDS): U.S. Geological Survey Open-File Report 82-291, 99 p.

Patenaude, A. W., 1982, Prime User's Guide, DOC4130-190, Third Edition: Prime Computer, Inc.