III Family History System Design

This section of the manual provides descriptions of some of the features of the software that resulted from decisions made during the design of the system. There is a lot of information here which is not really necessary for using the programs but it may help you to have a better understanding of the way the software works. There are several sections that do contain some essential information. Those sections are III.III.D through III.III.G.

III.A Modular Program Design

It was impossible to include all functions of the system within a single program, however the software was designed so that each major function would be accomplished by using a single program. This "modularity" simplifies the tasks of maintaining the software and expanding the system to include new options. It also reduces the amount of memory required on the PC's that run the software.

III.B Table Driven Design

One of the most significant changes in this update of the Family History System involves the use of many Tables to control the software's operation. (A "table" is simply a list of values for program variables or options) In doing this, the system also:

provides utility programs for customizing the tables
stores the table values in files external to the programs
allows the user to identify the table files that will be used during a working session.

A later section of this manual provides a detailed description of these system tables and their customization.

III.C Use of Work Files

The software uses a variety of external "work" files to hold the results of certain extended operations. These include "relationship" work files (which hold information about relationships to an individual), "select" work files (which hold the results of Search operations), Index files (which hold the results of "sort" operations), and "reference" work files (which are used to print report/chart indexes in the extended system). Originally, these work files were necessary to allow for the limited memory and slow operation of PC's in the early 1980's. Today, the work files still speed up the printing of most reports and charts and allow the sharing of information between programs in the system. See page III-6 for a more detailed description of the software's files.

III.D Fixed Formatted Displays

All of the programs of the system make use of "static" formatted screen displays. When the Family History System was first introduced in 1985, many programs for personal computers made use of "scrolling" text for presenting information on the screen. Today the FHS screen displays are no longer "novel", in fact many would consider them to be "old fashioned", but they are still serviceable for creating files and presenting options for printing reports. This manual frequently uses the term "view" to refer to each of these formatted screen displays.

III.D.1 Segmented Screen in the File Update Program

Because of the complex nature of the Family History System files and the variety of information that can be stored in them, the file update program (Main Menu option F1) uses a "segmented" screen to display and update information in these files. Within that program the standard 24x80 screen area is divided into 4 "viewing areas": upper left, upper right, lower left and lower right. A 5th viewing area occupies the lower half of the screen. (The Report Customization program, F3-B-F5, also makes extensive use of segmented displays of this type)

Different information is displayed in the various viewing areas so that up to 4 types of information may be viewed at one time without interference. Of the several viewing areas that may appear at one time on the screen, one will be designated the "current viewing area" and will be distinguishable by its being enclosed by a "hilited" border. The hilited border is moved from one viewing area to another by selecting options (or terminating requests using the ESCape key).

While viewing information for one of the record types that may occur multiple times, ordered by some date, you will be prompted by one of the messages:

"Press PGUP key for earlier record"
or "Press PGUP, PGDN for other records"
or "Press PGDN for later record"

if there is some record of that type which precedes or follows the one currently being viewed.

The lower half of the screen is used as a fifth viewing area for displaying lists of individuals resulting from a "search" of the system files or a request to list the children of an individual or of a marriage. Individuals may be selected from these lists for display of related information by following the instructions in the "view". Others in the list may be selected for display at a later time by returning to the list (after pressing the ESCape key in the "view" of Name record information).

In the upper right corner of most viewing areas is the "relative generation level" of the individual(s) whose information is displayed. This level is adjusted whenever a parent/child relationship is crossed and is set to 0 whenever an individual is selected for display based upon something other than a parent/child or spouse relationship (spouses are assumed to be in the same generation level).

III.D.2 Full Screen Mode of Data Update

Part of the decision to use static formatted screen displays in which data is shown in fixed labeled areas of the screen called "fields" was the plan to permit you to update the displayed information directly on the screen within the limits of the field containing the data. This has the advantage that you may make changes to any of the fields without prompting from the program. You may return to previous fields to correct errors and you may view all changes made before submitting the changes to the program for processing.

Certain conventions have been established to make use of many of the PC's special function keys to simplify the updating of information on the screen. Actually two sets of conventions were established, one for the update of text stored as comments, and the other for the update of information displayed in discrete fields on the screen. These sets of conventions will be described separately in the following paragraphs.

III.D.2.a Updating Screen Displays (Other than Comments)

The following conventions describe the entry of information into formatted screen displays:

- The "cursor control keys" can be used to move the cursor anywhere within the active viewing but information can only be typed on the screen when the "blinking" cursor rests in an "updatable" field on the screen
- The "TAB" key (just to the left of the "Q" key on most keyboards) may be used to move the cursor to the first position of the next "updatable" field on the screen (if there is no next field, the cursor goes to the first updatable field on the display)
- The "SHIFT+TAB" keys (press the SHIFT and TAB keys simultaneously) may be used to move the cursor to the last previous updatable field on the screen (if there is no prior field, the cursor goes to the beginning of the last updatable field on the screen)
- The "HOME" key moves the cursor to the first updatable field on the screen
- The "END" key moves the cursor to the last updatable field on the screen
- The Enter or Return Key moves the cursor to the first updatable field of the next line (when updating 2 or more lines of data on the screen)
- The "CTRL+END" keys erase (replaces with blanks) all characters from the cursor position to the end of the field containing the cursor
- Pressing the ESCape key while the cursor is in a field whose contents have changed will remove the changes from the field; Pressing the ESCape key while the cursor is in an unchanged field will terminate the update and restore the contents of all changed fields
- The "DEL" key removes the character at the cursor position and moves all trailing characters (in the field) one position to the left
- When a character is entered in the last position of an updatable field, the cursor is automatically "tabbed" to the next updatable field
- For some fields (e.g. Record ID, DATES) you will only be permitted to enter numeric digits; a tone is sounded if other characters are entered
- When entering information in a multiple digit numeric field, the entered digits will be right-justified as they are entered, replacing the previous contents of the field on the screen; (this is a new "feature" in this update)
- When entering values in date fields, it is unnecessary to enter the "delimiter" characters in the date... these will be automatically skipped over as you enter the date; (this is a new "feature" in this update)
- For some fields (e.g. SEX, File names) entered alphabetic characters will automatically be changed to upper case
- When entering NAME record information in the file update program the CTRL+R key combination is used to simplify the repetitive entry of information such as surname or birth/death places. Pressing the CTRL+R keys will restore the cursor field with the last displayed contents.

Entered updates are committed by pressing a function key designated by the program (usually F1) or by pressing the ENTER or RETURN key if no function key is designated. Pressing the ESC key terminates the update request without any changes being made.

III.D.2.b Updating Comment Displays

The following conventions describe the updating of comment information

a. Cursor control keys:

Right arrow - moves the cursor right one position; at the end of a line the cursor goes to the beginning of the next line; at the end if the last line, the cursor moves to the first position of the first line in the comment viewing area

Left arrow - moves the cursor left one position; at the beginning of a line the cursor goes to the end of the previous line; at the beginning of the first line, the cursor moves to the last position of the last line in the comment viewing area

Up arrow - moves the cursor to the next line up, same column; from the top line in the comment viewing area, the cursor moves to the same column of the bottom line

Down arrow - moves the cursor to the next line down, same column; from the bottom line in the comment viewing area, the cursor moves to the same column of the top line

HOME key - moves the cursor to the first position of the current line

END key - moves the cursor to the last non-blank character of the current line after the current cursor position

ENTER key - moves the cursor to the first position of the next line.

b. Special Update keys:

DEL key - erases character at cursor position and moves characters following it to the left one position

Ctrl + END - Erases current character and all characters following it on the line

INS key - toggles a "character insert" mode. When this mode is in effect a "^" character appears in the lower right corner of the screen.. Characters entered at the cursor location will cause the current character at that location, and all subsequent characters on the line to be moved right one position. The last character on the line will be truncated

BKSP key - same as Left arrow key

ESCape key - removes all updates made to the current line since moving the cursor to the line. (If the current line has not changed, pressing the ESCape key terminates the Comment display and returns to the originating viewing area)

c. Special function keys:

PGDN key - moves the current line to the top of the screen and displays the succeeding lines. If the current line is at the top of the page, the next full page of text is displayed. Changes which have been made to the displayed text lines will be written to the file

PGUP key - moves the current line to the bottom of the screen and displays the preceding lines. Changes made to the current page of text are written to the text file

F2 key - Inserts a blank line before the line in which the cursor is located

F3 key - Requests to "Delete" the current line. The current line is shown in "reverse video" and the user is asked to confirm that the line is to be "deleted".

The numbers shown in the upper right corner of the viewing area are the number of the first text line on the screen, and the total number of text lines for the comments. The first number may be greater than the second in the case that it is a new line that no operator action has yet caused to be added to the text of the comments.

Pressing the F1 key causes all unrecorded updates on the current display to be written to the file and then returns you to the view from which the comment display was requested.

III.D.2.c NOTE: Concerning the Formatting of Comments in Reports

When entering comment information you should take into consideration the following conventions for joining comment lines together to form blocks of text when comments are included in reports produced by the system:

- Three successive blanks at the beginning or in the middle of a comment line will cause all text on that line to the right of the blanks to be ignored
- A blank character is placed between two successive comment lines only if the last character of the first, or the first character of the second one is a space. (This permits a word which has been typed across a line break to be joined back together properly) Additional blank characters at the end of a comment line are dropped
- The backslash "\" character is recognized as a request to begin a new line of text in the formatted output. Two successive backslash characters result in a blank line being inserted between the preceding and following blocks of text when the comments are formatted for reports
- You may enclose parts of your comments in "curly brackets" or "braces", that is "{" and "}", and the report programs may be instructed to omit that text from the comments that are printed. This allows you to remove sensitive or conjectural remarks from reports that are distributed to others.

III.E System Messages

The bottom line on the screen is reserved for displaying messages. In some cases, these messages ask for a response from the operator (such as "Y" or "N"); if a "single-key" response is expected, you do not have to use the ENTER or RETURN key to indicate the end of your response. Some messages are merely informational; these will be terminated by an ellipsis (...) which indicates that the program is waiting for you to press any key on the keyboard to show that you have received the message so that the program may continue.

One of the customization files includes the text of all messages. This file also identifies the "default" response to messages that allow multiple "single key" replies. (The "default" response is the one that will be assumed by the program if the user "responds" by pressing the Enter key or Space Bar).

III.F Use of Program Function Keys

The system has been designed to take full advantage of the PC's function keys for simplifying the selection of program options. Allowable function keys are indicated on the currently displayed panel. Pressing an "illegal" key will result in the sounding of a soft tone without any further action. This (1997) update to the software includes changes to the way some function keys are used in the report programs. This was done to provide more consistent use of function keys in those programs.

III.G Use of the ESCAPE Key

The ESCAPE key, labeled "Esc" on most keyboards, is used almost uniformly as a request to terminate an operation without further action. It only has effect, however, at those times that the program is looking for input from the keyboard. It cannot be used to interrupt the adding of a record to the files after you have requested for the information to be written to disk, and it sometimes cannot be used to interrupt the creation of a work file.

One extended operation, which may be interrupted is the printing of reports. After each line of a report is written to the output device, the report program looks for input from the keyboard. If some key has been pressed, the printing is interrupted and a message such as:

"Waiting at page xxx line yyy..."

is displayed on the bottom line of the screen. If the ESCape key is then pressed, the report is terminated; pressing any other key causes the program to continue the printing of the report. The SPACE BAR is a convenient key for pausing and continuing a scrolling report.

NOTE: *Pressing the PGDN key to continue a report will result in the program's pausing at the top of the next page. This can be useful if you wish to print just one or two full pages of a report or if you need to add paper to a printer before continuing to print a report.*

The ESCape key is the standard means for returning from one "viewing area" of the segmented display used in the file maintenance program to the previous "viewing area" from which control was passed as a result of some operator request.

III.H Family History System Datasets and Files

This section provides a more detailed description of the FHS Family File format and the Work Files that were mentioned previously.

III.H.1 FHS Family File

The file used in the Family History System to store information about individuals and their family relationships consists of three datasets containing variable format "records" which are "linked" together into a "hierarchic" logical file structure. Pictorially, a portion of the logical file structure is represented by the diagram on the next page.

In that diagram, each of the "boxes" represents a record type in one of the system's datasets. In some cases, (for example: child records, marriage records, and address records) a "logical record" may include multiple records of information of that type. The number of multiple records is essentially unlimited (there can be no more than 32000 occurrences of the name or address records and no more than 64000 of the other types of records). Records containing information of the various types are "logically connected" by a system of program maintained "pointer" fields. Though this structure may appear a bit more complex than the more common "flat" file which has a single fixed record type, the advantage in using the hierarchic structure is that there is no need to "reserve" space in a dataset (other than a 2-character pointer field) for types of information that may or may not be recorded for an individual at some time in the future.

The only information that the user needs to provide to the system to begin retrieving information in one of these extended logical records is that required for locating the name record of the individual about whom the information has been recorded. The basic "record key" that the system requires is the "ID number" for the individual. This is a number, which is assigned to each individual by the system at the time his/her Name is initially entered into the system. These numbers are assigned sequentially (ID #216 will be assigned to the 216th person entered into the system). The ID numbers assigned two individuals need not indicate any particular relationship between the individuals. These ID numbers may (optionally) appear in reports produced by the system and may also be determined by "searching" the files for other information (such as surname, given name or birth date) using the search option of the file maintenance program.

While the ID numbers of two individuals need not indicate any blood relationship between them, these numbers are used to define the only type of relationship that you are required to establish between individuals. The relationship of father or mother to a child is specified by recording the ID numbers of the parents in the Name record for the child. All other blood relationships between individuals are determined from the complete system of parent-child relationships recorded in this way.

Perhaps it should be noted that the system provides for recording additional information (educational, occupational, military, health and special event information). Further, address and comment records may also be created under each of these record types.

While the system provides for extensive "commenting" with the comments or remarks being logically connected to the appropriate record type, care should be taken in the use of this feature of the system because of the limited number of records in the "...OTH" dataset of miscellaneous information. It is not intended for writing a person's life history or for extended anecdotes, but rather for recording notes concerning sources of, or explanations for, information found in the record.

In the cases where multiple record types are permitted within a logical record, the records are automatically maintained in some "natural" order. For all but comment records, this is based upon a date stored in the record. Children are ordered by increasing birth date; marriage records by decreasing date of marriage, and address records by decreasing beginning date of residency. This has the unfortunate consequence that unknown birth, marriage or beginning dates (recorded as 00/00/0000) may result in information appearing out of chronological sequence in the file and in reports. The order is automatically adjusted as the correct information is determined and recorded. You may consider entering a "best guess" for unknown dates, making note of the fact in comments for the record type. (It

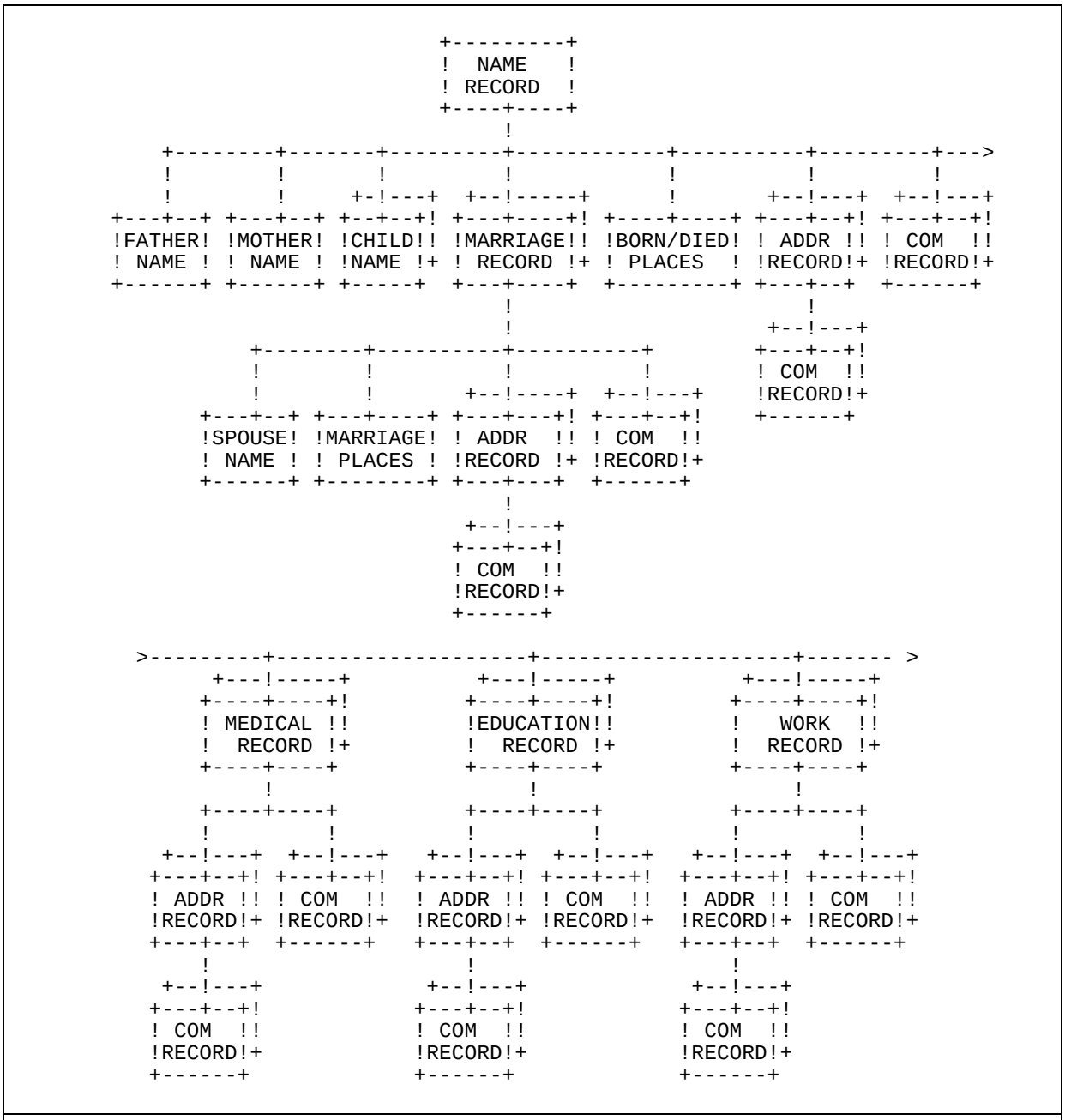

Figure: FHS Family File Structure Diagram

now is possible to manually resequence the children of an individual in the view which shows a list of children in the File Update program)

This discussion of the Family History System data files will conclude with a brief description of the datasets that comprise the file. There are three such datasets:

1. Name dataset - each record is 100 characters long; information stored includes surname, given name, date and time of birth and death, sex, and father and mother ID numbers. Up to 3600 name records may be stored on a single DS/DD diskette, or 32000 records may be stored on a hard disk
2. Address dataset - each record is 108 (short format) or 153 (long format) characters long; information stored includes: beginning and ending dates, 2 address lines, city, state/province, zip or postal code, and phone

number. The Long format address record also provides a field for the country. Up to (3500 short, 2300 long) address records may be stored on a single DS/DD diskette, or up to 32000 may be stored on a hard disk

3. Miscellaneous INFO dataset - each record in this dataset is 50 characters long. Up to 7000 records may be stored on a 5 ¼" DS/DD diskette; up to 65000 may be stored on a hard disk.

   Record types include:

   - Spouse, family or marriage record
   - Birth/Marriage/Death location record
   - Comment record (1 record for each line of comments)
   - Event Records
   - Occupation, Education, Military and Health records.

III.H.2 PROGRAM "WORK" FILES

There are several types of "work" datasets that are used in the Family History System. These are semi-temporary files that are used to store information derived from certain processes so that those sometimes-lengthy processes do not have to be repeated too frequently. Among these work datasets are the RELATIONSHIP Work Files, the NODE Work File, the SELECT Work file, the REFERENCE Work file, and the INDEX File. The following paragraphs provide more complete descriptions of these work files.

III.H.2.a RELATIONSHIP WORK FILES

A Relationship Work File must be created prior to producing the ancestor, descendant or relative reports, a register style group report, or the ancestor charts. Although there appear to be three types of relationship files: Ancestor, Descendant and Relative, in fact these all share a common format, the only differences being in the number of generations of ancestors or descendants that are searched in order to build the work file. When building an Ancestor work file, no search is performed for descendants at all. When building a Descendant work file, no search is performed for ancestors, while in creating a Relative work file, the program first searches for all ancestors and then all descendants of the ancestors. You may specify the maximum number of generations (of ancestors and descendants) that are to be included in the work dataset. This is done to permit you to exercise some control over the extent to which lines of ancestry or descendancy will be followed in producing the report. A relationship work file may be reused (without recreating it) if no new or changed relationships have been recorded in the family file that was used to create the work file.

III.H.2.b NODE WORK FILE

The "Generalized BOX Chart" program uses a NODE Work File to record the column, generation level, and relationships between the "information boxes" of a horizontally arranged box chart. These locations are determined by the type of relationships recorded (ancestral or descendant), the "base record", and the type of "alignment" that a node has with respect to related nodes in the next generation level. The alignment may be changed without having to recreate the NODE Work file, and a report of "Chart Statistics" can be printed from information in the Node Work File.

III.H.2.c SELECT WORK FILE

Another type of work file used by many programs in the Family History System is the SELECT file. Among these programs, the File Update and Search/Select/LIST programs use these files to store Search Results and the Validation program uses them to store lists of ID's for records that have errors of one type or another. This file is essentially an ID sequenced "check list" of individuals that have been chosen for processing. It permits the system to isolate the sometimes, complex process of selecting ID #'s within certain programs and to pass the results of the selection process to other programs in the system.

III.H.2.d REFERENCE WORK FILE

The March 1990 update of FHS introduced another type of Work file, the REFERENCE work file, which contains notes concerning the ID's that appear in a particular report or chart and the location of each appearance within that report or chart. This work file is used by a program in the extended system to print report indexes. These indexes may be printed for ancestor, descendant, relative and family group reports, as well as sets of ancestor charts, ancestor

maps and ancestor/descendant "box" charts. In this (1997) update, these reference work files can contain references from multiple reports and charts, making it possible to print a single index for a booklet that contains several reports or charts. One of the Global Report Options controls whether the report programs should ask the user if a Reference File should be created when a report or chart is printed. This allows the unregistered user to turn off these queries.

III.H.2.e INDEX FILES

The Family History System INDEX File is one that contains a complete but re-ordered sequence of ID #'s. The reordering is accomplished by Sorting the ID#'s based upon the contents of certain fields; for instance the ID's may be sorted in Birth date sequence, or in alphabetic sequence of Surname and Given Name. The option for creating an INDEX file is one of the "extensions" provided to registered users of the system. Even within the public version of the Family History System, there are opportunities to use these Index files; for example, to print Merged group reports in a sorted sequence or to print Sorted Summary reports in the Search/Select/LIST program. It is also possible to export records in sorted sequence using an Index file and Index files are used in the File Validation program to find "duplicate" records. But the most interesting reports and charts produced by the Family History System, those that emphasize the relationships between members of your family, have no need of the Index files.

III.H.2.f UNMATCHED WORK FILES

Each of the WORK files has a "header" record which contains a variety of information used by the programs to identify the type of work file, its "origin", and how to get to the work file records. Included in this header information are the Date and Time of "Creation" for the NAME File that was used to build the work file. This "Creation DATE-TIME Stamp" of the NAME file is used to distinguish the name file from all others. (It actually can only distinguish between name files that were not created within one minute of each other, and it cannot distinguish between two copies of the same name file) If you attempt to use a work file with a name file which doesn't match this date-time value, then you will get a message like:

"Unmatched Work File..." or "Unmatched INDEX File..."

This should tell you that you have to rebuild the work file for the family file that you are now using, or that you must change the name of the work file to one that was created for the family file that you are processing.