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Development of a Toxin Knowledge System

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Final Summary Report

Harold L. Trammel

November 12, 1990

for the Period April 6, 1987 through December 1, 1989

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University of Illinois
Urbana, Illinois 61801

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The development of a Toxin Knowledge System (TKS) was begun in an attempt to meet the needs for readily accessible toxin knowledge. This system was designed to extract facts from published literature using structured abstracting techniques, store these facts in a standard knowledge structure, control the terminology entered through the use of a standard nomenclature system, and subsequently generate standard monographs on individual toxins. The system uses a relational database management system and associated programming language on a minicomputer. Standard nomenclature systems were created for clinical findings, journal abbreviations, study terminology, and book information. The development of a chemical vocabulary was unsuccessful. The current TKS version is of primary value with papers describing in vivo toxicology studies. The TKS application facilitates the extraction of needed information from both journals and books through a sophisticated user interface. The user enters citation data and is then prompted for information about each study design (up to 99 per paper), each subject group (up to 99 per design) and exposure regimen (up to 99 per design)within each design, and how these factors interact to produce clinical effects. All reported clinical findings can be entered using the controlled vocabulary. Rudimentary monograph generation capabilities were initiated but need further development. So that USAMRIID personnel can use and further develop the TKS application, the TKS was ported to the MS-DOS platform.

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Summary

The published information about low molecular weight toxins grows steadily, yet there are few tools to manage this information. The information tools currently used are citation indexes or abstract services. These tools do not integrate facts into an existing knowledge base but merely provide citations or narrative abstracts. To meet the toxin knowledge needs and overcome the limitations of current information systems, a Toxin Knowledge System was created.

After studying the knowledge acquisition techniques used by individuals in different biomedical disciplines, we set out to automate the knowledge acquisition process and compile information into usable, continuously updated knowledge. The Toxin Knowledge System was built using Informix® relational database management system on a Sequent® minicomputer. The user interface application was developed using Informix-4GL® programming language and makes extensive use of windows, ring-menus, and pop-up choices on screen. The system was based on four concepts: a standard knowledge structure, standard nomenclature systems, a structured abstracting process, and computer-generated structured monographs.

The standard knowledge structure into four major parts: citation data, study design, results, and keywords-notes. Multiple database tables were created for each part. Because the interactions between these various tables were so complex, the user interface application had to be designed to manage these interactions with little user involvement.

To ensure that the information entered was consistent, standard nomenclature systems were created for clinical terminology (based on SNOMED/SNOVET), study information (internally developed), journal abbreviations (based on NLM List of Journals Indexed), and book information (internally developed). Attempts to create an efficient chemical vocabulary based on the Registry of Toxic Effects of Chemical Substances were unsuccessful. The user application contained mechanisms to add terms, modify, or delete terms from the various vocabularies.

Control of the structured abstracting process was built into the user application. Currently this process is primarily effective in *in vivo* toxicology studies although other study designs can be included. The application leads the abstractor from the citation data entry through the study materials and methods and on to the clinical effects reported in each subject group exposed to a given toxicant. The system is capable of abstracting papers with up to 99 different study designs, each containing up to 99 subject groups and 99 exposure regimens. For each design-subject group-exposure regimen, an unlimited number of clinical findings can be entered.

The number of computer-generated monographs developed was limited due to personnel shortages. We were able to develop three different monographs to a preliminary stage. The user application uses data entered by the abstractor to create paragraphs describing each clinical finding and the circumstances that created it.

By end of the contract, the Toxin Knowledge System had begun to show the promise that was proposed initially. Unfortunately it was not developed to full operational status due to programming personnel difficulties. The system was ported to the MS-DOS computer platform for further use and development.

C-2

Foreword

Citations of commercial organizations or trade names in this report do not constitute an official Department of the Army endorsement or approval of the products or services of these organizations.

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Toxin Knowledge System Final Report

1 Statement of Problem

The production and use of toxins against military and civilian populations remains a significant concern. To counteract an enemy attacking with a toxin, military and civil defense personnel need the knowledge to detect the toxin, diagnose the effects caused, and implement appropriate treatment. While the amount of information on toxins continues to grow, there is no system to collect, compile, and update this information into knowledge. Scientific knowledge can be defined as the sum total of what is known about a topic or as a body of systemized facts, information, principles, and experiences relating to a singular topic. Gaining this knowledge is a difficult and time consuming process. Updating this knowledge is even more difficult.

To complicate the problem, the toxin knowledge needs vary with the user. Researchers studying toxins need detailed, up-to-date information from the literature and other research groups. Others, such as military and civil defense health professionals, need extensive information on the detection, diagnosis, and treatment of toxin related problems. Military personnel at risk of exposure to toxins need immediately available references appropriate for the user's training.

Regardless of the toxin information needs, the factual basis for this knowledge is derived from the same literature sources. It would benefit the different interested groups if a single source of collected toxin information could meet each group's needs. This source of toxin information or knowledge should contain detailed, comprehensive information but be able to provide each group with the specific facts and details appropriate for the needs of the group.

To date, the most common means of keeping up with scientific information merely provides access to current literature though citation indexes and abstracting systems. Citation indexes are limited to providing users with journal article citations from which the original article can be obtained. Some form of keyword-based search strategy must be used to find the desired literature citations. A user with a journal citation will still have to find the actual article in order to obtain the facts necessary to add to his/her knowledge. Citation indexes are likely the most important ways to access the published literature and is the foundation of most other information systems. Unfortunately citation indexes are simply pointers to the facts and not the facts themselves. Abstracting systems build on the citation index foundation and add narrative abstracts of the paper. The primary purpose for the abstracts is to improve the efficiency of selecting journal articles for further review. A secondary purpose is to provide facts which increase knowledge on the topic. The amount of scientific information contained in these abstracts is limited. Usually the user will need to obtain and review the original paper to gain the knowledge s/he needs.

2 The Knowledge Acquisition Process

A scientist acquiring knowledge from the literature takes advantage of certain standard structures and terminologies. In using citation indexes and/or abstracting systems, s/he selects papers based on a standard keyword vocabulary. S/he uses the standard citation structure to identify the papers to be reviewed. This structure includes both the format of the citation and the standard abbreviations used.

After obtaining the desired papers, the scientist begins to read the papers and thereby uses the format used to write scientific papers. Each discipline has its own particular format and most papers from a given discipline are prepared according to that format. The standard format facilitates the scientist's identification of the critical components of the study design and the associated results and conclusions.

Frequently the scientist will sort the papers by the study design used. S/he may group the papers by case reports and animal studies. From this sorting, the scientist may further group the papers by the materials and methods. For example, s/he might group papers by dosage regimens to consider them from a dose-response perspective. The reader may have to sort the papers several times in various ways in order to obtain an understanding of the study and its results.

When the authors of a scientific paper wrote the paper, their goal was to communicate how their work was performed and what their results were. They used "standard" terms in order to assure that the reader would understand what they did and saw. This is especially true with clinical findings seen as result of the study. If the scientist reading the paper is unfamiliar with a particular term, s/he must either "translate" it into a term s/he already knows or add this term to his/her vocabulary. Subsequently the reviewer will consider the author's discussion of results. Frequently the discussion in current papers will provide both a reference to and an evaluation of older papers.

The data from the individual papers must be integrated into a cohesive form by the scientist. The result data from the various papers are considered by the reviewer as groups of results, along with the study design, materials and methods used, and conclusions drawn from the results. The form that the scientist's summary may take is quite varied. The end result can be a printed monograph on the topic, or may be kept only in the mind of the scientist.

Unfortunately, textual materials, such as reference books, monographs, and text books, are frequently neglected in this process. Too often, the scientist seeks his/her answers only in current literature with limited success, and yet part or all of the answers may have been published several years earlier and summarized in textual materials. Many times these important sources of information yield a deeper understanding, especially with regard to the historical development of an idea or procedure. This information should be included along with current journal articles to provide a more comprehensive understanding.

3 Approach to Problem

We studied the knowledge acquisition techniques used by individuals in different biomedical disciplines. This analysis revealed common methods and procedures as well as commonly accepted needs for how the knowledge should be made available. We believed the knowledge acquisition process could be automated to a significant degree and that we could develop a systemized method to extract needed data about toxins and compile that data into usable, continuously updated knowledge. This method would be based on a standard knowledge structure, use standard nomenclature systems and a structured abstracting process, and create structured monographs. To permit the user to interact with this knowledge system, a computer program would be needed.

We used a relational database management system and a minicomputer to manage the standard knowledge structure. As an abstractor read a journal or textual information

source, s/he would interact with the database via a computer program which would present questions and prompts to be completed by the abstractor using data from the papers. The data would be stored in various database tables. The underlying processes which maintain the database, such as links between tables, would be hidden from the user.

4 Results

4.1 Standard Knowledge Structure

The standard knowledge structure for the Toxin Knowledge System is primarily a complex relational database created with Informix-SQL® relational database management software on a Sequent® minicomputer. To provide access to this structure we used Informix-4GL®, a true fourth-generation computer language for Informix-based databases which permitted us to utilize the strengths of Informix-SQL® for the general database management process and have essentially full control over the user interface design.

We divided the knowledge structure into four major parts: citation data, study design, results, and keywords-notes. Database tables were created for each part. Because all data entered would be derived from a scientific publication, the citation database table was considered the primary entity. The primary foreign key used to relate data from all tables was a citation number derived from the journal, volume, page number, and year. In addition each record in all data tables were given a unique serial number. Within the paper content data tables, these serial numbers were used as additional keys between the tables.

Appendix A shows a graphical representation of the database design and Appendix B presents the details of the database design as text. The tables that were created for nomenclature data are also presented in Appendix A and B.

4.2 Standard Nomenclature

The standard nomenclature was primarily implemented in the form of "lookup" tables within the TKS database structure. Smaller portions of the standard nomenclature were integrated within the application as translation functions and on-screen choices. Considerable programming effort was needed to incorporate the standard nomenclature tables in an efficient manner.

4.2.1 Journal Vocabulary Table

In order to assure that journal abbreviations were consistent and to reduce the number of keystrokes needed to enter citation data, a database table to hold the journal reference data was created. This table, **journlst**, serves as a journal name controlled vocabulary. Each journal title was assigned a code number consisting of the letter "J" followed by a sequentially assigned accession number. This jcode is used as a link to the citation table. The journal title and abbreviation used was usually consistent with the National Library of Medicine (NLM) List of Journals Indexed. Abbreviations and titles for journals not found in this list were taken from the journals themselves.

To make the vocabulary as unobtrusive as possible, the application permitted journal names and abbreviations to be added to the vocabulary as needed, even while the user was putting journal citation data into the computer. A program module to manage the journal vocabulary data was developed. This program automatically assigns the sequential accession number and generates the code value for any new journal added to the vocabulary.

The user can search for any item in the journal vocabulary and update or delete it as is needed.

4.2.2 Book Vocabulary Table

Similarly, a table to hold book reference data was created and an Informix-4GL® program module prepared to manage this table. **Booklst** contains all the elements necessary to identify the specific book. Each book is assigned a code number consisting of the letter "B" and a sequentially assigned accession number. This code is used to link the book data to the citation table. Book data is entered as needed and can be added while the user is entering book citation data.

4.2.3 Study Information Terminology

As the structured abstract process was being developed, the data used in pop-up options on entry and update screens for study design, subject group, and exposure regimen became a controlled vocabulary. This was further reinforced when the monograph generation efforts began. The user had to choose the correct term at the data entry time in order to get the correct term in the monograph.

A separate aspect of study information terms was encountered in devising a listing of keywords to be used in the Keywords table. This listing is presented in Appendix C.

4.2.4 Clinical Finding Controlled Vocabulary

We hoped use an existing vocabulary for clinical findings and considered three such vocabularies: the National Library of Medicine Medical Subject Headings (MeSH), the World Health Organization International Classification of Diseases (ICD), and the American College of Pathology SNOMED and associated American Veterinary Medical Association SNOVET. The MeSH and the ICD were considered to have strength in disease terminology but did not have the specific pathology information necessary to describe clinical findings in published papers. Both were easily understood and could be used with limited modification for human data. Neither system was considered adequate for describing clinical findings in animals, a necessity when describing the results of animal studies. The ICD had no specific veterinary terms and the MeSH had a very limited set of such terms.

SNOMED was human-oriented and inadequate for veterinary or animal-research descriptions; however, SNOVET had been designed to be a animal-oriented superset of SNOMED and therefore included terms not in SNOMED. The SNOMED/SNOVET combination was determined to be the most appropriate base for a clinical finding vocabulary as it provided a broad set of specific pathologic terms applicable to both human and animal settings. Although the structure of the SNOMED and SNOVET computer tapes were dissimilar, we merged the terms into a species independent vocabulary.

The primarily obstacle we had to overcome in using the SNOMED/SNOVET coding system was its multiple axis arrangement. A user would have to enter 3 to 6 code numbers to characterize one clinical finding. We concluded that this multi-axis approach was too awkward and complex to use. We attempted to overcome the multi-axis difficulties by integrating the various SNOMED/SNOVET tables into a single, more cohesive system. This proved to be inefficient and awkward as well.

We eventually devised a two-tiered controlled vocabulary arrangement. The first tier consisted of a database table containing a frequently used subset of clinical findings ex-

tracted from the SNOMED/SNOVET tables. The first tier would also have a synonym table that would provide a lookup method for the first tier controlled vocabulary. If the desired clinical finding were not in the small controlled vocabulary or the synonym list, the user would be able to access the full SNOMED/SNOVET listing in the second tier. In this way, the usual data entry process would work at acceptable speed and only occasionally would the slower, full SNOMED/SNOVET access be needed.

This internally designed system divided the vocabulary into Site and Effect which was further divided into three broad areas: laboratory analysis and procedures, pathologic changes, and diseases and signs. For each clinical finding, the user would first select one of the Effect areas. If the user selected Laboratory, they were presented with a menu of sample matrix options which served as the Site. The Laboratory Effects were selected from portions of the SNOMED/SNOVET Functions and Procedures axes. If the user selected an Effect other than Laboratory, the Site would be selected using a modification of the SNOMED/SNOVET Topography axis. The vocabulary for pathologic findings was drawn from the SNOMED/SNOVET Morphology axis and the vocabulary for the disease, sign, syndrome, and abnormal function terms were drawn primarily from the SNOMED/SNOVET Function and Disease axes. A body system code derived from the modified Topography axis was used as well.

We created a separate SNOMEDVET database to hold the unmodified SNOMED and SNOVET terms. From this database, useful terms were extracted for use in the TKS clinical findings vocabularies.

4.2.5 Chemical Name Controlled Vocabulary

The Registry of Toxic Effects of Chemical Substances (RTECS, prepared by NIOSH was to serve as the controlled vocabulary for chemical names. Our goal was to have the RTECS data on-line as a look-up system for the toxic and therapeutic agents entered in the exposure regimen. Unfortunately RTECS is an extremely large system and could not be incorporated within the TKS database structure.

We decided to create a separate RTECS database with rudimentary screen access. The chemical table contained 96,724 rows, the chemical synonyms table contained 247,072 rows, and the toxic effects tables had 229,466 rows. The size of these tables made on-line functionality nearly impossible. A query using a synonym required up to five minutes to complete. Although the retrieved data was useful, the overall slowness maded the RTECS unsuitable for the purposes we intended. Because of this, we planned to develop a separate chemical controlled vocabulary table which would hold selected chemicals from the RTECS files and other information sources. As a smaller table within the TKS system, it would be more responsive and could hold other useful information such as the reprint filing system information. We were unable to complete this component by the end of the project.

4.3 User Application

The user application is how the user interacts with the underlying Toxin Knowledge System components. Through the application, the user can review, add, and modify the standard nomenclature data tables. It also guides the user through the structured abstracting process and subsequent structured monograph generation. Because the application is

essential for the effective use of the Toxin Knowledge System, it was the focus of much of the Toxin Knowledge System development.

The two main actions of the application were to communicate with the user and to communicate with the database. Because of the inherent complex relationships between the various data tables, the user could easily make a mistake in data entry that would drastically impact the TKS operations. The database tables relate and interact in a myriad of ways, much like a spider's web We believed the user should be able to use the application with limited effort needed to maintain the "spider's web." The application should make or break the connections as needed. If a change is made in one table that affects another table, the application should display the appropriate means for either monitoring the change or adjusting the table data. We wanted the application to maintain the inter-table relationships invisibly and with no input from the user. The application should also react to the data that the user enters to direct the structured abstracting process.

The application should use a combination of menus and windows to communicate with the user. Informix-4GL® provides the tools to rapidly implement windows and "ring menus" (i.e.. menus like Lotus 1-2-3®). Informix-4GL® does not provide for drop-down and hierarchical menus which we would have preferred. As new functions were added to the application, we were able to quickly incorporate them in to the menu structure. When the application contained about 75% of the functions, we had to revise the menu structure to better integrate the menu choices and make the overall flow easier to follow. This revision put similar procedures together. The menu titles were revised to have unique identifiers, further facilitating the users movement within the system. The revised menu system is depicted in Appendix D. An example of the menu changes was our putting all the "Add" functions under one menu and the "Find" functions under another. While this was generally less confusing, it was awkward to move between the "Add" menu and the "Find" menu, although this movement was frequently necessary. This was resolved by adding a mechanism to jump from one menu to the other without the usual maneuvering through the menu tree.

Some modules make extensive use of context sensitive pop-up options to guide the user. We used codes for all columns that would use the pop-up option and used an associated translation function to display the meaning of the code to the screen. Because the same translation functions were used to convert the codes for use in the monographs, the user saw the words that would be in the monograph as he/she selected the most appropriate pop-up choice.

Because the application would direct the flow of the user's interaction, it was important to communicate to the user where they were within the application. This involved consistently labeling the data entry screens so that the casual or infrequent users could know which table was being accessed or the function executed. Similar labels were placed on the menus. A more significant addition was the inclusion of on-line help screens into the application to provide context-sensitive assistance throughout the application.

For the user to find data within the system, we utilized "Query-by-example" search strategy in association with the data entry screens. This would permit the use of "wild-cards" to find terms. Once the user's query was complete, the application used a "Browse" menu to let the user page through the retrieve information. This "Browse" menu also included a "Query-Again" option to readily permit additional searches. The "Query-by-

example" approach generally retrieves data from one database table. This did not permit the user to see related data in other tables. To resolve this, we developed and incorporated a "top-down" query mechanism which allows a user to query on any single table and rapidly see the associated data in all other tables. This mechanism did not permit cross-table queries but did allow a user to enter search criteria and find the needed data. We also added summary fields to the citation and paper overview screens to show the number of records in each linked table.

TKS had been designed with the primary key being a citation number derived from the journal, volume, page, and year. This provided a unique number for identifying the paper. A citation file number was added to the system for internal filing purposes. With increased use, we found that the citation file number was easier to work with than the citation number. As papers were entered into the citation component of the system, the citation numbers were assigned. Users trying to add content data from a specific paper to the system had a copy of the paper in hand but could not readily derived the citation number from the paper alone. To overcome this we developed a mechanism for the user to enter the author, volume, page, and year information from the actual paper and access detailed information within the system. This mechanism was based on a revision of the citation file number format.

4.4 Structured Abstracting Process

The structured abstracting process uses windowed data entry screens to ask the user for the needed information. Dependant on the information entered, the application will generate needed codes, validate the data entered and give feedback to the user, select the options to be displayed on screen, and choose the next screen for data entry. The following section shows the flow and background of entering a new paper into the TKS system.

4.4.1 Citation Table

The citation of any piece of scientific information is the primary identifier and as such is the primary entity in the TKS entity-relationship model. Many citation based systems focus only on journal citations; however, we found this to be a restrictive approach. After analyzing the components of journal and book citations, we were able to identify similar elements which could be extracted to become the identifying data for a given citation. We put these elements into the citation table and the journal or book specific information became a part of the journal or book vocabulary. The citation table would serve as the master table for all subsequent data tables. The citation would link to the journal or book reference via the citsource column. Other data tables would link to the citation table using a citation code number created when the citation is first entered into the Toxin Knowledge System.

When the user first accesses the data entry screen, a window opens and prompts the user for the first author's last name. Subsequently, the main data entry screen for this table opens and is shown below in Figure 1.

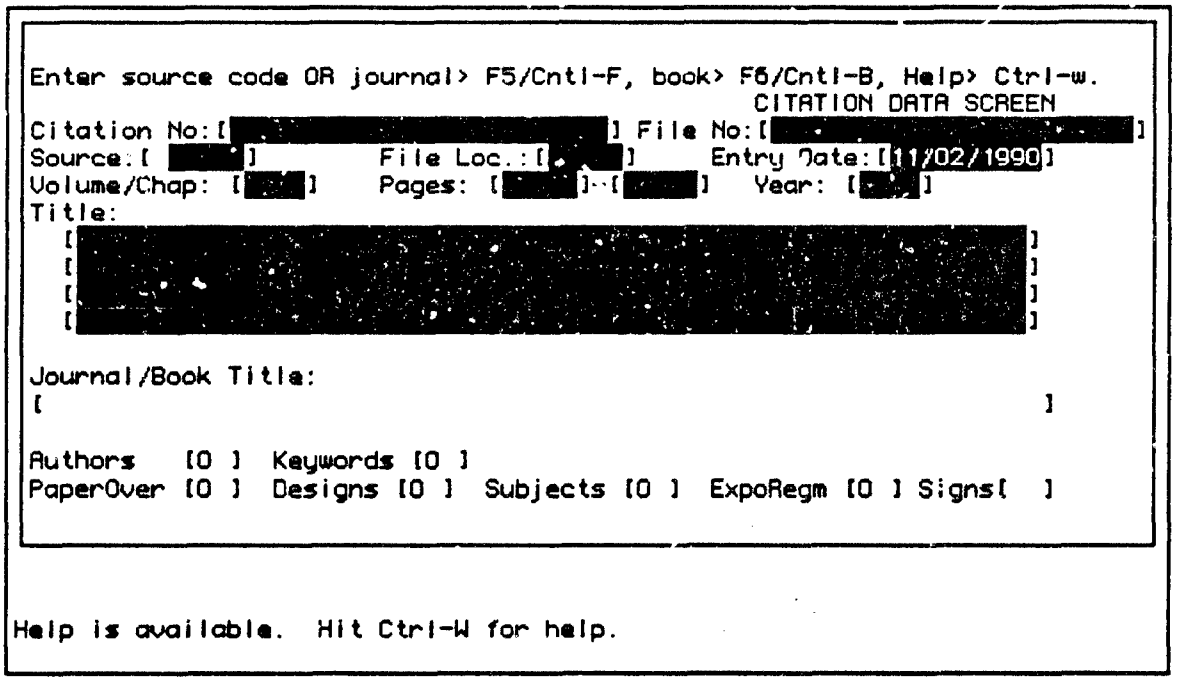

Figure 1. Citation Data Entry Screen

At first the cursor is in the Citation Source field and a message indicates that journal sources and book sources are available for look-up at the press of a function key. Figure 2 shows an example of the journal look-up screen. Depending on the function key selected, the user can query for a journal abbreviation or book title using wildcard searching. Up to thirty entries meeting the search criteria are displayed in the window. The user can scroll through these entries and select the desired journal or book by pressing the Escape key. The look-up window disappears, the selected journal or book code is automatically inserted into the Citation Source field, and the journal abbreviation or book title is displayed for verification. The user can elect to change this entry by entering a different number or pressing the look-up function key again.

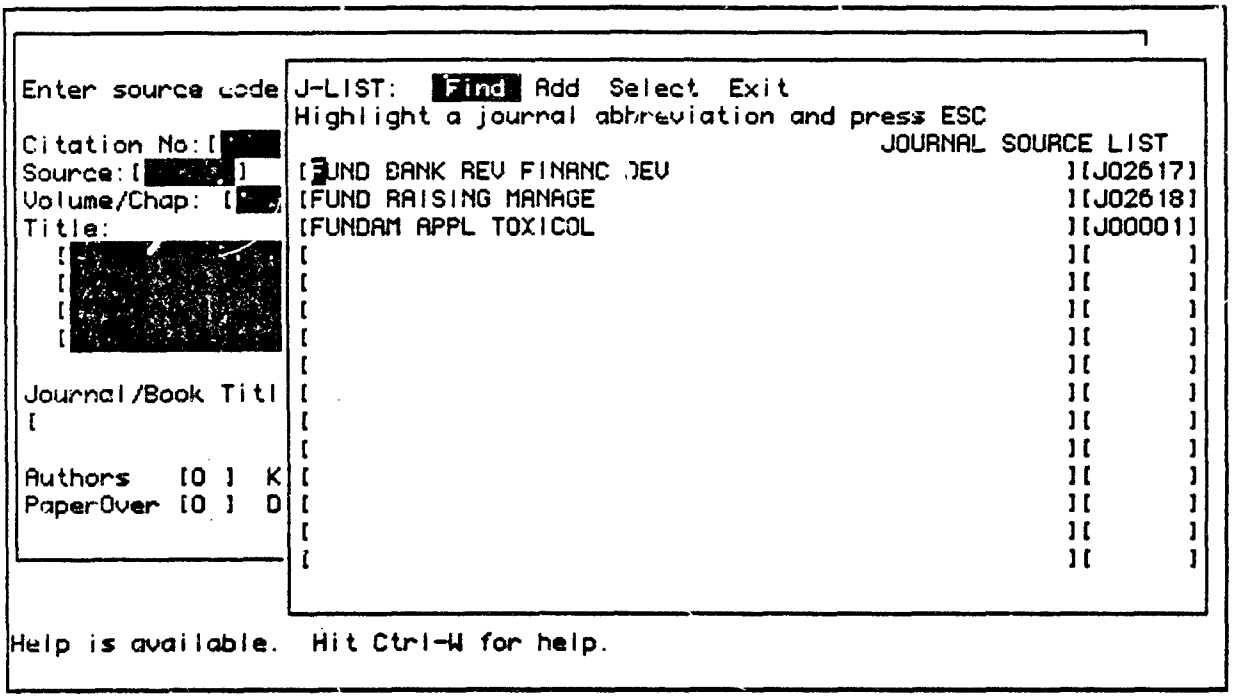

Figure 2. Journal Look-up Screen

After the Citation Source entry, the user continues to enter appropriate data into the screen entries. See Figure 3 below for completed screen. When all of the appropriate data is entered, s/he pushes the Escape key, the data is inserted into the citation table in the database, and the author entry portion is called.

An indication of the application's role in the structured abstracting process is seen in the generation of access coding. The primary access code was designed to be the citation number which is generated by the application. After the year value is entered, the the citation code number is generated and put in the corresponding field. The format for the code number is J/BSSSSS-VVVV-PPPPP-YYYY where J or B indicates whether it is from a journal or book, SSSSS indicates Citation Source value, VVVV is the volume/chapter number, PPPPP is the first page number, and YYYY is the year. For example, a citation from *Fundamental and Applied Toxicology*, volume 9, pages 588 to 594, published in 1987 would have the following citation code number: J00001-0009-00588-1987. The zero padding was required and managed by the application automatically. The citation file coding system was developed to assist users trying to add content data from a specific paper to the system. Generally the user had a copy of the paper in hand but could not readily derived the citation number from the paper alone. The citation file number was automatically generated by the application. The citation file number format was AAAA.V.P.YY where AAAA is the first four letters of the first authors last name, V is the volume number, P is the page number, and YY is the last two digits of the year.

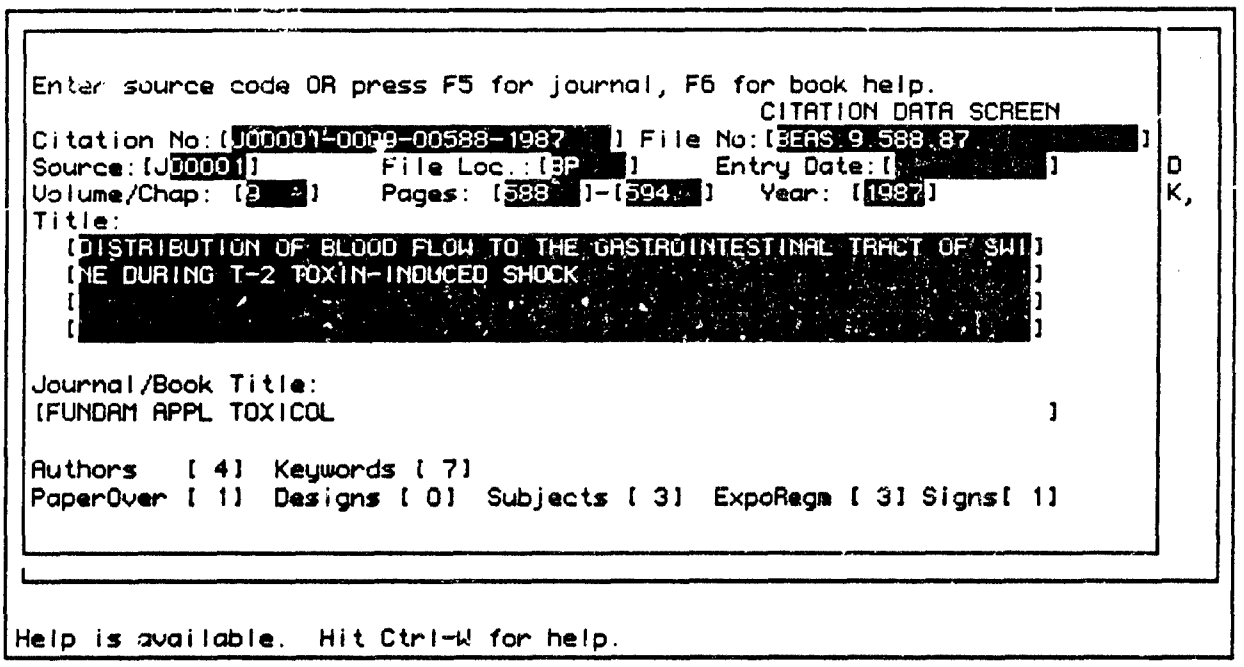

Figure 3. Completed Citation Data Entry Screen

As more papers were entered into the system, an increasing number of duplicate papers were found. We identified three situations where duplicate entries arose. One was a second copy of a previously entered paper. This situation could be handled by either ignoring the second copy or by updating the original entry as needed. The next situation was from keyboarding errors, which could be managed by correcting the erroneous information. The third and most difficult situation to manage were circumstances in which two papers actually have the same journal citation information. Examples of this are letters to the editor or abstracts in proceedings. We provided for a sequencing number to be added to the end of the citation number.

4.4.2 Author Table

Immediately after the Citation data has been accepted by the user, the Author entry window appears. Because the number of authors varies, we used a separate table to hold the author names and their order of authorship. Each entry was joined to the other tables via the citation code number. The entry screen for this table is shown in Figure 4 below. The citation code number is automatically displayed to assure correct links to the citation table. The user enters the authors' names into a scrolling entry array. Assuming the names are put into the system in order, the program will automatically generate the publication order number as the user puts additional names into the array. The current system allows up to 20 authors' names to be entered. Each author entry has a serial number assigned but it is not displayed.

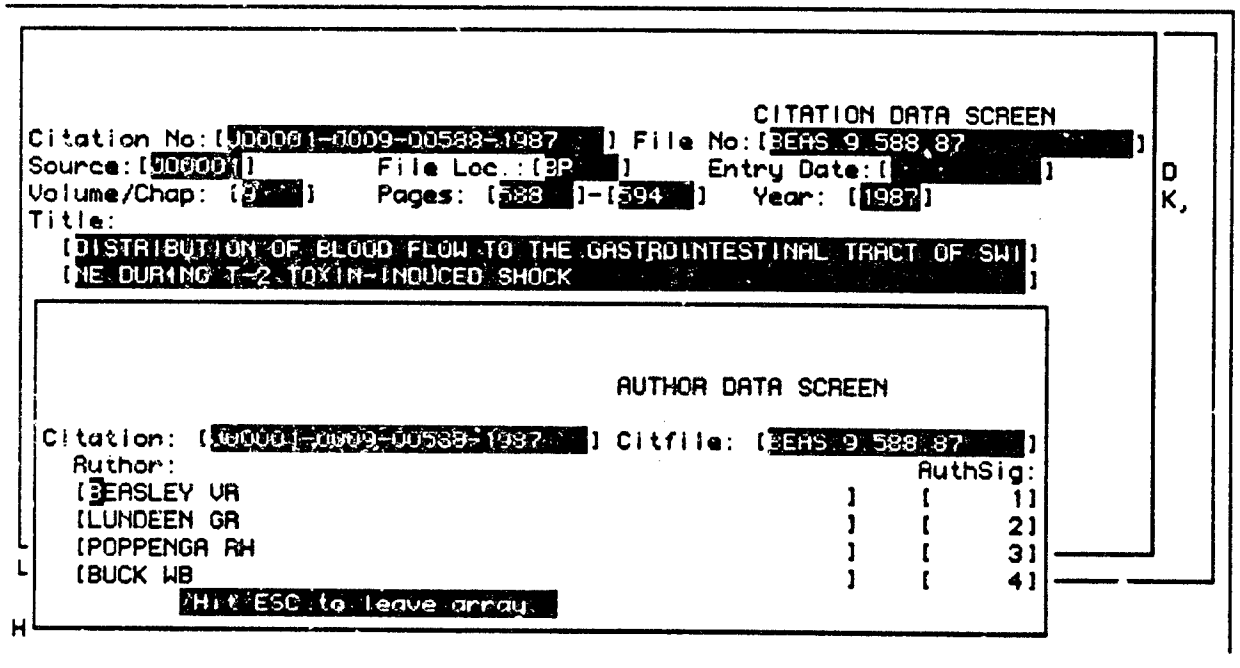

Figure 4. Author Data Entry Screen

4.4.3 Keyword Table

Toxin-related articles were entered into Toxin Knowledge System citation tables before the paper content tables were implemented. If the users were to have effective management of these citations, a mechanism other than the title had to be used.. We decided to add a keywords table and associated keyword list table to the system. As mentioned above Appendix C contains the keywords used. We originally planned to eliminate this table when the Toxin Knowledge System was complete. Late in the project, we began to appreciate the simplicity of the keyword approach and began to study ways that the application could automatically create keywords from the data entered in the structured abstracts. This was not completed.

After the user enters the citation and author data as described above, the keyword module is activated to permit entry of up to 20 keywords. The screen used to enter this data is shown in Figure 5.

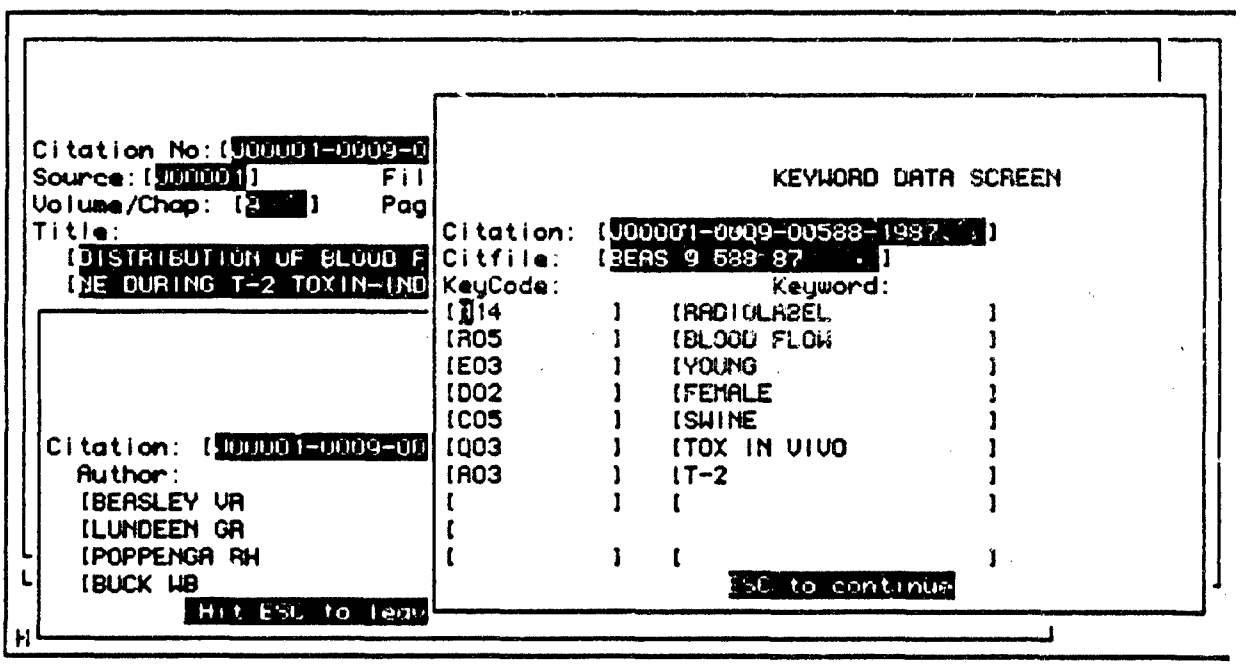

Figure 5. Keyword Data Entry Screen

The data entered is compared to a list of accepted keywords in the keylist table. This table is used for verification and on-line look-up. The interactions between the keywords table and the keylist table are depicted in Appendix A. Users can either input a code and the application will look up and insert the corresponding keyword or they can input a keyword and the corresponding code will be determined and inserted. This dual mechanism was found to be more effective than having only one mechanism. Users find that

there are certain keywords that are frequently used. If they learn the code for these words, three keystrokes produce a keyword that would require up to 20 keystrokes. Infrequently used terms might be remembered as words but not as the associated codes. The TKS application addresses both situations.

4.4.4 Paper Data Processing

After the citation, author, and keyword data have been entered, the application focuses on the paper's content. Because the interactions of study design, subject characteristics, exposure regimens, and results are inherently complex, the database design for the data tables was complex as well. The paper content is divided into four larger sections: Paper Overview, Methods and Materials, Results, and Discussion and Comments.

4.4.4.1 Paper Overview Section

The paper overview section is the master section for all content sections in the Toxin Knowledge System and consists of a single database table, paperover. The contents of this table are presented in Appendix B. Appendix A shows the interactions this table has with the tables in the Methods and Materials Section and the Results Section.

For each paper there is only one entry in the **paperover** table. It serves as a foundation for the multiple entities in the other content tables. In addition to the table-to-table linking information, this table contains certain basic information about the paper. Both the stated purpose of the paper and the abstractor's impression of an implied purpose are collected and stored here. An implied purpose can frequently give insight into the authors' biases that might be at work. This table also contains the aim of the paper based on a list of acceptable terms for this item. Data entered in this table provided the foundation for application-directed abstracted. After the abstractor indicates the number of designs in this table, the application controls how many study designs can be entered in the Materials and Methods Section. The data entry screen for this table is shown in Figure 6.

The user's interaction with the above screen is straightforward. When a new citation is entered into the system, the citation number and citation file number are carried over from the citation entry process. When the user intends to add content data for a citation already in the system, s/he will be prompted for the citation number or citation file number for the entered paper. Regardless of the access point, these numbers are put into the corresponding fields on screen. The user enters the purpose data and selects the desired aim or paper class from the choices available. After entry of the code number, the associated translation appears next to it. The user then enters the number of study designs in the paper. The system supports up to 99 study designs. For example, if the paper consists of a case report of a human exposed to a toxin and an animal study to replicate the effects seen in the human, there would be two study designs and a 2 would be entered in the screen field. After all the data is entered, the user pushes the Escape key and the data is inserted into the database. If this is the entry of a new citation or if the entry for the number of designs has increased, the user will automatically go to the study design screen.

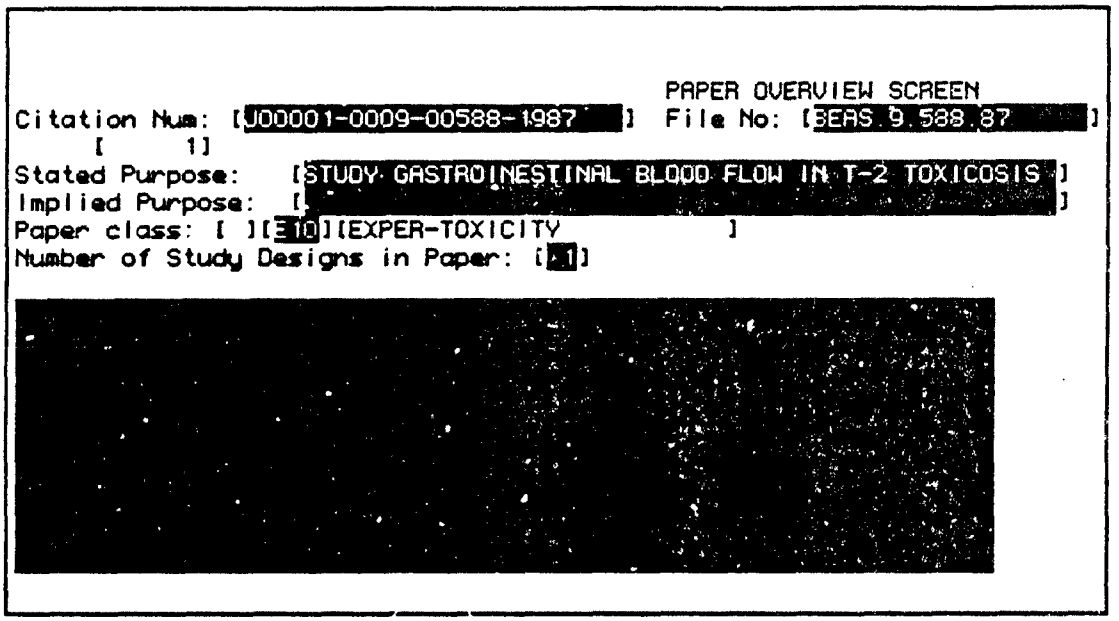

Figure 6. Paper Overview Entry Screen

4.4.4.2 Methods and Materials Section

In keeping with the standard style for writing scientific papers, the Methods and Materials section contains the data tables needed to hold data about the various methodologies and materials used in the study. These tables hold study design (**stdydsgn**), subject groups (**subjgrp**), exposure regimens (**exporegm**), and exposure groups (**expogrp**).

4.4.4.2.1 Study Design

The data table **stdydsgn** contains the general design information, the controlling technique data, the number of subject groups involved in this design, and the number of exposure regimens in this design. This table is described in detail in Appendix B. The number of entries permitted in this table is controlled by the number of designs entered in the **paperover** table. The data entry screen for this table is shown in Figure 7.

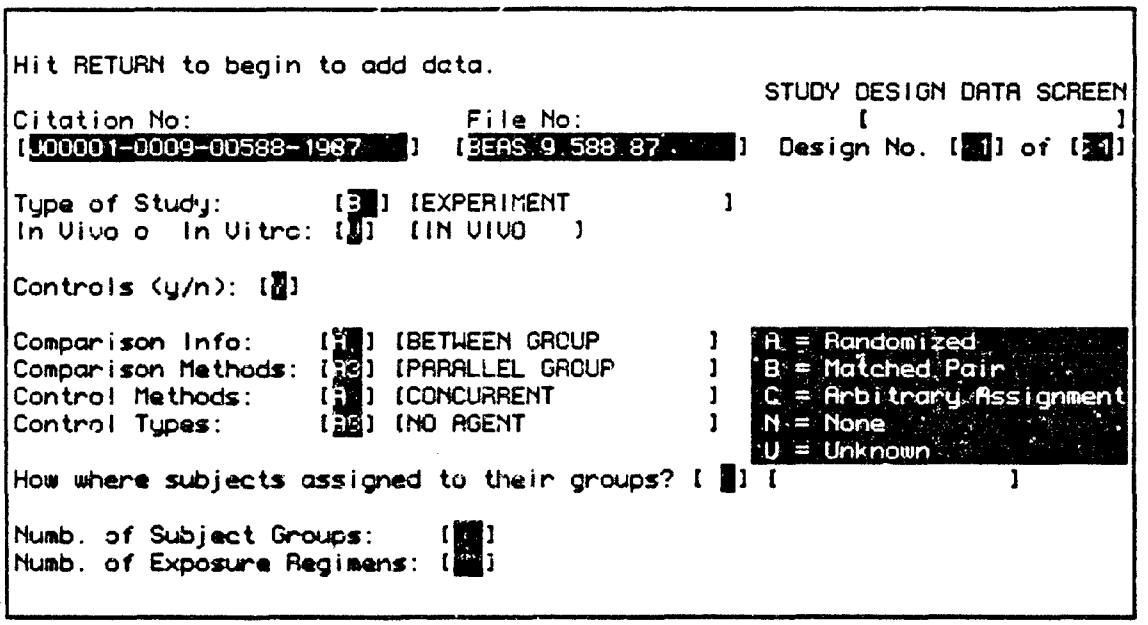

Figure 7. Study Design Data Entry Screen

Each entry is automatically assigned a serial number which is used by the application to link this table to the corresponding subject groups, exposure regimens, and exposure groups entries. When the screen opens, the citation number and the citation file number are filled in. The total number of designs is also indicated (passed in from the **paperover** table) and the design number for this design. In Figure 7, the entry is the first and only design. If there were 4 designs in the paper, the entry might read "Design No. 2 of 4". These values are maintained by the application. The first entry that the user/abstractor makes the Type of Study. (See Appendix G. Documentation for more detailed information about the choices for each field.) As the user moves the cursor through the entry fields, pop-up choices appropriate for that field appear. In Figure 7, the cursor is in the subject assignment field and 5 choices have appeared. After the user enters the code for a selection, the translated term appears to the right of the code. For example, the Type of Study code is "B" which is translated as "Experiment". When the user enters the number of subjects, the subject group data entry screen appears. After all subject groups have been entered, the user returns to the study design screen to enter the number of exposure regimens. With the entry of this number, the exposure regimen data entry screen appears for entry of all of the exposure regimens in this design. After all exposure regimens are entered, the user again returns to the study design screen to enter additional study designs as appropriate.

4.4.4.2.2 Subject Group Data

The information about the subjects in the study are stored in the **subjgrp** data table. This data is entered using the screen shown in Figure 8. Pop-up choices are used in this data screen as well. In order to assure consistency in the data collected, we added on-screen weight conversion to change all subject weights to kilograms. After the user enters the initial weight value and units, the program makes the necessary conversion and displayed the changes on-screen. This provided a more consistent way of comparing data in the monographs.

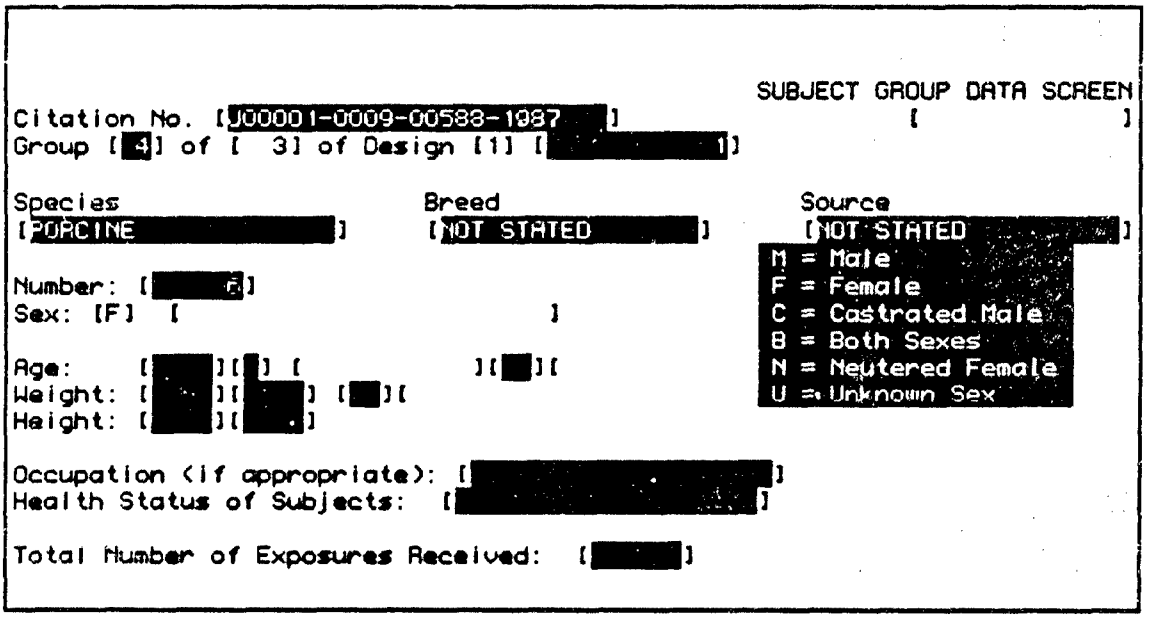

Figure 8. Subject Data Entry Screen

4.4.4.2.3 Exposure Regimens

Figure 9 shows the data entry screen for the Exposure Regimen data which is stored in the data table **exporegm**. Like the Study Design and Subject Group screens, pop-up choices and on-screen verification are extensively used. We intended for the exposure regimen entry process to utilize the Chemical Controlled Vocabulary to assure that the correct name for the exposure agent was entered. Because of the difficulties in working out an acceptable controlled vocabulary (see above), this function could not be developed.

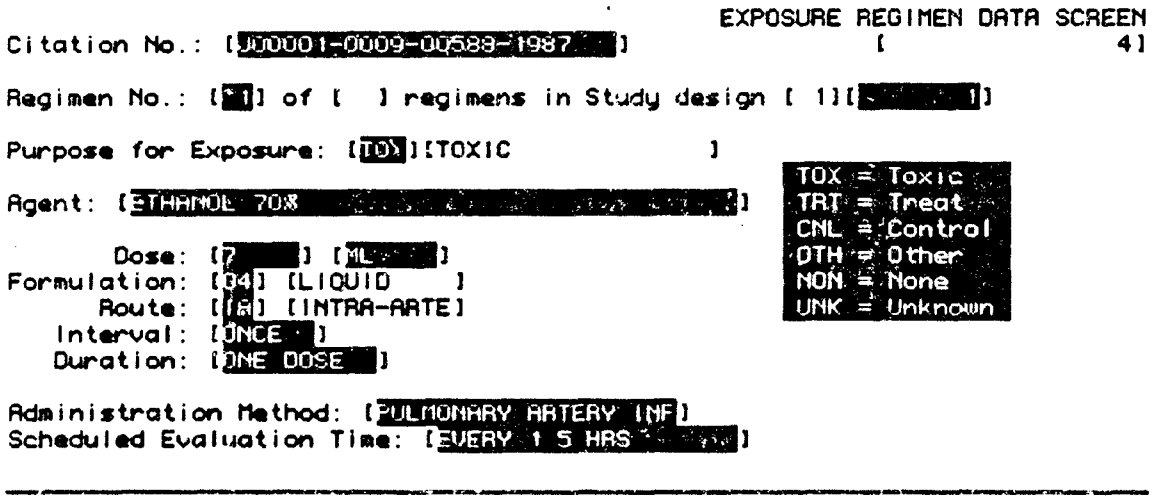

Figure 9. Exposure Regimen Entry Screen

4.4.4.2.4 Exposure Group Data

After the study design, subject group, and exposure regimen data are entered, the user must create the links between these information sets. This data is stored in **expogrp**. Although the TKS application manages most of the linkages between tables, we could not devise a mechanism to replace the manual creation of these links. The wide variations in study designs precluded making this automatic.

The purpose of the **expogrp** table (described in Appendix B) is to hold the design-subject group-exposure regimen link which is used to connect this information to the results data. In general, the **expogrp** consists of the link code and brief descriptions of the study design, the subject group, and the exposure regimen. The descriptions serve at least two purposes: to give on-screen verification of this information when the results data are being entered, and to provide this information as needed in the structured monographs.

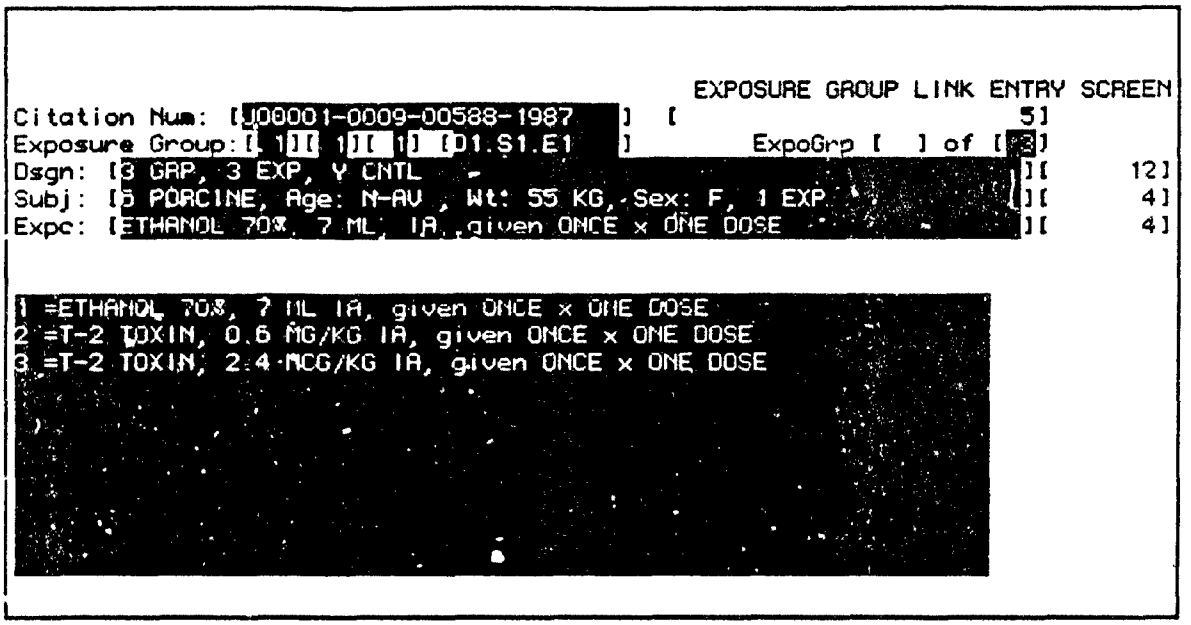

Figure 10. Exposure Group Link Entry Screen

After the last study design is completely entered, the screen in Figure 10 is opened. The user confirms the citation number and is then presented with descriptions of all the study designs entered for this paper. The application creates the descriptions by extracting data from the **stdydsgn** table. After the user selects the desired study design number, the application places the selected study design description in the appropriate field and then presents computer-prepared descriptions of the subjects involved in the selected design. Choosing the subject group results in the selected subject description being displayed, followed by presentation of similar descriptions for all exposure regimens in this design. In Figure 10, the user has selected design number 1, which is a controlled study involving 3 subject groups and 3 exposure regimens. Subject group 1 was selected. The corresponding description, which indicates that the group consisted of 6 female pigs with an average weight of 55 kg and were exposed once, was put into the subject group description field. The age of these pigs was not presented in the paper, thus the N-AV in the description. The cursor is in the exposure regimen field and the user is to choose between the three exposure regimen options displayed on-screen. From the paper, the user knows that group 1 received exposure regimen 1 and would enter this number. After the exposure option is chosen, the exposure-group link will be created, which in this case would be D1.S1.E1 meaning design 1, group 1, and exposure 1. This number would be difficult to use without the descriptions stored with the link.

A number of significant features were developed for this particular screen and modified for use in other areas of the application. One of the more important features was the automatic generation of the description by the application. This was the forerunner to the monograph generation development. Another feature was the method for paging through up to 99 possibilities on screen. This permits the user to page forwards and backwards as needed to select the desired item. This technique was modified for use in adding data to

papers already abstracted and was the basis for the pop-up choices in the various paper content screens.

4.4.4.3 Results Section

The Clinical Findings Module was a pivotal component of the TKS and the utility of the data entered in this section was dependant on a number of factors. Clinical findings are reported in various ways including text, tables, and graphs. Because the authors of a paper may report a wide range of clinical findings using different terms, an extensive controlled vocabulary was essential. Many different pieces of information must be managed at this point in the data entry process. The large amount of data that the TKS needed entered necessitated a clear and efficient mechanism for selecting and entering the data. The clinical findings had to be correctly linked to the appropriate study design, subject group, and exposure regimen.

Figure 11 shows the initial clinical findings screen and the type of data to be stored in the clinfind database table.

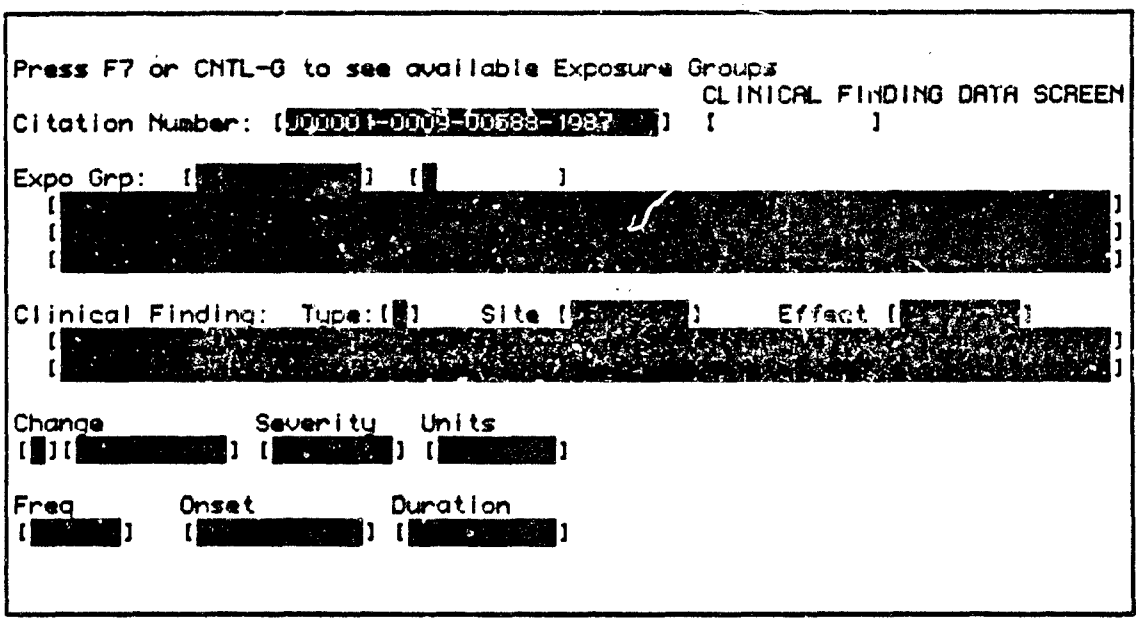

Figure 11. Clinical Findings Data Screen (Initial)

After confirming the citation number, the user must identify the exposure group that showed the clinical finding. The user is prompted to press certain keys after which brings up the Exposure Group Selection Window as shown in Figure 12. The user would the cursor down the list and select the appropriate group. The descriptions of the design, subjects, and regimen would be displayed on screen for validation.

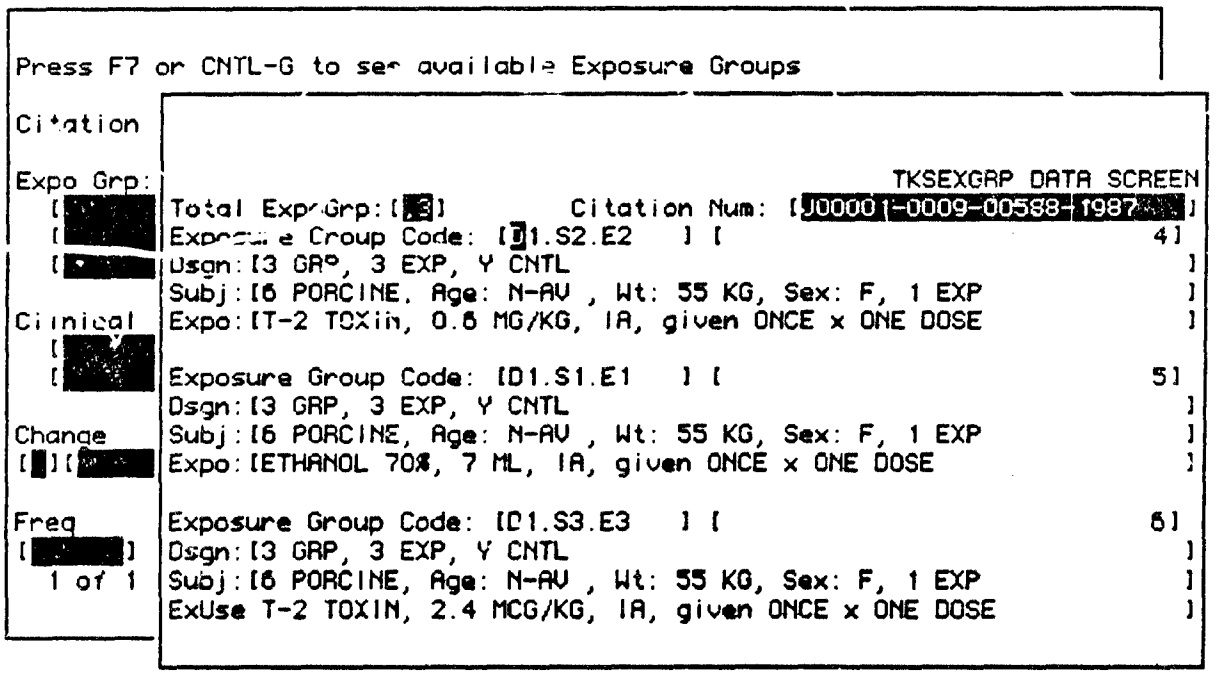

Figure 12. Clinical Findings Screen with Exposure Group Selection Window

One of the most difficult problems we faced in this section was in efficiently accessing the clinical controlled vocabulary. We recognized that the clinical findings data could be classified into three broad areas: pathologic changes, laboratory analysis and procedures, and diseases and signs. After entering the exposure group information, the cursor goes to the Clinical Finding Type field. The user first indicates the exposure and subject group link for the clinical signs. The user then can choose between Pathology, Laboratory, or Signs from a menu.

If the user chooses Signs, the Body System selection window appears, as in Figure 13. The user then chooses the appropriate body system for the sign in question and the TKS Findings Synonym screen appears (Figure 14).

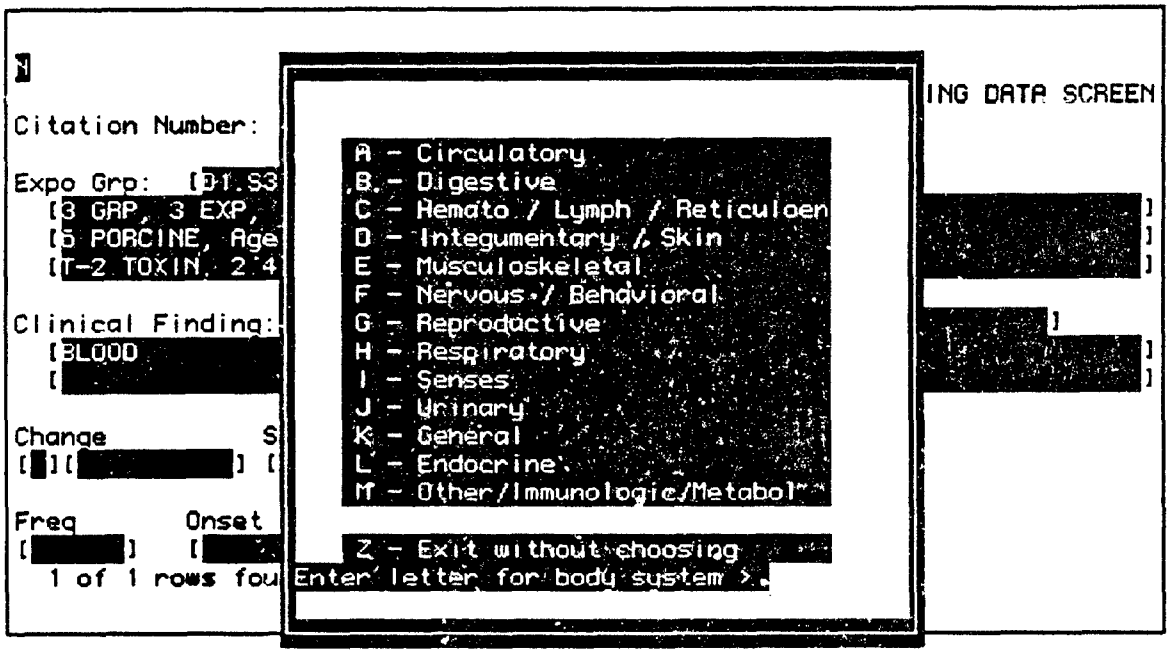

Figure 13. Clinical Findings Screen with Body System Selection Window

By dividing the user's approach to selecting the desired term, we were able to divide the controlled vocabulary into four areas. This approach in conjunction with our developing a two-tiered controlled vocabulary arrangement improved the performance in data entry. The first tier consists of a table of frequently used clinical findings extracted from the second tier SNOMED/SNOVET tables and a synonym table that provides a lookup method for the first tier controlled vocabulary. This is what is shown in Figure 14. The user enters a synonym in the TKS application and the program will search the synonym list for its presence. If the desired term is not present in the first tier vocabulary, the user can move to the second tier to search for and extract the desired term into the first tier if needed. The second tier system is a modification of the current methodology for selecting clinical findings. The relationships between the various vocabulary tables and the clinical findings table are shown in Appendix A.

```
Clinical Finding Synonyn                                    TKS FINDING SYNONYM SCREEN
[CARDIAC*
[A01962 ][CARDIAC DYSKINESIA
[A02172 ][CARDIAC DYSRHYTHMIA, NOS
[A01966 ][CARDIAC EJECTION FRACTION
[A01967 ][CARDIAC END DIASTOLIC VOLUME
[A01980 ][CARDIAC FLOW, ABNORMAL, NOS
[A01979 ][CARDIAC FLOW, NORMAL
[A01978 ][CARDIAC FLOW, NOS
[A01957 ][CARDIAC FUNCTION, ABNORMAL
[A01960 ][CARDIAC FUNCTION, DECREASED
[A01959 ][CARDIAC FUNCTION, INCREASED
[A01956 ][CARDIAC FUNCTION, NOS
[A01958 ][CARDIAC INSUFFICIENCY
[A02352 ][CARDIAC MURMUR, NOS
[A01970 ][CARDIAC OUTPUT, DECREASED
[A01969 ][CARDIAC OUTPUT, INCREASED
 Searching....
```

Figure 14. TKS Findings Synonym Screen (Sign Selection)

After the clinical finding is selected from the controlled vocabulary, the user returns to the Clinical Findings Screen where the selected body system and clinical finding is shown. The user then enters the semiqualitative changes, incidence information, and time factors. The completed clinical findings screen is shown in Figure 15.

```
                                                    CLINICAL FINDING DATA SCREEN
Citation Number: [J00001-0009-00588-1987    ]  [        133]

Expo Grp:  [D1 S3 E3    ]  [        6]
  [3 GRP, 3 EXP, Y CNTL                                                    ]
  [6 PORCINE, Age: N-AV , Wt: 55 KG, Sex: F, 1 EXP                         ]
  [T-2 TOXIN, 2 4 MCG/KG, IA, given ONCE x ONE DOSE                        ]

Clinical Finding:  Type:[S]    Site [A        ]    Effect [A01970  ]
  [CIRCULATORY                                                             ]
  [CARDIAC OUTPUT, DECREASED                                               ]

Change          Severity   Units
[4][INCREASE ]  [50       ]  [ML/MIN/K]

Freq        Onset          Duration
[AVERAG]    [BY 6 HR     ]  [NOT APPL  ]
```

Figure 15. Clinical Findings Screen (Completed)

If the user had chosen Laboratory Test as the Clinical Finding Type, a slightly different entry process is used. First a sample matrix menu is presented (Figure 16). The selected matrix is used as the site in the **clinfind** table.

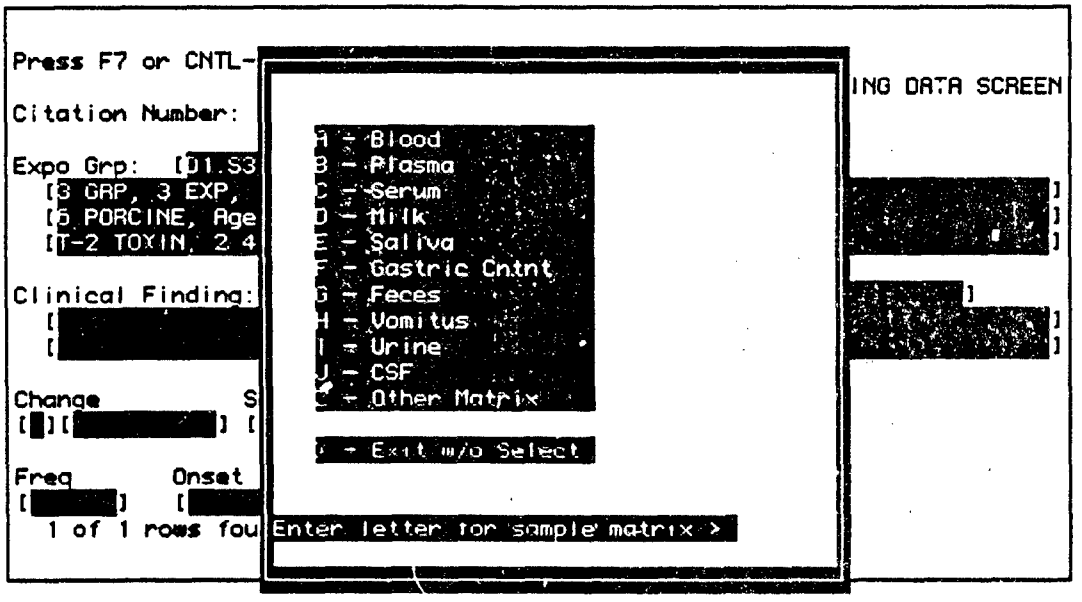

Figure 16. Clinical Findings Screen with Lab Matrix Selection Window

After the matrix is selected, a list of laboratory test categories is presented as in Figure 17. This categorization facilitates the selection of the actual laboratory test via a screen similar to that in Figure 14.

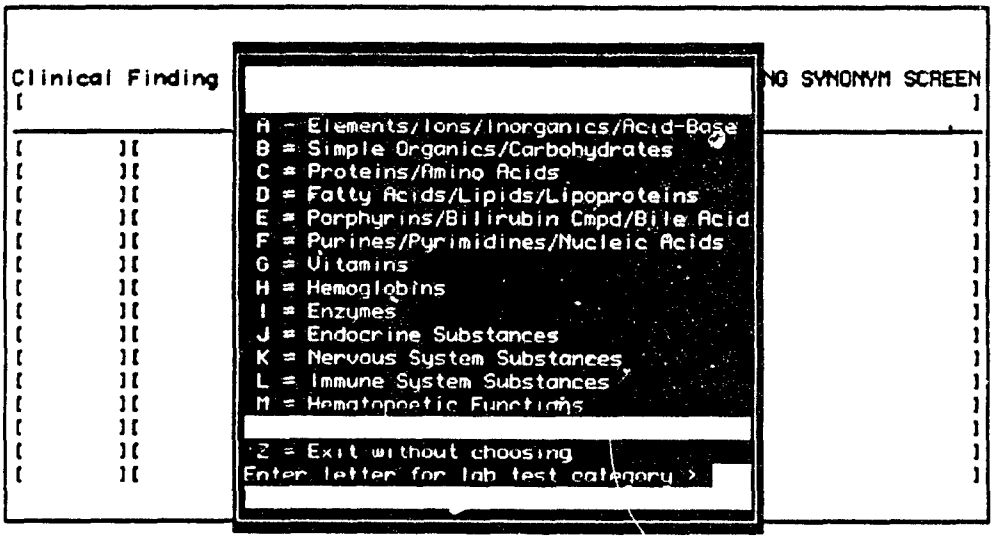

Figure 17. Clinical Findings Screen with Lab Test Group Selection Window

If the user had chosen Pathology as the Clinical Finding Type, the exact site of the pathologic lesion would be identified. This identification and selection process would uses the Body System Selection window (Figure 13) and the TKS Site Selection Screen (Figure 18). The user first selects the Body System and is then presented with the organs within the selected system. After the organ is selected, the exact sites within the organ are presented. With the selection of the specific site, the site code and site description are inserted into the clinical finding screen.

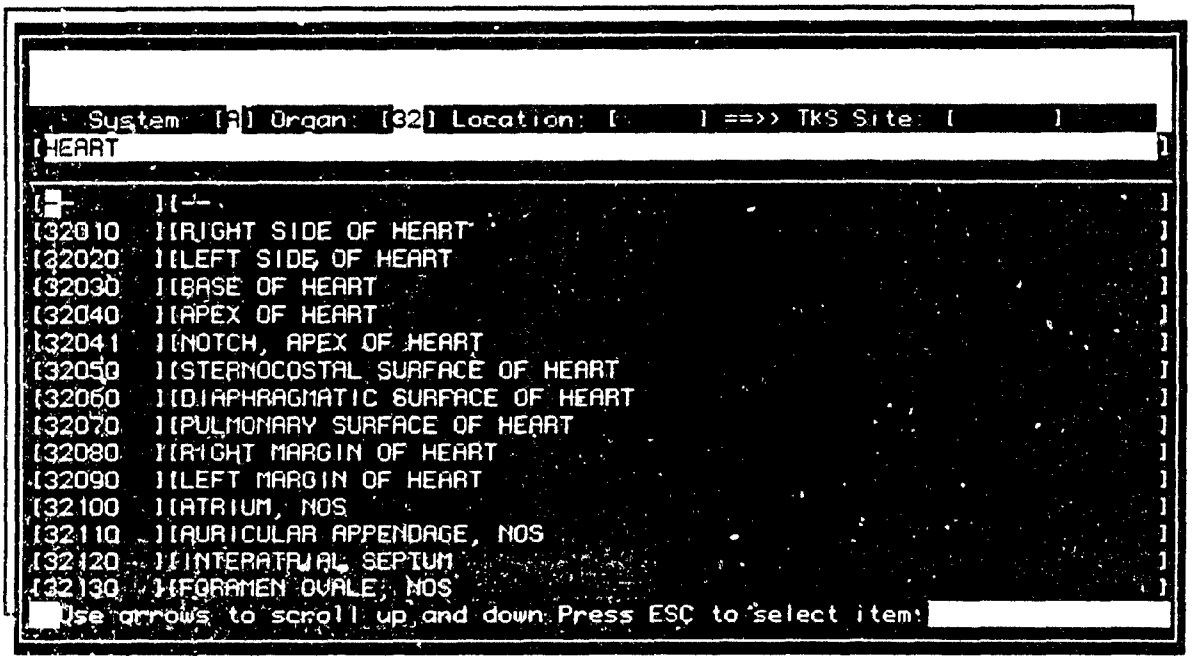

Figure 18. TKS Site Selection Screen for Pathology Findings

4.4.4.4 Discussion and Comments Section

The discussion section of scientific papers was difficult to manage within the TKS concept. While the structure of a scientific study provides the structure for much of a scientific paper, the discussions section is generally freeform. We conceived a method to manage the discussion data which would have had much broader applicability to the overall system. The concept would have permitted the inclusion of both comments about the paper being abstracted as well as the authors' comments about a previously published paper. Authors of scientific papers frequently compare their design, results, and conclusions to previous papers. They may state how their work supports, refutes, expands, or explains the previous work. The earlier design or work may be criticized or praised. All of these comments combine to provide a form of running commentary on a paper after it is published.

We designed a Comment table in the TKS database. Data in this table would have included the comment and the area of the paper involved. We had hoped to have comment creation accessible at any entry module in the system. By pressing a function key, the comment entry screen was to appear, allowing the abstractor to include their observations

in the comments table. We had hoped that the experience we gained in putting on-line helps throughout the application would have provide a means of accessing the comments files wherever needed. Unfortunately the programmer responsible for this area resigned and could not be replaced; thus, this section was not completed.

4.4.5 Cross Table Query Process for Keywords and Citations

In the first year of the contract we developed a query-by-example portion of the application to permit screen-oriented multi-table queries of the citation, author, and keyword tables This screen is shown in Figure 19 below.

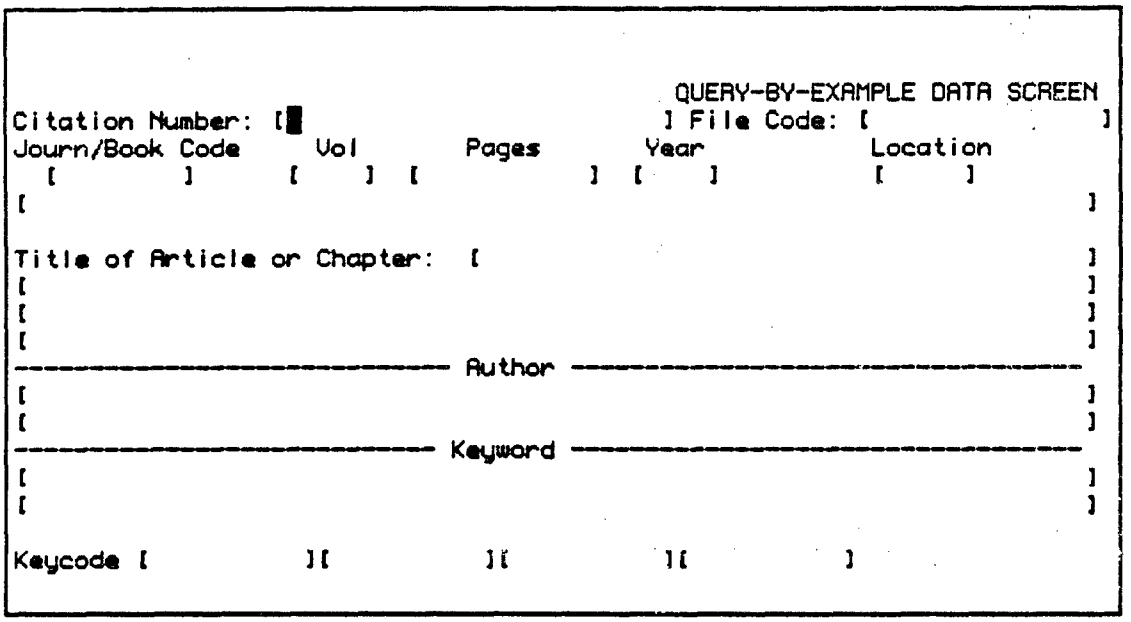

Figure 19. Cross-Table Query-by-Example Screen

The program queries for entries in all three tables which meet the appropriate search criteria. The program concatenates the author and keyword entries into character strings and displays them in the appropriate fields on screen. Figure 20 shows the results of such a query. Using the menus, the user can browse through the citations and elect to output all or selected citations to either a file or to a printer. The output resembles a list of bibliographic citations sorted by the first author's last name.

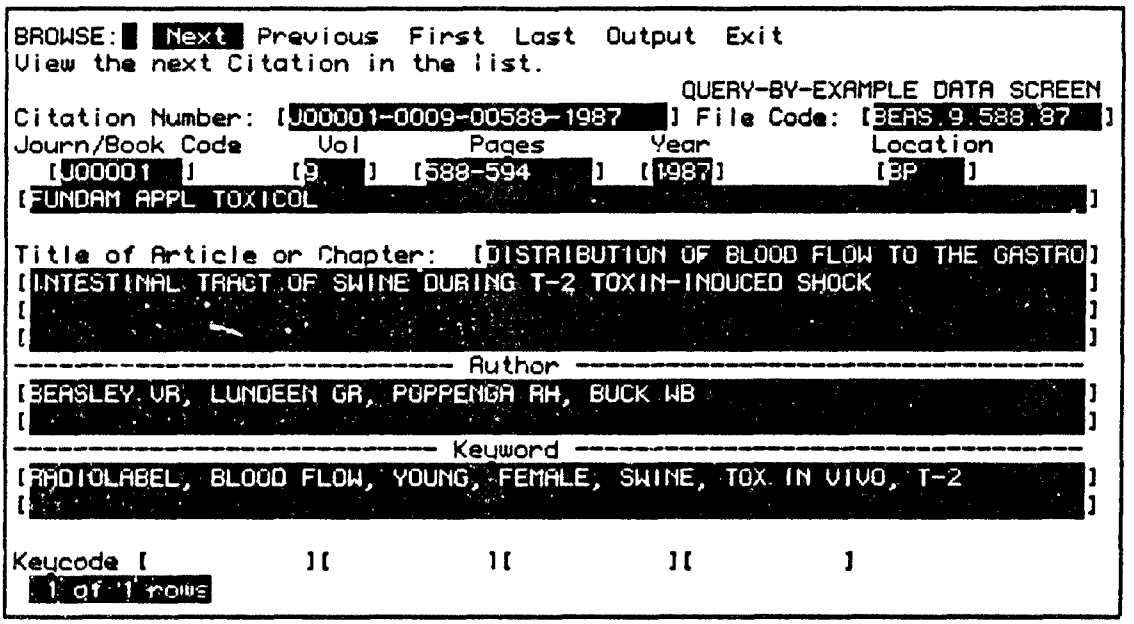

Figure 20. Cross-Table Query-by-Example Results

This module was very effective when searching for one term from each table; however, it would not produce correct results when more than one keyword or author was entered. This problem had two origins. One is fundamental to the relational model in that a Boolean "AND" within a table gives a negative search. A single entry in a table cannot two values. Using the Informix-SQL® query language, this can be overcome using a "UNION" statement in a select statement. Unfortunately the Informix-4GL® "CONSTRUCT" statement, the standard method for preparing query-by-example search procedures, did not permit the use of "UNION" within the query. We were not able to correct this problem by the end of the contract as it was of a less critical nature than the other modules of the application.

4.5 Structured Monograph

The Monograph Generation Module development was hampered by delays in finalizing the paper content components. We could do little effective work in this area with limited or incorrect data in the results tables. In spite of the significant delays, we were able to begin two basic monograph components.

The Monograph Generation Module consisted of a paper abstract component, a generic toxicant oriented component, and a bibliography generation component. The bibliography generation component permits a user to generate a bibliography for every paper in TKS, a given author, or a given generic. This function is automatically called to provide full citations for the generic toxicant abstracts. While the remaining structured abstracting components were being developed, the TKS Library Clerk found and entered almost 2500 citation into the TKS system. The application generated bibliography for these citations are presented in Appendix E.

One monograph component was the paper abstract which generates a monograph showing the entered data for a given paper. This monograph or "structured abstract" allows the user to compare the generated abstract and the original paper. These abstracts were used to identify mechanisms to improve the monograph program. The initial work with the monograph pointed out certain areas within the application we had revised to enter and maintain appropriate data for incorporation within the monograph. We determined that if all the entered data were entered in upper case and computer generated text were in lower case, the reader of a monograph could easily distinguish the paper data from the application data. This necessitated revision of several components of the application, primarily in the paper content sections. This also pointed out several wording problems that were largely the result of the translation functions. These were changed. Some other wording functions were not easily changed. Sample monographs from TKS are in Appendix F.

The monographs for generics were much more difficult to develop. We eventually provided the user with 5 different menu choices, of which 2 were completed. The first choice provided is "System-Sign-Species-Dose-Study Design". With this choice, the application generates a monograph presenting the Sign (clinical effect) grouped by body system and then by the sign. For each sign reported, a paragraph describing the severity and frequency of occurrence in the study group. A description of the subjects, the exposure regimen, and the study design is given, followed by the citation serial number in parenthesis. A reference list of papers cited in the monograph is at the end and arranged alphabetically.

The second choice available is the Total Generic Monograph. This was conceived to be a comprehensive presentation of all data in the TKS for a given toxin. This monograph currently presents a paragraph for each clinical effect seen in each paper entered into the TKS. This paragraph integrates the sign, design, subject, and exposure regimen information into a generally readable form.

Because the monograph is created from the entered data, the quality of the data entry process has major impact on the readability and correctness of the monograph. As we developed the monograph generation module, we became increasingly aware of the inconsistency and omissions in published papers. This created several problems in the TKS design. The entry of data was dependant on the TKS user's ability to translate the authors' statements into our form and terminology. In addition, we needed to have mechanisms to manage situations in which there was omitted data. We were unable to completely resolve these issues before the contract ended.

4.6 USAMRIID Personnel Utilization of System

We anticipated that USAMRIID personnel would utilize the Toxin Knowledge System on the Sequent minicomputer at the UI. As designed an authorized USAMRIID user could dial-up the Sequent computer through a 1200 baud modem or attempt ARPANet access. When the user logged into the Sequent, they would automatically enter a menu-driven program permitting connection to the TKS database. We expected ARPANet connection to serve as the primary means of access as well as providing electronic mail between TKS and USAMRIID personnel. The hardware components to connect the Sequent to the University of Illinois Campus Network were obtained and installed. Through this network, ARPANet connection was possible. Initially there were system software incompatibilities that ham-

pered both remote logins and electronic mail. Although these problems were overcome, USAMRIID personnel experienced performance problems which prevented ARPANet from being an acceptable means for accessing the TKS database. We did not have these performance problems when we accessed other computers via Internet/ARPANet and suspected that the performance problems were located on the USAMRIID computer side.

The USAMRIID personnel requested detailed documentation on the application so that they could more effectively use the system. We prepared the initial documentation on the Sequent but it was later moved to a Macintosh to permit inclusion of graphics, such as screen images and data diagrams. The current version is prepared using PageMaker 4.0 for the Macintosh. This documentation is included in Appendix G.

4.7 Porting TKS To Other Computer Platforms

Although the Sequent computer is an ideal platform for developing Informix applications and maintaining databases. We recognized the need for a "personal" version of the TKS application, a version which one person would use for a more limited set of data. Individuals could benefit by having their own journal selections abstracted into TKS. To achieve this and to make the application more usable for USAMRIID personnel we ported the TKS application to the MS-DOS personal computing platforms.

We obtained Informix-4GL® and the necessary C compiler for this programming environment. Because of limitations in the MS-DOS environment, we chose to use the Informix-4GL Rapid Development System instead. The TKS application was successfully ported to the MS-DOS platform using an IBM PC/AT with 2 megabytes of RAM running the Informix-4GL® Rapid Development System.

5 Discussion of Results

The Toxin Knowledge System was not fully developed during this contract. We experienced a number of setbacks, primarily in programmer support. The principle investigator had to serve as the data analyst, database and application designer, and primary programmer. The programmer hired to assist in this area had limited knowledge of biomedical literature and life science research which proved to be a significant deterent in her contributing to the overall effort. Her experience in computer system administration was very strong and her primary contributions were in maintaining the computer and network operations. In addition, she left the project early and for the last 12 months of the project all programming and computer support became the responsibility of the principle investigator. In retrospect, it is clear that the project needed at least two programmers for the full length of the contract and that at least one should have had some experience in life sciences. In spite of the problems, development of the TKS proceeded and the results shows some of the promise that a completed system would have.

5.1 Standard Knowledge Structure

The Standard Knowledge Structure developed for TKS primarily covers *in vivo* toxicology testing. It relates the various facets of study design to the clinical problems seen. The structure is sufficently flexible to permit extensions to cover other areas, such as analytical studies, *in vitro* work, and retrospective studies. We began the analysis for the analytical studies but personnel shortages forced us to abandon it for other more pressing areas.

The comments or discussion section of the Standard Knowledge Structure received considerable attention, but was not implemented. To implement this section, we needed to be able to provide *ad lib* access to the comments data table. This data table would need to have a many-to-many relationship model, which is difficult to execute with traditional relational database systems. By the end of the contract, we had several firm ideas of how to achieve this but did not have the personnel to do so.

5.2 Standard Nomenclature

The development of a functional species independant clinical findings vocabulary was an important step. The multi-tier approach and categorization of clinica findings has proven successful. While the current version of the vocabulary needs to be refined and synonyms added, it provides an excellent base for future work.

Unfortunately, the chemical vocabulary was not successfully developed in spite considerable effort. We believe that a multi-tier approach for this vocabulary would work as well but did not have the personnel to complete this work. The most promising mechanism to provide the chemical vocabulary would have used an "error list" of chemicals entered each day. As the abstractor entered agent data, the application would compare the entered agent against the vocabularies. If the agent were in the vocabularies, the application would proceed normally. If the agent were absent, the user would be prompted for the action to take. If the agent were misspelled the user could change the spelling. If the agent were not in the vocabulary but should be, the agent would be added but also put into the "error list" for periodic review. Initial papers would have taken much more time to enter with this approach, but eventually the vocabularies would contain the majority of the needed terms.

Expansion of the monograph generation functions would have necessitated additional changes in the Study Information Terminology. These changes would be have to be made to improve the readiblilty of the monographs, especially as new monograph forms were developed.

5.3 User Application

The user application works well for most situations. Although we would prefer to have drop-down and hierarchical menus instead of the ring-menus that Informix-4GL® provides, the overall functionality is excellent. Additional usage would obviously identify problems with the current programming and new ways to improve the users interaction.

5.4 Structured Abstracting Process

Scientific literature proved to be the most significant obstacle to the structured abstracting process, but the difficulties were enlightening to the abstractors. The TKS standard knowledge structure and corresponding structured abstracting process are based on certain assumptions which frequently were not true. The primary assumption is that the scientific papers are well done. Unfortunately, many authors inadequately describe the studies performed and the results they obtained. It is not uncommon for an author to use several different study designs and compare the results as if they were from a single design. Potentially important information about the subjects is frequently omitted from the paper. Results are difficult to find and/or interpret. The pressure on the authors to publish and the pressure on the journal editors to have papers publish is creating a situation that truely needs a system like TKS.

The problems mentioned do not keep TKS from working as designed, but they do make abstracting papers into TKS more time consuming than it should. On several occasions, TKS abstractors would recognize problems with a scientific paper while trying to put it into the system.

Our personal experience and discussions with other scientists suggest that many scientists are unable to fully read many of the papers that they retrieve and that those that are read are not being critically reviewed. Many do not read the papers they collect, but merely file them for possible future use. Some only read the abstracts of the papers which frequently do not accurately reflect the content of the paper.

A system like TKS could provide a more functional access to literture. If a repository of abstracted papers were available, a researcher could tailor their information requests to study design, not just the title of the paper. To do this however would necessitate having abstractors working continuously to maintain the repository which would be beneficial but manpower intensive. This abstracting process is unlikely to be automated because of the myriad of ways that a paper can be written.

We still believe that the concept of structured abstracting is valid and has promise. Perhaps the realization of this promise would be more likely to be seen if researchers were required to "write" their papers in a structured abstract form. This could communicate more than the pages of prose that currently is used.

5.5 Structured Monographs

We had just begun to develop the structured monograph generation modules at the end of the contract. While the current output is not entirely satisfactory, the programs that created them were written in under a day. With additional time and a larger number of papers entered into the TKS, the monographs could become very useful. The monograph forms currently are prose in nature. We think that additional forms, such as tabular output, could provide additional insight and comparison. A significant limitation of the current system is in typographic control. If the system were developed only for UNIX® computers, output controls using the text processing tools such as "nroff" and "ditroff" could be incorporated into the monograph. Better control might be achieved by using PageMaker style flags and downloading the monograph into a PageMaker file for output.

5.6 Comparison of this system with text retrieval systems

In the past year, a number of advances have been made in text retrieval systems which would appear to be more suitable for TKS than a relational database system. Recent articles in trade publications have described these systems along with their strenghts and weaknesses. We think that text retreival systems could be used to extract information for inclusion in TKS, but that the structured storage of data has more comparative and evaluative power than the text retrival systems. The text retrieval systems are designed to search through large amounts of text for a word or its synonyms. For these systems to be most effective, the synonym listings must be modified for local needs. This is similar to the creation of a controlled vocabulary.

6 Conclusions

The development of the Toxin Knowledge System was intended to provide a tool that would facilitate the acquistion and maintenance of knowledge. Tools are only useful when

they are used. If TKS had been completed, the major difficulty would be the amount of time needed to put the information into the system, yet researchers will overlook needed information, accept as truth the incorrect information in author's narrative abstracts, and fail to compare papers adequately.

While the limitations of scientific literature have been described for decades, few changes have been made in either the editing and publication of the papers or the critical utilization of the published works. The burgeoning amount of information being published makes it unreasonable to expect individual scientists to manage their own information to the extent needed. While it is unlikely, it would appear worthwhile to create and establish more critical information systems to suppliment the citation and abstracting systems currently in use. Reporting of biomedical research funded by federal funds should include detailed descriptions of study design and results on abstracting forms that could be easily coded into the these new information systems. This could provide an initial point for controlling the information glut.

The recent developments in imaging and text retrieval systems would appear to provide complimentary technologies to the TKS concept. If articles could be scanned into a computer and stored on optical disk for future review and usage, these could be viewed on screen while entering the data. With new technologies in relational database systems, these scanned images can be stored as a part of the relational database.

7 Recommendations

TKS is a needed tool. We would recommend that TKS be completed and expanded to incorporate new study designs and approaches. A central facility should be established to abstract papers and reports into the TKS. As more papers are entered into TKS, new monograph formats could be designed to better communicate the compiled data. It would seem worthy for USAMRIID to establish new requirements for the reporting of biomedical research to include detailed descriptions of study design and results on abstracting forms that could be easily coded into the TKS database.

Appendix A.
Graphical Depiction
of
Toxin Knowledge System
Database Design

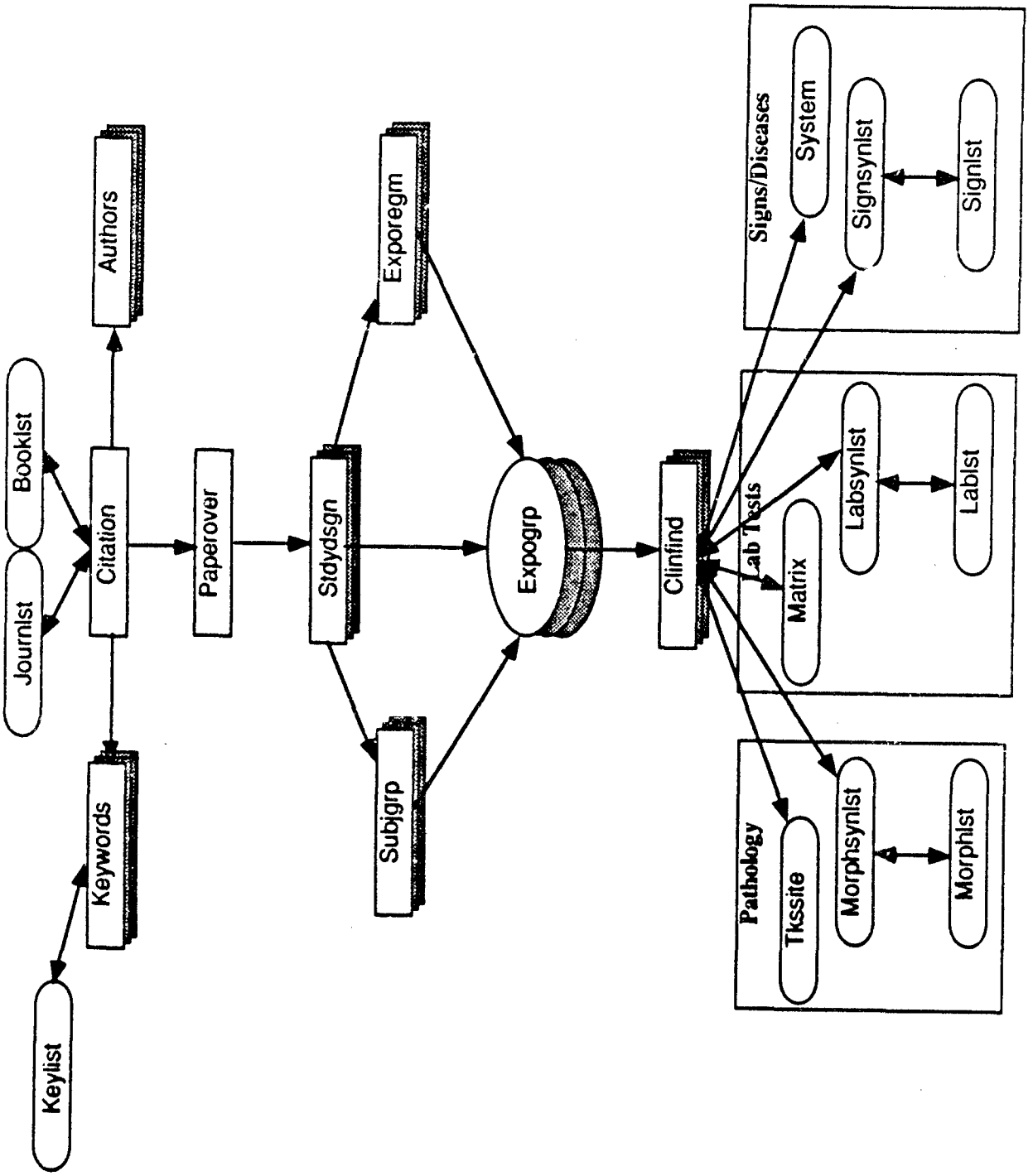

Figure 21. Overview of Toxin Knowledge System Database Design

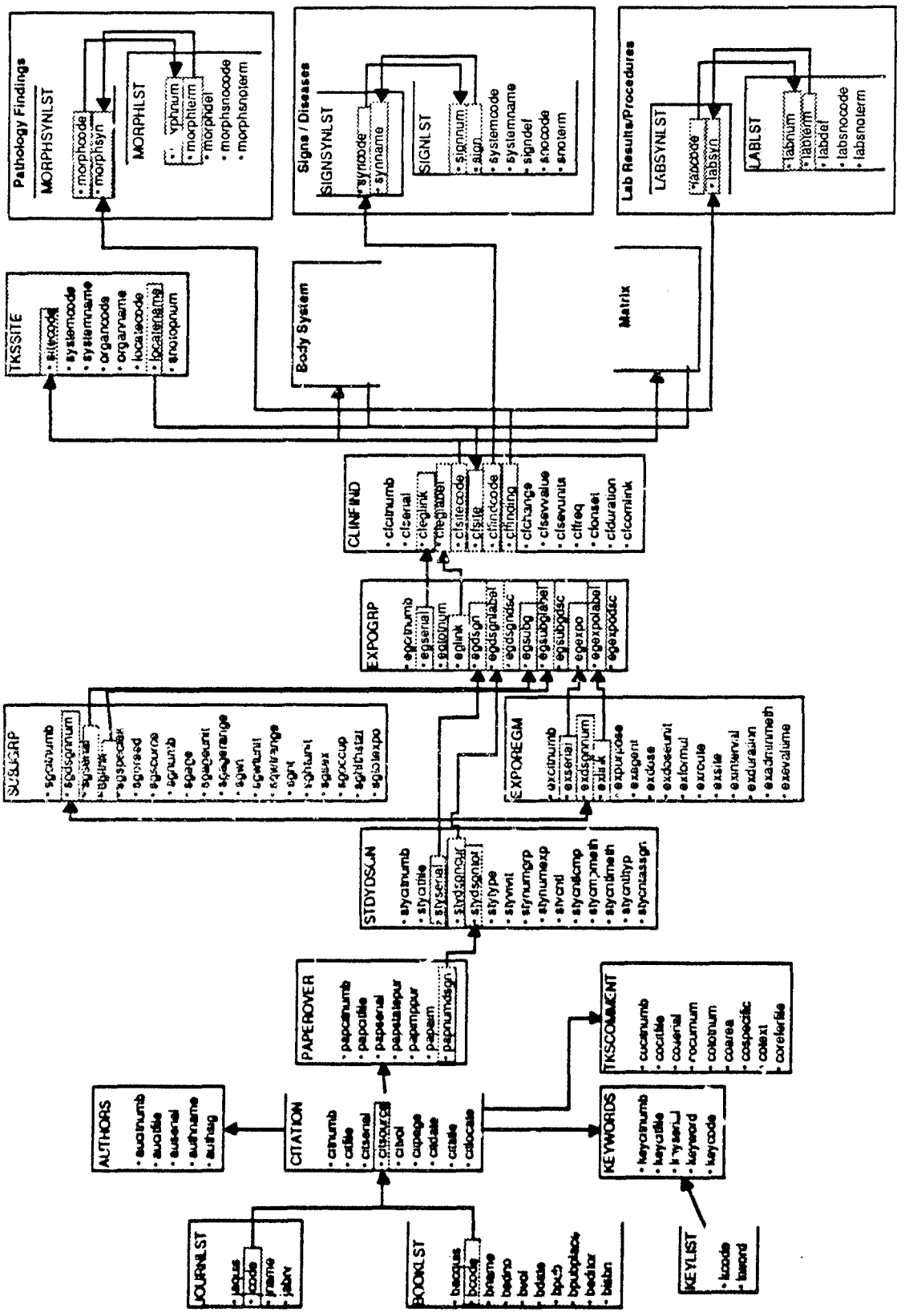

Figure 22. Detailled Overview of Toxin Knowledge System Database Design

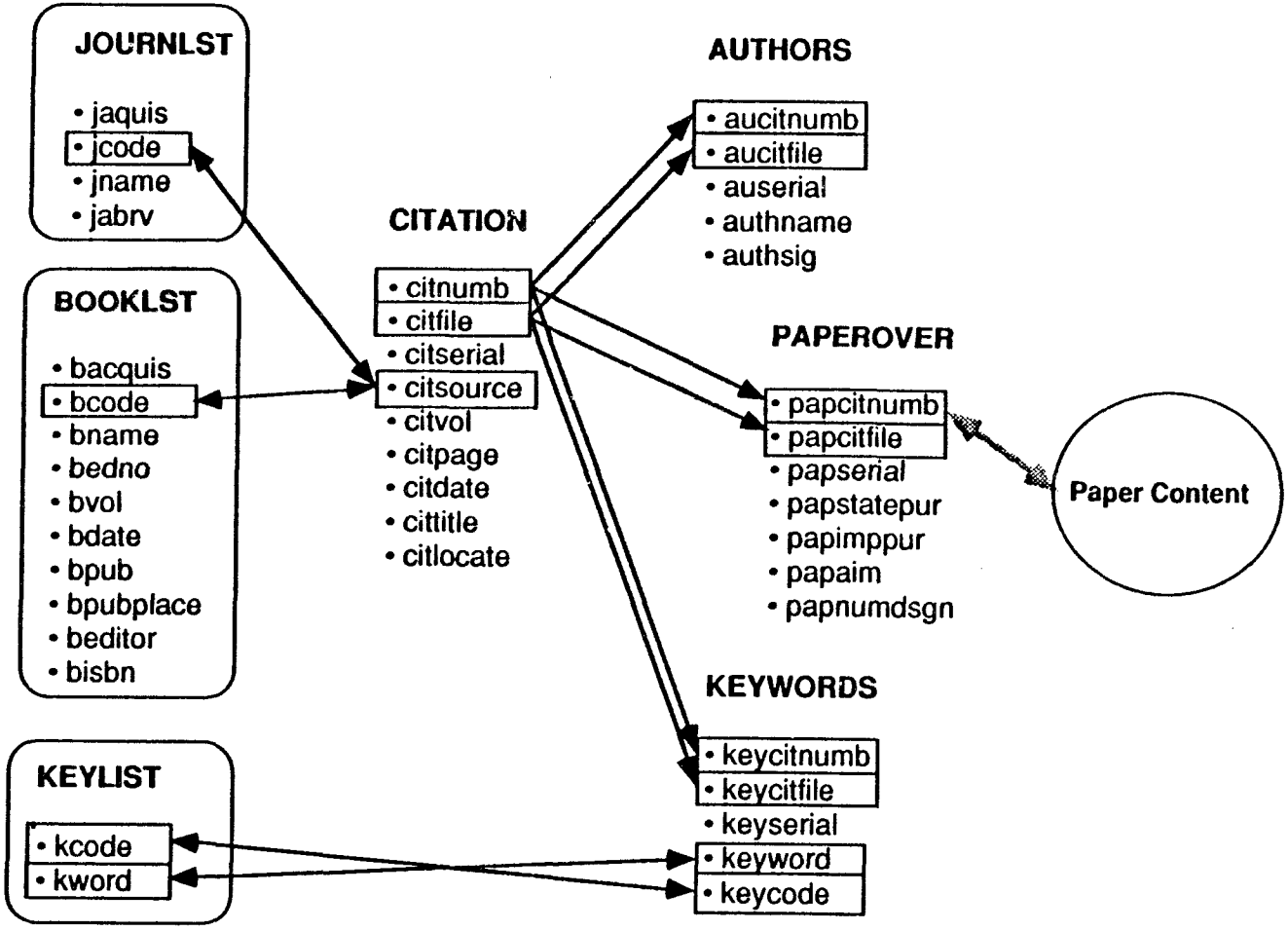

Figure 23. Citation Data Table Interactions

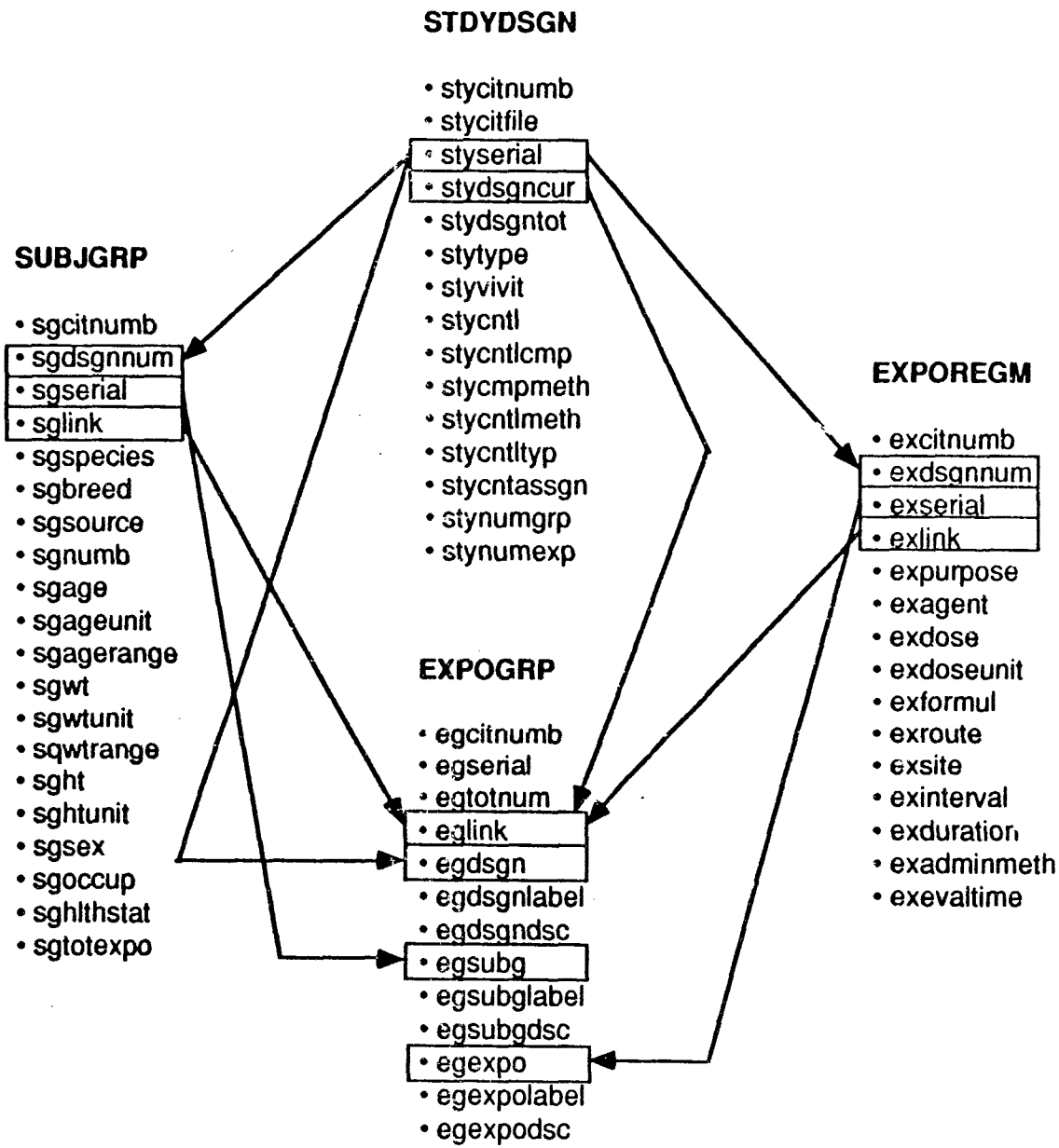

Figure 24. Paper Content Tables Interactions

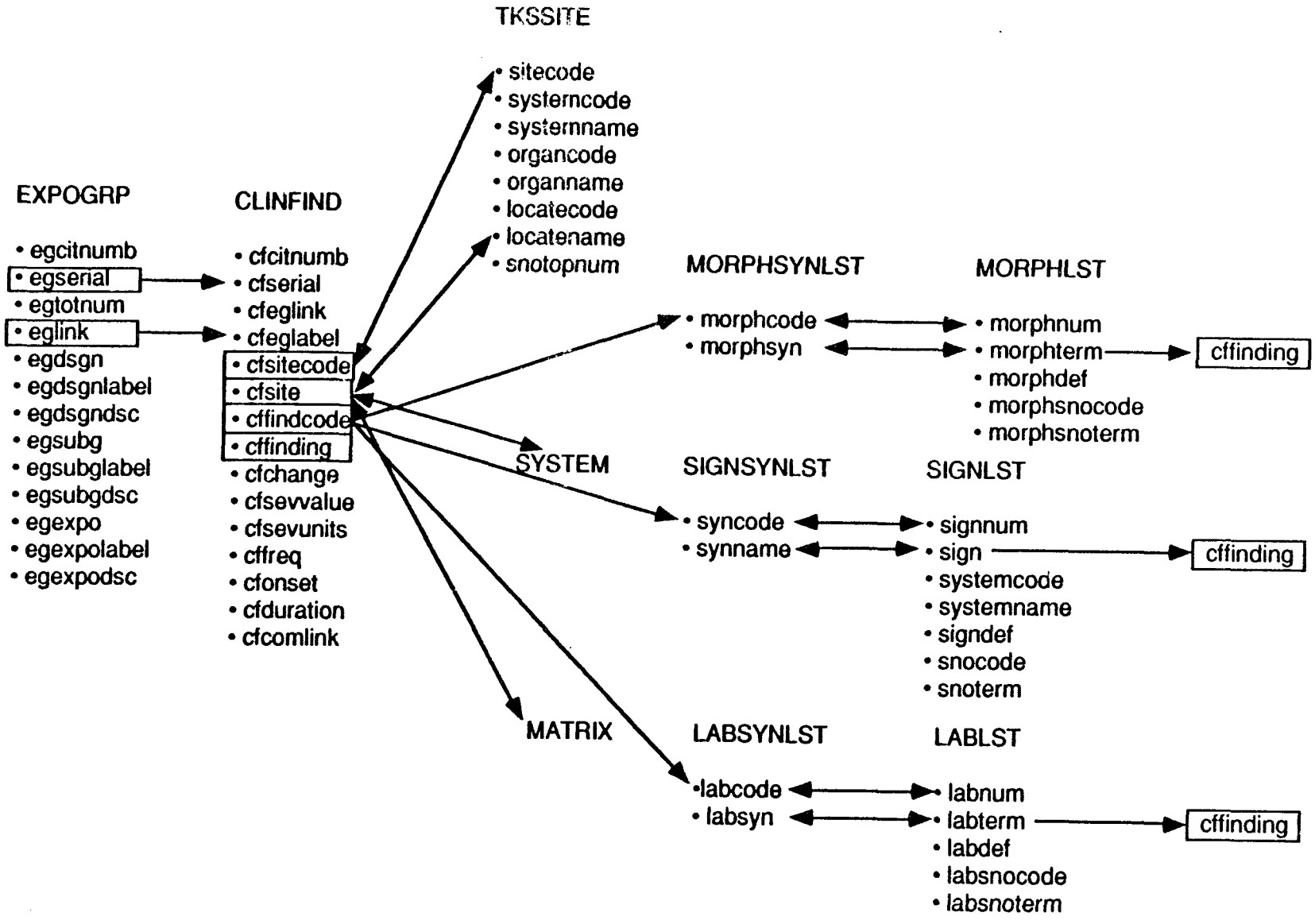

Figure 25. Clinical Finding Table and Reference Table Interactions

Appendix B.
Textual Description
of
Toxin Knowledge System
Database Design

Note: Database table names are presented in Helvetica Bold Italic and columns within the table are presented as Helvetica Bold only. General sections of the database are presented as Helvetica Bold Underline.

TKSTEST Database

The TKSTEST database is the primary TKS database and contains the data from the papers.

Citation data

citation

The citation building block of the whole system. Generates a citation number which serves as the primary connector for all other tables. This holds either journal article or book chapter data.

citnumb - char(25) not null

The relation between all tables. The number will have the following format:
JBJBJB-VVVV-PPPP-YYYY where:

JBJBJB = journal or book code (**journlst.jcode** or **booklst.bcode**)
VVVV = journal volume number or book chapter number, padded with zeros
PPPPP = first page number, padded with zeros
YYYY = year of publication

This number will be generated from data entered in the other columns in the **citation** table.

citfile - char(20) not null

A filing system number for the paper. Also used in author-oriented access to system. Format may be used for **citnumb** in the future. The format for this number is:

AAAA.V.P.YY where:

AAAA = first four letters of first author's lastname
V = volume number
P = first page number
YY = last two digits of year

Number is automatically generated by appliation.

citserial - serial not null

serial number for each citation entry

citsource - char(20)

Source of the citation; the corresponding **journlst.jcode** or **booklst.bcode**

citvol - char(4)

The journal volume number or book chapter number, not padded with zeros

citpage - char(11)

The inclusive page numbers "PPPPP-PPPPP", not padded with zeos

citdate - char(4)

The year of publication

cittitle - char(250)

The actual title of the paper or chapter

citlocate - char(5)

The location of the actual paper in filing systems within the group

entrydate - date

The date the paper was first entered into the system.

authors

Author data for paper or chapter

aucitnumb - char(25) not null

The link to **citation.citnumb**

aucitfile - char(20)

Link to **citation.citfile**

auserial - serial not null

author entry serial number

authname - char(50) not null
The name of the author formated as follows: last name, space, initials. No punctuation is to be used.

authsig - smallint not null
Publication order for the authors names

keywords

This table is to permit searching for unabstracted citations entered into the system. These will also be used to select citations for abstracting.

keycitnumb - char(25) not null
The link to **citation.citnumb**

keycitfile - char(20)
Link to **citation.citfile**

keyserial - serial not null
keyword serial number

keyword - char(20) not null
the keyword describing some aspect of the paper, matches the **keylist.kword**

keycode - char(10)
the keycode which can be used for group look-ups and is used to automatically insert the keyword when the code is entered. This is linked to the controlled vocabulary **keylist.kcode**

Materials and Methods data

paperover

The purpose for this table is to hold certain basic information about the paper. It holds the number of study designs within the paper as well as the purpose for the paper.

papcitnumb - char(25) not null
The link to **citation.citnumb**

papcitfile - char(20)
Link to **citation.citfile**

papserial - serial not null
paper overview serial number

papstatepur - char(50)
The stated purpose of the paper. This is both an evaluation point and information necessary to classify the paper.

papimppur - char(50)
The implied purpose of the paper. This can give insight into biases as well as "the real reason" for the study.

papaim - char(3)
A broad term to describe the aim of the study. This needs further clarification. Will be used to control analytical versus clinical studies paths for data entry.

papnumdsgn - smallint
The number of designs in the paper

stdydsgn

The purpose for this table is to hold certain basic information about the study. It holds confirming information on the number of groups involved, the number of exposures involved, and the presence or absense of controls. There is a functional limit of 99 designs per paper.

stycitnumb - char(25) not null
The link to **citation.citnumb**

stycitfile - char(20)
The link to **citation.citfile**

styserial - serial not null
study design serial number; linked to sgdsgnnum, exdsgnnum, egdsgn

stydsgncur - smallint
A number to identify this design from others in the paper. Used to link to subjgrp, exporegm, and expogrp.

stydsgntot - smallint
The total number of study designs in the paper. Linked to paperover.papnumdsgn.

stytype - char(2)
The broad type of study. This is potentially useful in controlling the abstracting process.

styvivvit - char(2)
Indication of whether the paper describes an *in vivo* or an *in vitro* experiment.

stycntl - char(1)
Flag to whether controls were used or not.

stycnticmp - char(2)
The group comparison information. (Within group, between groups, combination)

stycmpmeth - char(2)
The method for comparing the groups regardless of within or between

stycntlmeth - char(2)
Control methodology base — concurrent vs non-concurrent

stycntltyp - char(2)
The type of control used for the respective method

stycntassgn - char(2)
the method for assigning the subjects to the group

stynumgrp - smallint
This is the number of different groups studied

stynumexp - smallint
The number of different exposure regimens used

subjgrp

This table holds data about each group of subjects in the study. Each group is now assigned a number. Formerly a letter from "A" to "Z" was assigned sequentially but this caused a number of problems. There is now a functional limit of 99 groups per study design.

sgcitnumb - char(25) not null
The link to citation.citnumb

sgserial - serial not null
subject group serial number

sgdsgnnum – integer
The link to the identifying serial number of the study design, ie. stdydsgn.styserial.

sglink - smallint
Used to in association with the stdydsgn.stydsgncur and exporegm.exlink to form expogrp.eglink

sgspecies - char(20)
the species of the subjects used; not necessarily the Latin name. I would prefer to use English words instead.

sgbreed - char(20)
The breed, race, ethnic, or other genetic varitation

sgsource - char(20)
source of subjects used in study

sgnumb - smallint
number of subject in group

sgage - char(4)
The age of the subjects. This will need to work with multiple subjects as well. Can average be used? Should this and the units be incorporated into one column and an agerange column be added?

sgageunit - char(1)
The units for the age of the subjects. This will need to work with multiple subjects as well. Can average be used? Should this and the weight be incorporated into one column and an agerange column be added?

sgagerange - char(1)
Groupings of ages into 5 categories

sgwt - smallfloat
The weight of the subjects. This will need to work with multiple subjects as well. Can average be used? Should this and the units be incorporated into one column and a weightrange column be added?

sgwtunit - char(2)
The units for the weight of the subjects. This will need to work with multiple subjects as well. Can average be used? Should this and the weight be incorporated into one column and a weightrange column be added?

sgwtrange - char(2)
Uses groupings of weight to allow sorting of animal weight data

sght - char(4)
The height of the subjects. This likely to be only useful in human studies when it will allow determination of surface area. This will need to work with multiple subjects as well. Can average be used? Should this and the units be incorporated into one column and a heightrange column be added? Should this de deleted along with its units?

sghtunit - char(4)
The units for the height of the subjects. This will need to work with multiple subjects as well. Can average be used? Should this and the weight be incorporated into one column and a heightrange column be added?

sgsex - char(4)
The sex of the subject. This must cover multiple subjects, different sexes, and neutered animals.

sgoccup - char(20)
The occupation of the subjects; obviously aimed at human subjects.

sghlthstat - char(20)
The health status of the subjects. Can include vaccinations, preexisting illnesses, etc.

sgtotexpo - smallint
The number of exposures this group received during the study.

exporegm

This table holds data about the exposure regimens that the subjects will undergo. Each regimen will be assigned a number between "00" and "99" and will be joined with the subject group number to create an exposure-group link.

excitnumb - char(25) not null
The link to **citation.citnumb**

exserial - serial not null
exposure regimen serial number

exdsgnnum – integer
The link to the identifying serial number of the study design, ie. **stdydsgn.styserial.**

exlink - smallint
The link to **expogrp.eglink**, numbers "00" to "99". Need to work out mechanism to handle treatment as well.

expurpose - char(3)
The purpose of the exposure. For example, toxicity or treatment.

exagent - char(40)
Agent in exposure regimen

exdose - char(5)
Dose of agent used (no units)

exdoseunit - char(6)
Units of dose administered

exformul - char(2)
Formulation of the agent used in the regimen. An abbreviation of the formulation will be used and an acceptable list of abbreviations will be maintained.

exroute - char(2)
Route of administering the agent in question. An abbreviation of the routes will be used and a list of acceptable abbreviations will be maintained.

exinterval - char(6)
The interval between multiple exposures, eg. every 4 hours. This will need some mechanism to handle irratic exposures.

exduration - char(10)
The duration of exposure to include both duration of contact as well as number of doses received.

exadminmeth - char(20)
The method of administering the agent to the subjects. Not to be confused with route. Example: slow IV via pump. IV is the route, the rest part of administration method.

exevaltime - char(20)
The time for evaluation; can be interval of evaluation if needed. This particular item may be better maintained in another table, such as study design..

expogrp

This table holds the links and brief description of the group and exposure regimen. This will be used to link results to the subjects and regimens.

egcitnumb – char(25) not null
The link to citation.citnumb

egserial - serial not null
exposure group serial number

egtotnum – smallint
The total number of exposure group links that have been made for this design. *Is this column really needed?*

eglink – char(11)
This will be used to link the subject group and exposure regimen of a study design to a given result. The format of this number is:
Dd..se.Ee where:
- d = the current design number (**stdydsgn.stydsgncur**)
- s = the current subject group number (**subjgrp.sglink**)
- e = thecurrent exposure regimen number (**exporegm.exlink**)

This will be used as the value of **clinfind.cfeglabel**

egdsgn — integer
Direct link to **stdydsgn.styserial.**

egdsgnlabel — smallint
The value of stdyd[illegible].stydsgncur; used to create the eglink.

egdsgndsc – char(60)
Brief description of the study design. This is used to confirm on screen the design data when associated result data is entered. This should be generated by the computer and inserted when the user selects the study design data.

egsubg — integer
Direct link to **subjgrp.egserial.**

egsubglabel — smallint
The value of subjgrp.sglink; used to create the eglink.

egsubgdsc – char(60)
Brief description of the subject group. This is used to confirm on screen the group data when associated result data is entered. This should be generated by the computer and inserted when the user selects the exposure regimen data.

egexpo — integer
Direct link to **exporegm.exserial**.

egexpolabel — smallint
The value of exporegm.exlink; used to create the eglink.

egexpodsc – char(60)
Brief description of the exposure regimen. This is used to confirm on screen the exposure data when associated result data is entered. This should be generated by the computer and inserted when the user selects the exposure regimen data.

Results data

The results tables need to manage repeated values, lab data, and be more easily accessed.

clinfind

cfcitnumb - char(25) not null
The link to **citation.citnumb**

cfserial - serial not null
serial number for clinical findings

cfeglink - integer
This links to **expogrp.egserial**

cfeglabel - char(11)
This links to **expogrp.eglink**

cftype - char(1)
Whether the finding is a lab test, morphologic change, or sign/symptom/disease. Used to direct abstracting flow.

cfsitecode - char(6)
Link to **tkssite.sitecode** which will in turn is linked to the associated site of the clinical finding.

cfsite — char(70)
The anatomical site of the clinical finding. Linked to the **tkssite.locatename** via the **tkssite.sitecode**.

cffindcode — char(8)
Link to **tksfind.findcode** which will in turn is linked to the associated the clinical finding.

cffinding — char(70)
The clinical finding from the **tksfind.findterm**.

cfchange — char(10)
The type of change which occurred. Uses the SNOMED fuctional change codes to insert the appropriate terms in this column. This needs to be reduced to a single digit code and use translation functions to generate.

cfsevvalue - char(8)
The severity of the clinical finding. Estimated severity in non-lab values (1+ to 3+). For lab values, this is the specific lab finding.

cfsevunits - char(8)
The units used in the lab value from cfsevvalue.

cffreq - char(6)
The frequency of the finding in the group. Must resolve whether this should hold both numerator and denominator or just the numerator.

cfonset - char(10)
The time to onset in hours from the time of exposure.

cfduration - char(10)
The duration of the clinical finding from time of onset to termination of the observation.

Discussion data

Reference data

Evaluation data

tkscomment

cocitnumb - char(25) not null
The link to citation.citnumb

cocitfile — char(20)
Link to citation.citfile

coserial - serial not null
comment serial number

cotabname — char(20)
The name of the table holding the data being commented on.

cocolname — char(20)
The name of the column holding the data being commented on.

corownumb — integer
The row number of the row holding the data being commented on.

cotext - char(300)
Comments that the abstractor made about the paper. Could also be used for comments from the discussion section of the paper being reviewed. May be comments made by one author about the contents of another paper.

corefcrfile — char(20)
The source of the comment:
the TKS abstractor
link to the author of this paper
link to the author of another paper

Vocabulary Data

journlst

The purpose of this table is to provide a controlled listing of journals to be used in the citation process. This will permit journals and book citations to be entered in a similar fashion with the unique aspects of each maintained in their repsective tables.

jacquis - serial
Serially assigned number for each journal in the system

jcode - char(20)
A unique code for each journal in system composed of "J" and the jacquis number. While this number is 20 characters long in the database table, only 6 characters are actually used. The 20 characters are necessary to join the serial table and and the "J" together.

jname - char(120)
The exact name of the journal. Most are taken from the List of Journals Indexed by NLM.

jabrv - char(50)
Journal abbreviation, generally taken from List of Journals Indexed by NLM. These will be used in the reference listings and to display on screen when a journal code is entered in the citation table.

booklst

The purpose of this table is to provide a controlled listing of books to be used in the citation process. This will permit journals and book citations to be entered in a similar fashion with the unique aspects of each maintained in their repsective tables.

bacquis - serial
Serially assigned number for each book in the system

bcode - char(20)
A unique code for each book in system composed of "B" and the bacquis number. While this number is 20 characters long in the database table, only 6 characters are actually used. The 20 characters are necessary to join the serial table and and the "B" together.

bname - char(60)
The actual title of the book

bedno - char(2)
The edition number of the book

bvol - char(2)
The volume number of the book

bdate - char(4)
The year of the book's publication: should be edition specific.

bpub - char(20)
Publisher of this edition of the book

bpubplace - char(20)
Place of publication of this edition

beditor - char(50)
The editors of this edition of the book or the author(s) if not an edited work. This is a simple string and is not intended to do any more than complete the citation in a bibliography, etc.

bisbn - char(20)
The is the ISBN number for the book. This very well may be dropped in the future.

keylist

The purpose of this table is to provide a controlled vocabulary for keyword entry into the system

kcode - char(10)
Code number for linking the keyword. User can enter a kcode and the kword will pop up on screen. This can also be used to query for a group of keywords of the same group.

kword - char(20)
The controlled keyword vocabulary. These are arranged by group.

tkssite

This file holds the basic topography information for showing the site of the clinical finding. Modified information from SNOMED/SNOVET with our enhancements.

sitecode — char(6)
Code used to link the anatomic site to the clinical finding. Composed of a system code (A to Z) and a location code (digits 3 to 6 of SNOMED/SNOVET topography number)

systemcode — char(1)
Alphabetical value used in site code.

systemname — char(30)
Internal system name plus SNOMED/SNOVET system name when needed

organcode — char(2)
Code representing the organ or organ group. Uses the SNOMED two character code.

organname — char(60)
Name of the organ or organ group. Uses the SNOMED name.

locatecode — char(5)
Code representing the specific site of the lesion. This is usually a subdivision of the organ or organ group. Uses digits 3 to 5 of the SNOMED topographic code.

locatename — char(60)
The name of the specific organ or organ group site. Uses the SNOMED name. Many are too long and maybe too specific.

snotopnum — char(8)
The SNOMED/SNOVET coding number.

morphlst

The purpose of this table is to provide a smaller, more manageable, controlled vocabulary for morphologic findings. This table consists primarily of SNOMED/SNOVET morphology findings.

morphnum char(6)
Code number linked to **morphsynlst.morphcode**

morphterm char(60)
The TKS controlled vocabulary term for morphologic finding.

morphdef char(65)
The TKS definition for the morphologic finding

morphsnocde char(8)
The SNOMED/SNOVET code number for the term in the SNOMEDVET database.

morphsnotrm char(65)
The SNOMED/SNOVET term in the SNOMEDVET database.

morphsynlst

morphcode char(6)
Code number linked to **morphlst.morphnum**

morphsyn char(60)
Synonyms for the corresponding **morphlst.morphterm**

lablst

labnum char(6)
Code number linked to **labsynlst.labcode**

labterm char(60)
The TKS controlled vocabulary term for the labortory test/finding or procedure.

labdef char(65)
The TKS definition of the controlled vocabulary term for the labortory test/finding or procedure.

labsnocde char(8)
The SNOMED/SNOVET code number for the term in the SNOMEDVET database.

labsnotrm char(65)
The SNOMED/SNOVET term in the SNOMEDVET database.

labsynlst

labcode char(6)
Code number linked to **lablst.labnum**

labsynsys char(1)
Code letter for the laboratory grouping

labsyn char(60)
Synonyms for the corresponding **lablst.labterm**

signlst

signnum char(6)
Code number linked to **signsynlst.signcode**

sign char(60)
The TKS controlled vocabulary term for the disease, clinical finding, sign, or syndrome.

systemcode char(1)
The TKS code for the body system primarily involved. Related to **tkssite.systemcode.**

systemname char(30)
The TKS name for the body system primarily involved. Related to **tkssite.systemname.**

signdef char(65)
The TKS definition of the controlled vocabulary term for the disease, clinical finding, sign, or syndrome.

snocode char(8)
The SNOMED/SNOVET code number for the term in the SNOMEDVET database.

snoterm char(65)
The SNOMED/SNOVET term in the SNOMEDVET database.

signsynlst

signcode char(6)
Code number linked to **signlst.signnum**

signsynsys char(1)
The code for the body system

signsyn char(60)
Synonyms for the corresponding **signlst.signterm**

SNOMEDVET Database

The SNOMEDVET database contains the compiled SNOMED and SNOVET terms in a relational database form. This database was used to extract needed clinical finding vocabulary terms for the TKSTEST database.

Topography

snotopograph

topognum - char(8)

topogterm - char(100)

Functions

snofunction

functnum - char(8)

functterm - char(100)

Diseases

snodisease

diseasenum - char(8)

diseaseterm - char(100)

snoproced

procednum - char(8)

procedterm - char(100)

Appendix C.
Keywords Available for Use in Toxin Knowledge System

Mycotoxins

A01	OCHRATOXIN
A02	HT-2
A03	T-2
A04	AFLATOXIN
A05	T-2 TRIOL
A06	DAS
A07	OTH NONTRICHS
A08	T-2 TETRAOL
A09	DON
A10	MULTI MYCO
A11	3-ACETYL DON
A12	NIV
A13	MAS
A14	NEOSOLANIOL
A15	ZEN
A16	DEEPOXY
A17	FUSARENON
A18	MACRO
A19	VERRUCARIN A
A20	CYANIDE
A21	ZOL
A23	ACETYL T-2
A24	OTH TRICHS
A25	RORIDIN

Military Issue

B01	YELLOW RAIN
B02	CHEM WAR

Species

C01	BOV DAIRY
C02	RAT
C03	MOUSE
C04	BOV BEEF
C05	SWINE
C06	SHEEP
C07	BOV
C08	HUMAN
C09	MONKEY
C10	DOG
C11	HORSE
C12	CAT
C13	HAMSTER
C14	RABBIT
C15	FISH
C16	G PIG
C17	CHICKEN
C18	TURKEY
C19	DUCK
C20	PIGEON
C21	OTHER SPECIES

Gender

D01	MALE
D02	FEMALE
D03	NEUTERED

Age

E01	FETUS
E02	NEONATE
E03	YOUNG
E04	MIDAGE
E05	AGED
E06	EGG
E07	LARVAE

Sources/Form

F01	MOLDY FEED
F02	FUNGUS
F03	CRUDE EXTRACTS
F04	CRYSTAL
F05	AEROSOL

Toxicity Results

G01	LO
G02	LD50
G03	>LD50<LD100
G04	>LD100
G05	LD100
G06	LC50

Route of Administration

H01	IM
H02	IV
H03	IP
H04	ORAL GAVAGE
H05	TOPICAL
H06	ORAL DIET
H07	SUB Q
H08	INTRATRACH
H09	INTRADER
H10	GASTRIC INTUBATION
H11	MULTI DOSE
H12	INHAL

Chemical Techniques

I01	DERIV
I02	HFB
I03	TMS
I04	TFA
I05	PFP

Extractants

J01	ACETONE
J02	WATER
J03	SALINE
J04	CHLOROFORM
J05	CAR ETHANOL
J06	ETHYL ACET
J07	PROP GLY
J08	CAR NONE
J09	METHANOL
J10	CAR DMSO
J11	CAR OTHER

Sample Matrix

K01	SAMPLE MATRIX
K02	FEED
K03	FOOD
K04	PRODUCTION
K05	URINE
K06	BLOOD
K07	MILK
K08	BILE
K09	FECES
K10	RUMEN CONT
K11	SERUM
K12	GRAIN
K13	FORAGES
K14	CEREAL
K15	STRAW
K16	CORN
K17	OATS
K18	BARLEY

K19	MILLET
K20	SOYBEAN
K21	HULLS
K22	RICE
K23	WHEAT
K24	SORGHUM
K25	MEDIA
K26	FUNGAL
K27	PLASMA
K28	OTHER MATRIX

Chemical Info

L01	TOXIN CHAR
L02	STRUCT ID
L03	SYNTHESIS
L04	DEGRAD
L05	DETOX

Analytical

M01	ANAL
M02	ANAL GLC
M03	BIOAS
M04	NMR
M05	RIA
M06	ANAL ENZ
M07	PURIFIC
M08	TLC
M09	MS
M10	HPLC
M11	GS/MS
M12	AUTORAD
M13	FLUOR
M14	RADIOLABEL
M15	CAP GC
M16	TISS CULT
M17	SPECTRO
M18	CELL-FREE SYS

Mechanism of Action

N01	MECH ACTION
N02	PROT SYN
N03	DNA SYN
N04	ENERG MET
N05	MEMB EFFEC
N06	ENZ INHIB
N07	ANTI MITOT
N08	CHELATE
N09	OTHER MECH

Toxicokinetics

O01	ABSORB
O02	DISTRI
O03	EXCRE
O04	BOD BURD
O05	TISS RESID
O06	BOD FLU RESID

Metabolism

P01	METAB
P02	METAB IN VITRO
P03	METAB IN VIVO
P04	DEEPOXY METABS
P05	CONJU METABS

Toxicity Info

Q01	TOX
Q02	TOX IN VITRO
Q03	TOX IN VIVO
Q04	REPRO
Q05	PLACENTA
Q06	UTERUS
Q07	FETUS-TOX
Q08	TESTES
Q09	OVARIES
Q10	TERATO
Q11	CARCIN
Q12	GUT FLORA
Q13	ABORT

Q14 MUTAG
Q15 SURV RATE
Q16 SURV TIME
Q17 GROWTH
Q18 FEED REFUS
Q19 FEED EFFIC
Q20 FEED CONSUMP
Q21 ACUTE
Q22 CHRONIC
Q23 WATER CONSUMP

Clinical Findings

R01 PHYSIOLOGY
R02 CLIN SIGNS
R03 SHOCK
R04 COLD EXTREM
R05 BLOOD FLOW
R06 DIARRHEA
R07 HEMMOR
R08 VOMITING
R09 POST ATAX/WEAK
R10 IN CRT
R11 BLOOD PH
R12 IMMUNE
R13 BLOOD GAS
R14 CNS
R15 PNS
R16 GASTRIC PH
R17 LUNG
R18 BRAIN
R19 CHILLS
R20 FEVER
R21 GI
R22 GI PERISTALSIS
R23 BLOOD PHYSIOLOGY
R24 CVP
R25 HEART
R26 EKG
R27 KID FUNC
R28 PROSTAGL
R29 EDEMA
R30 RESP FUNC
R31 BLOOD PRES
R32 CLOTTING
R33 LIV FUNC
R34 CARDIAC OUTPUT
R35 DEATH
R36 HEART RATE
R37 PREGNANT
R38 TREMORS

Gross Pathology

S01 GROSS
S02 PATH HISTO
S03 PATH BODY
S04 CLIN SIGNS PATHOLOGY
S05 PATH ORAL
S06 PKID
S07 PRESP TRAC
S08 PPAN
S09 PDIG TRAC
S10 PSKIN
S11 PVESS
S12 PHEART
S13 PLIV
S14 PBONE MARROW
S15 PSPLEEN
S16 PADRENAL
S17 PNER SYS
S18 PLYMPH
S19 PREPRO MALE
S20 PTHYMUS
S21 SEM
S22 TEM
S23 PREPRO FEMALE
S24 PATH CLIN

S25 PLATELETS
S26 PPLACEN
S27 CBC
S28 PCV-PVC
S29 WBC
S30 RBC
S31 CLOT
S32 CLIN SER ENZ
S33 CLIN ENZ

Therapy

T01 THERAPY
T02 CHARCOAL
T03 DRUG
T04 ANTIBI
T05 FLUIDS
T06 ANTI BOD
T07 VIT C
T08 VIT K
T09 STEROIDS
T10 EFFEC
T11 NONEFFEC
T12 THIOCYANATE
T13 OTHER THERAPY

Study Type

U01 REVIEW
U02 SURVEY
U03 DIAG
U04 TECHNIQUES
U05 NAT OCCUR
U06 STATISTICS
U07 SYNERGISM
U08 LIGNANS
U09 IN VITRO
U10 PESTICIDES
U11 MODEL
U12 IN VIVO
U13 INSECTICIDES
U14 PHARM
U15 ADSORPTIVE CAPACITY
U16 COMBINATIONS
U17 RISK ASSESSMENT
U18 PRODUCTION REVIEW

Appendix D.
Graphical Depiction
of
Toxin Knowledge System
Application Menu Structure

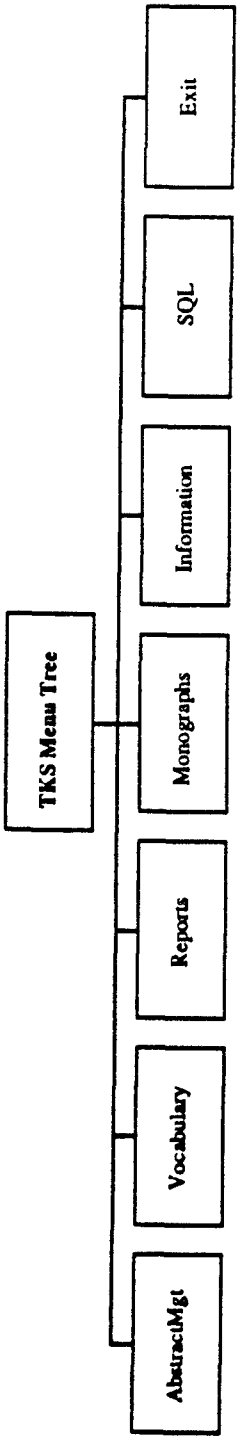

Figure 26. Main Menu of Toxin Knowledge System Application

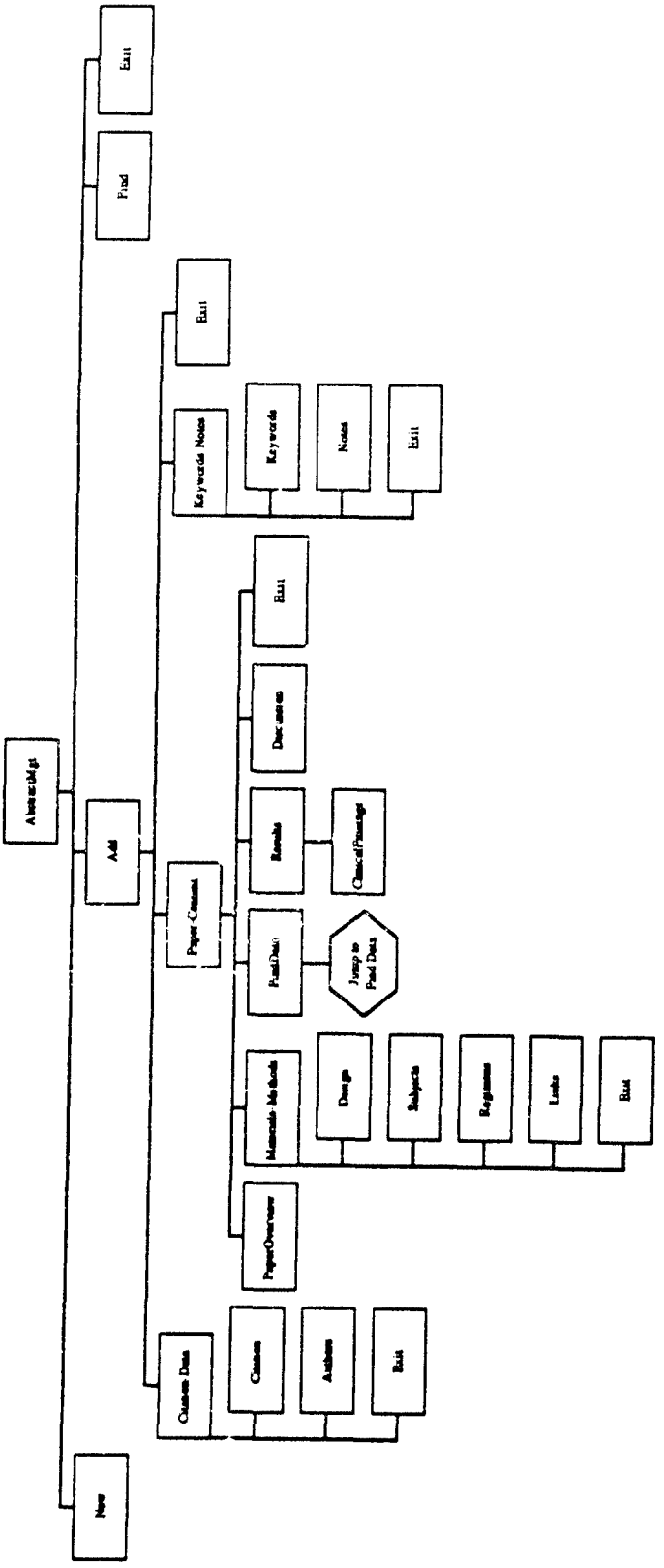

Figure 27. New and Add Submenus of the AbstractMgt Choice from the Main Menu

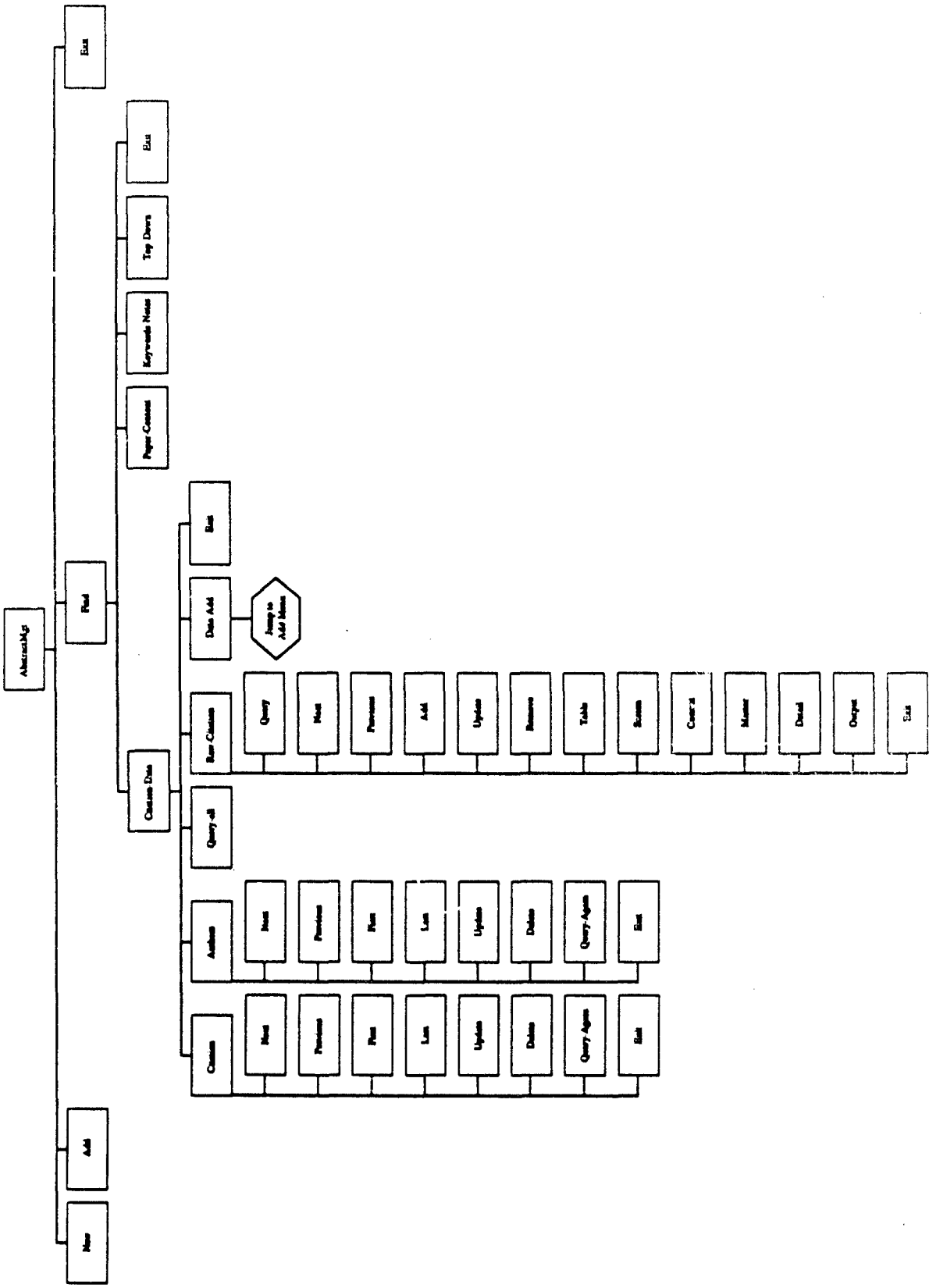

Figure 28. Find Citation Data Submenus of the AbstractMgt Choice from the Main Menu

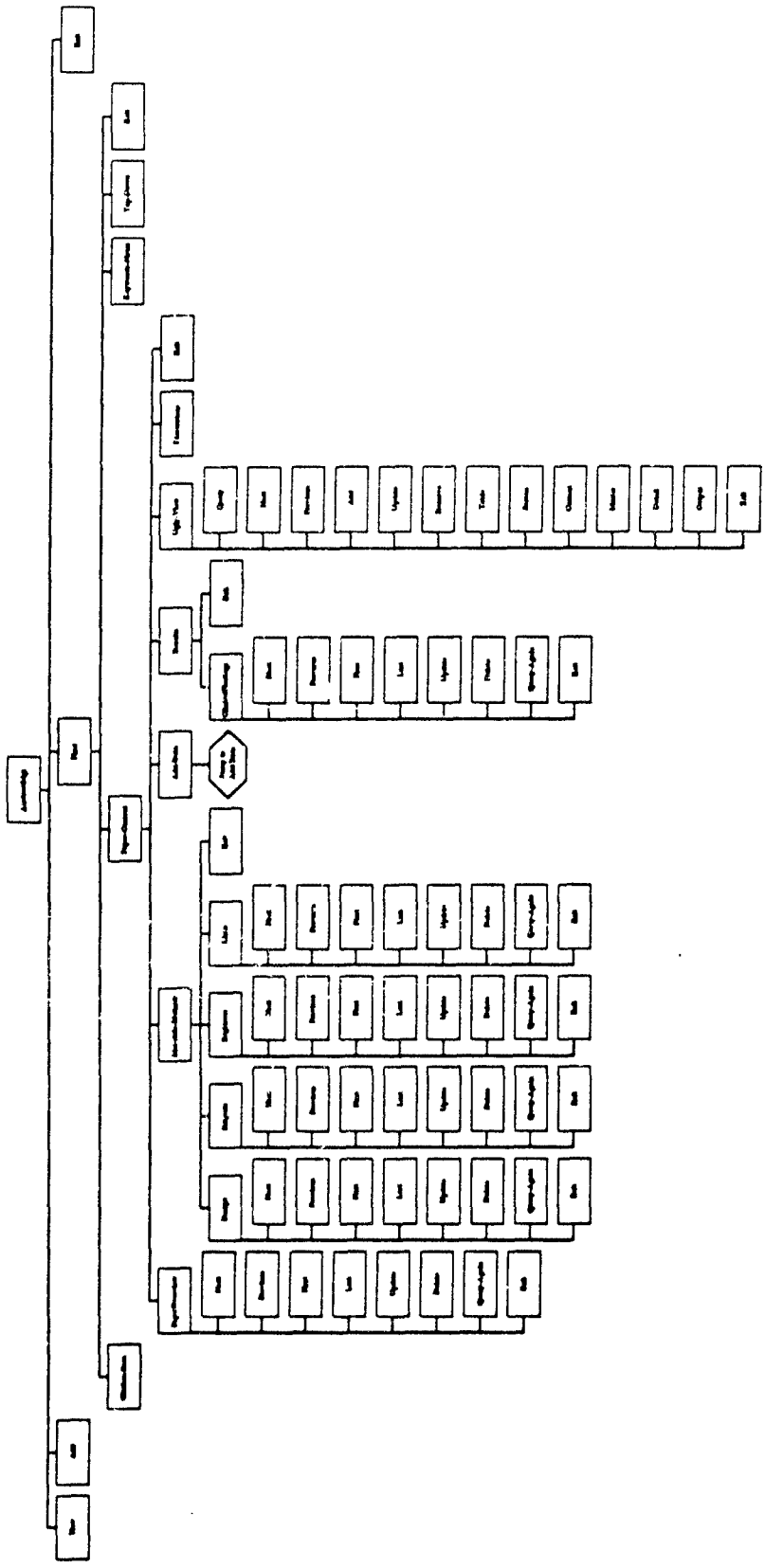

Figure 29. Find Paper-Content Submenus of the AbstractMgt Choice from the Main Menu

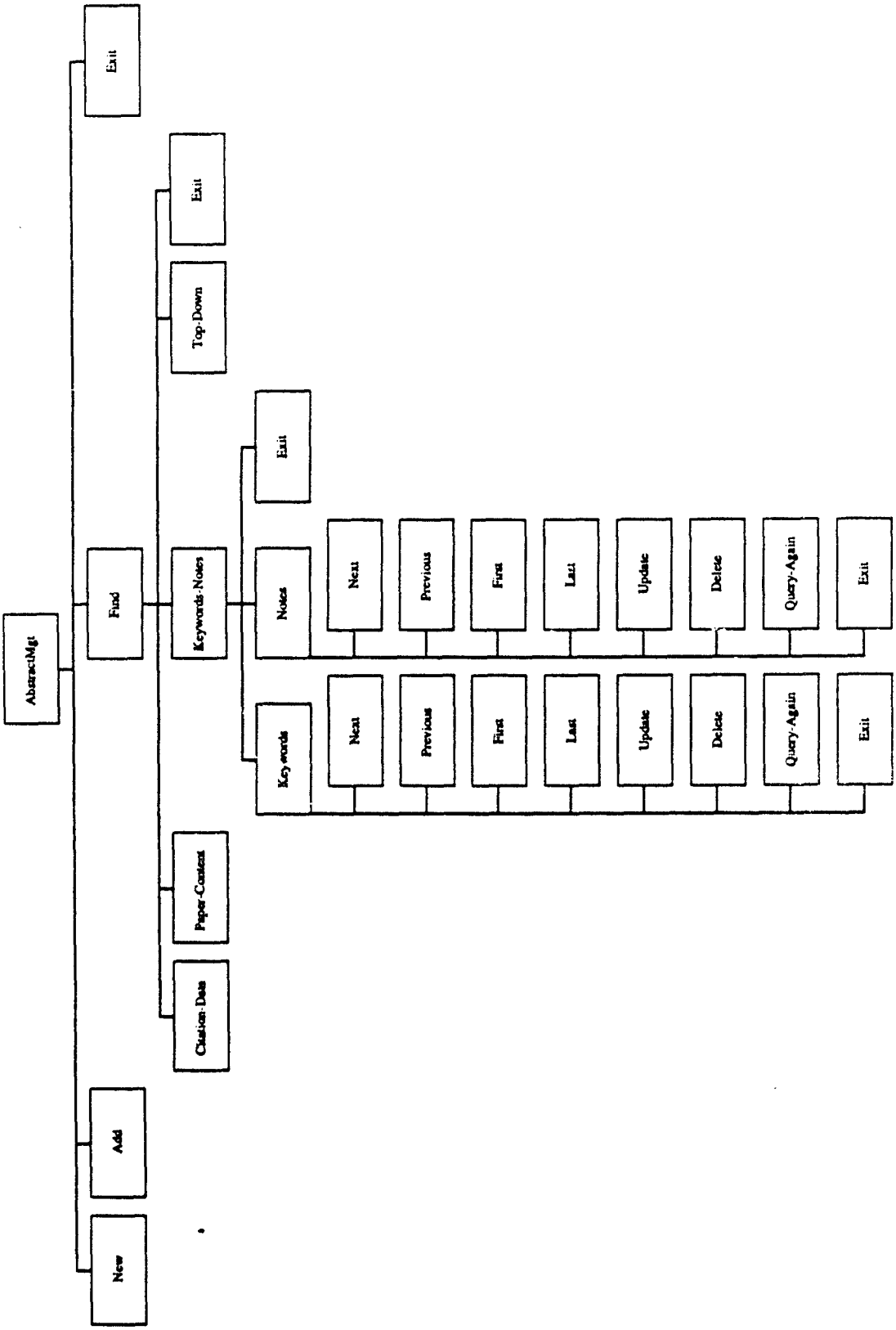

Figure 30. Find Keywords-Notes Submenus of the AbstractMgt Choice from the Main Menu

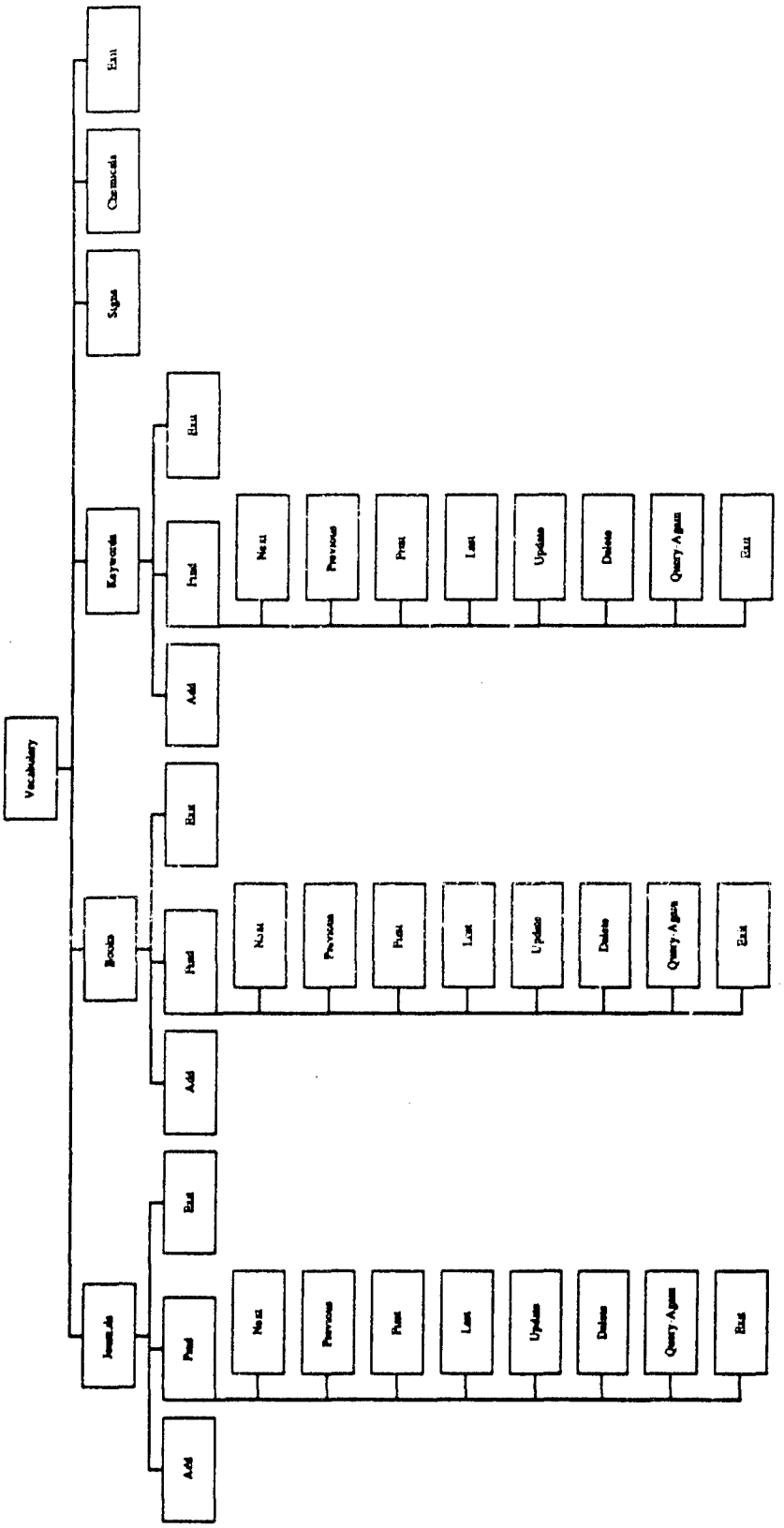

Figure 31. Journals, Books, and Keywords Submenus of the Vocabulary Choice from the Main Menu

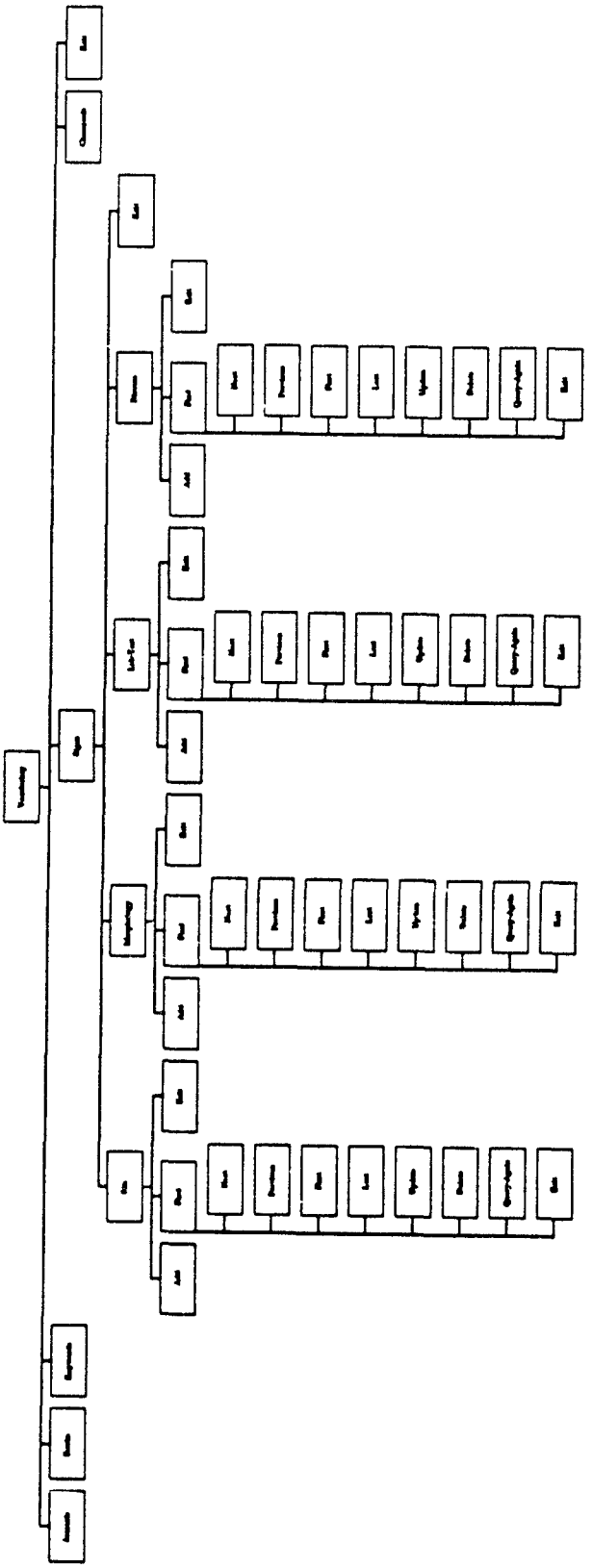

Figure 32. Signs Submenus of the Vocabulary Choice from the Main Menu

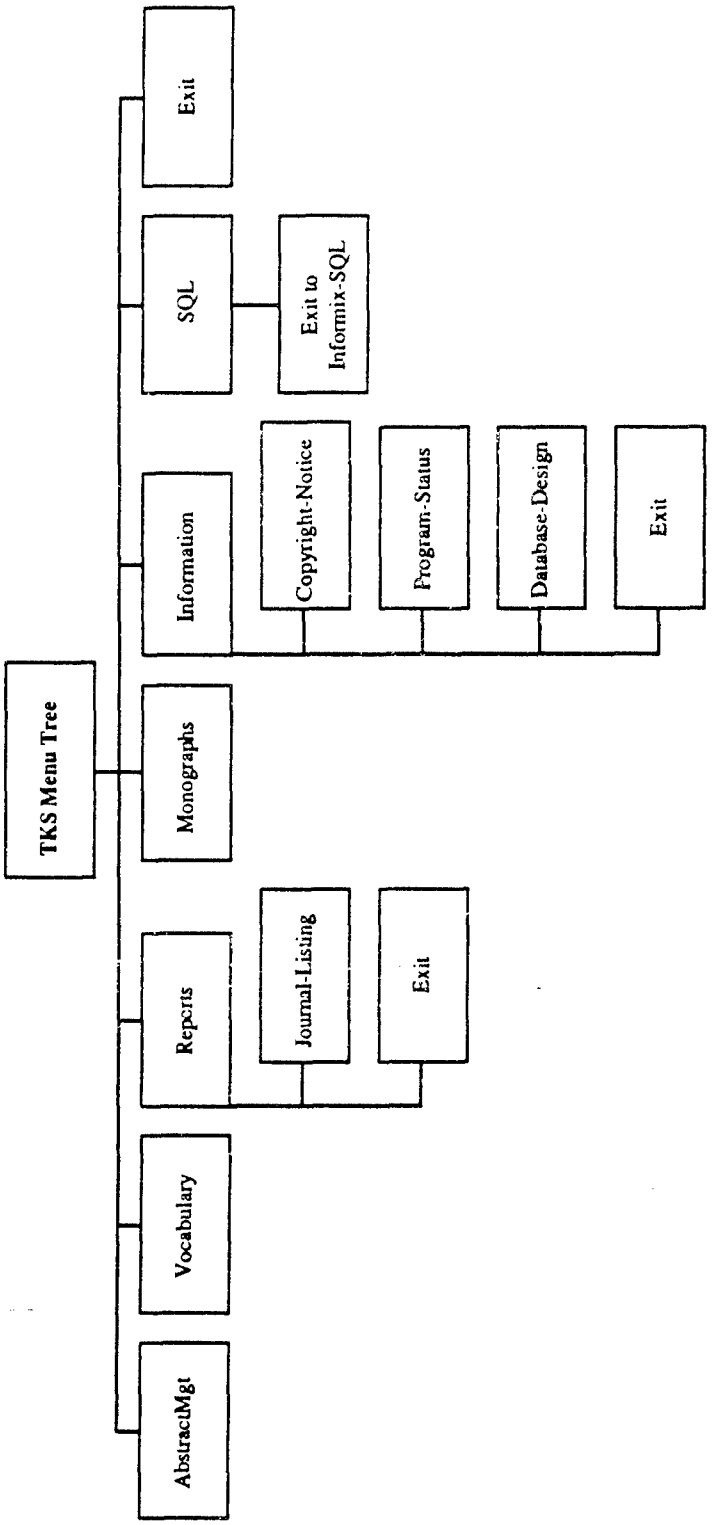

Figure 33.Submenus for the Reports, Information, and SQL Choices from the Main Menu

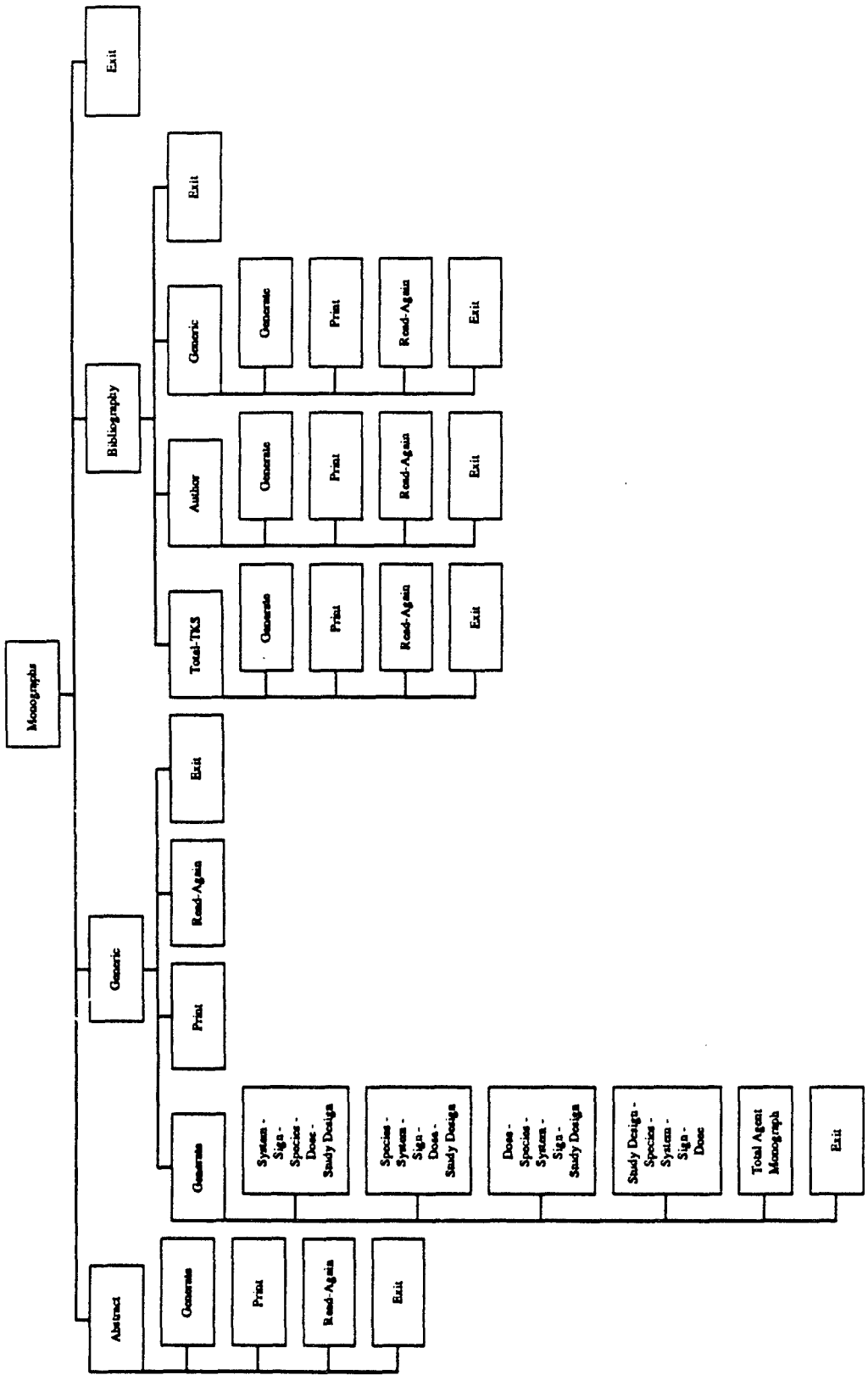

Figure 34. Submenus for the Monographs Choice from the Main Menu

Appendix E.
Citations Entered into Toxin Knowledge System

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(247) Ziegler FE, Nangia A, Schulte G: SYNTHESIS OF THE1,3-DIOXOLANE RING SYSTEM OF THE TRICHOTHECENES SAMBUCINOL AND SPOROL VIA A STEREOSELECTIVE CLAISEN REARRANGEENT, J AM CHEM SOC 109:3987-3991, 1987

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(1568) Ziprin RL, Corrier DE, Ziegler HK: T-2 TOXIN-ENHANCED RESISTANCE AGAINST LISTERIOSIS IN MICE: IMPORTANCE OF GASTROINTESTINAL LESIONS, AM J VET RES 48:998-1002, 1987

(2676) Ziprin RL, McMurray DN: DIFFERENTIAL EFFECT OF T-2 TOXIN ON MURINE HOST RESISTANCE TO THREE FACULTATIVE INTRACELLULAR BACTERIAL PATHOGENS: LISTERIA MONOCYTOGENES, SALMONELLA TYPHIMURIUM, AND MYCOBACTERIUM BOVIS, AM J VET RES 49:1188-1192, 1988

(3008) Zuber MS, Lillehoj EB: AFLATOXIN CONTAMINATION IN MAIZE AND ITS BIOCONTROL, BIOCONTROL PLANT DIS 2:85-102, 1988

Appendix F.
Sample Monographs Generated by the Toxin Knowledge System Application

Structured Abstracts

TKS Citation code: J00117-0178-00274-1981
File code: ANGS.178.274 81 in the following files: LP
(1883) Angsubhakorn S, Poomvises P, Romruen K, Newberne PM: AFLATOXICOSIS IN HORSES, J AM VET MED ASSOC 178:274-278,1981

Keywords Assigned: horse, aflatoxin, kid func, diag, feed, anal, corn, hemmor, death, clin signs, heart, fluids, rice, rbc, serum, soybean

ABSTRACT

Overview:
CASE REPORT paper with stated purpose of DOCUMENT AFLATOXIN POISONING IN HORSES reporting on 2 design(s).

Design Information:

Results: Design-Oriented
Design: 1 GRP, 1 EXP, CNTL
Subjects: 12 HORSE, Age: <1 Y, Wt: KG, Sex: M, EXP
Exposure Regimen: AFLATOXIN, 216 UG/KG, PO, given x FEW DAYS
UNK SEVERITY PETECHIA in HEART, NOS seen in NOT ST subjects

UNK SEVERITY MYOCARDIAL NECROSIS SYNDROME, NOS in MYOCARDIUM, NOS seen in NOT S subjects with onset of UNK hour(s)

UNK SEVERITY HEMORRHAGIC ENTERITIS (T-64000) in GASTROINTESTINAL TRACT, NOS seen in UNK subjects

UNK SEVERITY BILE STASIS in LIVER, NOS seen in NOT ST subjects

UNK SEVERITY INFILTRATION, FATTY in LIVER, NOS seen in UNK subjects

UNK SEVERITY INFLAMMATORY NECROSIS, NOS in LIVER, NOS seen in NOT ST subjects

UNK SEVERITY HYPERPLASIA, NOS in INTRAHEPATIC BILE DUCT seen in NOT ST subjects

UNK SEVERITY NECROSIS, NOS in CENTRILOBULAR REGION OF LIVER seen in NOT ST subjects with onset of NOT ST hour(s)

UNK SEVERITY FIBROSIS, NOS in PERIPHERAL LOBULAR REGION OF LIVER seen in NOT ST subjects

UNK SEVERITY EDEMA, NOS in KIDNEY, NOS seen in NOT ST subjects

UNK SEVERITY PALE RED COLOR in KIDNEY, NOS seen in UNK subjects

UNK SEVERITY DEATH, NOS in seen in 12/? subjects with onset of FEW DAYS hour(s)

Design: GRP, EXP, CNTL
No results reported for this Exposure Group.

Subjects: 2 HORSE, Age: UNK Y, Wt: KG, Sex: UNK, EXP
Exposure Regimen: PRESUMABLY NO AFLATO, , PO, given x UNK
No results reported for this Exposure Group.

TKS Citation code: J00005-0049-00482-1988
File code: HAR - 49 482.88 in the following files: P
(2556) Harvey RB, Huff WE, Kubena LF, Corrier DE, Phillips TD: PROGRESSION OF AFLATOXICOSIS IN GROWING BARROWS, AM J VET RES 49:482-487,1988

Keywords Assigned: aflatoxin, pliv, serum, pthymus, pbone marrow, prot syn, feed, g pig, pregnant, rat, feed effic, feed consump, don, zen, ochratoxin, gs/ms, sem, anal, swine, aged

ABSTRACT

Overview:
PROPER-TOXICITY paper with stated purpose of PATHOGENESIS OF AFLATOXICOSIS IN GROW. BARROWS and implied purpose of CLINICAL DIAGNOSIS OF AFLATOXICOSIS reporting on 1 design(s).

Design Information:

Results: Design-Oriented
Design. 5 GRP, 5 EXP, 1 CNTL.
Subjects: 5 PIG, Age: 6 W, Wt: 12 KG, Sex: C, 28 EXP
Exposure Regimen: NONE, CLEAN FEED, 0 MG/KG, PO, given CHRONI x 28 D
UNK SEVERITY NORMAL CONDITION in BODY AS A WHOLE seen in 5/5 subjects

Subjects: 5 PIG, Age: 6 W, Wt: 12 KG, Sex: C, 28 EXP
Exposure Regimen: AFLATOXIN, 1 MG/KG, PO, given CHRON x 28 D
UNK SEVERITY NORMAL CONDITION in BODY AS A WHOLE seen in 5/5 subjects

Subjects: 5 PIG, Age: 6 W, Wt: 12 KG, Sex: C, 28 EXP
Exposure Regimen: AFLATOXIN, 2 MG/KG, PO, given CHRON x 28 D
UNK SEVERITY NORMAL CONDITION in BODY AS A WHOLE seen in 5/5 subjects

Subjects: 5 PIG, Age: 6 W, Wt: 12 KG, Sex: C, 28 EXP
Exposure Regimen: AFLATOXIN, 3 MG/KG, PO, given CHRON x 28 D
No results reported for this Exposure Group.

Subjects: 5 PIG, Age: 6 W, Wt: 12 KG, Sex: C, 28 EXP
Exposure Regimen: AFLATOXIN, 4 MG/KG, PO, given CHRON x 28 D
UNK SEVERITY LIPIDOSIS, NOS in LIVER, NOS seen in 5/5 subjects

ASPARTATE AMINO TRANSFERASE (SGOT) MEASUREMENT (F-23160) (41 IU/L) in SERUM seen in MEAN subjects with onset of 14 DAYS hour(s) and duration of 14 DAYS hour(s).

CREATINE KINASE (CK) (109 IU/L) in SERUM seen in MEAN subjects with onset of 28 DAY hour(s)

GAMMA GLUTAMYL TRANSPEPTIDASE, SERUM, MEASUREMENT (GGT) (F-21340)

(29 IU/L) in SERUM seen in MEAN subjects with onset of 14 DAYS hour(s) and duration of 14 DAYS hour(s).

LACTIC DEHYDROGENASE ISOENZYME, NOS (277 IU/L) in SERUM seen in MEAN subjects with onset of 28 DAY hour(s)

UNK SEVERITY PHOSPHORUS, DECREASED LEVEL in SERUM seen in MEAN subjects with onset of 21 DAYS hour(s) and duration of 7 DAYS hour(s).

UNK SEVERITY ICTERUS, NOS in SKIN, NOS seen in 2/5 subjects with onset of 25 DAYS hour(s)

UNK SEVERITY DRY STRUCTURE in HAIR, NOS seen in 5/5 subjects with onset of UNK hour(s) and duration of UNK hour(s).

UNK SEVERITY CACHEXIA in BODY AS A WHOLE seen in 5/5 subjects with onset of UNK hour(s) and duration of UNK hour(s).

TKS Citation code: J00001-0005-00879-1985
File code: BEAS.5.879.85 in the following files: S P
(1410) Beasley VR: EXPERIMENTAL T-2 TOXICOSIS IN SWINE I. CHANGES IN CARDIAC OUTPUT,AORTIC MEAN PRESSURE, CATECHOLAMINES, 6-KETO-PGF1ALPHA,THROMBANE B2, AND ACID-BASE PARAMETERS, FUNDAM APPL TOXICOL 5:879-892,1985

Keywords Assigned: blood gas, blood ph, clin ser enz, blood pres, cardiac output, shock, female, t-2, swine, tox in vivo, cvp, iv

ABSTRACT

Overview:
EXPER-TOXICITY paper with stated purpose of CHARACTERIZE CARDIOVASULAR EFFECTS OF T-2 IN PIG reporting on 1 design(s).

Design Information:

Results: Design-Oriented
Design: 3 GRP, 3 EXP, Y CNTL
Subjects: 5 PORCINE, Age: UNK , Wt: 50 KG, Sex: F, 1 EXP
Exposure Regimen: T-2 TOXIN, 0.6 MG/KG, IA, given ONCE x ONE DOSE
VOMITING, PERSISTENT (3 —) in GASTROINTESTINAL TRACT, UPPER seen in 5/5 subjects with onset of ~1 HR hour(s) and duration of PERSISTANT hour(s).

SEVERE DIARRHEA, NOS in GASTROINTESTINAL TRACT, LOWER seen in ?/5 subjects with onset of ~1 HR hour(s) and duration of UNK hour(s).

UNK SEVERITY FLATULENCE in GASTROINTESTINAL TRACT, LOWER seen in ?/5 subjects with onset of ~1 HR hour(s) and duration of UNK hour(s).

CHEWING (— —) in MOUTH, NOS seen in 5/5 subjects with onset of < 0.5 HR hour(s) and duration of N/AV hour(s).

SALIVARY SECRETION, INCREASED (— —) in SALIVARY GLAND, NOS seen in 5/5 subjects with onset of < 0.5 HR hour(s) and duration of N/AV hour(s).

UNK SEVERITY RESTLESSNESS in BRAIN, NOS seen in 5/5 subjects with onset of UNK hour(s) and duration of UNK hour(s).

UNK SEVERITY STRAIN GAGE, BIOFEEDBACK in ABDOMEN, NOS seen in 3?/5 subjects with onset of < 1 HR hour(s)

Subjects: 5 PORCINE, Age: UNK , Wt: 50 KG, Sex: F, 1 EXP
Exposure Regimen: ETHANOL 70%, N/AV , IA, given ONCE x ONE DOSE
No results reported for this Exposure Group.

Subjects: 5 PORCINE, Age: UNK , Wt: 50 KG, Sex: F, 1 EXP
Exposure Regimen: T-2 TOXIN, 4.8 MG/KG, IA, given ONCE x ONE DOSE
VOMITING, PERSISTENT (3 —) in GASTROINTESTINAL TRACT, UPPER seen in 5/5 subjects with onset of ~1 HR hour(s) and duration of PERSISTANT hour(s).

SEVERE DIARRHEA, NOS in GASTROINTESTINAL TRACT, LOWER seen in ?/5 subjects with onset of ~1 HR hour(s) and duration of UNK hour(s).

UNK SEVERITY FLATULENCE in GASTROINTESTINAL TRACT, LOWER seen in ?/5 subjects with onset of ~1 HR hour(s) and duration of UNK hour(s).

CHEWING (— —) in MOUTH, NOS seen in 5/5 subjects with onset of < 0.5 HR hour(s) and duration of N/AV hour(s).

SALIVARY SECRETION, INCREASED (— —) in SALIVARY GLAND, NOS seen in 5/5 subjects with onset of < 0.5 HR hour(s) and duration of N/AV hour(s).

UNK SEVERITY RESTLESSNESS in BRAIN, NOS seen in 5/5 subjects with onset of UNK hour(s) and duration of UNK hour(s).

UNK SEVERITY DISORDER STRAIN GAGE, BIOFEEDBACK in ABDOMEN, NOS seen in subjects

TKS Citation code: J00001-0009-00588-1987
File code: BEAS.9.588.87 in the following files: BP
(1422) Beasley VR, Lundeen GR, Poppenga RH, Buck WB: DISTRIBUTION OF BLOOD FLOW TO THE GASTROINTESTINAL TRACT OF SWINE DURING T-2 TOXIN-INDUCED SHOCK, FUNDAM APPL TOXICOL 9:588-594,1987

Keywords Assigned: radiolabel, blood flow, young, female, swine, tox in vivo, t-2

ABSTRACT

Overview:
EXPER-TOXICITY paper with stated purpose of STUDY GASTROINESTINAL BLOOD FLOW IN T-2 TOXICOSIS reporting on 1 design(s).

Design Information:

Results: Design-Oriented
Design: 3 GRP, 3 EXP, Y CNTL
Subjects: 6 PORCINE, Age: N-AV , Wt: 55 KG, Sex: F, 1 EXP
Exposure Regimen: ETHANOL 70%, 7 ML, IA, given ONCE x ONE DOSE
No results reported for this Exposure Group.

Subjects: 6 PORCINE, Age: N-AV , Wt: 55 KG, Sex: F, 1 EXP
Exposure Regimen: T-2 TOXIN, 0.6 MG/KG, IA, given ONCE x ONE DOSE
No results reported for this Exposure Group.

Subjects: 6 PORCINE, Age: N-AV , Wt: 55 KG, Sex: F, 1 EXP
Exposure Regimen: T-2 TOXIN, 2.4 MCG/KG, IA, given ONCE x ONE DOSE
SEVERE VOMITING, NOS in GASTROINTESTINAL TRACT, UPPER seen in 3/3 subjects with onset of 1 HR hour(s) and duration of 4 HR hour(s).

TKS Citation code: J00217-0082-00532-1986
File code: COSG.82.532.86 in the following files: SLBP
(935) Cosgriff TM, Bunner DL, Wannemacher RW JR., Hodgson LA, Dinterman RE: THE HEMOSTATIC DERANGEMENT PRODUCED BY T-2 TOXIN IN CYNOMOLGUS MONKEYS, TOXICOL APPL PHARMACOL 82:532-539,1986

Keywords Assigned: other glycerol, water, car ethanol, plymph, gi, heart, gross, wbc, pcv-pvc, platelets, clot, clin ser enz, monkey, male, t-2, midage, hemmor, blood, rbc, lo

ABSTRACT

Overview:
EXPER-TOXICITY paper with stated purpose of DETERMINE EFFECTS OF T-2 ON BLOOD COAGULATION and implied purpose of PRIMATE MODEL FOR HUMAN EXPOSURE reporting on 1 design(s).

Design Information:

Results: Design-Oriented
Design: 1 GRP, 2 EXP, CNTL
Subjects: 12 MONKEY, Age: UNK ADUL, Wt: 4-6 KG, Sex: M, 1 EXP
Exposure Regimen: T-2 TOXIN, 0.65 MG/KG, IM, given x
UNK SEVERITY HEMORRHAGE, PETECHIAL in HEART, NOS seen in 3/5 subjects with onset of UNK hour(s)

UNK SEVERITY HEMORRHAGE, PETECHIAL in COLON, NOS seen in 3/5 subjects with onset of UNK hour(s)

UNK SEVERITY NECROSIS, NOS in LYMPH NODE, NOS seen in UNK subjects

UNK SEVERITY NEUTROPHILIC LEUKOCYTOSIS (T-0X160) in BLOOD NEUTROPHIL seen in UNK subjects with onset of 6 HR hour(s) and duration of 2 DAYS hour(s).

UNK SEVERITY LYMPHOCYTE PRODUCTION, DECREASED in BLOOD LYMPHOCYTE seen in UNK subjects with onset of 48 HRS hour(s) and duration of UNK hour(s).

LYMPHOCYTE PRODUCTION, INCREASED (20000 ML) in BLOOD LYMPHOCYTE seen in UNK subjects with onset of 6 HR hour(s) and duration of 18 HR hour(s).

UNK SEVERITY ACTIVATED PARTIAL THROMBOPLASTIN TIME in PLASMA seen in UNK subjects with onset of 12 HRS hour(s) and duration of ~3 DAYS hour(s).

UNK SEVERITY COAGULATION FACTOR II in PLASMA seen in UNK subjects with onset of 6-12 HR hour(s) and duration of 3 DAYS hour(s).

UNK SEVERITY COAGULATION FACTOR IX in PLASMA seen in UNK subjects with onset of 12 HRS hour(s) and duration of 2 DAYS hour(s).

UNK SEVERITY COAGULATION FACTOR V in PLASMA seen in UNK subjects with onset of 6-12 HRS hour(s) and duration of 1.5 DAYS hour(s).

UNK SEVERITY COAGULATION FACTOR VII in PLASMA seen in UNK subjects with onset of 12 HRS hour(s) and duration of >3DAYS hour(s).

UNK SEVERITY COAGULATION FACTOR VIII in PLASMA seen in UNK subjects with onset of 12 HRS hour(s) and duration of 2-3 DAYS hour(s).

UNK SEVERITY COAGULATION FACTOR X in PLASMA seen in UNK subjects with onset of 12 HRS hour(s) and duration of 1.5 DAYS hour(s).

UNK SEVERITY COAGULATION FACTOR XI in PLASMA seen in UNK subjects with onset of 6 HRS hour(s) and duration of 3 DAYS hour(s).

UNK SEVERITY COAGULATION FACTOR XII in PLASMA seen in UNK subjects with onset of 6 HRS hour(s) and duration of 3 DAYS hour(s).

PROTHROMBIN TIME (MODERATE SECONDS) in PLASMA seen in UNK subjects with onset of 6 HRS hour(s) and duration of 2 DAYS hour(s).

No results reported for this Exposure Group.

System-Sign-Species-Sign-Dose-Study Design Monographs

Aflatoxin

LIPIDOSIS, NOS
(SEVERE) occurring in 5/5 subjects at with duration. Subjects: 5 PIG, Age: 6 W, Wt: 12 KG, Sex: C, 28 EXP Exposures:AFLATOXIN, 4 MG/KG, PO, given CHRON x 28 D Design:5 GRP, 5 EXP, Y CNTL (2556)

ASPARTATE AMINO TRANSFERASE (SGOT) MEASUREMENT (F-23160)
(41IU/L) occurring in MEAN subjects at 14 DAYS with 14 DAYS duration. Subjects: 5 PIG, Age: 6 W, Wt: 12 KG, Sex: C, 28 EXP Exposures:AFLATOXIN, 4 MG/KG, PO, given CHRON x 28 D Design:5 GRP, 5 EXP, Y CNTL (2556)

CREATINE KINASE (CK)
(109IU/L) occurring in MEAN subjects at 28 DAY with duration. Subjects: 5 PIG, Age: 6 W, Wt: 12 KG, Sex: C, 28 EXP Exposures:AFLATOXIN, 4 MG/KG, PO, given CHRON x 28 D Design:5 GRP, 5 EXP, Y CNTL (2556)

GAMMA GLUTAMYL TRANSPEPTIDASE, SERUM, MEASUREMENT (GGT) (F-21340)
(29IU/L) occurring in MEAN subjects at 14 DAYS with 14 DAYS duration. Subjects: 5 PIG, Age: 6 W, Wt: 12 KG, Sex: C, 28 EXP Exposures:AFLATOXIN, 4 MG/KG, PO, given CHRON x 28 D Design:5 GRP, 5 EXP, Y CNTL (2556)

LACTIC DEHYDROGENASE ISOENZYME, NOS
(277IU/L) occurring in MEAN subjects at 28 DAY with duration. Subjects: 5 PIG, Age: 6 W, Wt: 12 KG, Sex: C, 28 EXP Exposures:AFLATOXIN, 4 MG/KG, PO, given CHRON x 28 D Design:5 GRP, 5 EXP, Y CNTL (2556)

PHOSPHORUS, DECREASED LEVEL
(SEVERE) occurring in MEAN subjects at 21 DAYS with 7 DAYS duration. Subjects: 5 PIG, Age: 6 W, Wt: 12 KG, Sex: C, 28 EXP Exposures:AFLATOXIN, 4 MG/KG, PO, given CHRON x 28 D Design:5 GRP, 5 EXP, Y CNTL (2556)

DRY STRUCTURE
(MILD) occurring in 5/5 subjects at UNK with UNK duration. Subjects: 5 PIG, Age: 6 W, Wt: 12 KG, Sex: C, 28 EXP Exposures:AFLATOXIN, 4 MG/KG, PO, given CHRON x 28 D Design:5 GRP, 5 EXP, Y CNTL (2556)

ICTERUS, NOS
(SEVERE) occurring in 2/5 subjects at 25 DAYS with duration. Subjects: 5 PIG, Age: 6 W, Wt: 12 KG, Sex: C, 28 EXP Exposures:AFLATOXIN, 4 MG/KG, PO, given CHRON x 28 D Design:5 GRP, 5 EXP, Y CNTL (2556)

CACHEXIA
(MILD) occurring in 5/5 subjects at UNK with UNK duration. Subjects: 5 PIG, Age: 6 W, Wt: 12 KG, Sex: C, 28 EXP Exposures:AFLATOXIN, 4 MG/KG, PO, given CHRON x 28 D Design:5 GRP, 5 EXP, Y CNTL (2556)

NORMAL CONDITION
() occurring in 5/5 subjects at with duration. Subjects: 5 PIG, Age: 6 W, Wt: 12 KG, Sex: C, 28 EXP Exposures:AFLATOXIN, 2 MG/KG, PO, given CHRON x 28 D Design:5 GRP, 5 EXP, Y CNTL (2556)

NORMAL CONDITION
() occurring in 5/5 subjects at with duration. Subjects: 5 PIG, Age: 6 W, Wt: 12 KG, Sex: C, 28 EXP Exposures:AFLATOXIN, 1 MG/KG, PO, given CHRON x 28 D Design:5 GRP, 5 EXP, Y CNTL (2556)

REFERENCES

(2556) Harvey RB, Huff WE, Kubena LF, Corrier DE, Phillips TD: PROGRESSION OF AFLATOXICOSIS IN GROWING BARROWS, AM J VET RES 49:482-487,1988

HEMORRHAGE, PETECHIAL
(MILD) occurring in 3/5 subjects at UNK with duration. Subjects: 12 MONKEY, Age: UNK ADUL, Wt: 4-6 KG, Sex: M, 1 EXP Exposures:T-2 TOXIN, 0.65 MG/KG, IM, given x Design:1 GRP, 2 EXP, CNTL (935)

CHEWING
(——) occurring in 5/5 subjects at < 0.5 HR with N/AV duration. Subjects: 5 PORCINE, Age: UNK , Wt: 50 KG, Sex. F, 1 EXP Exposures:T-2 TOXIN, 0.6 MG/KG, IA, given ONCE x ONE DOSE Design:3 GRP, 3 EXP, Y CNTL (1410)

CHEWING
(——) occurring in 5/5 subjects at < 0.5 HR with N/AV duration. Subjects: 5 PORCINE, Age: UNK , Wt: 50 KG, Sex: F, 1 EXP Exposures:T-2 TOXIN, 4.8 MG/KG, IA, given ONCE x ONE DOSE Design:3 GRP, 3 EXP, Y CNTL (1410)

DIARRHEA, NOS
(3) occurring in ?/5 subjects at ~1 HR with UNK duration. Subjects: 5 PORCINE, Age: UNK , Wt: 50 KG, Sex: F, 1 EXP Exposures:T-2 TOXIN, 0.6 MG/KG, IA, given ONCE x ONE DOSE Design:3 GRP, 3 EXP, Y CNTL (1410)

DIARRHEA, NOS
(3) occurring in ?/5 subjects at ~1 HR with UNK duration. Subjects: 5 PORCINE, Age: UNK , Wt: 50 KG, Sex: F, 1 EXP Exposures:T-2 TOXIN, 4.8 MG/KG, IA, given ONCE x ONE DOSE Design:3 GRP, 3 EXP, Y CNTL (1410)

FLATULENCE
(UNK) occurring in ?/5 subjects at ~1 HR with UNK duration. Subjects: 5 PORCINE, Age: UNK , Wt: 50 KG, Sex: F, 1 EXP Exposures:T-2 TOXIN, 0.6 MG/KG, IA, given ONCE x ONE DOSE Design:3 GRP, 3 EXP, Y CNTL (1410)

FLATULENCE
(UNK) occurring in ?/5 subjects at ~1 HR with UNK duration. Subjects: 5 PORCINE, Age: UNK , Wt: 50 KG, Sex: F, 1 EXP Exposures:T-2 TOXIN, 4.8 MG/KG, IA, given ONCE x ONE DOSE Design:3 GRP, 3 EXP, Y CNTL (1410)

HEMORRHAGE, PETECHIAL
(MILD) occurring in 3/5 subjects at UNK with duration. Subjects: 12 MONKEY, Age: UNK ADUL, Wt: 4-6 KG, Sex: M, 1 EXP Exposures:T-2 TOXIN, 0.65 MG/KG, IM, given x Design:1 GRP, 2 EXP, CNTL (935)

SALIVARY SECRETION, INCREASED
(——) occurring in 5/5 subjects at < 0.5 HR with N/AV duration. Subjects: 5 PORCINE, Age: UNK , Wt: 50 KG, Sex: F, 1 EXP Exposures:T-2 TOXIN, 0.6 MG/KG, IA, given ONCE x ONE DOSE Design:3 GRP, 3 EXP, Y CNTL (1410)

SALIVARY SECRETION, INCREASED
(——) occurring in 5/5 subjects at < 0.5 HR with N/AV duration. Subjects: 5 PORCINE, Age: UNK , Wt: 50 KG, Sex: F, 1 EXP Exposures:T-2 TOXIN, 4.8 MG/KG, IA, given ONCE x ONE DOSE Design:3 GRP, 3 EXP, Y CNTL (1410)

VOMITING, NOS
(3) occurring in 3/3 subjects at 1 HR with 4 HR duration. Subjects: 6 PORCINE, Age: N-AV , Wt: 55 KG, Sex: F, 1 EXP Exposures:T-2 TOXIN, 2.4 MCG/KG, IA, given ONCE x ONE DOSE Design:3 GRP, 3 EXP, Y CNTL (1422)

VOMITING, PERSISTENT
(3—) occurring in 5/5 subjects at ~1 HR with PERSISTANT duration. Subjects: 5 PORCINE, Age: UNK , Wt: 50 KG, Sex: F, 1 EXP Exposures:T-2 TOXIN, 0.6 MG/KG, IA, given ONCE x ONE DOSE Design:3 GRP, 3 EXP, Y CNTL (1410)

VOMITING, PERSISTENT
(3—) occurring in 5/5 subjects at ~1 HR with PERSISTANT duration. Subjects: 5 PORCINE, Age: UNK , Wt: 50 KG, Sex: F, 1 EXP Exposures:T-2 TOXIN, 4.8 MG/KG, IA, given ONCE x ONE DOSE Design:3 GRP, 3 EXP, Y CNTL (1410)

ACTIVATED PARTIAL THROMBOPLASTIN TIME
(MODERATE) occurring in UNK subjects at 12 HRS with ~3 DAYS duration. Subjects: 12 MONKEY, Age. UNK ADUL, Wt: 4-6 KG, Sex: M, 1 EXP Exposures:T-2 TOXIN, 0.65 MG/KG, IM, given x Design:1 GRP, 2 EXP, CNTL (935)

COAGULATION FACTOR II
(SIGNIF) occurring in UNK subjects at 6-12 HR with 3 DAYS duration. Subjects: 12 MONKEY, Age: UNK ADUL, Wt: 4-6 KG, Sex: M, 1 EXP Exposures:T-2 TOXIN, 0.65 MG/KG, IM, given x Design:1 GRP, 2 EXP, CNTL (935)

COAGULATION FACTOR IX
(MODERATE) occurring in UNK subjects at 12 HRS with 2 DAYS duration. Subjects: 12 MONKEY, Age: UNK ADUL, Wt: 4-6 KG, Sex: M, 1 EXP Exposures:T-2 TOXIN, 0.65 MG/KG, IM, given x Design:1 GRP, 2 EXP, CNTL (935)

COAGULATION FACTOR V
(MODERATE) occurring in UNK subjects at 6-12 HRS with 1.5 DAYS duration. Subjects: 12 MONKEY, Age: UNK ADUL, Wt: 4-6 KG, Sex: M, 1 EXP Exposures:T-2 TOXIN, 0.65 MG/KG, IM, given x Design:1 GRP, 2 EXP, CNTL (935)

COAGULATION FACTOR VII
(MODERATE) occurring in UNK subjects at 12 HRS with >3DAYS duration. Subjects: 12 MONKEY, Age: UNK ADUL, Wt: 4-6 KG, Sex: M, 1 EXP Exposures:T-2 TOXIN, 0.65 MG/KG, IM, given x Design:1 GRP, 2 EXP, CNTL (935)

COAGULATION FACTOR VIII
(MODERATE) occurring in UNK subjects at 12 HRS with 2-3 DAYS duration. Subjects: 12 MONKEY, Age: UNK ADUL, Wt: 4-6 KG, Sex: M, 1 EXP Exposures:T-2 TOXIN, 0.65 MG/KG, IM, given x Design:1 GRP, 2 EXP, CNTL (935)

COAGULATION FACTOR X
(MODERATE) occurring in UNK subjects at 12 HRS with 1.5 DAYS duration. Subjects: 12 MONKEY, Age: UNK ADUL, Wt: 4-6 KG, Sex: M, 1 EXP Exposures:T-2 TOXIN, 0.65 MG/KG, IM, given x Design:1 GRP, 2 EXP, CNTL (935)

COAGULATION FACTOR XI
(MODERATE) occurring in UNK subjects at 6 HRS with 3 DAYS duration. Subjects: 12 MONKEY, Age: UNK ADUL, Wt: 4-6 KG, Sex: M, 1 EXP Exposures:T-2 TOXIN, 0.65 MG/KG, IM, given x Design:1 GRP, 2 EXP, CNTL (935)

COAGULATION FACTOR XII
(MODERATE) occurring in UNK subjects at 6 HRS with 3 DAYS duration. Subjects: 12 MONKEY, Age: UNK ADUL, Wt: 4-6 KG, Sex: M, 1 EXP Exposures:T-2 TOXIN, 0.65 MG/KG, IM, given x Design:1 GRP, 2 EXP, CNTL (935)

LYMPHOCYTE PRODUCTION, DECREASED
(MILD) occurring in UNK subjects at 48 HRS with UNK duration. Subjects: 12 MONKEY, Age: UNK ADUL, Wt: 4-6 KG, Sex: M, 1 EXP Exposures:T-2 TOXIN, 0.65 MG/KG, IM, given x Design:1 GRP, 2 EXP, CNTL (935)

LYMPHOCYTE PRODUCTION, INCREASED
(20000ML) occurring in UNK subjects at 6 HR with 18 HR duration. Subjects: 12 MONKEY, Age: UNK ADUL, Wt: 4-6 KG, Sex: M, 1 EXP Exposures:T-2 TOXIN, 0.65 MG/KG, IM, given x Design:1 GRP, 2 EXP, CNTL (935)

NECROSIS, NOS
(NOT STAT) occurring in UNK subjects at with duration. Subjects: 12 MONKEY, Age: UNK ADUL, Wt: 4-6 KG, Sex: M, 1 EXP Exposures:T-2 TOXIN, 0.65 MG/KG, IM, given x Design:1 GRP, 2 EXP, CNTL (935)

NEUTROPHILIC LEUKOCYTOSIS (T-0X160)
(MODERATE) occurring in UNK subjects at 6 HR with 2 DAYS duration. Subjects: 12 MONKEY, Age: UNK ADUL, Wt: 4-6 KG, Sex: M, 1 EXP Exposures:T-2 TOXIN, 0.65 MG/KG, IM, given x Design:1 GRP, 2 EXP, CNTL (935)

PROTHROMBIN TIME
(MODERATESECONDS) occurring in UNK subjects at 6 HRS with 2 DAYS duration. Subjects: 12 MONKEY, Age: UNK ADUL, Wt: 4-6 KG, Sex: M, 1 EXP Exposures:T-2 TOXIN, 0.65 MG/KG, IM, given x Design:1 GRP, 2 EXP, CNTL (935)

RESTLESSNESS
(UNK) occurring in 5/5 subjects at UNK with UNK duration. Subjects: 5 PORCINE, Age: UNK , Wt: 50 KG, Sex: F, 1 EXP Exposures:T-2 TOXIN, 4.8 MG/KG, IA, given ONCE x ONE DOSE Design:3 GRP, 3 EXP, Y CNTL (1410)

RESTLESSNESS
(UNK) occurring in 5/5 subjects at UNK with UNK duration. Subjects: 5 PORCINE, Age: UNK , Wt: 50 KG, Sex: F, 1 EXP Exposures:T-2 TOXIN, 0.6 MG/KG, IA, given ONCE x ONE DOSE Design:3 GRP, 3 EXP, Y CNTL (1410)

STRAIN GAGE, BIOFEEDBACK
() occurring in 3?/5 subjects at < 1 HR with duration. Subjects: 5 PORCINE, Age: UNK , Wt: 50 KG, Sex: F, 1 EXP Exposures:T-2 TOXIN, 0.6 MG/KG, IA, given ONCE x ONE DOSE Design:3 GRP, 3 EXP, Y CNTL (1410)

STRAIN GAGE, BIOFEEDBACK
DISORDER () occurring in subjects at with duration. Subjects: 5 PORCINE, Age: UNK , Wt: 50 KG, Sex: F, 1 EXP Exposures:T-2 TOXIN, 4.8 MG/KG, IA, given ONCE x ONE

DOSE Design:3 GRP, 3 EXP, Y CNTL (1410)

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(1410) Beasley VR: EXPERIMENTAL T-2 TOXICOSIS IN SWINE I. CHANGES IN CARDIAC OUTPUT,AORTIC MEAN PRESSURE, CATECHOLAMINES, 6-KETO-PGF1ALPHA,THROMBANE B2, AND ACID-BASE PARAMETERS, FUNDAM APPL TOXICOL 5:879-892,1985

(935) Cosgriff TM, Bunner DL, Wannemacher RW JR., Hodgson LA, Dinterman RE: THE HEMOSTATIC DERANGEMENT PRODUCED BY T-2 TOXIN IN CYNOMOLGUS MONKEYS, TOXICOL APPL PHARMACOL 82:532-539,1986

Total Monograph

T-2 Toxin

T-2 TOXIN

CHEMICAL DATA: None available at this time.

UNK SEVERITY HEMORRHAGE, PETECHIAL seen in 3/5 FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 0.6 MG/KG T-2 TOXIN by PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. The subjects were evaluated at CONTINUOUSLY. Clinical effect had onset of UNK (935)

SEVERE VOMITING, NOS seen in 3/3 FEMALE, N-AV old N-AV PORCINE weighing 55 kilograms N-AV tallof GOOD, FEMORAL CATH health status (obtained from N-AV) which received a total of 1 exposure(s) to 2.4 MCG/KG T-2 TOXIN by PULMONARY ARTERY INF INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. The subjects were evaluated at EVERY 1.5 HR. Clinical effect had onset of 1 HR and duration of 4 HR. (1422)

VOMITING, PERSISTENT (3 —) seen in 5/5 FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 0.6 MG/KG T-2 TOXIN by PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. The subjects were evaluated at CONTINUOUSLY. Clinical effects had onset of ~1 HR and duration of PERSISTANT. (1410)

VOMITING, PERSISTENT (3 —) seen in 5/5 FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 4.8 MG/KG T-2 TOXIN by PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. The subjects were evaluated at CONTINOUSLY. Clinical effects had onset of ~1 HR and duration of PERSISTANT. (1410)

SEVERE DIARRHEA, NOS seen in ?/5 FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 0.6 MG/KG T-2 TOXIN by PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. T subjects were evaluated at CONTINUOUSLY. Clinical effect had onset of ~1 HR and duration of UNK. (1410)

SEVERE DIARRHEA, NOS seen in ?/5 FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 4.8 MG/KG T-2 TOXIN by PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. T subjects were evaluated at CONTINOUSLY. Clinical effect had onset of ~1 HR and duration of UNK. (1410)

UNK SEVERITY FLATULENCE seen in ?/5 FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 0.6 MG/KG T-2 TOXIN by PUMPE IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSI The subjects were evaluated at CONTINUOUSLY. Clinical effect had onset of ~1 HR and duration of UNK. (1410)

UNK SEVERITY FLATULENCE seen in ?/5 FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 4.8 MG/KG T-2 TOXIN by PUMPE IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE The subjects were evaluated at CONTINOUSLY. Clinical effect had onset of ~1 HR and duration of UNK. (1410)

CHEWING (— —) seen in 5/5 FEMALE, UNK old CROSSBRED FORCINE weigh ing 50 kilograms of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 0.6 MG/KG T-2 TOXIN by PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. The subjects were evaluated at CONTINUOUSLY. Clinical effects had onset of < 0.5 HR and duration of N/AV. (1410)

CHEWING (— —) seen in 5/5 FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 4.8 MG/KG T-2 TOXIN by PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. The subjects were evaluated at CONTINOUSLY. Clinical effects had onset of < 0.5 HR and duration of N/AV. (1410)

SALIVARY SECRETION, INCREASED (— —) seen in 5/5 FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 0.6 MG/KG T-2 TOXIN by PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. The subjects were evaluated at CONTINUOUSLY. Clinical effects had onset of < 0.5 HR and duration of N/AV. (1410)

SALIVARY SECRETION, INCREASED (— —) seen in 5/5 FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 4.8 MG/KG T-2 TOXIN by PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. The subjects were evaluated at CONTINOUSLY. Clinical effects had onset of < 0.5 HR and duration of N/AV. (1410)

UNK SEVERITY HEMORRHAGE, PETECHIAL seen in 3/5 FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 0.6 MG/KG T-2 TOXIN by PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. The subjects were evaluated at CONTINUOUSLY. Clinical effect had onset of UNK (935)

UNK SEVERITY NECROSIS, NOS seen in UNK FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 0.6 MG/KG T-2 TOXIN by PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. The subjects were evaluated at CONTINUOUSLY. (935)

UNK SEVERITY NEUTROPHILIC LEUKOCYTOSIS (T-0X160) seen in UNK FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 0.6

MG/KG T-2 TOXIN by PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. The subjects were evaluated at CONTINUOUSLY. Clinical effect had onset of 6 HR and duration of 2 DAYS. (935)

UNK SEVERITY LYMPHOCYTE PRODUCTION, DECREASED seen in UNK FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 0.6 MG/KG T-2 TOXIN by PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. The subjects were evaluated at CONTINUOUSLY. Clinical effect had onset of 48 HRS and duration of UNK. (935)

LYMPHOCYTE PRODUCTION, INCREASED (20000 ML) seen in UNK FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 0.6 MG/KG 2 TOXIN by PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. The subjects were evaluated at CONTINUOUSLY. Clinical effects had onset of 6 HR and duration of 18 HR. (935)

UNK SEVERITY ACTIVATED PARTIAL THROMBOPLASTIN TIME seen in UNI FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORA CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 0.6 MG/KG T-2 TOXIN by PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. The subjects were evaluated at CONTINUOUSLY. Clinical effect had onset of 12 HRS and duration of ~3 DAYS. (935)

UNK SEVERITY COAGULATION FACTOR II seen in UNK FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health statu (obtained from UNK) which received a total of 1 exposure(s) to 0.6 MG/KG T-2 TOXIN b PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route ever; ONCE for a duration of ONE DOSE. The subjects were evaluated at CONTINUOUSLY. Clinical effect had onset of 6-12 HR and duration of 3 DAYS. (935)

UNK SEVERITY COAGULATION FACTOR IX seen in UNK FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health statu (obtained from UNK) which received a total of 1 exposure(s) to 0.6 MG/KG T-2 TOXIN b PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. The subjects were evaluated at CONTINUOUSLY. Clinical effect had

onset of 12 HRS and duration of 2 DAYS. (935)

UNK SEVERITY COAGULATION FACTOR V seen in UNK FEMALE, UNK old CROSSBRED PORCINE weighing 50 l grams of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 0.6 MG/KG T-2 TOXIN by PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. The subjects were evaluated at CONTINUOUSLY. Clinical effect had onset of 6-12 HRS and duration of 1.5 DAYS (935)

UNK SEVERITY COAGULATION FACTOR VII seen in UNK FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 0.6 MG/KG T-2 TOXIN by PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. The subjects were evaluated at CONTINUOUSLY. Clinical effect had onset of 12 HRS and duration of >3DAYS. (935)

UNK SEVERITY COAGULATION FACTOR VIII seen in UNK FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 0.6 MG/KG T-2 TOXIN by PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. The subjects were evaluated at CONTINUOUSLY. Clinical effect had onset of 12 HRS and duration of 2-3 DAYS. (935)

UNK SEVERITY COAGULATION FACTOR X seen in UNK FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 0.6 MG/KG T-2 TOXIN by PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. The subjects were evaluated at CONTINUOUSLY. Clinical effect had onset of 12 HRS and duration of 1.5 DAYS. (935)

UNK SEVERITY COAGULATION FACTOR XI seen in UNK FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 0.6 MG/KG T-2 TOXIN by PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. The subjects were evaluated at CONTINUOUSLY. Clinical effect had onset of 6 HRS and duration of 3 DAYS.(935)

UNK SEVERITY COAGULATION FACTOR XII seen in UNK FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 0.6 MG/KG T-2 TOXIN by PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. The subjects were evaluated at CONTINUOUSLY. Clinical effect had onset of 6 HRS and duration of 3 DAYS.(935)

PROTHROMBIN TIME (MODERATE SECONDS) seen in UNK FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 0.6 MG/KG T-2 TOXIN by PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. The subjects were evaluated at CONTINUOUSLY. Clinical effects had onset of 6 HRS and duration of 2 DAYS.(935)

UNK SEVERITY RESTLESSNESS seen in 5/5 FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 4.8 MG/KG T-2 TOXIN by PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. The subjects were evaluated at CONTINOUSLY. Clinical effect had onset of UNK and duration of UNK. (1410)

UNK SEVERITY RESTLESSNESS seen in 5/5 FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 0.6 MG/KG T-2 TOXIN by PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. The subjects were evaluated at CONTINUOUSLY. Clinical effect had onset of UNK and duration of UNK. (1410)

UNK SEVERITY STRAIN GAGE, BIOFEEDBACK seen in 3?/5 FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 0.6 MG/KG T-2 TOXIN by PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. The subjects were evaluated at CONTINUOUSLY. Clinical effect had onset of < 1 HR (1410)

UNK SEVERITY DISORDER STRAIN GAGE, BIOFEEDBACK seen in FEMALE, UNK old CROSSBRED PORCINE weighing 50 kilograms of GOOD; FEMORAL CATH health status (obtained from UNK) which received a total of 1 exposure(s) to 4.8 MG/KG T-2 TOXIN by PUMPED IN OVER 5 MIN INTRA-ARTERIAL INJ route every ONCE for a duration of ONE DOSE. The subjects were evaluated at CONTINOUSLY. (1410)

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Appendix G.
Toxin Knowledge System Documentation

Note that the Documentation has its own page number sequencing and table of contents.

Toxin Knowledge System
Program Documentation

Version 7.11g5b1a

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Note to Users!

Please assist us by communicating anytime something doesn't work as described, or is not clear in this manual. Please feel free to make suggestions! You can contribute to the development and improvement of the program and its documentation. If you are located at the College of Veterinary Medicine, University of Illinois at Urbana-Champaign, messages can be left in our mailbox in room 1220, Veterinary Medicine Basic Sciences Building. We can be called at (217) 333-2053, or be sent electronic mail at htrammel@iapic.cvm.uiuc.edu.

Thank you,
Harold L. Trammel, Pharm. D., Richard J. Lambert, Ph.D., D.V.M.
TKS Development Team
December, 1989

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1 Program Overview

What is commonly called the "information explosion" has made it increasingly difficult to keep up with what is being published internationally, and to integrate and synthesize what is being done by numerous individual researchers. Even if the focus of interest is very narrow, it is often difficult to understand the meaning of experimental findings and how they relate to one another because there are so many different experimental variables. Each research group has a particular question they are trying to address. Even if one or more groups have the same question, they will go about answering it in very different ways. The following list includes some of the parameters that may differ: animal model, agent preparation methods and dosing formulations, duration of exposure, evaluation parameters and interpretation of results.

The concept of this program is to take the detailed information that is commonly given in written reports, break it down into component parts and place it within a consistent framework in a relational database. One can then ask general or specific questions of the database instead of studying each paper, making comparisons. Since the TKS system was initially developed using mycotoxin literature, we will use them as an example.

Suppose you wanted to identify the mycotoxins which were associated with kidney lesions in swine. The database could be asked for a list of citations in which swine were the subjects and where kidney lesions were found. It should also be possible to identify reports where a specific type of kidney lesion was reported, such as proximal tubular degeneration. As you can see, it is also possible to use the database as a diagnostic tool. What toxin is associated with causing cardiac lesions, elevated body temperature and decreased circulating neutrophils?

What does this give you that cannot be obtained from other citation databases? Well, you can also ask the TKS database to give you information about the material and methods sections of the citation matches so that you can compare the agent formulations, doses administered, route of administration and duration of exposure, as well as other parameters which may have influenced the results or their frequency of occurrence. The differences in experimental protocols could be used to explain variability in results and suggest unifying experiments.

The TKS system provides another tool for information management. Scientists will typically base their reprint files on particular subject groupings or alphabetize them based on the authors names. The TKS system provides a classification scheme and a way to locate information which utilizes both approaches. You can locate work done by certain people, yet perform searches looking for specific topical information.

Having the information available on a magnetic medium means that others with a terminal and connect permission may also have access to the information. The data is available in an abbreviated but detailed form to many. One can maintain a main repository or several component repositories for hard copies of the original manuscripts for reference purposes.

Although it was originally conceived as a mini or mainframe product to handle large amounts of data. The program is being ported to MS-DOS compatible microcomputers and perhaps to the Macintosh platform. This means that potential users could establish their own databases centered around the topics important to them on their own machines.

Documentation Overview

You can learn to use the Toxin Knowledge System by following the program documentation sequentially, starting at TKS-MAIN: Menu Options. You will be taken through the process of entering data from an article by first defining the citation data and paper overview, and later the other component parts such as the materials and methods (study design, subject groups, treatment regimens), results and discussion.

TKS-MAIN Menu

TKS-MAIN Menu Options

When the TKS-Program is started, the "TKS-MAIN" menu options are available (**Figure 1.1**). The first option in the list is selected as indicated by the reverse video (highlight or funnel enclosure on some screens) of "AbstractMgt." You can move through the menu by using the right and left arrow or cursor keys. Messages which briefly explain each option appear below the menu

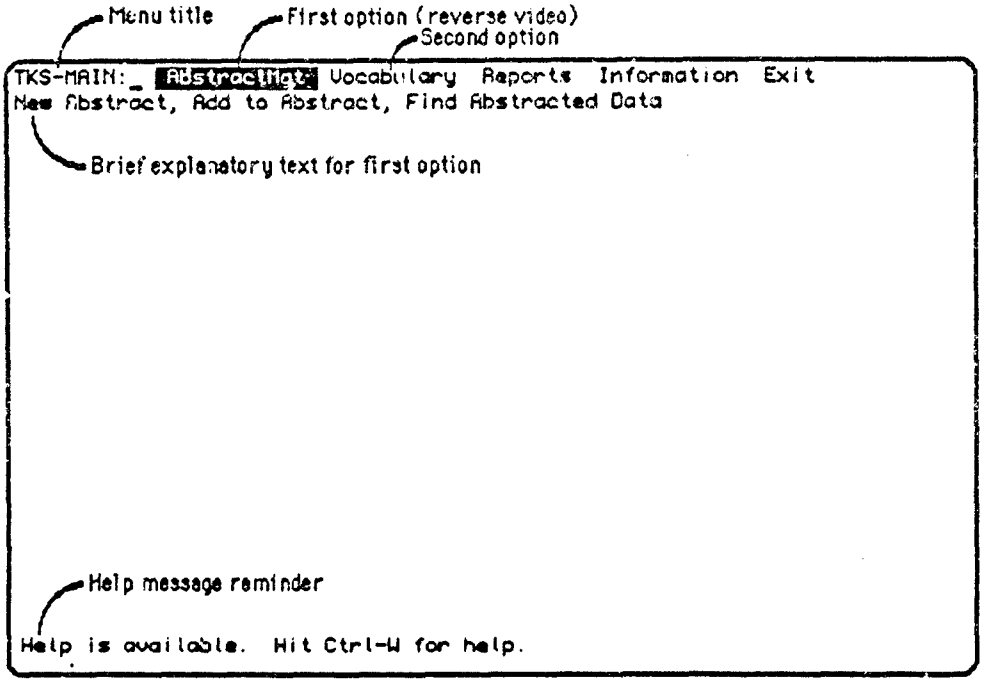


Figure 1.1 TKS-MAIN Menu and Screen bar.

In addition, on-screen help messages are available for most menu items and can be accessed by hitting the "control" and "w" keys simultaneously (Ctrl-w).

Study **Figure 1.1** and read the next few paragraphs before trying anything.

You may invoke the desired menu option by typing in lower case the first letter of the option you wish to select or by hitting "return" when an option is highlighted. For example, typing "e" will select the "Exit" option. However, this method may not allow you to see the brief explanatory text associated with each option.

AbstractMgt

Selecting the first option in the TKS-MAIN menu brings you to the "ABSTRACT" menu where abstracts can be entered, abstracts already entered can be added to (completed), or modified in some other way, or where searches for abstracted information can be performed. Documentation for this path begins below.

Vocabulary

This option allows access to the lists and codes for journals, books, keywords, clinical findings and chemical vocabulary. These areas can be browsed, modified, added to or searched.

Reports

This option displays the "Report" menu with two choices available at this time. This menu has just begun to be utilized but is not yet "on-line." Eventually this is where a user can view the most current monographs, generate new monographs (report summaries), generate structured abstracts for a specific paper, and use other features yet to be developed.

Information

Choosing this option brings the user to the "INFORMATION" menu which currently has two menu choices. They are "Copyright" and "Development." Copyright brings up the copyright notes and the program version number as well as a summary of the stages of development of the individual programs which form the *Toxin Knowledge System.*

Exit

Selecting "Exit" removes you from the TKS program if you are in the first menu (TKS-MAIN), and moves you to the previous menu if you are at any other point in the program.

ABSTRACT Menu Options

Select "AbstractMgt" and a new menu appears, entitled "ABSTRACT." The options presented (**Figure 1.2**) are "New," "Add," and "Find." Selecting "New" from this menu begins the process of entering a new citation. The "Add" option (see **Chapter 7**) allows you to add components to an already entered abstract. This frequently occurs when citation information has been entered but the content of the paper (materials and methods, subject group descriptions, etc.) has not been abstracted. Choosing the "Find" option allows you to search for various aspects of entered papers.

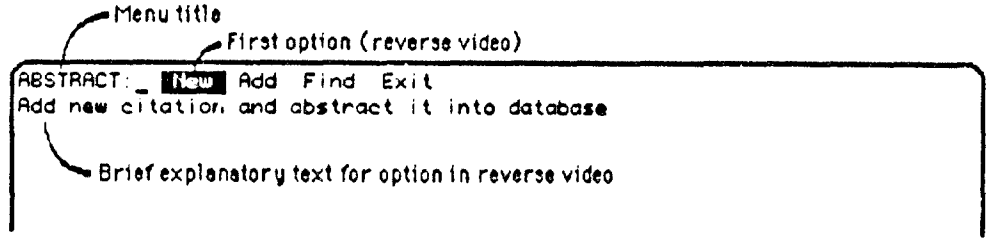


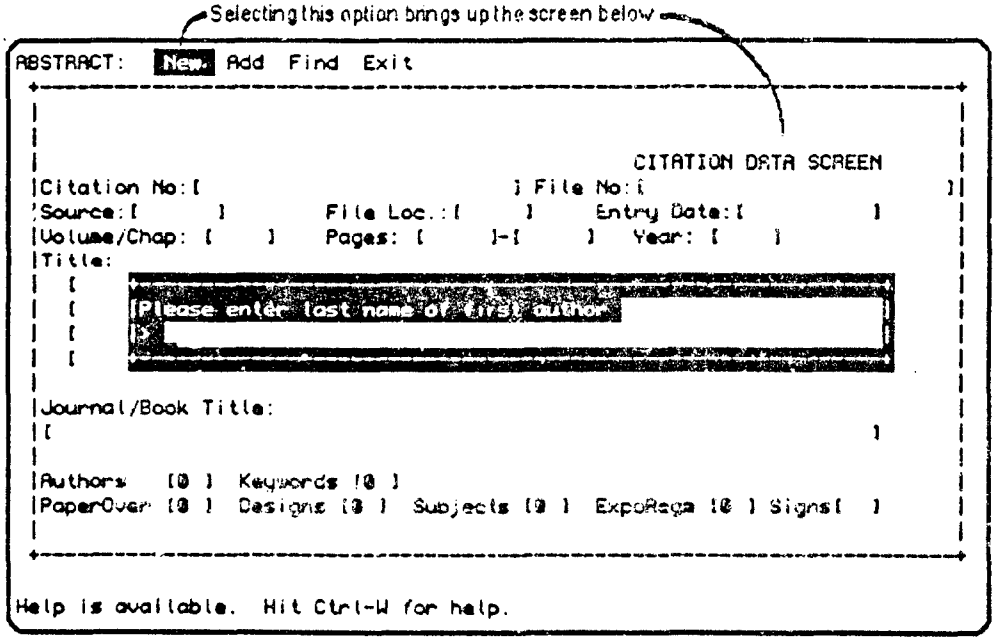
Figure 1.2 ABSTRACT Menu and Screen

New

The selection of the "ABSTRACT" menu choice "New" begins a series of screens which take the user through the entry process for a new document (journal article or book chapter) into the system. First, the user will enter citation data (Figure 1.3), followed by the author and keyword information, paper content, comments, etc.

Citation Data Information

Figure 1.3 CITATION DATA SCREEN



Author

After the *CITATION DATA SCREEN* is displayed, a dialog window appears and prompts you for the last name of the first author (you do not need to type upper case letters). Enter the author information, then hit the "return" key.

Source

You are then asked for the journal (or book) "source code" which is a 5 digit number with a "J" (or "B") prefix, for example, "J00217."

NOTE! *If you make a mistake and wish to abort an entry, use the "Del" (delete) key. A misspellingcan be corrected using the "Backspace" key.*

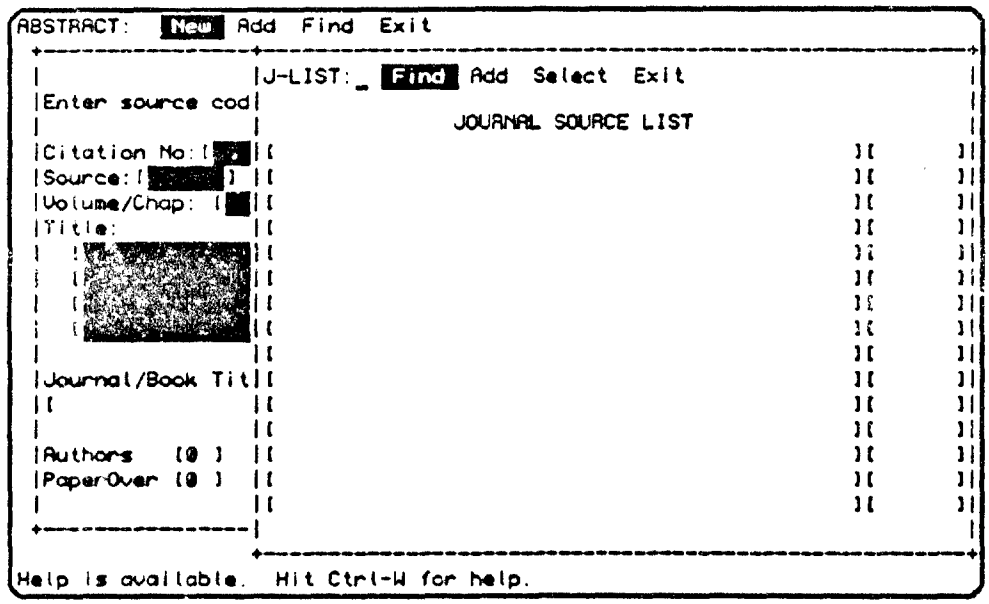
You are not likely to know the source code for a particular journal so the system provides help. As the message at the top of the screen will indicate, pressing function key 5, "F5" brings up a journal list (J-LIST) overlay (**Figure 1.4**) which also has options. Usually you will need to find a particular code to go with the journal you are abstracting. There are three options available: "Find," "Add," and "Select."

TKS JOURNAL-LIST (J-LIST) Menu

Find

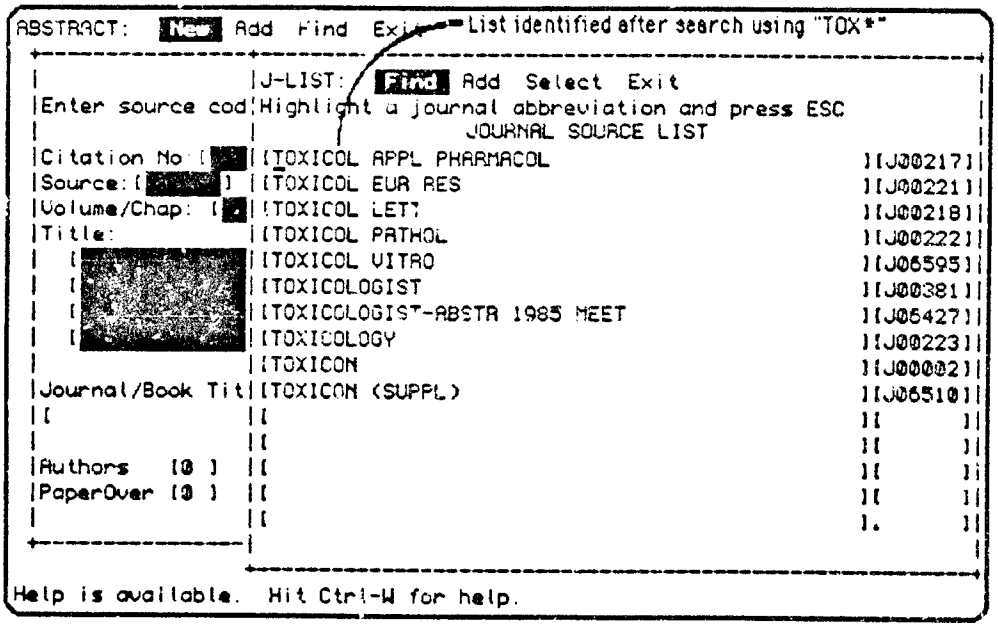
Select "Find" and type what you believe the correct abbreviation would be for that journal. As an example, type "TOX APPL PHARM" and hit the "escape" key (Esc). The program searches for a match. As you can see, sometimes one is not found. When this occurs you can try another option, or use an aid such as a "wild card" (*).

Figure 1.4
J-LIST Menu
(Overlay)



Try typing in "TOX*" and then "return." Observe that this time the system found a match (**Figure 1.5**), that the correct abbreviation is "TOXICOL APPL PHARMACOL" and the Source Code is J00217. Notice also that there are several other potential matches. Use the up and down arrow (cursor) keys to move through the list until you come to the selection you desire. You can then hit "Esc" to exit from that window and return to the abstract window, where the system automatically enters the journal source code you selected!

Figure 1.5 JOURNAL SOURCE LIST Screen after search using "TOX"*



Since there is a good chance that the article you are trying to abstract is not in the above list, you can abort the process by hitting the delete (Del) key. The cursor returns to the J-LIST menu, where you can repeat the procedure to find the source code for the journal of interest.

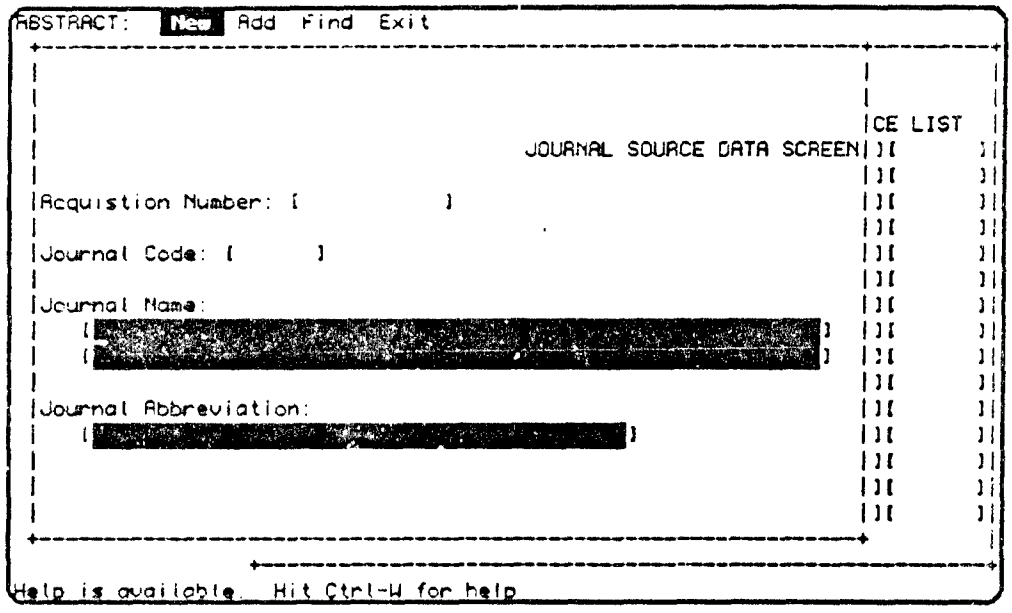
When you have completed the "Source Code" field, hitting the "return" key will move the cursor to the next field.

If the journal you are abstracting already has a source code, you may skip the section below and go directly to "File Loc." several paragraphs further down.

Add

This option is used to add new journals or books to the source code list. Type "a" and the *TKS JOURNAL SOURCE DATA SCREEN* pops up with the cursor on the "Journal Name" field.

Figure 1.6
JOURNAL SOURCE DATA SCREEN



It is the same screen as the one that can be accessed by selecting the "Vocabulary" option from the "TKS-MAIN" menu and "Journals from the subsequent "VOCABULARY" menu. **See the "Vocabulary" section for an explanation of the options.**

Type in the journal name followed by "return," until the next field is reached. Type in the journal abbreviation (obtained from the ***National Library of Medicine List of Journals Index***) and then "Esc," which causes the entry to be assigned an "Acquisition Number" which is given out sequentially, and a Journal Source Code, which is based on the Acquisition Number. The program automatically enters the new source code for the journal in the appropriate field in the *CITATION DATA SCREEN*.

Select

Choosing "Select" will serve no purpose unless you have a list of journals from which one needs to be selected. When a list is available, one can invoke this option by choosing it and then hitting "Esc" as requested on-screen.

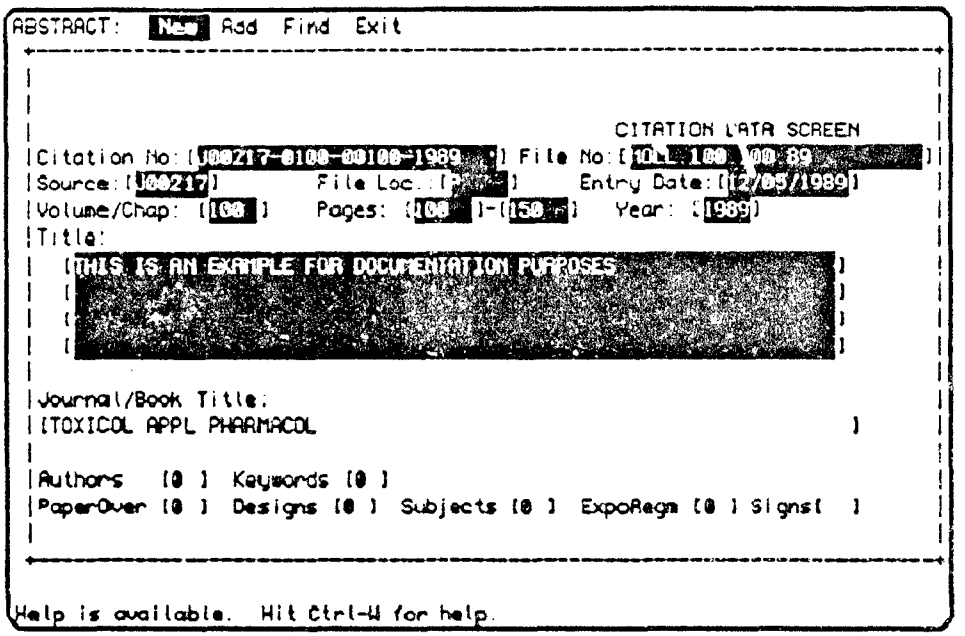


Figure 1.7 CITATION DATA SCREEN Completed via the "New" path from the "ABSTRACT" menu.

File Loc.

"File Loc." (**Figure 1.3**) is short for file location. This provides a way to indicate where a specific file may be located, and is particularly useful when files may be stored in several different locations. If one wants to locate a particular file, this field in TKS citation can be used to identify where to look (hopefully, it will be there).

Since there is space for only 6 characters, abbreviations can be set-up for particular places or names of individuals. Type in the location of the citation or book and hit "return."

If you do not wish to use this option hit "return" to move to the next entry point.

Volume/Chap

Enter the of the journal or the number of the book chapter from which the article was taken. Hit "return" to move to the next field.

Pages

Enter the beginning page number followed by a "return," and the ending page number and "return."

Year

Enter the year in which the citation was published, *using all four digits*, then "return." If you are not in a hurry, try entering just the last two digits of the year and "return." See what happens? Completing this field correctly provides the program with the final bit of information necessary to construct the citation number ("Citation No."), which now appears.

Citation No. and File No.;

The citation number consists of the journal source code (6 spaces), the volume or chapter number (4 spaces), the beginning page number (5 spaces) and the year (four digits). All items must be separated by hypens. The number must include characters in all of the spaces allotted, meaning that zero's (0, not the letter O) should be used to fill in blank characters at the beginning of a number. Each field is separated by a hypen. The following is an example, showing the blank characters underlined: J00033-0052-00167-1988.

Typing "return" again, fills in the "File No." field automatically. It consists of the first four letters of the first author's last name, the journal or chapter number, the beginning page number and last two digits of the year. This number may also be used to find the file after it is in the system. It does not consist of extra characters or spaces. There are periods separating portions of the entry. The following is an example, SMIT.33.52.167.88.

Hit "return" again.

If the citation you are attempting to enter is already in the system, you will receive notification of that fact. You may make changes in a file that is already in the system, but not from the "New" citation pathway This will be explained in a later section. If the citation data has already been entered, you can check to see if other components have been entered and either add them or "Exit" back to the "ABSTRACT" menu and begin the entry process again for another article.

If the citation you entered is new, the "return" following the "File No." will bring the cursor to the title entry.

Title

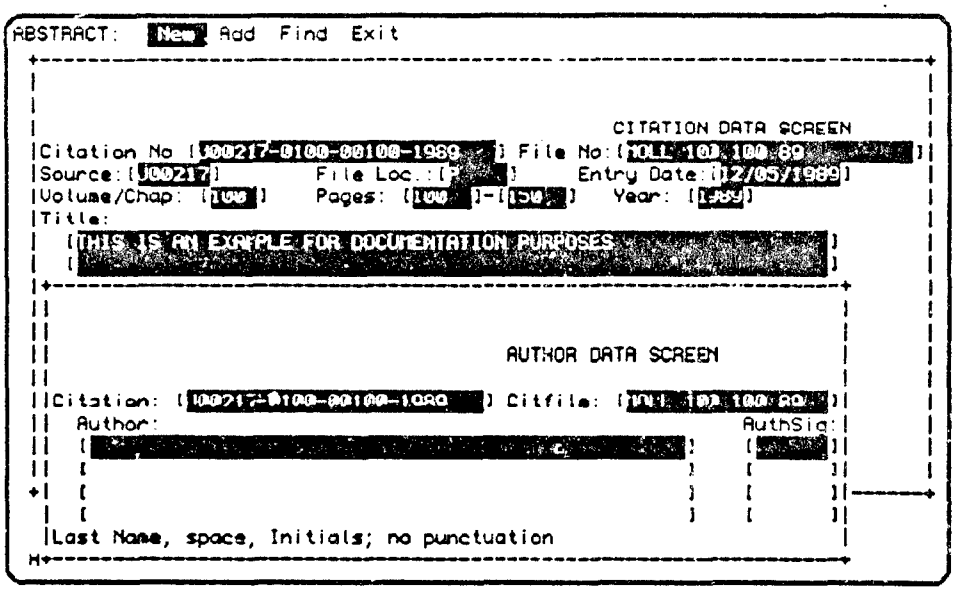
Enter the title of the article (type in small case) with no period. There is room for even lengthy titles. They will not automatically wrap around the alloted space. As a result, words may be split at the end of lines. Do not attempt to prevent this. The program does not correct spelling, so check your entry. Once the title is complete so is this screen, so hit "Esc," which causes what you typed to be written to memory.

Note! *Useful keys for correcting misspellings are the "Control-x" sequence to erase a letter and "Control-a" to insert characters*

AUTHOR DATA SCREEN

During the initial entry process for a new citation, the Author screen comes up after the title entry (see **Figure 1.8**). Enter the last name, a space and initials (no space between initials) of the first author as requested in the note on the bottom of the screen. Hit "return" and the cursor moves to the "AuthSig" area where you can enter the position of the author in the sequence of names on the publication. The program will enter the numbers if you enter the names in the proper order. Just hit "return" when the cursor is in the "AuthSig" field. You can add up to six names to the author list.

Figure 1.8
AUTHOR
DATA SCREEN
(Overlay)

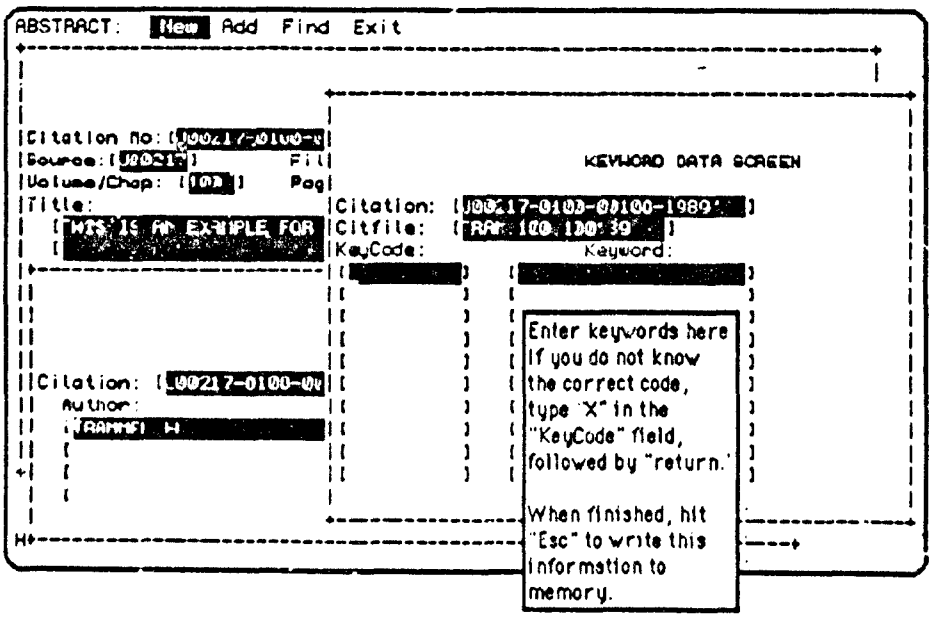


When you are finished, hit "Esc" once again. This writes to memory the author list and the keyword screen pops up.

KEYWORD DATA SCREEN

KeyCodes and Keywords can be used to enter specific information on any aspect of a paper. Clinical signs, physical signs, gross pathology, clinical pathology and histopathology findings, toxin preparation methods, animal treatment information, statistical analysis or any other component of a report.

Figure 1.9
KEYWORD
DATA SCREEN
(Overlay)



Keywords provide more than ancillary information. They can be used to search for certain papers that meet particular criteria. Which papers report effects of toxin "X" in monkeys? Who gave feed contaminated with purified toxin? cultured extracts? Which papers reported the use of fasted mice and which allowed access to food up until the time of dosing? Do young animals react differently than older ones?

KeyCodes are used to simplify the entry process by decreasing the number of key strokes needed to enter a description.

The current keywords were designed primarily for use with journal or book articles describing toxicologic studies with mycotoxins, though they should also be suitable for describing work with other toxins. They are arranged by major headings (toxin type, species, exposure route, etc.).

NOTE: *The KeyCode/Keyword portion of the TKS system is in an early stage of development.*

KeyCodes and Keywords

Enter the appropriate keycode(s) and hit "return." The keywords now appear to the right. Hit "Esc" to write them to memory.

If you do not wish to enter keywords at this time, hit the "delete" key.

Since you do not know any of the keycodes, enter a code of "C02" and press "return." The keyword matching that code is placed in the next field. If one knows the keycodes, this is the quickest way to enter them. Currently, it may be useful to have a hard copy of the Keycodes and Keywords in order to look the Keywords up "manually" by major heading and group.

If an incorrect entry is placed in the "Keycode" field followed by a "return," or you hit the "delete" key, the program *assumes* you need help, and brings up the *KEY-LIST SCREEN.*

KEY-LIST SCREEN

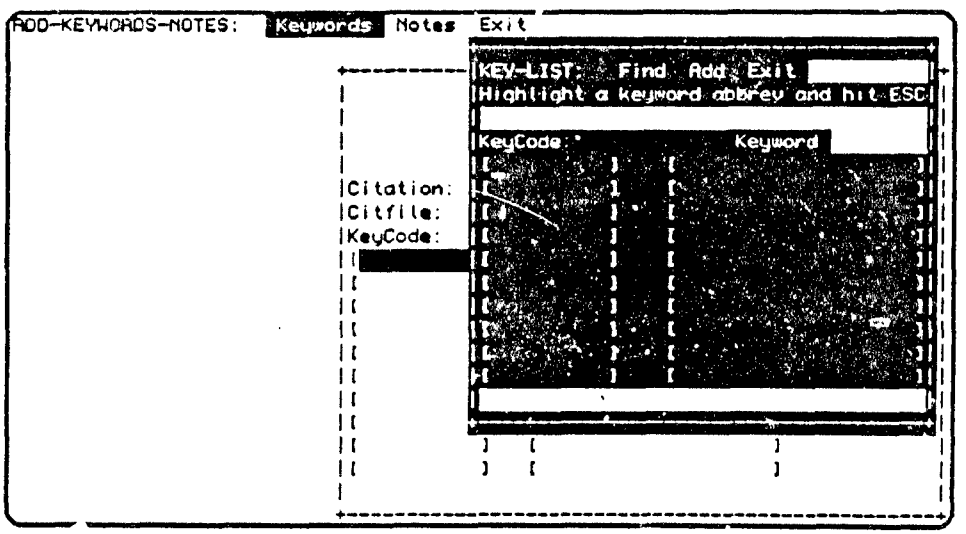


Figure 1.10 KEY-LIST SCREEN

KEY-LIST Menu

Find

The "Find" option helps you search for particular keywords that are in the list, and identifies their associated keycode.

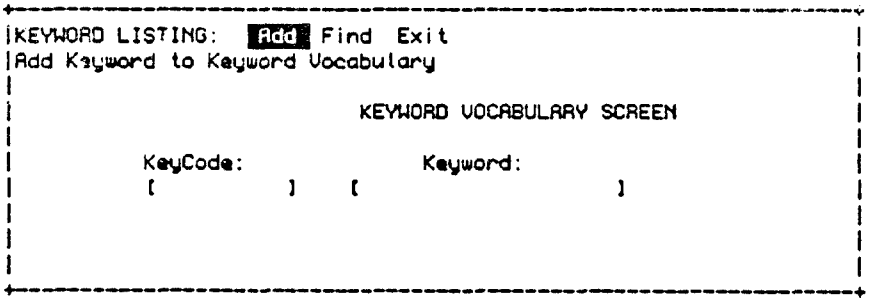
Type "f" and the cursor is placed on the first field (KeyCode). Hit "return" and the cursor goes to the "Keyword" field. Type in the word "mouse" and hit "Esc." The program searches for that keyword and, if it is found, fills in the keycode number. One can enter that KeyCode and Keyword combination in the *KEYWORD DATA SCREEN* by hitting "Esc" once again when the desired pair is highlighted. From there, the process starts over for the next keyword.

If a keyword is searched for but not found, the program responds with a message that "There is no keyword matching the first three letters" and returns you to the *KEYWORD DATA SCREEN.*

Add

The "Add" option allows the freedom to place new keywords and their accompanying codes into the KEY-LIST. Selecting it brings up the *KEYWORD VOCABULARY SCREEN KEYWORD VOCABULARY SCREEN* with the cursor in the "KeyCode" field. In order to complete the process for a new Keyword, you need to know the KeyCodes for the other Keywords in order not to alter already established associations. Enter the appropriate KeyCode, and associated Keyword, followed by "Esc."

Figure 1.11 KEYWORD VOCABULARY SCREEN



(If you do not wish to enter new keywords at this time, hit the "delete" key. If you follow this later path, the screen indicates that it is preparing citation "information.")

CURRENT PAPER Menu

The next menu is titled "CURRENT PAPER" and has only one option, "Exit." That is because you are finished with the first part of the system and must begin a new phase of data entry for the citation. Note that the screen provides a summary of what citation information has be entered so far, including keywords. Hit "e" or "return" to go on.

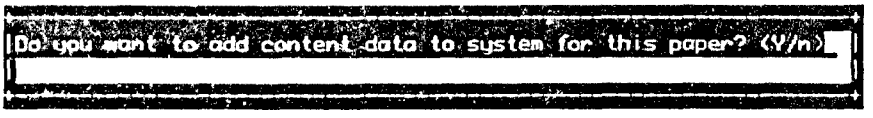
Figure 1.12 CURRENT PAPER Menu

```
CURRENT PAPER:  Exit

J00217-0100-00100-1989          TRAM.100.100.89
TRAMMEL HL,: THIS IS AN EXAMPLE FOR DOCUMENTATION PURPOSES, TOXICOL APPL PH
ARMACOL 100:100-150,1989  , rat, path clin, tox in vivo
```

You are then asked if you would like to "add content data . . . for this paper?" Content refers to data components such as Paper Overview, Designs, Subjects, Regimens, etc.

Figure 1.13 Query prior to entering additional citation data



If you type "n" then "return," you have completed the citation data portion of the entry process and will be returned to the "ABSTRACT" screen. Typing "y" followed by "return" results in a new screen which begins the paper overview process.

Return to TKS-MAIN Menu

TKS-MAIN Menu: Vocabulary

Following this path brings up the "VOCABULARY" menu which allows one to work with the Journal, Book, Keyword, Sign, and Chemical lists.

VOCABULARY Menu

Journals

Selecting "Journals" brings up the JOURNAL-VOCABULARY menu, with options to "Add" journals to the list, "Find" a particular journal, or "Exit" from the program.

JOURNAL-VOCABULARY Menu

Add

Selecting "Add," puts the cursor on the "Journal Name" field. Type in the journal name as given in the *National Library of Medicine List of Journals Index*, and hit "return" until the "Journal Abbreviation" field is reached and enter the appropriate abbreviation as given by that Index. Hit "Esc" and the journal is assigned a Journal Code Number. The numbers are unique to each journal, and assigned sequentially.

Find

Selecting "Find," puts the cursor in the "Journal Code" field. More commonly you will need to use the "Journal Name" field, so hit "return" to place the cursor there and type in the EXACT name of the journal in order to find its journal code. If you typed the name correctly and it is already in the system, the remaining information for that entry is now provided on-screen. If there is no match, check your spelling and title. If they are correct, and there is no match, you will have to enter it as a new journal via the "Add" feature. Go back to the JOURNAL-VOCABULARY screen and follow the "Add" path (see above).

You do not have to type in the whole name of the journal, you can use the first few letters of the first word, or the first word or two and a "wild card" symbol (*). For example, type in "American*" and hit "Esc." The message at the bottom left corner of the screen tells you that more than one match was found. Increasing the length of the search pattern will decrease the number of matches you obtain.

You can now "cycle" through the matches by using the first four options indicated in the "BROWSE" menu near the top of the screen. Hitting "n" for next, or "return" when next is highlighted or surrounded by quotes brings up the next entry in the list. An "l" will bring you to the last match found. By using the right and left arrow keys you can cycle through the "BROWSE" menu and obtain a brief description of each option.

Books

The "Book" list portion of the TKS system is not yet fully operational.

Keywords

Use of this option is described under Keywords for a "New" citation.

Signs

This portion of the program is not yet operational.

Chemicals

This portion of the program has not yet been implemented.

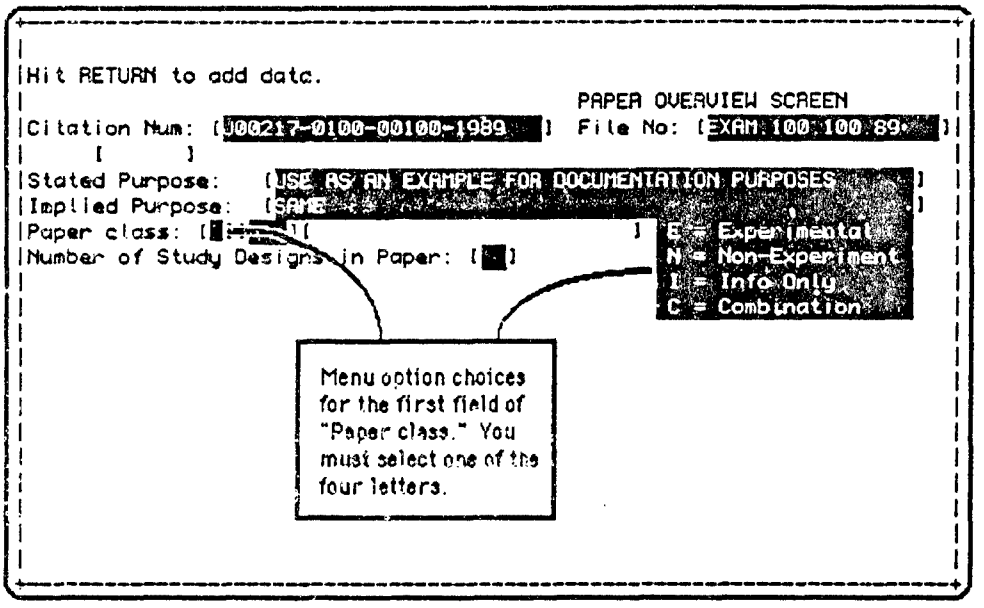
2 Paper Overview Entry

PAPER OVERVIEW SCREEN

The *PAPER OVERVIEW SCREEN* begins the paper content entry process. Following this screen, the user will be taken through sequential screens in order to enter data about different components of the paper's content. Currently the user will see this screen, the *STUDY DESIGN DATA SCREEN, SUBJECT GROUP DATA SCREEN, EXPOSURE REGIMEN DATA SCREEN,* and the *EXPOSURE GROUP LINK ENTRY SCREEN.*

Hit "return" until the cursor is in the "Stated Purpose" field.

Figure 2.1 PAPER OVERVIEW SCREEN



Stated Purpose

There is room here to succintly identify the stated purpose of the paper or book. That is, the purpose *as stated by the authors*. There are 50 spaces. Type in the stated purpose followed by "return."

Implied Purpose

One can often identify information which hints at a purpose not specifically stated. For example, researchers may study the effects of an expensive toxin on mice because they do not have enough material to use on a larger animal that may be more closely related to the target population, people. Perhaps, the long term effects of a toxin such as cadmium was the primary interest, but animals were only fed contaminated diets for 2 weeks because they developed a viral infection and began to die.

Type in the implied purpose followed by "return." If there is none, leave it blank (hit "return").

Paper Class

Select one of the descriptors from the pop-up menu on the right side of the screen (see **Figure 2.1**) by typing the indicated letter in the space provided.

The cursor moves to the second field for "Paper Class" and the descriptors change. Enter the appropriate classification (see **Figure 2.2**) and wait for the cursor to move to the next field.

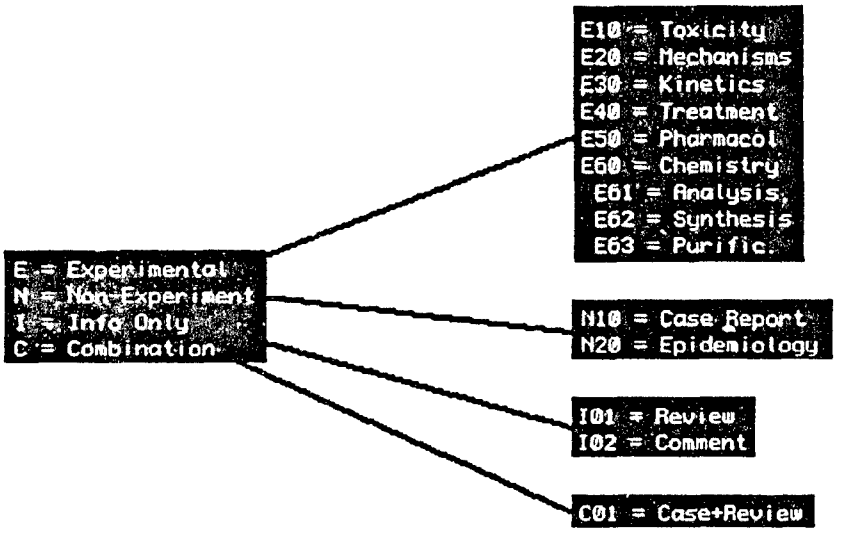


Figure 2.2 Options available for the "Paper class" fields

Number of Study Designs In Paper

This may be simply stated in the manuscript, but more often you will have to carefully check the material and methods section (and sometimes the Results and Discussion) to determine the number of designs used in the experiments described. Usually there will be a single study design for each particular question or hypothesis. Defining the study design goes hand in hand with determining the questions being asked. Good researchers will specifically state their hypotheses and this, in turn, will help you in entering their paper into the database.

You may use the arrow keys or the "return" key to cycle through portions of this screen if the need arises. You might think of a better way to express the implied purpose, or you may have made an error that needs to be corrected.

Remember, useful keys for correcting misspellings are the "Control-x" sequence to erase a letter in an entry, and "Control-a" to insert characters.

Enter the number of designs and hit "Esc," since you are done with this screen. The *STUDY DESIGN DATA SCREEN* comes up next.

3 Study Design Data Entry

STUDY DESIGN DATA SCREEN

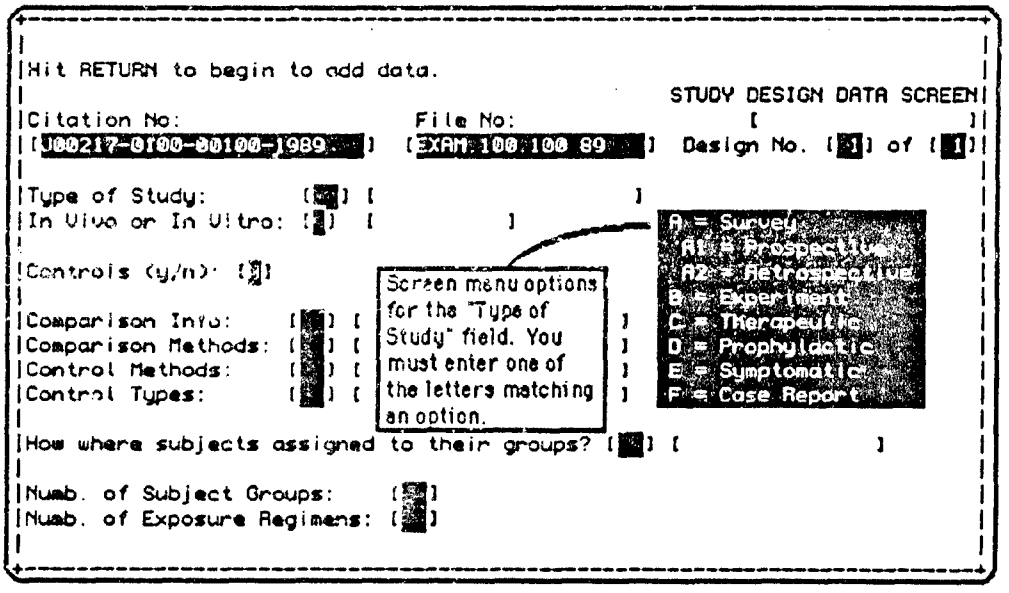
Below the title of the *STUDY DESIGN DATA SCREEN* you can see the number of the study design you will be entering and the total number of designs as indicated from the *PAPER OVERVIEW DATA SCREEN*. The number of designs will increment as additional screens are entered up to the maximum number of designs indicated in the paper overview screen. When the maximum number is reached, the design screen will disappear and the next part of the process begins.

The screen comes up with the cursor on the "Type of Study" entry field.

Type of Study

Enter a selection from the menu to the right by typing the corresponding abbreviation, followed by "return."

Figure 3.1 STUDY DESIGN DATA SCREEN



Note! *You can move through the different fields in this screen by using the arrow and/or return keys. This is particularly useful if you find that an error has been made and you need to edit a previous field.*

The type of small menu selection screen which comes up after an entry depends on the response in a previous field. For example, if you indicated earlier in the *PAPER OVERVIEW SCREEN* that the paper being entered was an "Info only" paper, then you would not have been able to indicate there were study designs, since those sorts of papers do not generally include experiments (experiments have, or at least should have, designs).

With the current screen, if you indicate that there are no controls, then you will not be able to enter the fields from "Comparison Info" on down.

In Vivo or In Vitro

Again, select from the menu to the right side of the screen and type in the designation for the appropriate classification, and the cursor will move to the next field. The choices for this field are illustrated below.

Figure 3.2 Choices for In Vivo or In Vitro field



Controls (y/n)

Enter "y" if negative or positive controls were used in the experimental design and "n" if they were not .

Comparison Info

If the answer to the above is "y," then you will be able to enter information in this and the following fields. Type the correct letter from the pop-up menu and hit "return" (see the following page for a representation of the options available)."

Comparison Methods

Type the appropriate letter and number (see the following page for a representation of the options available).

Control Methods

Type the proper letter and hit "return" (see the following page for a representation of the options available). No "return" is necessary

Control Types

Type the correct letter and number (see the following page for a representation of the options available).

How were subjects assigned to their groups?

Type the appropriate letter followed by a "return" (see the following page for a representation of the options available).

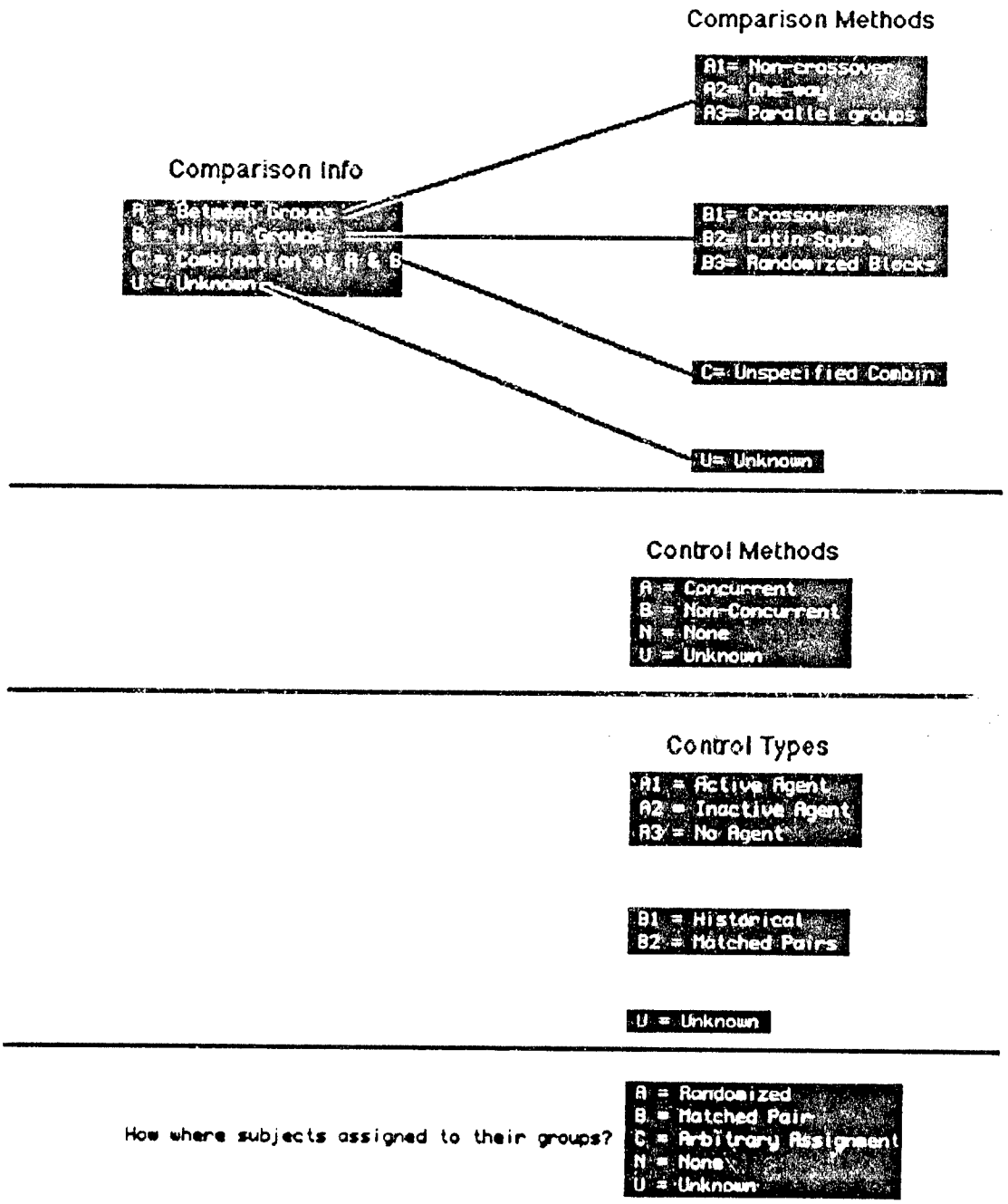


Figure 3.3 Summary of Options Available for the fields of the STUDY DESIGN DATA SCREEN

Number of Subject Groups

Examination of the report is necessary to determine the appropriate response here. Please note that the number of subject groups encompassing the current design should be entered! Other designs will have their own subject groups. Enter the number and then "return." This brings up the first *SUBJECT GROUP DATA SCREEN*. It will be followed by additional *SUBJECT GROUP DATA SCREEN*(s) if you indicated that there were multiple subject groups for a particular design. Hit "return" to automatically enter the "Citation No." and move the cursor to the first data field.

Number of Exposure Groups

As each *SUBJECT GROUP SCREEN* is completed one is given the opportunity to indicate how many *exposure* groups are associated with each *subject* group. For example, one subject group may consist of 60, 30-day old male Sprague Dawley rats exposed to a diet containing lead at a concentration of 10 ppm (30 animals) or a control diet with 0.05 ppm (background concentration) of lead. The two treatments, 10 or 0.05 ppm lead, constitute two exposure groups.

4 Subject Group Data Entry

SUBJECT GROUP DATA SCREEN

When this screen appears the number designation of the subject group you will be entering and the total in that particular design are indicated below the *SUBJECT GROUP DATA SCREEN*.

Figure 4.1 SUBJECT GROUP DATA SCREEN

```
+-------------------------------------------------------------------------+
|                                                                         |
|Enter search criteria and hit ESC to search                              |
|                                                  SUBJECT GROUP DATA SCREEN|
|Citation No. [                          ]                  [            ]|
|Group [  ] of [   ] of Design [ ] [            ]                         |
|                                                                         |
|Species                    Breed                    Source               |
|[                    ]     [                  ]     [                   ]|
|                                                                         |
|Number: [      ]                                                         |
|Sex: [ ]  [                          ]                                   |
|                                                                         |
|Age:    [    ][ ] [           ][  ][                      ]              |
|Weight: [    ][    ] [  ][                        ]                       |
|Height: [    ][    ]                                                     |
|                                                                         |
|Occupation (if appropriate): [                    ]                      |
|Health Status of Subjects:  [                    ]                       |
|                                                                         |
|Total Number of Exposures Received:  [      ]                            |
|                                                                         |
+-------------------------------------------------------------------------+
```

Exposure Group [ ] of [ ] of Design [ ]

Note that to the right of this heading and the subsequent fields is a statement "Group[ ] of [ ] of Design [ ]." These fields will be filled in by the system which usually begins with exposure group 1 of the total number of groups. The system derives information about the total number of subject groups and exposures from the responses given in the Design screen.

The designation for the first group (they are assigned sequential numbers) comes up automatically. Repetitive use of "return" will move you through the screen.

The screen comes up with the cursor on the "Species" field where the common name of the animal used can be entered. Another "return" places the cursor in the "Breed" field.

Source

"Source" is meant to be used to identify where the animals came from, i.e., the firm which raised them or the agent from whom they were purchased.

Number

"Number" refers to the number of animals in the group.

Sex

Figure 4.2 illustrates the suggested abbreviations for "Sex."

Figure 4.2 Suggested abbreviations for "Sex"



The program converts lower case letters to upper case so there is no need to use the shift key. There are four spaces in the field so it is possible to use some combinations. If all four spaces are filled, the cursor jumps to the next field.

Age

Animal age can be represented in any units using numbers in the first field and units of time in the second. When the cursor is in the second field a note at the bottom of the screen requests that the units be entered. If the age(s) are not given in the report type "UNK" in the space provided. You will still be required to enter a value for "Units."

Finally, enter the age category by selecting the appropriate number from the pop-up list which appears next (**Figure 4.3**)

Figure 4.3 Age Category Pop-Up List

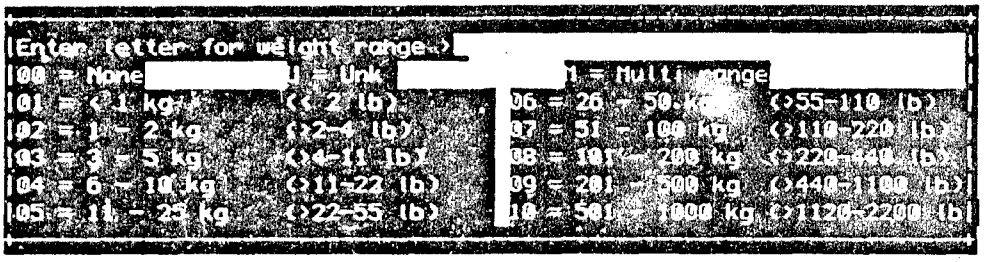


Weight

Subject weights may be entered in any form but they are converted by the program to metric units (kilograms). The first field is for a number and the second for the units (as indicated by the message at the bottom of the screen when the cursor is in the second field). In the event that the subject weight s are not given, enter "UNK" in the space provided for a number. The program still requires that you enter a value for units.

The program also requests that you provide the weight range of the subjects. Select a range from the pop-up list (**Figure 4.4**).

Figure 4.4
Weight Range List



Height

As for "Age" and "Weight," the first field should be a number and the second a unit of measure. Suggested abbreviations are indicated on screen.

Occupation

Papers involving people will often state their occupation(s). There are twenty spaces available for this data entry.

Health Status of Subjects

If this is not reported in the publication, leave the space blank, or indicate that no information is available. If it is, try to indicate the status in the space provided or type a more lengthy statement in the comment section and indicate in this field that there are comments. (THE COMMENT SECTION IS NOT YET READY FOR USE).

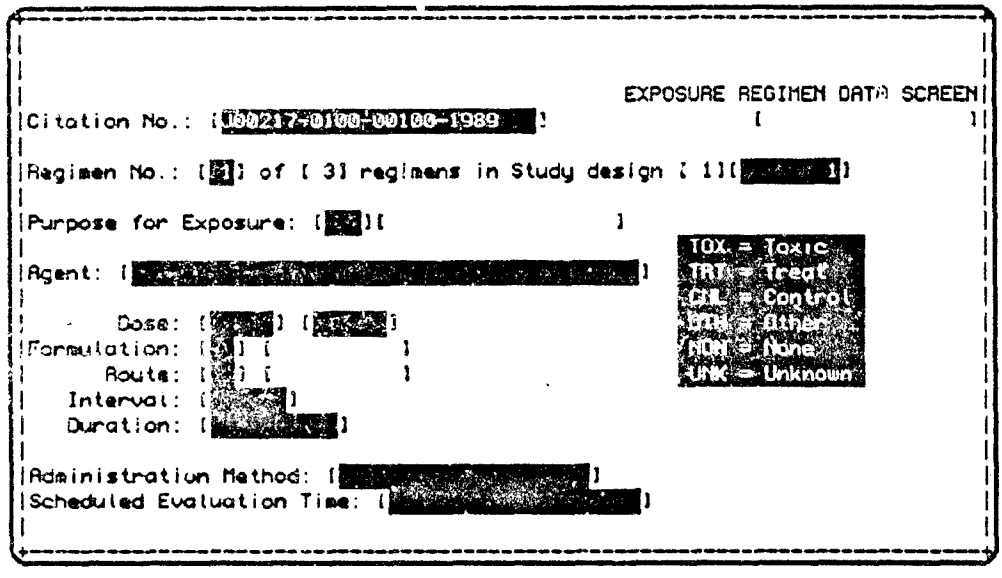
5 Exposure Regimen Data Entry

EXPOSURE REGIMEN DATA SCREEN

As with the *SUBJECT GROUP DATA SCREEN*, you can identify which group you are working with by looking at the description under the "Citation No." which tells you how many regimens there are (based on what you typed in previously) and which one you are currently describing. The screen example in **Figure 5.1** indicates that data can be entered for the first of 3 total regimens for the first design that was described.

As before, fill in the appropriate data by selecting from the options available when the cursor is in each field. You do not need to fill in every field, only those for which there is an appropriate response defined in the report. For example, if you indicate that there was only one exposure, then you need not fill in the field "Interval." Another option is to fill that field with the word "once."

Figure 5.1 EXPOSURE REGIMEN DATA SCREEN



There is no set format for filling in these spaces so try to make the information as descriptive as possible. Filling in all spaces in the field causes the cursor to roll over to the next one. If you do not fill in all spaces in a field you must hit "return" to move to the next field.

Purpose for Exposure

Select one of the potential responses for this field from the pop-up menu on the right side of the screen by typing the appropriate abbreviation in the space provided.

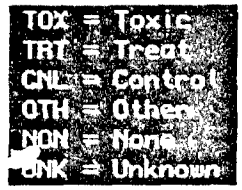


Figure 5.2 Potential responses when cursor is in the

"Purpose for Exposure" field

Agent

There should be sufficient space for you to succintly define the agent described in the article you are abstracting.

Dose

There are two fields available. One is for providing the quanity (amount), while the other is for the units of measure.

Formulation

The pop-up list to the right of the screen, which is reproduced below, presents the categories appropriate for this field. Type one of the the numbers in the "Formulation" field. You need to type the leading zero.

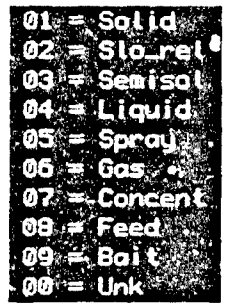


Figure 5.3 Potential responses when cursor is in the "Formulation" field

---

Route

A pop-up list with selections appropriate for this field appears on the right side of the screen. The possiblilites, which are reproduced below, should be sufficient to account for most exposures.

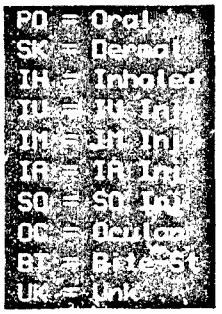


Figure 5.4 Potential responses when cursor is in the "Route" field

Interval

How often was the agent administered? If it was only once, then you can leave this field blank (hit "return"). If more than once, give the quanity and units of time. An abbreviation which can be useful is "q" for the latin "*quaque*" which means "every." For example, "q4 hr" means every four hours.

If there were multiple administrations and the intervals between treatments were variable, there will not be enough space to list them all. In order to accommodate this specific need, use the "Comment" section.

Duration

In instances where the agent was administered over time, indicate the duration of administration in this field. It does not matter what the route might have been. Some agents are "Comment" section if there were several evaluation times and/or multiple parameters evaluated at different times.

When you fill in the last field, and assuming there are multiple regimens, the next regimen screen is brought up with the cursor on the "Citation No." field. Hit "return" to fill it in. Once again, the up and down arrow (cursor) keys enable you to move between screens, which in this case are regimen descriptions.

When the regimen screen(s) is/are completed for one design, the *STUDY DESIGN DATA SCREEN* comes up and the cycle begins again for each design. Please note that "return" will fill in the "Citation No." field. Hit "return" when the cursor moves to the "Group" field.

When all of the design, subject and regimen screens are complete, you can establish the proper links between them, which constitutes an "Exposure Group.". This means placing them within the proper relationships so that, for example, the design for the rabbit portion of the study is properly related to the rabbit subject group and exposure regimen. The "Links" screen is next.

6 Exposure Group Creation

EXPOSURE GROUP LINK ENTRY SCREEN

Overview

The *EXPOSURE GROUP LINK ENTRY SCREEN* provides a means of storing the associations between designs, subject groups and exposure regimens with their respective results. This screen allows the user to manually define the associations, which then constitute an "Exposure Group." This process creates and stores a derived number for the process along with brief descriptions of the design, subject group and exposure regimen for each "Exposure Group."

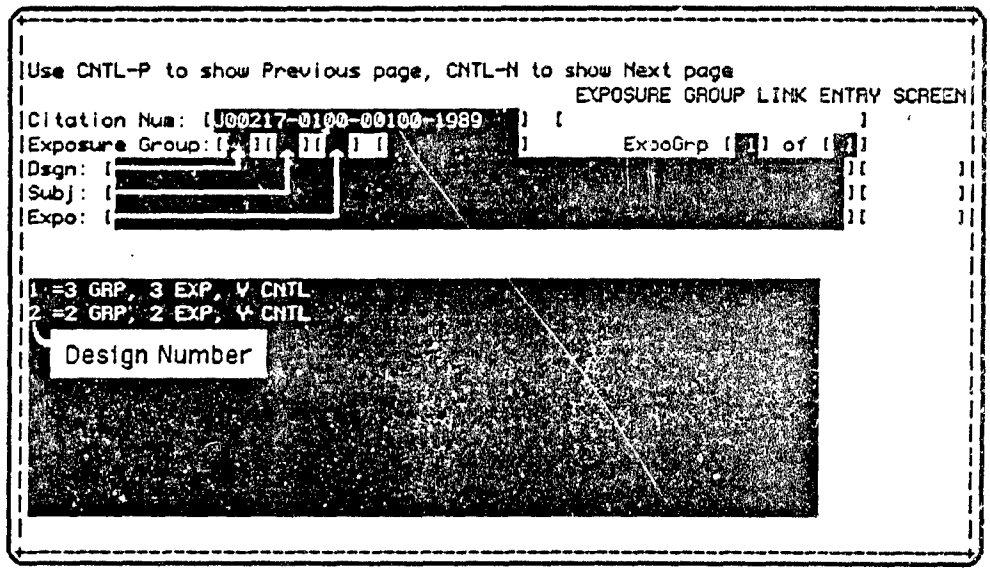


Figure 6.1 EXPOSURE GROUP LINK ENTRY SCREEN

Design Designation

The "Citation No." can be filled in using "return." "Exposure Group" is not asking you to arbitrarily assign a number or letter for an exposure group. Rather, the first field is for indicating the design for which you are setting up links (see the arrow in the first field after "Exposure Group" in **Figure 6.1** bove). The choices are given in the lower portion of the screen; use the numbers to the left of the "=" signs, (see the "Dsgn," "Subj," and "Expo" abbreviations below the words "Exposure Group" in **Figure 6.1**, above). Entering a valid design number (followed by "return") will cause the conditions you entered earlier for that design to pop up (in abbreviated form) next to "Dsgn." Also note that as they are are entered, an abbreviated form of each subject description appears mid-screen.

The program keeps track of each association foromed and you can identify them by using the "ExpoGrp [ ] of [ ]" indicators in the upper right of the screen.

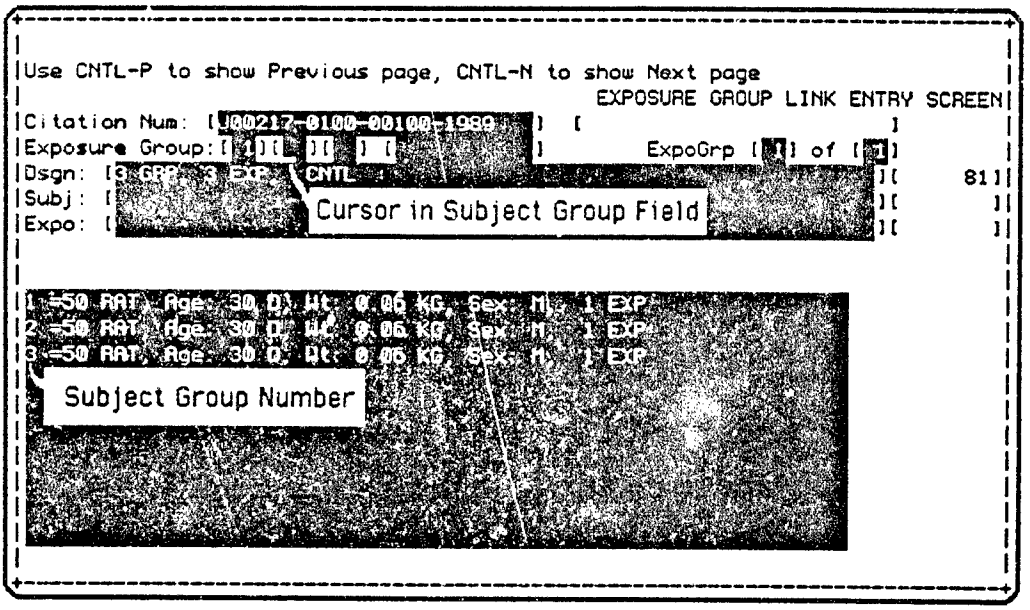


Figure 6.2 EXPOSURE GROUP LINK ENTRY SCREEN with cursor in the "Subject Group" link field.

After the "Dsgn" number is entered, the cursor moves to the next field where the letter for the subject portion of the link can be entered (see Figure 6.2). Completing the second field of "Exposure Group" causes an abbreviated summary of the subject group description to appear to the right of "Subj:."

Exposure Group Designation

Once again, the choices of regimens described previously are now presented in the middle of the screen, and the cursor is in the "regimen" field. To choose a regimen, place the correct regimen number selected from the right of the "=" signs in the third field of "Exposure Group." Completing this field causes the final field in the "Exposure Group" row to show the abbreviations of the previous three fields with the number of the design (D), subject (S) and exposure regimen (E) linked (see Figure 6.3).

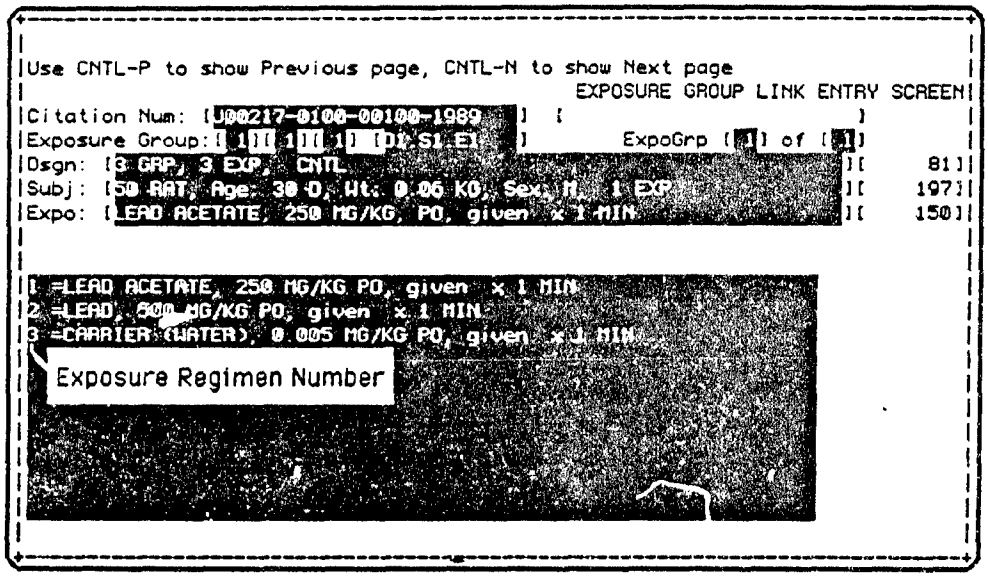


Figure 6.3 EXPOSURE GROUP LINK ENTRY SCREEN with relationships entered for Design 1, Subject Group 1 and Exposure Group 1

The cursor is now on the last field of "ExpoGrp [ ] of [ ]." Now hit "return," clearing each field and finally filling in the citation number and placing the cursor on the first field to the right of "Exposure Group." A total of 9 "returns" are necessary to reach the point where another "link" can be established. The link process can now begin again for the next subject group for the first design. Repeat the steps as described above.

When the first design is complete, and the cursor is on the first field to the right of "Exposure Group," enter 2 for the second design number and repeat the entry steps until all associations are defined. Complete all the associations for each design, exposure group and regimen.

Completion of Current Entry Procedures

This currently completes the entry process for TKS-MAIN menu option "New." Other segments are being prepared for addition to the system, including "Comments," "Results," and "Discussion" sections.

7 The Add Path from the ABSTRACT Menu

Add

The "Add" option in the ABSTRACT menu (the ABSTRACT menu is reached by selecting AbstractMgt in the TKS-MAIN menu) provides a means for adding to incomplete citation entries. For example, one can add descriptions of "Designs," "Subject Groups," "Exposure Regimens" and establish "Links."

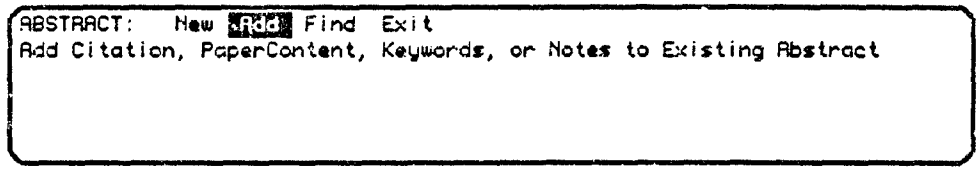


Figure 7.1 ABSTRACT Menu and options

Selecting "Add" brings you to the "SELECT-FILE-BY" menu. From here, one can search for a specific citation via the author-journal-volume number-first page number-and last two digits of the year, or, by giving the Citation No. (described earlier). The author path requests specific information that you must provide in order for the search process to begin.

Completion of the search process will result in finding the desired citation, or a message that the citation does not exist in the database. If a citation is not in the system, you cannot add anything to it and will have to start from "New" in the ABSTRACT menu.

SELECT-FILE-BY Menu Overview

In order to add information to a file, we have to tell the system which file we would like to add it to.

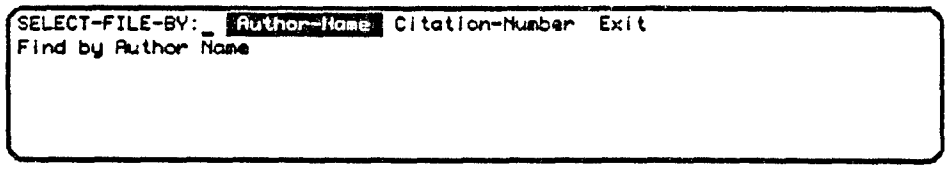


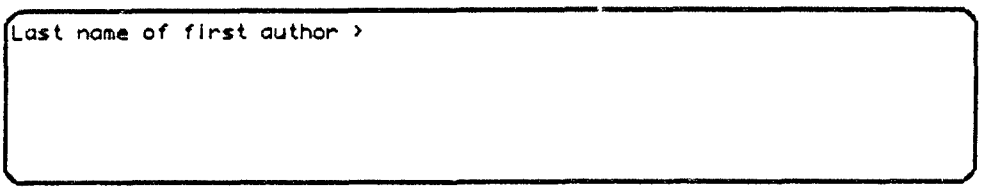
Figure 7.2 SELECT-FILE-BY Menu and options

There are several ways of locating the file of interest. We can search for it by looking for the first author's last name or the citation number.

Author-Name

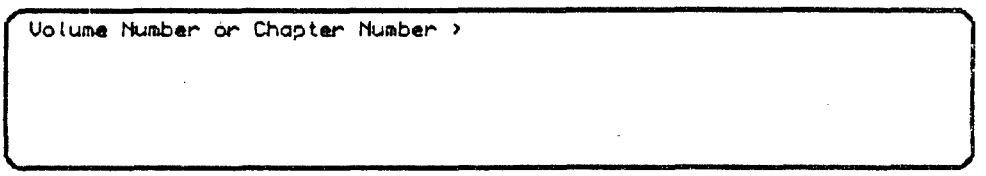
This option brings up a prompt which asks you for the author's last name, as indicated in the screen below.

Figure 7.3 SELECT-FILE-BY Author path question 1



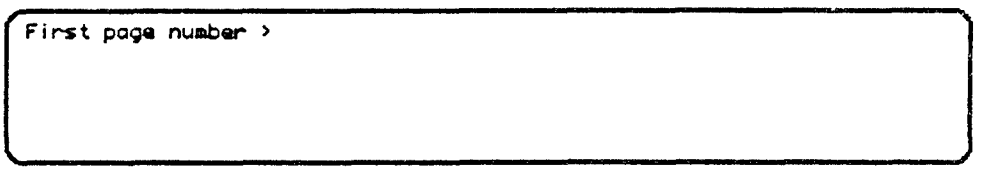
Enter the last name and hit "return." Now the program prompts you for the volume or chapter number.

Figure 7.4 SELECT-FILE-BY Author path question 2



Next, one is asked for the first page number of the article.

Figure 7.5 SELECT-FILE-BY Author path question 3



Finally, the last two digits of the year are requested.

Figure 7.6 SELECT-FILE-BY Author path question 4

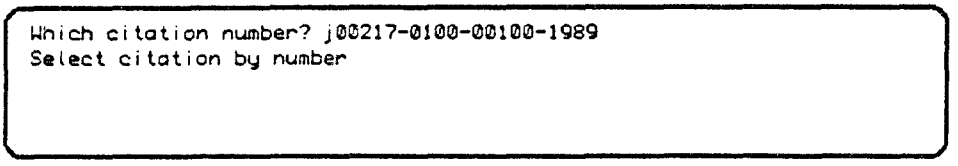


Currently, you must answer all of the questions posed by this path in order to search for a particular citation. In a later version you will be able to search after answering only one or more of the prompts. This will make it easier under some circumstances, but will also pose some problems. For example, searching via the last name alone will often result in finding more than one paper that matches the search criteria. The user will then have to cycle through them to find the desired one.

Citation-Number

Selecting this option prompts you for the specific citation number (e.g., J00217-0028-00189-1962) on which to do the search. Type in the J or B and the following 5 numbers, a hypen and the next 4 numbers, a hypen and 5 numbers, and the year, then "return."

Figure 7.7 SELECT-FILE-BY Citation Number path

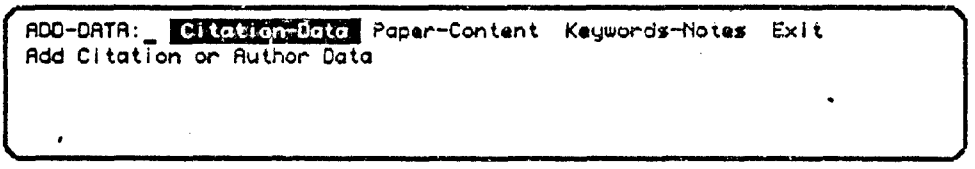


The program either finds a match and brings up the "ADD-DATA" menu asking what you would like to add, finds a match and tells you all data has been entered, or doesn't find a match and lets you know that too. Make sure you typed the citation number correctly before trying to enter new citation information (via the "New" option in the "ABSTRACT" menu), if no match was found.

ADD-DATA Menu

Respond to the SELECT-FILE-BY menu prompts and you will come to the "ADD-DATA" menu.

Figure 7.8 ADD-DATA Menu and options



At this point you will have three basic options available: "Citation Data," "Paper Content," and "Keywords-Notes." The most commonly used option in the current system is "Paper-Content," which consists of the "Paper Overview," "Materials and Methods (including Subject Groups, Exposure Regimens and Links)," "Clinical Findings" (Results) and "Discussion." Citation data is usually entered through the "New" path in "AbstractMgt" as indicated above. Since you already completed at least some of the "Citation-Data" section (otherwise there wouldn't have been anything to find!), you will probably want to use one of the other options.

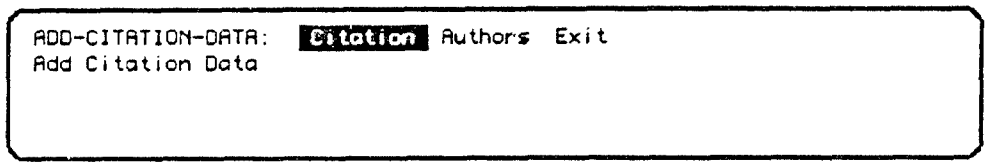
Citation-Data

This selection allows you to add citation data to material that is already in the system. Since one usually begins entry of a new document by entering the citation, you would not ordinarily need to use this option unless the citation had been deleted after it was entered, or the authors were not entered or complete.

ADD-CITATION-DATA Menu

Since citation data is essentially made up of the citation and author information, you can add those two components by selecting one or the other from this menu.

Figure 7.9 ADD-CITATION-DATA Menu and options



Citation

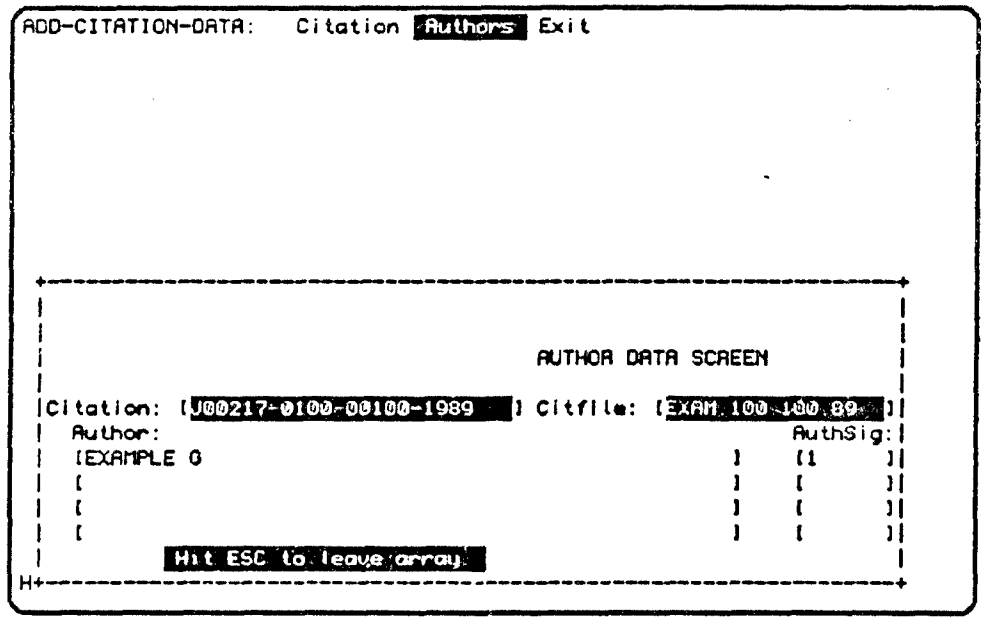
Selecting this option brings up the familiar citation screen. Its use is documented in Chapter 1. If information is already present in the citation screen for this document, you cannot change the screen using this pathway. To modify it you must use the "Update" option in the "BROWSE" menu which can be accessed via the "Find" path.

Authors

Selecting this option brings up the familiar *AUTHOR DATA SCREEN* which can be completed.

If there is already information in the author field(s) for the citation of interest, you cannot change the screen using this pathway. It is neccessary to use the "Update" option in the "BROWSE" menu accessed via the "Find" path.

Figure 7.10 AUTHOR DATA SCREEN from ADD-CITATION-DATA path



ADD-CONTENT Menu

The "ADD-CONTENT" menu which appears next requires you to select the type of data that will be entered. Available options include: "PaperOverview," "Materials-Methods," "Results," and "Discussion." *One can also go directly from here to the "Find" pathway via "FindData" for doing updates or deletions.*

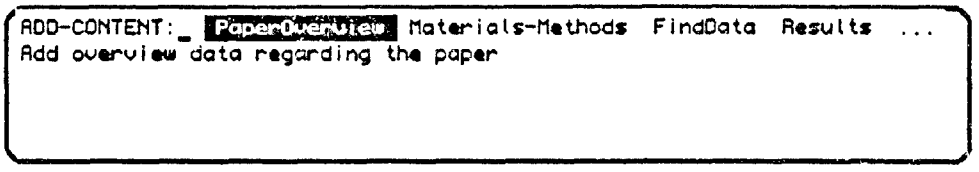


Figure 7.11 ADD-CONTENT Menu part I

Note that the "ADD-CONTENT" options are not all represented at the top of the screen. The three periods (. . .) indicate that there are other options after "Results." Use the cursor to move the highlighted option indicator past "Results" or to the left of "PaperOverview." The top of the screen then looks like the representation below. The option string can be viewed as though it were a circular continuum, where one can move in either direction on the circle.

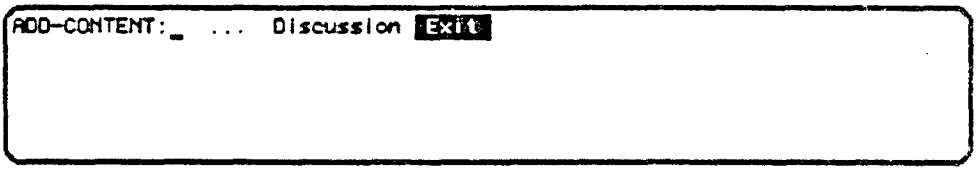


Figure 7.12 ADD-CONTENT Menu part II

Selecting "Paper-Content" from the "ADD-DATA" menu brings up the "ADD-CONTENT" menu.

PaperOverview

Selecting this option *may* result in the program reminding you that the overview portion has already been entered, and asking if you would like to "update that information." Selecting "y" followed by "return" will allow you to modify that section. Selecting "n" returns you to the "ADD-CONTENT" menu.

If citation information has been entered but not the "Paper Overview," the *PAPER OVERVIEW SCREEN* will appear.

Materials-Methods

The "MATERIALS METHODS" menu which comes up after this option has been selected has options for "Design," "Subjects," "Regimens," and "Links."

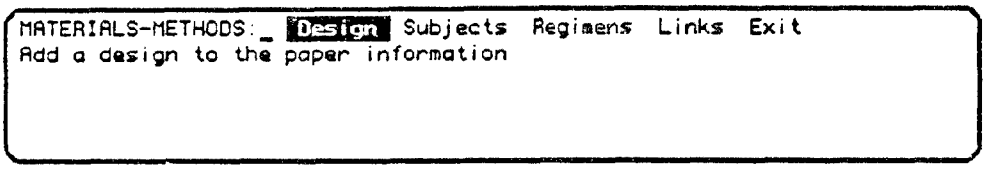


Figure 7.13 MATERIALS-METHODS Menu

Design

Select "Design" and as that screen comes up, be sure to note which design is being displayed (see the "Design No [ ] of [ ]" statement to the right of the file number).

The Design screen is similar to the one seen in the "new" pathway and is discussed in **Chapter 3**. "Return" causes the screen to come up with the Citation No. and File No. sections filled in. Type "return" until the first empty field is reached and begin filling in the appropriate responses. The possible options are listed as the cursor moves to each new field.

When all the data for that screen has been entered, hit "Esc" and the next design screen will come up as indicated by the different "Design No. [ ]." If the "Citation No." is not displayed, hit "return" and it will appear.

When all the design screens have been completed, hit "Esc," followed by "e" if you are finished. If the subsequent Subject sections have not been completed, the program will bring you to that section to provide the necessary information. The entry process is similar to that described previously for the *SUBJECT GROUP DATA SCREEN* in **Chapter 4.**

Subjects

This option permits the addition of subject group data via the *SUBJECT GROUP DATA SCREEN*. The process is similar to that for the *SUBJECT GROUP DATA SCREEN* described previously for a new paper in **Chapter 4.**

Regimens

This option permits the addition of exposure regimen data via the *EXPOSURE REGIMEN DATA SCREEN*. The process is similar to that for the *EXPOSURE REGIMEN DATA SCREEN* described previously for a new paper in **Chapter 5.**

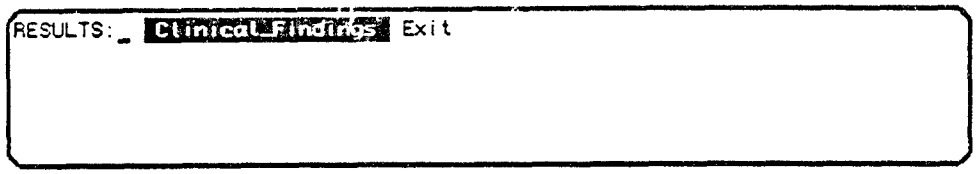
Links

This option permits the addition of the *EXPOSURE GROUP LINK ENTRY SCREEN*. The process is similar to that for the *EXPOSURE GROUP LINK ENTRY SCREEN* described previously for a new paper in **Chapter 6.**

When the *LINK* screen comes up, you must hit "return" first and the program will enter the Citation No. and File No. and show the designs available to choose from.

ResultsSelecting "Results" from the "ADD-CONTENT" menu brings up the the "RESULTS" menu with the "Clinical-Findings" option.

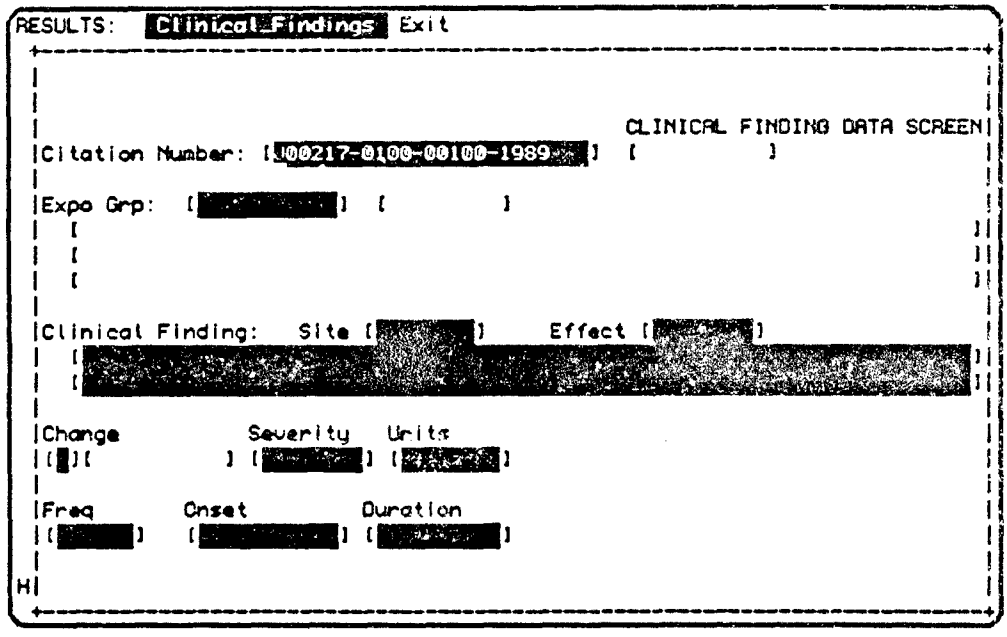
Figure 7.14
RESULTS
Menu



Clinical_Findings

Selecting the "Clinical_Findings" option in the "Results" menu brings up the *CLINICAL FINDINGS DATA SCREEN. Refer to Chapter 9, Results, for directions on using this screen.*

Figure 7.15
CLINICAL
FINDING DATA
SCREEN



Discussion

This option is not yet available for use.

Keywords-Notes

Selecting "Keywords-Notes" from the "ADD-DATA" menu allows you to add either keywords or notes (comments), depending on what is selected from the next menu.

ADD-KEYWORDS-NOTES MenuSelecting "Keywords-Notes" from the "ADD-DATA" menu brings up the "ADD-KEYWORDS-NOTES" menu.

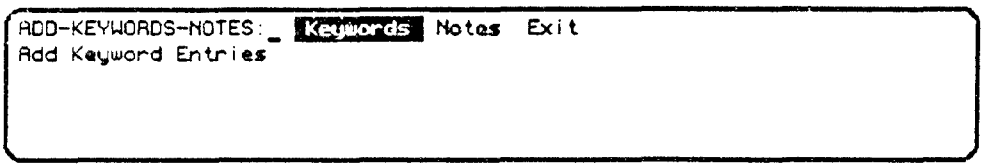


Figure 7.16 ADD-KEYWORDS-NOTES Menu

Keywords

Select "Keywords" and the keyword screen comes up. Use of this screen is documented in the section titled *KEYWORD DATA SCREEN* in **Chapter 1.**

Notes

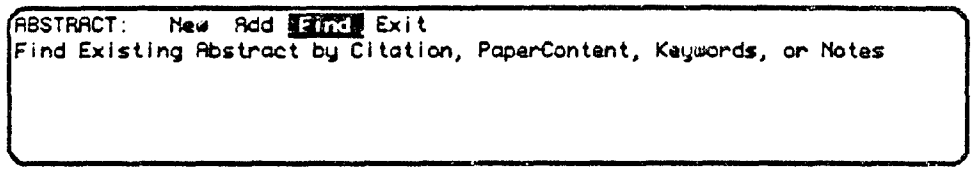
Select "Notes" and the comment screen will come up. ***Do not use this option because it is under development.***

8 The Find Path from the ABSTRACT Menu

ABSTRACT: Find

Selecting "Find" in the ABSTRACT menu (the ABSTRACT menu is reached by selecting AbstractMgt in the TKS-MAIN menu as described in Chapter 1), brings you to the FIND-DATA menu. You can pick from the options available.

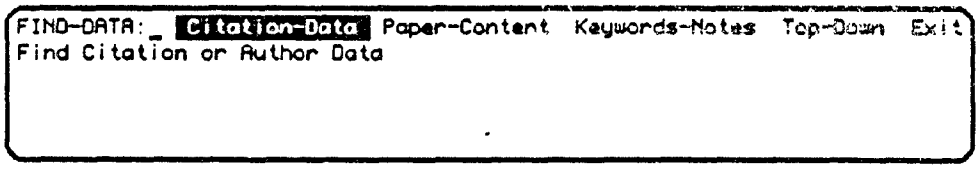
Figure 8.1 ABSTRACT Menu with Find in reverse video



FIND-DATA Menu

The FIND-DATA menu (below) allows you to search for citation data, paper content data, and keywords-notes data. In addition, the option "Top-Down" provides the user with the basic *CITATION DATA SCREEN* which can be used to initiate a search. If the search is successful, the fields for this screen are filled in including the bottom half of the screen where the number of other components associated with this citation are given. In addition, a "TOP-DOWN" menu appears with the data components listed as options. This allows the user to go immediately to the section of interest, e.g., Authors, Keywords, Paper Overview, Design(s), Materials-Methods, Results or Discussion.

Figure 8.2 FIND-DATA Menu

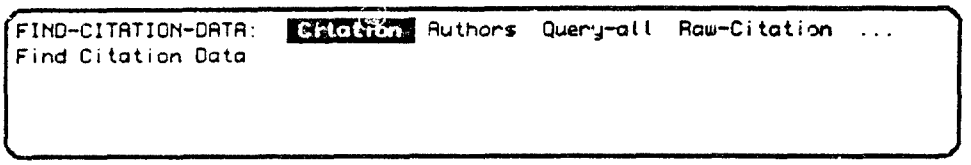


Select one of the options and follow the screen messages.

Citation-Data

This menu provides you with multiple methods of locating a particular citation. One can specify a Citation No., author(s), volume number, etc., or "Query" for all of those. One can also see the citations and associated information in a different format with different capabilities ("Raw-Citation"). After trying to "Find" a portion of an abstract and discovering it isn't in the system, you can use the "Add" option to add the missing component.

Figure 8.3 FIND-CITATION-DATA Menu and Options

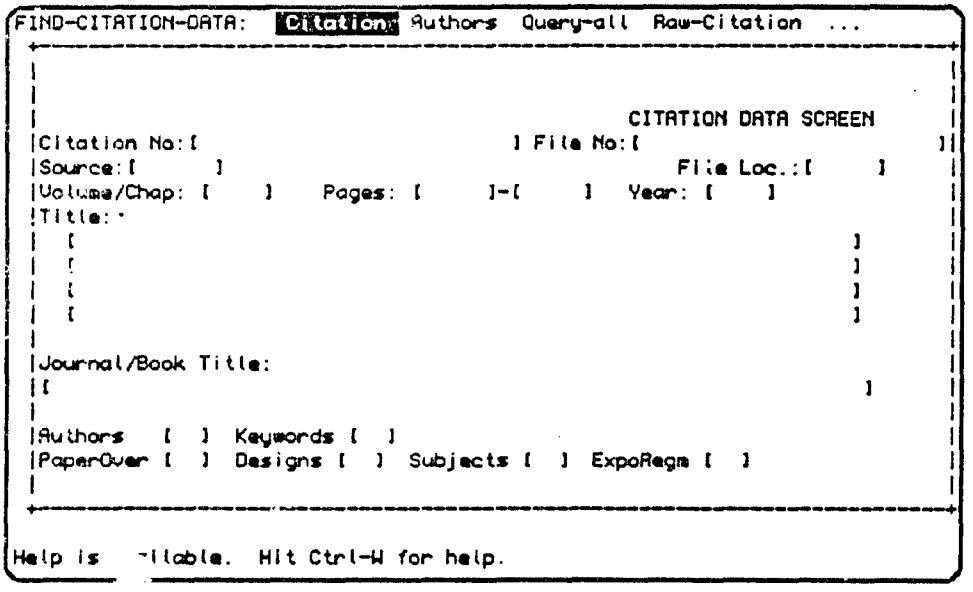


FIND-CITATION-DATA Menu

Citation

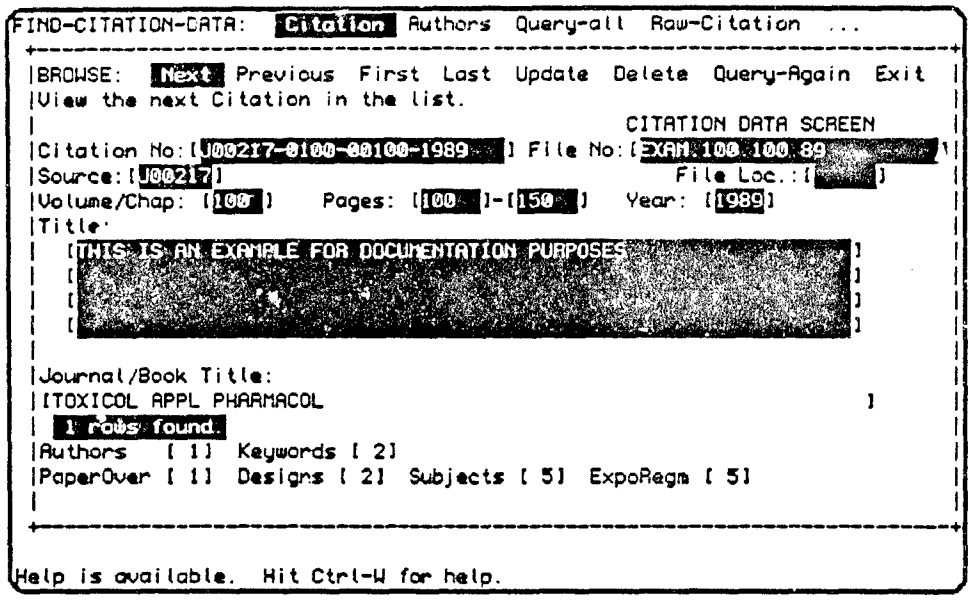
Select "Citation" and the familiar "CITATION DATA SCREEN" appears. Enter various parameters (wild card [*] searches are permitted) and hit "Esc" to initiate the search. The fewer the fields used, the less time the search is likely to take, but the less specific the outcome. In general, there won't be more than a few matches even if only one field is used in the search process. An exception might occur if you search for all papers associated with a particular journal using the wild card approach e.g., "J00217*."

Figure 8.4 CITATION DATA SCREEN from the FIND-CITATION-DATA path



In the sample screen below, the "Citation No" was used in the search process. Since all Citation No's are unique, one would expect to find only one match as indicated under the title of the journal in the screen below. Note that an additional menu appears after the search, the "BROWSE" menu.

Figure 8.5 BROWSE Menu on the CITATION DATA SCREEN



BROWSE Menu Overview

If the citation is found, a "BROWSE" menu appears from which one can choose to: view the "Next" citation if more than one match is found; see the "Previous" citation if the "Next" or "Last" options were used; go to the "Last" citation in the list of more than one match (the citation matches are arranged chronologically in the order in which they were entered into the system); see the "First" citation if you are elsewhere in the list; "Update" (modify or change) an entry; "Delete" the entry shown on-screen (with the option of deleting other portions of the data, e.g., Paper Overview, Design, etc.); "Query-Again" which clears the data fields and allows one to search for another citation; or "Exit" from the program.

Not all of the options are visible at the top of the screen at one time. To see the others, use the right and left (horizontal) arrow keys to move among the selections and see those on the right after the "...." notation. When the first option is highlighted (Next) you can use the left arrow key to see the end of the option list (horizontal wrap around for the BROWSE option list).

The first few BROWSE options as identified below, should require no further explanation.

Next

Previous

First

Last

Update (Citation)

Selecting "Update" places the cursor on the 'Source' field. You can cycle through the data fields by using the "return" key which functions in only one direction, or the left and right arrow keys.

Change the appropriate field(s) and hit "Esc" when you are finished. Wait for the cursor to return to a data field or menu. This procedure writes the updated information to memory.

The "Author" screen comes up next. Hit "Esc" as indicated at the bottom of the screen. The program will ask if you want to update the author list. If you select "n" the author screen is skipped and the keyword list comes up. Selecting "y" places the cursor on the first data field in the author screen. Change it if necessary, or use the arrow or return keys to cycle through the fields. Modify the entries or type in new authors, and then hit "Esc."

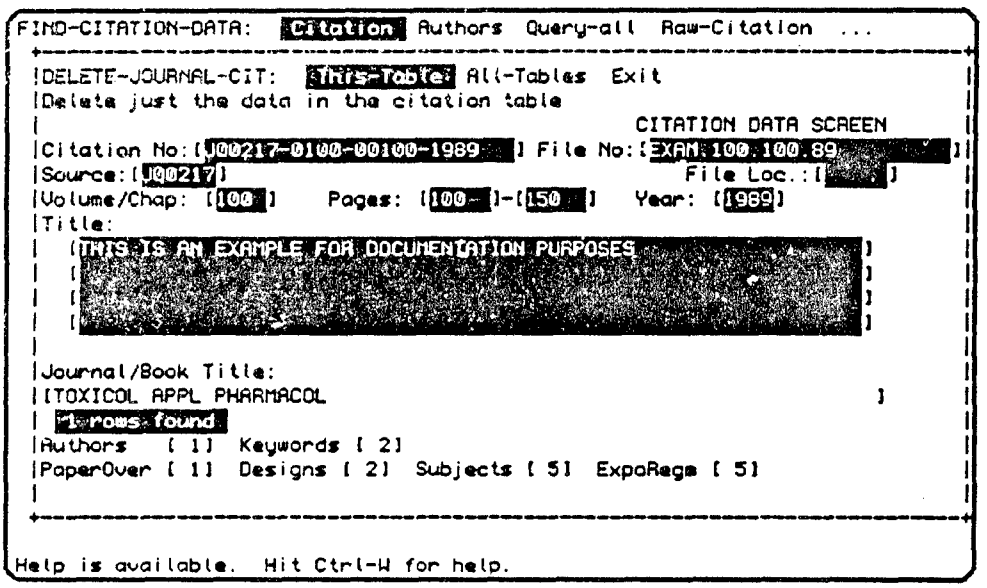
The "Keyword" screen appears next, and the same process occurs again. Refer to the earlier section on keywords in the "New" path (Chapter 1) for information on this screen. When you are finished modifying this screen hit "Esc."

This completes the "Update" process for citations. The program returns you to the citation screen with the "BROWSE" menu. Hit "e" to exit from this environment and return to the FIND-CITATION-DATA screen.

Delete

Invoking the "Delete" option from the "FIND-CITATION-DATA->Citation" pathway brings up a menu titled "DEL-JOURNAL-CIT."

Figure 8.5 DELETE JOURNAL-CIT Menu of CITATION DATA SCREEN



The options available are "This-Table" which deletes the table indicated on the screen and "All-Tables" which deletes *all* of the screens associated with that citation (Paper Overview, Design, Subjects, Regimens, Links,Comments, etc.).

Safe-guards are built in to prevent the latter from happening unless you are *sure* that is what you want. The program gives a warning. If you choose "This-Table" the following question is asked:

Deletion Promp:

```
Are you sure you want to delete this entry? (y/n)
Delete just the data in the citation table
```

If you choose "All-Tables" the program responds with this question:

Delete All Tables Prompt

```
Are you sure you want to delete this entry from all tables? (y/n) _
```

If you respond "n," "return," you are brought back to the 'FIND-CITATION-DATA-BROWSE' menu. If you respond "y," "return," the screen sends messages as each table (screen) is deleted. *There is no way to stop this process once it begins!*

FIND-CITATION-DATA MENU (Continued)

Authors

The author screen can be updated indirectly as described above under BROWSE: Update (Citation), or directly using the "FIND-CITATION-DATA" path as described below.

Selecting "Authors" from the "FIND-CITATION-DATA" menu brings up the author screen with the cursor on the citation number field.

Figure 8.7 AUTHOR DATA SCREEN

```
FIND-CITATION-DATA:   Citation  Authors  Query-all  Raw-Citation  ...

+-------------------------------------------------------------------+
|BROWSE:_ Next  Previous  First  Last  Update  Delete  ...          |
|View the next Author in the list.                                  |
|                                  AUTHOR DATA SCREEN               |
|                                                                   |
|Citation: [                      ] Citfile: [                    ]|
|  Author:                                                AuthSig:|
|  [                                                ]    [       ]|
|  [                                                ]    [       ]|
|  [                                                ]    [       ]|
|  [                                                ]    [       ]|
|                                                                   |
+-------------------------------------------------------------------+
```

Enter the citation number and then Esc." The screen comes up with a message in the lower left corner indictating how many matches were found and asks you to hit "Esc" to continue. A Browse menu appears with options similar to those described above under "Citation."

Author and AuthSig

This screen can also be used to identify articles where an author holds a particular place in the author sequence. For example, if you wanted to determine the "Citation No." associated with a particular paper where Ueno was the last name of the first author, you could select "Authors" in the "FIND-CITATION-DATA" menu, use the "Return" key to move past "Citation" and "Citfile" to the "Author" field, enter "Ueno Y" (or "Ueno Y*" using the wild card in case someone entered only one initial), followed by "Return." Enter "1" in the "AuthSig" field followed by "Esc" to start the search. The program will locate all citations fitting those criteria and you can "BROWSE" through them to locate the particular one of interest and obtain the desired number.

Figure 8.8 Portion of BROWSE Menu associated with AUTHOR DATA SCREEN

```
+-----------------------------------------------------------------------+
|BROWSE:    ...  Query-Again  Exit                                      |
|Leave this menu                                                        |
|                                    AUTHOR DATA SCREEN                 |
|                                                                       |
|Citation: [J00002-0023-00731-1985  ] Citfile: [HABE.23.731.85   ]|
|  Author:                                                  AuthSig:|
|  [HABERMEHL GG                                      ]    [1      ]|
|  [BUSAM L                                           ]    [2      ]|
|  [HEYDEL P                                          ]    [3      ]|
|  [MEBS D                                            ]    [4      ]|
|                                                                       |
+-----------------------------------------------------------------------+
```

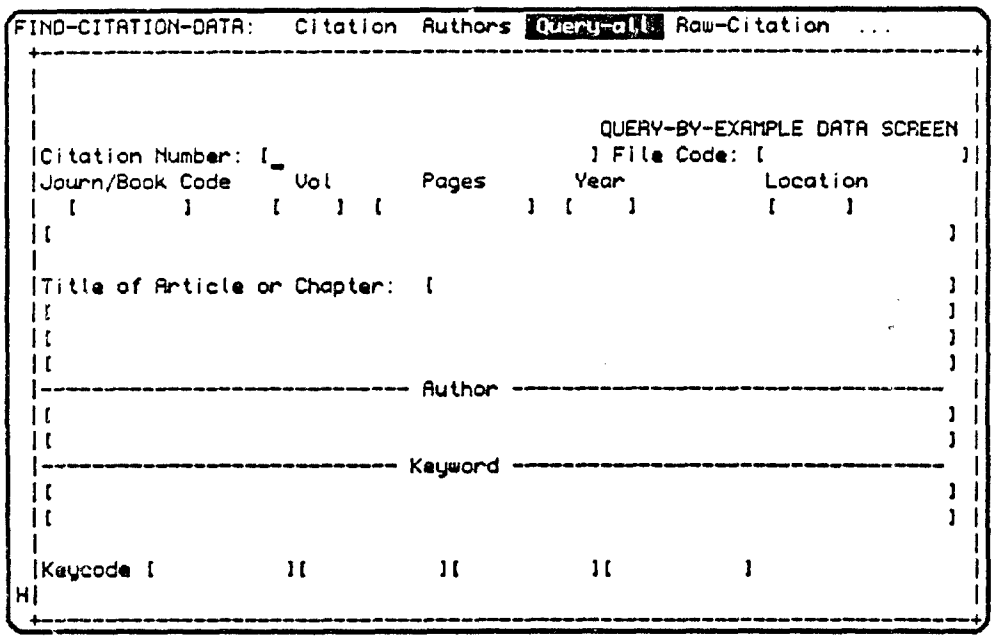
Query-All

This option provides a mechanism to search for citation, authors or keywords and gives a screen showing all of those components if a match is found.

When "Query-all" is chosen the screen below appears with the cursor in the "Citation Number" field. Use the "return" or cursor keys to select other fields. You can also utilize individual items from several of the component parts (fields) to narrow down the number of matches that may be found. For example, you could enter the year of publication, an author name and a keyword, if you cannot remember specifics such as the "Citation No," "Journal/Book Code" and "Pages."

Please note that you cannot do multiple searches *within* a particular field. For example, you cannot search for two "Authors" or two "Keywords" at the same time. The program keeps you from trying because it moves the cursor to another section as soon as you place data in a particular field

Figure 8.9 QUERY-BY EXAMPLE DATA SCREEN



Raw-Citation

This option invokes another program which provides access to data in the TKS System. It is meant to be used by developers of the TKS System and consists of data fields and their abbreviations. It is neccessary to be familiar with the screens in the TKS system in order to interpret the abbreviations. One can access the citation data only, from the Raw-Citation option (two different table types which can be seen by using the "Detail" and "Master" options).

Explanation of the various options can be found under the "Ugly-View" section, below.

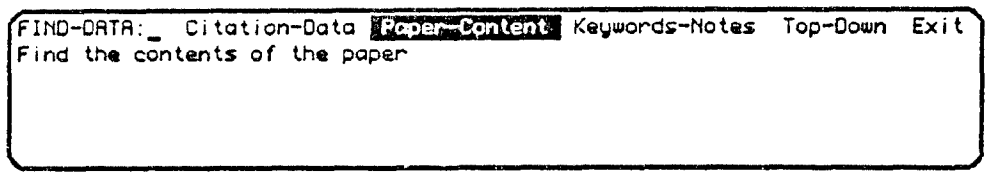
Data-Add

This option provides a mechanism for adding data citation components if a search via "FIND" is unsuccessful. Selecting it brings the cursor to an "SELECT-FILE-BY" menu from which the appropriate path (Author-Name or Citation-Number) can be selected for identifying the citation. Use of the "SELECT-FILE-BY" menu is described in Chapter 7.

FIND-DATA Menu (Continued)

Paper-Content

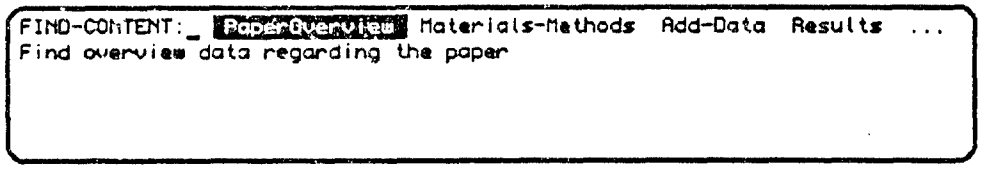
Figure 8.10 FIND-DATA Menu

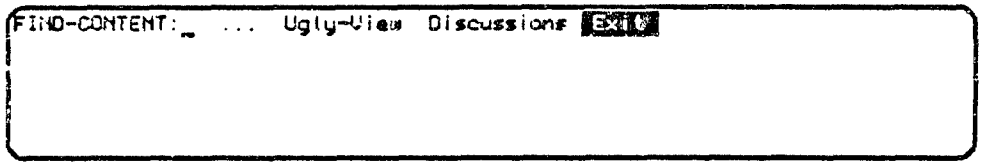


To find the data components associated with the ' Paper-Content" (PaperOverview, Materials-Methods, Results and Discussion), choose "Paper-Content" from the "FIND-DATA" menu. The "FIND-CONTENT" menu then appears.

FIND-CONTENT Menu

Figure 8.11 Entire FIND-CONTENT Menu





In addition to the components described above, one can also access the "Add" path and obtain the "Ugly-View" of the data.

PaperOverview

When this option is selected, a replica of the *PAPER OVERVIEW SCREEN* comes up with the cursor on the "Citation No." field and the statement "Enter search criteria and hit ESC to search." One can search via any of the fields represented on the screen, (use the "return" or cursor keys to move among the fields) but the "Citation No." and "File No." fields will be most commonly used.

Enter the Citation No. for the paper you wish to find and then "Esc." The program will search and indicate how many matches were found, and a "BROWSE" menu will appear (see Figure 8.12, below). The "BROWSE" options are explained under Find-Citation, above. There is no "Query-Again" option in this "BROWSE" menu.

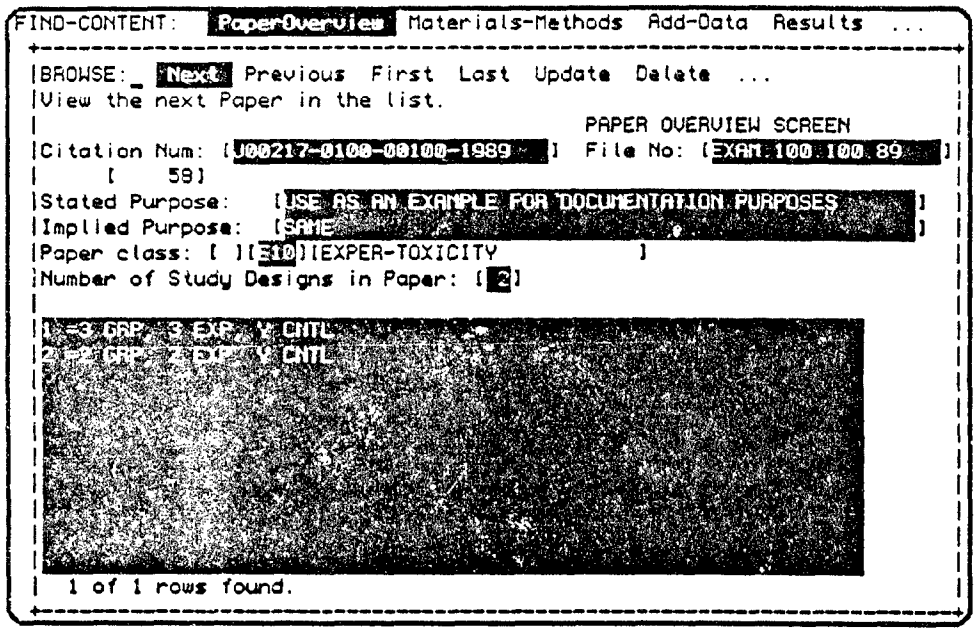


Figure 8.12 Results of a FIND-CONTENT->PaperOverview Search

Materials-Methods

Choosing this option brings up the "MATERIALS-METHODS" menu where one can then choose from the options "Design," "Subjects," "Regimens," and "Links."

MATERIALS-METHODS Menu

The options available with this menu are illustrated in the screen below. Selecting one of the options brings up the unique data screen associated with that particular option. Since this is part of the "Find" path, associated with each screen is a message asking the user to "Enter search criteria and hit ESC to begin search." One can use any field or combination of fields to initiate the search process.

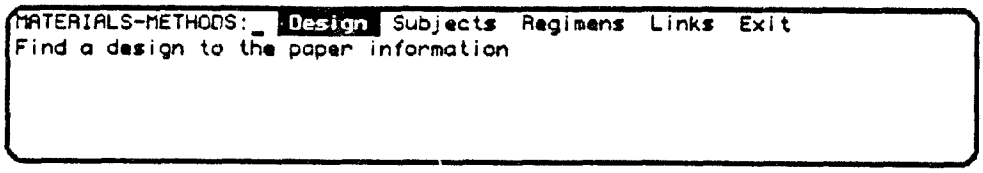


Figure 8.13 MATERIALS-METHODS Menu

When a search is successful the program brings up a screen with data, tells you how many rows matching the search criteria were found, and brings up a "BROWSE" menu. Documentation for the "BROWSE" menu can be found in Chapter 7, however, several additional comments should be made.

Find->BROWSE Menu

Update

This option provides a method for altering data that has already been entered. Cycle through the fields, making corrections as necessary, and hit "Esc" when you are finished, as indicated by the on-screen message.

If you are located in a section which has multiple screens such as multiple "Designs," "Subject" groups, "Regimens," etc., you will notice that if you page back and forth between them (using the up and down cursor keys) that it appears that the data you had changed is back in its old form! Please be aware that this is not so. The data has been changed if you had hit "Esc" appropriately. In order to see the newly altered data it is necessary to exit from the current menu and go back to it, doing another "Query" to pull up the same screens.

Please note that some fields require that you *re-enter* data in order to cycle through the entire screen. This is awkward at times since there is a risk of inaccurately entering information. We are considering improving this feature.

Delete

In each case a protective message appears when "Delete" is selected. You are asked "Do you want to delete this <component> (y/n)," with the component being the particular section just found. You must type in the desired letter (y for "yes" and n for "no"). What happens next is somewhat dependent on the component you are trying to delete. The following is an example: Deleting a design gives you the option to delete only the design on screen, or the visible design screen and all of the screens from that point forward (Subjects, Regimens, Links, etc.). The same is true of "Delete" and the other components of paper content; you can either delete the data on that screen alone, or that screen and all screens linked after it.

The screen messages should provide sufficient information to allow you to complete the "Delete" process.

Query-Again

Selecting this option enables you to perform another search immediatley. The screen is cleared of data and the cursor is placed on the first field, which is generally "Citation No."

Add-Data

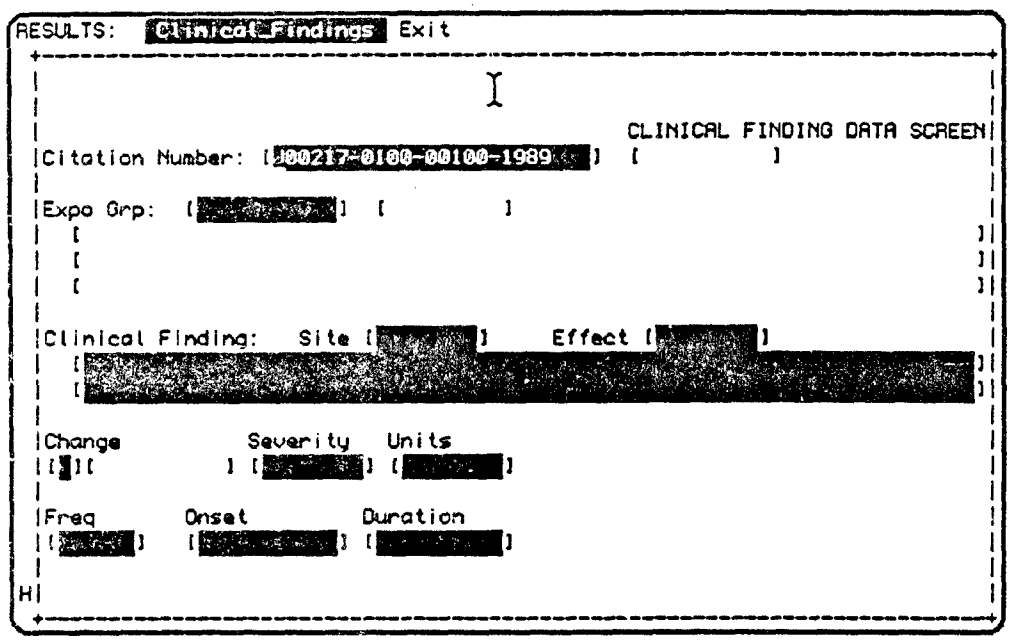
Selecting this option brings up the "SELECT-FILE-BY" menu which provides two methods for locating data, the "Author-Name" and "Citation-Number" paths. The "SELECT-FILE-BY" menu and how to use it is documented in Chapter 7. When the search is successful the "ADD-DATA" menu appears. It is also documented in Chapter 7.

ResultsChoosing "Results" from the "FIND-CONTENT" menu brings up the "RESULTS" menu which is illustrated below. This menu has one option, "ClinicalFindings." Selecting the it brings up the *CLINICAL FINDINGS DATA SCREEN. This section is not yet ready for use.*

Figure 8.14 RESULTS Menu from the FIND-CONTENT path



Figure 8.15 CLINICAL FINDINGS DATA SCREEN



Ugly-View

This option is used primarily as a developmental tool by the program developers. Its use is documented in Appendix A.

Discussion

This option is not yet implemented. Selecting it results in a message to that effect appearing on-screen.

Keywords-Notes

Selecting this option brings up the "FIND-KEYWORDS-NOTES" menu with the options indicated in the top of Figure 8.16, below.

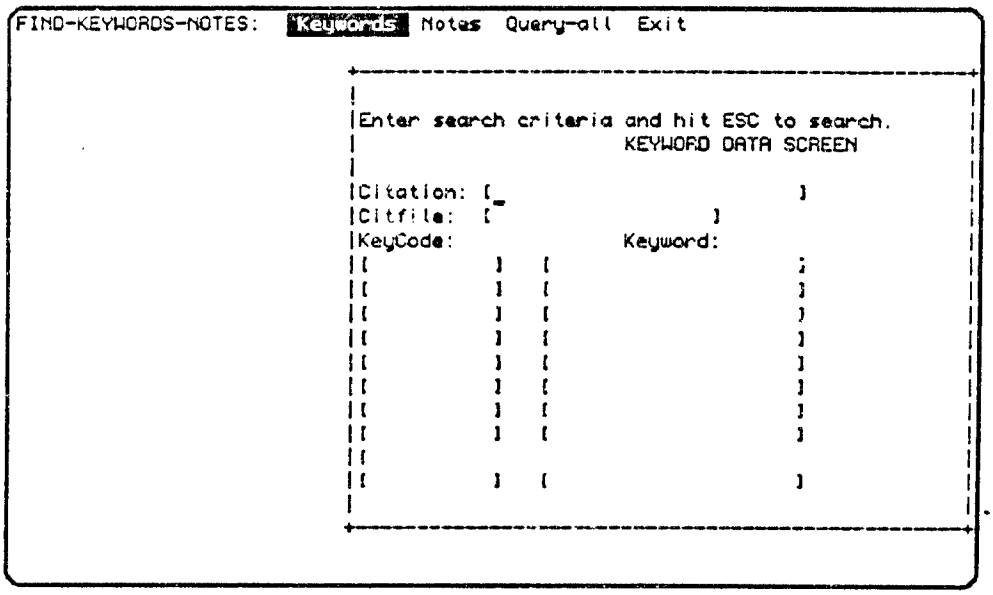
FIND-KEYWORDS-NOTES Menu

The "Keywords" option brings up the *KEYWORD DATA SCREEN* and the usual "Enter search criteria and hit ESC to search" message. One may search for all "Keywords"

associated with a particular citation by entering the appropriate "Citation No." or for all papers containing a particular "Keyword." *Please note that you can only search for one "Keyword" at a time!*

If a search is successful, the findings are put on-screen and the typical "BROWSE" menu appears. Use of this menu is documented above, and in Chapter 7.

Figure 8.16 FIND-KEYWORDS-NOTES menu and KEYWORD DATA SCREEN



Notes

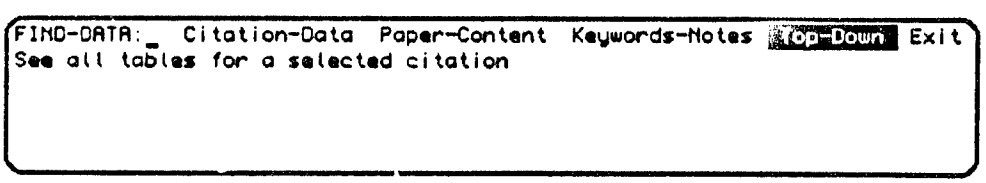
This option will provide a mechanism to record specific comments about a paper. It is not yet ready for use.

Query-All

Use of this option was documented earlier in this chapter.

Top-DownChoosing "Top-Down" from the "FIND-DATA" menu brings up the *CITATION DATA SCREEN* with a message asking you to "Enter search criteria and hit ESC to search."

Figure 8.17 The FIND-DATA Menu with Top-Down highlighted



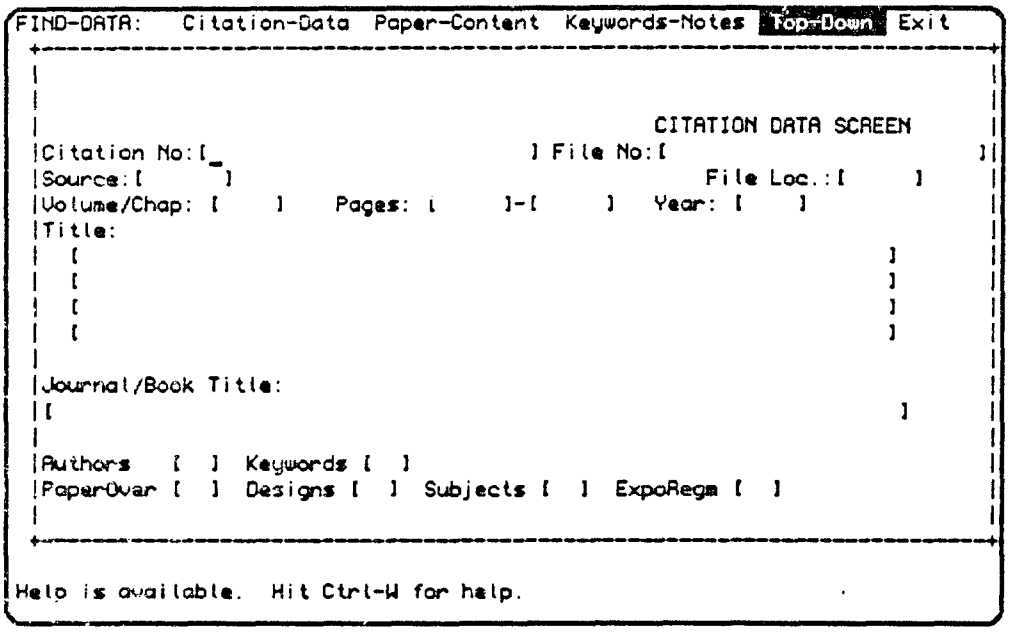


Figure 8.18 Selecting Top-Down brings up the CITATION DATA SCREEN

One may choose to search using any of the standard fields or combinations of them. The fields in the lower part of the screen cannot be searched.

If a search is successful, the "BROWSE" menu comes up. If there are multiple matches, such as might occur if you search by "Source" or use a wild-card in the "Citation No." or "File No" fields (J00217* or SMIT*), the "BROWSE" menu will help you to move among the selections. If only one match was found, or you come to the desired selection, hit "e" for exit, and the TOP_DOWN menu appears.

The TOP_DOWN menu gives you immediate access to all the data components of a particular paper by just selecting from its list of options (see Figures 8.19 and 8.20). Selecting from the list brings up the associated data screen which should be familiar. When there are several components, such as multiple subject groups, the "BROWSE" menu which appears allows you to move between them.

Figure 8.19 CITATION DATA SCREEN with first part of TOP_DOWN menu

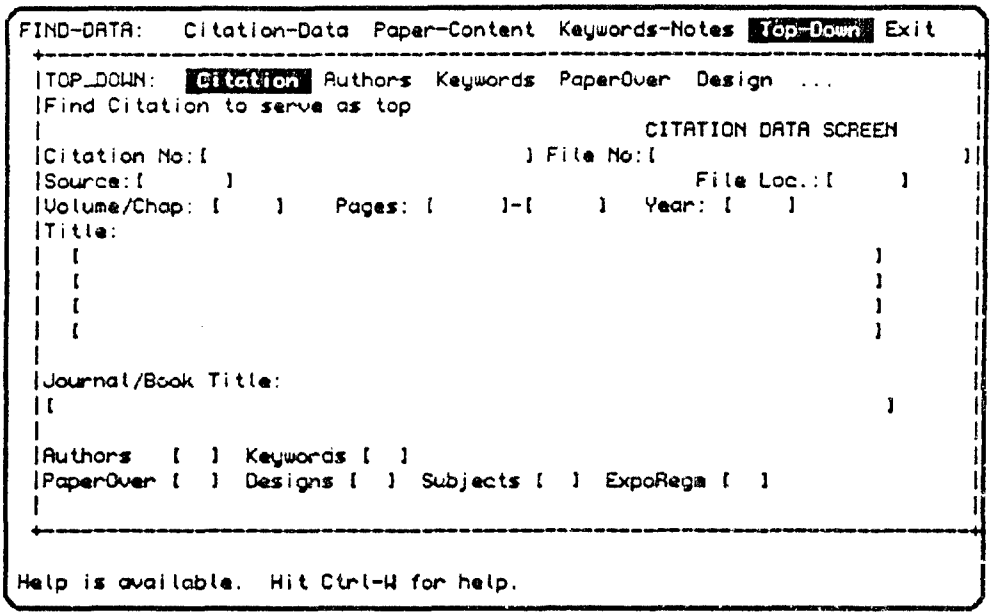
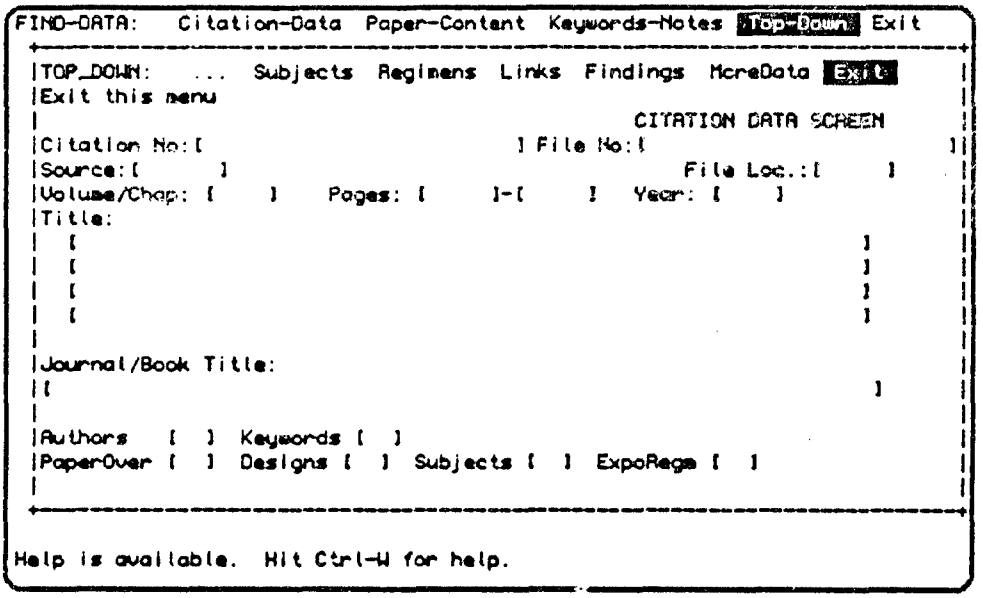


Figure 8.20 CITATION DATA SCREEN with second part of TOP_DOWN menu

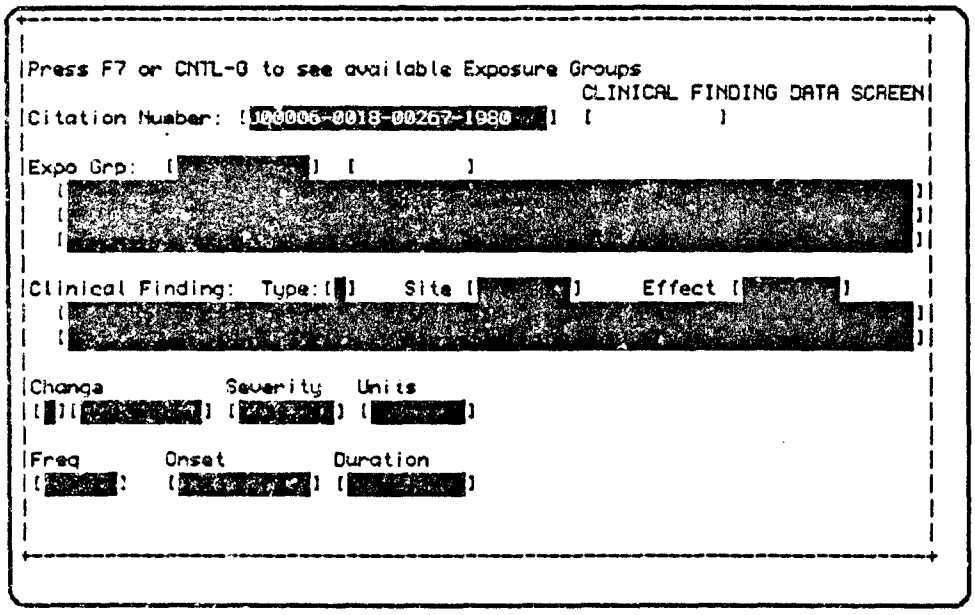


9 Results -> Clinical Findings

CLINICAL FINDING DATA SCREEN

Completing the "Links" in the "New" pathway from the ABSTRACT menu or selecting "Results" from the ADD-CONTENT menu brings up the *CLINICAL FINDING DATA SCREEN* shown in Figure 9.1.

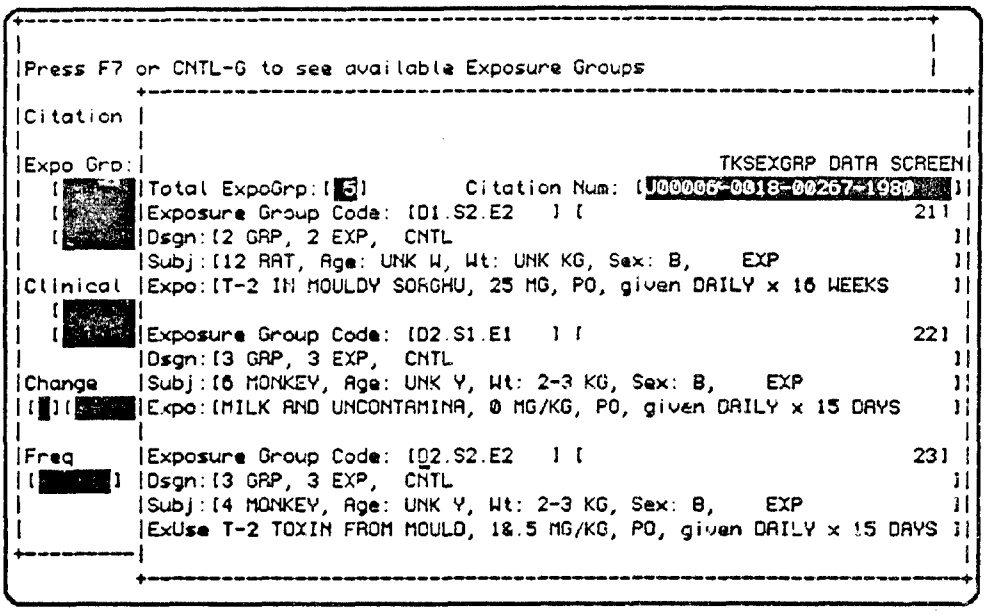
Figure 9.1 CLINICAL FINDING DATA SCREEN



Results are generally different for each treatment group. Therefore, the first step in entering results, which are also referred to as "Clinical Findings " is to define the particular exposure group whose results you wish to enter. As you might expect, and as the message at the top of the screen (or Figure 9.1) indicates, the program will show you the exposure groups associated with the citation. These were previously defined in the "Link" screen.

Press function key 7 (F7) or the control and G keys (CNTL-G) and a screen similar to that shown in Figure 9.2 will appear.

Figure 9.2
TKSEXGRP
DATA SCREEN

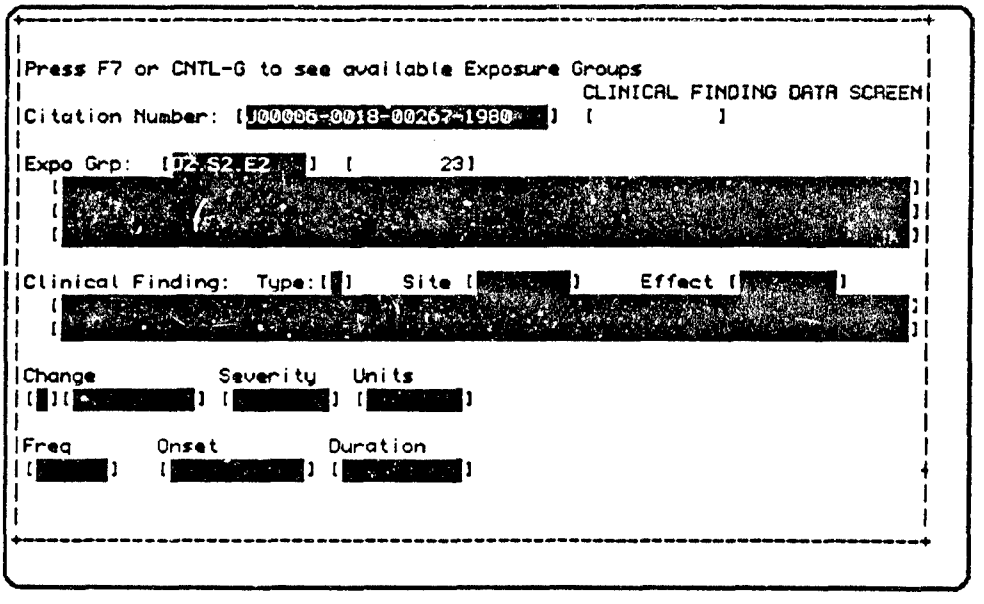


TKSEXGRP DATA SCREEN

This screen, which overlays the *CLINICAL FINDINGS DATA SCREEN* shows how many exposure groups exist for this citation ("ExpoGrp:[ ]" in upper left corner). You may scroll through tthe groups by using the up or down cursor (arrow) keys or, with some terminals, the return key. There are often no significant findings for control groups so you can skip to a treatment group which has important clinical findings.

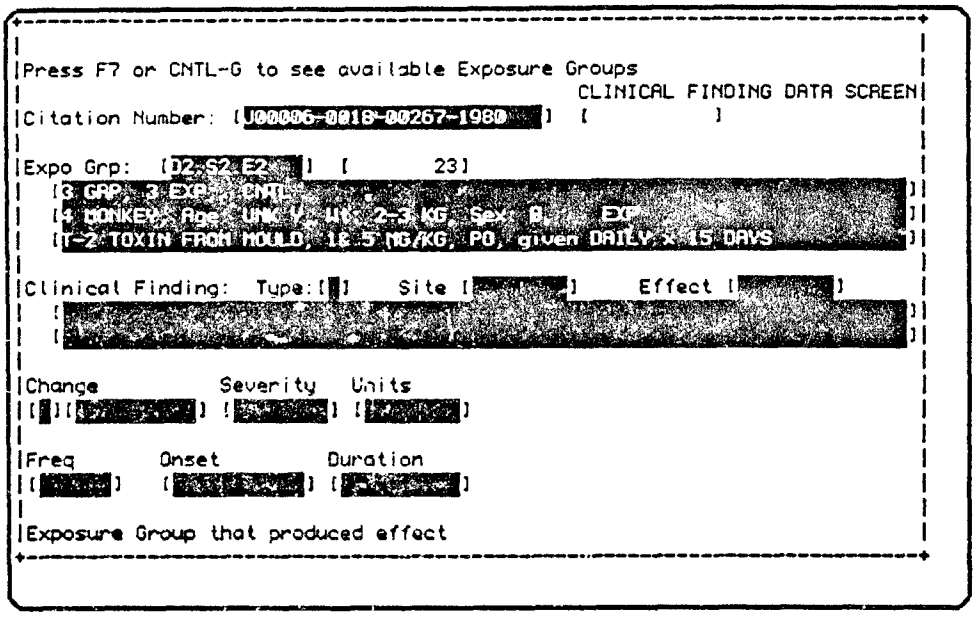
In the above example the user has skipped to Exposure Group Code D2.S2.E2 as indicated by the presence of the the cursor under the "D" in the row with a "23" to the far right. When the cursor is in the right place, hit "Esc" and the abbreviated description is placed in the appropriate field as indicated in Figure 9.3.

Figure 9.3
CLINICAL
FINDING DATA
SCREEN with
Expo Grp Field
Filled



If the user now hits the "return" key, information describing the selected group is displayed as shown in Figure 9.4.

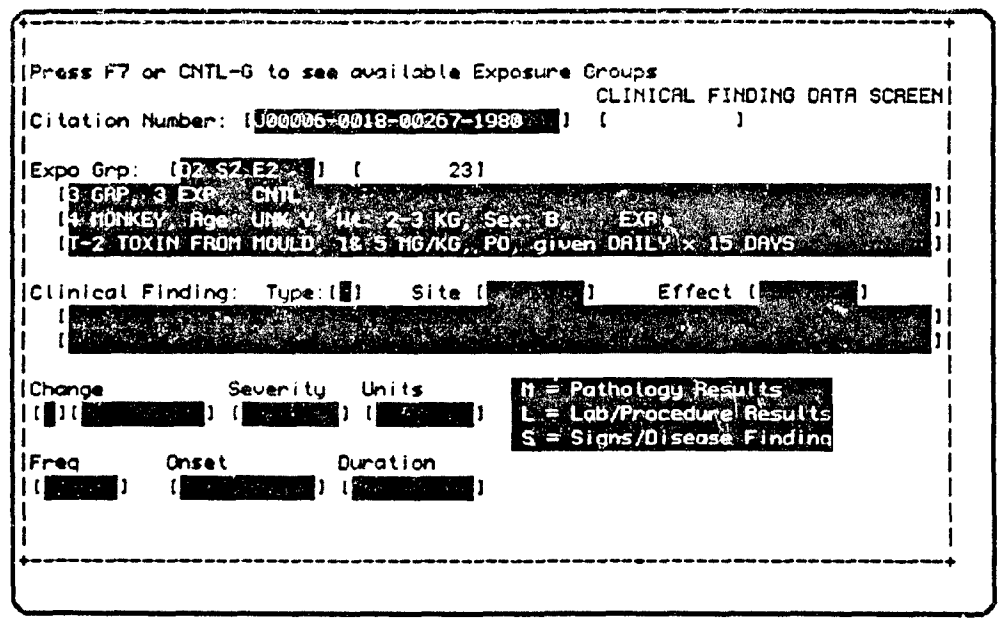
Figure 9.4 CLINICAL FINDING DATA SCREEN with Expo Grp Description



Type Field of CLINICAL FINDING DATA SCREEN

Another "return" brings up the options for the "Type" field as shown in Figure 9.5.

Figure 9.5 Options for "Type" field

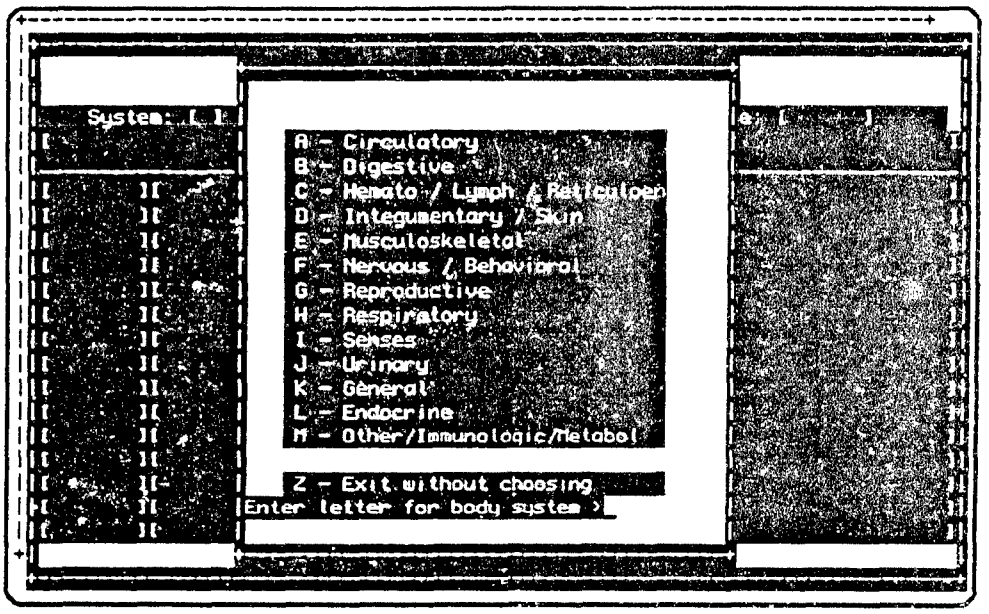


Select from the three choices by typing an "M" for "Pathology Results," "L" for "Laboratory tests" or "Procedure Results," or "S" for "Clinical Signs" or "Disease Findings." Your choice influences what will be seen next.

Pathology Results

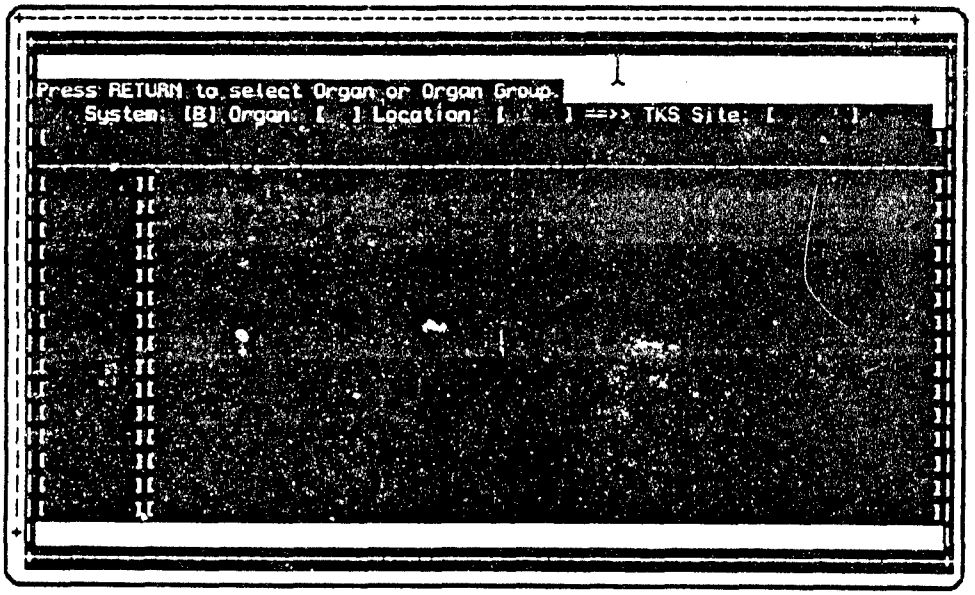
Selecting "M" for "Pathology Results" brings up the SCREEN with a "body system" list overlay.

Figure 9.6
Body System List



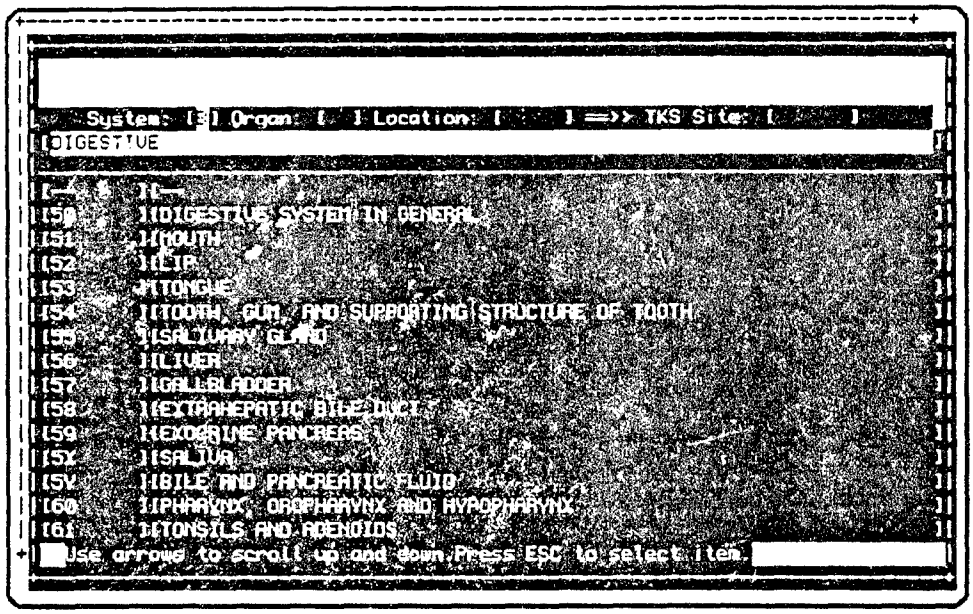
Choose the system related to the clinical finding you wish to describe. In the example given in Figure 9.7, system "B," "DIGESTIVE SYSTEM" was chosen.

Figure 9.7
Select Organ or Organ Group Screen



Upon hitting "return" as indicated at the top of the screen the following "Organ" list appears.

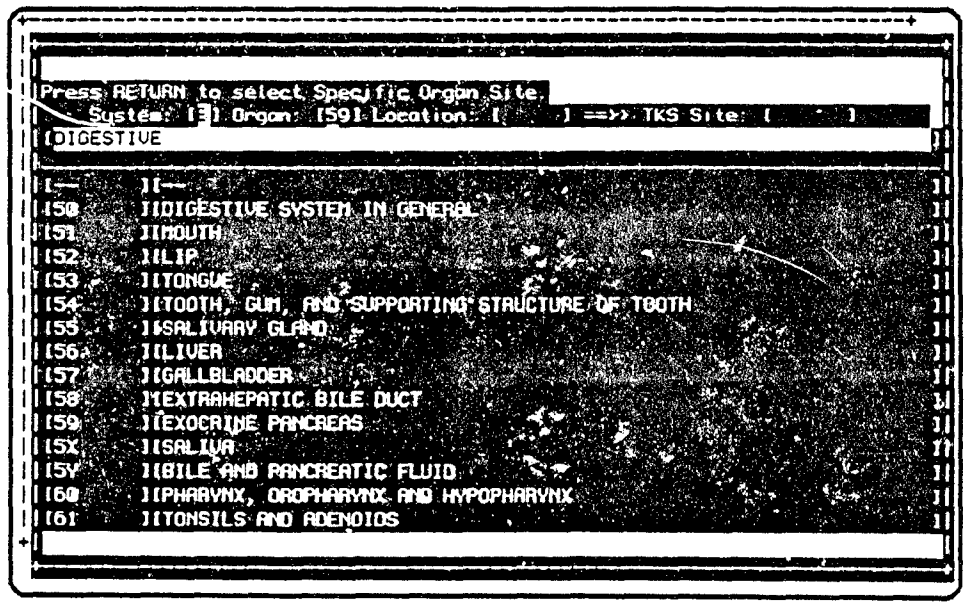
Figure 9.8 List Presented when Organ Code "B" is selected



The message at the bottom of the screen tells the user to scroll through the list using the cursor (arrow) keys and then hit "Esc" to make a selection. Please be aware that the list continues beyond the lower limit of the screen!

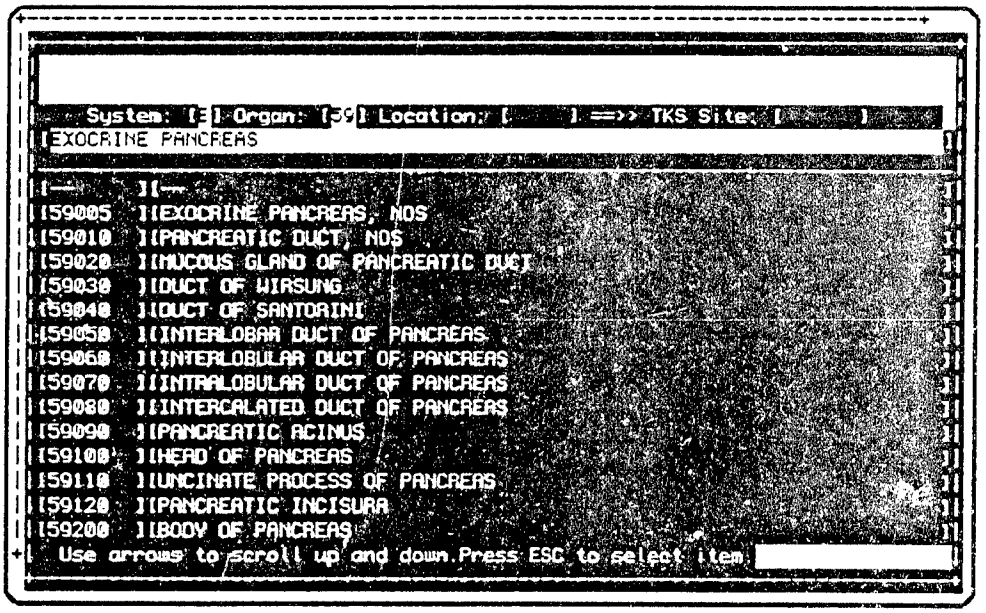
In our example the user has scrolled to number 59 "EXOCRINE PANCREAS" and hit "Esc," causing the code to be entered in the field after "Organ:."

Figure 9.9 Organ Code Entered



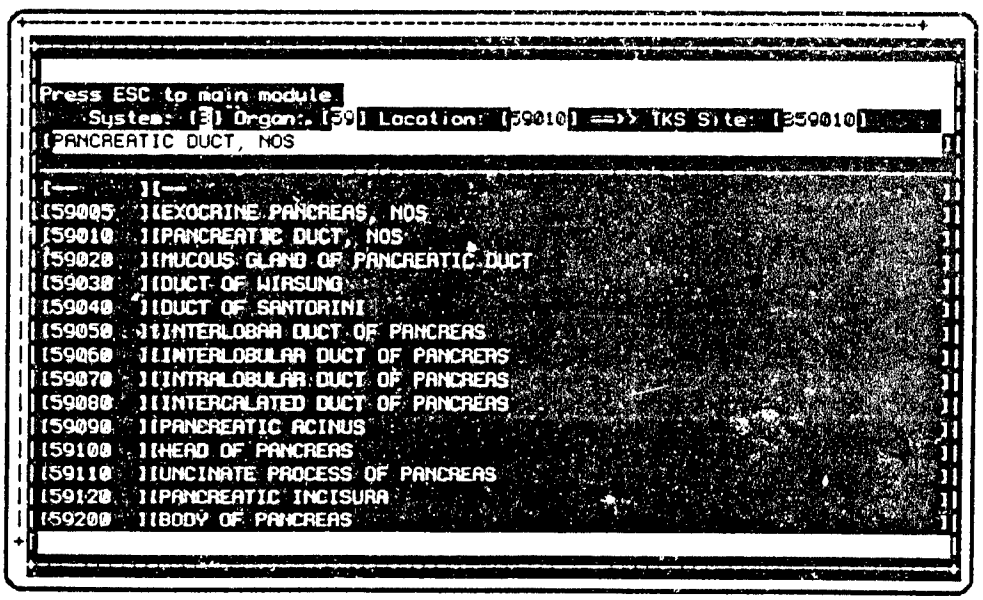
Once again, the program leads you through the process, telling the user to hit return to select a specific site (Location), in the message at the top of the screen.

Figure 9.10
Location List for Code 59



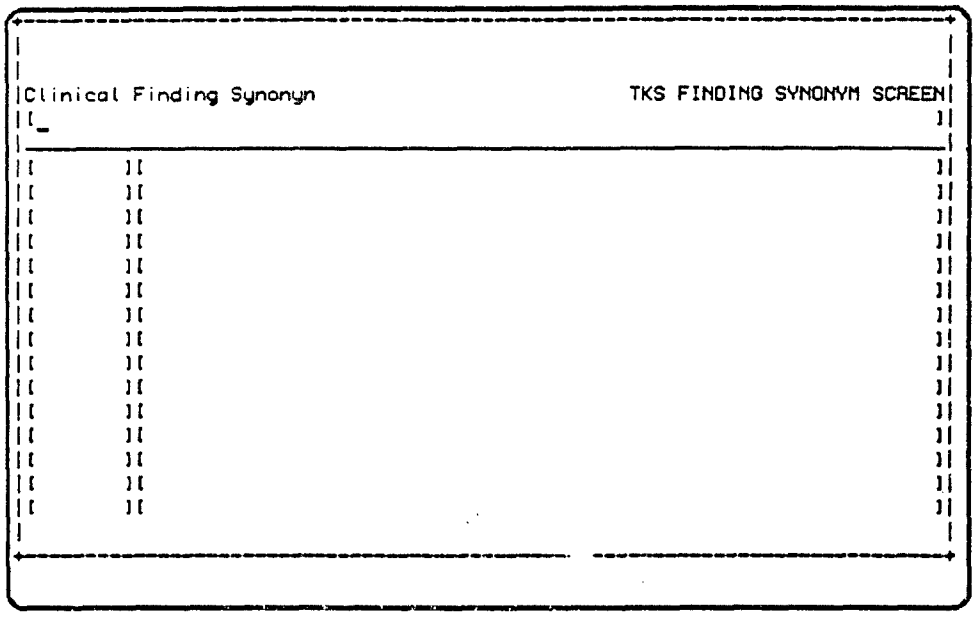
Use the "return" key to fill in the "TKS Site" field.

Figure 9.11
TKS Site Field Filled



It is now time to locate the specific descriptor for the lesion using the *TKS FINDING SYNONYM SCREEN.*

Figure 9.12 TKS FINDING SYNONYM SCREEN



Enter your search criteria and hit "Esc." In the example below, the user was searching for "inflammation" and used an abbreviation since the system could have it listed as inflammatory or some other similar term. In addition, wild cards were used, both before and after the abbreviation.

Figure 9.13 Search Criteria in TKS FINDING SYNONYM SCREEN

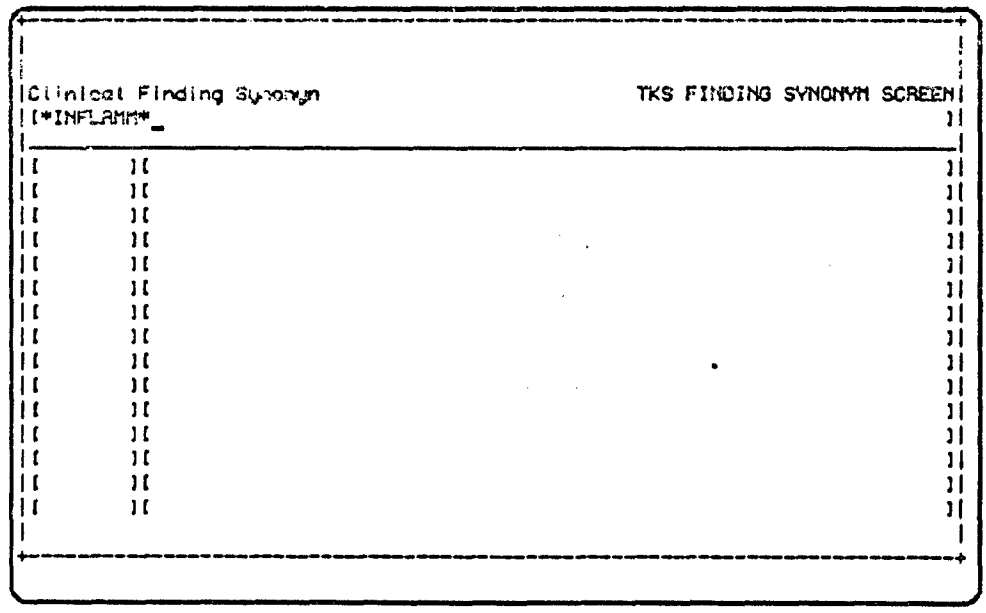
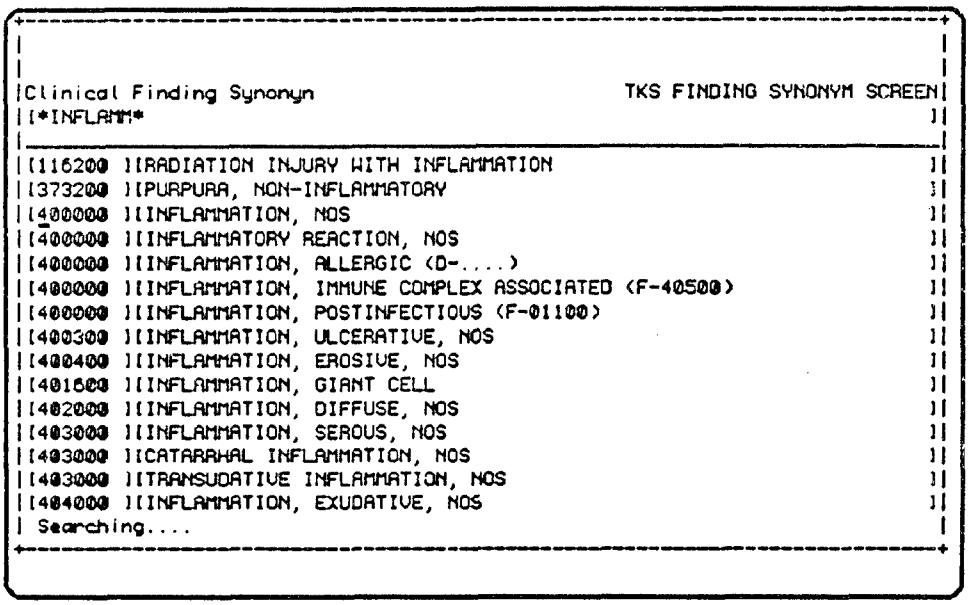


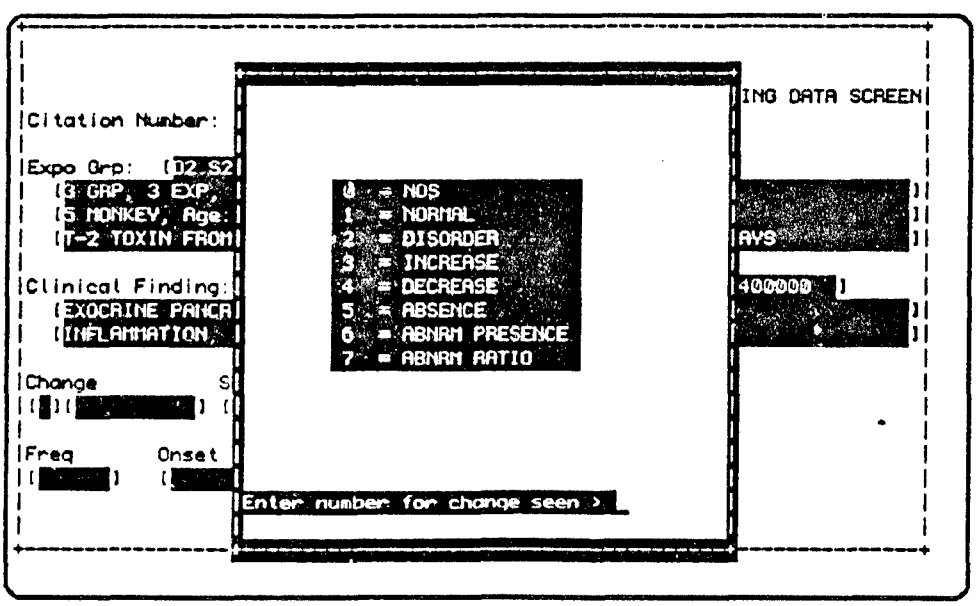
Figure 9.14 shows the partial listing obtained after the search using *INFLAMM*. Note that if the prefix wild card had not been used the first two items (and some others later on) would not have been found. If the suffix "*" had not been used, *no match would have been obtained* since there is no word with just INFLAMM, even with the wild card prefix. Scroll through the list until you reach the item of interest and hit "Esc" to enter the information in the *CLINICAL FINDING DATA SCREEN* and open the "change" overlay.

Figure 9.14 List Found after Search Using "INFLAMM"



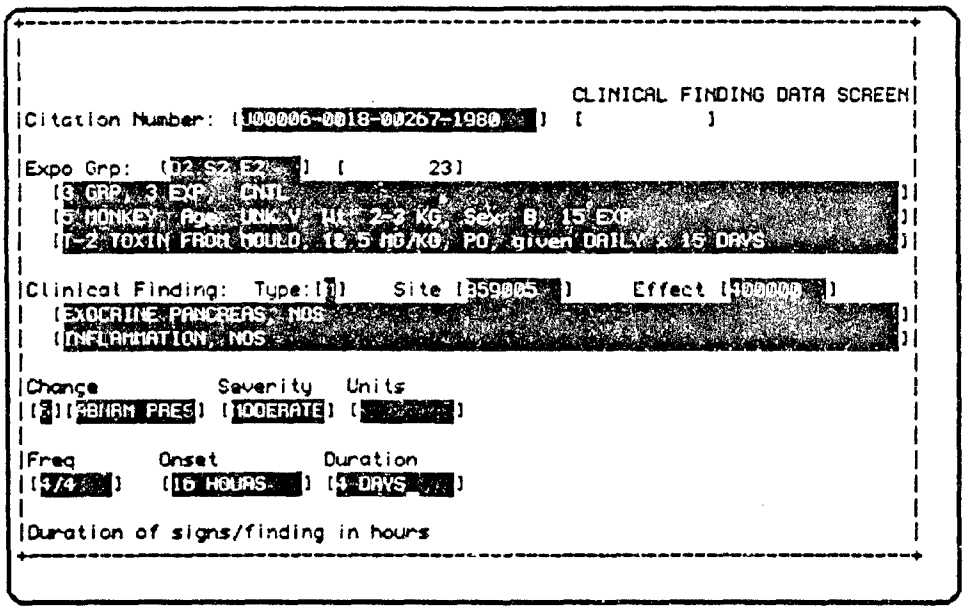
The choices for the "Change" field in the *TKS FINDING DATA SCREEN* are illustrated below. Type the appropriate number and hit "return."

Figure 9.15 Choices for "Change" field



It now remains for the user to indicate the "Severity" or value of the result along with the units, the "Frequency" of appearance of the path result among the experimental units, the time of "Onset" of the result and its "Duration." Follow the on-screen messages and prompts.

Figure 9.16 Completed CLINICAL FINDING DATA SCREEN

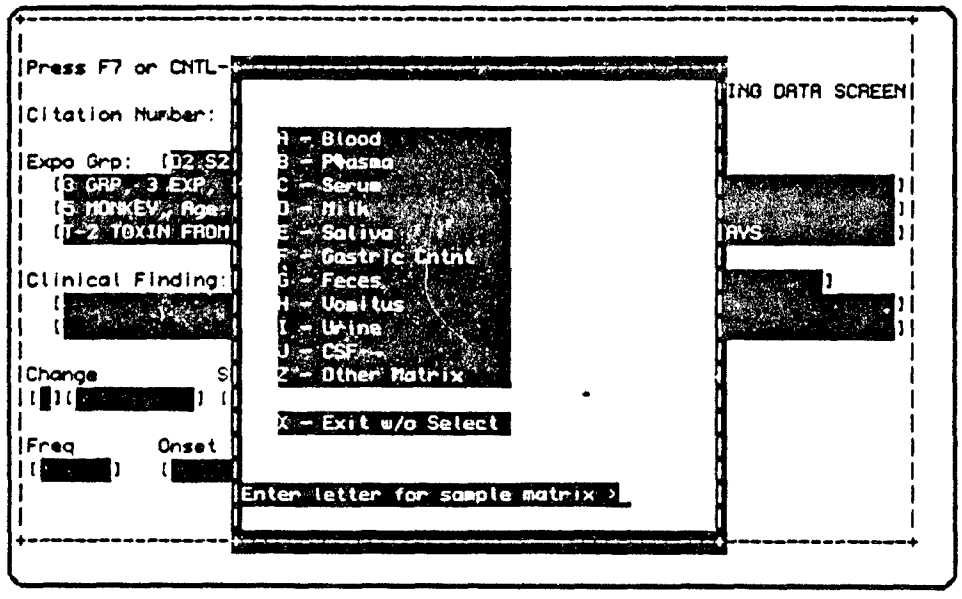


Upon completion of these fields, the user can hit "return" and the process will begin anew for the next clinical finding. WHEN YOU ARE FINISHED ENTERING DATA HIT "Esc."

Laboratory/Procedure Results

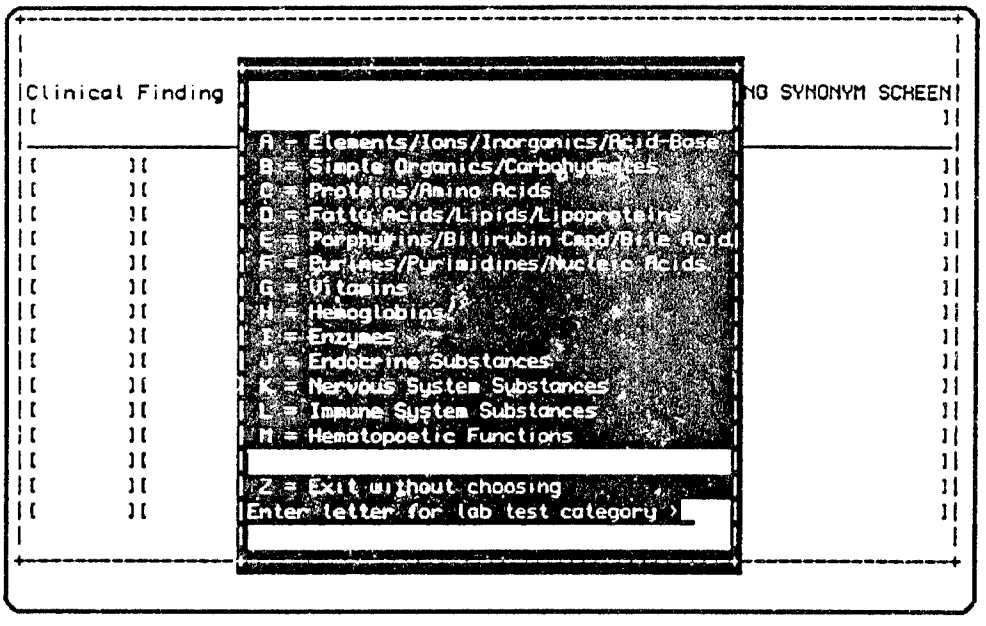
When "L" is chosen, the sample matrix list is presented (Figure 9.17). Select the type of sample which provided the material for the lab test or procedure by typing the proper letter.

Figure 9.17 Sample Matrix Overlay



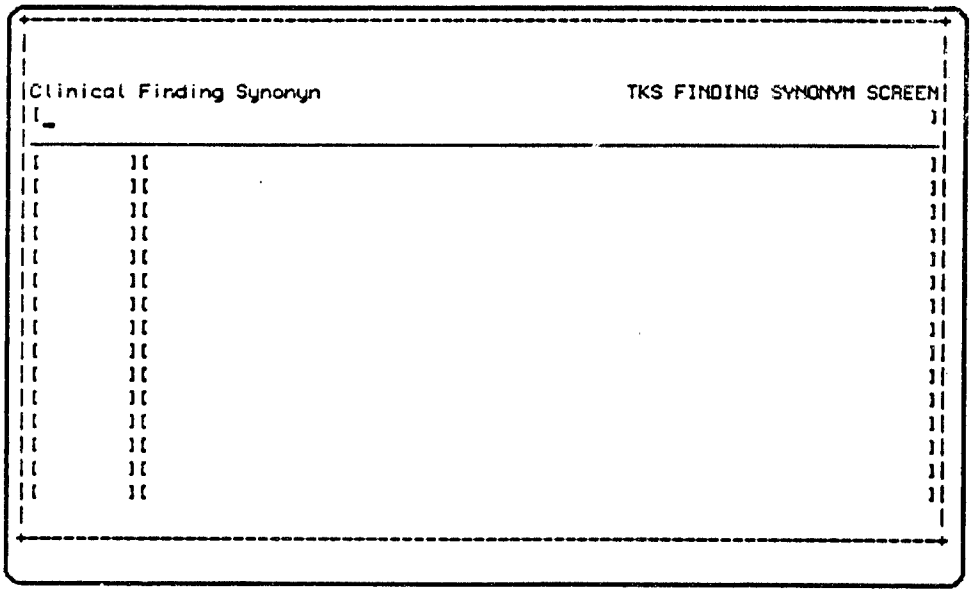
The test category list comes up next (Figure 9.18). Select the appropriate classification.

Figure 9.18 Lab Test Categories



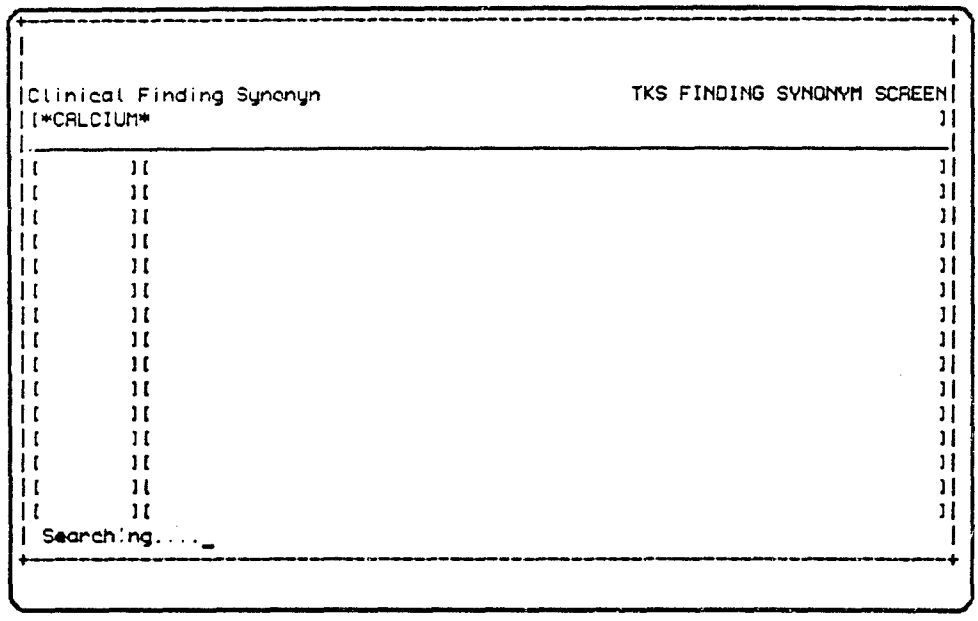
Now use the *TKS FINDING SYNONYM SCREEN* to search for the particular parameter of interest.

Figure 9.19 CLINICAL FINDING SYNONYM SCREEN



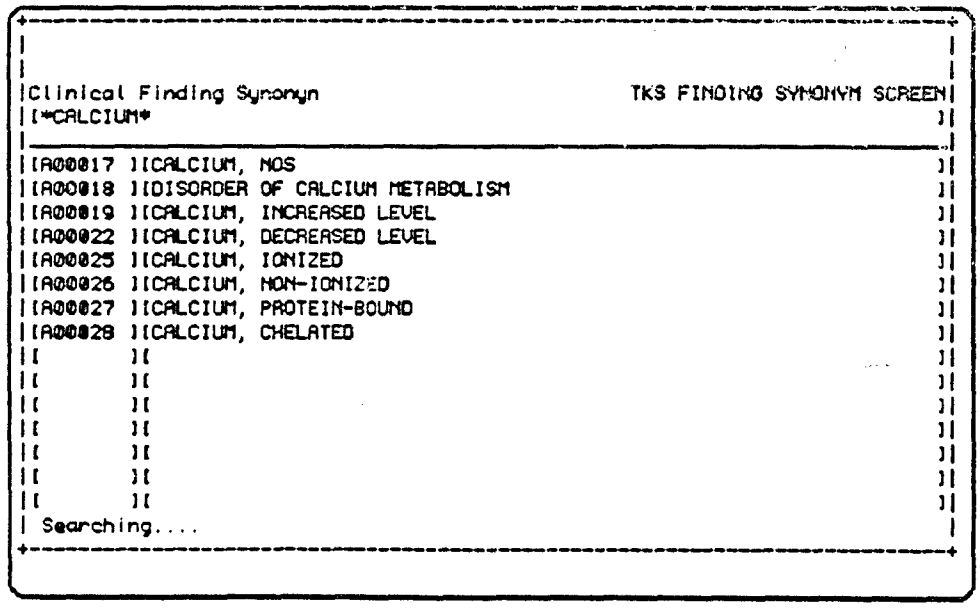
In the example shown in Figure 9.20 the user was looking for "calcium."

Figure 9.20 TKS FINDING SYNONYM SCREEN with "CALCIUM" search



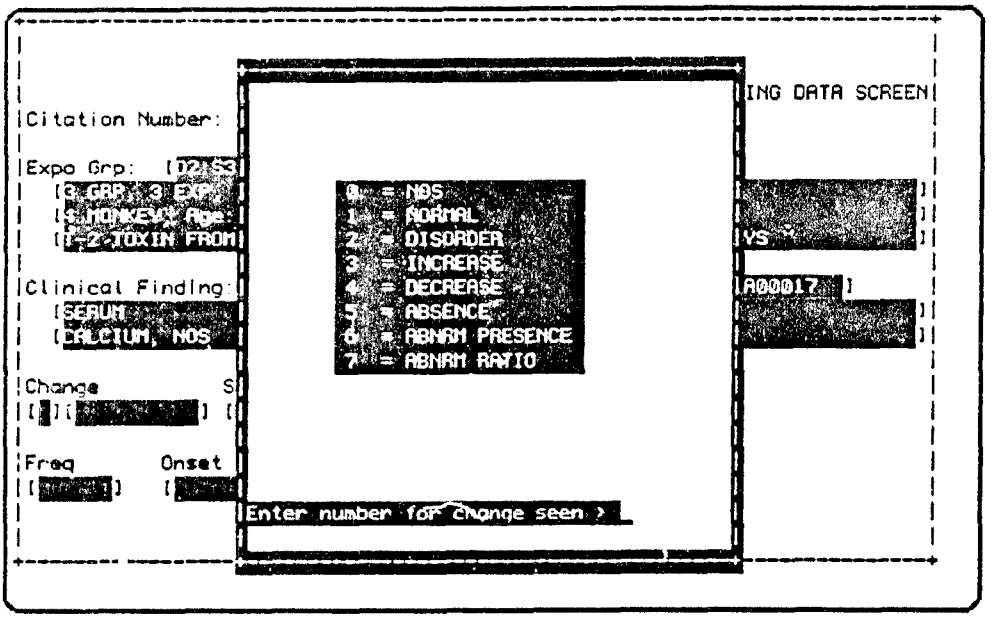
Searching for that word alone is unlikely to result in an exact match. It is generally necessary to use the wild card symbol (*) one or more times to increase the chances of a match. Type the search term and then hit "Esc" to initiate the search. If it is unsuccessful you will be brought back to the sample matrix screen to start the process again. If successful, there is usually more than one match (as shown) and you can choose among them using the cursor (arrow) keys.

Figure 9.21 Result of search using "CALCIUM"



Hit "Esc" when the cursor is on the correct line and the data will be entered in the "Clinical Finding" field and the descriptors associated with the parameter "Change" will be presented. Choose one from the list (Figure 9.22) and then hit "return."

Figure 9.22 Descriptors for changes

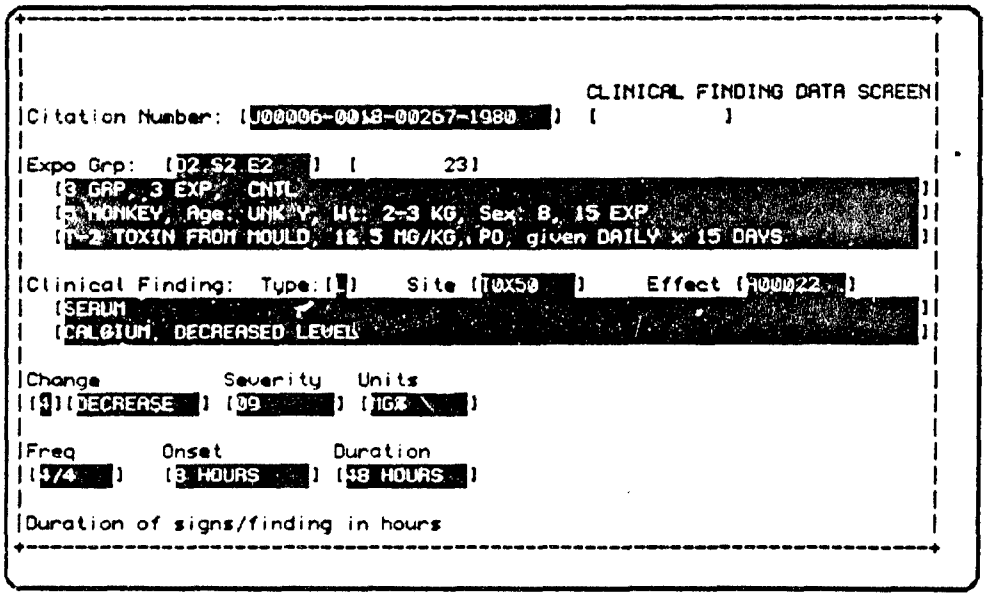


Hit "return" again to enter the value in the "Change" field and move to the "Severity" field. Enter the lab value if there is one, or a descriptive term (mild, moderate, severe), hit "return," and enter the "Units," (hit "return" again if you wish to skip this field) followed by another "return" to move to the "Freq" field.

The frequency provides a means to define the proportion affected. As the message at the bottom of the screen indicates, give the number affected / the total exposed for this group.

Next, indicate the time of "Onset" of the change, or the time it was identified.

Figure 9.23 Completed CLINICAL FINDING DATA SCREEN (Lab/ Procedure)



Finally, the time at which the change was identified is entered in the "Onset" field, and then the length of time the change was present in the "Duration" field. The appearance of a completed screen is shown in Figure 9.23.

When you are finished entering data hit "Esc," to place the data in permanent memory.

Signs/Disease Findings

Selecting "S" from the "Type" list brings up the body system overlay which enables you to choose the system associated with the sign or disease (Figure 9.24).

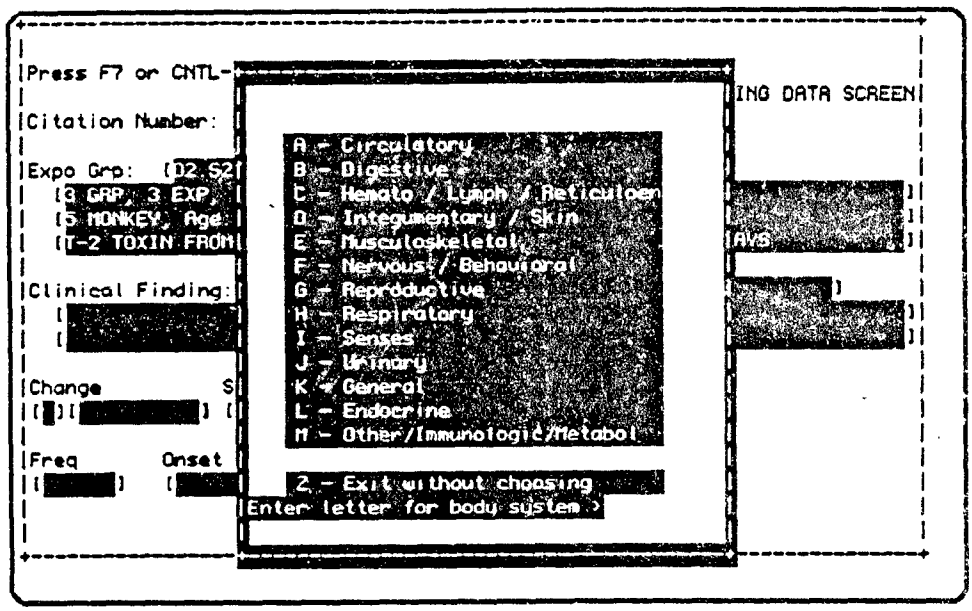


Figure 9.24 Body System Overlay

After making your selection, the TKS FINDING SCREEN appears and you can enter your search term, using wild card(s) if necessary. (See the discussions for Pathology Results and Lab/Procedure Results for additional information on these searches)

In the example below, the search term was "*VOMITING*."

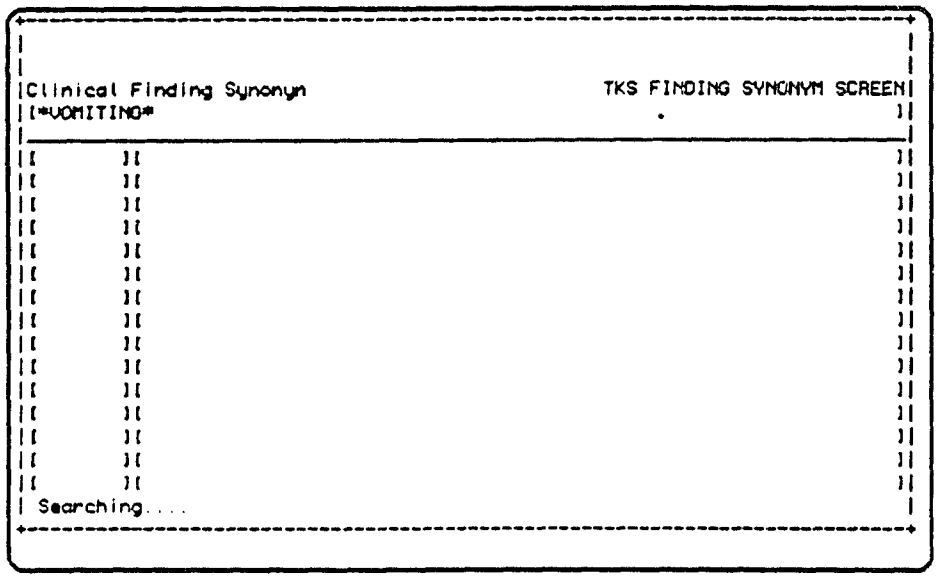
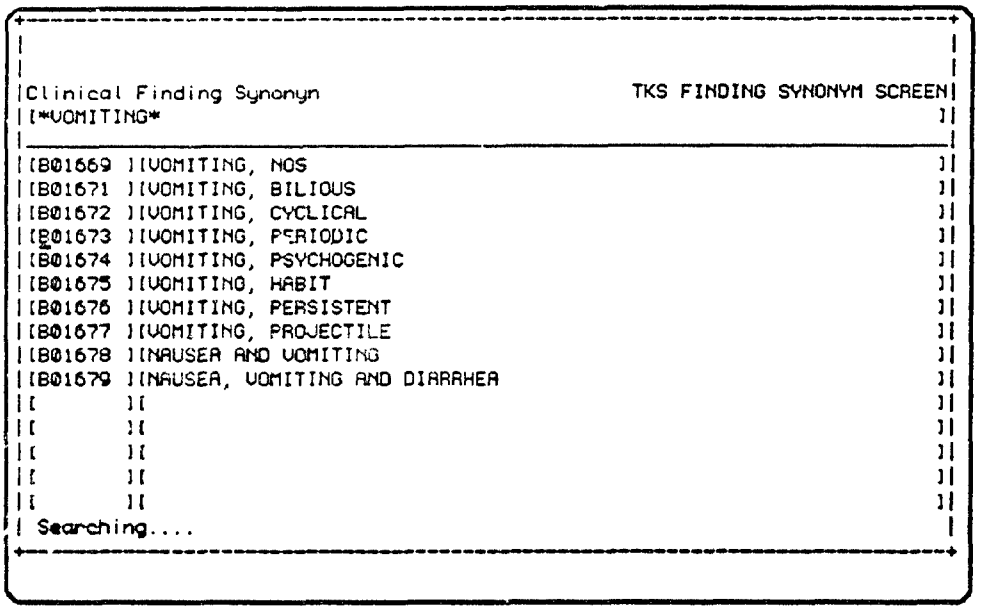


Figure 9.25 Search Term for Signs/ Disease Findings

Figure 9.26 illustrates the results of that search.

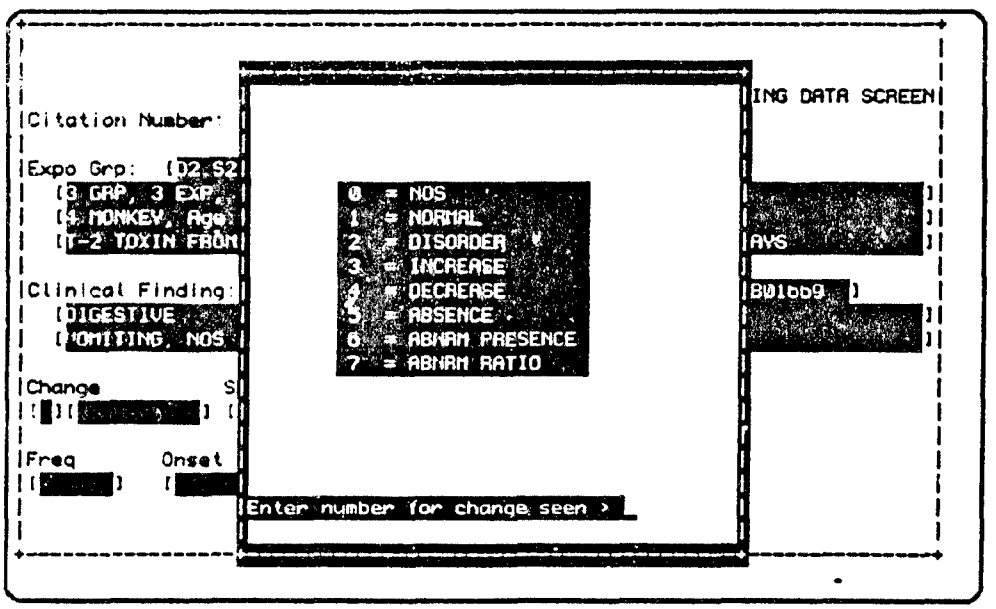
Figure 9.26 Results after Search on "VOMITING"



Place the cursor on the desired line (B01673 in the above example), and hit "Esc" to enter the information in the "Clinical Finding" field.

Next, select the type of change by entering the number from the list, followed by "return."

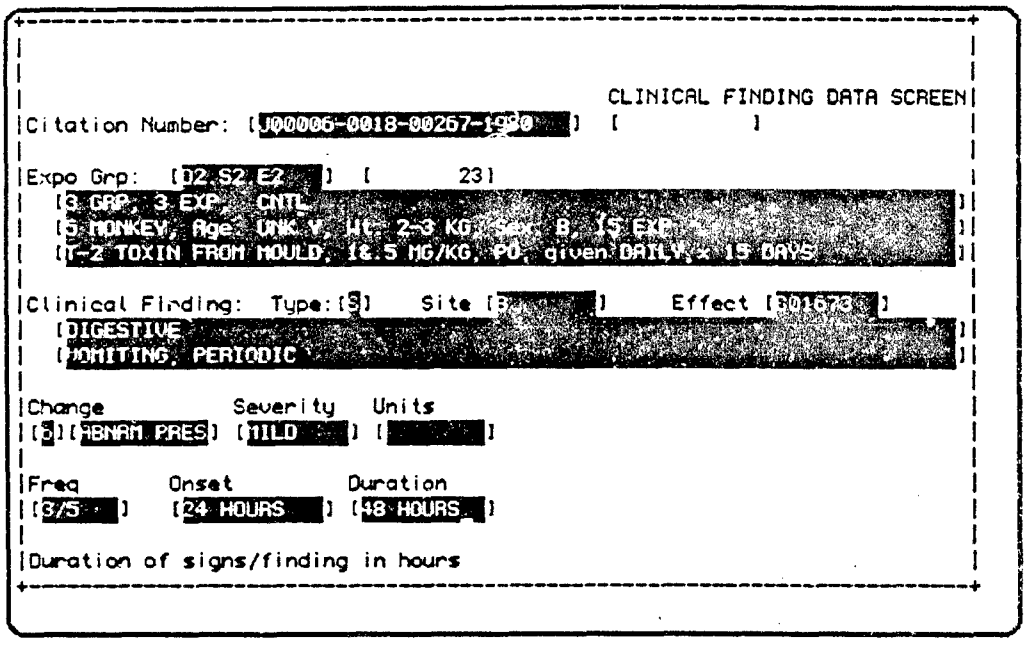
Figure 9.27 Type of Change Overlay



Now, proceed through the steps to describe the "Severity" of the change as a measured parameter with "Units," or as a subjective grade (e.g., mild, moderate, severe), the "Frequency" of occurrence of the change among experimental units, the time of "Onset,"

and the "Duration" of time the change was observed. A completed screen will appear similar to Figure 9.28.

Figure 9.28 Completed TKS CLINICAL FINDING DATA SCREEN



("S" Path)

When the screen is complete hit "return" to bring up a new screen to start the process again for another clinical finding, or hit "Esc" to place the data in system memory.

Modifying Clinical Findings

The *CLINICAL FINDING DATA SCREEN* can be modified using the "BROWSE" menu which is obtained after the screen for a particular citation is located via the "Find" pathway from the "ABSTRACT" menu, or by selecting "FindData" from the "ADD-CONTENT" menu.

Adding Clinical Findings

One can add Clinical Findings to a citation by following the "Add" pathway beginning in the "ABSTRACT" menu, or by selecting "AddData" from the FIND-CONTENT" menu.



Appendix A

FIND-CONTENT: Raw-Citation and Ugly-View

These options,are used to obtain another view of the data associated with a citation. It is a different program used primarily as a developmental tool and should not be used by the neophyte. *DO NOT USE THIS OPTION.*

Access to this view will become limited as the database program becomes fully operational.

"Raw-Citation" is the name for this option from the "Citation" pathway," while "Ugly-View" is used for the components from "Paper Content" and beyond. Selecting these options results in the program accessing the *Informix Perform* program which displays a "Perform" menu after about a 30 second delay.

Figure A.1 Selecting "Raw-Citation" or"Ugly-View" results in this screen

```
INFORMIX-SQL Version 2.10.00D

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All Rights Reserved

Software Serial Number RDS#RC59145
```

You will notice that the screen formats are different in this program, providing little explanation for what the data means. Below the menu in the upper right side of the screen is a number and text which will help you keep track of where you are.

The following are the meanings of the abbreviations found in the first window, "Paper Overview."

papcitnum = paper citation number

papcitfile = paper citation file

papstatepur = paper statement of purpose

papimpur = paper implied purpose

papaim = paper aim

papnumdsgn = the number of designs in the paper

PERFORM Menu

This menu has components which will be familiar to you from other screens, for example, "Next" and "Previous."

Figure A.2 First part of PERFORM Menu with RAW CITATION DATA SCREEN

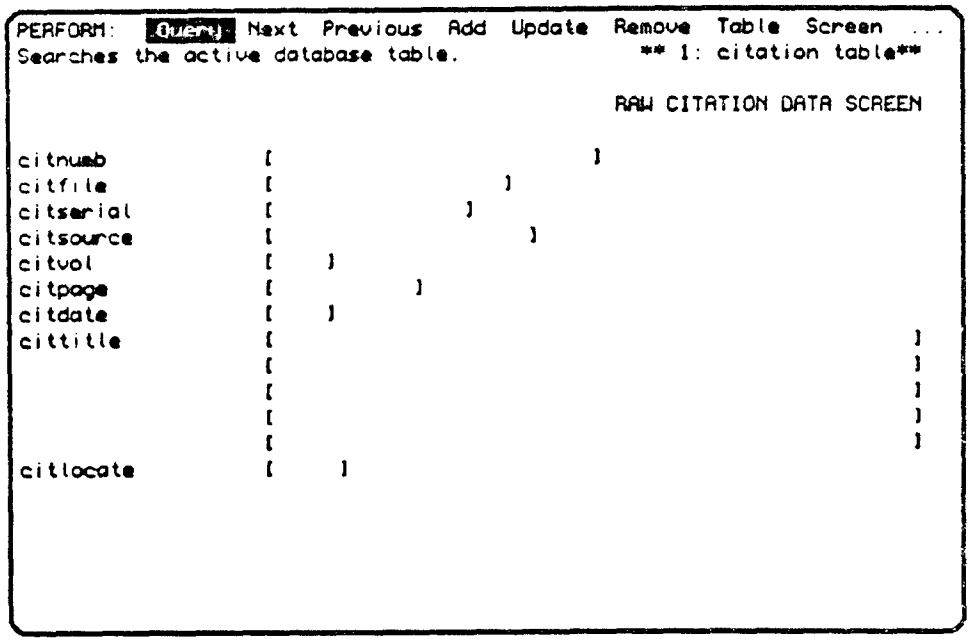
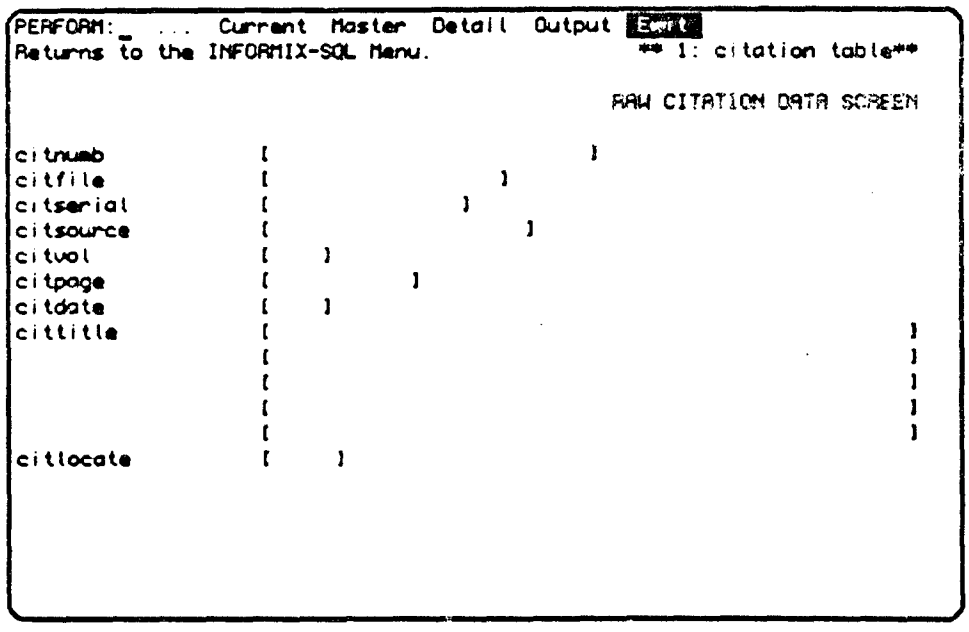


Figure A.2 Second part of PERFORM Menu with RAW CITATION DATA SCREEN



Query

This is similar to a search function. It is also an entry process in that it links you with certain data for particular citations. It can be performed at different levels (tables) in the program. For example, if you do a "Query" at the Paper Overview level you can move through the tables in the forward direction for a particular citation to "Study Design," "Subjects,"

"Regimens," "Links," "Clinical Findings," etc. If you do a "Query" starting at the "Design" level, you can't go backward to the "Overview" data table. Selecting "Query" places the cursor on the top data field."Returns" or the up and down arrow keys can be used to move among the different fields.

Select a field and enter the numbers or words you would like to search for, and hit "Esc" as indicated at the top of the screen. Again, wildcards (*) will prove to be useful as an aid to searching. Did the program find a match? If it did, let's find out how much information has been entered for the paper associated with the "Overview" indicated on the screen.

Add

Update

These options are similar to those described previously under the "Add" and "Find" pathways.

Remove

This option provides a means to delete a row from the active database file.

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Appendix H.
Toxin Knowledge System
Source Code

Note that the Source Code has its own page number sequencing and table of contents.

Toxin Knowledge System
Program Source Code

Version 7.11g5b1a

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Funded by US Army Contract DAMD 17-87-C-7114

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Source Code Overview

The Toxin Knowledge System was developed using software from Informix Sofware, Inc., 4100 Bohannon Drive, Menlo Park, California, 94025 (415) 926-6300. The database was managed using Informix-SQL™ and the user application was developed using Informix-4GL™. The original development took place on a Sequent™ Balance 8000 minicomputer running Dynix™ (a Unix-based operating system). Eventually the Toxin Knowledge System was ported to an IBM PC/AT platform running MS-DOS 3.3. This development used MS-DOS versions of Informix-SQL™, Informix-4GL™, and Informix-4GL/RDS™. The source code provided is Informix-4GL™ code.

#tksglob.4gl

```
{Comments:
TITLE: tksglob.4gl
Copyright Harold L. Trammel, 1987-1988
University of Illiois, CVM, IAPIC
Funded by US Army Contract DAMD-17-C-7114
}

DATABASE tkstest
GLOBALS
    DEFINE
        #basic table records
            T_journlst record like journlst.*,
            T_booklst record like booklst.*,
            T_citation record like citation.*,
            T_authors record like authors.*,
            T_paperover record like paperover.*,
            T_exporegm record like exporegm.*,
            T_subjgrp record like subjgrp.*,
            T_stdydsgn record like stdydsgn.*,
            T_expogrp record like expogrp.*,
            T_clinfind record like clinfind.*,
            T_tkscomment record like tkscomment.*,
            T_keywords record like keywords.*,
            T_keylist record like keylist.*,
            T_tkssite record like tkssite.*,
            T_morphlst record like morphlst.*,
            T_morphsynlst record like morphsynlst.*,
            T_lablst record like lablst.*,
            T_labsynlst record like labsynlst.*,
            T_signlst record like signlst.*,
            T_signsynlst record like signsynlst.*,
        # array records
            auth_array ARRAY[10] of RECORD like authors.*,
            a_array ARRAY[10] of RECORD
                auth    like authors.authname,
                sig  like authors.authsig
                end record,
            key_array ARRAY[20] of RECORD like keywords.*,
            k_array ARRAY[20] of RECORD
                code like keywords.keycode,
                keys like keywords.keyword
                end record,
            dsgn_array ARRAY[50] of record like stdydsgn.*,
            expo_array ARRAY[50] of record like exporegm.*,
            sgrp_array ARRAY[50] of record like subjgrp.*,
            exgp_array ARRAY[50] of record
                egcitnumb  like expogrp.egcitnumb,
                egserial integer,
                egdsgnlabel like expogrp.egdsgnlabel,
                egsubglabel like expogrp.egsubglabel,
                egexpolabel like expogrp.egexpolabel,
                eglink  like expogrp.eglink,
                egtotnum   smallint,
                egdsgndsc  like expogrp.egdsgndsc,
```

```
            egdsgn like expogrp.egdsgn,
            egsubgdsc  like expogrp.egsubgdsc,
            egsubg like expogrp.egsubg,
            egexpodsc  like expogrp.egexpodsc,
            egexpo like expogrp.egexpo
            end record,
        cf_array ARRAY[50] of record like clinfind.*,
        msyn_array ARRAY[50] of record like morphsynlst.*,
        lsyn_array ARRAY[50] of record
            labcode like labsynlst.labcode,
            labsyn  like labsynlst.labsyn
            end record,
        ssyn_array ARRAY[50] of record
            signcode    like signsynlst.signcode,
            signsyn like signsynlst.signsyn
            end record,
    # miscellaneous flags
        jw_flag, bw_flag, cw_flag, aw1_flag, kw1_flag, aw_flag      smallint,
        qw_flag, sg_flag, ins_flag, cont_flag smallint,
    # window flags
        papwin_flag, dsgnwin_flag, cntlwin_flag, expwin_flag        smallint,
        linkwin_flag, exgpwin_flag, dscwin_flag, comwin_flag        smallint,
        cfwin_flag, cf1win_flag, cf2win_flag, cf3win_flag    smallint,
        morph_flag, lab_flag, sign_flag, syn_flag, site_flag    smallint,
        a265_flag, a270_flag, a260_flag, a260p_flag   smallint,
        a1540_flag, a1940_flag, a875_flag    smallint,
        a1078_flag, a1978_flag   smallint,
    # big strings
        query1  char(500),
        select1  char(500),
        select2  char(500),
        bib_entry   char(800),
        keywdlst    char(420),
        pap_string  char(400),
        dsgn_string char(400),
        subj_string  char(400),
        expo_string char(400),
        find_string  char(400),
    # miscellaneous variables
        citnumber like citation.citnumb,
        citfileno like citation.citfile,
        outfile  char(30),
        versno  char(16),
        quote, beep, answer char(1),
        tmp_cnt, cnt, counter, curr_arr, scr_arr, arr_cnt   smallint,
        curr_exp, exp_cnt, curr_subj, subj_cnt    smallint,
        hold_dsgn  integer,
        chosen, x, sw, cw, pw, dw    smallint
END GLOBALS
```

#tksmain.4gl

```
{Comments:
TITLE: tksmain.4gl
Copyright Harold L. Trammel, 1987-1988,
University of Illiois, CVM, IAPIC
Funded by US Army Contract DAMD-17-C-7114
Contains the following functions:
    empty()
    new_abs()
    add_abs(t_cit)
    find_abs()
    select_src()
    delete_all(tmp_cit)
}

DATABASE tkstest
GLOBALS "tksglob.4gl"
MAIN
    define
        tmp_cit like citation.citnumb
    call versionNum() returning versno
    call copyright()
    # initial setup
        let beep = ASCII(7)
        let quote = "\""
        call startlog("tks.errors")
        DEFER INTERRUPT
        OPTIONS INPUT WRAP,
            help file "tkshelp.msg"
    DISPLAY "Help is available.  Hit Ctrl-W for help." AT 23,1
    MENU "TKS-MAIN"
        COMMAND "AbstractMgt"
            "New Abstract, Add to Abstract, Find Abstracted Data" HELP 10
            MENU "ABSTRACT"
                COMMAND "New"
                    "Add new citation and abstract it into database" HELP 20
                    call new_abs()
                COMMAND "Add"
                    "Add Citation, PaperContent, Keywords, or Notes to Existing Abstract" HELP 21
                    let tmp_cit = ""
                    call add_abs(tmp_cit)
                COMMAND "Find"
                    "Find Existing Abstract by Citation, PaperContent, Keywords, or Notes" HELP 22
                    call find_abs()
                COMMAND "Exit" "Leave this MENU" HELP 2
                    EXIT MENU
                END MENU
        COMMAND "Vocabulary"
            "Access Journal, Book, Keyword, Clinical Finding, or Chemical Vocabulary" HELP 11
            MENU "VOCABULARY"
                COMMAND "Journals" "Change Journal Listing" HELP 30
                    CALL j_list()
                COMMAND "Books" "Change Book Listing" HELP 30
                    CALL b_list()
                COMMAND "Keywords" "Change Keyword List" HELP 31
                    call k_list()
```

```
            COMMAND "Signs" "Change Sign or Clinical Finding List" HELP 32
                call s_list()
            COMMAND "Chemicals" "Change Chemical List" HELP 33
                CALL empty()
            COMMAND "Exit"  HELP 2
                EXIT MENU
            END MENU
        COMMAND "Reports" HELP 12
            MENU "REPORTS"
                COMMAND "Journal-Listing"
                    "Print current journal listing" HELP 40
                    RUN "sacego journalist"
                COMMAND "Exit"  HELP 2
                    EXIT MENU
                END MENU
        COMMAND "Monographs"
            call report_cntl()
        COMMAND "Information" HELP 13
            MENU "ADMIN-INFORMATION"
                COMMAND "Copyright-Notice" HELP 1
                    call copyright()
                COMMAND "Program-Status" HELP 1
                    call showstatus()
                COMMAND "Database-Design" HELP 1
                    call data_dict()
                COMMAND "Exit" HELP 2
                    EXIT MENU
                END MENU
        COMMAND "SQL" "Access ISQL"
            run "pisql"
        COMMAND "Exit" HELP 14
            EXIT MENU
        END MENU
    CLEAR SCREEN
    END MAIN
#########################################################################
FUNCTION empty()
    ERROR "FUNCTION NOT YET IMPLEMENTED"
    SLEEP 3
    CLEAR SCREEN
    END FUNCTION
#########################################################################
FUNCTION new_abs()
    define
        tmp_cit like citation.citnumb,
        aim like paperover.papaim
    let tmp_cit = null
    call add_cit(tmp_cit)
    if sw = 1
        then
            return
        else
            let tmp_cit = T_citation.citnumb
            call add_auth(tmp_cit)
            call add_key(tmp_cit)
            call show_fullcit(tmp_cit)
        end if
```

```
    call alrt265open()
    prompt "Do you want to add content data to system for this paper? (Y/n)"
        for char answer
    call alrt265close()
    if upshift(answer) <> "N"
        then
            select * into T_paperover.*
                from paperover
                where papcitnumb = tmp_cit
                if status = NOTFOUND
                    then
                        call add_paper(tmp_cit)
                        if pw = 1
                            then
                                return
                            else
                                select papaim into aim from paperover
                                    where papcitnumb = tmp_cit
                                case
                                    when aim[1,1] = "E"
                                        call add_exgp(tmp_cit)
                                        call find_control(tmp_cit)
                                        exit case
                                    otherwise
                                        call empty()
                                        return
                                        exit case
                                end case
                            end if
                    else
                        Error beep, " Paper Overview data exists for this Paper.  Use Find MENU to see
content."
                        sleep 3
                    end if
        end if
    END FUNCTION
#########################################################################
FUNCTION add_abs(t_cit)
    define
        t_cit like citation.citnumb,
        tmp_expo   smallint,
        tmp_dsgn   smallint,
        totnumdsgn      smallint,
        tmp_serial, pge  integer,
        tmp_subj   smallint
    let sw=0
    if t_cit is null
        then
            call select_src() returning t_cit
            if t_cit is null
                then return
                end if
        end if
    MENU "ADD-DATA"
        COMMAND "Citation-Data"
            "Add Citation or Author Data" HELP 60
            MENU "ADD-CITATION-DATA"
```

```
            COMMAND "Citation"
                "Add Citation Data" HELP 63
                select count(*) into cnt from citation
                    where citnumb = t_cit
                if status = NOTFOUND
                    then CALL add_cit(t_cit)
                    else error "Citation data already entered"
                        sleep 2
                    end if
            COMMAND "Authors"
                "Add Author Entries" HELP 64
                CALL see_auth(t_cit)
                CALL update_auth(t_cit)
            COMMAND "Exit" HELP 2
                EXIT MENU
            END MENU
        COMMAND "Paper-Content"
            "Add the contents of the paper" HELP 61
            MENU "ADD-CONTENT"
                COMMAND "PaperOverview"
                    "Add overview data regarding the paper" HELP 69
                    select * into T_paperover.*
                        from paperover
                        where papcitnumb = t_cit
                    if status = NOTFOUND
                        then
                            call add_paper(t_cit)
                        else
                            open window alrt1 at 10,3 with 2 rows, 60 columns
                                attribute (border, reverse, prompt line first +1)
                            display " Paper Overview data exists for this Paper." at 1,1
                            prompt "Do you want to update it? (Y/n) > " for answer HELP 23
                            close window alrt1
                            if upshift(answer) <> "N"
                                then
                                    call papwinopen()
                                    call disp_paper(t_cit)
                                    call update_paper(t_cit,
                                        T_paperover.papserial)
                                    call papwinclose()
                                end if
                        end if
                COMMAND "Materials-Methods" HELP 70
                    MENU "MATERIALS-METHODS"
                        COMMAND "Design"
                            "Add a design to the paper information" HELP 71
                            select papnumdsgn into totnumdsgn
                                from paperover
                                where papcitnumb = t_cit
                            select count(*) into cnt
                                from stdydsgn
                                where stycitnumb = t_cit
                            if totnumdsgn - cnt > 0
                                then
                                    call add_dsgn(t_cit, totnumdsgn, cnt)
                                    call add_exgp(t_cit)
                                else
```

```
                    call alrt260p1op()
                    display "Design count is equal to indicated number of designs      " at
1,1
                    prompt "Do you want to change PaperOverview? (Y/n) > " for answer
                    call alrt260p1cl()
                    if upshift(answer) <> "N"
                        then
                            call papwinopen()
                            select * into T_paperover.*
                                from paperover
                                where papcitnumb = t_cit
                            call disp_paper(t_cit)
                            call update_paper(t_cit,
                                T_paperover.papserial)
                            call papwinclose()
                        end if
                end if
            COMMAND "Subjects"
                "Add subject data for a specific design" HELP 72
                open window showdsgn at 2,2 with 21 rows, 75 columns
                    attribute(border)
                #show and select designs
                    call show_dsgn(t_cit, 0) returning pge
                    display "Use CNTL-P to show Previous page, CNTL-N to show Next page"
at 21, 2
                    prompt "For which design? " for tmp_dsgn HELP 73
                        on key (interrupt)
                            next option "Subjects"
                        on key (control-P)
                            call show_dsgn(t_cit, pge-1) returning pge
                        on key (CONTROL-N)
                            call show_dsgn(t_cit, pge+1) returning pge
                        end prompt
                    select styserial into tmp_serial from stdydsgn
                        where stycitnumb = t_cit
                        and stydsgncur = tmp_dsgn
                        if status = NOTFOUND
                            then
                                error "No designs for that number!"
                                sleep 2
                                next option "Subjects"
                            end if
                    select stynumgrp into tmp_subj from stdydsgn
                        where stycitnumb = t_cit
                        and styserial = tmp_serial
                    close window showdsgn
                    clear screen
                    select count(*) into cnt from subjgrp
                        where sgcitnumb = t_cit
                        and sgdsgnnum = tmp_serial
                    call add_sgrp(t_cit, cnt, tmp_subj, tmp_serial)
            COMMAND "Regimens"
                "Add Exposure Regimen data for a specific design" HELP 74
                #show and select designs
                    call show_dsgn(t_cit, 0) returning pge
                    display "Use CNTL-P to show Previous page, CNTL-N to show Next page"
at 21, 2
```

```
                    prompt "For which study design? " for tmp_dsgn HELP 75
                        on key(interrupt)
                            next option "Regimens"
                        on key (control-P)
                            call show_dsgn(t_cit, pge-1) returning pge
                        on key (CONTROL-N)
                            call show_dsgn(t_cit, pge+1) returning pge
                        end prompt
                    select styserial into tmp_serial from stdydsgn
                        where stycitnumb = t_cit
                        and stydsgncur = tmp_dsgn
                        if status = NOTFOUND
                            then error "No designs for that number!"
                                next option "Regimens"
                            end if
                    clear screen
                    select stynumexp into tmp_expo from stdydsgn
                        where stycitnumb = t_cit
                        and styserial = tmp_serial
                    select count(*) into cnt from exporegm
                        where excitnumb = t_cit
                        and exdsgnnum = tmp_serial
                    call add_expo(t_cit, cnt, tmp_expo, tmp_serial)
                COMMAND "Links"
                    "Create the Exposure Group links" HELP 77
                    call add_exgp(t_cit)
                COMMAND "Exit" HELP 2
                    EXIT MENU
                END MENU
            COMMAND "FindData"
                "Find previously entered data" HELP 76
                call find_abs()
            COMMAND "Results"
                "Enter Findings from Study" HELP 78
                call find_control(t_cit)
            COMMAND "Discussion" HELP 79
                call empty()
            COMMAND "Exit" HELP 2
                EXIT MENU
            END MENU
        COMMAND "Keywords-Notes" HELP 62
            MENU "ADD-KEYWORDS-NOTES"
                COMMAND "Keywords" "Add Keyword Entries" HELP 65
                    CALL see_keys(t_cit)
                    CALL update_key(t_cit)
                COMMAND "Notes" "Add notes to citation" HELP 66
                    call empty()
                COMMAND "Exit" HELP 2
                    EXIT MENU
                END MENU
        COMMAND "Exit" HELP 2
            EXIT MENU
        END MENU
    END FUNCTION
#########################################################################
FUNCTION find_abs()
    let citnumber = ""
```

```
let hold_asgn = 0
MENU "FIND-DATA"
    COMMAND "Citation-Data"
        "Find Citation or Author Data" HELP 50
        MENU "FIND-CITATION-DATA"
            # Needs mechanism to search for citation data based on
            # authors, journal, etc and select it for adding to the
            # paper data files
            COMMAND "Citation"
                "Find Citation Data" HELP 80
                call find_cit(citnumber)
                call cwinclose()
            COMMAND "Authors"
                "Find Author Entries" HELP 81
                call find_auth(citnumber)
                call auwinclose()
            COMMAND "Query-all"
                "See data for citation, authors, keywords" HELP 82
                call querybib()
            COMMAND "Raw-Citation"
                "See a raw form of the citation, author and keyword data" HELP 83
                run "sperform allcit"
            COMMAND "Data-Add"
                "Add data to system" HELP 84
                let citnumber = ""
                call add_abs(citnumber)
            COMMAND "Exit" HELP 2
                EXIT MENU
            END MENU
    COMMAND "Paper-Content"
        "Find the contents of the paper" HELP 51
        MENU "FIND-CONTENT"
            COMMAND "PaperOverview"
                "Find overview data regarding the paper" HELP 90
                call find_paper(citnumber)
                call papwinclose()
            COMMAND "Materials-Methods" HELP 99
                MENU "MATERIALS-METHODS"
                    COMMAND "Design"
                        "Find a design to the paper information" HELP 91
                        call find_dsgn(citnumber)
                        call dsgnwinclose()
                    COMMAND "Subjects"
                        "Find subject data for a specific design" HELP 92
                        call find_sgrp(citnumber,hold_dsgn)
                        call swinclose()
                    COMMAND "Regimens"
                        "Find Exposure Regimen data for a specific design" HELP 93
                        call find_expo(citnumber,hold_dsgn)
                        call expwinclose()
                    COMMAND "Links"
                        "Find existing Exposure Group link"  HELP 94
                        call find_exgp(citnumber)
                        call linkwinclose()
                    COMMAND "Exit" HELP 2
                        EXIT MENU
                    END MENU
```

```
            COMMAND "Add-Data"
                "Add data to system" HELP 95
                let citnumber = ""
                call add_abs(citnumber)
            COMMAND "Results" HELP 15
                MENU "RESULTS"
                    COMMAND "ClinicalFindings"
                        "Find Findings entered from Study"  HELP 96
                        call find_cfind(citnumber)
                        call cf3winclose()
                    COMMAND "Exit" HELP 2
                        EXIT MENU
                    END MENU
            COMMAND "Ugly-View"
                "See raw data for all paper content tables"  HELP 97
                run "sperform allpaper"
            COMMAND "Discussions" HELP 16
                call empty()
            COMMAND "Exit" HELP 2
                EXIT MENU
            END MENU
        COMMAND "Keywords-Notes" HELP 52
            MENU "FIND-KEYWORDS-NOTES"
            COMMAND "Keywords"
                "Find Keyword Entries"  HELP 53
                call find_key(citnumber)
                call keywinclose()
            COMMAND "Notes"
                "Find notes to citation" HELP 54
                RUN "sperform comment"
            COMMAND "Query-all"
                "See data for citation, authors, keywords" HELP 55
                call querybib()
            COMMAND "Exit" HELP 2
                EXIT MENU
            END MENU
        COMMAND "Top-Down"
            "See all tables for a selected citation"
            call top_down() {located in tksquery.4gl}
        COMMAND "Exit" HELP 2
            EXIT MENU
        END MENU
    END FUNCTION
#####################################################################
FUNCTION select_src()
    define
        author      char(30),
        volume, vol1, auth1 char(4),
        page2, page1        char(5),
        citdate     char(2),
        t_cit           like citation.citnumb,
        len1, len2      smallint
    Message ""
    let t_cit = ""
    MENU "SELECT-FILE-BY"
        COMMAND "Author-Name" "Find by Author Name" HELP 42
        {
```

```
This needs better mechanism for:
    - situations where an authname might result in similar citfile code
    - listing of authors and possible papers similar to show_dsgn()
}

    message ""
    let sw = 0
    prompt "Last name of first author > " for author  HELP 43
        on key(interrupt)
            let sw=1
            end prompt
        let author = upshift(author)
        let auth1 = author[1,4]
    prompt "Volume Number or Chapter Number > " for volume HELP 44
        on key(interrupt)
            let sw=1
            end prompt
    prompt "First page number > " for page1 HELP 1
        on key(interrupt)
            let sw=1
            end prompt
    prompt "Last 2 digits of year > " for citdate HELP 1
        on key(interrupt)
            let sw=1
            end prompt
    let citfileno = auth1 clipped, ".",
         volume clipped, ".",
         page1 clipped, ".",
         citdate
    if sw = 1
        then
            next option "Author-Name"
        else
            select citnumb into t_cit
            from citation
                where citfile = citfileno
            if status = notfound
                then
                    error beep, "No citation entered for this paper!"
                    let t_cit = ""
                    message ""
                end if
            EXIT MENU
        end if
COMMAND "Citation-Number"
    "Select citation by number" HELP 45
    let sw = 0
    prompt "Which citation number? " for t_cit  HELP 46
        on key(interrupt)
            let sw = 1
            end prompt
    let t_cit = upshift(t_cit)
    if sw = 1
        then
            next option "Citation-Number"
        else
            select citnumb from citation
```

```
                    where citnumb = t_cit
                    if status = notfound
                        then
                            error beep, "No citation entered for this paper!"
                            let t_cit = ""
                            message ""
                        end if
                    EXIT MENU
                end if
            COMMAND "Exit"  HELP 2
                EXIT MENU
            END MENU
        return t_cit
        END FUNCTION
##########################################################################
FUNCTION delete_all(tmp_cit)
    # this is called from delete_cit when all entered papers are to be deleted.
    define
        answer char(1),
        thold, hold smallint,
        tmp_cit like citation.citnumb
    call alrt270open()
    prompt "Are you sure you want to delete this entry from all tables? (y/n) "
        for answer
    call alrt270close()
    if upshift(answer) = "Y"
        then
            select aucitnumb from authors
                where aucitnumb = tmp_cit
            union
                select keycitnumb from keywords
                    where keycitnumb = tmp_cit
            union
                select papcitnumb from paperover
                    where papcitnumb = tmp_cit
            union
                select stycitnumb from stdydsgn
                    where stycitnumb = tmp_cit
            union
                select sgcitnumb from subjgrp
                    where sgcitnumb = tmp_cit
            union
                select excitnumb from exporegm
                    where excitnumb = tmp_cit
            union
                select egcitnumb from expogrp
                    where egcitnumb = tmp_cit
            union
                select cfcitnumb from clinfind
                    where cfcitnumb = tmp_cit
            union
                select cocitnumb from tkscomment
                    where cocitnumb = tmp_cit
            if status = NOTFOUND
                then
                    delete from citation where citnumb = tmp_cit
                    clear form
```

```
        Message "ROW DELETED - no other rows!!"
            sleep 1
            Message ""
    else
        delete from citation where citnumb = tmp_cit
        clear form
        call alrt265open()
        message beep,
            "There is information in other tables with this number!"
            sleep 2
        let thold = 0
        select count(*) into hold from authors
            where aucitnumb = tmp_cit
            delete from authors
                where aucitnumb = tmp_cit
            display "" at 2,1
            display " ", hold using "##&", " author rows deleted" at 2,1
            sleep 2
        select count(*) into hold from keywords
            where keycitnumb = tmp_cit
            delete from keywords
                where keycitnumb = tmp_cit
            display "" at 2,1
            display " ", hold using "##&", " keyword rows deleted" at 2,1
            sleep 2
        select count(*) into hold from paperover
            where papcitnumb = tmp_cit
            delete from paperover
                where papcitnumb = tmp_cit
            display "" at 2,1
            display " ", hold using "##&", " paper overview rows deleted" at 2,1
            sleep 2
        select count(*) into hold from stdydsgn
            where stycitnumb = tmp_cit
            delete from stdydsgn
                where stycitnumb = tmp_cit
            display "" at 2,1
            display " ", hold using "##&", " study design rows deleted" at 2,1
            sleep 2
        select count(*) into hold from subjgrp
            where sgcitnumb = tmp_cit
            delete from subjgrp
                where sgcitnumb = tmp_cit
            display "" at 2,1
            display " ", hold using "##&", " subject group rows deleted" at 2,1
            sleep 2
        select count(*) into hold from exporegm
            where excitnumb = tmp_cit
            delete from exporegm
                where excitnumb = tmp_cit
            display "" at 2,1
            display " ", hold using "##&", " exposure regimen rows deleted" at 2,1
            sleep 2
        select count(*) into hold from expogrp
            where egcitnumb = tmp_cit
            delete from expogrp
                where egcitnumb = tmp_cit
```

```
                    display "" at 2,1
                    display " ", hold using "##&", " exposure group rows deleted" at 2,1
                    sleep 2
                select count(*) into hold from clinfind
                    where cfcitnumb = tmp_cit
                    delete from clinfind
                        where cfcitnumb = tmp_cit
                    display "" at 2,1
                    display " ", hold using "##&", " clinical finding rows deleted" at 2,1
                    sleep 2
                select count(*) into hold from tkscomment
                    where cocitnumb = tmp_cit
                    delete from tkscomment
                        where cocitnumb = tmp_cit
                    display "" at 2,1
                    display " ", hold using "##&", " comment rows deleted" at 2,1
                    sleep 2
                call alrt265close()
            end if
        else
            clear form
            message "Row NOT deleted"
                sleep 1
                message ""
            return
        end if
    END FUNCTION
```

#tksdev.4gl

```
{TITLE: tksdev.4gl
    Copyright Harold L. Trammel, 1987-1988
    University of Illiois, CVM, IAPIC
    Funded by US Army Contract DAMD-17-C-7114
    PURPOSE: to list the status of the developmental TKS
    Contains the following functions:
        versionNum()
        showstatus()
        data_dict()
        copyright()
    }

database tkstest
globals "tksglob.4gl"
##########################################################################
FUNCTION versionNum()
    {DEVELOPMENT NOTES
    1. Version Numbers 10-14-88
        TKS Version numbers should indicate the number of major
        revisions, the number of gamma level modules, the number
        of beta level module, and the number of alpha modules.

    major revisions - changes made to the majority of
        the modules these changes would reduce affected modules
        from gamma level to beta level until changes confirmed
        correct.
    gamma level     - module has been debugged to a
        reasonable level and can be used safely
        by non-programming and testing staff
    beta level      - module that have high level of
        development and programmer level debugging.
    alpha level     - initial development modules, prone
        to have bugs a' plenty

    10-14-88 version number= tks5.9g8b2a
        Citation data fully operational
        Paper Content partially operational
        Monograph Begun
        Vocabulary fully operational xc SNOVET into SNOMED
    12-25-88 version number tks6.9g8b2a
        Help messages added to all modules
    1-26-89 version number tks7.5g3b11a
        Added serial numbers to all tables, modifications to
        all modules to provide support of those numbers
    4-3-89 version number tks7.11g.5b.1a
        Supports serial numbers all the way to finding.
        Finding needs almost full revision.
    10-6-89 version number tks7.10g.5b.2b
        Vocabulary modules significantly revised; clinical finding
        }

    define
        vers char(25)
    let vers = "tks7.10g5b2a"
    return vers
```

```
    end function
#########################################################################
function showstatus()
    open window devwin at 3,4 with 18 rows, 75 columns attribute(border)
    display "STATUS - DEVELOPMENTAL TOXIN KNOWLEDGE SYSTEM" at 2,1
    display "" at 3,1
    display "main gamma"       at 4,3
    display "globals gamma"        at 4,30
    display "citation gamma"   at 6,3
    display "authors gamma"    at 6,30
    display "keywords gamma"   at 6,50
    display "query gamma"      at 8,3
    display "shows gamma"          at 8,30
    display "paperoverview gamma" at 10,3
    display "design beta"          at 10,30
    display "subjgrp beta"         at 10,50
    display "exporegm beta"        at 12,3
    display "expogrp beta"         at 12,30
    display "findings alpha"       at 12,50
    display "vocabulary alpha"  at 14,3
    display "monograph beta"    at 14,30
    display "translation gamma"     at 16,3
    display "window mgt gamma"  at 16,30
    sleep 4
    close window devwin
    end function
#########################################################################
function data_dict()
    clear screen
    display " Getting the information ... " at 10,30
        attribute(reverse)
    run "isql ikstest infotks > infotks.out"
    run "less infotks.out"
    display "" at 10,30
    end function
#########################################################################
function copyright()
    call alrt1540open()
    display "    _________ __  _____    " at 2,2 attribute(reverse)
    display "   /   |   | / /   /    " at 3,2 attribute(reverse)
    display "   |   |< <_____  " at 4,2 attribute(reverse)
    display "   |   | \\    >   " at 5,2 attribute(reverse)
    display "   _/  _/  >_______/ " at 6,2 attribute(reverse)
    display "    " at 7,2 attribute(reverse)
    display "Toxin Knowledge System ver.",versno clipped at 9,2
    display "Copyright 1988,1989 Harold L. Trammel " at 10,2
    display "    University of Illinois     " at 11,2
    display "    Funded by  " at 13,2
    display "  US Army Contract DAMD17-C-87-7114     " at 14,2
    sleep 5
    call alrt1540close()
    end function
```

#tkswinmg.4gl

{TITLE: tkswinmg.4gl
Copyright Harold L. Trammel, 1987-1988
University of Illiois, CVM, IAPIC
Funded by US Army Contract DAMD-17-C-7114

Purpose: central file to hold window management functions for entire program

Contains the following functions:

- alrt1940open()
- alrt1940close()
- alrt260open()
- alrt260close()
- alrt270open()
- alrt270close()
- alrt260p1op()
- alrt260p1cl()
- alrt265open()
- alrt265close()
- alrt1540open()
- alrt1540close()
- alrt875open()
- alrt875close()
- qwinopen()
- qwinclose()
- auwinopen()
- auwinclose()
- keywinclose()
- keywinopen()
- cwinopen()
- cwinclose()
- papwinopen()
- papwinclose()
- dsgnwinopen()
- dsgnwinclose()
- expwinopen()
- expwinclose()
- swinopen()
- swinclose()
- linkwinopen()
- linkwinclose()
- exgpwinopen()
- exgpwinclose()
- dscwinopen()
- dscwinclose()
- cfwinopen()
- cfwinclose()
- cf1winopen()
- cf1winclose()
- cf2winopen()
- cf2winclose()
- cf3winopen()
- cf3winclose()
- alrt1078open()
- alrt1078close()

```
    morphwinopen()
    morphwinclose()
    sitewinopen()
    sitewinclose()
    labwinopen()
    labwinclose()
    signwinopen()
    signwinclose()
    synwinopen()
    synwinclose()
}

database tkstest
globals "tksglob.4gl"

########################################################################
FUNCTION alrt1940open()
if a1940_flag <>1
    then
        open window alrt1940 at 4,20 with 19 rows, 40 columns
            attribute (border, reverse, prompt line last -1)
        let a1940_flag = 1
    else
        current window is alrt1940
end if
end function

########################################################################
FUNCTION alrt1940close()
if a1940_flag =1
    then
        close window alrt1940
        let a1940_flag = 0
end if
END FUNCTION

########################################################################
FUNCTION alrt260open()
if a260_flag <>1
    then
        open window alrt260 at 10,10 with 2 rows, 60 columns
            attribute (border,reverse)
        let a260_flag = 1
    else
        current window is alrt260
end if
end function

########################################################################
FUNCTION alrt260close()
if a260_flag =1
    then
        close window alrt260
        let a260_flag = 0
end if
END FUNCTION
```

```
#########################################################################
FUNCTION alrt270open()
if a270_flag <>1
    then
        open window alrt270 at 10,5 with 2 rows, 70 columns
            attribute (border,reverse)
        let a270_flag = 1
    else
        current window is alrt270
end if
end function

#########################################################################
FUNCTION alrt270close()
if a270_flag =1
    then
        close window alrt270
        let a270_flag = 0
end if
END FUNCTION

#########################################################################
FUNCTION alrt260p1op()
if a260p_flag <>1
    then
        open window alrt260p1 at 10,10 with 2 rows, 60 columns
            attribute (border,reverse, prompt line first+1)
        let a260p_flag = 1
    else
        current window is alrt260p1
end if
end function

#########################################################################
FUNCTION alrt260p1cl()
if a260p_flag =1
    then
        close window alrt260p1
        let a260p_flag = 0
end if
END FUNCTION

#########################################################################
FUNCTION alrt265open()
if a265_flag <>1
    then
        open window alrt265 at 10,7 with 2 rows, 65 columns
            attribute (border,reverse)
        let a265_flag = 1
    else
        current window is alrt265
end if
end function

#########################################################################
FUNCTION alrt265close()
if a265_flag =1
```

```
    then
        close window alrt265
        let a265_flag = 0
end if
END FUNCTION

#####################################################################
FUNCTION alrt1540open()
if a1540_flag <>1
    then
        open window alrt1540 at 5,20 with 15 rows, 40 columns
            attribute (border)
        let a1540_flag = 1
    else
        current window is alrt1540
end if
end function

#####################################################################
FUNCTION alrt1540close()
if a1540_flag =1
    then
        close window alrt1540
        let a1540_flag = 0
end if
END FUNCTION

#####################################################################
FUNCTION alrt875open()
if a875_flag <>1
    then
        open window alrt875 at 5,2 with 8 rows, 75 columns
            attribute (border)
        let a875_flag = 1
    else
        current window is alrt875
end if
end function

#####################################################################
FUNCTION alrt875close()
if a875_flag =1
    then •
        close window alrt875
        let a875_flag = 0
end if
END FUNCTION

#####################################################################
FUNCTION qwinopen()
display "" at 2,2
if qw_flag <>1
    then
        open window querywin at 2,2 with form "querybib"
            attribute(border)
        let qw_flag = 1
        display "" at 1,1
```

```
        display "" at 2,2
    else
        current window is querywin
        display "" at 1,1
        display "" at 2,2
end if
end FUNCTION

#########################################################################
FUNCTION qwinclose()
display "" at 2,2
if qw_flag = 1
    then
        close window querywin
        let qw_flag = 0
end if
end FUNCTION


#########################################################################
FUNCTION auwinopen()
display "" at 2,2

if aw1_flag <> 1
    then
        OPEN WINDOW auwin1 at 12,3 WITH FORM "tksauth"
            ATTRIBUTE (border)
        let aw1_flag = 1
        display "" at 1,1
        display "" at 2,2
    else
        current window is auwin1
        display "" at 1,1
        display "" at 2,2
end if
end function

#########################################################################
FUNCTION auwinclose()

display "" at 2,2
if aw1_flag = 1
    then close window auwin1
        let aw1_flag = 0
end if
end function


#########################################################################
FUNCTION keywinclose()
display "" at 2,2
    if kw1_flag = 1
        then
            close window kewin1
            let kw1_flag = 0
            end if
end function
```

```
#####################################################################
FUNCTION keywinopen()
display "" at 2,2
    if kw1_flag <> 1
    then
        OPEN WINDOW kewin1 at 4,29 WITH 18 rows, 50 columns
            ATTRIBUTE (border)
        open form k_wrds from "tkskey"
        display form k_wrds
        let kw1_flag = 1
        display "" at 1,1
        display "" at 2,2
    else
        current window is kewin1
        display "" at 1,1
        display "" at 2,2
        display "" at 16,2
    end if
end function

#####################################################################
FUNCTION cwinopen()
display "" at 2,2
    if cw_flag <> 1
    then
        OPEN WINDOW cit1 at 2,2 WITH FORM "tkscit" ATTRIBUTE (BORDER)
        let cw_flag = 1
        display "" at 1,1
        display "" at 2,2
    else
        current window is cit1
        display "" at 1,1
        display "" at 2,2
    end if
end function


#####################################################################
FUNCTION cwinclose()
display "" at 2,2
    if cw_flag = 1
    then
        close window cit1
        let cw_flag = 0
        end if
end function


#####################################################################
FUNCTION papwinopen()
display "" at 2,2
    if papwin_flag <> 1
    then
        open window paperwin at 2,2 with form "tkspaper"
            attribute(border)
```

```
        let papwin_flag = 1
        display "" at 1,1
        display "" at 2,2
    else
        current window is paperwin
        display "" at 1,1
        display "" at 2,2
end if
end FUNCTION


#####################################################################
FUNCTION papwinclose()
display "" at 2,2
if papwin_flag = 1
    then
        close window paperwin
        let papwin_flag = 0
end if
end FUNCTION


#####################################################################
FUNCTION dsgnwinopen()
display "" at 2,2
    if dsgnwin_flag <> 1
    then
        open window dsgnwin at 2,2 with form "tksdsgn"
            attribute(border)
        let dsgnwin_flag = 1
        display "" at 1,1
        display "" at 2,2
    else
        current window is dsgnwin
        display "" at 1,1
        display "" at 2,2
end if
end FUNCTION


#####################################################################
FUNCTION dsgnwinclose()
display "" at 2,2
if dsgnwin_flag = 1
    then
        close window dsgnwin
        let dsgnwin_flag = 0
end if
end FUNCTION


#####################################################################
FUNCTION expwinopen()
display "" at 2,2
    if e   in_flag <> 1
    th
        pen window expowin at 2,2 with form "tksexpo"
```

```
            attribute(border)
          let expwin_flag = 1
          display "" at 1,1
          display "" at 2,2
     else
         current window is expowin
         display "" at 1,1
         display "" at 2,2
     end if
end FUNCTION


#####################################################################
FUNCTION expwinclose()
display "" at 2,2
if expwin_flag = 1
     then
         close window expowin
         let expwin_flag = 0
end if
end FUNCTION


#####################################################################
FUNCTION swinopen()
display "" at 2,2
     if sg_flag <> 1
     then
         OPEN WINDOW sgrp1 at 2,2 WITH FORM "tkssubj" ATTRIBUTE (BORDER)
         let sg_flag = 1
         display "" at 1,1
         display "" at 2,2
     else
         current window is sgrp1
         display "" at 1,1
         display "" at 2,2
     end if
end function


#####################################################################
FUNCTION swinclose()
display "" at 2,2
     if sg_flag <> 1
     then
         close window sgrp1
         let sg_flag = 0
         end if
end function


#####################################################################
FUNCTION linkwinopen()
display "" at 2,2
     if linkwin_flag <> 1
     then
         open window linkwin at 2,2 with form "tkseg1"
```

```
            attribute(border)
          let linkwin_flag = 1
          display "" at 1,1
          display "" at 2,2
     else
         current window is linkwin
         display "" at 1,1
         display "" at 2,2
     end if
end FUNCTION


#########################################################################
FUNCTION linkwinclose()
display "" at 2,2
if linkwin_flag = 1
     then
         close window linkwin
         let linkwin_flag = 0
         display "" at 1,1
         display "" at 2,2
end if
end FUNCTION

#########################################################################
FUNCTION exgpwinopen()
display "" at 2,2
     if exgpwin_flag <> 1
     then
         open window exgpwin at 5,3 with form "tkseg2"
             attribute(border)
          let exgpwin_flag = 1
          display "" at 1,1
          display "" at 2,2
     else
         current window is exgpwin
         display "" at 1,1
         display "" at 2,2
     end if
end FUNCTION


#########################################################################
FUNCTION exgpwinclose()
display "" at 2,2
if exgpwin_flag = 1
     then
         close window exgpwin
         let exgpwin_flag = 0
end if
end FUNCTION


#########################################################################
FUNCTION dscwinopen()
display "" at 2,2
     if dscwin_flag <> 1
```

```
    then
        open window dscwin at 10,3 with 10 rows, 65 columns
            attribute(border)
         let dscwin_flag = 1
         display "" at 1,1
         display "" at 2,2
     else
        current window is dscwin
        display "" at 1,1
        display "" at 2,2
    end if
end FUNCTION


#########################################################################
FUNCTION dscwinclose()
display "" at 2,2
if dscwin_flag = 1
    then
        close window dscwin
        let dscwin_flag = 0
end if
end FUNCTION

#########################################################################
FUNCTION cfwinopen()
display "" at 2,2
if cfwin_flag <>1
    then
        open window cfind1 at 2,2  with form "tk3cf"
            attribute(border)
        let cfwin_flag = 1
        display "" at 1,1
        display "" at 2,2
    else
        current window is cfind1
        display "" at 1,1
        display "" at 2,2
end if
end FUNCTION


#########################################################################
FUNCTION cfwinclose()
display "" at 2,2
if cfwin_flag = 1
    then
        close window cfind1
        let cfwin_flag = 0
end if
END FUNCTION


#########################################################################
FUNCTION cf1winopen()
display "" at 2,2
if cf1win_flag <>1
```

```
    then
        open window cfind1 at 2,2  with form "tkscf1"
            attribute(border)
        let cf1win_flag = 1
        display "" at 1,1
        display "" at 2,2
    else
        current window is cfind1
        display "" at 1,1
        display "" at 2,2
end if
end FUNCTION


#########################################################################
FUNCTION cf1winclose()
display "" at 2,2
if cf1win_flag = 1
    then
        close window cfind1
        let cf1win_flag = 0
end if
END FUNCTION


#########################################################################
FUNCTION cf2winopen()
display "" at 2,2
if cf2win_flag <>1
    then
        open window cfind2 at 2,2  with form "tkscf2"
            attribute(border)
        let cf2win_flag = 1
        display "" at 1,1
        display "" at 2,2
    else
        current window is cfind2
        display "" at 1,1
        display "" at 2,2
end if
end FUNCTION


#########################################################################
FUNCTION cf2winclose()
display "" at 2,2
if cf2win_flag = 1
    then
        close window cfind2
        let cf2win_flag = 0
end if
END FUNCTION


#########################################################################
FUNCTION cf3winopen()
display "" at 2,2
```

```
if cf3win_flag <>1
    then
        open window cfind3 at 2,2  with form "tkscf3"
            attribute(border)
        let cf3win_flag = 1
        display "" at 1,1
        display "" at 2,2
    else
        current window is cfind3
        display "" at 1,1
        display "" at 2,2
end if
end FUNCTION


#########################################################################
FUNCTION cf3winclose()
display "" at 2,2
if cf3win_flag = 1
    then
        close window cfind3
        let cf3win_flag = 0
end if
END FUNCTION

#########################################################################
FUNCTION alrt1978open()

if a1978_flag <>1
    then
        open window alrt1978 at 2,2 with 19 rows, 78 columns
            attribute (border)
        let a1978_flag = 1
    else
        current window is alrt1978
end if
end function

#########################################################################
FUNCTION alrt1978close()
if a1978_flag = 1 then
    close window alrt1978
    let a1978_flag = 0
end if
END FUNCTION

#########################################################################
FUNCTION alrt1078open()

if a1078_flag <>1
    then
        open window alrt1078 at 12,2 with 10 rows, 78 columns
            attribute (border)
        let a1078_flag = 1
    else
        current window is alrt1078
end if
```

```
end function

#########################################################################
FUNCTION alrt1078close()
if a1078_flag = 1 then
    close window alrt1078
    let a1078_flag = 0
end if
END FUNCTION

#########################################################################
FUNCTION morphwinopen()
display "" at 2,2
    if morph_flag <> 1
    then
        OPEN WINDOW morph at 2,2 WITH FORM "vocmorph" ATTRIBUTE (BORDER)
        let morph_flag = 1
        display "" at 1,1
        display "" at 2,2
    else
        current window is morph
        display "" at 1,1
        display "" at 2,2
    end if
end function


#########################################################################
FUNCTION morphwinclose()
display "" at 2,2
    if morph_flag = 1
    then
        close window morph
        let morph_flag = 0
        end if
end function

#########################################################################
FUNCTION sitewinopen()
display "" at 2,2
    if site_flag <> 1
    then
        OPEN WINDOW site at 2,2 WITH FORM "vocsite" ATTRIBUTE (BORDER)
        let site_flag = 1
        display "" at 1,1
        display "" at 2,2
    else
        current window is site
        display "" at 1,1
        display "" at 2,2
    end if
end function


#########################################################################
FUNCTION sitewinclose()
display "" at 2,2
```

```
    if site_flag = 1
    then
        close window site
        let site_flag = 0
        end if
end function

#####################################################################
FUNCTION labwinopen()
display "" at 2,2
    if lab_flag <> 1
    then
        OPEN WINDOW lab at 2,2 WITH FORM "voclab" ATTRIBUTE (BORDER)
        let lab_flag = 1
        display "" at 1,1
        display "" at 2,2
    else
        current window is lab
        display "" at 1,1
        display "" at 2,2
    end if
end function


#####################################################################
FUNCTION labwinclose()
display "" at 2,2
    if lab_flag = 1
    then
        close window lab
        let lab_flag = 0
        end if
end function

#####################################################################
FUNCTION signwinopen()
display "" at 2,2
    if sign_flag <> 1
    then
        OPEN WINDOW sign at 2,2 WITH FORM "vocsign" ATTRIBUTE (BORDER)
        let sign_flag = 1
        display "" at 1,1
        display "" at 2,2
    else
        current window is sign
        display "" at 1,1
        display "" at 2,2
    end if
end function


#####################################################################
FUNCTION signwinclose()
display "" at 2,2
    if sign_flag = 1
    then
        close window sign
```

```
        let sign_flag = 0
        end if
end function

#########################################################################
FUNCTION synwinopen()
display "" at 2,2
    if syn_flag <> 1
    then
        OPEN WINDOW syn at 2,2 WITH FORM "tkssynls" ATTRIBUTE (BORDER)
        let syn_flag = 1
        display "" at 1,1
        display "" at 2,2
    else
        current window is syn
        display "" at 1,1
        display "" at 2,2
    end if
end function


#########################################################################
FUNCTION synwinclose()
display "" at 2,2
    if syn_flag = 1
    then
        close window syn
        let syn_flag = 0
        end if
end function
```

#tkscit.4gl

```
{TITLE: tkscit.4gl
Copyright Harold L. Trammel, 1987-1988
University of Illiois, CVM, IAPIC
Funded by US Army Contract DAMD-17-C-7114
Contains the following FUNCTIONs:
    add_cit(argcit)
    find_cit(t_cit)
    view_cit()
    update_cit(tmp_citserial)
    delete_cit(tmp_citserial)
    distitle()
    see_journ()
    see_book()
    get_auth1()
    citnumb_exists(c_num)
    citfile_exists(c_file)
    exist_citnumb(c_cit)
    exist_citfile(c_cit)
    }
DATABASE tkstest
GLOBALS "tksglob.4gl"
##############################################################################
FUNCTION add_cit(argcit)
    DEFINE
        ctitle1, ctitle2, ctitle3, ctitle4 char(63),
        cpage1, cpage2, cpage3, tmp_page char(5),
        cvol, thisyear char(4),
        len1, len2, len3, x, y  smallint,
        tmp_auth    like authors.authname,
        tmpname     char(60),
        tmp_add     char(2),
        argcit like citation.citnumb,
        argfile like citation.citfile,
        cc          integer,
        auth1 like authors.authname
    #initial screen setup
        call cwinopen()
        CLEAR FORM
        display "" at 15,2
        let sw = 0
        display "0" to authors
        display "0" to keywords
        display "0" to paperover
        display "0" to designs
        display "0" to subjects
        display "0" to exposures
    call get_auth1() returning auth1
    options input wrap,
            help file "tkshelp.msg",
            help key CONTROL-n
    INPUT
        T_citation.citsource,
        T_citation.citlocate,
        T_citation.entrydate,
        T_citation.citvol,
```

```
        cpage1, cpage2,
        T_citation.citdate,
        T_citation.citnumb,
        T_citation.citfile,
        ctitle1, ctitle2, ctitle3, ctitle4
        FROM
            citsource, citlocate, entrydate, citvol, citpage, cp2,
            citdate, citnumb, citfile, cittitle, ct2, ct3, ct4
        ON Key(interrupt)
            let sw = 1
            exit input
        ON Key(control-w)
            case
                when infield(citnumb)
                    call showhelp(112)
                when infield(citsource)
                    call showhelp(100)
                when infield(citlocate)
                    call showhelp(101)
                when infield(citvol)
                    call showhelp(102)
                when infield(citpage)
                    call showhelp(103)
                when infield(cp2)
                    call showhelp(103)
                when infield(citdate)
                    call showhelp(104)
                when infield(cittitle)
                    call showhelp(105)
                end case

        before field citsource
            MESSAGE "Enter source code OR journal> F5/Cntl-F, book> F6/Cntl-B, Help> Ctrl-w."
            ON Key(F5,CONTROL-F)
                if infield(citsource) then
                    let T_citation.citsource= see_journ()
                    OPTIONS help key CONTROL-W
                    next field citsource
                    end if
            ON Key(F6,CONTROL-B)
                if infield(citsource) then
                    let T_citation.citsource= see_book()
                    next field citsource
                    end if
        after field citsource
            message ""
            case
                when T_citation.citsource[1,1] = "J"
                    select jabrv into tmpname from journlst
                        where journlst.jcode = T_citation.citsource
                        if status=NOTFOUND then
                            ERROR "Not currently in vocabulary"
                            next field citsource
                            end if
                    display by name tmpname
                    exit case
```

```
            when T_citation.citsource[1,1] = "B"
                select bname into tmpname from booklst
                    where booklst.bcode = T_citation.citsource
                    if status=NOTFOUND then
                        ERROR "Not currently in vocabulary"
                        next field citsource
                        end if
                display by name tmpname
                exit case
            otherwise
                ERROR "Not a Journal or Book! ! !"
                next field citsource
                exit case
            END case
    before field citvol
        let cvol = "0000"
    after field citvol
        let len1 = length(T_citation.citvol)-1
        let cvol[4-len1,4]  = T_citation.citvol
        display by name T_citation.citvol
    before field citpage
        let cpage3 = "00000"
    after field citpage
        let len2 = length(cpage1)-1
        let x = cpage1
        let cpage3[5-len2,5] = cpage1
        display cpage1 to citpage
        let T_citation.citpage = cpage1 clipped, "-"
    after field cp2
        let y = cpage2
        let len3 = length(cpage2)-1
        let T_citation.citpage = T_citation.citpage clipped, cpage2
        if y < x
            then error beep, "Last page less than first page!!!"
                next field citpage
            end if
        display cpage2 to cp2
    after field citdate
        let thisyear = year(today) using "####"
        if T_citation.citdate < "1000" or T_citation.citdate > thisyear
            then
                ERROR beep, "Not a valid year! ! !"
                next field citdate
            else
                let T_citation.citnumb = T_citation.citsource clipped,"-",
                    cvol,"-",
                    cpage3,"-",
                    T_citation.citdate
                display by name T_citation.citnumb
            end if
    after field citnumb
        if T_citation.citnumb is not null
            then
                let argcit = T_citation.citnumb clipped,"%"
                call exist_citnumb(argcit) returning cnt
                if cnt >= 1 then
                    call citnumb_exists(argcit)
```

```
                    current window is cit1
                    display "" at 1,1
                    end if
                let tmp_add = " "
                if length(T_citation.citnumb) > 22
                    then let tmp_add = ".",T_citation.citnumb[24]
                    end if
                let T_citation.citfile = auth1[1,4] clipped,".",
                    T_citation.citvol clipped,".",
                    cpage1 clipped,".",
                    T_citation.citdate[3, 4],
                    tmp_add
                display by name T_citation.citfile
            else
                error beep,"Must have citation number!"
                next field citdate
            end if
        after field citfile
            if T_citation.citfile is not null
                then
                    let argfile = T_citation.citfile clipped, "%"
                    call exist_citfile(argcit) returning cnt
                    if cnt >= 1 then
                        call citfile_exists(argfile)
                        current window is cit1
                        display "" at 1,1
                        end if
                else
                    error beep, "Must have citation file number!"
                    next field citdate
                end if
        after input
            let T_citation.cittitle = ctitle1, ctitle2, ctitle3, ctitle4[1,61]
            let T_citation.citserial = 0
        END INPUT
    options help key control-w
    if sw = 1 then return end if
    insert into citation values (T_citation.*)
    let cc= status
        if cc < 0 then
            error cc
            return
            end if
    MESSAGE "Row added"
        SLEEP 1
        MESSAGE ""
    END FUNCTION
###############################################################################
FUNCTION find_cit(t_cit)
    define t_cit like citation.citnumb
    call cwinopen()
    case
        when t_cit is null
            OPTIONS input wrap,
            HELP file "tkshelp.msg"
            clear form
            let int_flag = 0
```

```
            construct
                query1 on citnumb, citsource, citfile, citlocate,
                    citvol, citpage, citdate, cittitle
                from citnumb, citsource, citfile, citlocate, citvol,
                    citpage, citdate, cittitle
            prompt "For Journal codes <F5>, Bookcodes <F6>, else <Return> "
                for answer
                on key(F5,CONTROL-F)
                    call see_journ()
                on key(F6,CONTROL-B)
                    call see_book()
                end prompt
            if int_flag <>0 then return end if
            let select1 = "select * from citation where ",
                query1 clipped
            let select2 = "select count(*) from citation where ",
                query1 clipped
            exit case
        otherwise
            let select1 = "select * from citation where ",
                " citnumb = ", quote, t_cit, quote
            let select2 = "select count(*) from citation where ",
                " citnumb = ", quote, t_cit, quote
            exit case
        end case
    prepare cit_find from select1
    prepare cit_cnt from select2
    display " Searching... " at 15,2 attribute(reverse)
    declare cit_curs cursor for cit_cnt
    foreach cit_curs into cnt end foreach
    declare c_curs SCROLL CURSOR FOR cit_find
    open c_curs
    CALL view_cit()
    END FUNCTION
#####################################################################
FUNCTION view_cit()
    define
        arg like citation.citnumb,
        cc integer
    FETCH FIRST c_curs into T_citation.*
        if status = NOTFOUND
            THEN
                MESSAGE "No citation found."
                    SLEEP 1
                    MESSAGE ""
            ELSE
                CALL distitle()
                let tmp_cnt = 1
                display "" at 15,2
                display " ", cnt, " rows found." at 15, 2 attribute(reverse)
            end if
    MENU "BROWSE"
        COMMAND "Next"
            "View the next Citation in the list." HELP 170
            display " Searching ..." at 15,50 attribute(reverse)
            FETCH NEXT c_curs INTO T_citation.*
            let tmp_cnt = tmp_cnt +1
```

```
        IF status = NOTFOUND THEN
            MESSAGE "No more Citations in this direction."
            SLEEP 1
            let tmp_cnt = cnt
            MESSAGE ""
            FETCH LAST c_curs INTO T_citation.*
            END IF
        call distitle()
        display "" at 15,2
        display " ",tmp_cnt, " of ", cnt, " rows" at 15,2
            attribute(reverse)
    COMMAND "Previous"
        "View the Previous Citation in the list." HELP 170
        display " Searching ..." at 15,50 attribute(reverse)
        FETCH PREVIOUS c_curs INTO T_citation.*
        let tmp_cnt = tmp_cnt - 1
        IF status = NOTFOUND THEN
            MESSAGE "No more Citations in this direction."
            SLEEP 1
            MESSAGE ""
            let tmp_cnt = 1
            FETCH FIRST c_curs INTO T_citation.*
            END IF
        call distitle()
        display " ",tmp_cnt, " of ", cnt, " rows" at 15,2
            attribute(reverse)
    COMMAND "First"
        "View the first Citation in the list." HELP 170
        display " Searching ..." at 15,50 attribute(reverse)
        FETCH FIRST c_curs INTO T_citation.*
        let tmp_cnt = 1
        call distitle()
        display " ",tmp_cnt, " of ", cnt, " rows" at 15,2
            attribute(reverse)
    COMMAND "Last"
        "View the Last Citation in the list." HELP 170
        display " Searching ..." at 15,50 attribute(reverse)
        message "Searching for last record...."
        FETCH LAST c_curs INTO T_citation.*
        let tmp_cnt = cnt
        message ""
        call distitle()
        display " ",tmp_cnt, " of ", cnt, " rows" at 15,2
            attribute(reverse)
    command "Update"
        "Update citation data" HELP 171
        call update_cit(T_citation.citserial)
    command "Delete"
        "Delete this entry from database <submenu>" HELP 172
        menu "DELETE-JOURNAL-CIT"
            command "This-Table"
                "Delete just the data in the citation table" HELP 174
                call delete_cit(T_citation.citserial)
                exit menu
            command "All-Tables"
                "Delete all information in database related to this entry <DANGER>!" HELP 175
                call delete_all(T_citation.citnumb)
```

```
                exit menu
            command "Exit"
                "Exit Delete Submenu" HELP 2
                exit menu
            end menu
        COMMAND "Query-Again"
            "Enter new search criteria" HELP 176
            close c_curs
            let citnumber = ""
            call find_cit(citnumber)
            exit menu
        COMMAND "Exit"
            "Leave this menu" HELP 2
            close c_curs
            EXIT MENU
        END MENU
    END FUNCTION
###############################################################################
FUNCTION update_cit(tmp_citserial)
    DEFINE
        ctitle1, ctitle2, ctitle3, ctitle4 char(63),
        cpage1, cpage2, tmp_page char(5),
        cvol    char(4),
        citvol char(4),
        tmp_add    char(2),
        jnme        like journlst.jabrv,
        bnme   like booklst.bname,
        tmp_auth   like authors.authname,
        argcit like citation.citnumb,
        argfile like citation.citfile,
        tmp_citnum like citation.citnumb,
        tmp_citfile like citation.citfile,
        c_cnt   smallint,
        len1, len2, len3 smallint,
        cc, tmp_citserial     integer
    #Initial setup
        MESSAGE ""
        let sw = 0
        let len1 = length(T_citation.citpage)
        for x = 1 to len1
            if T_citation.citpage[x] = "-" then
                let cpage1 = T_citation.citpage[1,x-1]
                if len1 > x
                    then
                        let cpage2 = T_citation.citpage[x+1,len1]
                    else
                        let cpage2 = "?"
                    end if
                exit for
                end if
            end for
        let tmp_citfile = T_citation.citfile
        let tmp_citnum = T_citation.citnumb
        let ctitle1 = T_citation.cittitle[1,63]
        let ctitle2 = T_citation.cittitle[64,126]
        let ctitle3 = T_citation.cittitle[127,189]
        let ctitle4 = T_citation.cittitle[190,250]
```

```
    options input wrap,
        help file "tkshelp.msg",
        help key control-n
    INPUT
        T_citation.citsource,
        T_citation.citlocate,
        T_citation.citvol,
        cpage1, cpage2,
        T_citation.citdate,
        T_citation.citnumb,
        T_citation.citfile
        ctitle1, ctitle2, ctitle3, ctitle4
        WITHOUT DEFAULTS
        FROM
            citsource,citlocate,citvol,citpage,cp2,
            citdate, citnumb,citfile,cittitle, ct2, ct3, ct4
        on key(interrupt)
            let sw = 1
            exit input
        ON Key(control-w)
            case
                when infield(citnumb)
                    call showhelp(112)
                when infield(citsource)
                    call showhelp(100)
                when infield(citlocate)
                    call showhelp(101)
                when infield(citvol)
                    call showhelp(102)
                when infield(citpage)
                    call showhelp(103)
                when infield(cp2)
                    call showhelp(103)
                when infield(citdate)
                    call showhelp(104)
                when infield(cittitle)
                    call showhelp(105)
                end case

        before field citsource
            MESSAGE "Enter source code OR press F5 for journal, F6 for book help."
            ON Key(F5,CONTROL-F)
                if infield(citsource) then
                    let T_citation.citsource = see_journ()
                    next field citsource
                    end if
            ON Key(F6,CONTROL-B)
                if infield(citsource) then
                    call see_book() returning T_citation.citsource
                    next field citsource
                    end if
        after field citsource
            if T_citation.citsource[1,1] = "J"
                then
                    select jabrv into jnme from journlst
                        where journlst.jcode = T_citation.citsource
                        display jnme to tmpname
```

```
        else
            select bname into bnme from booklst
                where booklst.bcode = T_citation.citsource
                display bnme to tmpname
        end if
before field citvol
    for x = 1  to 4
        if T_citation.citvol[x] <> "0" then
            let T_citation.citvol = T_citation.citvol[x,4]
            display by name T_citation.citvol
            exit for
            end if
        end for
    let cvol = "0000"
after field citvol
    let len1 = length(T_citation.citvol)-1
    let cvol[4-len1,4] = T_citation.citvol
    display by name T_citation.citvol
before field citpage
    if cpage1[1] = "0" then
        for x = 1 to 5
            if cpage1[x] <> "0" then
                let cpage1 = cpage1[x,5]
                let tmp_page = cpage1
                display tmp_page to citpage
                exit for
                end if
            end for
        end if
after field citpage
    let T_citation.citpage = cpage1
    let len2 = length(T_citation.citpage)-1
    let cpage1 = "00000"
    let cpage1[5-len2,5] = T_citation.citpage
    let tmp_page = T_citation.citpage
    display T_citation.citpage to citpage
    let T_citation.citpage = T_citation.citpage clipped, "-"
before field cp2
    if cpage2[1] = "0" then
        for x = 1 to 5
            if cpage2[x] <> "0" then
                let cpage2 = cpage2[x,5]
                display cpage2 to cp2
                exit for
                end if
            end for
        end if
after field cp2
    if cpage2 < cpage1
        then
            error beep, "Last page less than first page!!!"
            next field citpage
        else
            display cpage2 to cp2
            let T_citation.citpage =
                T_citation.citpage clipped, cpage2 clipped
        end if
```

```
        after field citdate
            let T_citation.citnumb = T_citation.citsource clipped,"-",
                cvol,"-",
                cpage1,"-",
                T_citation.citdate
            display T_citation.citnumb to citnumb
        after field citnumb
            if T_citation.citnumb is null
                then
                    error beep, "Must have citation number!"
                    next field citdate
                else
                    if T_citation.citnumb <> tmp_citnum
                        then
                            let argcit = T_citation.citnumb clipped,"%"
                            select count(*) into cnt from citation
                                where citnumb like argcit
                            if cnt >= 1
                                then
                                    call citnumb_exists(argcit)
                                    current window is cit1
                                    display "" at 1,1
                                end if
                        end if
                    select authnam  into tmp_auth
                        from authors
                        where aucitnumb = tmp_citnum
                        and authsig = 1
                        if status = NOTFOUND
                            then let tmp_auth = "ANON"
                            end if
                    for x = 2 to 4
                        if tmp_auth[x] = " "
                            then
                                let tmp_auth = tmp_auth[1,x-1]
                                exit for
                            end if
                        end for
                    if length(T_citation.citnumb) > 22
                        then let tmp_add = ".",T_citation.citnumb[24]
                        end if
                    let T_citation.citfile = tmp_auth[1,4] clipped,".",
                        T_citation.citvol clipped,".",
                        tmp_page clipped,".",
                        T_citation.citdate[3, 4],
                        tmp_add
                    display by name T_citation.citfile
                end if
        after field citfile
            if T_citation.citfile is null
                then
                    error beep, "Must have citation file number!"
                    next field citdate
                else
                    if T_citation.citfile <> tmp_citfile
                        then
                            let argfile = T_citation.citfile clipped, "%"
```

```
                    select count(*) into cnt from citation
                        where citfile like argfile
                    if cnt >= 1
                        then
                            call citfile_exists(argfile)
                            current window is cit1
                            display "" at 1,1
                        end if
                end if
            end if
        after input
            let T_citation.cittitle = ctitle1,ctitle2,ctitle3,ctitle4[1,61]
        END INPUT
    options help key control-w
    if sw = 1 then return end if
    UPDATE citation set citation.* = T_citation.*
        where citation.citserial = tmp_citserial
        # update other tables
            UPDATE authors
                set aucitnumb = T_citation.citnumb,
                    aucitfile = T_citation.citfile
                where aucitnumb = tmp_citnum
            UPDATE keywords
                set keycitnumb = T_citation.citnumb,
                    keycitfile = T_citation.citfile
                where keycitnumb = tmp_citnum
            UPDATE paperover
                set papcitnumb = T_citation.citnumb,
                    papcitfile = T_citation.citfile
                where papcitnumb = tmp_citnum
            UPDATE stdydsgn
                set stycitnumb = T_citation.citnumb,
                    stycitfile = T_citation.citfile
                where stycitnumb = tmp_citnum
            UPDATE subjgrp
                set sgcitnumb = T_citation.citnumb
                where sgcitnumb = tmp_citnum
            UPDATE exporegm
                set excitnumb = T_citation.citnumb
                where excitnumb = tmp_citnum
            UPDATE expogrp
                set egcitnumb = T_citation.citnumb
                where egcitnumb = tmp_citnum
            UPDATE clinfind
                set cfcitnumb = T_citation.citnumb
                where cfcitnumb = tmp_citnum
            UPDATE tkscomment
                set cocitnumb = T_citation.citnumb,
                    cocitfile = T_citation.citfile
                where cocitnumb = tmp_citnum
        MESSAGE "Row updated"
            SLEEP 1
            MESSAGE ""
    let citnumber = T_citation.citnumb
    # Author data update option
        call auwinopen()
        call see_auth(citnumber)
```

```
        prompt "Do you want to update authors? (y/n) " for char answer
        if upshift(answer) = "Y" then
            call update_auth(citnumber)
            call auwinclose()
            end if
    # Keyword data update option
        let citnumber = T_citation.citnumb
        call keywinopen()
        call see_keys(citnumber)
        prompt "Do you want to update keywords? (y/n) " for char answer
        if upshift(answer) = "Y" then
            call update_key(citnumber)
            call keywinclose()
        end if
    end FUNCTION
##########################################################################
FUNCTION delete_cit(tmp_citserial)
    Define answer char(1),
        tmp_citserial integer

        PROMPT "Are you sure you want to delete this entry? (y/n) " for answer
        IF upshift(answer) = "N"
            then
                CLEAR FORM
                MESSAGE "Row NOT deleted."
                sleep 1
                MESSAGE ""
                RETURN
            else
                DELETE FROM citation where citserial = tmp_citserial
                clear form
                MESSAGE "Row deleted."
                SLEEP 1
                MESSAGE ""
            end if
    END FUNCTION
##########################################################################
FUNCTION distitle()
    define
        ctit1,ctit2,ctit3,ctit4  char(63),
        cpg1, cpg2 char(5),
        len1 smallint,
        authors,keywords,paperover,designs smallint,
        subjects,exposures,signs  smallint,
        tmp_name  char(60)
    current window is cit1
    let ctit1 = T_citation.cittitle[1,63]
    let ctit2 = T_citation.cittitle[64,126]
    let ctit3 = T_citation.cittitle[127,189]
    let ctit4 = T_citation.cittitle[190,250]
    let len1 = length(T_citation.citpage)
    if len1 > 0 then
        for x = 1 to len1
            if T_citation.citpage[x] = "-" then
                let cpg1 = T_citation.citpage[1,x-1]
                if len1 > x
                  then
```

```
                let cpg2 = T_citation.citpage[x+1,len1]
            else
                let cpg2 = "?"
            end if
            exit for
        end if
    end for
    end if
        if T_citation.citsource[1,1] = "J"
            then
            select jabrv into tmp_name from journlst
                where jcode = T_citation.citsource
        else
            select bname into tmp_name from booklst
                where bcode = T_citation.citsource
        end if
        display
            T_citation.citnumb,
            T_citation.citsource,
            T_citation.citfile,
            T_citation.citlocate,
            T_citation.entrydate,
            T_citation.citvol,
            cpg1, cpg2,
            T_citation.citdate,
            ctit1, ctit2, ctit3, ctit4,
            tmp_name
        to
            citnumb, citsource, citfile,citlocate,
            entrydate, citvol, citpage, cp2,
            citdate, cittitle, ct2, ct3, ct4, tmpname
#display " Counting..." at 15,50 attribute(reverse)
select count(*) into authors
    from authors
    where aucitnumb = T_citation.citnumb
display by name authors
select count(*) into keywords
    from keywords
    where keycitnumb = T_citation.citnumb
display by name keywords
select count(*) into paperover
    from paperover
    where papcitnumb = T_citation.citnumb
display by name paperover
select count(*) into designs
    from stdydsgn
    where stycitnumb = T_citation.citnumb
display by name designs
select count(*) into subjects
    from subjgrp
    where sgcitnumb = T_citation.citnumb
display by name subjects
select count(*) into exposures
    from exporegm
    where excitnumb = T_citation.citnumb
display by name exposures
select count(*) into signs
```

```
        from clinfind
        where cfcitnumb = T_citation.citnumb
    display by name signs
    display "" at 15,50
    END FUNCTION
##########################################################################
FUNCTION see_journ()
    DEFINE j_list ARRAY[30] of RECORD
        jabrv    like journlst.jabrv,
        jcode    like journlst.jcode
    end record,
    holdjcode like journlst.jcode,
    counter smallint
    Open Window seej1 at 3,20 with form "jlist"
        attribute (border)
    OPTIONS input wrap,
    help file "tkshelp.msg"
    MENU "J-LIST"
        command "Find" HELP 106
            let sw =0
            clear form
            construct query1 on jabrv, jcode from j_listing[1].*
            let select1 = "select jabrv, jcode from journlst where ",
                query1 clipped
        prepare slct_4 from select1
        declare j_curs cursor for slct_4
        let counter = 1
        foreach j_curs into j_list[counter].*
            let counter = counter + 1
            if counter > 30 then
                exit foreach
            end if
        end foreach

        if counter = 1 then
            message "No Journal found with these first letters"
            sleep 2
            message "Try using '*' to mean any sequence of characters"
            sleep 2
            continue menu
        end if
        call set_count(counter -1)
        message "Highlight a journal abbreviation and press ESC"
        Display array j_list to j_listing.*
            on key(interrupt)
                let sw = 1
                exit display
        end display
        if sw = 1
            then next option "Find"
            else
                let counter = arr_curr()
                let holdjcode = j_list[counter].jcode
                message holdjcode
                exit menu
        end if
        command "Add" HELP 107
```

```
            let sw =0
            open window jw2 at 3,3 with form "vocjourn"
                attribute (Border)
            call add_journ()
            close window jw2
            let holdjcode = T_journlst.jcode
            message holdjcode
            exit menu
        command "Select" HELP 108
            let sw =0
            call set_count(counter -1)
            message "Highlight a journal abbreviation and press ESC"
            Display array j_list to j_listing.*
                on key(interrupt)
                    let sw = 1
                    exit display
            end display
            if sw = 1
                then next option "Find"
                else
                    let counter = arr_curr()
                    let holdjcode = j_list[counter].jcode
                    message holdjcode
                    exit menu
            end if
        command "Exit" HELP 2
            If sw = 0 then
            let holdjcode = NULL
            end if
            let sw =0
            exit menu
        end menu
    close window seej1
    return holdjcode
    END FUNCTION
################################################################################
FUNCTION see_book()
    DEFINE b_list ARRAY[30] of RECORD
        bname  like booklst.bname,
        bcode  like booklst.bcode
    end record,
    holdbcode like booklst.bcode,
    counter smallint
    Open Window seeb1 at 3,20 with form "blist"
        attribute (border)
    MENU "B-LIST"
        command "Find" HELP 109
            let sw =0
            clear form
            construct query1 on bname, bcode from b_listing[1].*
            let select1= "select bname, bcode from booklst where ",
                query1 clipped
            prepare slct_5 from select1
            declare b_curs cursor for slct_5
            let counter = 1
            foreach b_curs into b_list[counter].*
                let counter = counter + 1
```

```
            if counter > 30 then
                exit foreach
            end if
        end foreach

        if counter = 1 then
            message "No Book found with these first letters"
            sleep 2
            continue menu
        end if
        call set_count(counter -1)
        message "Highlight a book abbreviation and press ESC"
        Display array b_list to b_listing.*
            on key(interrupt)
                let sw = 1
                exit display
        end display
        if sw = 1
            then next option "Find"
            else
                let counter = arr_curr()
                let holdbcode = b_list[counter].bcode
                message holdbcode
                exit menu
        end if
    command "Add" HELP 110
        let sw =0
        open window bw2 at 3,3 with 20 rows, 68 columns
            attribute (Border)
        open form s_book from "bookadd"
        display form s_book
        call add_book()
        close window bw2
        let holdbcode = T_booklst.bcode
        message holdbcode
        exit menu
    command "Select" HELP 111
        let sw =0
        call set_count(counter -1)
        message "Highlight a book abbreviation and press ESC"
        Display array b_list to b_listing.*
            on key(interrupt)
                let sw = 1
                exit display
        end display
        if sw = 1
            then next option "Find"
            else
                let counter = arr_curr()
                let holdbcode = b_list[counter].bcode
                message holdbcode
                exit menu
        end if
    command "Exit" HELP 2
        if sw = 0 then
        let holdbcode = NULL
        end if
```

```
            let sw =0
            exit menu
        end menu
    close window seeb1
    return holdbcode
    END FUNCTION
##########################################################################
FUNCTION get_auth1()
    define auth1 like authors.authname
    call alrt260p1op()
    display "Please enter last name of first author." at 1,1
    prompt "> " for auth1
    let auth1 = upshift(auth1)
    call alrt260p1cl()
    return auth1
    END FUNCTION
##########################################################################
FUNCTION citnumb_exists(c_num)
    define c_num like citation.citnumb
    error "Information for that citation number has already been entered!"
    sleep 1
    call show_fullcit2(c_num)
    END FUNCTION
##########################################################################
FUNCTION citfile_exists(c_file)
    define c_file like citation.citfile
    error "Information for that file number has already been entered!"
    call show_file(c_file)
    END FUNCTION
##########################################################################
FUNCTION exist_citnumb(c_cit)
    define c_cit like citation.citnumb,
        does_exist smallint
    select count(*) into does_exist
        from citation
        where citnumb like c_cit
        {
        if does_exist = 0
            then error beep,"No CITATION with that NUMBER"
                sleep 2
        end if
        }
    return does_exist
    END FUNCTION
##########################################################################
FUNCTION exist_citfile(c_cit)
    define c_cit like citation.citfile,
        does_exist smallint
    select count(*) into does_exist
        from citation
        where citfile like c_cit
        {
        if does_exist = 0
            then error beep,"No CITATION with that NUMBER"
                sleep 2
        end if
        }
```

```
    return does_exist
    END FUNCTION
```

#tksauth.4gl

```
{
TITLE: tksauth.4gl
Copyright Harold L. Trammel, 1987-1988
University of Illiois, CVM, IAPIC
Funded by US Army Contract DAMD-17-C-7114
Contains the following functions:
    add_auth(a_cit)
    find_auth(a_cit)
    view_auth()
    disp_auth(a_cit)
    update_auth(a_cit)
    renum_auths()
    delete_auth(a_cit)
    see_auth(c_num)
}
DATABASE tkstest
GLOBALS "tksglob.4gl"
#-------------------------------------------------------------#
FUNCTION add_auth(a_cit)
define
    a_cit like authors.aucitnumb,
    R_authnumb like authors.aucitnumb,
    R_authfile like authors.aucitfile,
    tmp_cnt, cnt, numauth smallint
let sw = 0
call auwinopen()
clear form
display a_cit to aucitnumb
select citfile into citfileno from citation
    where citnumb = a_cit
display citfileno to aucitfile
if a_cit is null then
    options
        input no wrap
    clear form
    input R_authnumb, R_authfile from aucitnumb, aucitfile
        on key(interrupt)
            clear screen
            let sw = 1
            exit input
    end input
    options input wrap
    let a_cit = R_authnumb
    let citfileno = R_authfile
else
    let R_authnumb = a_cit
    let R_authfile = citfileno
end if
options input no wrap
for cnt = 1 to 10
    initialize a_array[cnt].* to null
end for
```

```
call set_count(10)
options
    help file "tkshelp.msg"
{   help key F4 }

input array a_array from a_listing.* HELP 200
    on key(interrupt)
        clear screen
        let sw = 1
        return
display R_authnumb to aucitnumb
display R_authfile to aucitfile
before field authname
    let curr_arr = arr_curr()
after field authname
    let a_array[curr_arr].sig = arr_curr()
    let scr_arr = scr_line()
before field authsig
    display a_array[curr_arr].sig to a_listing[scr_arr].authsig
after delete
    call renum_auths()
after insert
    call renum_auths()
after input
    let numauth = arr_count()
end input
if sw = 1 then return
end if
for tmp_cnt = 1 to numauth
    if a_array[tmp_cnt].auth is not null
    then
        insert into authors values (R_authnumb, R_authfile,0,
                                    a_array[tmp_cnt].auth,
                                    a_array[tmp_cnt].sig)
    end if
end for
end FUNCTION
#-------------------------------------------------------------#
FUNCTION find_auth(t_cit)
define t_cit like authors.authname
call auwinopen()
case
    when t_cit is null
        clear form
            let int_flag = 0
        construct query1 on aucitnumb, aucitfile, authname, authsig
                from aucitnumb, aucitfile, authname, authsig
            if int_flag <> 0 then return end if
        let select1 = "select * from authors where ",
            query1 clipped
        let select2 = "select count(*) from authors where ",
            query1 clipped
        exit case
    otherwise
        let select1 = "select * from authors where ",
            " aucitnumb = ",quote, t_cit clipped, quote
        let select2 = "select count(*) from authors where ",
```

```
            " aucitnumb = ", quote, t_cit clipped, quote
        exit case
end case
prepare select_auth from select1
prepare au_cnt from select2
display "Searching . . . . . " at 11,2 attribute(reverse)
declare at_curs cursor for au_cnt
foreach at_curs into cnt
end foreach
declare auth_curs scroll cursor for select_auth
let chosen = false
open auth_curs
    call view_auth()
end FUNCTION
#-------------------------------------------------------------#
FUNCTION view_auth()
define cc integer
fetch first auth_curs into T_authors.*
let cc=status
if (cc < 0) then error cc
end if
if status = notfound then
    message "No citation found."
    sleep 1
    message ""
else
    display " ", cnt, " rows found" at 11,2 attribute(reverse)
    display "ESC to continue" at 11,22 attribute(reverse)
    call disp_auth(T_authors.aucitnumb)
 let tmp_cnt = 1
 display "" at 11,2
end if
menu "BROWSE"
    command "Next" "View the next Author in the list." HELP 170
        fetch next auth_curs into T_authors.*
        let tmp_cnt = tmp_cnt + 1
        if status = notfound then
            message "No more Authors in this direction."
            sleep 1
            let tmp_cnt = cnt
            message ""
            fetch last auth_curs into T_authors.*
        end if
        display " ",tmp_cnt," of ",cnt," rows" at 11,2 attribute(reverse)
        call disp_auth(T_authors.aucitnumb)
        display "" at 11,3
    command "Previous" "View the Previous Author in the list." HELP 170
        fetch previous auth_curs into T_authors.*
        let tmp_cnt = tmp_cnt - 1
        if status = notfound then
            message "No more Authors in this direction."
            sleep 1
            message ""
            let tmp_cnt = 1
            fetch first auth_curs into T_authors.*
        end if
        display " ",tmp_cnt," of ",cnt," rows" at 11,2 attribute(reverse)
```

```
        call disp_auth(T_authors.aucitnumb)
        display "" at 11,3
    command "First" "View the first Author in the list." HELP 170
        message "Searching for first record...." attribute(reverse)
        fetch first auth_curs into T_authors.*
        let tmp_cnt = 1
        message ""
        display " ",tmp_cnt," of ",cnt," rows" at 11,2 attribute(reverse)
        call disp_auth(T_authors.aucitnumb)
        display "" at 11,3
    command "Last" "View the Last Author in the list." HELP 170
        message "Searching for last record...." attribute(reverse)
        fetch last auth_curs into T_authors.*
        let tmp_cnt = cnt
        message ""
        display " ",tmp_cnt," of ",cnt," rows" at 11,2 attribute(reverse)
        message ""
        call disp_auth(T_authors.aucitnumb)
        display "" at 11,3
    command "Update" "Add, Modify, or Remove Authors in Existing Citation" HELP 171
          call update_auth(T_authors.aucitnumb)
    command "Delete" "Delete ALL authors for a given citation" HELP 205
          call delete_auth(T_authors.aucitnumb)
    command "Query-Again" "Enter new search criteria" HELP 176
        close auth_curs
        let citnumber = ""
        call find_auth(citnumber)
        exit menu
    command "Exit" "Leave this menu" HELP 2
        close auth_curs
        exit menu
end menu
end FUNCTION
#-------------------------------------------------------------------#
FUNCTION disp_auth(a_cit)
define
    a_cit like authors.aucitnumb,
    counter smallint
clear form
let a_cit = T_authors.aucitnumb
let citfileno = T_authors.aucitfile
display a_cit to aucitnumb
display citfileno to aucitfile
declare au_curs cursor for
    select authname, authsig from authors
    where aucitnumb = a_cit
    order by authsig
let counter = 1
foreach au_curs into a_array[counter].*
    let counter = counter + 1
    if counter > 10 then
        exit foreach
    end if
end foreach
call set_count(counter -1)
display "ESC to continue" at 11,22 attribute(reverse)
display array a_array to a_listing.*
```

```
    on key(interrupt)
        exit display
end display
close au_curs
end FUNCTION
#-------------------------------------------------------------#
FUNCTION update_auth(a_cit)
define
    a_cit, tmp_citnum like authors.aucitnumb,
    cite like authors.aucitfile,
    counter smallint
message ""
let sw = 0
let tmp_citnum = a_cit
options input no wrap
display a_cit to aucitnumb
select citfile into cite from citation
    where citation.citnumb = a_cit
display cite to aucitfile
input a_cit, cite without defaults from aucitnumb, aucitfile
    on key(interrupt)
        let sw = 1
        exit input
    after field aucitnumb
        if a_cit is null then
            next field aucitnumb
            message "MUST have number!!!"
        end if
        if a_cit <> tmp_citnum then
            call exist_citnumb(a_cit) returning x
            if x = 0
                then
                    error "No CITATION entered with this number"
                    next field aucitnumb
                else
                    select count(*) into x
                        from authors
                        where aucitnumb = a_cit
                    if x > 0
                        then
                            error "Author data already exists for this number."
                            next field aucitnumb
                    end if
            end if
        end if
end input
if sw = 1 then return end if
message ""
options input wrap
input array a_array without defaults from a_listing.*
    on key(interrupt)
        let sw = 1
        exit input
    display "ESC to continue" at 11,22 attribute (reverse)
before field authname
    let curr_arr = arr_curr()
    let scr_arr = scr_line()
```

```
after field authname
    let a_array[curr_arr].sig = arr_curr()
    let scr_arr = scr_line()
before field authsig
    display a_array[curr_arr].sig to a_listing[scr_arr].authsig
    after insert
        call renum_auths()
    after delete
        call renum_auths()
end input
if sw = 1 then return end if
delete from authors
    where aucitnumb = tmp_citnum
for counter = 1 to arr_count()
    if a_array[counter].auth is not null
    then
        insert into authors
            values (a_cit,cite,0,
                a_array[counter].auth,
                a_array[counter].sig)
    end if
end for
end FUNCTION
#-------------------------------------------------------------#
FUNCTION renum_auths()
define a_cur, a_cnt, s_lin, s_tot,ksmallint
let a_cur = arr_curr()
let a_cnt = arr_count()
let s_lin = scr_line()
let s_tot = 4
for k = a_cur to a_cnt
    let a_array[k].sig = k
    if s_lin <= s_tot then
        display k to a_listing[s_lin].authsig
        let s_lin = s_lin + 1
    end if
end for
end FUNCTION
#-------------------------------------------------------------#
FUNCTION delete_auth(a_cit)
define answer char(1),
    a_cit like authors.aucitnumb
Prompt "Delete ALL author entries for this Citation (y/n) " for answer
if upshift(answer) = "Y" then
    delete from authors where aucitnumb = a_cit
    clear form
    message "ROW DELETED!"
    sleep 1
    Message ""
else
    clear form
    message "Row NOT deleted."
    sleep 1
    Message ""
    return
end if
end FUNCTION
```

```
#-------------------------------------------------------------#
FUNCTION see_auth(c_num)
define c_num    like authors.aucitnumb
call auwinopen()
clear form
display c_num to aucitnumb
display " Hit ESC to leave array. " at 11,10 attribute(reverse)
declare au_see cursor for
     select * from authors
     where aucitnumb = c_num
     order by authsig
let counter = 1
foreach au_see into
     T_authors.aucitnumb,
     T_authors.aucitfile,
     T_authors.auserial,
     a_array[counter].auth,
     a_array[counter].sig
     let counter = counter + 1
     if counter > 10 then
          exit foreach
     end if
end foreach
display by name T_authors.aucitfile
call set_count(counter -1)
display array a_array to a_listing.*
     on key(interrupt)
          exit display
end display
close au_see
end FUNCTION
```

#tkskey.4gl

```
{TITLE: tkskey.4gl
Copyright Harold L. Trammel, 1987-1988
University of Illiois, CVM, IAPIC
Funded by US Army Contract DAMD-17-C-7114
Contains the following functions:
    add_key(k_cit)
    find_key(t_cit)
    view_key()
    disp_key(k_cit)
    update_key(k_cit)
    delete_key(k_cit)
    seekeylist()
    see_keys(c_num)
}
DATABASE tkstest
GLOBALS "tksglob.4gl"
##########################################################################
FUNCTION add_key(k_cit)
    define
        k_cit like keywords keycitnumb,
        R_keynumb like keywords.keycitnumb,
        R_keyfile    like keywords.keycitfile,
        tmp_keyword like keywords.keyword,
        tmp_code like keywords.keycode,
        numkey  smallint
    #initial setup
        let sw = 0
        call keywinopen()
        clear form
    display k_cit to keycitnumb
    if citfileno is null
        then
            select citfile into citfileno from citation
                where citnumb = k_cit
            display citfileno to keycitfile
        end if
    if k_cit is null *
        then
            options input no wrap
            clear form
            input R_keynumb, R_keyfile from keycitnumb, keycitfile
                on key(interrupt)
                clear screen
                let sw=1
                exit input
            end input
            let k_cit = R_keynumb
            let citfileno = R_keyfile
        else
            let R_keynumb = k_cit
            let R_keyfile = citfileno
        end if
    for tmp_cnt = 1 to 20
        initialize k_array[tmp_cnt].* to null
        end for
```

```
    display R_keynumb to keycitnumb
    display R_keyfile to keycitfile
    options input wrap, help file "tkshelp.msg"
    input array k_array from k_listing.* HELP 300
        on key(interrupt)
            exit input
        before field keycode
            let curr_arr = arr_curr()
            let scr_arr = scr_line()
        after field keycode
            if k_array[curr_arr].code is not null
                then
                    let tmp_code = k_array[curr_arr].code
                    select kword into tmp_keyword from keylist
                        where keylist.kcode = tmp_code
                    if status=NOTFOUND
                        then
                            call seekeylist() returning k_array[curr_arr].code
                            display k_array[curr_arr].code
                                to k_listing[scr_arr].keycode
                            select kword into tmp_keyword from keylist
                                where keylist.kcode = k_array[curr_arr].code
                            let k_array[curr_arr].keys = tmp_keyword
                            display tmp_keyword to k_listing[scr_arr].keyword
                            next field keyword
                        else
                            display tmp_code to k_listing[scr_arr].keycode
                            display tmp_keyword to k_listing[scr_arr].keyword
                            let k_array[curr_arr].keys = tmp_keyword
                            let k_array[curr_arr].code = tmp_code
                        end if
                else
                    next field keyword
                end if
        after field keyword
            if k_array[curr_arr].keys is not null
                then
                    let tmp_keyword = k_array[curr_arr].keys
                    select kcode into tmp_code from keylist
                        where keylist.kword = tmp_keyword
                    if status=NOTFOUND
                        then
                            message beep, "This is not an acceptable keyword"
                        else
                            let k_array[curr_arr].code = tmp_code
                            let k_array[curr_arr].keys = tmp_keyword
                            display tmp_code to k_listing[scr_arr].keycode
                            display tmp_keyword to k_listing[scr_arr].keyword
                        end if
                end if
        before insert
            let numkey = arr_count()
        end input
    if sw = 1 then return end if
    for tmp_cnt = 1 to numkey
        insert into keywords values
```

```
            (R_keynumb,
            R_keyfile,
            0,
            k_array[tmp_cnt].keys,
            k_array[tmp_cnt].code)
        end for
    clear screen
    END FUNCTION
###########################################################################
FUNCTION find_key(t_cit)
    define t_cit like keywords.keycitnumb
    case
        when t_cit is null
            call keywinopen()
            clear form
            message "Enter search criteria and hit ESC to search."
                let int_flag = 0
            construct query1 on keycitnumb, keycitfile, keycode, keyword
                from keycitnumb, keycitfile, keycode, keyword
            if int_flag <> 0 then return end if
            let select1 = "select * from keywords where ", query1 clipped
            let select2 = "select count(*) from keywords where ",
                query1 clipped
            exit case
        otherwise
            let select1 = "select * from keywords where ",
                " keycitnumb = ", quote, t_cit, quote
            let select2 = "select count(*) from keywords where ",
                " keycitnumb = ", quote, t_cit, quote
            call keywinopen()
            exit case
        end case
    prepare find_key from select1
    prepare key_cnt from select2
    display " Searching... " at 18,2 attribute(reverse)
    declare ky_curs cursor for key_cnt
        foreach ky_curs into cnt
            end foreach
    declare key_curs scroll cursor or find_key
    open key_curs
    call view_key()
    close key_curs
    END FUNCTION
###########################################################################
FUNCTION view_key()
    fetch first key_curs into T_keywords.*
    if status = notfound
        then
            message "No citation found."
            sleep 1
            return
        end if
    message ""
    display " ", cnt, " rows found." at 18, 2 attribute(reverse)
    call disp_key(T_keywords.keycitnumb)
    let tmp_cnt = 1
    menu "BROWSE"
```

```
    command "Next"
        "View the next Keyword in the list." HELP 170
        fetch next key_curs into T_keywords.*
        let tmp_cnt = tmp_cnt + 1
        if status = notfound then
            message "No more Keywords in this direction."
            sleep 1
            let tmp_cnt = cnt
            message ""
            fetch last key_curs into T_keywords.*
            end if
        display "" at 18,2
        display " ",tmp_cnt, " of ", cnt, " rows" at 18,2
            attribute(reverse)
        call disp_key(T_keywords.keycitnumb)
        display "" at 18,3
    command "Previous"
        "View the Previous Keyword in the list." HELP 170
        fetch previous key_curs into T_keywords.*
        let tmp_cnt = tmp_cnt - 1
        if status = notfound then
            message "No more Keywords in this direction."
            sleep 1
            message ""
            let tmp_cnt = 1
            fetch first key_curs into T_keywords.*
            end if
        display "" at 18,2
        display " ", tmp_cnt, " of ", cnt, " rows" at 18,2
            attribute(reverse)
        call disp_key(T_keywords.keycitnumb)
        display "" at 18,3
    command "First"
        "View the first Keyword in the list." HELP 170
        fetch first key_curs into T_keywords.*
        let tmp_cnt = 1
        display "" at 18,2
        display " ",tmp_cnt, " of ", cnt," rows" at 18,2
            attribute(reverse)
        call disp_key(T_keywords.keycitnumb)
        display "" at 18,3
    command "Last"
        "View the Last Keyword in the list." HELP 170
        message "Searching for last record...."
        fetch last key_curs into T_keywords.*
        let tmp_cnt = cnt
        message ""
        display "" at 18,2
        display " ",tmp_cnt, " of ", cnt, " rows" at 18,2
            attribute(reverse)
        message ""
        call disp_key(T_keywords.keycitnumb)
        display "" at 18,3
    command "Update"
        "Add, Modify, or Delete Keywords for This Citation" HELP 171
        call update_key(T_keywords.keycitnumb)
    command "Delete"
```

```
            "Delete ALL Keywords for a Given Citation" HELP 305
            call delete_key(T_keywords.keycitnumb)
        command "Query-Again"
            "Enter new search criteria" HELP 176
            close key_curs
            let citnumber = ""
            call find_key(citnumber)
            exit menu
        command "Exit"
            "Leave this menu" HELP 2
            close key_curs
            exit menu
        end menu
    END FUNCTION
################################################################################
FUNCTION disp_key(k_cit)
    define
        counter smallint,
        k_cit like keywords.keycitnumb
    clear form
    let k_cit = T_keywords.keycitnumb
    let citfileno = T_keywords.keycitfile
    display k_cit  to keycitnumb
    display citfileno to keycitfile
    declare ke_curs cursor for
        select keycode, keyword from keywords
        where keycitnumb = k_cit
    let counter = 1
    foreach ke_curs into k_array[counter].*
        let counter = counter + 1
        if counter > 20 then
            exit foreach
            end if
        end foreach
    call set_count(counter -1)
    display "ESC to continue" at 18,20 attribute(reverse)
    display array k_array to k_listing.*
        on key(interrupt)
            exit display
        end display
    close ke_curs
    END FUNCTION
################################################################################
FUNCTION update_key(k_cit)
    define
        tmp_citnum like keywords.keycitnumb,
        k_cit like keywords.keycitnumb,
        cite like keywords.keycitfile,
        counter smallint,
        tmp_code like keywords.keycode,
        tmp_keyword like keywords.keyword
    message ""
    let tmp_citnum = k_cit
    options input no wrap
    display k_cit to keycitnumb
    select citfile into cite from citation
        where citation.citnumb = k_cit
```

```
display cite to keycitfile
input k_cit, cite without defaults from keycitnumb, keycitfile
    on key(interrupt)
        exit input
    after field keycitnumb
        if k_cit is null
            then next field keycitnumb
                message "MUST have number!!!"
            end if
        if k_cit <> tmp_citnum
            then
                call exist_citnumb(k_cit) returning x
                if x = 0
                    then
                        error "CITATION does not exist for this number."
                        sleep 2
                        next field keycitnumb
                    else
                        select count(*) into x
                            from keywords
                            where keycitnumb = k_cit
                        if  > 0
                            then
                                error "Keywords for this citation number already exists"
                                sleep 2
                                next field keycitnumb
                            end if
                    end if
            end if
    end input
message ""
options input wrap
input array k_array without defaults from k_listing.*
    on key(interrupt)
        exit input
    before field keycode
        let curr_arr = arr_curr()
        let scr_arr = scr_line()
    after field keycode
        if k_array[curr_arr].code is not null
            then
                let tmp_code = k_array[curr_arr].code
                select kword into tmp_keyword from keylist
                    where keylist.kcode = tmp_code
                if status=NOTFOUND
                    then
                        call seekeylist() returning k_array[curr_arr].code
                        display k_array[curr_arr].code
                            to k_listing[scr_arr].keycode
                        select kword into tmp_keyword from keylist
                            where keylist.kcode = k_array[curr_arr].code
                        let k_array[curr_arr].keys = tmp_keyword
                        display tmp_keyword to k_listing[scr_arr].keyword
                        next field keyword
                    else
                        display tmp_code to k_listing[scr_arr].keycode
                        display tmp_keyword to k_listing[scr_arr].keyword
```

```
                    let k_array[curr_arr].keys = tmp_keyword
                    let k_array[curr_arr].code = tmp_code
                end if
            else
                next field keyword
            end if
        after field keyword
            if k_array[curr_arr].keys is not null
                then
                    let tmp_keyword = k_array[curr_arr].keys
                    select kcode into tmp_code from keylist
                        where keylist.kword = tmp_keyword
                    if status=notfound
                        then
                            message beep, "This is not an acceptable keyword"
                        else
                            let k_array[curr_arr].code = tmp_code
                            let k_array[curr_arr].keys = tmp_keyword
                            display tmp_code to k_listing[scr_arr].keycode
                            display tmp_keyword to k_listing[scr_arr].keyword
                        end if
                end if
        end input
    delete from keywords
        where keycitnumb = tmp_citnum
    for counter = 1 to arr_count()
        insert into keywords values (k_cit,
            cite, 0,
            k_array[counter].keys,
            k_array[counter].code)
        end for
    END FUNCTION
#########################################################################
FUNCTION delete_key(k_cit)
    define answer char(1),
        k_cit like keywords.keycitnumb
    prompt "Delete ALL keywords for this citation (y/n) " for answer
    if upshift(answer) = "N"
        then
            clear form
            message "Row NOT deleted."
            sleep 1
            Message ""
            return
        else
            delete from keywords where keycitnumb = k_cit
            clear form
            message "ROW DELETED!"
            sleep 1
            Message ""
        end if
    END FUNCTION
#########################################################################
FUNCTION seekeylist()
    define
        key_list array[30] of record
            kcode   like keylist.kcode,
```

```
            kword  like keylist.kword
            end record,
        holdkcode like keylist.kcode,
        cont smallint
    open window seek1 at 3,40
        with form "seekeys" attribute (border, reverse)
    menu "KEY-LIST"
        command "Find" HELP 302
            clear form
            construct query1 on kcode, kword from k_list[1].*
            let select1 = "select kcode, kword from keylist where ",
                query1 clipped
            prepare select_klist from select1
            declare k_curs cursor for select_klist
            let cont = 1
            foreach k_curs into key_list[cont].*
                let cont = cont + 1
                if cont > 30
                    then
                        exit foreach
                    end if
                end foreach
            if cont = 1
                then
                    message "No Keyword found with these first letters"
                    sleep 2
                    exit menu
                end if
            call set_count(cont -1)
            message "Highlight a keyword abbrev and hit ESC"
            display array key_list to k_list.*
                on key(interrupt)
                    exit display
                end display
            let cont = arr_curr()
            let holdkcode = key_list[cont].kcode
            exit menu
        command "Add" HELP 303
            open window kw2 at 3,3 with 20 rows, 66 columns
                attribute (Border)
            open form s_key from "vockeys"
            display form s_key
            call add_klist()
            close window kw2
        command "Exit" HELP 2
            exit menu
        end menu
    close window seek1
    return holdkcode
    END FUNCTION
###################################################################
FUNCTION see_keys(c_num)
    define
        c_num like keywords.keycitnumb,
        c_fil like keywords.keycitfile,
        citfile like citation.citfile
    call keywinopen()
```

```
clear form
display c_num to keycitnumb
select unique(keycitfile) into citfile
    from keywords
    where keycitnumb = c_num
display citfile to keycitfile
display "ESC to continue" at 18,20 attribute(reverse)
declare key_see cursor for
    select keycode, keyword from keywords
    where keycitnumb = c_num
let counter = 1
foreach key_see into k_array[counter].*
    let counter = counter + 1
    if counter > 20 then exit foreach end if
    end foreach
call set_count(counter -1)
display array k_array to k_listing.*
    on key(interrupt)
        exit display
    end display
close key_see
END FUNCTION
```

```
#tksquery.4gl
{
TITLE: tksquery.4gl
Copyright Harold L. Trammel, 1987-1988
University of Illiois, CVM, IAPIC
Funded by US Army Contract DAMD-17-C-7114
Purpose: to provide a Query-by-example mechanism for citation.
authors, keywords
Contains the following functions:
    querybib()
    view_all()
     see_cit(c_numb)
    out_cit(c_num,pf)
    top_down()
}
database tkstest
globals "tksglob.4gl"
############################################################
FUNCTION querybib()
    call qwinopen()
    let int_flag = 0
    construct query1 on
        #items
            citnumb, citfile, citsource, citvol, citpage, citdate, citlocate,
            cittitle, authname,
            keyword, keycode
        from
            citnumb, citfile, citsource, citvol, citpage, citdate, citlocate,
            ct1, authname,
            keyword, keycode
    let select1 = "select unique(citnumb), citfile, citserial, citvol, citpage, citdate, cittitle, citlocate",
        " from citation, authors, keywords where ",
        query1 clipped,
        " andcitnumb = aucitnumb and citnumb = keycitnumb ",
        " order by citfile, citnumb"
    prepare select_all from select1
    if int_flag <>0
        then return
        end if
    display " Searching ..." at 21,2 attribute(reverse)
    let cnt = 0
    declare q_cnt cursor for select_all
    foreach q_cnt into T_citation.*
        let cnt = cnt +1
        if status = notfound
            then
                let cnt = 0
                exit foreach
            end if
        end foreach
    if int_flag <>0
        then return
        end if
    declare q_curs scroll cursor for select_all
    open q_curs
    fetch first q_curs into T_citation.*
    if status = NOTFOUND
```

```
        then
            message "No citation found."
            sleep 1
            message ""
        else
            display " ", cnt, " citations found." at 21,2
                attribute(reverse)
            let tmp_cnt = 1
            call view_all()
        end if
    close q_curs
    end FUNCTION
##############################################################
FUNCTION view_all()
    call see_cit(T_citation.citnumb)
    let tmp_cnt = 1
    display "" at 21,2
    display " ", tmp_cnt, " of ", cnt, " rows" at 21,2
        attribute(reverse)
    MENU "BROWSE"
        COMMAND "Next"
            "View the next Citation in the list." HELP 170*
            display " Searching ..." at 21,2 attribute(reverse)
            FETCH NEXT q_curs INTO T_citation.*
            IF status = NOTFOUND THEN
                MESSAGE beep,"No more Citations in this direction."
                SLEEP 1
                MESSAGE ""
                FETCH LAST q_curs INTO T_citation.*
                END IF
            call see_cit(T_citation.citnumb)
            let tmp_cnt = tmp_cnt +1
            display " ", tmp_cnt, " of ", cnt, " rows" at 21,2
                attribute(reverse)
            message ""
        COMMAND "Previous"
            "View the Previous Citation in the list." HELP 170
            display " Searching ..." at 21,2 attribute(reverse)
            FETCH PREVIOUS q_curs INTO T_citation.*
            IF status = NOTFOUND THEN
                MESSAGE beep,"No more Citations in this direction."
                SLEEP 1
                MESSAGE ""
                FETCH FIRST q_curs INTO T_citation.*
                END IF
            call see_cit(T_citation.citnumb)
            let tmp_cnt = tmp_cnt -1
            display " ", tmp_cnt, " of ", cnt, " rows" at 21,2
                attribute(reverse)
            message ""
        COMMAND "First"
            "View the first Citation in the list." HELP 170
            display " Searching ..." at 21,2 attribute(reverse)
            FETCH FIRST q_curs INTO T_citation.*
            call see_cit(T_citation.citnumb)
            let tmp_cnt = 1
            display " ", tmp_cnt, " of ", cnt, " rows" at 21,2
```

```
                attribute(reverse)
            message ""
        COMMAND "Last"
            "View the Last Citation in the list." HELP 170
            display " Searching ..." at 21,2 attribute(reverse)
            FETCH LAST q_curs INTO T_citation.*
            call see_cit(T_citation.citnumb)
            let tmp_cnt = cnt
            display " ", tmp_cnt, " of ", cnt, " rows" at 21,2
                attribute(reverse)
            message ""
        COMMAND "Output"
            "Output selected data" HELP 1300
            call out_all(T_citation.citnumb)
        COMMAND "Exit"
            "Leave this menu" HELP 2
            EXIT MENU
        END MENU
    end FUNCTION
##########################################################
FUNCTION see_cit(c_numb)
    define
        ctit1 char(50),
        ctit2,ctit3,ctit4   char(70),
        tmpname char(70),
        c_numb like citation.citnumb,
        auth_string, key_string char(500),
        atemp1, atemp2, atemp3 char(70),
        temp1, temp2, temp3 char(70)
    select * into T_citation.*
        from citation
        where citnumb = c_numb
    let ctit1 = T_citation.cittitle[1,40]
    let ctit2 = T_citation.cittitle[41,110]
    let ctit3 = T_citation.cittitle[111,180]
    let ctit4 = T_citation.cittitle[181,250]
    if T_citation.citsource[1,1] = "J"
        then
            select jabrv into tmpname from journlst
                where jcode = T_citation.citsource
        else
            select bname into tmpname from booklst
                where bcode = T_citation.citsource
        end if
    declare au_see cursor for
        select * from authors
        where aucitnumb = c_numb
        order by authsig
    let counter = 1
    let auth_string = ""
    foreach au_see into T_authors.*
        if counter = 1
            then
                let auth_string = T_authors.authname clipped
            else
                if (length(auth_string) + length(T_authors.authname)) > 497
                    then exit foreach
```

```
                end if
            let auth_string = auth_string clipped,", ",
                T_authors.authname clipped
        end if
    let counter = counter + 1
    if counter > 10 then exit foreach end if
    end foreach
if length(auth_string) > 210
    then let auth_string[208,210] = "..."
    end if
let atemp1 = auth_string[1,70]
let atemp2 = auth_string[71,140]
let atemp3 = auth_string[141,210]
close au_see
declare key_see cursor for
    select * from keywords
    where keycitnumb = c_numb
let counter = 1
let key_string = ""
foreach key_see into T_keywords.*
    if counter = 1
        then
            let key_string = T_keywords.keyword clipped
        else
            if (length(key_string) + length(T_keywords.keyword)) > 497
                then exit foreach
                end if
            let key_string = key_string clipped,", ",
                T_keywords.keyword clipped
        end if
    let counter = counter + 1
    if counter > 20 then exit foreach end if
    end foreach
if length(key_string) > 210
    then let key_string[208,210] = "..."
    end if
let temp1 = key_string[1,70]
let temp2 = key_string[71,140]
let temp3 = key_string[141,210]
close key_see
display
    #items
        T_citation.citnumb,
        T_citation.citsource,
        T_citation.citfile,
        T_citation.citlocate,
        T_citation.citvol,
        T_citation.citpage,
        T_citation.citdate,
        ctit1, ctit2, ctit3, ctit4,
        tmpname,
        atemp1, atemp2,
        temp1, temp2
    to
        citnumb, citsource, citfile,citlocate, citvol, citpage,
        citdate, ct1, ct2, ct3, ct4, citname,
        authname, authname2,
```

```
            keyword, keyword2
    end FUNCTION
##########################################################
FUNCTION out_all(c_num)
    define
        c_num like citation.citnumb,
        print_cnt smallint,
        fp char(30)
    menu "OUTPUT"
        command "Printer"
            "Send data to line printer" HELP 1301
            menu "OUT-TO-PRINTER"
                command "This-Citation"
                    "Send the displayed citation to printer" HELP 1302
                    let fp = "cat > tmp.out"
                    message "Printing ..."
                    call out_cit(c_num,fp)
                    run "print tmp.out; rm tmp.out"
                    exit menu
                command "All-Citations"
                    "Send all citations from current query printer" HELP 1303
                    let fp = "cat >> tmp.out"
                    let print_cnt = 0
                    declare outp_curs cursor for select_all
                    foreach outp_curs into c_num
                        let print_cnt = print_cnt + 1
                        message "Printing ...", print_cnt
                        call out_cit(c_num,fp)
                        end foreach
                    run "print tmp.out; rm tmp.out"
                    exit menu
                command "Exit" HELP 2
                    exit menu
                end menu
            exit menu
        command "File"
            "Send data to file" HELP 1304
            menu "OUT-TO-FILE"
                command "This-Citation"
                    "Send the displayed citation to a file" HELP 1305
                    MENU "FILE-SELECTION"
                        command "New-File" HELP 1306
                            prompt "Send to what file > " for fp
                            message "Writing to file ", fp
                            let fp = "cat >", fp clipped
                            call out_cit(c_num,fp)
                            exit menu
                        command "Append-to-File" HELP 1307
                            prompt "Send to what file > " for fp
                            message "Writing to file ", fp
                            let fp = "cat >>", fp clipped
                            call out_cit(c_num,fp)
                            exit menu
                        command "Exit" HELP 2
                            exit menu
                        end menu
                command "All-Citations"
```

```
                "Send all citations from current query to file" HELP 1308
                MENU "FILE-SELECTION"
                    command "New-File" HELP 1309
                        prompt "Send to what file > " for fp
                        let fp = "cat >>", fp clipped
                        let print_cnt = 0
                        declare outf_curs cursor for select_all
                        foreach outf_curs into c_num
                            let print_cnt = print_cnt + 1
                            message "Writing ", print_cnt ," to file ", fp
                            call out_cit(c_num,fp)
                            end foreach
                        exit menu
                    command "Append-to-File" HELP 1310
                        prompt "Send to what file > " for fp
                        let fp = "cat >>", fp clipped
                        let print_cnt = 0
                        declare outaf_curs cursor for select_all
                        foreach outaf_curs into c_num
                            let print_cnt = print_cnt + 1
                            message "Writing ", print_cnt ," to file ", fp
                            call out_cit(c_num,fp)
                            end foreach
                        exit menu
                    command "Exit" HELP 2
                        exit menu
                    end menu
                command "Exit" HELP 2
                    exit menu
                end menu
            exit menu
        command "Exit" "Exit this window" HELP 2
            exit menu
        end menu
    end FUNCTION
############################################################
FUNCTION out_cit(c_num,pf)
    define
        c_num like citation.citnumb,
        O_citation record like citation.*,
        pf char(30)
    declare out_curs cursor for
        select * from citation
        where citnumb = c_num
        order by citnumb
    start report cit_out to pipe pf
        foreach out_curs into O_citation.*
            output to report cit_out (O_citation.*)
            end foreach
    finish report cit_out
    end FUNCTION


############################################################
REPORT cit_out(c_citation)
    define
        c_citation record like citation.*,
```

```
        c_authors record like authors.*,
        c_keywords record like keywords.*,
        tmpname     char(60),
        a_string char(550),
        k_string char(550),
        hold_string char(1100),
        tot_len, x, y smallint
    output
        report to "tks_query.out"
        left margin 0
        top margin 0
        bottom margin 0
        page length 10
    order external by c_citation.citnumb
    format
        before group of c_citation.citnumb
            let hold_string = ""
            declare a_see cursor for
                select * from authors
                where aucitnumb = c_citation.citnumb
                order by authsig
            let counter = 1
            let a_string = ""
            foreach a_see into c_authors.*
                if counter = 1
                    then
                        let a_string = c_authors.authname clipped
                    else
                        if (length(a_string) + length(c_authors.authname)) >538
                            then
                                let a_string[538,540] = "..."
                                exit foreach
                            else
                                let a_string = a_string clipped,", ",
                                 c_authors.authname clipped
                            end if
                end if
                let counter = counter + 1
                if counter > 10 then exit foreach end if
                end foreach
            close a_see
            declare k_see cursor for
                select * from keywords
                where keycitnumb = c_citation.citnumb
            let counter = 1
            let k_string = ""
            foreach k_see into c_keywords.*
                if counter = 1
                    then
                        let k_string = C_keywords.keyword clipped
                    else
                        if (length(k_string) + length(c_keywords.keyword)) >538
                            then
                                let k_string[538,540] = "..."
                                exit foreach
                            else
                                let k_string=k_string clipped,", ",
```

```
                                    c_keywords.keyword clipped
                                end if
                            end if
                        let counter = counter + 1
                        if counter > 20 then exit foreach end if
                        end foreach
                    close k_see
    after group of c_citation.citnumb
        if c_citation.citsource[1,1] = "]"
            then
                select jabrv into tmpname from journlst
                    where jcode = c_citation.citsource
            else
                select bname into tmpname from booklst
                where bcode = c_citation.citsource
            end if
        print
        print "TKS code: ", c_citation.citnumb
        print "File code: ", c_citation.citfile clipped, " in ",
            c_citation.citlocate clipped, " files "
        print
        let hold_string = a_string clipped, ": ",
            c_citation.cittitle clipped, ", ",
            tmpname clipped, " ",
            c_citation.citvol, ":",
            c_citation.citpage,", ",
         c_citation.citdate
        let tot_len = length(hold_string)
        if tot_len >= 80
            then let y = 80
            else let y = tot_len
            end if
        for x = 1 to tot_len step 80
            print hold_string[x,y]
            if tot_len - x < 80
                then let y = tot_len
                else let y = y + 80
                end if
            end for
        let k_string = "Keywords: ", k_string clipped
        let tot_len = length(k_string)
        if tot_len >= 80
            then let y = 80
            else let y = tot_len
            end if
        for x = 1 to tot_len step 80
            print k_string[x,y]
            if tot_len - x < 80
                then let y = tot_len
                else let y = y + 80
                end if
            end for
    end report
############################################################
FUNCTION top_down()
{ This section needs to have additional options }
    let citnumber = ""
```

```
    call find_cit(citnumber)
    menu "TOP_DOWN"
        command "Citation"
            "Find Citation to serve as top"
            let citnumber = ""
            call find_cit(citnumber)
        command "Authors"
            "See Authors for selected top"
            call find_auth(T_citation.citnumb)
        command "Keywords"
            "See Keywords for selected top"
            call find_key(T_citation.citnumb)
        command "PaperOver"
            "See Paper Overview for selected top"
            call find_paper(T_citation.citnumb)
        command "Design"
            "See Study Designs for selected top"
            call find_dsgn(T_citation.citnumb)
        command "Subjects"
            "See Subject Groups for selected top"
            call find_sgrp(T_citation.citnumb,0)
        command "Regimens"
            "See Exposure Regimens for selected top"
            call find_expo(T_citation.citnumb,0)
        command "Links"
            "See Exposure Groups for selected top"
            call find_exgp(T_citation.citnumb)
        command "Findings"
            "See Clinical Findings for selected top"
            call find_cfind(T_citation.citnumb)
        command "MoreData"
            "Add more data to the selected citation tables"
            call add_abs(T_citation.citnumb)
        command "Exit"
            "Exit this menu"
            exit menu
        end menu
    end function
```

#tksshows.4gl

```
{
TITLE: tksshows.4gl
Copyright Harold L. Trammel, 1987-1988
University of Illiois, CVM, IAPIC
Funded by US Army Contract DAMD-17-C-7114
Contains the following functions:
    show_dsgn(p_cit, cur_pge)
    gen_dsgdsc(p_cit, tmp_dsgn)
    show_subj(s_cit, tmp_dsgn, cur_pge
    gen_subdsc (s_cit, tmp_dsgn, tmp
    show_expo(e_cit, tmp_dsgn, cur_
    gen_expdsc (e_cit, tmp_dsgn, tmp_
    show_fullcit(t_cit)
    show_fullcit2(in_cit)
    show_file(in_file)
    disp_fullcit(t_cit)
}

database tkstest
globals "tksglob.4gl"
#####################################################################
FUNCTION show_dsgn(p_cit, cur_pge)
    define hold_dsgn char(650),
        theCnt, x, y smallint,
        tmp1,tmp2,tmp3,tmp4,tmp5,tmp6,tmp7,tmp8,tmp9,tmp10 char(65),
        p_cit like paperover.papcitnumb,
        tot_pge, cur_pge, cur_row, p_numdsgn, cc  integer
    select count(*) into p_numdsgn
        from stdydsgn
        where stycitnumb = p_cit
    let tot_pge = p_numdsgn/10
    case
        when (cur_pge > tot_pge)
            error "No more rows in this direction"
            return tot_pge
            exit case
        when (cur_pge < 0)
            error "No more rows in this direction"
            return 0
            exit case
        end case
    declare dsgn scroll cursor for
        select * from stdydsgn
        where stycitnumb = p_cit
        order by stydsgncur
    let x = 1
    let theCnt = 0
    let hold_dsgn = " "
    open dsgn
    for cur_row = (cur_pge*10+1) to (cur_pge*10+10)
        if cur_row > p_numdsgn
            then exit for
            end if
        fetch absolute cur_row dsgn into T_stdydsgn.*
        let theCnt = theCnt + 1
```

```
        let hold_dsgn[x,x+4] = T_stdydsgn.stydsgncur using "<&"," = "
        let hold_dsgn= hold_dsgn clipped,
            T_stdydsgn.stynumgrp using "<&"," GRP, ",
            T_stdydsgn.stynumexp using "<&", " EXP, ",
            T_stdydsgn.stycntl, " CNTL "
        let x = theCnt * 65 + 1
        end for
    # Create values
        let tmp1 = hold_dsgn[1,65]
        let tmp2 = hold_dsgn[66,130]
        let tmp3 = hold_dsgn[131,195]
        let tmp4 = hold_dsgn[196,260]
        let tmp5 = hold_dsgn[261,325]
        let tmp6 = hold_dsgn[326,390]
        let tmp7 = hold_dsgn[391,455]
        let tmp8 = hold_dsgn[456,520]
        let tmp9 = hold_dsgn[521,585]
        let tmp10 = hold_dsgn[586,650]
    # Display values
        display tmp1  at 11,1 attribute(reverse)
        display tmp2  at 12,1 attribute(reverse)
        display tmp3  at 13,1 attribute(reverse)
        display tmp4  at 14,1 attribute(reverse)
        display tmp5  at 15,1 attribute(reverse)
        display tmp6  at 16,1 attribute(reverse)
        display tmp7  at 17,1 attribute(reverse)
        display tmp8  at 18,1 attribute(reverse)
        display tmp9  at 19,1 attribute(reverse)
        display tmp10  at 20,1 attribute(reverse)
    close dsgn
    return cur_pge
    END FUNCTION
##########################################################################
FUNCTION gen_dsgdsc(p_cit, tmp_dsgn)
    define
        hold_dsgn char(65),
        p_cit like paperover.papcitnumb,
        hold_styserial   integer,
        tmp_dsgn smallint
    declare gen_dsgn cursor for
        select * from stdydsgn
        where stycitnumb = p_cit
        and stydsgncur = tmp_dsgn
    foreach gen_dsgn into T_stdydsgn.*
        let hold_dsgn= T_stdydsgn.stynumgrp using "<&", " GRP, ",
             T_stdydsgn.stynumexp using "<&", " EXP, ",
             T_stdydsgn.stycntl clipped, " CNTL "
        let hold_styserial = T_stdydsgn.styserial
        end foreach
    return hold_dsgn, hold_styserial
    END FUNCTION
##########################################################################
FUNCTION show_subj(s_cit, tmp_dsgn, cur_pge)
    define
        hold_subj char(650),
        tmp_dsgn   integer,
        theCnt, x, y smallint,
```

```
    tmp1,tmp2,tmp3,tmp4,tmp5,tmp6,tmp7,tmp8,tmp9,tmp10 char(65),
    s_cit like subjgrp.sgcitnumb,
    tot_pge, cur_pge, cur_row, p_subnum, cc  integer
select count(*) into p_subnum from subjgrp
    where sgcitnumb = s_cit
    and sgdsgnnum = tmp_dsgn
let tot_pge = p_subnum/10
case
    when (cur_pge > tot_pge)
        error "No more rows in this direction"
        return tot_pge
        exit case
    when (cur_pge < 0)
        error "No more rows in this direction"
        return 0
        exit case
    end case
declare subj_curs scroll cursor for
    select * from subjgrp
    where sgcitnumb = s_cit
    and sgdsgnnum = tmp_dsgn
    order by sglink
let x = 1
let theCnt = 0
let hold_subj = " "
open subj_curs
for cur_row = (cur_pge*10+1) to (cur_pge*10+10)
    if cur_row > p_subnum
        then exit for
        end if
    fetch absolute cur_row subj_curs into T_subjgrp.*
    let theCnt = theCnt + 1
    let hold_subj[x,x+4] = T_subjgrp.sglink using "<&", " = "
    let hold_subj= hold_subj clipped,
        T_subjgrp.sgnumb using "<<<&", " ",
        T_subjgrp.sgspecies clipped, ", ",
        "Age: ", T_subjgrp.sgage clipped, " ",
        T_subjgrp.sgageunit clipped, ", ",
        "Wt: ", T_subjgrp.sgwt using "<<<<<&.<<", " ",
        T_subjgrp.sgwtunit clipped, ", "
        "Sex: ", T_subjgrp.sgsex clipped, ", ",
        T_subjgrp.sgtotexpo using "<&", " EXP"
    let x = theCnt * 65 + 1
    end for
#Create values
    let tmp1 = hold_subj[1,65]
    let tmp2 = hold_subj[66,130]
    let tmp3 = hold_subj[131,195]
    let tmp4 = hold_subj[196,260]
    let tmp5 = hold_subj[261,325]
    let tmp6 = hold_subj[326,390]
    let tmp7 = hold_subj[391,455]
    let tmp8 = hold_subj[456,520]
    let tmp9 = hold_subj[521,585]
    let tmp10 = hold_subj[586,650]
#display values
    display tmp1  at 11,1 attribute(reverse)
```

```
        display tmp2  at 12,1 attribute(reverse)
        display tmp3  at 13,1 attribute(reverse)
        display tmp4  at 14,1 attribute(reverse)
        display tmp5  at 15,1 attribute(reverse)
        display tmp6  at 16,1 attribute(reverse)
        display tmp7  at 17,1 attribute(reverse)
        display tmp8  at 18,1 attribute(reverse)
        display tmp9  at 19,1 attribute(reverse)
        display tmp10  at 20,1 attribute(reverse)
    close subj_curs
    return cur_pge
    END FUNCTION
#####################################################################
FUNCTION gen_subdsc (s_cit, tmp_dsgn, tmp_subj)
    define
        tmp_dsgn   integer,
        hold_sgserial    integer,
        hold_subj char(65),
        s_cit like subjgrp.sgcitnumb,
        tmp_subj  smallint
    declare gen_curs cursor for
        select * from subjgrp
        where sgcitnumb = s_cit
            and sgdsgnnum = tmp_dsgn
            and sglink = tmp_subj
    foreach gen_curs into T_subjgrp.*
        let hold_subj= T_subjgrp.sgnumb using "<<<&", " ",
            T_subjgrp.sgspecies clipped, ", ",
            "Age: ", T_subjgrp.sgage clipped, " ",
            T_subjgrp.sgageunit clipped, ", ",
            "Wt: ", T_subjgrp.sgwt using "<<<<<&.<<", " ",
            T_subjgrp.sgwtunit clipped, ", ",
            "Sex: ", T_subjgrp.sgsex clipped, ", ",
            T_subjgrp.sgtotexpo using "<&", " EXP"
    let hold_sgserial = T_subjgrp.sgserial
    end foreach
    return hold_subj, hold_sgserial
    END FUNCTION
#####################################################################
FUNCTION show_expo(e_cit, tmp_dsgn, cur_pge)
    define
        hold_expo char(650),
        tmp_dsgn   integer,
        theCnt, x, y smallint,
        tmp1,tmp2,tmp3,tmp4,tmp5,tmp6,tmp7,tmp8,tmp9,tmp10 char(65),
        e_cit like exporegm.excitnumb,
        tot_pge, cur_pge, cur_row, p_expnum, cc  integer
    select count(*) into p_expnum from exporegm
        where excitnumb = e_cit
        and exdsgnnum = tmp_dsgn
    let tot_pge = p_expnum/10
    case
        when (cur_pge > tot_pge)
            error "No more rows in this direction"
            return tot_pge
            exit case
        when (cur_pge < 0)
```

```
            error "No more rows in this direction"
            return 0
            exit case
        end case
    declare expo_curs scroll cursor for
        select * from exporegm
        where excitnumb = e_cit
        and exdsgnnum = tmp_dsgn
        order by exlink
    let x = 1
    let theCnt = 0
    let hold_expo = " "
    open expo_curs
    for cur_row = (cur_pge*10+1) to (cur_pge*10+10)
        if cur_row > p_expnum
            then exit for
            end if
        fetch absolute cur_row expo_curs into T_exporegm.*
        let theCnt = theCnt + 1
        let hold_expo[x,x+4] = T_exporegm.exlink using "<&", " = "
        let hold_expo= hold_expo clipped,
            T_exporegm.exagent[1,20] clipped, ", ",
             T_exporegm.exdose clipped, " ",
             T_exporegm.exdoseunit clipped, " ",
             T_exporegm.exroute, ", given ",
             T_exporegm.exinterval clipped, " x ",
             T_exporegm.exduration[1,8] clipped
        let x = theCnt * 65 + 1
        end for
    #create values
        let tmp1 = hold_expo[1,65]
        let tmp2 = hold_expo[66,130]
        let tmp3 = hold_expo[131,195]
        let tmp4 = hold_expo[196,260]
        let tmp5 = hold_expo[261,325]
        let tmp6 = hold_expo[326,390]
        let tmp7 = hold_expo[391,455]
        let tmp8 = hold_expo[456,520]
        let tmp9 = hold_expo[521,585]
        let tmp10 = hold_expo[586,650]
    #display values
        display tmp1  at 11,1 attribute(reverse)
        display tmp2  at 12,1 attribute(reverse)
        display tmp3  at 13,1 attribute(reverse)
        display tmp4  at 14,1 attribute(reverse)
        display tmp5  at 15,1 attribute(reverse)
        display tmp6  at 16,1 attribute(reverse)
        display tmp7  at 17,1 attribute(reverse)
        display tmp8  at 18,1 attribute(reverse)
        display tmp9  at 19,1 attribute(reverse)
        display tmp10  at 20,1 attribute(reverse)
    close expo_curs
    return cur_pge
    END FUNCTION
#####################################################################
FUNCTION gen_expdsc (e_cit, tmp_dsgn, tmp_expo)
    define
```

```
        hold_expo char(65),
        tmp_dsgn   integer,
        hold_exserial    integer,
        e_cit like exporegm.excitnumb,
        tmp_expo  smallint
    declare exp_curs cursor for
        select * from exporegm
        where excitnumb = e_cit
            and exdsgnnum = tmp_dsgn
            and exlink = tmp_expo
    foreach exp_curs into T_exporegm.*
        let hold_expo= T_exporegm.exagent[1,20] clipped, ", ",
             T_exporegm.exdose clipped, " ",
             T_exporegm.exdoseunit clipped, ", ",
             T_exporegm.exroute, "; given ",
             T_exporegm.exinterval clipped, " x ",
             T_exporegm.exduration[1,8] clipped
        let hold_exserial = T_exporegm.exserial
        end foreach
    return hold_expo, hold_exserial
    END FUNCTION
##################################################################
FUNCTION show_fullcit(t_cit)
    define
        t_cit like citation.citnumb,
        t_file like citation.citfile,
        tmp_string char(75),
        len, y, x smallint
    call alrt1978open()
    display "Preparing Citation Information ...." at 10, 10
        attribute(reverse)
    call disp_fullcit(t_cit)
    menu "CURRENT PAPER"
        command "Exit" HELP 1408
            exit menu
        end menu
    call alrt1978close()
    end function
##################################################################
FUNCTION show_fullcit2(in_cit)
    define
        in_cit, t_cit like citation.citnumb
    call alrt1978open()
    display "Preparing Citation Information ...." at 4,12
        attribute(reverse)
    declare full_cit2 scroll cursor for
        select citnumb
            from citation
            where citnumb like in_cit
            order by citnumb
    open full_cit2
    fetch first full_cit2 into t_cit
        if status = NOTFOUND
            THEN
                MESSAGE "No papers found."
                SLEEP 1
                MESSAGE ""
```

```
                RETURN
            else
                call disp_fullcit(t_cit)
            end if
        menu "CURRENT-CITATIONS"
            command "Next"
                "See next citation" HELP 140
                fetch next full_cit2 into t_cit
                if status = NOTFOUND
                    THEN
                        MESSAGE "No more papers found in this direction."
                        SLEEP 1
                        MESSAGE ""
                        fetch last full_cit2 into t_cit
                        call disp_fullcit(t_cit)
                    else
                        call disp_fullcit(t_cit)
                    end if
            command "Previous"
                "See Previous citation" HELP 1401
                fetch Previous full_cit2 into t_cit
                if status = NOTFOUND
                    THEN
                        MESSAGE "No more papers found in this direction."
                        SLEEP 1
                        MESSAGE ""
                        fetch first full_cit2 into t_
                        call disp_fullcit(t_cit)
                    else
                        call disp_fullcit(t_cit)
                    end if
            command "Select"
                "Select the correct citation for use as is." HELP 1402
                let citnumber = t_cit
                select * into T_citation.*
                    from citation
                    where citnumb = t_cit
                call distitle()
                call update_cit(t_cit)
                let sw = 0
            command "Use-Current"
                "Use the newly entered citation " HELP 1403
                exit menu
            command "Exit" HELP 2
                exit menu
            end menu
        call alrt1978close()
        end function
##################################################################
FUNCTION show_file(in_file)
        define
            t_cit like citation.citnumb,
            t_journ like journlst.jabrv,
            t_vol like citation.citvol,
            t_loc like citation.citlocate,
            t_page like citation.citpage,
            t_date like citation.citdate,
```

```
        t_title like citation.cittitle,
        in_file, t_file like citation.citfile
    declare full_file2 scroll cursor for
        select citnumb from citation
            where cittle like in_file
            order by citnumb
    call alrt1978open()
    display "Preparing Citation Information ...." at 4,12
        attribute(reverse)
    open full_file2
    fetch first full_file2 into t_cit
        if status = NOTFOUND
            THEN
                MESSAGE "No papers found."
                SLEEP 1
                MESSAGE ""
                RETURN
            else
                call disp_fullcit(t_cit)
            end if
    menu "CURRENT-CITATIONS"
        command "Next"
            "See next citation" HELP 1404
            fetch next full_file2 into t_cit
                if status = NOTFOUND
                    THEN
                        MESSAGE "No more papers found in this direction."
                        SLEEP 1
                        MESSAGE ""
                        fetch ast full_file2 into t_cit
                        call disp_fullcit(t_cit)
                    else
                        call disp_fullcit(t_cit)
                    end if
        command "Previous"
            "See Previous citation" HELP 1405
            fetch previous full_file2 into t_cit
            if status = NOTFOUND
                THEN
                    MESSAGE "No more papers found in this direction."
                    SLEEP 1
                    MESSAGE ""
                    fetch first full_file2 into t_cit
                    call disp_fullcit(t_cit)
                else
                    call disp_fullcit(t_cit)
                end if
        command "Select"
            "Select the correct citation for use as is." HELP 1406
            let citnumber = t_cit
            select * into T_citation *
                from citation
                where citnumb = t_cit
            call distitle()
            call update_cit(t_cit)
            let sw = 0
        command "Use-Current"
```

```
            "Use the newly entered citation." HELP 1407
            exit menu
        command "Exit" HELP 2
            exit menu
        end menu
    call alrt1978close()
    end function
##################################################################
FUNCTION disp_fullcit(t_cit)
define
    file_string char(80),
    t_file like citation.citfile,
    t_loc like citation.citlocate,
    t_cit like citation.citnumb,
    tmp_string  char(800),
        y    smallint
    select citfile, citlocate into t_file, t_loc
        from citation
        where citnumb = t_cit
    let file_string =
        "C#:", t_cit clipped, 3 spaces,
        "F#:", t_file clipped, 3 spaces,
        "Lc:", t_loc clipped
    call biblio_gen(t_cit)
    call keywd_list(t_cit)
    display "" at 10,10
    let y = 4
    display file_string at 4,2
    for x = 1 to length(bib_entry) step 75
        let y = y + 1
        let tmp_string = bib_entry[x, x+75]
        display tmp_string at y,2
        end for
    let y = y + 1
    for x = 1 to length(keywdlst) step 75
        let y = y + 1
        let tmp_string = keywdlst[x, x+75]
        display tmp_string at y,2
        end for
    END FUNCTION
```

Pages 86 - 94 intentionally left blank

#tkspapovr.4gl

```
{Comments:
Title: tkspapovr.4gl
Copyright Harold L. Trammel, 1987-1988
University of Illiois, CVM, IAPIC
Funded by US Army Contract DAMD-17-C-7114
Purpose: to manage the paper overview data
Contains the following functions:
    add_paper(pap_citnumb)
    find_paper(t_cit)
    view_paper()
    disp_paper(pap_citnumb)
    update_paper(pap_citnumb, tmp_papserial)
    alrt_dsgn_del(pap_citnumb)
    delete_paper(pap_citnumb, tmp_papserial)
    blowpaper(pap_citnumb,tmp_papserial)
}

database tkstest
GLOBALS "tksglob.4gl"
##########################################################################
FUNCTION add_paper(pap_citnumb)
    define
        tmp_aim char(20),
        numdsgn, x smallint,
        pge integer,
        pap_citnumb like paperover.papcitnumb,
        aim char(1)
    call papwinopen()
    message ""
    clear form
    for x = 10 to 20
        display "" at x, 1
        end for
    let pw = 0
    options input wrap,
        help file "tkshelp.msg",
        help key F10
    input by name
        T_paperover.papcitnumb,
        T_paperover.papcitfile,
        T_paperover.papstatepur,
        T_paperover.papimppur,
        aim,
        T_paperover.papaim,
        T_paperover.papnumdsgn
        on key(interrupt)
            let pw = 1
            exit input

        before field papcitnumb
            message "Hit RETURN to add data."
            if pap_citnumb is not null
                then
                    let T_paperover.papcitnumb = pap_citnumb
                    display by name T_paperover.papcitnumb
```

```
                select citfile into citfileno
                    from citation
                    where citnumb = pap_citnumb
                let T_paperover.papcitfile = citfileno
                display by name T_paperover.papcitfile
                next field papstatepur
            end if
        after field papcitnumb
            if T_paperover.papcitnumb is null
                then
                    error "Must have CITATION number"
                    next field papcitnumb
                else
                    call exist_citnumb(T_paperover.papcitnumb) returning x
                    if x = 0
                        then
                            error "No CITATION data has been entered for this number"
                            next field papcitnumb
                        else
                            select count(*) into x from paperover
                                where papcitnumb = T_paperover.papcitnumb
                            if x > 0 then
                                error beep,"PAPER OVERVIEW data already exists."
                                next field papcitnumb
                                end if
                        end if
                end if
            select citfile into citfileno from citation
                where citnumb = T_paperover.papcitnumb
            let T_paperover.papcitfile = citfileno
            display by name T_paperover.papcitnumb
            display by name T_paperover.papcitfile
            message "Hit ESCAPE when enter data into database when finished."
            next field papstatepur
        before field aim
            if (T_paperover.papaim) is not null and aim <> "0"
                then
                    let aim = T_paperover.papaim[1]
                    message beep, "Enter 0 to see all Aim Choices"
                        attrib  (reverse)
                else
                    let aim = "0"
                end if
            call aim_choice(aim)
        after field aim
            if aim = "0"
                then
                    next field aim
                else
                    call aim_choice(aim)
                    if chosen = 0
                        then next field aim
                        end if
                    message "Hit ESC to add row"
                end if
        after field papaim
            call aim_trans(T_paperover.papaim) returning tmp_aim
```

```
            if chosen = 0
                then next field papaim
                end if
            display tmp_aim to class
            call clear_choice(8,16,50)
        before field papnumdsgn
            call show_dsgn(T_paperover.papcitnumb, 0) returning pge
            on key (control-P)
                if infield(egdsgn) then
                    call show_dsgn(T_paperover.papcitnumb, pge-1) returning pge
                    end if
            on key (CONTROL-N)
                if infield(egdsgn) then
                    call show_dsgn(T_paperover.papcitnumb, pge+1) returning pge
                    end if
        after field papnumdsgn
            let numdsgn = T_paperover.papnumdsgn
            if T_paperover.papaim[1] = "1"
                then
                    if (numdsgn <> 0 or cnt <> 0) then
                        Error "Cannot have designs for information only papers"
                        next field aim
                        end if
                else
                    if numdsgn = 0 then
                        Error beep, "Design Required for this paper aim"
                        next field aim
                        end if
                end if
        On key (control-w)
            case
                when infield(papstatepur)
                    call showhelp(400)
                when infield(papimppur)
                    call showhelp(401)
                when infield(papaim)
                    call showhelp(402)
                when infield(papnumdsgn)
                    call showhelp(403)
                end case
        after input
            let T_paperover.papserial = 0
        end input
    options help key control-w
    if pw = 1 then return end if
    insert into paperover values(T_paperover.*)
    message "Row Added"
        sleep 1
        message ""
    select count(*) into x from stdydsgn
        where stycitnumb = T_paperover.papcitnumb
        if status = NOTFOUND
            then let x = 0
            end if
    call papwinclose()
    if T_paperover.papnumdsgn > x
        then call add_dsgn(pap_citnumb, T_paperover.papnumdsgn, x)
```

```
        end if
    END FUNCTION
##########################################################################
FUNCTION find_paper(t_cit)
    define
        t_cit like paperover.papcitnumb
    call papwinopen()
    case
        when t_cit is null
            clear form
            message "Enter search criteria and hit ESC to search"
            let int_flag=0
            construct by name query1 on paperover.*
            if int_flag <> 0 then return end if
            let select1 = "select * from paperover where ",
                query1 clipped, " order by papcitnumb"
            let select2 = "select count(*) from paperover where ",
                query1 clipped
            exit case
        otherwise
            let select1="select * from paperover where papcitnumb = ",
                quote, t_cit clipped, quote, " order by papcitnumb"
            let select2="select count(*) from paperover where papcitnumb =",
                quote, t_cit clipped, quote
            exit case
        end case
    prepare select_paper from select1
    prepare cnt_paper from select2
    declare cnt_curs cursor for cnt_paper
        foreach cnt_curs into cnt
        end foreach
    declare p_curs scroll cursor for select_paper
    open p_curs
    call view_paper()
    close p_curs
    call papwinclose()
    END FUNCTION
##########################################################################
FUNCTION view_paper()
    fetch first p_curs into T_paperover.*
        if status = NOTFOUND
            then
                MESSAGE "No papers found."
                SLEEP 1
                MESSAGE ""
            else
                let tmp_cnt = 1
                call disp_paper(T_paperover.papcitnumb)
                display "" at 21,2
                display " ", tmp_cnt, " of ", cnt, " rows found." at 21,2
            end if
    MENU "BROWSE"
        COMMAND "Next" "View the next Paper in the list." HELP 170
            FETCH NEXT p_curs INTO T_paperover.*
            let tmp_cnt = tmp_cnt +1
            IF status = NOTFOUND THEN
                MESSAGE "No more Papers in this direction."
```

```
            SLEEP 1
            let tmp_cnt = cnt
            MESSAGE ""
            FETCH LAST p_curs INTO T_paperover.*
            END IF
        display "" at 21,2
        display " ",tmp_cnt, " of ", cnt, " rows" at 21,2
            attribute(reverse)
        call disp_paper(T_paperover.papcitnumb)
    COMMAND "Previous" "View the Previous Paper in the list." HELP 170
        FETCH PREVIOUS p_curs INTO T_paperover.*
        let tmp_cnt = tmp_cnt - 1
        IF status = NOTFOUND THEN
            MESSAGE "No more Papers in this direction."
            SLEEP 1
            MESSAGE ""
            let tmp_cnt = 1
            FETCH FIRST p_curs INTO T_paperover.*
            END IF
        display "" at 21,2
        display " ",tmp_cnt, " of ", cnt, " rows" at 21,2
            attribute(reverse)
        call disp_paper(T_paperover.papcitnumb)
    COMMAND "First" "View the first Paper in the list." HELP 170
        FETCH FIRST p_curs INTO T_paperover.*
        let tmp_cnt = 1
        display "" at 21,2
        display " ",tmp_cnt, " of ", cnt, " rows" at 21,2
            attribute(reverse)
        call disp_paper(T_paperover.papcitnumb)
    COMMAND "Last" "View the Last Paper in the list " HELP 170
        message "Searching for last record...."
        FETCH LAST p_curs INTO T_paperover.*
        let tmp_cnt = cnt
        message ""
        display "" at 21,2
        display " ",tmp_cnt, " of ", cnt, " rows" at 21,2
            attribute(reverse)
        call disp_paper(T_paperover.papcitnumb)
    COMMAND "Update" "Update data in this paper" HELP 171
        call update_paper(T_paperover.papcitnumb,
            T_paperover.papserial)
    COMMAND "Delete" "Delete this entry from database" HELP 404
        call delete_paper(T_paperover.papcitnumb,
            T_paperover.papserial)
    COMMAND "Query-Again" "Enter new search criteria"
        close p_curs
        let citnumber = ""
        call find_paper(citnumber)
        exit menu
    COMMAND "Exit" "Leave this menu" HELP 2
        EXIT MENU
    END MENU
END FUNCTION
###############################################################################
FUNCTION disp_paper(pap_citnumb)
    define
```

```
        tmp_aim char(20),
        pap_citnumb like paperover.papcitnumb,
        x smallint
    for x = 10 to 20
        display "" at x, 1
        end for
    display by name T_paperover.*
    call aim_trans(T_paperover.papaim) returning tmp_aim
    display tmp_aim to class
    call show_dsgn(T_paperover.papcitnumb, 0) returning x
    END FUNCTION
#####################################################################
FUNCTION update_paper(pap_citnumb, tmp_papserial)
    define
        tmp_aim char(20),
        pap_citnumb, tmp_citno like paperover.papcitnumb,
        pge, tmp_papserial integer,
        aim char(1),
        numdsgn, hold_dsgn, x, pw smallint
    message ""
    let tmp_citno = pap_citnumb
    let pw = 0
    message "Hit ESC to update row."
    input by name
        T_paperover.papcitnumb,
        T_paperover.papcitfile,
        T_paperover.papstatepur,
        T_paperover.papimppur,
        aim,
        T_paperover.papaim,
        T_paperover.papnumdsgn
        without defaults
        on key(interrupt)
            let pw = 1
            exit input

        after field papcitnumb
            message "Hit ESCAPE to update row"
            if T_paperover.papcitnumb is null
                then error "Must have citnumber!"
                end if
            if pap_citnumb <> T_paperover.papcitnumb
                then call exist_citnumb(T_paperover.papcitnumb) returning x
                if x = 0
                    then
                        error beep, "No CITATION entered with this NUMBER "
                        next field papcitnumb
                    else
                        select count(*) into x from paperover
                            where papcitnumb = T_paperover.papcitnumb
                        if x > 0 then
                            error "PAPER data already entered for this paper."
                            sleep 2
                            next field papcitnumb
                            end if
                    end if
                end if
```

```
before field aim
    if (T_paperover.papaim) is not null and aim <> "0"
        then
            let aim = T_paperover.papaim[1]
            message beep, "Enter 0 to see all Aim Choices"
                attribute (reverse)
        else
            let aim = "0"
        end if
    call aim_choice(aim)
after field aim
    if aim = "0"
        then
            next field aim
        else
            call aim_choice(aim)
            if chosen = 0
                then next field aim
                end if
            message "Hit ESC to update row"
        end if
after field papaim
    call aim_trans(T_paperover.papaim) returning tmp_aim
    if chosen = 0
        then next field papaim
        end if
    display tmp_aim to class
    call clear_choice(8,16,50)
before field papnumdsgn
    call show_dsgn(T_paperover.papcitnumb, 0) returning pge
    on key (control-P)
        if infield(egdsgn) then
            call show_dsgn(T_paperover.papcitnumb, pge-1) returning pge
            end if
    on key (CONTROL-N)
        if infield(egdsgn) then
            call show_dsgn(T_paperover.papcitnumb, pge+1) returning pge
            end if
after field papnumdsgn
    select count(*) into hold_dsgn
        from stdydsgn
        where stycitnumb = T_paperover.papcitnumb
        if status = NOTFOUND then
            let hold_dsgn = 0
            end if
    let numdsgn = T_paperover.papnumdsgn
    if T_paperover.papaim[1] = "1"
        then
            if (numdsgn <> 0 or hold_dsgn <> 0)
                then
                    Error "Cannot have designs for information only papers"
                    next field aim
                    end if
        else
            Case
                when numdsgn = 0
                    Error beep, "Design Required for this paper aim"
```

```
                        next field aim
                        exit case
                    when hold_dsgn < T_paperover.papnumdsgn
                        call add_dsgn(T_paperover.papcitnumb, T_paperover.papnumdsgn, 0)
                        call add_exgp(T_paperover.papcitnumb)
                        exit case
                    when hold_dsgn > T_paperover.papnumdsgn
                        call alrt_dsgn_del(T_paperover.papcitnumb)
                        exit case
                    end case
                end if
            end input
        if pw = 1 then return end if
        update paperover set paperover.* =T_paperover.*
            where papserial = tmp_papserial
        if tmp_citno <> T_paperover.papcitnumb
            then
                UPDATE stdydsgn
                    set stycitnumb = T_paperover.papcitnumb,
                    stycitfile = T_paperover.papcitfile
                    where stycitnumb = tmp_citno
                UPDATE subjgrp
                    set sgcitnumb = T_paperover.papcitnumb
                    where sgcitnumb = tmp_citno
                UPDATE exporegm
                    set excitnumb = T_paperover.papcitnumb
                    where excitnumb = tmp_citno
                UPDATE expogrp
                    set egcitnumb = T_paperover.papcitnumb
                    where egcitnumb = tmp_citno
                UPDATE clinfind
                    set cfcitnumb = T_paperover.papcitnumb
                    where cfcitnumb = tmp_citno
                UPDATE tkscomment
                    set cocitnumb = T_paperover.papcitnumb,
                    cocitfile = T_paperover.papcitfile
                    where cocitnumb = tmp_citno
            end if
        message "Row updated!"
        sleep 1
        END FUNCTION
#####################################################################
FUNCTION alrt_dsgn_del(pap_citnumb)
    define
        pap_citnumb like paperover.papcitnumb,
        hold_dsgncur    integer,
        hold_dsgnserial integer
    call alrt265open()
    menu "There are more designs than indicated"
        COMMAND "Cancel" "Return and correct number of designs" HELP 405
            exit menu
        COMMAND "Delete-Design" "Search for and delete designs" HELP 406
            Prompt "Which of displayed designs should be deleted? > "
                for hold_dsgncur HELP 411
            select styserial into hold_dsgnserial from stdydsgn
                where stydsgncur = hold_dsgncur
                and stycitnum = pap_citnumb
```

```
            call delete_design(pap_citnumb,hold_dsgnserial)
        end menu
    call alrt265close()
    END FUNCTION
##########################################################################
FUNCTION delete_paper(pap_citnumb, tmp_papserial)
    define
        pap_citnumb like paperover.papcitnumb,
        tmp_papserial integer
    prompt "Do you want to delete this paper overview? (y/n)"
        for answer
    IF upshift(answer) = "N"
        then
            MESSAGE "Row NOT deleted."
            sleep 1
            MESSAGE ""
            RETURN
        else
            select stycitnumb from stdydsgn
                where stycitnumb = pap_citnumb
            union
                select excitnumb from exporegm
                where excitnumb = pap_citnumb
            union
                select sgcitnumb from subjgrp
                where sgcitnumb = pap_citnumb
            union
                select egcitnumb from expogrp
                where egcitnumb = pap_citnumb
            union
                select cfcitnumb from clinfind
                where cfcitnumb = pap_citnumb
            if status = NOTFOUND
                then
                    DELETE FROM paperover
                        where papserial = tmp_papserial
                    MESSAGE "Row deleted."
                    SLEEP 1
                    MESSAGE ""
                else
                    call blowpaper(pap_citnumb,tmp_papserial)
                end if
        end if
    END FUNCTION
##########################################################################
FUNCTION blowpaper(pap_citnumb,tmp_papserial)
    define
        pap_citnumb like paperover.papcitnumb,
        tmp_papserial integer,
        hold_dsgn smallint,
        hold_msg char(80)
    call alrt270open()
    message beep, beep, beep,"There are other tables linked tothis record"
        sleep 2
    menu "DELETE_PAPER"
        COMMAND "Exit"      HELP 2
            exit menu
```

```
        COMMAND "All-Links"
            "Delete all linked paper-related tables.CAN BE DANGEROUS"        HELP 408
            menu "DO YOU REALLY WANT TO DELETE ALL CONNECTED TABLES ? "
                COMMAND "No"  HELP 409
                    exit menu
                COMMAND "Yes"  HELP 410
                    delete from paperover
                        where papserial = tmp_papserial
                    select count(*) into hold_dsgn from stdydsgn
                        where stycitnumb = pap_citnumb
                        display "" at 2,2
                        display " ", hold_dsgn using "<<&",
                            " designs deleted" at 2,2
                        delete from stdydsgn where stycitnumb = pap_citnumb
                    select count(*) into hold_dsgn from exporegm
                        where excitnumb = pap_citnumb
                        display "" at 2,2
                        display " ", hold_dsgn using "<<&",
                            " exposure regimens deleted" at 2,2
                        delete from exporegm
                            where excitnumb = pap_citnumb
                    select count(*) into hold_dsgn from subjgrp
                        where sgcitnumb = pap_citnumb
                        display "" at 2,2
                        display " ", hold_dsgn using "<<&",
                            " subject groups deleted" at 2,2
                        delete from subjgrp
                            where sgcitnumb = pap_citnumb
                    select count(*) into hold_dsgn from expogrp
                        where egcitnumb = pap_citnumb
                        display "" at 2,2
                        display " ", hold_dsgn using "<<&",
                            " exposure groups deleted" at 2,2
                        delete from expogrp
                            where egcitnumb = pap_citnumb
                    select count(*) into hold_dsgn from clinfind
                        where cfcitnumb = pap_citnumb
                        display "" at 2,2
                        display " ", hold_dsgn using "<<&",
                            " clinical findings deleted" at 2,2
                        delete from clinfind
                            where cfcitnumb = pap_citnumb
                    exit menu
                end menu
                exit menu
        end menu
    call aIrt2_fclose()
    END FUNCTION
```

#tksdsgn.4gl

```
{
Title: tksdsgn.4gl
Copyright Harold L. Trammel, 1987-1988
University of Illiois, CVM, IAPIC
Funded by US Army Contract DAMD-17-C-7114
Contains the following functions:
    add_dsgn(tmp_stycitnumb, tot_numdsgn, dsgnnum_cnt)
    find_dsgn(t_cit)
    view_design()
    disp_dsgn(tmp_stycitnumb, tmp_styserial)
    update_dsgn(tmp_stycitnumb, tmp_styserial)
    delete_design(tmp_stycitnumb, tmp_styserial)
    blowdesign(tmp_stycitnumb, tmp_styserial)
    renum_dsgn(tmp_stycitnumb, del_dsgn,tot_dsgn)
    add_details(t_cit, t_type, t_subj, t_expo, t_dsgn)
    chk_cntl_chnge()
    alrt_box1()
    alrt_box2()
}
database tkstest
globals "tksglob.4gl"
##########################################################################
FUNCTION add_dsgn(t_stycitnumb, tot_numdsgn, dsgnnum_cnt)
    # citation number, total number of designs, existing number of designs
    define
        stdy_trans char(20),
        vivvit char(10),
        study, cntlcmp, cntltyp, cntlmeth char(20),
        compmeth, cntlassgn char(20),
        tot_numdsgn, hold_dsgn like stdydsgn.stydsgntot,
        numsubj like stdydsgn.stynumgrp,
        numexpo like stdydsgn.stynumexp,
        tmp_aim like paperover.papaim,
        tmp_2ch char(2),
        t_stycitnumb, tmp_cit like stdydsgn.stycitnumb,
        dsgn_cnt, dsgnnum_cnt smallint,
        tmp_styserial    integer,
        y, z smallint
    # initial setup
        call dsgnwinopen()
        clear form
        let dw= 0
        select papaim into tmp_aim from paperover
            where papcitnumb = t_stycitnumb
        for cnt = (dsgnnum_cnt+1) to tot_numdsgn
            initialize dsgn_array[cnt].* to null
            end for
        call set_count(tot_numdsgn)
    options help file "tkshelp.msg"
    select citfile into citfileno
        from citation
        where citnumb = t_stycitnumb
    input array dsgn_array from dsgn_rec.*
        on key(interrupt)
            let dw = 1
```

```
        exit input
    ON Key(control-w)
        case
            when infield(stycitnumb)
                call showhelp(500)
            when infield(stycitfile)
                call showhelp(517)
            when infield(dsgncur)
                call showhelp(518)
            when infield(dsgntot)
                call showhelp(519)
            when infield(styvivit)
                call showhelp(501)
            when infield(stycntl)
                call showhelp(503)
            when infield(stycntlcmp)
                call showhelp(504)
            when infield(stycmpmeth)
                call showhelp(505)
            when infield(stycntlmeth)
                call showhelp(506)
            when infield(stycntltyp)
                call showhelp(507)
            when infield(stycntassgn)
                call showhelp(508)
            when infield(numsubj)
                call showhelp(509)
            when infield(stynumexp)
                call showhelp(510)
            end case


    before field stycitnumb
        let curr_arr = arr_curr() + dsgnnum_cnt
        let dsgn_cnt = arr_count() + dsgnnum_cnt
        let dsgn_array[curr_arr].styserial = 0
        let dsgn_array[curr_arr].stydsgncur = curr_arr
        let hold_dsgn = curr_arr
        let dsgn_array[curr_arr].stydsgntot = dsgn_cnt
        #initial displays
            message "Hit RETURN to begin to add data."
            display "" to study
            display "" to vivvit
            display "" to cntlcmp
            display "" to compmeth
            display "" to cntlmeth
            display "" to cntltyp
            display "" to cntlassgn
            display by name dsgn_array[curr_arr].stydsgncur
            display by name dsgn_array[curr_arr].stydsgntot
        if t_stycitnumb is not null
            then
                let dsgn_array[curr_arr].stycitnumb = t_stycitnumb
                let dsgn_array[curr_arr].stycitfile = citfileno
                display by name dsgn_array[curr_arr].stycitnumb
                display by name dsgn_array[curr_arr].stycitfile
                next field stytype
```

```
        end if
after field stycitnumb
    if dsgn_array[curr_arr].stycitnumb is null
        then
            error "Must have Citation Number"
            next field stycitnumb
        else
            let tmp_cit = dsgn_array[curr_arr].stycitnumb
            let x = exist_citnumb( tmp_cit)
            if x = 0 then
                error "No CITATION DATA entered with this number."
                next field stycitnumb
                end if
        end if
    let dsgn_array[curr_arr].stycitnumb = t_stycitnumb
    let dsgn_array[curr_arr].stycitfile = citfileno
    display by name dsgn_array[curr_arr].stycitnumb
    display by name dsgn_array[curr_arr].stycitfile
    next field stytype
before field stytype
    call stype_choice(tmp_aim)
after field stytype
    let tmp_2ch = dsgn_array[curr_arr].stytype
    call stype_trans(tmp_2ch) returning study
    display by name study
before field styvivit
    call vivit_choice()
after field styvivit
    let tmp_2ch = dsgn_array[curr_arr].styvivit
    call vivit_trans(tmp_2ch) returning vivvit
    if chosen = 0
        then next field styvivit
        else display by name vivvit
        end if
before field stycntl
    if dsgn_array[curr_arr].stytype = "F"
        then let dsgn_array[curr_arr].stycntl = "N"
        next field stynumgrp
        end if
after field stycntl
    if dsgn_array[curr_arr].stycntl = "N"
        then
            let dsgn_array[curr_arr].stycntlcmp = ""
            let dsgn_array[curr_arr].stycmpmeth = ""
            let dsgn_array[curr_arr].stycntlmeth = ""
            let dsgn_array[curr_arr].stycntltyp = ""
            let dsgn_array[curr_arr].stycntassgn = ""
            display by name dsgn_array[curr_arr].stycntlcmp
            display by name dsgn_array[curr_arr].stycmpmeth
            display by name dsgn_array[curr_arr].stycntlmeth
            display by name dsgn_array[curr_arr].stycntltyp
            display by name dsgn_array[curr_arr].stycntassgn
            next field stynumgrp
            end if
before field stycntlcmp
    if dsgn_array[curr_arr].stycntl = "N"
        then next field stycntl
```

```
            else call cntlcmp_choice()
            end if
        after field stycntlcmp
            let tmp_2ch = dsgn_array[curr_arr].stycntlcmp
            call cntlcmp_trans(tmp_2ch) returning cntlcmp
            if chosen = 0
                then next field stycntlcmp
                else display by name cntlcmp
                end if
        before field stycmpmeth
            let tmp_2ch = dsgn_array[curr_arr].stycntlcmp
            call cmpmeth_choice(tmp_2ch)
        after field stycmpmeth
            let tmp_2ch = dsgn_array[curr_arr].stycmpmeth
            call cmpmeth_trans(tmp_2ch) returning compmeth
            if chosen = 0
                then next field stycmpmeth
                else display by name compmeth
                end if
        before field stycntlmeth
            if dsgn_array[curr_arr].stycntl = "N"
                then next field stycntl
                else call cntlmeth_choice()
                end if
        after field stycntlmeth
            let tmp_2ch = dsgn_array[curr_arr].stycntlmeth
            call cntlmeth_trans(tmp_2ch) returning cntlmeth
            if chosen = 0
                then next field stycntlmeth
                else display by name cntlmeth
                end if
        before field stycntltyp
            let tmp_2ch = dsgn_array[curr_arr].stycntlmeth
            call cntltyp_choice(tmp_2ch)
        after field stycntltyp
            let tmp_2ch = dsgn_array[curr_arr].stycntltyp
            call cntltyp_trans(tmp_2ch) returning cntltyp
            if chosen = 0
                then next field stycntltyp
                else display by name cntltyp
                end if
        before field stycntassgn
            call cntlassgn_choice()
        after field stycntassgn
            let tmp_2ch = dsgn_array[curr_arr].stycntassgn
            call cntlassgn_trans(tmp_2ch) returning cntlassgn
            if chosen = 0
                then next field stycntassgn
                else display by name cntlassgn
                end if
    after field stynumgrp
        let numsubj = dsgn_array[curr_arr].stynumgrp
        if numsubj > 99
            then
                error beep, "The maximum number of Subject Groups is 99!"
                next field stynumgrp
            end if
```

```
            call add_details(t_stycitnumb,study,numsubj,0,hold_dsgn)
            select count(*) into cnt from subjgrp
                where sgcitnumb = dsgn_array[curr_arr].stycitnumb
                and sgdsgnnum = dsgn_array[curr_arr].stydsgncur
            display cnt using "<<&", " Groups Entered  " at 19,40
                attribute(reverse)
        after field stynumexp
            let numexpo = dsgn_array[curr_arr].stynumexp
            if numexpo > 99
                then
                    error beep, "The maximum number of Exposure Regimens is 99!"
                    next field stynumexp
                end if
            call add_details(t_stycitnumb,study,0,numexpo,hold_dsgn)
            select count(*) into cnt from exporegm
                where excitnumb = dsgn_array[curr_arr].stycitnumb
                and exdsgnnum = dsgn_array[curr_arr].stydsgncur
            display cnt using "<<&", " Regimens Entered " at 20,40
                attribute(reverse)
            if dsgn_cnt = tot_numdsgn
                then exit input
                end if
        end input
    if dw = 1 then return end if
    for cnt = (dsgnnum_cnt+1) to dsgn_cnt
        insert into stdydsgn values(
            dsgn_array[cnt].stycitnumb,
            dsgn_array[cnt].stycitfile,
            dsgn_array[cnt].styserial,
            dsgn_array[cnt].stydsgncur,
            dsgn_cnt,
            dsgn_array[cnt].stytype,
            dsgn_array[cnt].styvivit,
            dsgn_array[cnt].stycntl,
            dsgn_array[cnt].stycntlcmp,
            dsgn_array[cnt].stycmpmeth,
            dsgn_array[cnt].stycntlmeth,
            dsgn_array[cnt].stycntltyp,
            dsgn_array[cnt].stycntassgn,
            dsgn_array[cnt].stynumgrp,
            dsgn_array[cnt].stynumexp)

        #converts temporary dsgn number to serial number in subj and expo
        select styserial into tmp_styserial
            from stdydsgn
            where stycitnumb = dsgn_array[cnt].stycitnumb
            and stydsgncur= dsgn_array[cnt].stydsgncur
        update exporegm
            set exdsgnnum = tmp_styserial
            where excitnumb = dsgn_array[cnt].stycitnumb
            and exdsgnnum = dsgn_array[cnt].stydsgncur
        update subjgrp
            set sgdsgnnum = tmp_styserial
            where sgcitnumb = dsgn_array[cnt].stycitnumb
            and sgdsgnnum = dsgn_array[cnt].stydsgncur
        end for
    call swinclose()
```

```
    call expwinclose()
    call dsgnwinclose()
    END FUNCTION
##########################################################################
FUNCTION find_dsgn(t_cit)
    define t_cit like stdydsgn.stycitnumb
    call dsgnwinopen()
    case
        when t_cit is null
            clear form
            message "Enter search criteria and hit ESC to begin search"
            let int_flag=0
            construct by name query1 on stdydsgn.*
                if int_flag <> 0 then return end if
            let select1 = "select * from stdydsgn where ",
                query1 clipped, " order by stycitnumb, stydsgncur"
            let select2 = "select count(*) from stdydsgn where ",
                query1 clipped
            exit case
        otherwise
            let select1 = "select * from stdydsgn where ",
                "stycitnumb = ", quote, t_cit, quote,
                " order by stycitnumb, stydsgncur"
            let select2 = "select count(*) from stdydsgn where ",
                "stycitnumb = ", quote, t_cit, quote
            exit case
        end case
    prepare select_design from select1
    prepare cnt_design from select2
    display " Searching . . . " at 21,2 attribute(reverse)
    declare cnt_curs cursor for cnt_design
        foreach cnt_curs into cnt
        end foreach
    declare d_curs scroll cursor for select_design
    open d_curs
    call view_design()
    close d_curs
    END FUNCTION
##########################################################################
FUNCTION view_design()
    fetch first d_curs into T_stdydsgn.*
        if status = NOTFOUND
            then
                MESSAGE "No designs found.", beep
                SLEEP 1
                MESSAGE ""
                display "" at 21,2
            else
                let tmp_cnt = 1
                display "" at 21,2
                call disp_dsgn(T_stdydsgn.stycitnumb,T_stdydsgn.styserial)
                display " ", tmp_cnt, " of ", cnt, " rows found." at 21,2
            end if
    MENU "BROWSE"
        COMMAND "Next"
            "View the next Design in the list." HELP 170
            FETCH NEXT d_curs INTO T_stdydsgn.*
```

```
    let tmp_cnt = tmp_cnt +1
    IF status = NOTFOUND THEN
        MESSAGE "No more Designs in this direction."
        SLEEP 1
        let tmp_cnt = cnt
        MESSAGE ""
        FETCH LAST d_curs INTO T_stdydsgn.*
        END IF
    display "" at 21,2
    display " ",tmp_cnt, " of ", cnt, " rows" at 21,2
    attribute(reverse)
    call disp_dsgn(T_stdydsgn.stycitnumb,T_stdydsgn.styserial)
COMMAND "Previous"
    "View the Previous Design in the list." HELP 170
    FETCH PREVIOUS d_curs INTO T_stdydsgn.*
    let tmp_cnt = tmp_cnt - 1
    IF status = NOTFOUND THEN
        MESSAGE "No more Designs in this direction."
        SLEEP 1
        MESSAGE ""
        let tmp_cnt = 1
        FETCH FIRST d_curs INTO T_stdydsgn.*
        END IF
    display "" at 21,2
    display " ",tmp_cnt, " of ", cnt, " rows" at 21,2
    attribute(reverse)
    call disp_dsgn(T_stdydsgn.stycitnumb,T_stdydsgn.styserial)
COMMAND "First"
    "View the first Design in the list." HELP 170
    FETCH FIRST d_curs INTO T_stdydsgn.*
    let tmp_cnt = 1
    display "" at 21,2
    display " ",tmp_cnt, " of ", cnt, " rows" at 21,2
    attribute(reverse)
    call disp_dsgn(T_stdydsgn.stycitnumb,T_stdydsgn.styserial)
COMMAND "Last"
    "View the Last Design in the list." HELP 170
    message "Searching for last record...."
    FETCH LAST d_curs INTO T_stdydsgn.*
    let tmp_cnt = cnt
    message ""
    display "" at 21,2
    display " ",tmp_cnt, " of ", cnt, " rows" at 21,2
    attribute(reverse)
    call disp_dsgn(T_stdydsgn.stycitnumb,T_stdydsgn.styserial)
COMMAND "Update"
    "Update the Current Design in the list." HELP 171
    call update_dsgn(T_stdydsgn.stycitnumb,T_stdydsgn.styserial)
    call disp_dsgn(T_stdydsgn.stycitnumb,T_stdydsgn.styserial)
COMMAND "Delete"
    "Delete this entry from database" HELP 511
    call delete_design(T_stdydsgn.stycitnumb,T_stdydsgn.styserial)
    call disp_dsgn(T_stdydsgn.stycitnumb,T_stdydsgn.styserial)

COMMAND "Query-Again"
    "Enter new search criteria" HELP 512
    close d_curs
```

```
            let citnumber = ""
            call find_dsgn(citnumber)
            exit menu
        COMMAND "Exit"
            "Leave this menu" HELP 2
            close d_curs
            EXIT MENU
        END MENU
    END FUNCTION
##########################################################################
FUNCTION disp_dsgn(tmp_stycitnumb, tmp_styserial)
    define stdy_trans char(20),
        vivvit char(10),
        study, cntlcmp, cntltyp, cntlmeth, compmeth, cntlassgn char(20),
        tmp_stycitnumb like stdydsgn.stycitnumb,
        tmp_numdsgn like stdydsgn.stydsgntot,
        tmp_styserial integer,
        tmp_grp,tmp_exp smallint
    display by name T_stdydsgn.*
    if T_stdydsgn.stytype is not null
        then call stype_trans(T_stdydsgn.stytype) returning study
        else let study = ""
        end if
    display by name study
    if T_stdydsgn.styvivit is not null
        then call vivit_trans(T_stdydsgn.styvivit) returning vivvit
        else let vivvit = ""
        end if
    display by name vivvit
    if T_stdydsgn.stycntlcmp is not null
        then call cntlcmp_trans(T_stdydsgn.stycntlcmp) returning cntlcmp
        else let cntlcmp = ""
        end if
    display by name cntlcmp
    if T_stdydsgn.stycmpmeth is not null
        then call cmpmeth_trans(T_stdydsgn.stycmpmeth) returning compmeth
        else let compmeth = ""
        end if
    display by name compmeth
    if T_stdydsgn.stycntlmeth is not null
        then call cntlmeth_trans(T_stdydsgn.stycntlmeth) returning cntlmeth
        else let cntlmeth = ""
        end if
    display by name cntlmeth
    if T_stdydsgn.stycntltyp is not null
        then call cntltyp_trans(T_stdydsgn.stycntltyp) returning cntltyp
        else let cntltyp = ""
        end if
    display by name cntltyp
    if T_stdydsgn.stycntassgn is not null
        then call cntlassgn_trans(T_stdydsgn.stycntassgn) returning cntlassgn
        else let cntlassgn = ""
        end if
    display by name cntlassgn
    select count(*) into tmp_grp
        from subjgrp
        where sgcitnumb = tmp_stycitnumb
```

```
        and sgdsgnnum = tmp_styserial
    display tmp_grp using "<<&", " Groups Entered      " at 19,40
        attribute(reverse)
    select count(*) into tmp_exp
        from exporegm
        where excitnumb = tmp_stycitnumb
        and exdsgnnum = tmp_styserial
    display tmp_exp using "<<&", " Regimens Entered " at 20,40
        attribute(reverse)
    END FUNCTION
###############################################################################
FUNCTION update_dsgn(tmp_stycitnumb, tmp_styserial)
    define stdy_trans char(20),
        vivvit char(10),
        study, cntlcmp, cntltyp, cntlmeth, compmeth, cntlassgn char(20),
        tmp_stycitnumb like stdydsgn.stycitnumb,
        tmp_numdsgn, numdsgn like stdydsgn.stydsgntot,
        numsubj like stdydsgn.stynumgrp,
        numexpo like stdydsgn.stynumexp,
        tmp_aim like paperover.papaim,
        tmp_styserial integer,
        sg_cnt, ex_cnt, y, z smallint
    let dw= 0
    let tmp_numdsgn = T_stdydsgn.stydsgncur
    select papaim into tmp_aim from paperover
        where papcitnumb = T_stdydsgn.stycitnumb
    options input wrap,
        help file "tkshelp.msg"
    input T_stdydsgn.* without defaults from dsgn_rec.*
        on key(interrupt)
            let dw = 1
            exit input
        ON Key(control-w)
            case
                when infield(stycitnumb)
                    call showhelp(500)
                when infield(stycitfile)
                    call showhelp(517)
                when infield(dsgncur)
                    call showhelp(518)
                when infield(dsgntot)
                    call showhelp(519)
                when infield(styvivit)
                    call showhelp(501)
                when infield(stycntl)
                    call showhelp(503)
                when infield(stycntlcmp)
                    call showhelp(504)
                when infield(stycmpmeth)
                    call showhelp(505)
                when infield(stycntlmeth)
                    call showhelp(506)
                when infield(stycntltyp)
                    call showhelp(507)
                when infield(stycntassgn)
                    call showhelp(508)
                when infield(numsubj)
```

```
                call showhelp(509)
            when infield(stynumexp)
                call showhelp(510)
            end case

    before field stycitnumb
        message "Hit ESC to update row"
    after field stycitnumb
        if T_stdydsgn.stycitnumb is null
            then
                error "You must have a CITATION number"
                next field stycitnumb
                end if
        if T_stdydsgn.stycitnumb <> tmp_stycitnumb
            then
                call exist_citnumb(T_stdydsgn.stycitnumb ) returning x
                if x = 0
                    then
                        error "CITATION data not entered for this number"
                        next field stycitnumb
                    else
                        select count(*) into x
                            from stdydsgn
                            where stycitnumb = T_stdydsgn.stycitnumb
                        if x > 0
                            then
                                error "DESIGN data already entered for this number"
                                next field stycitnumb
                            end if
                    end if
            end if
        next field stytype
    after field stydsgncur
        if T_stdydsgn.stydsgncur <> tmp_numdsgn
            then
                select count(*) into x from stdydsgn
                    where stydsgncur = T_stdydsgn.stydsgncur
                    and stycitnumb = T_stdydsgn.stycitnumb
                if x > 0 then
                    error Data already entered for that Design Number"
                    next field stydsgncur
                    end if
            end if
    before field stytype
        call stype_choice(tmp_aim)
    after field stytype
        call stype_trans(T_stdydsgn.stytype) returning study
        display by name study
    before field styvivit
        call vivit_choice()
    after field styvivit
        call vivit_trans(T_stdydsgn.styvivit) returning vivvit
        if chosen = 0
            then next field styvivit
            else display by name vivvit
            end if
    after field stycntl
```

```
        if T_stdydsgn.stycntl = "N"
            then
                let T_stdydsgn.stycntlcmp = ""
                let T_stdydsgn.stycmpmeth = ""
                let T_stdydsgn.stycntlmeth = ""
                let T_stdydsgn.stycntltyp = ""
                let T_stdydsgn.stycntassgn = ""
                display by name T_stdydsgn.stycntlcmp
                display by name T_stdydsgn.stycmpmeth
                display by name T_stdydsgn.stycntlmeth
                display by name T_stdydsgn.stycntltyp
                display by name T_stdydsgn.stycntassgn
                next field stynumgrp
                end if
    before field stycntlcmp
        if T_stdydsgn.stycntl = "N"
            then next field stycntl
            else call cntlcmp_choice()
            end if
    after field stycntlcmp
        call cntlcmp_trans(T_stdydsgn.stycntlcmp) returning cntlcmp
        if chosen = 0
            then next field stycntlcmp
            else display by name cntlcmp
            end if
    before field stycmpmeth
        call cmpmeth_choice(T_stdydsgn.stycntlcmp)
    after field stycmpmeth
        call cmpmeth_trans(T_stdydsgn.stycmpmeth) returning compmeth
        if chosen = 0
            then next field stycmpmeth
            else display by name compmeth
            end if
    before field stycntlmeth
        if T_stdydsgn.stycntl = "N"
            then next field stycntl
            else call cntlmeth_choice()
            end if
    after field stycntlmeth
        call cntlmeth_trans(T_stdydsgn.stycntlmeth)
            returning cntlmeth
        if chosen = 0
            then next field stycntlmeth
            else display by name cntlmeth
            end if
    before field stycntltyp
        call cntltyp_choice(T_stdydsgn.stycntlmeth)
    after field stycntltyp
        call cntltyp_trans(T_stdydsgn.stycntltyp)
            returning cntltyp
        if chosen = 0
            then next field stycntltyp
            else display by name cntltyp
            end if
    before field stycntassgn
        call cntlassgn_choice()
    after field stycntassgn
```

```
        call cntlassgn_trans(T_stdydsgn.stycntassgn)
            returning cntlassgn
        if chosen = 0
            then next field stycntassgn
            else display by name cntlassgn
            end if
    before field stynumgrp
        let numsubj = T_stdydsgn.stynumgrp
        select count(*) into x
            from subjgrp
            where sgcitnumb = T_stdydsgn.stycitnumb
            and sgdsgnnum = T_stdydsgn.stydsgncur
    after field stynumgrp
        if T_stdydsgn.stynumgrp > 99
            then error beep, "The maximum number of Subject Groups is 99!"
            next field stynumgrp
            end if
        case
            when x = T_stdydsgn.stynumgrp
                next field stynumexp
                exit case
            when x < T_stdydsgn.stynumgrp
                call add_details(T_stdydsgn.stycitnumb,
                    T_stdydsgn.stytype,
                    T_stdydsgn.stynumgrp,
                    0,
                    T_stdydsgn.styserial)
                select count(*) into sg_cnt
                    from subjgrp
                    where sgcitnumb = T_stdydsgn.stycitnumb
                    and sgdsgnnum = T_stdydsgn.styserial
                let T_stdydsgn.stynumgrp = sg_cnt
                display sg_cnt using "<<&", " Groups Entered      " at 19,40 attribute(reverse)
                # needs flag to force jump to exposure groups
                exit case
            when numsubj < T_stdydsgn.stynumgrp
                call alrt_box1()
                if upshift(answer) = "Y"
                    then
                        call add_details(T_stdydsgn.stycitnumb,
                            T_stdydsgn.stytype,
                            T_stdydsgn.stynumgrp,
                            0,
                            T_stdydsgn.styserial)
                        select count(*) into sg_cnt
                            from subjgrp
                            where sgcitnumb = T_stdydsgn.stycitnumb
                            and sgdsgnnum = T_stdydsgn.styserial
                        let T_stdydsgn.stynumgrp = sg_cnt
                        display sg_cnt using "<<&",
                            " Groups Entered    " at 19,40
                            attribute(reverse)
                        # needs flag to force jump to exposure groups
                    else next field stynumgrp
                    end if
                exit case
            when x > T_stdydsgn.stynumgrp
```

```
                call alrt_box2()
                if upshift(answer) = "Y"
                    then call find_sgrp(T_stdydsgn.stycitnumb,
                        T_stdydsgn.styserial)
                        select count(*) into sg_cnt
                            from subjgrp
                            where sgcitnumb = T_stdydsgn.stycitnumb
                            and sgdsgnnum = T_stdydsgn.styserial
                        let T_stdydsgn.stynumgrp = sg_cnt
                        display sg_cnt using "<<&",
                            " Groups Entered    " at 19,40
                            attribute(reverse)
                    else next field stynumgrp
                    end if
                exit case
            end case
    before field stynumexp
        let numexpo = T_stdydsgn.stynumexp
        select count(*) into x
            from exporegm
            where excitnumb = T_stdydsgn.stycitnumb
            and exdsgnnum = T_stdydsgn.styserial
    after field stynumexp
        if T_stdydsgn.stynumexp > 99
            then
                error beep, "The maximum number of Exposure Regimens is 99!"
                next field stynumexp
            end if
        case
            when x = T_stdydsgn.stynumexp
                next field stynumexp
                exit case
            when x < T_stdydsgn.stynumexp
                call add_details(T_stdydsgn.stycitnumb,
                    T_stdydsgn.stytype,
                    0,
                    T_stdydsgn.stynumexp,
                    T_stdydsgn.styserial)
                select count(*) into ex_cnt
                    from exporegm
                    where excitnumb = T_stdydsgn.stycitnumb
                    and exdsgnnum = T_stdydsgn.styserial
                let T_stdydsgn.stynumexp = ex_cnt
                display ex_cnt using "<<&",
                    " Regimens Entered " at 20,40
                    attribute(reverse)
                # needs flag to force jump to exposure groups
                exit case
            when numexpo < T_stdydsgn.stynumexp
                call alrt_box1()
                if upshift(answer) = "Y"
                    then
                        call add_details(T_stdydsgn.stycitnumb,
                            T_stdydsgn.stytype,
                            0,
                            T_stdydsgn.stynumexp,
                            T_stdydsgn.styserial)
```

```
                        select count(*) into ex_cnt
                            from exporegm
                            where excitnumb = T_stdydsgn.stycitnumb
                            and exdsgnnum = T_stdydsgn.styserial
                        let T_stdydsgn.stynumexp = ex_cnt
                        display ex_cnt using "<<&",
                            " Regimens Entered " at 20,40
                            attribute(reverse)
                        # needs flag to force jump to exposure groups
                    else
                        next field stynumexp
                    end if
                exit case
            when x >T_stdydsgn.stynumexp
                call alrt_box2()
                if upshift(answer) = "Y"
                    then
                        call find_expo(T_stdydsgn.stycitnumb,
                            T_stdydsgn.styserial)
                        select count(*) into ex_cnt
                            from exporegm
                            where excitnumb = T_stdydsgn.stycitnumb
                            and exdsgnnum = T_stdydsgn.styserial
                        let T_stdydsgn.stynumexp = ex_cnt
                        display ex_cnt using "<<&",
                            " Regimens Entered " at 20,40
                            attribute(reverse)
                    else
                        next field stynumexp
                    end if
                exit case
            end case
        end input
    if dw = 1
        then return
        end if
    update stdydsgn
    set stdydsgn.* = T_stdydsgn.*
        where styserial = tmp_styserial
    {
        jump to exposure groups after change in number of subjects /
        exposures is needed here
        }
    message " Row updated. " attribute(reverse)
    END FUNCTION
#########################################################################
FUNCTION delete_design(tmp_stycitnumb, tmp_styserial)
    define tmp_stycitnumb like stdydsgn.stycitnumb,
        tmp_styserial integer,
        tmp_dsgn, tmp_totdsgn smallint
    call alrt265open()
    prompt "Do you want to delete this design overview? (y/n) > "
        for char answer
    IF upshift(answer) = "N"
        then
            MESSAGE "Row NOT deleted."
            sleep 1
```

```
            MESSAGE ""
            RETURN
        else
            select excitnumb from exporegm
                where excitnumb = tmp_stycitnumb
                and exdsgnnum = tmp_styserial
            union
            select sgcitnumb from subjgrp
                where sgcitnumb = tmp_stycitnumb
                and sgdsgnnum = tmp_styserial
            union
            select egcitnumb from expogrp
                where egcitnumb = tmp_stycitnumb
                and egdsgn = tmp_styserial
            union
            select cfcitnumb from clinfind
                where cfcitnumb = tmp_stycitnumb
                and cfeglink = any
                (select egserial from expogrp
                 where egdsgn = tmp_styserial)
            if status = NOTFOUND
                then
                    select count(*) into tmp_totdsgn
                        from stdydsgn
                        where stycitnumb = tmp_stycitnumb
                    select stydsgncur into tmp_dsgn
                        from stdydsgn
                        where styserial = tmp_styserial
                    DELETE FROM stdydsgn
                        where styserial = tmp_styserial
                    if tmp_dsgn < tmp_totdsgn then
                        call renum_dsgn(tmp_stycitnumb, tmp_dsgn, tmp_totdsgn)
                        end if
                    select count(*) into tmp_totdsgn
                        from stdydsgn
                        where stycitnumb = tmp_stycitnumb
                    update stdydsgn
                        set stydsgntot = tmp_totdsgn
                        where stycitnumb = tmp_stycitnumb
                    update paperover
                        set papnumdsgn = tmp_totdsgn
                        where papcitnumb = tmp_stycitnumb
                    MESSAGE "Row deleted."
                    SLEEP 1
                    MESSAGE ""
                else
                    call blowdesign(tmp_stycitnumb, tmp_styserial)
                end if
        end if
    call alrt265close()
    END FUNCTION
##########################################################################
FUNCTION blowdesign(tmp_stycitnumb, tmp_styserial)
    define tmp_stycitnumb like stdydsgn.stycitnumb,
        tmp_styserial integer,
        tmp_totdsgn, tmp_dsgn, x smallint,
        hold_msg char(80)
```

```
    call alrt270open()
    message beep, beep, beep,
    "There are other tables linked to this record"
    sleep 2
    menu "DELETE_DESIGN"
        COMMAND "Exit" HELP 2
            exit menu
        COMMAND "All-Links"
            "Delete all linked design-related tables. CAN BE DANGEROUS" HELP 514
            menu "Are you really sure you want to delete all these ?"
                COMMAND "NO" HELP 515
                    exit menu
                COMMAND "YES" HELP 516
                    select unique(stydsgntot) into tmp_totdsgn
                        from stdydsgn where stycitnumb = tmp_stycitnumb
                    select stydsgncur into tmp_dsgn
                        from stdydsgn
                        where styserial = tmp_styserial
                    DELETE FROM stdydsgn
                        where styserial = tmp_styserial
                    if tmp_dsgn < tmp_totdsgn then
                        call renum_dsgn(tmp_stycitnumb, tmp_dsgn, tmp_totdsgn)
                        end if
                    select count(*) into tmp_totdsgn
                        from stdydsgn
                        where stycitnumb = tmp_stycitnumb
                    update stdydsgn
                        set stydsgntot = tmp_totdsgn
                        where stycitnumb = tmp_stycitnumb
                    update paperover
                        set papnumdsgn = tmp_totdsgn
                        where papcitnumb = tmp_stycitnumb
                    select count(*) into x from exporegm
                        where excitnumb = tmp_stycitnumb
                        and exdsgnnum = tmp_styserial
                    display "" at 2,2
                    call delete_expo(tmp_stycitnumb,tmp_styserial,0,0)
                    display " ", x using "<<&", " exposure regimens deleted" at 2,2
                    select count(*) into x from subjgrp
                        where sgcitnumb = tmp_stycitnumb
                        and sgdsgnnum = tmp_styserial
                    display "" at 2,2
                    call delete_sgrp(tmp_stycitnumb,tmp_styserial,0,0)
                    display " ", x using "<<&", " subject groups deleted" at 2,2
                    select count(*) into x from expogrp
                        where egcitnumb = tmp_stycitnumb
                        and egdsgn = tmp_styserial
                    display "" at 2,2
                    call delete_exgp(tmp_stycitnumb,tmp_styserial,0,0)
                    display " ", x using "<<&", " exposure groups deleted" at 2,2
                    exit menu
                end menu
            exit menu
        end menu
    call alrt270close()
    END FUNCTION
##################################################################
```

```
FUNCTION renum_dsgn(tmp_stycitnumb, del_dsgn,tot_dsgn)
    define
        tmp_stycitnumb      like stdydsgn.stycitnumb,
        tmp_styserial integer,
        tmp_cur, del_dsgn, tot_dsgn smallint
    declare renum cursor for
        select styserial, stydsgncur
            into tmp_styserial, tmp_cur
            from stdydsgn
        where stycitnumb = tmp_stycitnumb
        and stydsgncur >= del_dsgn
        order by 2
    foreach renum
        update stdydsgn
            set stydsgncur = (stydsgncur - 1)
            where styserial = tmp_styserial
        call renum_exgp(tmp_stycitnumb, tmp_styserial, 0, 0)
        end foreach
    END FUNCTION
##############################################################################
FUNCTION add_details(t_cit, t_type, t_subj, t_expo, t_dsgn)
    {
        need to have a branch here for various designs
        for example, analytical design would need a different set of calls
    }

    define
        t_cit     like stdydsgn.stycitnumb,
        t_type    like stdydsgn.stytype,
        t_subj    like stdydsgn.stynumgrp,
        t_expo    like stdydsgn.stynumexp,
        t_dsgn    integer,
        c_expo, c_subj   smallint
    case
        when t_subj = 0
            select count(*) into c_expo
                from exporegm
                where excitnumb = t_cit
                and exdsgnnum = t_dsgn
            if status = NOTFOUND
                then let c_expo = 0
                end if
            call add_expo(t_cit, c_expo, t_expo, t_dsgn)
            exit case
        when t_expo = 0
            select count(*) into c_subj
                from subjgrp
                where sgcitnumb = t_cit
                and sgdsgnnum = t_dsgn
            if status = NOTFOUND
                then let c_subj = 0
                end if
            call add_sgrp(t_cit, c_subj, t_subj, t_dsgn)
            exit case
        otherwise
            call add_sgrp(t_cit, 0, t_subj, t_dsgn)
            call add_expo(t_cit, 0, t_expo, t_dsgn)
```

```
            exit case
        end case
    current window is dsgnwin
    END FUNCTION
#########################################################################
FUNCTION chk_cntl_chnge()
    open window ck_cntl_chg at 10,10 with 2 rows, 50 columns
        attribute (border, reverse, prompt line first + 1)
    display " This will change existing data in the fields below. " at 1,1
        attribute (reverse)
    prompt " Continue? (y/N) " for answer
    close window ck_cntl_chg
    return answer
    END FUNCTION
#########################################################################
FUNCTION alrt_box1()
    open window alrt_box1 at 10,10 with 2 rows, 50 columns
        attribute (border, reverse, prompt line first + 1)
    display " This value is greater than previously indicated. " at 1,1
        attribute (reverse)
    prompt " Do you want to add items? (y/n) > " for answer
    close window alrt_box1
    END FUNCTION
#########################################################################
FUNCTION alrt_box2()
    open window alrt_box2 at 10,10 with 2 rows, 50 columns
        attribute (border, reverse, prompt line first + 1)
    display " This value is less than previously indicated. " at 1,1
        attribute (reverse)
    prompt " Do you want to remove items? (y/n) > " for answer
    close window alrt_box2
    END FUNCTION
```

#tkssgrp.4gl

```
{TITLE: tkssgrp.4gl
Copyright Harold L. Trammel, 1987-1988
University of Illiois, CVM, IAPIC
Funded by US Army Contract DAMD-17-C-7114
Contains the following functions:
    add_sgrp(tmp_sgcitnum, cursubj, tot_numsubj, tmp_design)
    find_sgrp(t_cit,t_dsgn)
    view_sgrp()
    disp_sgrp()
    update_sgrp(tmp_sgcitnum, tmp_sgserial)
    delete_sgrp(tmp_sgcitnum, sg_dsgn, sg_serial, del_flag)
    renum_subj(o_cit,n_cit,o_dsgn,o_subj,n_subj)
}

database tkstest
globals "tksglob.4gl"
##########################################################################
FUNCTION add_sgrp(tmp_sgcitnum, cursubj, tot_numsubj, tmp_design)
    # receiving (cit no., current subj no., total no. of subj, dsgn serial no.)
    define
        tmp_design integer,
        tmp_sgcitnum, tmp_cit like subjgrp.sgcitnum),
        dsgnlabel smallint,
        totval, remain, let1, let2 smallint,
        tmp_link char(2),
        sextrans,ageunit char(20),
        tmp_sex, tmp_ar char(1),
        tmp_age, tmp_wr char(2),
        tmp_agerange char(10),
        tmp_wtrange char(10),
        tot_numsubj, cursubj, x smallint
    call swinopen()
    clear form
    let chosen = 1
    display "" at 1,1
    select stydsgncur into dsgnlabel
        from stdydsgn
        where styserial = tmp_design
        if status = NOTFOUND
            then let dsgnlabel = tmp_design
            end if
    let sw = 0
    for cnt = (cursubj+1) to tot_numsubj
        INITIALIZE sgrp_array[cnt].* to null
        end for
    call set_count(tot_numsubj)
    options help file "tkshelp.msg", help key control-w
    input array sgrp_array from sgrp_rec.*
        ON KEY (INTERRUPT)
            let sw =1
            exit input
        ON Key(control-w)
            case
                when infield(sglink)
                    call showhelp(600)
```

```
            when infield(sgsource)
                call showhelp(602)
            when infield(sgnunb)
                call showhelp(603)
            when infield(sgsex)
                call showhelp(604)
            when infield(sgage)
                call showhelp(605)
            when infield(sgwt)
                call showhelp(606)
            when infield(sght)
                call showhelp(607)
            when infield(sgoccup)
                call showhelp(608)
            when infield(sghlthstat)
                call showhelp(609)
            when infield(sgtotexpo)
                call showhelp(610)
        end case
    BEFORE field sgcitnumb
        #initial displays
            display "" to sextrans
            display "" to ageunit
            display "" to agerange
            display "" to wtrange
            display by name tot_numsubj
            display by name dsgnlabel
            curr_subj = arr_curr() + cursubj
            subj_cnt = arr_count() + cursubj
        let sgrp_array[curr_subj].sgserial = 0
        let sgrp_array[curr_subj].sglink = curr_subj
        display by name sgrp_array[curr_subj].sglink
        if tmp_sgcitnum is not null
            then
                let sgrp_array[curr_subj].sgcitnumb = tmp_sgcitnum
                let sgrp_array[curr_subj].sgdsgnnum = tmp_design
                display by name sgrp_array[curr_subj].sgcitnumb
                display by name sgrp_array[curr_subj].sgdsgnnum
            end if
        next field sgspecies
    AFTER field sgcitnumb
        if sgrp_array[curr_arr].sgcitnumb is null
            then
                error "Must have Citation Number"
                next field sgcitnumb
            else
                let tmp_cit = sgrp_array[curr_arr].sgcitnumb
                let x = exist_citnumb(tmp_cit)
                if x = 0 then
                    error "No CITATION DATA entered with this number."
                    next field sgcitnumb
                    end if
            end if
    before field sgsex
        call sex_choice()
    after field sgsex
        let tmp_sex = sgrp_array[curr_subj].sgsex
```

```
        call sex_trans(tmp_sex) returning sextrans
        if chosen = 0
            then next field sgsex
            else
                display by name sextrans
                call clear_choice(9,14,50)
            end if
    before field sgageunit
        call date_choice()
    after field sgageunit
        let tmp_age = sgrp_array[curr_subj].sgageunit
        call date_trans(tmp_age) returning ageunit
        if chosen = 0
            then next field sgageunit
            else
                display by name ageunit
                call clear_choice(9,14,50)
            end if
    before field sgagerange
        call agergn_choice()
    after field sgagerange
        let tmp_ar = sgrp_array[curr_subj].sgagerange
        call agergn_tran(tmp_ar) returning tmp_agerange
        if chosen = 0
            then
                next field sgagerange
            else
                display tmp_agerange to agerange
                call clear_choice(9,14,50)
            end if
    before field sgwtunit
        call wt_choice()
    after field sgwtunit
        case
            when sgrp_array[curr_subj].sgwtunit = "LB"
                let sgrp_array[curr_subj].sgwt = sgrp_array[curr_subj].sgwt / 2.2
                let sgrp_array[curr_subj].sgwtunit = "KG"
                display by name sgrp_array[curr_subj].sgwt
                display by name sgrp_array[curr_subj].sgwtunit
                exit case
            when sgrp_array[curr_subj].sgwtunit = "OZ"
                let sgrp_array[curr_subj].sgwt = sgrp_array[curr_subj].sgwt /16 / 2.2
                let sgrp_array[curr_subj].sgwtunit = "KG"
                display by name sgrp_array[curr_subj].sgwt
                display by name sgrp_array[curr_subj].sgwtunit
                exit case
            when sgrp_array[curr_subj].sgwtunit = "GM"
                let sgrp_array[curr_subj].sgwt = sgrp_array[curr_subj].sgwt / 1000
                let sgrp_array[curr_subj].sgwtunit = "KG"
                display by name sgrp_array[curr_subj].sgwt
                display by name sgrp_array[curr_subj].sgwtunit
                exit case
            when sgrp_array[curr_subj].sgwtunit = "KG"
                let sgrp_array[curr_subj].sgwt = sgrp_array[curr_subj].sgwt
                let sgrp_array[curr_subj].sgwtunit = "KG"
                display by name sgrp_array[curr_subj].sgwt
                display by name sgrp_array[curr_subj].sgwtunit
```

```
                    exit case
                otherwise
                    error "Indicated units are not acceptable!"
                    sleep 1
                    next field sgwtunit
                    exit case
            end case
            call clear_choice(9,14,50)
        before field sgwtrange
            call wrangeChoice() returning sgrp_array[curr_subj].sgwtrange
        after field sgwtrange
            let tmp_wr = sgrp_array[curr_subj].sgwtrange
            call wtrgn_tran(tmp_wr) returning tmp_wtrange
            if chosen = 0
                then
                    next field sgwtrange
                else
                    display tmp_wtrange to wtrange
                    call clear_choice(9,14,50)
                end if
        after field sgtotexpo
            if subj_cnt = tot_numsubj
                then exit input
                end if
        end input
    if sw = 1 then return end if
    for cnt = (cursubj+1) to subj_cnt
        insert into subjgrp values(sgrp_array[cnt].*)
        end for
    call swinclose()
    END FUNCTION
##########################################################################
FUNCTION find_sgrp(t_cit,t_dsgn) {citation, design serial number}
    define
        t_cit like subjgrp.sgcitnumb,
        t_dsgn integer
    call swinopen()
    case
        when (t_cit is null and t_dsgn = 0)
            clear form
            message "Enter search criteria and hit ESC to search"
                let int_flag = 0
            construct by name query1 on subjgrp.*
                if int_flag <> 0 then return end if
            let select1 = "select * from subjgrp where ",
                  query1 clipped,
              " order by sgcitnumb, sgdsgnnum, sglink"
            let select2 = "select count(*) from subjgrp where ",
                  query1 clipped
            exit case
        when (t_cit is not null and t_dsgn = 0)
            let select1 = "select * from subjgrp where sgcitnumb = ",
                  quote, t_cit clipped, quote,
              " order by sgcitnumb, sgdsgnnum, sglink"
            let select2 = "select count(*) from subjgrp where sgcitnumb =",
                  quote, t_cit clipped, quote
            exit case
```

```
        otherwise
            let select1 = "select * from subjgrp where ",
                "sgcitnumb = ", quote, t_cit clipped, quote,
                " and sgdsgnnum = ", t_dsgn,
             " order by sgcitnumb, sgdsgnnum, sglink"
            let select2 = "select count(*) from subjgrp where ",
                "sgcitnumb = ", quote, t_cit clipped, quote,
                " and sgdsgnnum = ", t_dsgn
            exit case
        end case
    prepare cnt_subjgrp from select2
    prepare slct_subjgrp from select1
    display "Searching . . . " at 21,2 attribute(reverse)
    declare cnt_curs cursor for cnt_subjgrp
        foreach cnt_curs into cnt
        end foreach
    declare s_curs scroll cursor for slct_subjgrp
    open s_curs
    call view_sgrp()
    close s_curs
    end function
###########################################################################
FUNCTION view_sgrp()
    FETCH FIRST s_curs into T_subjgrp.*
        if status = NOTFOUND
            THEN
                MESSAGE "No subjects found."
                SLEEP 1
                MESSAGE ""
            else
                let tmp_cnt = 1
                call disp_sgrp()
                display "" at 21,2
                display " ", tmp_cnt, " of ", cnt, " rows found." at 21,2
            end if
    MENU "BROWSE"
        COMMAND "Next"
            "View the next Subject Group in the list." HELP 170
            FETCH NEXT s_curs into T_subjgrp.*
            let tmp_cnt = tmp_cnt +1
            if status = NOTFOUND THEN
                message "No more Subject Groups in this direction."
                sleep 1
                let tmp_cnt = cnt
                message ""
                fetch last s_curs into T_subjgrp.*
                end if
            display "" at 21,2
            display " ", tmp_cnt, " of ", cnt, " rows" at 21,2
                attribute(reverse)
            call disp_sgrp()
        COMMAND "Previous"
            "View the previous Subject Groups in the list." HELP 170
            FETCH PREVIOUS s_curs into T_subjgrp.*
            let tmp_cnt = tmp_cnt -1
            if status = NOTFOUND THEN
                message "No more Subject Groups in this direction."
```

```
                sleep 1
                message ""
                let tmp_cnt = 1
                fetch first s_curs into T_subjgrp.*
                end if
            display "" at 21,2
            display " ", tmp_cnt, " of ", cnt, " rows" at 21,2
                attribute(reverse)
            call disp_sgrp()
        COMMAND "First"
            "View the first Subject Group in the list." HELP 170
            FETCH FIRST s_curs into T_subjgrp.*
            let tmp_cnt = 1
            display "" at 21,2
            display " ", tmp_cnt, " of ", cnt, " rows" at 21,2
                attribute(reverse)
            call disp_sgrp()
        COMMAND "Last"
            "View the last Subject Group in the list." HELP 170
            message "Searching for last record...."
            FETCH LAST s_curs into T_subjgrp.*
            let tmp_cnt = cnt
            message ""
            display "" at 21,2
            display " ", tmp_cnt, " of ", cnt, " row" at 21,2
                attribute(reverse)
            call disp_sgrp()
        COMMAND "Update"
            "Update Subject data" HELP 171
            call update_sgrp(T_subjgrp.sgcitnumb,T_subjgrp.sgserial)
            call disp_sgrp()
        COMMAND "Delete"
            "Delete this entry from the database<submenu>" HELP 611
            call delete_sgrp(T_subjgrp.sgcitnumb, T_subjgrp.sgdsgnnum,T_subjgrp.sgserial,1)
            call disp_sgrp()
        COMMAND "Query-Again"
            "Enter new search criteria" HELP 612
            close s_curs
            let citnumber = ""
            let hold_dsgn = 0
            call find_sgrp(citnumber,hold_dsgn)
            exit menu
        COMMAND "Exit"
            "Leave this menu." HELP 2
            clos  _curs
            exit menu
        end menu
    close s_curs
    END FUNCTION
###########################################################################
FUNCTION disp_sgrp()
    define
        tot_numsubj smallint,
        dsgnlabel integer,
        agerange, wtrange char(20),
        sextrans,ageunit char(20)
    select count(*) into tot_numsubj
```

```
        from subjgrp
        where sgcitnumb = T_subjgrp.sgcitnumb
        and sgdsgnnum = T_subjgrp.sgdsgnnum
    display by name T_subjgrp.*
    call sex_trans(T_subjgrp.sgsex) returning sextrans
    display by name sextrans
    call date_trans(T_subjgrp.sgageunit) returning ageunit
    display by name ageunit
    call agergn_tran(T_subjgrp.sgagerange) returning agerange
        display by name agerange
    call wtrgn_tran(T_subjgrp.sgwtrange) returning wtrange
        display by name wtrange
    display by name tot_numsubj
    select stydsgncur into dsgnlabel
        from stdydsgn
        where styserial = T_subjgrp.sgdsgnnum
    display by name dsgnlabel
    END FUNCTION
#########################################################################
FUNCTION update_sgrp(tmp_sgcitnum, tmp_sgserial)
    define
        tmp_sgserial integer,
        tmp_sgcitnum like subjgrp.sgcitnumb,
        sextrans,ageunit char(20),
        tmp_sex, tmp_ar char(1),
        tmp_age, tmp_wr char(2),
        tmp_agerange char(10),
        tmp_wtrange char(10),
        tmp_dsgn like subjgrp.sgdsgnnum,
        list_flag, tmp_sgnum, sg_cnt  smallint
    let sw = 0
    display tmp_sgcitnum to sgcitnumb
    display tmp_sgserial to sgserial
    INPUT T_subjgrp.* without defaults from sgrp_rec.*
        ON KEY (INTERRUPT)
            let sw = 1
            exit input
        before field sgcitnumb
            select stydsgncur into tmp_dsgn
                from stdydsgn
                where styserial = T_subjgrp.sgdsgnnum
            display tmp_dsgn to dsgnlabel
            select count(*) into sg_cnt
                from subjgrp
                where sgdsgnnum = T_subjgrp.sgdsgnnum
            display sg_cnt to tot_numsubj
        after field sgcitnumb
            message "Hit ESCAPE to update row"
            if T_subjgrp.sgcitnumb is null
                then
                    error "Must have citnumber!"
            end if
            if tmp_sgcitnum <> T_subjgrp.sgcitnumb then
                call exist_citnumb(T_subjgrp.sgcitnumb) returning x
                if x = 0
                    then
                        error beep, "No CITATION entered with this NUMBER "
```

```
                next field sgcitnumb
            else
                select count(*) into x
                    from subjgrp
                    where sgcitnumb = T_subjgrp.sgcitnumb
                if x > 0 then
                    error "SUBJECT data already entered for this paper."
                    sleep 2
                    next field sgcitnumb
                end if
        end if
    end if
after field sgdsgnnum
    select stydsgncur into tmp_dsgn
        from stdydsgn
        where styserial = T_subjgrp.sgdsgnnum
    display tmp_dsgn to dsgnlabel
before field sgsex
    call sex_choice()
after field sgsex
    call sex_trans(T_subjgrp.sgsex) returning sextrans
    if chosen = 0
        then next field sgsex
        else
            display by name sextrans
            call clear_choice(9,14,50)
        end if
before field sgageunit
    call date_choice()
after field sgageunit
    call date_trans(T_subjgrp.sgageunit) returning ageunit
    if chosen = 0
        then next field sgageunit
        else
            display y name ageunit
            call clear_choice(9,14,50)
        end if
before field sgagerange
    call agergn_choice()
after field sgagerange
    let tmp_ar = T_subjgrp.sgagerange
    call agergn_tran(tmp_ar) returning tmp_agerange
    if chosen = 0
        then
            next field sgagerange
        else
            display tmp_agerange to agerange
            call clear_choice(9,14,50)
        end if
before field sgwtunit
    call wt_choice()
after field sgwtunit
    case
        when T_subjgrp.sgwtunit = "LB"
            let T_subjgrp.sgwt = T_subjgrp.sgwt * 2.2
            let T_subjgrp.sgwtunit = "KG"
            display by name T_subjgrp.sgwt
```

```
                display by name T_subjgrp.sgwtunit
                exit case
            when T_subjgrp.sgwtunit = "OZ"
                let T_subjgrp.sgwt = T_subjgrp.sgwt /16 * 2.2
                let T_subjgrp.sgwtunit = "KG"
                display by name T_subjgrp.sgwt
                display by name T_subjgrp.sgwtunit
                exit case
            when T_subjgrp.sgwtunit = "GM"
                let T_subjgrp.sgwt = T_subjgrp.sgwt / 1000
                let T_subjgrp.sgwtunit = "KG"
                display by name T_subjgrp.sgwt
                display by name T_subjgrp.sgwtunit
                exit case
            when T_subjgrp.sgwtunit = "KG"
                let T_subjgrp.sgwt = T_subjgrp.sgwt
                let T_subjgrp.sgwtunit = "KG"
                display by name T_subjgrp.sgwt
                display by name T_subjgrp.sgwtunit
                exit case
            otherwise
                error "Indicated units are not acceptable!"
                sleep 1
                next field sgwtunit
                exit case
        end case
        call clear_choice(9,14,50)
    before field sgwtrange
        call wrangeChoice() returning T_subjgrp.sgwtrange
    after field sgwtrange
        let tmp_wr = T_subjgrp.sgwtrange
        call wtrgn_tran(tmp_wr) returning tmp_wtrange
        if chosen = 0
            then
                next field sgwtrange
            else
                display tmp_wtrange to wtrange
                call clear_choice(9,14,50)
            end if

    End Input
  if sw = 1 then return end if
  UPDATE subjgrp set subjgrp.* = T_subjgrp.*
    where subjgrp.sgserial = tmp_sgserial
  END FUNCTION
#####################################################################
FUNCTION delete_sgrp(tmp_sgcitnum, sg_dsgn, sg_serial, del_flag)
  define tmp_sgcitnum like subjgrp.sgcitnumb,
      sg_dsgn like subjgrp.sgdsgnnum,
      sg_serial   integer,
      del_flag, tot_sg, sg_lnk smallint
  if del_flag <> 0
    then
      call alrt260open()
      PROMPT "Do you want to delete this Subject Group? (y/n) "
        for char answer
      If upshift(answer) = "N"
```

```
                then
                    message "Row NOT deleted"
                    sleep 1
                    Message ""
                    call alrt260close()
                    return
                else
                    if sg_serial = 0
                        then
                            DELETE FROM subjgrp
                                where sgcitnumb = tmp_sgcitnum
                                and sgdsgnnum = sg_dsgn
                            clear form
                        else
                            select count(*) into tot_sg
                                from subjgrp
                                where sgcitnumb = tmp_sgcitnum
                                and sgdsgnnum = sg_dsgn
                            select sglink into sg_lnk
                                from subjgrp
                                where sgserial = sg_serial
                            DELETE FROM subjgrp
                                where sgserial = sg_serial
                            if sg_lnk < tot_sg then
                                for x = sg_lnk to tot_sg
                                    call renum_subj(tmp_sgcitnum,"0", sg_dsgn, x+1, x)
                                    end for
                                end if
                            if del_flag <> 0
                                then
                                    Message "ROW DELETED."
                                    sleep 1
                                    Message ""
                                    call alrt260close()
                                end if
                        end if
                end if
        end if
    end FUNCTION
#########################################################################
FUNCTION renum_subj(o_cit,n_cit,o_dsgn,o_subj,n_subj)
    # This probably needs an internal loop to manage the counting
    define
        o_cit,n_cit   like subjgrp.sgcitnumb,
        o_dsgn integer,
        o_subj, n_subj like subjgrp.sglink
    update subjgrp
        set sglink = n_subj
        where sgcitnumb = o_cit
        and sglink = o_subj
        and sgdsgnnum = o_dsgn
    call renum_exgp(o_cit,n_cit,o_dsgn,o_subj,n_subj,0,0)
    end FUNCTION
```

#tksexpo.4gl

```
{Title: tksexpo.4gl
Copyright Harold L. Trammel, 1987-1988
University of Illiois, CVM, IAPIC
Funded by US Army Contract DAMD-17-C-7114
Contains the following functions:
    add_expo(ex_cit, tmp_numexpo, tot_numexpo, tmp_design)
    find_expo(t_cit,t_dsgn)
    view_expo()
    disp_expo()
    update_expo(tmp_citno,tmp_serial)
    delete_expo(ex_cit, ex_dsgn, ex_serial, del_flag)
    renum_expo(o_cit,n_cit,o_dsgn,n_dsgn,o_expo,n_expo)
    }
database tkstest
globals "tksglob.4gl"
########################################################################
FUNCTION add_expo(ex_cit, tmp_numexpo, tot_numexpo, tmp_design)
    # citation num, current expo cnt, tot num of expo, design serial num
    define
        formulation, route, purpose char(10),
        ex_cit like exporegm.excitnumb,
        tmp_design integer,
        tmp_2ch    char(2),
        tmp_3ch    char(3),
        dsgnlabel,tmp_numexpo, tot_numexpo smallint,
        ew, curr_exp, exp_cnt, xsmallint
    #initial setup
        call expwinopen()
        display "" at 1,1
        clear form
        let ew = 0
        select stydsgncur into dsgnlabel
            from stdydsgn
            where styserial = tmp_design
            if status = NOTFOUND
                then let dsgnlabel = tmp_design
                end if
        for cnt = (tmp_numexpo+1) to tot_numexpo
            initialize expo_array[cnt].* to null
            end for
        call set_count(tot_numexpo)
    options help file "tkshelp.msg",
        help key CONTROL-w
    input array expo_array from exp_rec.*
        on key(interrupt)
            let ew = 1
            exit input
        On Key(control-w)
            case
                when infield(expurpose)
                    call showhelp(701)
                when infield(exagent)
                    call showhelp(702)
                when infield(exdose)
                    call showhelp(703)
```

```
            when infield(exformul)
                call showhelp(704)
            when infield(exroute)
                call showhelp(705)
            when infield(exinterval)
                call showhelp(706)
            when infield(exduration)
                call showhelp(707)
            when infield(exadminmeth)
                call showhelp(708)
            when infield(exevaltime)
                call showhelp(709)
            end case

    before field excitnumb
        let curr_exp = arr_curr() + tmp_numexpo
        let exp_cnt = arr_count() + tmp_numexpo
        let expo_array[curr_exp].exdsgnnum = tmp_design
        let expo_array[curr_exp].exserial = 0
        let expo_array[curr_exp].exlink = curr_exp
        #initial displays
            display "" to frm_only.formulation
            display "" to frm_only.route
            display "" to frm_only.purpose
            display ex_cit to excitnumb
            display by name tot_numexpo
            display by name dsgnlabel
            display by name expo_array[curr_exp].exdsgnnum
            display by name expo_array[curr_exp].exlink
        if ex_cit is not null
            then
                let expo_array[curr_exp].excitnumb = ex_cit
                display by name expo_array[curr_exp].excitnumb
                next field expurpose
            end if
    before field expurpose
        call pur_choice()
    after field expurpose
        let tmp_3ch = expo_array[curr_exp].expurpose
        call pur_trans(tmp_3ch) returning purpose
        if chosen = 0
            then next field expurpose
            else display by name purpose
            end if
        call clear_choice(9,14,52)
    before field exdoseunit
        call dose_choice()
    before field exformul
        call form_choice()
    after field exformul
        let tmp_2ch = expo_array[curr_exp].exformul
        call form_trans(tmp_2ch) returning formulation
        if chosen = 0
            then next field exformul
            else display by name formulation
            end if
    before field exroute
```

```
            call rte_choice()
        after field exroute
            let tmp_2ch = expo_array[curr_exp].exroute
            call rte_trans(tmp_2ch) returning route
            if chosen = 0
                then next field exroute
                else display by name route
                end if
            call clear_choice(9,18,52)
        after field exevaltime
            if exp_cnt = tot_numexpo
                then exit input
                end if
        end input
    options help key control-w
    if ew = 1
        then return
        end if
    for cnt = (tmp_numexpo + 1) to exp_cnt
        insert into exporegm values (expo_array[cnt].*)
        end for
    call expwinclose()
    end FUNCTION
###########################################################################
FUNCTION find_expo(t_cit,t_dsgn) {citation, design serial number}
    define
        t_cit like exporegm.excitnumb,
        t_dsgn integer
    call expwinopen()
    case
        when (t_cit is null and t_dsgn = 0)
            clear form
            message "Enter search criteria and hit ESC to search"
            let int_flag = 0
            construct by name query1 on exporegm.*
                if int_flag <> 0 then return end if
            let select1 = "select * from exporegm where ",
                query1 clipped,
                " order by excitnumb, exdsgnnum, exlink"
            let select2 = "select count(*) from exporegm where ",
                query1 clipped
            exit case
        when (t_cit is not null and t_dsgn = 0)
            let select1 = "select * from exporegm where excitnumb = ",
                 quote, t_cit clipped, quote,
                " order by excitnumb, exdsgnnum, exlink"
            let select2 = "select count(*) from exporegm where excitnumb =",
                quote, t_cit clipped, quote
            exit case
        otherwise
            let select1 = "select * from exporegm where ",
                "excitnumb = ",quote, t_cit clipped,quote,
                " and exdsgnnum = ", t_dsgn,
                " order by excitnumb, exdsgnnum, exlink"
            let select2 = "select count(*) from exporegm where ",
                "excitnumb = ",quote, t_cit clipped,quote,
                " and exdsgnnum = ", t_dsgn
```

```
            exit case
        end case
    prepare cnt_expo from select2
    prepare select_expo from select1
    display "Searching . . . " at 20,2 attribute(reverse)
    declare cnt_curs cursor for cnt_expo
        foreach cnt_curs into cnt
            end foreach
    declare e_curs scroll cursor for select_expo
    open e_curs
    call view_expo()
    end FUNCTION
###########################################################################
FUNCTION view_expo()
    fetch first e_curs into T_exporegm.*
        if status = NOTFOUND
            then
                MESSAGE "No exposures found."
                SLEEP 1
                MESSAGE ""
            else
                let tmp_cnt = 1
                call disp_expo()
                display "" at 20,2
                display " ", tmp_cnt, " of ", cnt, " rows found." at 20,2
            end if
    MENU "BROWSE"
        COMMAND "Next"
            "View the next Exposure Regimen in the list." HELP 170
            FETCH NEXT e_curs INTO T_exporegm.*
            let tmp_cnt = tmp_cnt +1
            IF status = NOTFOUND THEN
                MESSAGE "No more Exposure Regimens in this direction."
                SLEEP 1
                let tmp_cnt = cnt
                MESSAGE ""
                FETCH LAST e_curs INTO T_exporegm.*
                END IF
            display "" at 20,2
            display " ",tmp_cnt, " of ", cnt, " rows" at 20,2
                attribute(reverse)
            call disp_expo()
        COMMAND "Previous"
            "View the Previous Exposure Regimen in the list." HELP 170
            FETCH PREVIOUS e_curs INTO T_exporegm.*
            let tmp_cnt = tmp_cnt - 1
            IF status = NOTFOUND THEN
                MESSAGE "No more Exposure Regimens in this direction."
                SLEEP 1
                MESSAGE ""
                let tmp_cnt = 1
                FETCH FIRST e_curs INTO T_exporegm.*
                END IF
            display "" at 20,2
            display " ",tmp_cnt, " of ", cnt, " rows" at 20,2
                attribute(reverse)
            call disp_expo()
```

```
        COMMAND "First"
            "View the first Exposure Regimen in the list." HELP 170
            FETCH FIRST e_curs INTO T_exporegm.*
            let tmp_cnt = 1
            display "" at 20,2
            display " ",tmp_cnt, " of ", cnt, " rows" at 20,2
                attribute(reverse)
            call disp_expo()
        COMMAND "Last"
            "View the Last Exposure Regimen in the list." HELP 170
            message "Searching for last record...."
            FETCH LAST e_curs INTO T_exporegm.*
            let tmp_cnt = cnt
            message ""
            display "" at 20,2
            display " ",tmp_cnt, " of ", cnt, " rows" at 20,2
                attribute(reverse)
            call disp_expo()
        command "Update"
            "Update Exposure Data" HELP 171
            call update_expo(T_exporegm.excitnumb,T_exporegm.exserial)
            call disp_expo()
        command "Delete"
            "Delete this entry from database <submenu>" HELP 715
            call delete_expo(T_exporegm.excitnumb,0,T_exporegm.exlink,1)
            call disp_expo()
        COMMAND "Query-again"
            "Enter new search criteria" HELP 716
            close e_curs
            let citnumber = ""
            call find_expo(citnumber,0)
            exit menu
        COMMAND "Exit"
            "Leave this menu" HELP 2
            close e_curs
            EXIT MENU
        END MENU
    end FUNCTION
##########################################################################
FUNCTION disp_expo()
    define
        tmp_formul char(10),
        formulation, route, purpose char(10),
        tmp_route char(10),
        tmp_numexp char(2),
        dsgnlabel integer
    select unique(stynumexp) into tmp_numexp
        from stdydsgn
        where styserial = T_exporegm.exdsgnnum
    select stydsgncur into dsgnlabel
        from stdydsgn
        where styserial = T_exporegm.exdsgnnum
    display by name dsgnlabel
    display by name T_exporegm.*
    display tmp_numexp to tot_numexpo
    call pur_trans(T_exporegm.expurpose) returning purpose
    display by name purpose
```

```
    call form_trans(T_exporegm.exformul) returning formulation
    display by name formulation
    call rte_trans(T_exporegm.exroute) returning route
    display by name route
    end FUNCTION
#####################################################################
FUNCTION update_expo(tmp_citno,tmp_serial)
    define
        formulation, route, purpose char(10),
        tmp_citno like exporegm.excitnumb,
        tmp_exno like exporegm.exlink,
        tmp_dsgn like exporegm.exdsgnnum,
        tmp_serial integer,
        x, ew, curr_exp, exp_cnt smallint
    let ew = 0
    display tmp_citno to excitnumb
    display tmp_serial to exserial
    input by name T_exporegm.* without defaults
        on key(interrupt)
            let ew = 1
            exit input
        before field excitnumb
            select stydsgncur
                into tmp_dsgn
                from stdydsgn
                where styserial = T_exporegm.exdsgnnum
            display tmp_dsgn to dsgnlabel
            select count(*)
                into exp_cnt
                from exporegm
                where exdsgnnum = T_exporegm.exdsgnnum
            display exp_cnt to tot_numexpo
        after field exdsgnnum
            select stydsgncur
                into tmp_dsgn
                from stdydsgn
                where styserial = T_exporegm.exdsgnnum
            display tmp_dsgn to dsgnlabel
            select count(*)
                into exp_cnt
                from exporegm
                where exdsgnnum = T_exporegm.exdsgnnum
            display exp_cnt to tot_numexpo
        before field expurpose
            call pur_choice()
        after field expurpose
            call pur_trans(T_exporegm.expurpose) returning purpose
            if chosen = 0
                then next field expurpose
                else display by name purpose
                end if
            call clear_choice(9,18,52)
        before field exdoseunit
            call dose_choice()
        before field exformul
            call form_choice()
        after field exformul
```

```
            call form_trans(T_exporegm.exformul) returning formulation
            if chosen = 0
                then next field exformul
                else display by name formulation
                end if
        before field exroute
            call rte_choice()
        after field exroute
            call rte_trans(T_exporegm.exroute) returning route
            if chosen = 0
                then next field exroute
                else display by name route
                end if
            call clear_choice(9,18,52)
        end input
    if ew = 1
        then return
        end if
    update exporegm set exporegm.* = T_exporegm.*
        where exporegm.exserial = tmp_serial
    # Logic question
        {
            quesion the logic of this part
            if (T_exporegm.excitnumb <> tmp_citno or
                T_exporegm.exdsgnnum <> tmp_dsgn or
                T_exporegm.exlink <> tmp_exno)
                    then
                    call renum_expo(tmp_citno, T_exporegm.excitnumb,
                        tmp_dsgn, T_exporegm.exdsgnnum,
                        tmp_exno, T_exporegm.exlink)
            link to the expogrp tables maintained in renum_expo
            end if
            }

    end FUNCTION
##########################################################################
FUNCTION delete_expo(ex_cit, ex_dsgn, ex_serial, del_flag)
    # ex_dsgn = 0 to delete only this lnk
    # ex_serial = 0 to delete all of dsgn(x)
    # del_flag to control dialog box

    define ex_cit like exporegm.excitnumb,
        ex_dsgn like exporegm.exdsgnnum,
        ex_serial    like exporegm.exlink,
        ex_lnk, del_flag, tot_ex smallint
    if del_flag <> 0
        then
            call alrt260open()
            PROMPT "Do you want to delete this Exposure Regimen? (y/n) "
                for answer
            If upshift(answer) = "N"
                then
                    message "Row NOT deleted"
                    sleep 1
                    Message ""
                    call alrt260close()
                    return
```

```
                else
                    if ex_serial = 0
                        then
                            DELETE FROM exporegm
                                where excitnumb = ex_cit
                                and exdsgnnum = ex_dsgn
                        else
                            select count(*) into tot_ex
                                from exporegm
                                where excitnumb = ex_cit
                                and exdsgnnum = ex_dsgn
                            select exlink into ex_lnk
                                from exporegm
                                where exserial = ex_serial
                            DELETE FROM exporegm
                                where exserial = ex_serial
                            if ex_lnk < tot_ex then
                                for x = ex_lnk to tot_ex
                                    call renum_expo(ex_cit,"0",ex_dsgn,"0",x+1,x)
                                    end for
                                end if
                            if del_flag <> 0
                                then
                                    Message "ROW DELETED."
                                    sleep 1
                                    Message ""
                                    call alrt260close()
                                end if
                        end if
                end if
        end if
    end FUNCTION
#########################################################################
FUNCTION renum_expo(o_cit,n_cit,o_dsgn,n_dsgn,o_expo,n_expo)
    define o_cit,n_cit    like exporegm.excitnumb,
        o_dsgn, n_dsgn like exporegm.exdsgnnum,
        o_expo, n_expo like exporegm.exlink
    if n_dsgn > 0
        then
            update exporegm
                set exdsgnnum = n_dsgn
                where excitnumb = o_cit
                and exdsgnnum = o_dsgn
        else
            update exporegm
                set exlink = n_expo
                where excitnumb = o_cit
                and exlink = o_expo
                and exdsgnnum = o_dsgn
        end if
    {
        need some mechanism to renumber exposure group data
        }
    end FUNCTION
```

#tksexpgrp.4gl

```
{Comments:
Title: tksexpgrp.4gl
Copyright Harold L. Trammel, 1987-1988
University of Illiois, CVM, IAPIC
Funded by US Army Contract DAMD-17-C-7114
Purpose: to establish links between regimens and groups
Contains the following functions:
    add_exgp(t_citnumber)
    find_exgp(t_cit)
    view_exgp()
    disp_exgp()
    update_exgp(tmp_citnumb, tmp_egserial)
    delete_exgp(tmp_citnumb,tmp_dsgn, tmp_egserial, del_flag)
    renum_exgp(t_cit, t_dsgn, t_sg, t_ex)
}

database tkstest
globals "tksglob.4gl"
##############################################################################
FUNCTION add_exgp(t_citnumber)
    define
        hold_serial integer,
        hold_descript   like expogrp.egdsgndsc,
        t_citnumber like expogrp.egcitnumb,
        tmp_dsgnlbl like expogrp.egdsgnlabel,
        tmp_dsgn like expogrp.egdsgn,
        tmp_subj, tmp_expo      smallint,
        numexgp smallint,
        pge integer,
        p_numdsgn,eg, x, y, curr_exgp, exgp_cnt smallint
    #initial setup
        call linkwinopen()
        clear form
        display "" at 1,1
        let eg=0
        for cnt = 1 to 50
            initialize exgp_array[cnt].* to null
            end for
        call set_count(50)
        options help file "tkshelp.msg",
            help key CONTROL-w
    if t_citnumber is null
        then prompt "Which citation? " for t_citnumber
            let t_citnumber = upshift(t_citnumber)
            select count(*) into cnt from citation
            where citnumb = t_citnumber
            if cnt < 1 then
                ERROR "Must add citation with this number > ",
                t_citnumber
                end if
        end if
    input array exgp_array from exgp_rec.*
        on key(interrupt)
            let eg=1
            exit input
```

```
        on key(CONTROL-w)
            case
            # these need to be updated 3/21/89
                when infield(egcitnumb)
                    call showhelp(800)
                when infield(egdsgndsc)
                    call showhelp(801)
                when infield(egsubgdsc)
                    call showhelp(802)
                when infield(egexpodsc)
                    call showhelp(803)
                when infield(egtotnum)
                    call showhelp(804)
                end case

        before field egcitnumb
            let curr_exgp = arr_curr()
            let exgp_cnt = arr_count()
            let exgp_array[curr_exgp].egserial = 0
            if t_citnumber is not null
                then
                    let exgp_array[curr_exgp].egcitnumb = t_citnumber
                    display by name exgp_array[curr_exgp].egcitnumb
                    select count(*) into numexgp
                        from expogrp
                        where egcitnumb = t_citnumber
                    let y = curr_exgp + numexgp
                    let exgp_array[curr_exgp].egtotnum = exgp_cnt+numexgp
                    display y to egnum
                    display by name exgp_array[curr_exgp].egtotnum
                    next field egdsgnlabel
                end if
        before field egdsgnlabel
            call show_dsgn(t_citnumber, 0) returning pge
            message "Use CNTL-P to show Previous page, CNTL-N to show Next page "
            on key (CONTROL-P)
                if infield(egdsgnlabel)
                    then
                        call show_dsgn(t_citnumber, pge-1) returning pge
                    end if
            on key (CONTROL-N)
                if infield(egdsgnlabel)
                    then
                        call show_dsgn(t_citnumber, pge+1) returning pge
                    end if
        after field egdsgnlabel
            let tmp_dsgnlbl = exgp_array[curr_exgp].egdsgnlabel
            call gen_dsgdsc(t_citnumber, tmp_dsgnlbl)
                returning hold_descript, hold_serial
            let exgp_array[curr_exgp].egdsgndsc = hold_descript
            let exgp_array[curr_exgp].egdsgn = hold_serial
            display by name exgp_array[curr_exgp].egdsgndsc
            display by name exgp_array[curr_exgp].egdsgn
        before field egsubglabel
            let tmp_dsgn = exgp_array[curr_exgp].egdsgn
            call show_subj(t_citnumber, tmp_dsgn, 0) returning pge
            message "Use CNTL-P to show Previous page, CNTL-N to show Next page "
```

```
            on key (CONTROL-P)
                call show_subj(t_citnumber, tmp_dsgn, pge-1) returning pge
            on key (CONTROL-N)
                call show_subj(t_citnumber, tmp_dsgn, pge+1) returning pge
        after field egsubglabel
            let tmp_subj = exgp_array[curr_exgp].egsubglabel
            call gen_subdsc(t_citnumber, tmp_dsgn, tmp_subj)
                returning hold_descript, hold_serial
            let exgp_array[curr_exgp].egsubgdsc = hold_descript
            let exgp_array[curr_exgp].egsubg = hold_serial
            display by name exgp_array[curr_exgp].egsubgdsc
            display by name exgp_array[curr_exgp].egsubg
        before field egexpolabel
            call show_expo(t_citnumber, tmp_dsgn, 0) returning pge
            message "Use CNTL-P to show Previous page, CNTL-N to show Next page "
            on key (CONTROL-P)
                if infield(egexpolabel) then
                    call show_expo(t_citnumber, tmp_dsgn, pge-1) returning pge
                    end if
            on key (CONTROL-N)
                if infield(egexpolabel) then
                    call show_expo(t_citnumber, exgp_array[curr_exgp].egdsgn, pge+1) returning pge
                    end if
        after field egexpolabel
            let tmp_expo = exgp_array[curr_exgp].egexpolabel
            call gen_expdsc(t_citnumber, tmp_dsgn, tmp_expo)
                returning hold_descript, hold_serial
            let exgp_array[curr_exgp].egexpodsc = hold_descript
            let exgp_array[curr_exgp].egexpo = hold_serial
            display by name exgp_array[curr_exgp].egexpodsc
            display by name exgp_array[curr_exgp].egexpo
            let exgp_array[curr_exgp].eglink = "D",
                exgp_array[curr_exgp].egdsgnlabel using "<<", ".S",
                exgp_array[curr_exgp].egsubglabel using "<<", ".E",
                exgp_array[curr_exgp].egexpolabel using "<<"
            display by name exgp_array[curr_exgp].eglink
        end input
    options help key CONTROL-w
    if eg =1
        then return
        end if
    for cnt = 1 to exgp_cnt
        insert into expogrp values
            (exgp_array[cnt].egcitnumb,
            exgp_array[cnt].egserial,
            exgp_cnt,
            exgp_array[cnt].eglink,
            exgp_array[cnt].egdsgn,
            exgp_array[cnt].egdsgnlabel,
            exgp_array[cnt].egdsgndsc,
            exgp_array[cnt].egsubg,
            exgp_array[cnt].egsubglabel,
            exgp_array[cnt].egsubgdsc,
            exgp_array[cnt].egexpo,
            exgp_array[cnt].egexpolabel,
            exgp_array[cnt].egexpodsc)
        end for
```

```
    select count(*) into y from expogrp
        where egcitnumb = t_citnumber
    update expogrp
        set egtotnum = y
        where egcitnumb = t_citnumber
    END FUNCTION
##########################################################################
FUNCTION find_exgp(t_cit)
    define
        t_cit like expogrp.egcitnumb
    call linkwinopen()
    case
        when t_cit is null
            let int_flag=0
            construct query1 on expogrp.* from exgp_rec2.*
                if int_flag <> 0 then return end if
            let select1 = "select * from expogrp where ",
                query1 clipped, " order by egcitnumb, eglink"
            let select2 = "select count(*) from expogrp where ",
                query1 clipped
            exit case
        otherwise
            let select1 = "select * from expogrp where ",
                "egcitnumb = ",quote, t_cit, quote,
                " order by egcitnumb, eglink"
            let select2 = "select count(*) from expogrp where ",
                "egcitnumb = ",quote, t_cit, quote
            exit case
        end case
    prepare select_exgp from select1
    prepare cnt_exgp from select2
    display "" at 21,2
    display " Searching . . . " at 21,2 attribute(reverse)
    declare cnt_curs cursor for cnt_exgp
        foreach cnt_curs into cnt
        end foreach
    declare eg_curs scroll cursor for select_exgp
    open eg_curs
    call view_exgp()
    close eg_curs
    END FUNCTION
##########################################################################
FUNCTION view_exgp()
    fetch first eg_curs into T_expogrp.*
        if status = NOTFOUND
            then
                MESSAGE "No exposure groups found."
                SLEEP 1
                MESSAGE ""
            else
                let tmp_cnt = 1
                display "" at 21,2
                call disp_exgp()
                display " ", tmp_cnt, " of ", cnt, " rows found." at 21,2
            end if
    MENU "BROWSE"
        COMMAND "Next"
```

```
        "View the next Exposure Group in the list." HELP 170
        FETCH NEXT eg_curs INTO T_expogrp.*
        let tmp_cnt = tmp_cnt +1
        IF status = NOTFOUND THEN
            MESSAGE "No more Exposure Groups in this direction."
            SLEEP 1
            let tmp_cnt = cnt
            MESSAGE ""
            FETCH LAST eg_curs INTO T_expogrp.*
            END IF
        display "" at 21,2
        display " ",tmp_cnt, " of ", cnt, " rows" at 21,2
            attribute(reverse)
        call disp_exgp()
    COMMAND "Previous"
        "View the Previous Exposure Group in the list." HELP 170
        FETCH PREVIOUS eg_curs INTO T_expogrp.*
        let tmp_cnt = tmp_cnt - 1
        IF status = NOTFOUND THEN
            MESSAGE "No more Exposure Groups in this direction."
            SLEEP 1
            MESSAGE ""
            let tmp_cnt = 1
            FETCH FIRST eg_curs INTO T_expogrp.*
            END IF
        display "" at 21,2
        display " ",tmp_cnt, " of ", cnt, " rows" at 21,2
            attribute(reverse)
        call disp_exgp()
    COMMAND "First"
        "View the first Exposure Group in the list." HELP 170
        FETCH FIRST eg_curs INTO T_expogrp.*
        let tmp_cnt = 1
        display "" at 21,2
        display " ",tmp_cnt, " of ", cnt, " rows" at 21,2
            attribute(reverse)
        call disp_exgp()
    COMMAND "Last"
        "View the Last Exposure Group in the list." HELP 170
        message "Searching for last record...."
        FETCH LAST eg_curs INTO T_expogrp.*
        let tmp_cnt = cnt
        message ""
        display "" at 21,2
        display " ",tmp_cnt, " of ", cnt, " rows" at 21,2
            attribute(reverse)
        call disp_exgp()
    command "Update"
        "Update Exposure Group Link" HELP 171
        call update_exgp(T_expogrp.egcitnumb, T_expogrp.egserial)
        call disp_exgp()
    command "Delete"
        "Delete this entry from database" HELP 805
        call delete_exgp(T_expogrp.egcitnumb,0,T_expogrp.egserial,1)
        call disp_exgp()
    command "Query-Again"
        "Enter new search criteria" HELP 806
```

```
            close eg_curs
            let ci' .mber = ""
            call find_exgp(citnumber)
            exit menu
        COMMAND "Exit"
            "Leave this menu" HELP 2
            EXIT MENU
        END MENU
    end FUNCTION
################################################################################
FUNCTION disp_exgp()
    for x = 11 to 20
        display "" at x,1
        end for
    display by name T_expogrp.*
    END FUNCTION
################################################################################
FUNCTION update_exgp(tmp_citnumb, tmp_egserial)
    define
        tmp_citnumb like expogrp.egcitnumb,
        tmp_egserial, hold_serial integer,
        hold_descript   like expogrp.egdsgndsc,
        eg, x, y, curr_exgp, exgp_cnt smallint,
        pge integer
    let eg=0
    input
        T_expogrp.egcitnumb,
        T_expogrp.egserial,
        T_expogrp.egdsgnlabel,
        T_expogrp.egsubglabel,
        T_expogrp.egexpolabel,
        T_expogrp.eglink,
        T_expogrp.egtotnum ,
        T_expogrp.egdsgndsc,
        T_expogrp.egdsgn,
        T_expogrp.egsubgdsc,
        T_expogrp.egsubg,
        T_expogrp.egexpodsc,
        T_expogrp.egexpo
        without defaults
        from exgp_rec.*
        on key(interrupt)
            let eg=1
            exit input

        after field egcitnumb
            display by name T_expogrp.egcitnumb
            display by name T_expogrp.egtotnum
        before field egdsgnlabel
            call show_dsgn(tmp_citnumb, 0) returning pge
            message "Use CNTL-P to show Previous page, CNTL-N to show Next page"
            on key (CONTROL-P)
                if infield(egdsgnlabel)
                    then call show_dsgn(tmp_citnumb, pge-1) returning pge
                    end if
            on key (CONTROL-N)
                if infield(egdsgnlabel)
```

```
                then call show_dsgn(tmp_citnumb, pge+1) returning pge
                end if
        after field egdsgnlabel
            call gen_dsgdsc(tmp_citnumb, T_expogrp.egdsgnlabel)
                returning hold_descript, hold_serial
            let T_expogrp.egdsgndsc = hold_descript
            let T_expogrp.egdsgn = hold_serial
            display by name T_expogrp.egdsgndsc
            display by name T_expogrp.egdsgn
        before field egsubglabel
            call show_subj(tmp_citnumb, T_expogrp.egdsgn, 0) returning pge
            message "Use CNTL-P to show Previous page, CNTL-N to show Next page"
            on key (CONTROL-P)
                if infield(egsubglabel) then
                call show_subj(tmp_citnumb, T_expogrp.egdsgn, pge-1) returning pge
                end if
            on key (CONTROL-N)
                if infield(egsubglabel) then
                call show_subj(tmp_citnumb, T_expogrp.egdsgn, pge+1) returning pge
                end if
        after field egsubglabel
            call gen_subdsc(tmp_citnumb,
                T_expogrp.egdsgn,
                T_expogrp.egsubglabel)
                returning hold_descript, hold_serial
            let T_expogrp.egsubgdsc = hold_descript
            let T_expogrp.egsubg = hold_serial
            display by name T_expogrp.egsubgdsc
            display by name T_expogrp.egsubg
        before field egexpolabel
            call show_expo(tmp_citnumb, T_expogrp.egdsgn, 0) returning pge
            message "Use CNTL-P to show Previous page, CNTL-N to show Next page"
            on key (CONTROL-P)
                if infield(egexpolabel) then
                    call show_expo(tmp_citnumb, T_expogrp.egdsgn, pge-1) returning pge
                    end if
            on key (CONTROL-N)
                if infield(egexpolabel) then
                    call show_expo(tmp_citnumb, T_expogrp.egdsgn, pge+1) returning pge
                    end if
        after field egexpolabel
            call gen_expdsc(tmp_citnumb,
                T_expogrp.egdsgn,
                T_expogrp.egexpolabel)
                returning hold_descript, hold_serial
            let T_expogrp.egexpodsc = hold_descript
            let T_expogrp.egexpo = hold_serial
            display by name T_expogrp.egexpodsc
            display by name T_expogrp.egexpo
            let T_expogrp.eglink = "D",
                T_expogrp.egdsgnlabel using "<<", ".S",
                T_expogrp.egsubglabel using "<<", ".E",
                T_expogrp.egexpolabel using "<<"
            display by name T_expogrp.eglink
        end input
    options help key CONTROL-w
    if eg =1 then return end if
```

```
    update expogrp
        set expogrp.* = T_expogrp.*
        where egcitnumb = tmp_citnumb
        and egserial = tmp_egserial
    update clinfind
        set cfcitnumb = T_expogrp.egcitnumb,
            cfeglink = T_expogrp.egserial,
            cfeglabel = T_expogrp.eglink
        where cfcitnumb = tmp_citnumb
        and cfeglink = tmp_egserial
    END FUNCTION
#############################################################################
FUNCTION delete_exgp(tmp_citnumb,tmp_dsgn, tmp_egserial, del_flag)
# de' _flag should be 0 to delete without prompt
# del_flag should be 1 to delete with confirmation prompt
# this also handles global deletes from clinfind table
    define
        tmp_citnumb,t_cit like expogrp.egcitnumb,
        tmp_egserial, t_eg integer,
        tmp_dsgn, t_dsgn   like expogrp.egdsgn,
        del_flag smallint
    if del_flag = 0
        then
            case
                when tmp_egserial = 0
                    declare del_eg cursor for
                        select egcitnumb, egdsgn, egserial
                            from expogrp
                            where egcitnumb = tmp_citnumb
                            and egdsgn = tmp_dsgn
                    foreach del_eg into t_cit, t_dsgn, t_eg
                        delete from expogrp
                            where egcitnumb = t_cit
                            and egdsgn = t_dsgn
                        delete from clinfind
                            where cfcitnumb = t_cit
                            and cfeglink = t_eg
                        end foreach
                    exit case
                when tmp_egserial <> 0
                    delete from expogrp
                        where egcitnumb = tmp_citnumb
                        and egserial = tmp_egserial
                    delete from clinfind
                        where cfcitnumb = tmp_citnumb
                        and cfeglink = tmp_egserial
                    exit case
                end case
        else
            call alrt260open()
            prompt "Do you really want to delete this record? (y/N) "
                for answer
                    on key(interrupt)
                        return
                        end prompt
            if upshift(answer) = "Y"
                then
```

```
                delete from expogrp
                    where egcitnumb = tmp_citnumb
                    and egserial = tmp_egserial
                select count(*) into x from clinfind
                    where cfcitnumb = tmp_citnumb
                    and cfeglink = tmp_egserial
                if x > 0
                    then
                        call alrt260p1op()
                        message " ", x using "##&"," clinical findings are linked to this."
                        prompt "Do you want to delete them? (Y/N) > "
                            for answer
                        if upshift(answer) = "Y"
                            then
                                delete from clinfind
                                    where cfcitnumb = tmp_citnumb
                                    and cfeglink = tmp_egserial
                                message x using "##&", "rows deleted."
                                sleep 2
                            else
                                message "No rows deleted."
                                sleep 2
                            end if
                    end if
                call alrt260p1cl()
            else
                message beep, "No rows deleted"
                sleep 1
            end if
        call alrt260close()
    end if
select count(*) into x from expogrp
    where egcitnumb = tmp_citnumb
if status = 0
    then update expogrp set egtotnum = x
        where egcitnumb = tmp_citnumb
    end if
END FUNCTION
########################################################################
FUNCTION renum_exgp(t_cit, t_dsgn, t_sg, t_ex)
# t_dsgn = styserial number# t_sg = sgserial# t_ex = exserial# only one non-zero number permitted
define
    t_cit     like expogrp.egcitnumb,
    t_dsgn, t_sg, t_ex     integer,
    hold_dsgn, hold_sg, hold_ex, hold_eg     integer,
    hold_link     like expogrp.eglink
case
    when t_dsgn != 0
        select stydsgncur into hold_dsgn
            from stdydsgn
            where styserial = t_dsgn
        update expogrp
            set egdsgnlabel = hold_dsgn
            where egdsgn = t_dsgn
        declare eg_gen1 cursor for
            select egdsgnlabel, egsubglabel, egexpolabel, egserial
            from expogrp
```

```
                where egcitnumb = t_cit
                and egdsgn = t_dsgn
                for update of eglink
            foreach  eg_gen1 into hold_dsgn, hold_sg, hold_ex, hold_eg
                let hold_link = "D", hold_dsgn using "<<",
                    ".S", hold_sg using "<<",
                    ".E", hold_ex using "<<"
                update expogrp
                    set eglink = hold_link
                    where current of eg_gen1
                update clinfind
                    set cfeglabel = hold_link
                    where cfcitnumb = t_cit
                    and cfeglink = hold_eg
                end foreach
            exit case
        when t_sg != 0
            select sglink into hold_sg
                from subjgrp
                where sgserial = t_sg
            update expogrp
                set egsubglabel = hold_sg
                where egsubg = t_sg
            declare eg_gen2 cursor for
                select egdsgnlabel, egsubglabel, egexpolabel
                from expogrp
                where egcitnumb = t_cit
                and egdsgn = t_sg
                for update of eglink
            foreach  eg_gen2 into hold_dsgn, hold_sg, hold_ex
                let hold_link = "D", hold_dsgn using "<<",
                    ".S", hold_sg using "<<",
                    ".E", hold_ex using "<<"
                update expogrp
                    set eglink = hold_link
                    where current of eg_gen2
                update clinfind
                    set cfeglabel = hold_link
                    where cfcitnumb = t_cit
                    and cfeglink = hold_eg
                end foreach
            exit case
        when t_ex != 0
            select exlink into hold_ex
                from exporegm
                where exserial = t_ex
            update expogrp
                set egexpolabel = hold_ex
                where egexpo = t_ex
            declare eg_gen3 cursor for
                select egdsgnlabel, egsubglabel, egexpolabel
                from expogrp
                where egcitnumb = t_cit
                and egdsgn = t_ex
                for update of eglink
            foreach  eg_gen3 into hold_dsgn, hold_sg, hold_ex
                let hold_link = "D", hold_dsgn using "<<",
```

```
                    ".S", hold_sg using "<<",
                    ".E", hold_ex using "<<"
                update expogrp
                    set eglink = hold_link
                    where current of eg_gen3
                update clinfind
                    set cfeglabel = hold_link
                    where cfcitnumb = t_cit
                    and cfeglink = hold_eg
                end foreach
            exit case
        otherwise
            error "The programmer blew it here!"
            sleep 3
            exit case
        end case
    end function
```

#tkscfind.4gl

```
{TITLE: tkscfind.4gl
Copyright, Harold L. Trammel, 1987-1989
University of Illiois, CVM, IAPIC
Funded by US Army Contract DAMD-17-C-7114
Purpose: to provide entry mechanism for clinical findings
Contains the following FUNCTIONs:
    find_control(t_cit)
    add_find(tmp_citnumb)
    find_cfind(t_cit)
    view_cfind()
    disp_cfind(tmp_serial)
    update_cfind(tmp_serial)
    renum_cfind(cf_cit, cf_oldeg, cf_neweg)
    delete_cfind(cf_serial,cf_flag)
}
database tkstest
globals "tksglob.4gl"
########################################################################
FUNCTION find_control(t_cit)
    define t_cit like clinfind.cfcitnumb

    call add_find(t_cit)
    END FUNCTION


########################################################################
FUNCTION add_find(tmp_citnumb)
    define
        tmp_sitecode char(8),
        holdsitenum, holdfindnum  char(8),
        holdsiteterm, holdfindterm  char(70),
        dsgn like expogrp.egdsgndsc,
        subg like expogrp.egsubgdsc,
        expo like expogrp.egexpodsc,
        link like expogrp.eglink,
        tmp_egserial integer,
        tmp_value, tmp_sys char(1),
        tmp_change, t_change like clinfind.cfchange,
        tmp_citnumb, t_cit like clinfind.cfcitnumb,
        tmp_findcode like clinfind.cffindcode,
        tmp_eglink like clinfind.cfeglink
    call cfwinopen()
    let cw=0
    let tmp_egserial=0
    for cnt = 1 to 50
        initialize cf_array[curr_arr].* to null
        end for
    call set_count(50)
    input array cf_array from cf_list.*
        on key(interrupt)
            let cw =1
            exit input
        on key(control-p)
            case
                when infield(cfcitnumb)
```

```
            let cf_array[curr_arr].cfcitnumb=T_clinfind.cfcitnumb
            next  field cfeglink
        when infield(cfeglink)
            let cf_array[curr_arr].cfeglink=T_clinfind.cfeglink
            next field cfsitecode
        when infield(cfsitecode)
            let cf_array[curr_arr].cfsitecode=T_clinfind.cfsitecode
            next field cffindcode
        when infield(cffindcode)
            let cf_array[curr_arr].cffindcode=T_clinfind.cffindcode
            next field cfchange
        when infield(cfchange)
            let cf_array[curr_arr].cfchange=T_clinfind.cfchange
            next field cfsevvalue
        when infield(cfsevvalue)
            let cf_array[curr_arr].cfsevvalue=T_clinfind.cfsevvalue
            next field cfsevunits
        when infield(cfsevunits)
            let cf_array[curr_arr].cfsevunits=T_clinfind.cfsevunits
            next field cffreq
        when infield(cffreq)
            let cf_array[curr_arr].cffreq=T_clinfind.cffreq
            next field cfonset
        when infield(cfonset)
            let cf_array[curr_arr].cfonset=T_clinfind.cfonset
            next field cfduration
        when infield(cfduration)
            let cf_array[curr_arr].cfduration=T_clinfind.cfduration
            next field cfonset
        end case
before field cfcitnumb
    #initial displays
        message ""
        display "" to egdsgndsc
        display "" to egsubgdsc
        display "" to egexpodsc
        display "" to change
    let curr_arr = arr_curr()
    if curr_arr > 0
        then let T_clinfind.* = cf_array[curr_arr].*
        end if
    if tmp_citnumb is not null
        then
            let cf_array[curr_arr].cfcitnumb = tmp_citnumb
            let cf_array[curr_arr].cfserial = 0
            display by name cf_array[curr_arr].cfcitnumb
            next field cfeglink
        end if
after field cfcitnumb
    if cf_array[curr_arr].cfcitnumb is null
        then
            error "You must have a CITATION number"
            next field cfcitnumb
        end if
    display by name cf_array[curr_arr].cfcitnumb
    if cf_array[curr_arr].cfcitnumb <> tmp_citnumb
        then
```

```
                let t_cit = cf_array[curr_arr].cfcitnumb
                call exist_citnumb(t_cit) returning x
                if x = 0 then
                    error "CITATION data not entered for this number"
                    next field cfcitnumb
                    end if
            end if
        before field cfeglink
            let tmp_egserial = 0
            message beep, "Press F7 or CNTL-G to see available Exposure Groups"
            on key(F7, control-g)
                if infield(cfeglink)
                    then
                        let t_cit = cf_array[curr_arr].cfcitnumb
                        call see_eg(t_cit)
                            returning link, tmp_egserial, dsgn, subg, expo
                        display tmp_egserial to cfeglink
                        display link to cfeglabel
                    end if
        after field cfeglink
            if tmp_egserial <> 0
                then
                    let cf_array[curr_arr].cfeglink = tmp_egserial
                end if
            select egdsgndsc, egsubgdsc, egexpodsc, eglink
                into dsgn, subg, expo, cf_array[curr_arr].cfeglabel
                from expogrp
                where egserial = cf_array[curr_arr].cfeglink
            if status = NOTFOUND then
                error "No entry for this Exposure Group Number"
                next field cfeglink
                end if
            display by name cf_array[curr_arr].cfeglink
            display by name cf_array[curr_arr].cfeglabel
            display dsgn to egdsgndsc
            display subg to egsubgdsc
            display expo to egexpodsc
        before field cftype
            display " M = Pathology Results" at 15,40 attribute(reverse)
            display " L = Lab/Procedure Results" at 16,40 attribute(reverse)
            display " S = Signs/Disease Finding" at 17,40 attribute(reverse)
        after field cftype
            for x = 15 to 17
                display "" at x,40
                end for
            if (cf_array[curr_arr].cftype <> "M" and
                cf_array[curr_arr].cftype <> "L" and
                cf_array[curr_arr].cftype <> "S")
                then
                    error beep,"Wrong choice!"
                    next field cftype
                end if
        before field cfsitecode
            let chosen = 0
            case
                when cf_array[curr_arr].cftype = "M"
                    call pick_site() returning holdsitenum, holdsiteterm
```

```
                exit case
            when cf_array[curr_arr].cftype = "L"
                call matrix_choice() returning tmp_value
                call matrix_trans(tmp_value)
                    returning holdsitenum, holdsiteterm
                exit case
            when cf_array[curr_arr].cftype = "S"
                call system_choice() returning tmp_value
                call system_trans(tmp_value)
                    returning holdsitenum, holdsiteterm
                exit case
            end case
        if chosen = 0
            then
                let cf_array[curr_arr].cfsitecode = holdsitenum
                let cf_array[curr_arr].cfsite = holdsiteterm
                display by name cf_array[curr_arr].cfsitecode
                display by name cf_array[curr_arr].cfsite
                next field cffindcode
            else
                next field cftype
            end if
    before field cffindcode
        let chosen = 0
        case
            when cf_array[curr_arr].cftype = "M"
                call pick_path()
                    returning holdfindnum, holdfindterm
                exit case
            when cf_array[curr_arr].cftype = "L"
                call pick_lab()
                    returning holdfindnum, holdfindterm
                exit case
            when cf_array[curr_arr].cftype = "S"
                let tmp_sys = cf_array[curr_arr].cfsitecode clipped
                call pick_sign(tmp_sys)
                    returning holdfindnum, holdfindterm
                exit case
            end case
        if chosen = 0
            then
                let cf_array[curr_arr].cffindcode = holdfindnum
                let cf_array[curr_arr].cffinding = holdfindterm
                display by name cf_array[curr_arr].cffindcode
                display by name cf_array[curr_arr].cffinding
                next field cfchange
            else
                next field cfsitecode
            end if
    before field cfchange
        call change_choice() returning cf_array[curr_arr].cfchange
    after field cfchange
        let t_change = cf_array[curr_arr].cfchange
        call trans_change(t_change) returning tmp_change
        display tmp_change to change
        display by name cf_array[curr_arr].cfchange
    end input
```

```
    if cw = 1 then return end if
    for x = 1 to arr_count()
        insert into clinfind values(cf_array[x].*)
        end for
    END FUNCTION
#####################################################################
FUNCTION find_cfind(t_cit)
    define
        t_cit like clinfind.cfcitnumb
    call cfwinopen()
    let int_flag=0
    construct query1
        on
            cfcitnumb,
            cfsitecode,
            cfsite,
            cffindcode,
            cffinding,
            cfeglink,
            cfchange,
            cfsevvalue,
            cfsevunits,
            cffreq,
            cfonset,
            cfduration
        from
            cfcitnumb,
            cfsitecode,
            cfsite,
            cffindcode,
            cffinding,
            cfeglink,
            cfchange,
            cfsevvalue,
            cfsevunits,
            cffreq,
            cfonset,
            cfduration
    if int_flag <> 0 then return end if
    let select1 = "select * from clinfind where ",
        query1 clipped, " order by cfcitnumb, cfeglink"
    let select2 = "select count(*) from clinfind where ", query1 clipped
    prepare select_cfind from select1
    prepare cnt_cfind from select2
    display "" at 20,2
    display " Searching . . . " at 20,2 attribute(reverse)
    declare cnt_curs cursor for cnt_cfind
        foreach cnt_curs into cnt end foreach
    declare cf_curs scroll cursor for select_cfind
    open cf_curs
    call view_cfind()
    close cf_curs
    END FUNCTION
#####################################################################
FUNCTION view_cfind()
    fetch first cf_curs into T_clinfind.*
    if status = NOTFOUND
```

```
    then
        MESSAGE "No clinical findings found."
        SLEEP 1
        MESSAGE ""
    else
        let tmp_cnt = 1
        call disp_cfind(T_clinfind.cfserial)
        display "" at 20,2
        display " ", tmp_cnt, " of ", cnt, " rows found." at 20,2
    end if
MENU "BROWSE"
    COMMAND "Next"
        "View the next Clinical Finding in the list." HELP 170
        FETCH NEXT cf_curs INTO T_clinfind.*
        let tmp_cnt = tmp_cnt +1
        IF status = NOTFOUND THEN
            MESSAGE "No more Clinical Findings in this direction."
            SLEEP 1
            let tmp_cnt = cnt
            MESSAGE ""
            FETCH LAST cf_curs INTO T_clinfind.*
            END IF
        display "" at 20,2
        display " ",tmp_cnt, " of ", cnt, " rows" at 20,2
            attribute(reverse)
        call disp_cfind(T_clinfind.cfserial)
    COMMAND "Previous"
        "View the Previous Clinical Finding in the list." HELP 170
        FETCH PREVIOUS cf_curs INTO T_clinfind.*
        let tmp_cnt = tmp_cnt - 1
        IF status = NOTFOUND THEN
            MESSAGE "No more Clinical Findings in this direction."
            SLEEP 1
            MESSAGE ""
            let tmp_cnt = 1
            FETCH FIRST cf_curs INTO T_clinfind.*
            END IF
        display "" at 20,2
        display " ",tmp_cnt, " of ", cnt, " rows" at 20,2
            attribute(reverse)
        call disp_cfind(T_clinfind.cfserial)
    COMMAND "First"
        "View the first Clinical Finding in the list." HELP 170
        FETCH FIRST cf_curs INTO T_clinfind.*
        let tmp_cnt = 1
        display "" at 20,2
        display " ",tmp_cnt, " of ", cnt, " rows" at 20,2
            attribute(reverse)
        call disp_cfind(T_clinfind.cfserial)
    COMMAND "Last"
        "View the Last Clinical Finding in the list." HELP 170
        message "Searching for last record...."
        FETCH LAST cf_curs INTO T_clinfind.*
        let tmp_cnt = cnt
        message ""
        display "" at 20,2
        display " ",tmp_cnt, " of ", cnt, " rows" at 20,2
```

```
                attribute(reverse)
            call disp_cfind(T_clinfind.cfserial)
        COMMAND "Update"
            "Update Clinical Finding" HELP 171
            call update_cfind(T_clinfind.cfserial)
        COMMAND "Delete"
            "Delete this entry from database" HELP 1003
            call delete_cfind(T_clinfind.cfserial,0)
        COMMAND "Query-Again"
            "Enter new search criteria" HELP 1004
            close cf_curs
            let citnumber = ""
            call find_cfind(citnumber)
            exit menu
        COMMAND "Exit" "Leave this menu" HELP 2
            close cf_curs
            EXIT MENU
        END MENU
    END FUNCTION
###############################################################################
FUNCTION disp_cfind(tmp_serial)
    define
        tmp_aim char(20),
        dsgn like expogrp.egdsgndsc,
        subg like expogrp.egsubgdsc,
        expo like expogrp.egexpodsc,
        tmp_serial integer,
        x smallint
    display by name T_clinfind.*
    # need clinfind change translation call here
    select egdsgndsc, egsubgdsc, egexpodsc
        into dsgn, subg, expo
        from expogrp
        where egserial = T_clinfind.cfeglink
    display dsgn to egdsgndsc
    display subg to egsubgdsc
    display expo to egexpodsc
    END FUNCTION
###############################################################################
FUNCTION update_cfind(tmp_serial)
    define
        tmp_sitecode char(8),
        holdsitenum, holdfindnum char(8),
        holdsiteterm, holdfindterm char(70),
        dsgn like expogrp.egdsgndsc,
        subg like expogrp.egsubgdsc,
        expo like expogrp.egexpodsc,
        link like expogrp.eglink,
        tmp_egserial, tmp_serial integer,
        tmp_value, tmp_sys char(1),
        tmp_change like clinfind.cfchange,
        tmp_citnumb like clinfind.cfcitnumb,
        tmp_findcode like clinfind.cffindcode,
        tmp_eglink like clinfind.cfeglink
    let cv=0
    let tmp_citnumb = T_clinfind.cfcitnumb
    input T_clinfind.*
```

```
without defaults from cf_list.*
on key(interrupt)
    let cw =1
    exit input
before field cfcitnumb
    message ""
    display "" to egdsgndsc
    display "" to egsubgdsc
    display "" to egexpodsc
    display "" to change
    display by name T_clinfind.cfcitnumb
after field cfcitnumb
    if T_clinfind.cfcitnumb is null
        then
            error "You must have a CITATION number"
            next field cfcitnumb
        end if
    if T_clinfind.cfcitnumb <> tmp_citnumb
        then
            call exist_citnumb(T_clinfind.cfcitnumb) returning x
            if x = 0
                then
                    error "CITATION data not entered for this number"
                    next field cfcitnumb
                end if
        end if
before field cfeglink
    message beep, "Press F7 or CNTL-G to see available Exposure Groups"
    on key(F7, control-g)
        if infield(cfeglink)
            then
                call see_eg(T_clinfind.cfcitnumb)
                    returning link, tmp_egserial, dsgn, subg, expo
                display tmp_egserial to cfeglink
                display link to cfeglabel
            end if
after field cfeglink
    if tmp_egserial <> 0 then
        let T_clinfind.cfeglink = tmp_egserial
        end if
    select egdsgndsc, egsubgdsc, egexpodsc, eglink
        into dsgn, subg, expo, T_clinfind.cfeglabel
        from expogrp
        where egserial = T_clinfind.cfeglink
    if status = NOTFOUND then
        error "No entry for this Exposure Group Number"
        next field cfeglink
        end if
    display by name T_clinfind.cfeglink
    display by name T_clinfind.cfeglabel
    display dsgn to egdsgndsc
    display subg to egsubgdsc
    display expo to egexpodsc
before field cftype
    display " M = Pathology Results" at 15,40 attribute(reverse)
    display " L = Lab/Procedure Results" at 16,40 attribute(reverse)
    display " S = Signs/Disease Finding" at 17,40 attribute(reverse)
```

```
        after field cftype
            for x = 15 to 17
                display "" at x,40
                end for
            if (T_clinfind.cftype <> "M" and
                T_clinfind.cftype <> "L" and
                T_clinfind.cftype <> "S")
                then
                    error beep,"Wrong choice!"
                    next field cftype
                end if
        before field cfsitecode
            case
                when T_clinfind.cftype = "M"
                    call pick_site() returning holdsitenum, holdsiteterm
                    exit case
                when T_clinfind.cftype = "L"
                    call matrix_choice() returning tmp_value
                    call matrix_trans(tmp_value)
                        returning holdsitenum, holdsiteterm
                    exit case
                when T_clinfind.cftype = "S"
                    call system_choice() returning tmp_value
                    call system_trans(tmp_value)
                        returning holdsitenum, holdsiteterm
                    exit case
                end case
            if chosen = 0
                then
                    let T_clinfind.cfsitecode = holdsitenum
                    let T_clinfind.cfsite = holdsiteterm
                    display by name T_clinfind.cfsitecode
                    display by name T_clinfind.cfsite
                    next field cffindcode
                else
                    next field cftype
                end if
        before field cffindcode
            case
                when T_clinfind.cftype = "M"
                    call pick_path()
                        returning holdfindnum, holdfindterm
                    exit case
                when T_clinfind.cftype = "L"
                    call pick_lab()
                        returning holdfindnum, holdfindterm
                    exit case
                when T_clinfind.cftype = "S"
                    let tmp_sys = T_clinfind.cfsitecode
                    call pick_sign(tmp_sys[1])
                        returning holdfindnum, holdfindterm
                    exit case
                end case
            If chosen = 0
                then
                    let T_clinfind.cffindcode = holdfindnum
                    let T_clinfind.cffinding = holdfindterm
```

```
                display by name T_clinfind.cffindcode
                display by name T_clinfind.cffinding
                next field cfchange
            else
                next field cffindcode
            end if
        before field cfchange
            call change_choice() returning T_clinfind.cfchange
        after field cfchange
            call trans_change(T_clinfind.cfchange) returning tmp_change
            display tmp_change to change
            display by name T_clinfind.cfchange
        end input
    if cw = 1 then return end if
    update clinfind
        set clinfind.* = T_clinfind.*
            where cfserial = tmp_serial
    END FUNCTION
#########################################################################
FUNCTION renum_cfind(cf_cit, cf_oldeg, cf_neweg)
# renumbers the eglinks after deletes or updates of eglink
# currently this is managed by renum_exgp() in tksexpgrp.4gl
    define
            cf_cit like clinfind.cfcitnumb,
            cf_oldeg, cf_neweg like clinfind.cfeglink
    update clinfind
        set cfeglink = cf_neweg
        where cfcitnumb = cf_cit
        and cfeglink = cf_oldeg
    END FUNCTION
#########################################################################
FUNCTION delete_cfind(cf_serial,cf_flag)
# to delete all cfinds for a given eglink, cf_flag = 0
# otherwise pass through the actual cf_flag, cf_serial
    define
            cf_serial integer,
            cf_flag smallint
    if cf_flag = 0
        then
            delete from clinfind
                where cfserial = cf_serial
        else
            call alrt260open()
            prompt "Are you sure you want to delete this record? (y/N) "
                for answer
                if upshift(answer) = "Y"
                    then
                        delete from clinfind
                            where cfserial = cf_serial
                    else
                        message "No row deleted."
                        sleep 1
                    end if
            call alrt260close()
        end if
    END FUNCTION
```

#tkscfget.4gl

```
{TITLE: tkscfget.4gl
Copyright, Harold L. Trammel, 1987-1989
University of Illiois, CVM, IAPIC
Funded by US Army Contract DAMD 17-C-7114
Purpose: to provide selction mechanism for clinical findings from controlled clinical vocabulary
Contains the following functions:
    pick_path()
    pick_lab()
    pick_sign(tmp_sys)
    pick_site()
    see_organ(tmp_sys)
    see_locate(tmp_sys, tmp_org)
    see_eg(tmp_cit)
}
database tkstest
globals "tksglob.4gl"
##########################################################################
FUNCTION pick_path()
    define
        T_path record
            morphcode like morphsynlst.morphcode,
            morphname like morphsynlst.morphsyn
        end record
    call synwinopen()
    let int_flag = 0
    construct query1 on morphsyn from finding
    if int_flag <> 0 then return end if
    let select1= "Select morphcode, morphsyn from morphsynlst where ",
        query1 clipped
    prepare find_morph from select1
    display "Searching...." at 21,2
    declare morph_curs cursor for find_morph
    let counter = 1
    foreach morph_curs into msyn_array[counter].*
        let counter = counter + 1
        if counter > 50 then exit foreach end if
        end foreach
    case
        when counter = 1
            message "No rows found" attribute(reverse)
            sleep 2
            # need something better to handle no find's
            let chosen = 1
            let T_path.morphcode = "null"
            let T_path.morphname = "null"
            exit case
        when counter = 2
            let T_path.* = msyn_array[1].*
            exit case
        otherwise
            call set_count(counter - 1)
            display array msyn_array to holder.*
                on key(interrupt)
                    exit display
                end display
```

```
            let counter = arr_curr()
            let T_path.* = msyn_array[counter].*
            exit case
        end case
    select morphterm into T_path.morphname
        from morphlst
        where morphnum = T_path.morphcode
    call synwinclose()
    return T_path.morphcode, T_path.morphname
    END FUNCTION
#####################################################################
FUNCTION pick_lab()
    define
        T_lab record
            labcode like labsynlst.labcode,
            labname like labsynlst.labsyn
            end record,
        tmp_sys char(1)
    call synwinopen()
    call labCatChoice() returning tmp_sys
    let int_flag = 0
    construct query1 on labsyn from finding
    if int_flag <> 0 then return end if
    let select1= "Select labcode, labsyn from labsynlst where ",
        query1 clipped, " and labsynsys = ", quote, tmp_sys, quote
    prepare find_lab from select1
    display "Searching...." at 21,2
    declare lab_curs cursor for find_lab
    let counter = 1
    foreach lab_curs into lsyn_array[counter].*
        let counter = counter + 1
        if counter > 50 then exit foreach end if
        end foreach
    case
        when counter = 1
            message "No rows found" attribute(reverse)
            sleep 2
            # need something better to handle no find's
            let chosen = 1
            let T_lab.labcode = "null"
            let T_lab.labname = "null"
            exit case
        when counter = 2
            let T_lab.* = lsyn_array[1].*
            exit case
        otherwise
            call set_count(counter - 1)
            display array lsyn_array to holder.*
                on key(interrupt)
                    exit display
                end display
            let counter = arr_curr()
            let T_lab.* = lsyn_array[counter].*
            exit case
        end case
    select labterm into T_lab.labname
        from lablst
```

```
        where labnum = T_lab.labcode
    call synwinclose()
    return T_lab.labcode, T_lab.labname
    END FUNCTION
#####################################################################
FUNCTION pick_sign(tmp_sys)
    define
        T_sign record
            signcode like signsynlst.signcode,
            signname like signsynlst.signsyn
            end record,
        tmp_sys char(1)
    call synwinopen()
    let int_flag = 0
    construct query1 on signsyn from finding
    if int_flag <> 0 then return end if
    let select1= "Select signcode, signsyn from signsynlst where ",
        " signsynsys = ", quote, tmp_sys, quote, " and ", query1 clipped
    prepare find_sign from select1
    display "Searching...." at 21,2
    declare sign_curs cursor for find_sign
    let counter = 1
    foreach sign_curs into ssyn_array[counter].*
        let counter = counter + 1
        if counter > 50 then exit foreach end if
        end foreach
    case
        when counter = 1
            message "No rows found" attribute(reverse)
            sleep 2
            # need something better to handle no find's
            let chosen = 1
            let T_sign.signcode = "null"
            let T_sign.signname = "null"
            exit case
        when counter = 2
            let T_sign.* = ssyn_array[1].*
            exit case
        otherwise
            call set_count(counter - 1)
            display array ssyn_array to holder.*
                on key(interrupt)
                    exit display
                end display
            let counter = arr_curr()
            let T_sign.* = ssyn_array[counter].*
            exit case
        end case
    select sign into T_sign.signname
        from signlst
        where signnum = T_sign.signcode
    call synwinclose()
    return T_sign.signcode, T_sign.signname
    END FUNCTION
#####################################################################
FUNCTION pick_site()
    define
```

```
        T_site record
            sys char(1),
            org char(3),
            loc char(5),
            sitecode like tkssite.sitecode,
            locatename like tkssite.locatename
            end record,
        tmp_value  char(1),
        tmp_systemname like tkssite.systemname,
        tmp_organname like tkssite.organname
    open window picksite at 3,3 with form "tkssite"
        attribute(border, reverse)
    input T_site.* from inputer.*
        before field sys
            call system_choice() returning tmp_value
            call system_trans(tmp_value)
                returning T_site.sys, tmp_systemname
            message "Press RETURN to select Organ or Organ Group."
        after field sys
            display by name T_site.sys
            display tmp_systemname to choicename
            message ""
            call see_organ(T_site.sys) returning T_site.org, tmp_organname
            message "Press RETURN to select Specific Organ Site."
        after field org
            display by name T_site.org
            display tmp_organname to choicename
            message ""
            call see_locate(T_site.sys, T_site.org)
                returning T_site.loc, T_site.locatename
            message "Press RETURN to create Site Code."
        after field loc
            display by name T_site.loc
            display T_site.locatename to choicename
            message "Press ESC to main module."
            let T_site.sitecode = T_site.sys clipped, T_site.loc clipped
            display T_site.sitecode to choice
        end input
    close window picksite
    return T_site.sitecode, T_site.locatename
    END FUNCTION
##########################################################################
FUNCTION see_organ(tmp_sys)
    define
        tmp_sys char(1),
        holdcode like tkssite.organcode,
        holdname like tkssite.organname,
        list_org ARRAY[50] of record
            code like tkssite.organcode,
            organ like tkssite.organname
            end record
    declare see_organ cursor for
        select organcode, organname from tkssite
        where systemcode = tmp_sys
        and locatecode = "--"
        order by 1
    display "" at 21,3
```

```
    display "Searching . . . " at 21,3
    let counter = 1
    foreach see_organ into list_org[counter].*
        let counter = counter + 1
        if counter > 50 then exit foreach end if
        end foreach
    display "Use arrows to scroll up and down.Press ESC to select item." at 21,3
    call set_count(counter -1)
    display array list_org to holder.*
    let counter = arr_curr()
    let holdcode = list_org[counter].code
    let holdname = list_org[counter].organ
    return holdcode, holdname
    END FUNCTION
#####################################################################
FUNCTION see_locate(tmp_sys, tmp_org)
    define
        tmp_sys char(1),
        tmp_org char(3),
        holdcode like tkssite.locatecode,
        holdname like tkssite.locatename,
        list_loc ARRAY[50] of record
            code like tkssite.locatecode,
            locate like tkssite.locatename
            end record
    declare see_locate cursor for
        select locatecode, locatename from tkssite
        where systemcode = tmp_sys
        and organcode = tmp_org
        order by 1
    display "" at 21,3
    display "Searching . . . " at 21,3
    let counter = 1
    foreach see_locate into list_loc[counter].*
        let counter = counter + 1
        if counter > 50 then exit foreach end if
        end foreach
    display "Use arrows to scroll up and down.Press ESC to select item." at 21,3
    call set_count(counter -1)
    display array list_loc to holder.*
    let counter = arr_curr()
    let holdcode = list_loc[counter].code
    let holdname = list_loc[counter].locate
    return holdcode, holdname
    END FUNCTION
#####################################################################
FUNCTION see_eg(tmp_cit)
    define
        tmp_cit like expogrp.egcitnumb,
        T_eg record like expogrp.*,
        eg_array ARRAY[20] of record
            eglink like expogrp.eglink,
            egserial like expogrp.egserial,
            egdsgndsc like expogrp.egdsgndsc,
            egsubgdsc like expogrp.egsubgdsc,
            egexpodsc like expogrp.egexpodsc
            end record,
```

```
    holdlink like expogrp.eglink,
    holdserial like expogrp.egserial,
    holddsgn like expogrp.egdsgndsc,
    holdsubg like expogrp.egsubgdsc,
    holdexpo like expogrp.egexpodsc
declare eg_curs cursor for
    select * from expogrp
    where egcitnumb = tmp_cit
    if status = NOTFOUND
        then return 0,0,0,0
        end if
let counter = 1
foreach eg_curs into T_eg.*
    let eg_array[counter].eglink = T_eg.eglink
    let eg_array[counter].egserial = T_eg.egserial
    let eg_array[counter].egdsgndsc = T_eg.egdsgndsc
    let eg_array[counter].egsubgdsc = T_eg.egsubgdsc
    let eg_array[counter].egexpodsc = T_eg.egexpodsc
    let counter = counter +1
    if counter > T_eg.egtotnum then exit foreach end if
    end foreach
open window see_eg at 5,12 with form "tkseg2"
    attribute (border)
display "Use arrows to scroll up and down.Press ESC to select item" at 18,3
call set_count( counter -1)
display by name T_eg.egtotnum, T_eg.egcitnumb
display array eg_array to exgp_rec.*
let counter = arr_curr()
let holdlink=eg_array[counter].eglink
let holdserial=eg_array[counter].egserial
let holddsgn=eg_array[counter].egdsgndsc
let holdsubg=eg_array[counter].egsubgdsc
let holdexpo=eg_array[counter].egexpodsc
close window see_eg
return holdlink, holdserial, holddsgn, holdsubg, holdexpo
END FUNCTION
```

#tksmon1.4gl

```
{
TITLE: tksmonog1.4gl
Copyright, 1987-1988 University of Illiois, CVM, IAPIC
Funded by US Army Contract DAMD-17-C-7114
Contains the following functions:
    single_mono()
    out_mono(c_num)
}

database tkstest
globals "tksglob.4gl"

########################################################################
FUNCTION report_cntl()
    MENU "TKS-MONO"
        COMMAND "Abstract"
            "Generate a Structured Abstract for a Given Citation"
            call single_mono()
        COMMAND "Generic"
            "Generate a Monograph for a Given Generic"
            call generic_mono()
        COMMAND "Biblography"
            "Generate a list of papers in TKS database"
            call biblio_list()
        COMMAND "Exit"
            EXIT MENU
        END MENU
    END FUNCTION
################################### ####################################
FUNCTION single_mono()
    define
        t_cit     like citation.citnumb
    menu "PAPER-ABSTRACT"
        COMMAND "Generate"
            "Generate a new monograph for a single paper" HELP 1
            call select_src() returning t_cit
                if t_cit is null
                    then return
                    end if
            clear screen
            display "Preparing Monograph..." at 10, 20
                attribute(reverse)
            call out_mono(t_cit)
            clear screen
            run "less mngrph.out"
        COMMAND "Print"
            "Print hard copy of current monograph" HELP 1
            clear screen
            display "Printing Output Now..." at 10,20
                attribute(reverse)
            run "print mngrph.out"
        COMMAND "Read-Again"
            "View current monograph on-screen" HELP 1
            clear screen
            run "less mngrph.out"
```

```
        COMMAND "Exit" HELP 2
            exit menu
        end menu
    END FUNCTION
##################################################################
FUNCTION generic_mono()
    define
        tmp_val     char(1),
        tmp_gen     like exporegm.exagent,
        runfile  char(50)
    menu "GENERIC-MONO"
        COMMAND "Generate"
            "Generate a new monograph for a single generic" HELP 1
            clear screen
            call alrt260open()
            MENU "This will take awhile to generate"
                command "Continue"
                    clear window alrt250
                    call select_generic() returning tmp_gen
                    call genMonoOpt() returning tmp_val
                    if tmp_val = "Z"
                        then
                            exit menu
                        else
                            clear window alrt260
                            display " Preparing Monograph ...." at 2,2
                            call genMonoGen(tmp_val, tmp_gen)
                        end if
                    let runfile = "less ", outfile
                    run runfile
                    exit menu
                command "Quit"
                    exit menu
                end menu
            call alrt260close()
        COMMAND "Print"
            "Print hard copy of current monograph" HELP 1
            clear screen
            display "Printing Output Now..." at 10,20
                attribute(reverse)
            let runfile = "print ", outfile
            run runfile
        COMMAND "Read-Again"
            "View current monograph on-screen" HELP 1
            clear screen
            let runfile = "less ", outfile
            run runfile
        COMMAND "Exit" HELP 2
            exit menu
        end menu
    END FUNCTION
##################################################################
FUNCTION biblio_list()
    define
        tmp_cit like citation.citnumb,
        tmp_auth    like authors.authname,
        tmp_gen     like exporegm.exagent
```

```
menu "BIBLIOGRAPHY"
    COMMAND "Total TKS"
        "Generate a comprehensive bibliography of TKS records"
        MENU "TOTAL-TKS"
            COMMAND "Generate"
                "Generate a new bibliography" HELP 1
                call alrt260open()
                MENU "This will take awhile to generate"
                    command "Continue"
                        display " Preparing bibliography ...." at 2,2
                        let outfile = "tottks.out"
                        declare bib_gen cursor for
                            select citnumb, authname
                                from citation, authors
                                where authsig = 1
                                and citnumb = aucitnumb
                                order by 2, 1
                        start report bib_out to outfile
                            foreach bib_gen into tmp_cit, tmp_auth
                                output to report bib_out (tmp_cit, tmp_auth)
                                end foreach
                        finish report bib_out
                        exit menu
                    command "Quit"
                        exit menu
                    end menu
                    call alrt260close()
            COMMAND "Print"
                "Print hard copy of current bibliography" HELP 1
                run "print tottks.out"
            COMMAND "Read-Again"
                "View current bibliography on-screen" HELP 1
                run "less tottks.out"
            COMMAND "Exit" HELP 2
                exit menu
            end menu
    COMMAND "Author"
        "Generate a comprehensive bibliography for a given author"
        MENU "AUTHOR-TKS"
            COMMAND "Generate"
                "Generate a new bibliography" HELP 1
                call alrt260open()
                prompt "Enter last name and initials >"
                    for tmp_auth
                let tmp_auth = upshift(tmp_auth)
                MENU "This will take awhile to generate"
                    command "Continue"
                        display " Preparing bibliography ...." at 2,2
                        let outfile = "authtks.out"
                        declare auth_gen cursor for
                            select aucitnumb, authname
                                from authors
                                where authname = tmp_auth
                                order by 2,1
                        start report bib_out to outfile
                            foreach auth_gen into tmp_cit, tmp_auth
                                output to report bib_out (tmp_cit, tmp_auth)
```

```
                    end foreach
                finish report bib_out
                exit menu
            command "Quit"
                exit menu
            end menu
            call alrt260close()
        COMMAND "Print"
            "Print hard copy of current bibliography" HELP 1
            run "print authtks.out"
        COMMAND "Read-Again"
            "View current bibliography on-screen" HELP 1
            run "less authtks.out"
        COMMAND "Exit" HELP 2
            exit menu
        end menu
    COMMAND "Generic"
        "Generate a comprehensive bibliography on a given generic"
        MENU "GENERIC-TKS"
            COMMAND "Generate"
                "Generate a new bibliography" HELP 1
                call select_generic() returning tmp_gen
                call alrt260open()
                MENU "This will take awhile to generate"
                    command "Continue"
                        display " Preparing bibliography ...." at 2,2
                        let outfile = "generictks.out"
                        declare gen_gen cursor for
                            select unique(excitnumb), authname, exagent
                                from exporegm, authors
                                where exagent = tmp_gen
                                and aucitnumb = excitnumb
                                and authsig = 1
                                order by 2, 1
                        start report bib_out to outfile
                            foreach gen_gen into tmp_cit, tmp_auth, tmp_gen
                                output to report bib_out (tmp_cit, tmp_auth)
                                end foreach
                        finish report bib_out
                        exit menu
                    command "Quit"
                        exit menu
                    end menu
                    call alrt260close()
            COMMAND "Print"
                "Print hard copy of current bibliography" HELP 1
                run "print generictks.out"
            COMMAND "Read-Again"
                "View current bibliography on-screen" HELP 1
                run "less generictks.out"
            COMMAND "Exit" HELP 2
                exit menu
            end menu
    COMMAND "Exit"
        exit menu
    END MENU
END FUNCTION
```

```
##########################################################################
FUNCTION out_mono(c_num)
    define
        c_num like citation.citnumb
    declare out_curs cursor for
        select * from citation
        where citnumb = c_num
        order by citnumb
    start report mono_out to "mngrph.out"
        foreach out_curs into T_citation.*
            output to report mono_out (T_citation.*)
            end foreach
    finish report mono_out
    end FUNCTION
##########################################################################
REPORT mono_out(c_citation)
    define
        c_citation record like citation.*,
        tmp_string  char(500),
        tmpname char(60),
        author  like authors.authname,
        keyword     like keywords.keyword,
        aim_str char(20),
        h_dsgnno, h_subino, h_expono  smallint,
        bdwdon, bdwdoff, itwdon, itwdoff  char(5)
    output
        report to "tks_query.tmp"
        left margin 0
        top margin 0
        bottom margin 0
    order external by c_citation.citnumb
    format
        before group of c_citation.citnumb
            let citnumber = c_citation.citnumb
        after group of c_citation.citnumb
            #citation information
                print "TKS Citation code: ", c_citation.citnumb
                print "File code: ", c_citation.citfile clipped,
                    " in the following files: ", c_citation.citlocate clipped
                call biblio_gen(c_citation.citnumb)
                print bib_entry clipped
                print
            # keyword information
                call keywd_list(c_citation.citnumb)
                print  "Keywords Assigned: ", keywdlst clipped
            # paper information
                select count(*) into cnt
                    from paperover
                    where papcitnumb = citnumber
                if cnt > 0
                    then
                        print
                        print "ABSTRACT"
                        print
                        # Paper overview information
                            print "Overview:"
                            call paper_entry(c_citation.citnumb)
```

```
                print pap_string clipped
            # Design information
                print
                print "Design Information:"
                declare dsgn_cur cursor for
                    select * into T_stdydsgn.*
                        from stdydsgn
                        where stycitnumb = c_citation.citnumb
                foreach dsgn_cur
                    print
                    print "Design Number ",T_stdydsgn.stydsgncur using "<<<"
                    call dsgn_entry(c_citation.citnumb)
                    print dsgn_string clipped
                    # Subject Information
                        print
                        print "Subject Group Information"
                        declare subj_curs cursor for
                            select * into T_subjgrp.*
                            from subjgrp
                            where sgcitnumb = c_citation.citnumb
                            and sgdsgnnum = T_stdydsgn.styserial
                            order by sgdsgnnum
                        foreach subj_curs
                            print
                            print "Subject Group ",
                                T_subjgrp.sglink using "<<",
                                " of Design ", T_stdydsgn.stydsgncur using "<<",":"
                            call subj_entry(c_citation.citnumb)
                            print subj_string clipped
                            end foreach
                        close subj_curs
                    # Exposure Regimen
                        print
                        print "Exposure Regimen Information"
                        declare expo_curs cursor for
                            select * into T_exporegm.*
                            from exporegm
                            where excitnumb = c_citation.citnumb
                            and exdsgnnum = T_stdydsgn.styserial
                            order by exdsgnnum
                        foreach expo_curs
                            print
                            print "Exposure Regimen ",
                                T_exporegm.exlink using "<<",
                                " of Design ", T_stdydsgn.stydsgncur using "<<",":"
                            call expo_entry(c_citation.citnumb)
                            print expo_string clipped
                            end foreach
                        close expo_curs
                    end foreach
            end if
        # finding/results information
            print
            print"Results: Design-Oriented"
            select count(*) into cnt from clinfind
                where cfcitnumb = c_citation.citnumb
            if cnt < 1
```

```
                then
                    print "No clinical findings entered."
                    print
                    return
                end if
            declare exgp_curs cursor for
                select * from expogrp
                where egcitnumb = c_citation.citnumb
                order by egdsgn, egsubg, egexpo
            let h_dsgnno = 0
            let h_subjno = 0
            let h_expono = 0
            foreach exgp_curs into T_expogrp.*
                if T_expogrp.egdsgn <> h_dsgnno
                    then
                        print 3 spaces, "Design: ", T_expogrp.egdsgndsc clipped
                        let h_dsgnno = T_expogrp.egdsgn
                    end if
                if T_expogrp.egsubg <> h_subjno
                    then
                        print 6 spaces, "Subjects: ", T_expogrp.egsubgdsc clipped
                        let h_subjno = T_expogrp.egsubg
                    end if
                if T_expogrp.egexpo <> h_expono
                    then
                        print 6 spaces, "Exposure Regimen: ",T_expogrp.egexpodsc clipped
                        let h_expono = T_expogrp.egexpo
                    end if
                declare find_curs cursor for
                    select * from clinfind
                    where cfcitnumb = T_expogrp.egcitnumb
                    and cfeglink = T_expogrp.egserial
                    order by cfeglink, cfsitecode, cffinding
                let cnt = 0
                foreach find_curs into T_clinfind.*
                    let cnt = cnt + 1
                    call find_entry(T_clinfind.cfcitnumb)
                    print find_string clipped
                    print
                    end foreach
                if cnt = 0
                    then
                        print "No results reported for this Exposure Group."
                        print
                    end if
                close find_curs
                end foreach
            close exgp_curs
    end report
##########################################################################
REPORT bib_out(c_citation, author)
    define
        c_citation like citation.citnumb,
        tmp_string  char(500),
        tmpname char(60),
        author  like authors.authname
    output
```

```
    report to "tks_query.tmp"
    left margin 0
    top margin 0
    bottom margin 0
order external by author, c_citation
format
    first page header
        print "REFERENCES"
        print
    after group of c_citation
        #citation information
            call biblio_gen(c_citation)
            print bib_entry clipped
            print
end report
```

#tksmon2.4gl

```
{
TITLE: tksmon2.4gl
Copyright Harold L. Trammel, 1987-1988
University of Illiois, CVM, IAPIC
Funded by US Army Contract DAMD-17-C-7114
Contains the following functions:
     biblio_gen(in_cit)
    auth_gen(in_cit)
    auth_down(t_auth)
    keywd_list(in_cit)
    paper_entry(in_cit)
    dsgn_entry(in_cit)
    subj_entry(in_cit)
    expo_entry(in_cit)
    find_entry(in_cit)
}

database tkstest
globals "tksglob.4gl"
define
    auth_string char(320)
##################################################################
FUNCTION biblio_gen(in_cit)
# generates bibliographic entry for a given citation and puts
# entry in a global variable 'bib_entry'
    define
        in_cit like citation.citnumb,
        t_serial integer,
        t_journ like journlst.jabrv,
        t_vol like citation.citvol,
        t_page like citation.citpage,
        t_src like citation.citsource,
        t_date like citation.citdate,
        t_title like citation.cittitle,
        book    record like booklst.*,
        num_string char(10),
        cit_string char(480),
        len smallint
    call auth_gen(in_cit)
    #citation string prep
        let cit_string = ""
        select citserial, citsource, citvol, citpage, citdate, cittitle
            into t_serial, t_src, t_vol, t_page, t_date, t_title
            from citation
            where citnumb = in_cit
        if status = NOTFOUND
            then
                MESSAGE "No papers found."
                SLEEP 1
                MESSAGE ""
                RETURN
            else
                #generate citation
                    if t_src[1,1] = "J"
                        then
```

```
                    select jabrv into t_journ from journlst
                        where jcode = t_src
                    let cit_string =
                        t_title clipped, ", ",
                        t_journ clipped," ",
                        t_vol clipped,":",
                        t_page clipped,",",
                        t_date
                else
                    select * into book.* from booklst
                        where bcode = t_src
                    let cit_string =
                        t_title clipped, ", in ",
                        book.beditor clipped, ":",
                        book.bname clipped,", "
                    if book.bedno is not null
                        then
                            let cit_string =
                                cit_string clipped,
                                book.bedno clipped,"ed."
                        end if
                    if book.bvol is not null
                        then
                            let cit_string =
                                cit_string clipped,
                                book.bvol clipped
                        end if
                    let cit_string =
                        cit_string clipped,
                        book.bpub clipped, ", ",
                        book.bpubplace clipped, ", ",
                        book.bdate clipped,",",
                        " pp. ", t_page clipped
                end if
            end if
        let num_string = "(", t_serial using "<<<<<<<<", ")"
        let bib_entry =
            num_string clipped, " ",
            auth_string clipped, ": ",
            cit_string clipped
    END FUNCTION
#################################################################
FUNCTION auth_gen(in_cit)
    define
        in_cit like citation.citnumb,
        t_auth like authors.authname,
        t_asig like authors.authsig,
        aucnt smallint
    let auth_string = ""
    select count(*) into aucnt
        from authors
        where aucitnumb = in_cit
    if status = NOTFOUND
        then
            let auth_string = "Anonymous"
            return
        else
```

```
            declare full_auth cursor for
                select authname, authsig
                from authors
                where aucitnumb = in_cit
                order by 2
            foreach full_auth into t_auth, t_asig
                case
                    when t_asig > 6
                        let auth_string = auth_string clipped, " et al"
                        exit foreach
                        exit case
                    when t_asig = aucnt
                        call auth_down(t_auth) returning t_auth
                        let auth_string =
                            auth_string clipped,
                            " ",
                            t_auth clipped
                        exit case
                    when t_asig < aucnt
                        call auth_down(t_auth) returning t_auth
                        let auth_string =
                            auth_string clipped,
                            " ",
                            t_auth clipped,
                            ", "
                        exit case
                    end case
                end foreach
        end if
    END FUNCTION
#####################################################################
FUNCTION auth_down(t_auth)
    define
        t_auth like authors.authname,
        len smallint
    let len = length(t_auth)
    for x = 2 to len
        case
            when t_auth[x,x] = ","
                let t_auth[x,x] = ""
                exit for
                exit case
            when t_auth[x,x] = " "
                let t_auth[x,x] = " "
                exit for
                exit case
            when t_auth[x,x] = "-"
                let x = x+1
                exit case
            otherwise
                let t_auth[x,x] = downshift(t_auth[x,x])
                exit case
            end case
        end for
    return t_auth
    END FUNCTION
#####################################################################
```

```
FUNCTION keywd_list(in_cit)
# generates a string containing the keywords and puts them
# in global variable "keywdlst"
    define
        t_key       like keywords.keyword,
        in_cit   like citation.citnumb,
        x, cnt   smallint
    select count(*) into cnt
        from keywords
        where keycitnumb = in_cit
    if cnt < 1
        then
            let keywdlst = "No keywords entered."
            return
        end if
    let x = 0
    declare full_keys cursor for
        select keyword from keywords
        where keycitnumb = in_cit
    let keywdlst = ""
    foreach full_keys into t_key
        let x = x + 1
        if x >= cnt
            then
                let keywdlst = keywdlst clipped," ",
                    downshift(t_key) clipped
                exit foreach
            else
                let keywdlst = keywdlst clipped, " ",
                    downshift(t_key) clipped, ", "
            end if
        end foreach
    END FUNCTION
###################################################################
FUNCTION paper_entry(in_cit)
    define
        in_cit like paperover.papcitnumb
    select * into T_paperover.*
        from paperover
        where papcitnumb = in_cit
    let pap_string =
         aim_trans(T_paperover.papaim) clipped,
        " paper with stated purpose of ",
         T_paperover.papstatepur clipped
    if length(T_paperover.papimppur) > 0
        then
            let pap_string =
                pap_string clipped,
                " and implied purpose of ",
                T_paperover.papimppur clipped
        end if
    let pap_string =
        pap_string clipped, " reporting on ",
        T_paperover.papnumdsgn using "<<<", " design(s)."
    END FUNCTION
###################################################################
```

```
FUNCTION dsgn_entry(in_cit)
    define
        in_cit    like citation.citnumb
    let dsgn_string =
        "Design Type: ",
        stype_trans(T_stdydsgn.stytype) clipped,
        " experiments were performed in an ",
        vivit_trans(T_stdydsgn.styvivit) clipped,
        " setting with "
    case
        when T_stdydsgn.stycntl = "Y"
            let dsgn_string = dsgn_string clipped, " ",
                cntlcmp_trans(T_stdydsgn.stycntlcmp) clipped, " ",
                cmpmeth_trans(T_stdydsgn.stycmpmeth) clipped," ",
                "control(s) using a(n) ",
                cntlmeth_trans(T_stdydsgn.stycntlmeth) clipped, " ",
                cntltyp_trans(T_stdydsgn.stycntltyp) clipped, " ",
                "with ",
                T_stdydsgn.stynumgrp using "<< ", "subject group(s) ",
                cntlassgn_trans(T_stdydsgn.stycntassgn) clipped, " ",
                "assigned to ",
                T_stdydsgn.stynumexp using "<< ", "exposure regimens."
            exit case
        when T_stdydsgn.stycntl = "N"
            let dsgn_string = dsgn_string clipped, " ",
            "no controls using ",
            T_stdydsgn.stynumgrp using "<< ",
             "subject groups and ",
            T_stdydsgn.stynumexp using "<< ",
             "exposure regimens."
            exit case
        end case
    END FUNCTION
##########################################################################
FUNCTION subj_entry(in_cit)
    define
        in_cit    like citation.citnumb
    let subj_string =
        "Consisted of ", T_subjgrp.sgnumb using "<<<<", " ",
         sex_trans(T_subjgrp.sgsex) clipped, ", ",
         T_subjgrp.sgage clipped, " ",
         date_trans(T_subjgrp.sgageunit) clipped, " old ",
         T_subjgrp.sgbreed clipped, " ",
         T_subjgrp.sgspecies clipped, " weighing ",
         T_subjgrp.sgwt using "<<<<<", " kilograms "
    if (length(T_subjgrp.sght) > 0 and T_subjgrp.sght <> "NA")
        then
            let subj_string = subj_string clipped," ",
                T_subjgrp.sght clipped, " ",
                T_subjgrp.sghtunit clipped, " tall"
        end if
    if (length(T_subjgrp.sgoccup) > 0 and T_subjgrp.sgoccup <> "NA")
        then
            let subj_string = subj_string clipped," ",
                " with ", T_subjgrp.sgoccup clipped,
                " occupation "
        end if
```

```
    let subj_string = subj_string clipped," ",
        "of ", T_subjgrp.sghlthstat clipped,
        " health status obtained from ",
        T_subjgrp.sgsource clipped,
        " and received a total of ",
        T_subjgrp.sgtotexpo using "<<<<", " exposure(s)."
    END FUNCTION
#####################################################################
FUNCTION expo_entry(in_cit)
    define
        in_cit    like citation.citnumb
    let expo_string = "Involving exposure to ",
        T_exporegm exagent clipped,
        " for the purpose of assessing ",
        T_exporegm.expurpose clipped,
        " [effects]. It was given by ",
        T_exporegm.exadminmeth clipped,
        " at a dose of ",
        T_exporegm.exdose clipped, " ",
        T_exporegm.exdoseunit clipped, " in a ",
        form_trans(T_exporegm.exformul) clipped, " form by the ",
        rte_trans(T_exporegm.exroute) clipped, " route every ",
        T_exporegm.exinterval clipped, " for a duration of ",
        T_exporegm.exduration clipped, ". "
        if (T_exporegm.exevaltime <> "NA"
            or length(T_exporegm.exevaltime) > 0)
            then
                let expo_string = expo_string clipped," ",
                "The subjects were evaluated at ",
                T_exporegm.exevaltime clipped, "."
            end if
    END FUNCTION
#####################################################################
FUNCTION find_entry(in_cit)
    define
        in_cit    like citation.citnumb
    if length(T_clinfind.cfsevunits) < 1
        then
            let find_string =
                severe_trans(T_clinfind.cfsevvalue) clipped," ",
                trans_change(T_clinfind.cfchange) clipped," ",
                upshift(T_clinfind.cffinding) clipped," ",
                "in ", upshift(T_clinfind.cfsite) clipped," ",
                "seen in ", upshift(T_clinfind.cffreq) clipped,
                " subjects "
            if T_clinfind.cfonset is not null
                then
                    let find_string = find_string clipped,
                        " with onset of ",
                        upshift(T_clinfind.cfonset) clipped," hour(s) "
                end if
            if T_clinfind.cfduration is not null
                then
                    if T_clinfind.cfduration = "CHRONIC"
                        then
```

```
                        let find_string = find_string clipped,
                            " and CHRONIC duration."
                    else
                        let find_string = find_string clipped,
                            " and duration of ",
                            upshift(T_clinfind.cfduration) clipped,
                            " hour(s)."
                    end if
                end if
            else
                let find_string =
                    trans_change(T_clinfind.cfchange) clipped," ",
                    upshift(T_clinfind.cffinding) clipped," ",
                    "(",upshift(T_clinfind.cfsevvalue) clipped, " ",
                    upshift(T_clinfind.cfsevunits) clipped, ") ",
                    "in ", upshift(T_clinfind.cfsite) clipped," ",
                    "seen in ", upshift(T_clinfind.cffreq) clipped,
                    " subjects "
                if T_clinfind.cfonset is not null
                    then
                        let find_string = find_string clipped,
                            " with onset of ",
                            upshift(T_clinfind.cfonset) clipped," hour(s) "
                    end if
                if T_clinfind.cfduration is not null
                    then
                        if T_clinfind.cfduration = "CHRONIC"
                            then
                                let find_string = find_string clipped,
                                    " and CHRONIC duration."
                            else
                                let find_string = find_string clipped,
                                    " and duration of ",
                                    upshift(T_clinfind.cfduration) clipped,
                                    " hour(s)."
                            end if
                    end if
            end if
        END FUNCTION
```

```
#tksmon3.4gl
{
TITLE: tksmon3.4gl
Copyright Harold L. Trammel, 1987-1988
University of Illiois, CVM, IAPIC
Funded by US Army Contract DAMD-17-C-7114
Contains the following functions:

}
database tkstest
globals "tksglob.4gl"
define
    T_generic like exporegm.exagent,
    chem_string     char(80),
    outfile3        char(80)
##################################################################
FUNCTION select_generic()
    define
        tmp_gen like exporegm.exagent
    open window a260 at 10,10 with 2 rows, 60 columns
        attribute(border, green)
    prompt "Enter generic >"
        for tmp_gen
        let tmp_gen = upshift(tmp_gen)
    close window a260
    return tmp_gen
    end function
##################################################################
FUNCTION genMonoOpt()
    open window alrt1960 at 4,20 with 19 rows, 60 columns
        attribute (border, green, prompt line last -1)
    display "REPORT CHOICES FOR GENERIC— DEC. 1989" at 1,10
    display "A = System-Sign-Species-Dose-Study Design " at 3,2
    display "B = Species-System-Sign-Dose-Study Design " at 5,2
    display "C = Dose-Species-System-Sign-Study Design " at 7,2
    display "D = Study Design-Species-System-Sign-Dose " at 9,2
    display "T = Total Agent Monograph     " at 15,2
    display "Z = Exit " at 17,2
    prompt "Enter report choice > " for char answer
        on key(interrupt)
            let answer = "Z"
             close window alrt1960
            return answer
            end prompt
    let answer = upshift(answer)
    close window alrt1960
    return answer
    end function
##################################################################
FUNCTION genMonoGen(tmp_val, tmp_gen)
    define
        tmp_val     char(1),
        runfile,outfile2  char(80),
        tmp_gen     like exporegm.exagent,
        t_sys    char(1),
        t_citnumb like citation.citnumb,
```

```
        t_cftype like clinfind.cftype,
        t_cffinding like clinfind.cffinding,
        t_cfchange like clinfind.cfchange,
        t_cfsevvalue like clinfind.cfsevvalue,
        t_cfsevunits like clinfind.cfsevunits,
        t_cffreq like clinfind.cffreq,
        t_cfonset like clinfind.cfonset,
        t_cfduration like clinfind.cfduration,
        t_egsubgdsc like expogrp.egsubgdsc,
        t_egexpodsc like expogrp.egexpodsc,
        t_egdsgndsc like expogrp.egdsgndsc,
        t_authname like authors.authname,
        t_exagent like exporegm.exagent,
        t_citserial like citation.citserial,
        t_gen    char(4)

    let t_gen = tmp_gen[1,4]
    for x = 1 to 4
        if t_gen[x,x] = " "
            then
                let t_gen[x,x] = "_"
            end if
        end for
    Case
        when tmp_val = "A"
            let outfile = t_gen,"mono.out"
            let outfile2 = t_gen,"bib.out"
            let outfile3 = t_gen,".out"
            declare a_curs cursor for
                select
                    cftype,
                    cfsitecode[1],
                    cffinding,
                    cfchange,
                    cfsevvalue,
                    cfsevunits,
                    cffreq,
                    cfonset,
                    cfduration,
                    egsubgdsc,
                    egexpodsc,
                    egdsgndsc,
                    citserial
                from clinfind, expogrp, exporegm, citation
                where exagent = tmp_gen
                and egexpo = exserial
                and cfeglink = egserial
                and citnumb = cfcitnumb
                order by 1 desc, 2, 3, 4
            start report genMono to outfile
                foreach a_curs into
                    t_cftype, t_sys, t_cffinding,t_cfchange,
                        t_cfsevvalue,t_cfsevunits,t_cffreq,t_cfonset,
                        t_cfduration,t_egsubgdsc,t_egexpodsc,t_egdsgndsc,
                        t_citserial
                    output to report genMono(
                        t_cftype, t_sys, t_cffinding, t_cfchange,
```

```
                        t_cfsevvalue,t_cfsevunits,t_cffreq,t_cfonset,
                        t_cfduration,t_egsubgdsc,t_egexpodsc,t_egdsgndsc,
                        t_citserial)
                end foreach
            finish report genMono
        close a_curs
        declare a_bib cursor for
            select unique(egcitnumb), authname, exagent
                from clinfind, authors, exporegm, expogrp
                where exagent = tmp_gen
                and egexpo = exserial
                and authsig = 1
                and egcitnumb = cfcitnumb
                and egcitnumb = aucitnumb
                and egcitnumb = excitnumb
                order by 2
            start report bib_out to outfile2
                foreach a_bib into t_citnumb, t_authname, t_exagent
                    output to report bib_out(t_citnumb, t_authname)
                    end foreach
                finish report bib_out
            Close a_bib
        let runfile = "cat ", outfile clipped, " ", outfile2 clipped,">", outfile3 clipped
        run runfile
        exit case
    when tmp_val = "B"
    when tmp_val = "C"
    when tmp_val = "D"
    when tmp_val = "T"
        call genMonoTot(tmp_gen)
        exit case
    end case
end function
##################################################################
REPORT genMono(t_cftype, t_sys, t_cffinding, t_cfchange, t_cfsevvalue, t_cfsevunits, t_cffreq,
t_cfonset, t_cfduration, t_egsubgdsc, t_egexpodsc, t_egdsgndsc, t_citserial)
    define
        tmp_val     char(1),
        tmp_gen     like exporegm.exagent,
        tmp_sys     like tkssite.systemcode,
        tmp_systemname    like tkssite.systemname,
        junque  char(10),
        t_cftype like clinfind.cftype,
        t_sys    char(1),
        t_cffinding like clinfind.cffinding,
        t_cfchange like clinfind.cfchange,
        t_cfsevvalue like clinfind.cfsevvalue,
        t_cfsevunits like clinfind.cfsevunits,
        t_cffreq like clinfind.cffreq,
        t_cfonset like clinfind.cfonset,
        t_cfduration like clinfind.cfduration,
        t_egsubgdsc like expogrp.egsubgdsc,
        t_egexpodsc like expogrp.egexpodsc,
        t_egdsgndsc like expogrp.egdsgndsc,
        t_citserial like citation.citserial
    output
        left margin 0
```

```
        right margin 0
        bottom margin 0
    order external by t_cftype, t_sys, t_cffinding, t_cfchange
    format
        before group of t_cftype
            case
                when t_cftype = "S"
                    print "Signs/Disease"
                    print
                    exit case
                when t_cftype = "M"
                    print "Morphology"
                    print
                    exit case
                when t_cftype = "L"
                    print "Laboratory Findings"
                    print
                    exit case
                end case
        before group of t_sys
            case
                when t_cftype = "S"
                    call system_trans(t_sys) returning junque, tmp_systemname
                    exit case
                when t_cftype = "M"
                    call system_trans(t_sys) returning junque, tmp_systemname
                    exit case
                when t_cftype = "L"
                    call matrix_trans(t_sys) returning junque, tmp_systemname
                    exit case
                end case
            print tmp_systemname
        before group of t_cffinding
            print 3 spaces, t_cffinding clipped
        on every row
            print trans_change(t_cfchange) clipped. 1 spaces,
                "(",t_cfsevvalue clipped,
                t_cfsevunits clipped, ") occurring in ",
                t_cffreq clipped, " subjects at ",
                t_cfonset clipped, " with ",
                t_cfduration clipped, " duration. ",
                " Subjects: ",t_egsubgdsc clipped,
                " Exposures:", t_egexpodsc clipped,
                " Design:",t_egdsgndsc clipped,
                " (", t_citserial using "<<<<<<",")"
            print
    end report
##################################################################
FUNCTION chem_data(t_gen)
    define t_gen like exporegm.exagent

    let chem_string = "CHEMICAL DATA: None available at this time."
    END FUNCTION
##################################################################
FUNCTION genMonoTot(t_gen)
    define
        t_gen like exporegm.exagent,
```

```
    outfile2, runfile char(80),
    t_citnumb like citation.citnumb,
    t_authname like authors.authname,
    t_exagent like exporegm.exagent
    t_gen1  char(4)

let t_gen1 = t_gen[1,4]
for x = 1 to 4
    if t_gen1[x,x] = " "
        then
            let t_gen1[x,x] = "_"
        end if
    end for

let outfile = t_gen1,"tot.out"
let outfile2 = t_gen1,"bib.out"
let outfile 3 = t_gen1,".out"
let T_generic = t_gen

declare agt_curs cursor for
    select
        cfcitnumb,
        cfserial,
        cfeglink,
        cfeglabel,
        cftype,
        cfsitecode,
        cfsite,
        cffindcode,
        cffinding,
        cfchange,
        cfsevvalue,
        cfsevunits,
        cffreq,
        cfonset,
        cfduration
    from clinfind, exporegm, expogrp
    where exporegm.exagent = t_gen
    and expogrp.egexpo = exporegm.exserial
    and cfeglink = expogrp.egserial
    order by cftype desc, cfsitecode, cffinding, cfchange,cfsevvalue
start report totGenMono to outfile
    foreach agt_curs into T_clinfind.*
        output to report totGenMono(T_clinfind.*)
        end foreach
    finish report totGenMono
close agt_curs
declare agt_bib cursor for
    select unique(egcitnumb), authname, exagent
    from clinfind, authors, exporegm, expogrp
    where exagent = t_gen
    and egexpo = exserial
    and authsig = 1
    and egcitnumb = cfcitnumb
    and egcitnumb = aucitnumb
    and egcitnumb = excitnumb
    order by 2
```

```
        start report bib_out to outfile2
            foreach agt_bib into t_citnumb, t_authname, t_exagent
                output to report bib_out(t_citnumb, t_authname)
                end foreach
            finish report bib_out
        Close agt_bib
        let runfile = "cat", outfile clipped, " ", outfile2 clipped, ">", outfile3 clipped
        run runfile
    end function

##########################################################################
REPORT totGenMono(c_clinfind)
    define
        c_clinfind record like clinfind.*,
        t_sys    char(1),
        junque  char(10),
        t_cftype like clinfind.cftype,
        tmp_systemname like tkssite.systemname,
        tmp_citserial    integer
    order external by c_clinfind.cftype,
            c_clinfind.cfsitecode,
            c_clinfind.cffinding,
            c_clinfind.cfchange,
            c_clinfind.cfsevvalue
    format
        first page header
            print t_generic
            print
            call chem_data(t_generic)
            print chem_string
            print
        page header
            print t_generic clipped, " MONOGRAPH — page ",pageno using "<<<<"
            print
        before group of c_clinfind.cftype
            case
                when c_clinfind.cftype = "S"
                    print
                    print "Signs/Disease"
                    exit case
                when c_clinfind.cftype = "M"
                    print
                    print "Morphology"
                    exit case
                when c_clinfind.cftype = "L"
                    print
                    print "Laboratory Findings"
                    exit case
                end case
        before group of c_clinfind.cfsitecode
            let t_sys = c_clinfind.cfsitecode[1]
            case
                when c_clinfind.cftype = "S"
                    call system_trans(t_sys) returning junque, tmp_systemname
                    exit case
                when c_clinfind.cftype = "M"
                    call system_trans(t_sys) returning junque, tmp_systemname
```

```
                exit case
            when c_clinfind.cftype = "L"
                call matrix_trans(t_sys) returning junque, tmp_systemname
                exit case
            end case
        print
        print tmp_systemname
    on every row
        select * into T_subjgrp.*
            from subjgrp, expogrp
            where sgserial = egsubg
            and egserial= c_clinfind.cfeglink
        select * into T_exporegm.*
            from exporegm, expogrp
            where c_clinfind.cfeglink = egserial
            and exserial = egexpo
        select citserial into tmp_citserial
            from citation
            where citnumb = c_clinfind.cfcitnumb
        if length(T_clinfind.cfsevunits) < 1
            then
            print
            print
                severe_trans(T_clinfind.cfsevvalue) clipped," ",
                trans_change(T_clinfind.cfchange) clipped," ",
                upshift(T_clinfind.cffinding) clipped," ";
                if T_clinfind.cftype <> "S"
                    then
                        print "in ", upshift(T_clinfind.cfsite) clipped," ";
                    end if
            print    "seen in ", upshift(T_clinfind.cffreq) clipped, " ",
                sex_trans(T_subjgrp.sgsex) clipped, ", ",
                T_subjgrp.sgage clipped, " ",
                date_trans(T_subjgrp.sgageunit) clipped, " old ",
                T_subjgrp.sgbreed clipped, " ",
                T_subjgrp.sgspecies clipped, " weighing ",
                T_subjgrp.sgwt using "<<<<<", " kilograms ";
                if (length(T_subjgrp.sght) > 0 and T_subjgrp.sght <> "NA")
                    then
                        print T_subjgrp.sght clipped, " ",
                            T_subjgrp.sghtunit clipped, " tall";
                    end if
                if (length(T_subjgrp.sgoccup) > 0 and T_subjgrp.sgoccup <> "NA")
                    then
                        print " with ", T_subjgrp.sgoccup clipped,
                            " occupation ";
                    end if
            print    "of ", T_subjgrp.sghlthstat clipped,
                " health status (obtained from ",
                T_subjgrp.sgsource clipped,
                ") which received a total of ",
                T_subjgrp.sgtotexpo using "<<<<", " exposure(s) to ",
                T_exporegm.exdose clipped, " ",
                T_exporegm.exdoseunit clipped, 1 space,
                T_exporegm.exagent clipped, " by ",
                T_exporegm.exadminmeth clipped," ",
                rte_trans(T_exporegm.exroute) clipped, " route every ",
```

```
                T_exporegm.exinterval clipped, " for a duration of ",
                T_exporegm.exduration clipped, ". ";
                if (T_exporegm.exevaltime <> "NA"
                    or length(T_exporegm.exevaltime) > 0)
                    then
                        print "The subjects were evaluated at ",
                        T_exporegm.exevaltime clipped, ". ";
                    end if
                if T_clinfind.cfonset is not null
                    then
                        print " Clinical effect had onset of ",
                        upshift(T_clinfind.cfonset) clipped," ";
                    end if
                if T_clinfind.cfduration is not null
                    then
                        if T_clinfind.cfduration = "CHRONIC"
                            then
                                print " and CHRONIC duration. ";
                        else
                            print " and duration of ",
                            upshift(T_clinfind.cfduration) clipped,
                            ". ";
                        end if
                    end if
            print " (", tmp_citserial using "<<<<<<<" , ")"
    else
        print
        print    trans_change(T_clinfind.cfchange) clipped," ",
            upshift(T_clinfind.cffinding) clipped," ",
            "(",upshift(T_clinfind.cfsevvalue) clipped, " ",
            upshift(T_clinfind.cfsevunits) clipped, ") ";
            if T_clinfind.cftype <> "S"
                then
                    print "in ", upshift(T_clinfind.cfsite) clipped," ";
                end if
            print "seen in ", upshift(T_clinfind.cffreq) clipped, " ",
            sex_trans(T_subjgrp.sgsex) clipped, ", ",
            T_subjgrp.sgage clipped, " ",
            date_trans(T_subjgrp.sgageunit) clipped, " old ",
            T_subjgrp.sgbreed clipped, " ",
            T_subjgrp.sgspecies clipped, " weighing ",
            T_subjgrp.sgwt using "<<<<<", " kilograms ";
            if (length(T_subjgrp.sght) > 0 and T_subjgrp.sght <> "NA")
                then
                    print T_subjgrp.sght clipped, " ",
                        T_subjgrp.sghtunit clipped, " tall ";
                end if
            if (length(T_subjgrp.sgoccup) > 0 and T_subjgrp.sgoccup <> "NA")
                then
                    print " with ", T_subjgrp.sgoccup clipped,
                        " occupation ";
                end if
        print    "of ", T_subjgrp.sghlthstat clipped,
            " health status (obtained from ",
            T_subjgrp.sgsource clipped,
            ") which received a total of ",
            T_subjgrp.sgtotexpo using "<<<<", " exposure(s) to ",
```

```
                T_exporegm.exdose clipped, " ",
                T_exporegm.exdoseunit clipped, 1 space,
               T_exporegm.exagent clipped, " by ",
                T_exporegm.exadminmeth clipped, " ",
                rte_trans(T_exporegm.exroute) clipped, " route every ",
                T_exporegm.exinterval clipped, " for a duration of ",
                T_exporegm.exduration clipped, ". ";
                if (T_exporegm.exevaltime <> "NA"
                    or length(T_exporegm.exevaltime) > 0)
                    then
                        print " The subjects were evaluated at ",
                        T_exporegm.exevaltime clipped, ". ";
                    end if
               if T_clinfind.cfonset is not null
                    then
                        print " Clinical effects had onset of ",
                        upshift(T_clinfind.cfonset) clipped," ";
                    end if
               if T_clinfind.cfduration is not null
                    then
                        if T_clinfind.cfduration = "CHRONIC"
                            then
                                print " and CHRONIC duration. ";
                            else
                                print " and duration of ",
                                upshift(T_clinfind.cfduration) clipped,
                                ". ";
                        end if
                    print " (", tmp_citserial using "<<<<<<", ")"
            end if
        end if
end report
```

#tksvoc.4gl

```
{
TITLE: tksvoc.4gl
Copyright Harold L. Trammel, 1987-1988
University of Illiois, CVM, IAPIC
Funded by US Army Contract DAMD-17-C-7114
Contains the following FUNCTIONs:
    j_list()
    add_journ()
    update_journ()
    delete_journ()
    query_journ()
    view_journ()
    dispname()
    b_list()
    add_book()
    update_book()
    delete_book()
    query_book()
    view_book()
    bdispname()
    k_list()
    add_klist()
    update_klist()
    delete_klist()
    query_klist()
    view_klist()
    dispkey()
}
DATABASE tkstest
GLOBALS "tksglob.4gl"
#Journal FUNCTION
FUNCTION j_list()
    define
        answer char(1)
    open window jw1 at 3,3 with form "vocjourn" ATTRIBUTE (BORDER)
    menu "JOURNAL-VOCABULARY"
        COMMAND "Add"
            "Add Journal to Journal Vocabulary" HELP 900
            call add_journ()
        COMMAND "Find"
            "Find Journal in Journal Vocabulary" HELP 901
            call query_journ()
        COMMAND "Exit"
            "Exit from Journal Vocabulary Modification" HELP 2
            exit menu
        END menu
    Close window jw1
    clear screen
    END FUNCTION
FUNCTION add_journ()
    define
        jname2 char(60),
        jname1 char(60),
        jrow        integer
    MESSAGE ""
```

```
    CLEAR FORM
    let sw = 0
    INPUT
        jname1, jname2, T_journlst.jabrv
        FROM
        jname, jnm, jabrv
        ON KEY (INTERRUPT)
            let sw = 1
            EXIT INPUT
        END INPUT
    IF sw = 1 then RETURN end if
    let T_journlst.jacquis = 0
    let T_journlst.jcode = "J00000"
    let T_journlst.jname = jname1 clipped, jname2
    insert into journlst values (T_journlst.*)
    let T_journlst.jacquis = SQLCA.SQLERRD[2]
    let T_journlst.jcode = "J",T_journlst.jacquis using "&&&&&&"
    update journlst set jcode = T_journlst.jcode
        where T_journlst.jabrv = journlst.jabrv
    display T_journlst.jacquis to jacquis
    display T_journlst.jcode to jcode
    MESSAGE "Row Added"
    sleep 1
    MESSAGE ""
    END FUNCTION
FUNCTION update_journ()
    define
        jname2 char(60),
        jname1 char(60),
        jrow        integer
    let jname1 = T_journlst.jname[1,60]
    let jname2 = T_journlst.jname[61,120]
    let sw = 0
    INPUT
        T_journlst.jacquis, T_journlst.jcode,
        jname1, jname2,
        T_journlst.jabrv
        WITHOUT DEFAULTS
        FROM
            jacquis, jcode, jname, jnm, jabrv
        ON KEY (INTERRUPT)
            let sw = 1
            EXIT INPUT
        END INPUT
    IF sw = 1 then RETURN END IF
    let T_journlst.jname = jname1 clipped, jname2
    UPDATE journlst
        SET journlst.* = T_journlst.*
            where journlst.jcode= T_journlst.jcode
    MESSAGE "Row Updated."
    SLEEP 1
    MESSAGE ""
    END FUNCTION
FUNCTION delete_journ()
    DELETE FROM journlst WHERE jcode= T_journlst.jcode
    CLEAR FORM
    MESSAGE "Row Deleted."
```

```
    SLEEP 1
    MESSAGE ""
    END FUNCTION
FUNCTION query_journ()
    clear form
    let int_flag = 0
    construct query1 on jcode, jname, jabrv
        from journlst.*
    if int_flag <> 0 then return end if
    let select1 = "select * from journlst where ", query1 clipped
    prepare select_2 from select1
    let select2 = "select count(*) from journlst where ", query1 clipped
    prepare jor_cnt from select2
    declare jor_curs cursor for jor_cnt
    foreach jor_curs into cnt end foreach
    declare j_curs SCROLL CURSOR FOR select_2
    let chosen = FALSE
    OPEN j_curs
    MESSAGE " Searching... "
    FETCH FIRST j_curs into T_journlst.*
    IF status = NOTFOUND
        THEN
            MESSAGE "No Journal Found"
            SLEEP 1
            MESSAGE ""
        ELSE
            display " ", cnt, " rows found" at 17,2 attribute(reverse)
                CALL view_journ()
        END IF
    CLOSE j_curs
    END FUNCTION
FUNCTION view_journ()
    CALL dispname()
    let tmp_cnt = 1
    display "" at 17,2
    display " ",tmp_cnt, " of ", cnt, " rows" at 17,2
    MENU "BROWSE"
        COMMAND "Next"
            "View the next Journal in the list." HELP 170
            FETCH NEXT j_curs INTO T_journlst.*
            let tmp_cnt = tmp_cnt + 1
            IF status = NOTFOUND THEN
                MESSAGE "No more Journals in this direction."
                SLEEP 1
                let tmp_cnt = cnt
                MESSAGE ""
                FETCH LAST j_curs INTO T_journlst.*
                END IF
            display " ", tmp_cnt, " of ", cnt, " rows" at 17,2
            attribute(reverse)
            call dispname()
        COMMAND "Previous"
            "View the Previous Journal in the list." HELP 170
            FETCH PREVIOUS j_curs INTO T_journlst.*
            let tmp_cnt = tmp_cnt - 1
            IF status = NOTFOUND THEN
                MESSAGE "No more Journals in this direction."
```

```
            SLEEP 1
            MESSAGE ""
            let tmp_cnt = 1
            FETCH FIRST j_curs INTO T_journlst.*
            END IF
        display " ", tmp_cnt, " of ", cnt, " rows" at 17,2
        attribute(reverse)
        call dispname()
    COMMAND "First"
        "View the first Journal in the list." HELP 170
        FETCH FIRST j_curs INTO T_journlst.*
        let tmp_cnt = 1
        display " ", tmp_cnt, " of ", cnt, " rows" at 17,2
        attribute(reverse)
        call dispname()
    COMMAND "Last"
        "View the Last Journal in the list." HELP 170
        message "Searching for last record...."
        FETCH LAST j_curs INTO T_journlst.*
        let tmp_cnt = cnt
        message ""
        display " ", tmp_cnt, " of ", cnt, " rows" at 17,2
        attribute(reverse)
        message ""
        call dispname()
    COMMAND "Update"
        "Update Journal in Journal Vocabulary" HELP 171
        call update_journ()
    COMMAND "Delete"
        "Delete Journal from Journal Vocabulary" HELP 908
        prompt "Are you sure you want to delete this Journal (y/n)? "
            for answer
        IF answer = "y"
            then
                call delete_journ()
            else
                next option "Next"
            END IF
    COMMAND "Exit" "Leave this menu" HELP 2
        EXIT MENU
    END MENU
END FUNCTION
FUNCTION dispname()
    define
        jname1 char(60),
        jname2 char(60)
    let jname1 = T_journlst.jname[1,60]
    let jname2 = T_journlst.jname[61,120]
    display
        T_journlst.jacquis,
        T_journlst.jcode,
        jname1,
        jname2,
        T_journlst.jabrv
        to
            jacquis, jcode, jname, jnm, jabrv
    END FUNCTION
```

```
#Book FUNCTION
FUNCTION b_list()
    define
        answer char(1)
    open window bw1 at 3,3 with 20 rows, 69 columns ATTRIBUTE (BORDER)
    open form s_book from "vocbook"
    display form s_book
    let chosen = FALSE
    menu "BOOK-VOCABULARY"
        COMMAND "Add"
            "Add Book to Book Vocabulary" HELP 906
            call add_book()
        COMMAND "Find"
            "Find Book in Book Vocabulary" HELP 907
            call query_book()
        COMMAND "Exit"
            "Exit from Book Vocabulary Modification" HELP 2
            exit menu
        END menu
    Close window bw1
    clear screen
    END FUNCTION
FUNCTION add_book()
    define
        bname2      char(60),
        bname1      char(60),
        brow        integer
    MESSAGE ""
    CLEAR FORM
    let sw = 0
    INPUT BY NAME
        T_booklst.bname THRU T_booklst.bisbn
        ON KEY (INTERRUPT)
            let sw = 1
            EXIT INPUT
        END INPUT
    IF sw = 1 then RETURN end if
    let T_booklst.bacquis = 0
    let T_booklst.bcode = "B00000"
    insert into booklst values (T_booklst.*)
    let T_booklst.bacquis = SQLCA.SQLERRD[2]
    let T_booklst.bcode = "B",T_booklst.bacquis using "&&&&&&"
    update booklst set bcode = T_booklst.bcode
        where booklst.bacquis = T_booklst.bacquis
    display T_booklst.bacquis to bacquis
    display T_booklst.bcode to bcode
    MESSAGE "Row Added"
    sleep 1
    MESSAGE ""
    END FUNCTION
FUNCTION update_book()
    define
        bname2 char(60),
        bname1 char(60),
        brow        integer
    let sw = 0
    INPUT BY NAME
```

```
        T_booklst.* WITHOUT DEFAULTS
        ON KEY (INTERRUPT)
            let sw = 1
            EXIT INPUT
        END INPUT
    IF sw = 1 then RETURN end if
    UPDATE booklst
        SET booklst.* = T_booklst.*
            where booklst.bcode= T_booklst.bcode
    MESSAGE "Row Updated."
    SLEEP 1
    MESSAGE ""
    END FUNCTION
FUNCTION delete_book()
    DELETE FROM booklst WHERE bcode= T_booklst.bcode
    CLEAR FORM
    MESSAGE "Row Deleted."
    SLEEP 1
    MESSAGE ""
    END FUNCTION
FUNCTION query_book()
    clear form
    let int_flag = 0
    construct query1
        on
            bcode, bname, bedno, bvol,
            bdate, bpub,
            bpubplace, beditor, bisbn
        from
            booklst.bcode, booklst.bname, booklst.bedno, booklst.bvol,
            booklst.bdate, booklst.bpub,
            booklst.bpubplace, booklst.beditor, booklst.bisbn
    if int_flag <> 0 then return end if
    let select1 = "select * from booklst where ", query1 clipped
    prepare select_3 from select1
    let select2 = "select count(*) from booklst where ", query1 clipped
    prepare bk_cnt from select2
    declare bk_curs cursor for bk_cnt
    foreach bk_curs into cnt
    end foreach
    declare b_curs SCROLL CURSOR FOR select_3
    let chosen = FALSE
    OPEN b_curs
    MESSAGE " SEARCHING..."
    FETCH FIRST b_curs into T_booklst.*
    IF status = NOTFOUND
        THEN
            MESSAGE "No Book Four 1"
            SLEEP 1
            MESSAGE ""
        ELSE
            display " ", cnt, " rows found" at 16,2 attribute(reverse)
            CALL bdispname()
            CALL view_book()
        END IF
        CLOSE b_curs
    END FUNCTION
```

```
FUNCTION view_book()
    let tmp_cnt = 1
    display "" at 16,2
    MENU "BROWSE"
        COMMAND "Next"
            "View the next Book in the list." HELP 170
            FETCH NEXT b_curs INTO T_booklst.*
            let tmp_cnt = tmp_cnt + 1
            IF status = NOTFOUND THEN
                MESSAGE "No more Books in this direction."
                SLEEP 1
                let tmp_cnt = cnt
                MESSAGE ""
                FETCH LAST b_curs INTO T_booklst.*
                END IF
            display " ", tmp_cnt, " of ", cnt, " rows" at 16,2
            attribute(reverse)
            call bdispname()
        COMMAND "Previous"
            "View the Previous Book in the list." HELP 170
            FETCH PREVIOUS b_curs INTO T_booklst.*
            let tmp_cnt = tmp_cnt - 1
            IF status = NOTFOUND THEN
                MESSAGE "No more book in this direction."
                SLEEP 1
                MESSAGE ""
                let tmp_cnt = 1
                FETCH FIRST b_curs INTO T_booklst.*
                END IF
            display " ", tmp_cnt, " of ", cnt, " rows" at 16,2
            attribute(reverse)
            call bdispname()
        COMMAND "First" "View the first Book in the list." HELP 170
            FETCH FIRST b_curs INTO T_booklst.*
            let tmp_cnt = 1
            display " ", tmp_cnt, " of ", cnt, " rows" at 16,2
            attribute(reverse)
            call bdispname()
        COMMAND "Last" "View the Last Book in the list." HELP 170
            message "Searching for last record...."
            FETCH LAST b_curs INTO T_booklst.*
            let tmp_cnt = cnt
            message ""
            display " ", tmp_cnt, " of ", cnt, " rows" at 16,2
            attribute(reverse)
            call bdispname()
        COMMAND "Update" "Update Book in Book Vocabulary" HELP 171
            call bdispname()
            call update_book()
        COMMAND "Delete" "Delete Book from Book Vocabulary" HELP 909
            call bdispname()
            prompt "Are you sure you want to delete this Book (y/n)? "
                for answer
            IF answer = "y"
                then
                    call delete_book()
                ELSE
```

```
                NEXT OPTION "Find"
            END IF
        COMMAND "Exit"
            "Leave this menu" HELP 2
            EXIT MENU
        END MENU
    END FUNCTION
FUNCTION bdispname()
    display
        T_booklst.bacquis,
        T_booklst.bcode,
        T_booklst.bname,
        T_booklst.bedno,
        T_booklst.bvol,
        T_booklst.bdate,
        T_booklst.bpub,
        T_booklst.bpubplace,
        T_booklst.beditor,
        T_bcoklst.bisbn
        to
            bacquis, bcode, bname, bedno,
            bvol, bdate,
            bpub, bpubplace, beditor, bisbn
    END FUNCTION
#Keyword FUNCTION
FUNCTION k_list()
    define
        answer char(1)
    open window kw1 at 10,3 with 10 rows, 66 columns ATTRIBUTE (BORDER)
    open form s_key from "vockeys"
    display form s_key
    menu "KEYWORD_LISTING"
        COMMAND "Add"
            " Add Keyword to Keyword Vocabulary" HELP 903
            call add_klist()
        COMMAND "Find"
            "Find Keyword in Keyword Vocabulary" HELP 904
            call query_klist()
        COMMAND "Exit" "Exit from Keyword Vocabulary Modification" HELP 2
            exit menu
        END menu
    Close window kw1
    clear screen
    END FUNCTION
FUNCTION add_klist()
    MESSAGE ""
    CLEAR FORM
    INPUT by name T_keylist.*
        ON KEY (INTERRUPT)
            let sw = 1
            EXIT INPUT
        END INPUT
    if sw = 1 then return end if
    insert into keylist values (T_keylist.*)
    MESSAGE "Row added"
    sleep 1
    MESSAGE ""
```

```
    END FUNCTION
FUNCTION update_klist()
    define
        tmp_code like keylist.kcode
    let tmp_code = T_keylist.kcode
    INPUT by name T_keylist.* WITHOUT DEFAULTS
        ON KEY (INTERRUPT)
            EXIT INPUT
        END INPUT
    UPDATE keylist
        SET keylist.* = T_keylist.*
            where keylist.kcode= tmp_code
    MESSAGE "Row Updated."
    SLEEP 1
    MESSAGE ""
    END FUNCTION
FUNCTION delete_klist()
    DELETE FROM keylist WHERE kcode= T_keylist.kcode
    CLEAR FORM
    MESSAGE "Row Deleted."
    SLEEP 1
    MESSAGE ""
    END FUNCTION
FUNCTION query_klist()
    clear form
    let int_flag = 0
    construct query1 on kcode, kword from keylist.*
    if int_flag <> 0 then return end if
    let select1 = "select * from keylist where ", query1 clipped
    prepare select_key from select1
    let select2 = "select count(*) from keylist where ", query1 clipped
    prepare kl_cnt from select2
    declare kl_curs cursor for  kl_cnt
    foreach kl_curs into cnt
        end foreach
    declare k_curs SCROLL CURSOR FOR select_key
    let chosen = FALSE
    OPEN k_curs
    call view_klist()
    CLOSE k_curs
    END FUNCTION
FUNCTION view_klist()
    FETCH FIRST k_curs into T_keylist.*
        IF status = NOTFOUND THEN
            MESSAGE "No Keyword Found"
            SLEEP 1
            MESSAGE ""
        ELSE
            display " ", cnt, " rows found" at 9,3 attribute(reverse)
            CALL dispkey()
            CALL view_klist()
        END IF
    let tmp_cnt = 1
    display "" at 9,3
    MENU "BROWSE"
        COMMAND "Next"
            "View the next Keyword in the list." HELP 170
```

```
        FETCH NEXT k_curs INTO T_keylist.*
        let tmp_cnt = tmp_cnt + 1
        IF status = NOTFOUND THEN
            MESSAGE "No more Keywords in this direction."
            SLEEP 1
            let tmp_cnt = cnt
            MESSAGE ""
            FETCH I    T k_curs INTO T_keylist.*
            END IF
        display " ", tmp_cnt, " of ", cnt, " rows" at 9,3
        attribute(reverse)
        call dispkey()

    COMMAND "Previous"
        "View the Previous Keyword in the list." HELP 170
        FETCH PREVIOUS k_curs INTO T_keylist.*
        let tmp_cnt = tmp_cnt - 1
        IF status = NOTFOUND THEN
            MESSAGE "No more Keywords in this direction."
            SLEEP 1
            MESSAGE ""
            let tmp_cnt = 1
            FETCH FIRST k_curs INTO T_keylist.*
            END IF
        display " ", tmp_cnt, " of ", cnt, " rows" at 9,3
        attribute(reverse)
        call dispkey()

    COMMAND "First"
        "View the first Keyword in the list." HELP 170
        FETCH FIRST k_curs INTO T_keylist.*
        let tmp_cnt = 1
        display " ", tmp_cnt, " of ", cnt, " rows" at 9,3
        attribute(reverse)
        call dispkey()
    COMMAND "Last"
        "View the Last Keyword in the list." HELP 170
        message "Searching for last record...."
        FETCH LAST k_curs INTO T_keylist.*
        let tmp_cnt = cnt
        message ""
        display " ", tmp_cnt, " of ", cnt, " rows" at 9,3
        attribute(reverse)
        message ""
        call dispkey()
    COMMAND "Update"
        "Update Keyword in Keyword Vocabulary" HELP 171
        call update_klist()
    COMMAND "Delete"
        "Delete Keyword from Keyword Vocabulary" HELP 910
        prompt "Are you sure you want to delete this Keyword (y/n)? "
            for answer
        IF answer = "y"
            then
                call delete_klist()
            else
                next option "Next"
```

```
            END IF
        COMMAND "Exit" "Leave this menu" HELP 2
            EXIT MENU
        END MENU
    END FUNCTION
FUNCTION dispkey()
    display by name T_keylist.*
    END FUNCTION
```

#tksvoc2.4gl

```
{
TITLE: tksvoc2.4gl
Copyright, Harold L. Trammel, 1987-1988
University of Illiois, CVM, IAPIC
Funded by US Army Contract DAMD-17-C-7114
Purpose: provide basic clinical finding vocabulary management menu,
site vocabulary, morphology vocabulary
Contains the following functions:
    s_list()
    add_site()
    update_site()
    delete_site()
    find_site()
    view_site()
    add_morph()
    find_morph()
    morph_find()
    view_morph()
    update_morph(tmp_morphnum)
    delete_morph(tmp_morphnum)
    see_morph(tmp_morphnum)
    morphsyn_find()
    view_morphsyn()
    see_morphsyn(tmp_morphcode)
}

DATABASE tkstest
GLOBALS "tksglob.4gl"
##########################################################################
FUNCTION s_list()
    menu "SIGN-VOCABULARY"
        COMMAND "Site"
            "Site information" HELP 913
            menu "SITE-VOCABULARY"
                COMMAND "Add" "Add Site Information"
                    call add_site()
                COMMAND "Find" "Find Site Information"
                    call find_site()
                COMMAND "Exit" "Exit menu"
                    exit menu
                end menu
        COMMAND "Morphology"
            "Access Morphology Vocabulary" HELP 911
            menu "MORPHOLOGY-VOCABULARY"
```

```
            COMMAND "Add" "Add Morphology Information"
                call add_morph()
            COMMAND "Find" "Find Morphology Information"
                call find_morph()
            COMMAND "Exit" "Exit menu"
                exit menu
            end menu
        COMMAND "Lab-Test"
            "Access Laboratory Test Vocabulary" HELP 912
            menu "LAB-TEST-VOCABULARY"
                COMMAND "Add" "Add Lab-Test Information"
                    call add_lab()
                COMMAND "Find" "Find Lab-Test Information"
                    call find_lab()
                COMMAND "Exit" "Exit menu"
                    exit menu
                end menu
        COMMAND "Disease"
            "Access Disease Vocabulary" HELP 914
            menu "DISEASE-VOCABULARY"
                COMMAND "Add" "Add Disease Information"
                    call add_sign()
                COMMAND "Find" "Find Disease Information"
                    call find_sign()
                COMMAND "Exit" "Exit menu"
                    exit menu
                end menu
        COMMAND "Exit"
            "Exit from Sign Vocabulary Modification" HELP 2
            exit menu
        END menu
    END FUNCTION
##########################################################################
FUNCTION add_site()
    call sitewinopen()
    let sw = 0
    INPUT by name T_tkssite.*
        ON KEY (INTERRUPT)
            let sw = 1
            EXIT INPUT
        END INPUT
    IF sw = 1 then RETURN END IF
    insert into tkssite values (T_tkssite.*)
    MESSAGE "Row Added"
    sleep 1
    MESSAGE ""
    call sitewinclose()
    END FUNCTION
##########################################################################
FUNCTION update_site()
    let sw = 0
    INPUT BY NAME T_tkssite.* WITHOUT DEFAULTS
        ON KEY (INTERRUPT)
            let sw = 1
            EXIT INPUT

        END INPUT
```

```
    IF sw = 1 then RETURN END IF
    UPDATE tkssite
        SET tkssite.* = T_tkssite.*
            where tkssite.sitecode= T_tkssite.sitecode

    MESSAGE "Row Updated."
    SLEEP 3
    MESSAGE ""
    END FUNCTION
#########################################################################
FUNCTION delete_site()
    DELETE FROM tkssite WHERE sitecode= T_tkssite.sitecode
    MESSAGE "Row Deleted."
    SLEEP 3
    MESSAGE ""
    END FUNCTION
#########################################################################
FUNCTION find_site()
    define
        query1 char(300),
        select1  char(300),
        answer char(1),
        found  smallint
    call sitewinopen()
    message " Enter search criteria and hit ESC "
    let int_flag = 0
    construct query1
        on
            sitecode,
            systemcode, systemname,
            organcode, organname,
            locatecode, locatename,
            snotopnum
        from tkssite.*
    if int_flag <> 0 then return end if
    let select1 = "select * from tkssite where ", query1 clipped
    prepare select_1 from select1
    let select2 = "select count(*) from tkssite where ",query1 clipped
    prepare sn_cnt from select2
    display " Searching . . . " at 17,2 attribute(reverse)
    declare sn_curs cursor for sn_cnt
    foreach sn_curs into cnt
        end foreach
    declare q_curs SCROLL CURSOR FOR select_1
    let chosen = FALSE
    OPEN q_curs
    CALL view_site()
    CLOSE q_curs
    call sitewinclose()
    END FUNCTION
#########################################################################
FUNCTION view_site()
    let tmp_cnt = 1
    FETCH FIRST q_curs into T_tkssite.*
    IF status = NOTFOUND
        THEN
            MESSAGE "No Site Found"
```

```
        SLEEP 3
        MESSAGE ""
    ELSE
        display "" at 17,2
        display " ", cnt, " rows found" at 17,2 attribute(reverse)
        DISPLAY BY NAME T_tkssite.*
    END IF
MENU "BROWSE"
    COMMAND "Next"
        "View the next site in the list." HELP 170
        FETCH NEXT q_curs INTO T_tkssite.*
            let tmp_cnt = tmp_cnt + 1
        IF status = NOTFOUND THEN
            MESSAGE "No more sites in this direction."
            SLEEP 3
            let tmp_cnt = cnt
            MESSAGE ""
            FETCH LAST q_curs INTO T_tkssite.*
            END IF
        display "" at 17,2
        display " ",tmp_cnt," of ", cnt," rows" at 17,2
         attribute(reverse)
        DISPLAY BY NAME T_tkssite.*
    COMMAND "Previous"
        "View the Previous site in the list." HELP 170
        FETCH PREVIOUS q_curs INTO T_tkssite.*
            let tmp_cnt = tmp_cnt - 1
        IF status = NOTFOUND THEN
            MESSAGE "No more sites in this direction."
            SLEEP 3
            MESSAGE ""
            let tmp_cnt = 1
            FETCH FIRST q_curs INTO T_tkssite.*
            END IF
        display "" at 17,2
        display " ", tmp_cnt, " of ", cnt, " rows" at 17,2
         attribute(reverse)
        DISPLAY BY NAME T_tkssite.*
    COMMAND "First"
        "View the first site in the list." HELP 170
        FETCH FIRST q_curs INTO T_tkssite.*
        let tmp_cnt = 1
        display "" at 17,2
        display " ", tmp_cnt, " of ", cnt, " rows" at 17,2
         attribute(reverse)
        DISPLAY BY NAME T_tkssite.*
    COMMAND "Last"
        "View the Last site in the list." HELP 170
        FETCH LAST q_curs INTO T_tkssite.*
        let tmp_cnt = cnt
        message ""
        display "" at 17,2
        display " ", tmp_cnt, " of ", cnt, " rows" at 17,2
         attribute(reverse)
        DISPLAY BY NAME T_tkssite.*
    COMMAND "Update"
        "Update site in Site Vocabulary" HELP 171
```

```
            call update_site()
        COMMAND "Delete"
            "Delete site from Site Vocabulary" HELP 915
            prompt "Are you sure you want to delete this site (y/n)? "
                for answer
            IF answer = "y" then
                call delete_site()
                END IF
        COMMAND "Exit"
            "Leave this menu" HELP 2
            EXIT MENU
        END MENU
    END FUNCTION
################################################################
FUNCTION add_morph()
    call morphwinopen()
    let sw = 0
    options input wrap
    input by name T_morphlst.*
        on key (interrupt)
            let sw =1
            exit input
        after field morphnum
            display "Checking for duplicates ..." at 20,3
            select count(*) into x from morphlst
                where morphnum = T_morphlst.morphnum
            if x > 0
                then
                    error beep, "Value already used"
                    call see_morphsyn(T_morphlst.morphnum)
                    next field morphnum
                end if
        after field morphterm
            display "Checking for duplicates ..." at 20,3
            select count(*) into x from morphlst
                where morphterm = T_morphlst.morphterm
            if x > 0
                then
                    error beep, "Value already used"
                    call see_morphsyn(T_morphlst.morphnum)
                    next field morphterm
                end if
        end input
    if sw = 1 then return end if
    insert into morphlst values(T_morphlst.*)
    insert into morphsynlst values(T_morphlst.morphnum,T_morphlst.morphterm)
    call see_morphsyn(T_morphlst.morphnum)
    input array msyn_array without defaults from holder.*
        on key (interrupt)
            let sw =1
            exit input
        display "Hit ESC to continue" at 20,3

        before field morphcode
            let curr_arr = arr_curr()
            let msyn_array[curr_arr].morphcode = T_morphlst.morphnum
            next field morphsyn
```

```
        end input
    if sw = 1 then return end if
    delete from morphsynlst where morphcode = T_morphlst.morphnum
    for counter = 1 to arr_count()
        insert into morphsynlst values(msyn_array[counter].*)
        end for
    END FUNCTION
#####################################################################
FUNCTION find_morph()
    call morphwinopen()
    menu "FIND_MORPHOLOGY_VOCABULARY"
        COMMAND "Preferred_Term"
            call morph_find()
        COMMAND "Synonyms"
            call morphsyn_find()
        COMMAND "Exit"
            exit menu
        end menu
    call morphwinclose()
    END FUNCTION

#####################################################################
FUNCTION morph_find()
    let int_flag=0
    construct query1
        on
            morphnum, morphterm, morphdef, morphsnocde, morphsnotrm
        from
            morphnum, morphterm, morphdef, morphsnocde, morphsnotrm
    if int_flag <> 0 then return end if
    let select1 = "Select * from morphlst where ", query1 clipped
    prepare find_morph from select1
    let select2 = "select count(*) from morphlst where ", query1 clipped
    prepare cnt_morph from select2
    display " Searching ... " at 20,3
    declare cnt_mrph cursor for cnt_morph
    foreach cnt_mrph into cnt
        end foreach
    close cnt_mrph
    declare m_curs scroll cursor for find_morph
    open m_curs
    call view_morph()
    close m_curs
    END FUNCTION
#####################################################################
FUNCTION view_morph()
    let tmp_cnt = 1
    FETCH FIRST m_curs into T_morphlst.*
    IF status = NOTFOUND
        THEN
            MESSAGE "No Morphology Found"
            SLEEP 3
            MESSAGE ""
        ELSE
            display "" at 20,3
            display " ", cnt, " rows found" at 20,3 attribute(reverse)
            DISPLAY BY NAME T_morphlst.*
```

```
            call see_morphsyn(T_morphlst.morphnum)
        END IF
    MENU "BROWSE"
        COMMAND "Next"
            "View the next term in the list." HELP 170
            FETCH NEXT m_curs INTO T_morphlst.*
            let tmp_cnt = tmp_cnt + 1
            IF status = NOTFOUND THEN
                MESSAGE "No more terms in this direction."
                SLEEP 3
                let tmp_cnt = cnt
                MESSAGE ""
                FETCH LAST m_curs INTO T_morphlst.*
                END IF
            display "" at 20,3
            display " ",tmp_cnt," of ", cnt," rows" at 20,3
             attribute(reverse)
            DISPLAY BY NAME T_morphlst.*
            call see_morphsyn(T_morphlst.morphnum)
        COMMAND "Previous"
            "View the Previous term in the list." HELP 170
            FETCH PREVIOUS m_curs INTO T_morphlst.*
            let tmp_cnt = tmp_cnt - 1
            IF status = NOTFOUND THEN
                MESSAGE "No more terms in this direction."
                SLEEP 3
                MESSAGE ""
                let tmp_cnt = 1
                FETCH FIRST m_curs INTO T_morphlst.*
                END IF
            display "" at 20,3
            display " ", tmp_cnt, " of ", cnt, " rows" at 20,3
             attribute(reverse)
            DISPLAY BY NAME T_morphlst.*
            call see_morphsyn(T_morphlst.morphnum)
        COMMAND "First"
            "View the first term in the list." HELP 170
            FETCH FIRST m_curs INTO T_morphlst.*
            let tmp_cnt = 1
            display "" at 20,3
            display " ", tmp_cnt, " of ", cnt, " rows" at 20,3
                attribute(reverse)
            DISPLAY BY NAME T_morphlst.*
            call see_morphsyn(T_morphlst.morphnum)
        COMMAND "Last"
            "View the Last term in the list." HELP 170
            FETCH LAST m_curs INTO T_morphlst.*
            let tmp_cnt = cnt
            message ""
            display "" at 20,3
            display " ", tmp_cnt, " of ", cnt, " rows" at 20,3
                attribute(reverse)
            DISPLAY BY NAME T_morphlst.*
            call see_morphsyn(T_morphlst.morphnum)
        COMMAND "Update"
            "Update term in Morphology Vocabulary" HELP 171
            call update_morph(T_morphlst.morphnum)
```

```
        COMMAND "Delete"
            "Delete term from Morphology Vocabulary" HELP 915
            prompt "Are you sure you want to delete this term (y/n)? "
                for answer
            IF answer = "y" then
                call delete_morph(T_morphlst.morphnum)
            END IF
        COMMAND "Exit"
            "Leave this menu" HELP 2
            EXIT MENU
        END MENU
    END FUNCTION
#####################################################################
FUNCTION update_morph(tmp_morphnum)
    define
        tmp_morphnum like morphlst.morphnum,
        tmp_morphterm like morphlst.morphterm
    let tmp_morphterm = T_morphlst.morphterm
    options input wrap
    input by name T_morphlst.* without defaults
        on key (interrupt)
            let sw =1
            exit input
        after field morphnum
            if T_morphlst.morphnum <> tmp_morphnum
                then
                    select count(*) into x from morphlst
                        where morphnum = T_morphlst.morphnum
                    if x > 0
                        then
                            error beep, "Value already used"
                            call see_morphsyn(T_morphlst.morphnum)
                            next field morphnum
                        end if
                end if
        after field morphterm
            if T_morphlst.morphterm <> tmp_morphterm
                then
                    select count(*) into x from morphlst
                        where morphterm = T_morphlst.morphterm
                    if x > 0
                        then
                            error beep, "Value already used"
                            call see_morphsyn(T_morphlst.morphterm)
                            next field morphterm
                        end if
                end if
        end input
    if sw = 1 then return end if
    update morphlst set morphlst.* = T_morphlst.*
    {
    THERE MAY NEED TO BE A MECHANISM FOR UPDATING LINKED SYNONYMS
    }
    END FUNCTION
#####################################################################
FUNCTION delete_morph(tmp_morphnum)
    define
```

```
        tmp_morphnum like morphlst.morphnum
    call alrt260open()
    prompt "Do you really want to delete this term? (y/n) "
        for answer
    if upshift(answer) = "N"
        then
            message "Row not deleted"
            sleep 1
            message ""
            return
        else
            select count(*) into x from morphsynlst
                where morphcode = tmp_morphnum
            if x > 1
                then
                    DELETE FROM morphlst WHERE morphnum= tmp_morphnum
                    MESSAGE "Row Deleted."
                    SLEEP 1
                    MESSAGE ""
                else
                    prompt "There are associated synonyms.  Delete them also? (y/n) "
                        for answer
                    if upshift(answer) = "Y"
                        then
                            delete from morphsynlst
                                where morphcode = tmp_morphnum
                        else
                            return
                        end if
                end if
        end if
    call alrt260close()
    END FUNCTION
###################################################################
FUNCTION see_morph(tmp_morphnum)
    define
        tmp_morphnum like morphlst.morphnum
    select * into T_morphlst.* from morphlst
        where morphnum = tmp_morphnum
    display by name T_morphlst.*
    END FUNCTION
###################################################################
FUNCTION morphsyn_find()
    let int_flag=0
    construct query1 on morphcode, morphsyn from holder.*
    if int_flag <> 0 then return end if
    let select1 = "Select * from morphsynlst where ", query1 clipped
    prepare find_morphsyn from select1
    let select2 = "select count(*) from morphsynlst where ", query1 clipped
    prepare cnt_morphsyn from select2
    display " Searching .... " at 20,3
    declare cnt_mrphsyn cursor for cnt_morphsyn
    foreach cnt_mrphsyn into cnt
        end foreach
    close cnt_mrphsyn
    declare msyn_curs scroll cursor for find_morphsyn
    open msyn_curs
```

```
    call view_morphsyn()
    close msyn_curs
    END FUNCTION
##################################################################
FUNCTION view_morphsyn()
    let tmp_cnt = 1
    FETCH FIRST msyn_curs into T_morphsynlst.*
    IF status = NOTFOUND
        THEN
            MESSAGE "No Morphology Found"
            SLEEP 3
            MESSAGE ""
        ELSE
            display "" at 20,3
            display " ", cnt, " rows found" at 20,3 attribute(reverse)
            DISPLAY BY NAME T_morphsynlst.*
            call see_morph(T_morphsynlst.morphcode)
        END IF
    MENU "BROWSE"
        COMMAND "Next"
            "View the next term in the list." HELP 170
            FETCH NEXT msyn_curs INTO T_morphsynlst.*
            let tmp_cnt = tmp_cnt + 1
            IF status = NOTFOUND THEN
                MESSAGE "No more terms in this direction."
                SLEEP 3
                let tmp_cnt = cnt
                MESSAGE ""
                FETCH LAST msyn_curs INTO T_morphsynlst.*
                END IF
            display "" at 20,3
            display " ",tmp_cnt," of ", cnt," rows" at 20,3
             attribute(reverse)
            DISPLAY BY NAME T_morphsynlst.*
            call see_morph(T_morphsynlst.morphcode)
        COMMAND "Previous"
            "View the Previous term in the list." HELP 170
            FETCH PREVIOUS msyn_curs INTO T_morphsynlst.*
            let tmp_cnt = tmp_cnt - 1
            IF status = NOTFOUND THEN
                MESSAGE "No more terms in this direction."
                SLEEP 3
                MESSAGE ""
                let tmp_cnt = 1
                FETCH FIRST msyn_curs INTO T_morphsynlst.*
                END IF
            display "" at 20,3
            display " ", tmp_cnt, " of ", cnt, " rows" at 20,3
             attribute(reverse)
            DISPLAY BY NAME T_morphsynlst.*
            call see_morph(T_morphsynlst.morphcode)
        COMMAND "First"
            "View the first term in the list." HELP 170
            FETCH FIRST msyn_curs INTO T_morphsynlst.*
            let tmp_cnt = 1
            display "" at 20,3
            display " ", tmp_cnt, " of ", cnt, " rows" at 20,3
```

```
                attribute(reverse)
            DISPLAY BY NAME T_morphsynlst.*
            call see_morph(T_morphsynlst.morphcode)
        COMMAND "Last"
            "View the Last term in the list." HELP 170
            FETCH LAST msyn_curs INTO T_morphsynlst.*
            let tmp_cnt = cnt
            message ""
            display "" at 20,3
            display " ", tmp_cnt, " of ", cnt, " rows" at 20,3
                attribute(reverse)
            DISPLAY BY NAME T_morphsynlst.*
            call see_morph(T_morphsynlst.morphcode)
        COMMAND "Update"
            "Update term in Morphology Vocabulary" HELP 171
            #call update_morphsyn(T_morphsynlst.morphcode)
        COMMAND "Exit"
            "Leave this menu" HELP 2
            EXIT MENU
        END MENU
    END FUNCTION
###################################################################
FUNCTION see_morphsyn(tmp_morphcode)
    define tmp_morphcode like morphsynlst.morphcode
    display " Hit ESC to leave array" at 20,3 attribute(reverse)
    declare morph_see cursor for
        select * from morphsynlst
            where morphcode = tmp_morphcode
            order by morphsyn
    let counter = 1
    foreach morph_see into msyn_array[counter].*
        let counter = counter +1
        if counter > 50
            then exit foreach
            end if
        end foreach
    call set_count(counter -1)
    display array msyn_array to holder.*
        on key(interrupt)
            exit display
        end display
    close morph_see
    END FUNCTION
```

```
#tksvoc3.4gl
{
TITLE: tksvoc3.4gl
Copyright, Harold L. Trammel, 1987-1988
University of Illiois, CVM, IAPIC
Funded by US Army Contract DAMD-17-C-7114
Contains the following functions:
    add_lab()
    find_lab()
    lab_find()
    view_lab()
    update_lab(tmp_labnum)
    delete_lab(tmp_labnum)
    see_lab(tmp_labnum)
    labsyn_find()
    view_labsyn()
    see_labsyn(tmp_labcode)
    add_sign()
    find_sign()
    sign_find()
    view_sign()
    update_sign(tmp_signnum)
    delete_sign(tmp_signnum)
    see_sign(tmp_signnum)
    signsyn_find()
    view_signsyn()
    see_signsyn(tmp_signcode)
}

DATABASE tkstest
GLOBALS "tksglob.4gl"
##################################################################
FUNCTION add_lab()
    call labwinopen()
    let sw = 0
    options input wrap
    input by name T_lablst.*
        on key (interrupt)
            let sw =1
            exit input
        after field labnum
            display "Checking for duplicates ..." at 20,3
            select count(*) into x from lablst
                where labnum = T_lablst.labnum
            if x > 0
                then
                    error beep, "Value already used"
                    call see_labsyn(T_lablst.labnum)
                    next field labnum
                end if
        after field labterm
            display "Checking for duplicates ..." at 20,3
            select count(*) into x from lablst
                where labterm = T_lablst.labterm
            if x > 0
                then
```

```
                    error beep, "Value already used"
                    call see_labsyn(T_lablst.labnum)
                    next field labterm
                end if
        end input
    if sw = 1 then return end if
    insert into lablst values(T_lablst.*)
    insert into labsynlst
        values(T_lablst.labnum,T_lablst.labsys,T_lablst.labterm)
    call see_labsyn(T_lablst.labnum)
    input array lsyn_array without defaults from holder.*
        on key (interrupt)
            let sw =1
            exit input
        display "Hit ESC to continue" at 20,3
        before field labcode
            let curr_arr = arr_curr()
            let lsyn_array[curr_arr].labcode = T_lablst.labnum
            next field labsyn
        end input
    if sw = 1 then return end if
    delete from labsynlst where labcode = T_lablst.labnum
    for counter = 1 to arr_count()
        insert into labsynlst values(lsyn_array[counter].*)
        end for
    END FUNCTION
#####################################################################
FUNCTION find_lab()
    call labwinopen()
    menu "FIND_LAB_VOCABULARY"
        COMMAND "Preferred_Term"
            call lab_find()
        COMMAND "Synonyms"
            call labsyn_find()
        COMMAND "Exit"
            exit menu
        end menu
    call labwinclose()
    END FUNCTION

#####################################################################
FUNCTION lab_find()
    clear form
    let int_flag=0
    construct query1
        on
            labnum, labterm, labsyn, labdef, labsnocde, labsnotrm
        from
            labnum, labterm, labsyn, labdef, labsnocde, labsnotrm
    if int_flag <> 0 then return end if
    let select1 = "Select * from lablst where ", query1 clipped
    prepare find_lab from select1
    let select2 = "select count(*) from lablst where ", query1 clipped
    prepare cnt_lab from select2
    display " Searching .... " at 20,3
    declare cnt_labs cursor for cnt_lab
    foreach cnt_labs into cnt
```

```
        end foreach
    close cnt_labs
    declare l_curs scroll cursor for find_lab
    open l_curs
    call view_lab()
    close l_curs
    END FUNCTION
##########################################################################
FUNCTION view_lab()
    let tmp_cnt = 1
    FETCH FIRST l_curs into T_lablst.*
    IF status = NOTFOUND
        THEN
            MESSAGE "No Lab Test Found"
            SLEEP 3
            MESSAGE ""
        ELSE
            display "" at 20,3
            display " ", cnt, " rows found" at 20,3 attribute(reverse)
            DISPLAY BY NAME T_lablst.*
            call see_labsyn(T_lablst.labnum)
        END IF
    MENU "BROWSE"
        COMMAND "Next"
            "View the next term in the list." HELP 170
            FETCH NEXT l_curs INTO T_lablst.*
            let tmp_cnt = tmp_cnt + 1
            IF status = NOTFOUND THEN
                MESSAGE "No more terms in this direction."
                SLEEP 3
                let tmp_cnt = cnt
                MESSAGE ""
                FETCH LAST l_curs INTO T_lablst.*
                END IF
            display "" at 20,3
            display " ",tmp_cnt," of ", cnt," rows" at 20,3
             attribute(reverse)
            DISPLAY BY NAME T_lablst.*
            call see_labsyn(T_lablst.labnum)
        COMMAND "Previous"
            "View the Previous term in the list." HELP 170
            FETCH PREVIOUS l_curs INTO T_lablst.*
            let tmp_cnt = tmp_cnt - 1
            IF status = NOTFOUND THEN
                MESSAGE "No more terms in this direction."
                SLEEP 3
                MESSAGE ""
                let tmp_cnt = 1
                FETCH FIRST l_curs INTO T_lablst.*
                END IF
            display "" at 20,3
            display " ", tmp_cnt, " of ", cnt, " rows" at 20,3
             attribute(reverse)
            DISPLAY BY NAME T_lablst.*
            call see_labsyn(T_lablst.labnum)
        COMMAND "First"
            "View the first term in the list." HELP 170
```

```
            FETCH FIRST l_curs INTO T_lablst.*
            let tmp_cnt = 1
            display "" at 20,3
            display " ", tmp_cnt, " of ", cnt, " rows" at 20,3
                attribute(reverse)
            DISPLAY BY NAME T_lablst.*
            call see_labsyn(T_lablst.labnum)
        COMMAND "Last"
            "View the Last term in the list." HELP 170
            FETCH LAST l_curs INTO T_lablst.*
            let tmp_cnt = cnt
            message ""
            display "" at 20,3
            display " ", tmp_cnt, " of ", cnt, " rows" at 20,3
                attribute(reverse)
            DISPLAY BY NAME T_lablst.*
            call see_labsyn(T_lablst.labnum)
        COMMAND "Update"
            "Update term in Lab Test Vocabulary" HELP 171
            call update_lab(T_lablst.labnum)
        COMMAND "Delete"
            "Delete term from Lab Test Vocabulary" HELP 915
            prompt "Are you sure you want to delete this term (y/n)? "
                for answer
            IF answer = "y" then
                call delete_lab(T_lablst.labnum)
            END IF
        COMMAND "Exit"
            "Leave this menu" HELP 2
            EXIT MENU
        END MENU
    END FUNCTION
###################################################################
FUNCTION update_lab(tmp_labnum)
    define
        tmp_labnum like lablst.labnum,
        tmp_labterm like lablst.labterm
    let tmp_labterm = T_lablst.labterm
    options input wrap
    input by name T_lablst.* without defaults
        on key (interrupt)
            let sw =1
            exit input
        after field labnum
            if T_lablst.labnum <> tmp_labnum
                then
                    select count(*) into x from lablst
                        where labnum = T_lablst.labnum
                    if x > 0
                        then
                            error beep, "Value already used"
                            call see_labsyn(T_lablst.labnum)
                            next field labnum
                        end if
                end if
        after field labterm
            if T_lablst.labterm <> tmp_labterm
```

```
            then
                select count(*) into x from lablst
                    where labterm = T_lablst.labterm
                if x > 0
                    then
                        error beep, "Value already used"
                        call see_labsyn(T_lablst.labterm)
                        next field labterm
                    end if
            end if
        end input
    if sw = 1 then return end if
    update lablst set lablst.* = T_lablst.*
    {
    THERE MAY NEED TO BE A MECHANISM FOR UPDATING LINKED SYNONYMS
    }
    END FUNCTION
#####################################################################
FUNCTION delete_lab(tmp_labnum)
    define
        tmp_labnum like lablst.labnum
    call alrt260open()
    prompt "Do you really want to delete this term? (y/n) "
        for answer
    if upshift(answer) = "N"
        then
            message "Row not deleted"
            sleep 1
            message ""
            return
        else
            select count(*) into x from labsynlst
                where labcode = tmp_labnum
            if x > 1
                then
                    DELETE FROM lablst WHERE labnum= tmp_labnum
                    MESSAGE "Row Deleted."
                    SLEEP 1
                    MESSAGE ""
                else
                    prompt "There are associated synonyms.  Delete them also? (y/n) "
                        for answer
                    if upshift(answer) = "Y"
                        then
                            delete from labsynlst
                                where labcode = tmp_labnum
                        else
                            return
                        end if
                end if
        end if
    call alrt260close()
    END FUNCTION
#####################################################################
FUNCTION see_lab(tmp_labnum)
    define tmp_labnum like lablst.labnum
    select * into T_lablst.* from lablst
```

```
        where labnum = tmp_labnum
    display by name T_lablst.*
    END FUNCTION
##################################################################
FUNCTION labsyn_find()
    clear form
    let int_flag=0
    construct query1 on labcode, labsyn, labsynsys from holder.*,labsynsys
    if int_flag <> 0 then return end if
    let select1 = "Select * from labsynlst where ", query1 clipped
    prepare find_labsyn from select1
    let select2 = "select count(*) from labsynlst where ", query1 clipped
    prepare cnt_labsyn from select2
    display " Searching .... " at 20,3
    declare cnt_labssyn cursor for cnt_labsyn
    foreach cnt_labssyn into cnt
        end foreach
    close cnt_labssyn
    declare lsyn_curs scroll cursor for find_labsyn
    open lsyn_curs
    call view_labsyn()
    close lsyn_curs
    END FUNCTION
##################################################################
FUNCTION view_labsyn()
    let tmp_cnt = 1
    FETCH FIRST lsyn_curs into T_labsynlst.*
    IF status = NOTFOUND
        THEN
            MESSAGE "No Lab Test Found"
            SLEEP 3
            MESSAGE ""
        ELSE
            display "" at 20,3
            display " ", cnt, " rows found" at 20,3 attribute(reverse)
            DISPLAY BY NAME T_labsynlst.*
            call see_lab(T_labsynlst.labcode)
        END IF
    MENU "BROWSE"
        COMMAND "Next"
            "View the next term in the list." HELP 170
            FETCH NEXT lsyn_curs INTO T_labsynlst.*
            let tmp_cnt = tmp_cnt + 1
            IF status = NOTFOUND THEN
                MESSAGE "No more terms in this direction."
                SLEEP 3
                let tmp_cnt = cnt
                MESSAGE ""
                FETCH LAST lsyn_curs INTO T_labsynlst.*
                END IF
            display "" at 20,3
            display " ",tmp_cnt," of ", cnt," rows" at 20,3
             attribute(reverse)
            DISPLAY BY NAME T_labsynlst.*
            call see_lab(T_labsynlst.labcode)
        COMMAND "Previous"
            "View the Previous term in the list." HELP 170
```

```
            FETCH PREVIOUS lsyn_curs INTO T_labsynlst.*
            let tmp_cnt = tmp_cnt - 1
            IF status = NOTFOUND THEN
                MESSAGE "No more terms in this direction."
                SLEEP 3
                MESSAGE ""
                let tmp_cnt = 1
                FETCH FIRST lsyn_curs INTO T_labsynlst.*
                END IF
            display "" at 20,3
            display " ", tmp_cnt, " of ", cnt, " rows" at 20,3
             attribute(reverse)
            DISPLAY BY NAME T_labsynlst.*
            call see_lab(T_labsynlst.labcode)
        COMMAND "First"
            "View the first term in the list." HELP 170
            FETCH FIRST lsyn_curs INTO T_labsynlst.*
            let tmp_cnt = 1
            display "" at 20,3
            display " ", tmp_cnt, " of ", cnt, " rows" at 20,3
                attribute(reverse)
            DISPLAY BY NAME T_labsynlst.*
            call see_lab(T_labsynlst.labcode)
        COMMAND "Last"
            "View the Last term in the list." HELP 170
            FETCH LAST lsyn_curs INTO T_labsynlst.*
            let tmp_cnt = cnt
            message ""
            display "" at 20,3
            display " ", tmp_cnt, " of ", cnt, " rows" at 20,3
                attribute(reverse)
            DISPLAY BY NAME T_labsynlst.*
            call see_lab(T_labsynlst.labcode)
        COMMAND "Update"
            "Update term in Lab Test Vocabulary" HELP 171
            #call update_labsyn(T_labsynlst.labcode)
        COMMAND "Exit"
            "Leave this menu" HELP 2
            EXIT MENU
        END MENU
    END FUNCTION
###################################################################
FUNCTION see_labsyn(tmp_labcode)
    define
        tmp_labcode like labsynlst.labcode,
        tmp_sys     char(1)
    display " Hit ESC to leave array" at 20,3 attribute(reverse)
    declare lab_see cursor for
        select labcode, labsyn, labsynsys from labsynlst
            where labcode = tmp_labcode
            order by labsyn
    let counter = 1
    foreach lab_see into lsyn_array[counter].*, tmp_sys
        let counter = counter +1
        if counter > 50
            then exit foreach
            end if
```

```
        end foreach
    call set_count(counter -1)
    display tmp_sys to labsynsys
    display array lsyn_array to holder.*
        on key(interrupt)
            exit display
        end display
    close lab_see
    END FUNCTION
#################################################################
FUNCTION add_sign()
    define
        tmp_value  char(1)
    call signwinopen()
    let sw = 0
    options input wrap
    input by name T_signlst.*
        on key (interrupt)
            let sw =1
            exit input
        after field signnum
            display "Checking for duplicates ..." at 20,3
            select count(*) into x from signlst
                where signnum = T_signlst.signnum
            if x > 0
                then
                    error beep, "Value already used"
                    call see_signsyn(T_signlst.signnum)
                    next field signnum
                end if
        after field signterm
            display "Checking for duplicates ..." at 20,3
            select count(*) into x from signlst
                where sign = T_signlst.sign
            if x > 0
                then
                    error beep, "Value already used"
                    call see_signsyn(T_signlst.signnum)
                    next field sign
                end if
        before field systemcode
            call system_choice() returning tmp_value
            call system_trans(tmp_value)
                returning T_signlst.systemcode, T_signlst.systemname
            if chosen = 0
                then
                    display by name T_signlst.systemcode, T_signlst.systemname
                    next field signdef
                else next field systemcode
                end if
        end input
    if sw = 1 then return end if
    insert into signlst values(T_signlst.*)
    insert into signsynlst values(T_signlst.signnum,T_signlst.sign)
    call see_signsyn(T_signlst.signnum)
    input array ssyn_array without defaults from holder.*
        on key (interrupt)
```

```
            let sw =1
            exit input
        display "Hit ESC to continue" at 20,3
        before field signcode
            let curr_arr = arr_curr()
            let ssyn_array[curr_arr].signcode = T_signlst.signnum
            next field signsyn
        end input
    if sw = 1 then return end if
    delete from signsynlst where signcode = T_signlst.signnum
    for counter = 1 to arr_count()
        insert into signsynlst values(ssyn_array[counter].*)
        end for
    END FUNCTION
#####################################################################
FUNCTION find_sign()
    call signwinopen()
    menu "FIND_MORPHOLOGY_VOCABULARY"
        COMMAND "Preferred_Term"
            call sign_find()
        COMMAND "Synonyms"
            call signsyn_find()
        COMMAND "Exit"
            exit menu
        end menu
    call signwinclose()
    END FUNCTION

#####################################################################
FUNCTION sign_find()
    let int_flag=0
    construct query1
        on
            signnum, sign, systemcode, systemname, signdef, snocode, snoterm
        from
            signnum, sign, systemcode, systemname, signdef, snocode, snoterm
    if int_flag <> 0 then return end if
    let select1 = "Select * from signlst where ", query1 clipped
    prepare find_sign from select1
    let select2 = "select count(*) from signlst where ", query1 clipped
    prepare cnt_sign from select2
    display " Searching .... " at 19,3
    declare cnt_sgn cursor for cnt_sign
    foreach cnt_sgn into cnt
        end foreach
    close cnt_sgn
    declare s_curs scroll cursor for find_sign
    open s_curs
    call view_sign()
    close s_curs
    END FUNCTION
#####################################################################
FUNCTION view_sign()
    let tmp_cnt = 1
    FETCH FIRST s_curs into T_signlst.*
    IF status = NOTFOUND
        THEN
```

```
            MESSAGE "No Sign/Disease Found"
            SLEEP 3
            MESSAGE ""
        ELSE
            display "" at 19,3
            display " ", cnt, " rows found" at 19,3 attribute(reverse)
            DISPLAY BY NAME T_signlst.*
            call see_signsyn(T_signlst.signnum)
        END IF
    MENU "BROWSE"
        COMMAND "Next"
            "View the next term in the list." HELP 170
            FETCH NEXT s_curs INTO T_signlst.*
            let tmp_cnt = tmp_cnt + 1
            IF status = NOTFOUND THEN
                MESSAGE "No more terms in this direction."
                SLEEP 3
                let tmp_cnt = cnt
                MESSAGE ""
                FETCH LAST s_curs INTO T_signlst.*
                END IF
            display "" at 19,3
            display " ",tmp_cnt," of ", cnt," rows" at 19,3
             attribute(reverse)
            DISPLAY BY NAME T_signlst.*
            call see_signsyn(T_signlst.signnum)
        COMMAND "Previous"
            "View the Previous term in the list." HELP 170
            FETCH PREVIOUS s_curs INTO T_signlst.*
            let tmp_cnt = tmp_cnt - 1
            IF status = NOTFOUND THEN
                MESSAGE "No more terms in this direction."
                SLEEP 3
                MESSAGE ""
                let tmp_cnt = 1
                FETCH FIRST s_curs INTO T_signlst.*
                END IF
            display "" at 19,3
            display " ", tmp_cnt, " of ", cnt, " rows" at 19,3
             attribute(reverse)
            DISPLAY BY NAME T_signlst.*
            call see_signsyn(T_signlst.signnum)
        COMMAND "First"
            "View the first term in the list." HELP 170
            FETCH FIRST s_curs INTO T_signlst.*
            let tmp_cnt = 1
            display "" at 19,3
            display " ", tmp_cnt, " of ", cnt, " rows" at 19,3
                attribute(reverse)
            DISPLAY BY NAME T_signlst.*
            call see_signsyn(T_signlst.signnum)
        COMMAND "Last"
            "View the Last term in the list." HELP 170
            FETCH LAST s_curs INTO T_signlst.*
            let tmp_cnt = cnt
            message ""
            display "" at 19,3
```

```
            display " ", tmp_cnt, " of ", cnt, " rows" at 19,3
                attribute(reverse)
            DISPLAY BY NAME T_signlst.*
            call see_signsyn(T_signlst.signnum)
        COMMAND "Update"
            "Update term in Sign/Disease Vocabulary" HELP 171
            call update_sign(T_signlst.signnum)
        COMMAND "Delete"
            "Delete term from Sign/Disease Vocabulary" HELP 915
            prompt "Are you sure you want to delete this term (y/n)? "
                for answer
            IF answer = "y" then
                call delete_sign(T_signlst.signnum)
            END IF
        COMMAND "Exit"
            "Leave this menu" HELP 2
            EXIT MENU
        END MENU
    END FUNCTION
#####################################################################
FUNCTION update_sign(tmp_signnum)
    define
        tmp_signnum like signlst.signnum,
        tmp_sign like signlst.sign,
        tmp_sys like signlst.systemname,
        tmp_value char(1)
    let tmp_sign = T_signlst.sign
    options input wrap
    input by name T_signlst.* without defaults
        on key (interrupt)
            let sw =1
            exit input
        after field signnum
            if T_signlst.signnum <> tmp_signnum
                then
                    select count(*) into x from signlst
                        where signnum = T_signlst.signnum
                    if x > 0
                        then
                            error beep, "Value already used"
                            call see_signsyn(T_signlst.signnum)
                            next field signnum
                        end if
                end if
        after field sign
            if T_signlst.sign <> tmp_sign
                then
                    select count(*) into x from signlst
                        where sign = T_signlst.sign
                    if x > 0
                        then
                            error beep, "Value already used"
                            call see_signsyn(T_signlst.sign)
                            next field sign
                        end if
                end if
        after field systemcode
```

```
            if T_signlst.systemcode is null
                then
                    call system_choice() returning tmp_value
                    call system_trans(tmp_value)
                        returning T_signlst.systemcode, T_signlst.systemname
                    if chosen = 0
                        then
                            display by name T_signlst.systemcode, T_signlst.systemname
                            next field signdef
                        else next field systemcode
                        end if
                else
                    select systemname from tkssite
                        where systemcode = T_signlst.systemcode
                            and organcode = "—"
                    if status = NOTFOUND
                        then error beep,"Not accepable system code"
                            call system_choice() returning tmp_value
                            call system_trans(tmp_value)
                                returning T_signlst.systemcode, T_signlst.systemname
                            if chosen = 0
                                then
                                    display by name T_signlst.systemcode, T_signlst.systemname
                                    next field signdef
                                else next field systemcode
                                end if
                        end if
                end if
        end input
    if sw = 1 then return end if
    update signlst set signlst.* = T_signlst.*
    {
    THERE MAY NEED TO BE A MECHANISM FOR UPDATING LINKED SYNONYMS
    }
    END FUNCTION
#################################################################
FUNCTION delete_sign(tmp_signnum)
    define
        tmp_signnum like signlst.signnum
    call alrt260open()
    prompt "Do you really want to delete this term? (y/n) "
        for answer
    if upshift(answer) = "N"
        then
            message "Row not deleted"
            sleep 1
            message ""
            return
        else
            select count(*) into x from signsynlst
                where signcode = tmp_signnum
            if x > 1
                then
                    DELETE FROM signlst WHERE signnum= tmp_signnum
                    MESSAGE "Row Deleted."
                    SLEEP 1
                    MESSAGE ""
```

```
            else
                prompt "There are associated synonyms.  Delete them also? (y/n) "
                    for answer
                if upshift(answer) = "Y"
                    then
                        delete from signsynlst
                            where signcode = tmp_signnum
                    else
                        return
                    end if
            end if
        end if
    call alrt260close()
    END FUNCTION
#####################################################################
FUNCTION see_sign(tmp_signnum)
    define tmp_signnum like signlst.signnum
    select * into T_signlst.* from signlst
        where signnum = tmp_signnum
    display by name T_signlst.*
    END FUNCTION
#####################################################################
FUNCTION signsyn_find()
    let int_flag=0
    construct query1 on signcode, signsyn from holder.*
    if int_flag <> 0 then return end if
    let select1 = "Select * from signsynlst where ", query1 clipped
    prepare find_signsyn from select1
    let select2 = "select count(*) from signsynlst where ", query1 clipped
    prepare cnt_signsyn from select2
    display " Searching .... " at 19,3
    declare cnt_sgnsyn cursor for cnt_signsyn
    foreach cnt_sgnsyn into cnt
        end foreach
    close cnt_sgnsyn
    declare ssyn_curs scroll cursor for find_signsyn
    open ssyn_curs
    call view_signsyn()
    close ssyn_curs
    END FUNCTION
#####################################################################
FUNCTION view_signsyn()
    let tmp_cnt = 1
    FETCH FIRST ssyn_curs into T_signsynlst.*
    IF status = NOTFOUND
        THEN
            MESSAGE "No Sign/Disease Found"
            SLEEP 3
            MESSAGE ""
        ELSE
            display "" at 19,3
            display " ", cnt, " rows found" at 19,3 attribute(reverse)
            DISPLAY BY NAME T_signsynlst.*
            call see_sign(T_signsynlst.signcode)
        END IF
    MENU "BROWSE"
        COMMAND "Next"
```

```
        "View the next term in the list." HELP 170
        FETCH NEXT ssyn_curs INTO T_signsynlst.*
        let tmp_cnt = tmp_cnt + 1
        IF status = NOTFOUND THEN
            MESSAGE "No more terms in this direction."
            SLEEP 3
            let tmp_cnt = cnt
            MESSAGE ""
            FETCH LAST ssyn_curs INTO T_signsynlst.*
            END IF
        display "" at 19,3
        display " ",tmp_cnt," of ", cnt," rows" at 19,3
         attribute(reverse)
        DISPLAY BY NAME T_signsynlst.*
        call see_sign(T_signsynlst.signcode)
    COMMAND "Previous"
        "View the Previous term in the list." HELP 170
        FETCH PREVIOUS ssyn_curs INTO T_signsynlst.*
        let tmp_cnt = tmp_cnt - 1
        IF status = NOTFOUND THEN
            MESSAGE "No more terms in this direction."
            SLEEP 3
            MESSAGE ""
            let tmp_cnt = 1
            FETCH FIRST ssyn_curs INTO T_signsynlst.*
            END IF
        display "" at 19,3
        display " ", tmp_cnt, " of ", cnt, " rows" at 19,3
         attribute(reverse)
        DISPLAY BY NAME T_signsynlst.*
        call see_sign(T_signsynlst.signcode)
    COMMAND "First"
        "View the first term in the list." HELP 170
        FETCH FIRST ssyn_curs INTO T_signsynlst.*
        let tmp_cnt = 1
        display "" at 19,3
        display " ", tmp_cnt, " of ", cnt, " rows" at 19,3
            attribute(reverse)
        DISPLAY BY NAME T_signsynlst.*
        call see_sign(T_signsynlst.signcode)
    COMMAND "Last"
        "View the Last term in the list." HELP 170
        FETCH LAST ssyn_curs INTO T_signsynlst.*
        let tmp_cnt = cnt
        message ""
        display "" at 19,3
        display " ", tmp_cnt, " of ", cnt, " rows" at 19,3
            attribute(reverse)
        DISPLAY BY NAME T_signsynlst.*
        call see_sign(T_signsynlst.signcode)
    COMMAND "Update"
        "Update term in Sign/Disease Vocabulary" HELP 171
        #call update_signsyn(T_signsynlst.signcode)
    COMMAND "Exit"
        "Leave this menu" HELP 2
        EXIT MENU
    END MENU
```

```
    END FUNCTION
#####################################################################
FUNCTION see_signsyn(tmp_signcode)
    define
    tmp_signcode like signsynlst.signcode
    display " Hit ESC to leave array" at 19,3 attribute(reverse)
    declare sign_see cursor for
        select * from signsynlst
            where signcode = tmp_signcode
            order by signsyn
    let counter = 1
    foreach sign_see into ssyn_array[counter].*
        let counter = counter +1
        if counter > 50
            then exit foreach
            end if
        end foreach
    call set_count(counter -1)
    display array ssyn_array to holder.*
        on key(interrupt)
            exit display
        end display
    close sign_see
    END FUNCTION
```

#tkstrans.4gl

```
{
    Title: tkstrans.4gl
Copyright Harold L .Trammel, 1987-1988
University of Illiois, CVM, IAPIC
Funded by US Army Contract DAMD-17-C-7114
Contains the following functions:
    clear_choice(topRow,bottomRow,leftCol)
    aim_choice(aim)
    aim_trans(aim_hold)
    stype_choice()
    stype_trans(tmp_type)
    vivit_choice()
    vivit_trans(hold_vivit)
    cntlcmp_choice()
    cntlcmp_trans(hold_cntlcmp)
    cmpmeth_choice(cntlcmp)
    cmpmeth_trans(compmeth)
    cntlmeth_choice()
    cntlmeth_trans(hold_cntlmeth)
    cntltyp_choice(stycntlmeth)
    cntltyp_trans(cntltyp)
    cntlassgn_choice()
    cntlassgn_trans(cntlassgn)
    rte_choice()
    rte_trans(rte)
    sex_choice()
    sex_trans(sex)
    date_choice()
    date_trans(dte)
    wt_choice()
    form_choice()
    form_trans(formul)
    severe_trans(hold_severe)
    pur_choice()
    pur_trans(tmp_val)
    dose_choice()
    change_choice()
    trans_change(tmp_cng)
    system_choice()
    system_trans(tmp_value)
    labCatChoice()
    labCatTran(tmp_value)
}

database tkstest
globals "tksglob.4gl"
##########################################################################
FUNCTION clear_choice(topRow,bottomRow,leftCol)
    define topRow, bottomRow, leftCol smallint
    for x = topRow to bottomRow
        display "" at x,leftCol
        end for
    end function
##########################################################################
```

```
FUNCTION aim_choice(aim)
    define aim char(1)
    call clear_choice(8,16,50)
    let chosen = 1
    case
        when aim = "0"
            display " E = Experimental  " at 8,50 attribute(reverse)
            display " N = Non-Experiment " at 9,50 attribute(reverse)
            display " I = Info Only  " at 10,50 attribute(reverse)
            display " C = Combination  " at 11,50 attribute(reverse)
            exit case
        when aim = "E"
            display " E10 = Toxicity " at 8, 50 attribute(reverse)
            display " E20 = Mechanisms " at 9, 50 attribute(reverse)
            display " E30 = Kinetics " at 10, 50 attribute(reverse)
            display " E40 = Treatment " at 11, 50 attribute(reverse)
            display " E50 = Pharmacol " at 12, 50 attribute(reverse)
            display " E60 = Chemistry " at 13, 50 attribute(reverse)
            display "  E61 = Analysis " at 14, 50 attribute(reverse)
            display "  E62 = Synthesis " at 15, 50 attribute(reverse)
            display "  E63 = Purific. " at 16, 50 attribute(reverse)
            exit case
        when aim = "N"
            display " N10 = Case Report  " at 8, 50 attribute(reverse)
            display " N20 = Epidemiology " at 9, 50 attribute(reverse)
            exit case
        when aim = "I"
            display " I01 = Review  " at 8, 50 attribute(reverse)
            display " I02 = Comment " at 9, 50 attribute(reverse)
            exit case
        when aim = "C"
            display " C01 = Case+Review " at 8, 50 attribute(reverse)
            display " C02 = Case+Experi " at 9, 50 attribute(reverse)
            display " C03 = Exper+Revue " at 10, 50 attribute(reverse)
            exit case
        otherwise
            error beep, "Not an acceptable choice"
            let chosen = 0
            exit case
        end case
    end function
#########################################################################
FUNCTION aim_trans(aim_hold)
    define
        aim_hold like paperover.papaim,
        aim_class char(20)
    let chosen = 1
        Case
            when aim_hold = "E10"
                let aim_class = "EXPER-TOXICITY"
                exit case
            when aim_hold = "E20"
                let aim_class = "EXPER-MECHANISMS"
                exit case
            when aim_hold = "E30"
                let aim_class = "EXPER-KINETICS"
                exit case
```

```
            when aim_hold = "E40"
                let aim_class = "EXPER-TREAT"
                exit case
            when aim_hold = "E50"
                let aim_class = "EXPER-PHARMACOL"
                exit case
            when aim_hold = "E60"
                let aim_class = "EXP-CHEM-NOS"
                exit case
            when aim_hold = "E61"
                let aim_class = "EXP-CHEM-ANALYT"
                exit case
            when aim_hold = "E62"
                let aim_class = "EXP-CHEM-SYNTH"
                exit case
            when aim_hold = "E63"
                let aim_class = "EXP-CHEM-PURIF"
                exit case
            when aim_hold = "N10"
                let aim_class = "CASE REPORT"
                exit case
            when aim_hold = "N20"
                let aim_class = "EPIDEMIOLOGY"
                exit case
            when aim_hold = "I10"
                let aim_class = "REVIEW"
                exit case
            when aim_hold = "I20"
                let aim_class = "COMMENT"
                exit case
            when aim_hold = "C01"
                let aim_class = "CASE-REVIEW"
                exit case
            when aim_hold = "C02"
                let aim_class = "CASE-EXPER"
                exit case
            when aim_hold = "C03"
                let aim_class = "EXPER-REVUE"
                exit case
            when aim_hold = "C04"
                let aim_class = "CASE-EPIDEM"
                exit case
            when aim_hold = "C05"
                let aim_class = "EXPR-EPIDEM"
                exit case
            otherwise
                error beep, "Not an acceptable choice"
                let aim_class = " "
                let chosen = 0
                exit case
            end case
    return aim_class
    end FUNCTION
##########################################################################
FUNCTION stype_choice(tmp_aim)
    define
        tmp_aim like paperover.papaim
```

```
    call clear_choice(8,16,50)
    case
        when tmp_aim[1] = "N"  or tmp_aim = "C04"
            display " A = Survey      " at 8,50 attribute(reverse)
            display "  A1 = Prospective  " at 9,50 attribute(reverse)
            display "  A2 = Retrospective " at 10,50 attribute(reverse)
            display " F = Case Report     " at 15,50 attribute(reverse)
            exit case
        when tmp_aim[1] = "E"
            display " B = Experiment     " at 11,50 attribute(reverse)
            display " C = Therapeutic    " at 12,50 attribute(reverse)
            display " D = Prophylactic   " at 13,50 attribute(reverse)
            display " E = Symptomatic    " at 14,50 attribute(reverse)
            exit case
        when tmp_aim = "C01"
            display " F = Case Report     " at 15,50 attribute(reverse)
            exit case
        when tmp_aim = "C02"
            display " B = Experiment     " at 11,50 attribute(reverse)
            display " C = Therapeutic    " at 12,50 attribute(reverse)
            display " D = Prophylactic   " at 13,50 attribute(reverse)
            display " E = Symptomatic    " at 14,50 attribute(reverse)
            display " F = Case Report     " at 15,50 attribute(reverse)
            exit case
        when tmp_aim = "C03"
            display " B = Experiment     " at 11,50 attribute(reverse)
            display " C = Therapeutic    " at 12,50 attribute(reverse)
            display " D = Prophylactic   " at 13,50 attribute(reverse)
            display " E = Symptomatic    " at 14,50 attribute(reverse)
            exit case
        when tmp_aim = "C05"
            display " A = Survey      " at 8,50 attribute(reverse)
            display "  A1 = Prospective  " at 9,50 attribute(reverse)
            display "  A2 = Retrospective " at 10,50 attribute(reverse)
            display " B = Experiment     " at 11,50 attribute(reverse)
            display " C = Therapeutic    " at 12,50 attribute(reverse)
            display " D = Prophylactic   " at 13,50 attribute(reverse)
            display " E = Symptomatic    " at 14,50 attribute(reverse)
            display " F = Case Report     " at 15,50 attribute(reverse)
            exit case
        end case
    end function
###################################################################
FUNCTION stype_trans(tmp_type)
    define
        tmp_type like stdydsgn.stytype,
        hold_type char(20)
    let chosen = 1
    case
        when tmp_type = "A"
            let hold_type = "SURVEY NOS"
            exit case
        when tmp_type = "A1"
            let hold_type = "SURVEY-PRO"
            exit case
        when tmp_type = "A2"
            let hold_type = "SURVEY-RETRO"
```

```
            exit case
        when tmp_type = "B"
            let hold_type = "EXPERIMENT"
            exit case
        when tmp_type = "C"
            let hold_type = "THERAPEUTIC"
            exit case
        when tmp_type = "D"
            let hold_type = "PROPHYLACTIC"
            exit case
        when tmp_type = "E"
            let hold_type = "SYMPTOMATIC"
            exit case
        when tmp_type = "F"
            let hold_type = "CASE REPORT"
            exit case
        otherwise
            let hold_type = "NONE"
            let chosen = 1
            exit case
        end case
    return hold_type
    END FUNCTION
#########################################################################
FUNCTION vivit_choice()
    call clear_choice(8,16,50)
    display " V = in viVo     " at 8,50 attribute(reverse)
    display " T = in viTro  " at 9,50 attribute(reverse)
    display " I = Info only " at 10,50 attribute(reverse)
    end function
#########################################################################
FUNCTION vivit_trans(hold_vivit)
    define
        hold_vivit like stdydsgn.styvivit,
        tmp_vivit char(10)
    let chosen = 1
    Case
        when hold_vivit = "V"
            let tmp_vivit = "IN VIVO"
            exit case
        when hold_vivit = "T"
            let tmp_vivit = "IN VITRO"
            exit case
        when hold_vivit = "I"
            let tmp_vivit = "INFO ONLY"
            exit case
        otherwise
            error beep, "Not an acceptable choice"
            let tmp_vivit = " "
            let chosen = 0
            exit case
        end case
    return tmp_vivit
    end function
#########################################################################
FUNCTION cntlcmp_choice()
    call clear_choice(8,16,50)
```

```
    display " A = Between Groups    " at 12, 50 attribute(reverse)
    display " B = Within Groups     " at 13, 50 attribute(reverse)
    display " C = Combination of A & B " at 14, 50 attribute(reverse)
    display " U = Unknown " at 15, 50 attribute(reverse)
    end function
################################################################ ####
FUNCTION cntlcmp_trans(hold_cntlcmp)
    define hold_cntlcmp like stdydsgn.stycntlcmp,
        tmp_cntlcmp char(20)
    let chosen = 1
    case
        when hold_cntlcmp = "A"
            let tmp_cntlcmp = "BETWEEN GROUP"
            exit case
        when hold_cntlcmp = "B"
            let tmp_cntlcmp = "WITHIN GROUP"
            exit case
        when hold_cntlcmp = "C"
            let tmp_cntlcmp = "BETWEEN & WITHIN GRS "
            exit case
        when hold_cntlcmp = "U"
            let tmp_cntlcmp = "UNKNOWN"
            exit case
        otherwise
            error beep, "Not an acceptable choice"
            let tmp_cntlcmp = " "
            let chosen = 0
            exit case
        end case
    return tmp_cntlcmp
    end function
################################################################################
FUNCTION cmpmeth_choice(cntlcmp)
    define
        cntlcmp char(1)
    call clear_choice(8,16,50)
    case
        when cntlcmp = "A"
            display " A1= Non-crossover     " at 12,50 attribute(reverse)
            display " A2= One-way " at 13,50 attribute(reverse)
            display " A3= Parallel groups " at 14,50 attribute(reverse)
            exit case
        when cntlcmp = "B"
            display " B1= Crossover" at 12,50 attribute(reverse)
            display " B2= Latin Square   " at 13,50 attribute(reverse)
            display " B3= Randomized Blocks " at 14,50 attribute(reverse)
            exit case
        when cntlcmp = "C"
            display " C= Unspecified Combin " at 12,50 attribute(reverse)
            exit case
        when cntlcmp = "U"
            display " U= Unknown " at 12,50 attribute(reverse)
            exit case
        end case
    end function
################################################################################
```

```
FUNCTION cmpmeth_trans(compmeth)
    define
        cmpmeth   char(20),
        compmeth  char(2)
    let chosen = 1
    case
        when compmeth = "A1"
            let cmpmeth = "NON-CROSSOVER"
            exit case
        when compmeth = "A2"
            let cmpmeth = "ONE-WAY"
            exit case
        when compmeth = "A3"
            let cmpmeth = "PARALLEL GROUP"
            exit case
        when compmeth = "B1"
            let cmpmeth = "CROSSOVER"
            exit case
        when compmeth = "B2"
            let cmpmeth = "LATIN SQUARE"
            exit case
        when compmeth = "B3"
            let cmpmeth = "RANDOMIZED BLOCK"
            exit case
        when compmeth = "C"
            let cmpmeth = "COMBINATION NOS"
            exit case
        when compmeth = "U"
            let cmpmeth = "UNKNOWN"
            exit case
        otherwise
            let cmpmeth = " "
            error beep, "Not an acceptable choice!"
            let chosen = 0
            exit case
        end case
    return cmpmeth
    end function
##########################################################################
FUNCTION cntlmeth_choice()
    call clear_choice(8,16,50)
    display " A = Concurrent     " at 12, 50 attribute(reverse)
    display " B = Non-Concurrent " at 13, 50 attribute(reverse)
    display " N = None " at 14, 50 attribute(reverse)
    display " U = Unknown " at 15, 50 attribute(reverse)
    end function
##########################################################################
FUNCTION cntlmeth_trans(hold_cntlmeth)
    define
        hold_cntlmeth like stdydsgn.stycntlmeth,
        tmp_cntlmeth char(20)
    let chosen = 1
    case
        when hold_cntlmeth = "A"
            let tmp_cntlmeth = "CONCURRENT"
            exit case
        when hold_cntlmeth = "B"
```

```
            let tmp_cntlmeth = "NON-CONCURRENT"
            exit case
        when hold_cntlmeth = "N"
            let tmp_cntlmeth = "NONE"
            exit case
        when hold_cntlmeth = "U"
            let tmp_cntlmeth = "UNKNOWN"
            exit case
        otherwise
            error beep, "Not an acceptable choice"
            let tmp_cntlmeth = " "
            let chosen = 0
            exit case
        end case
    return tmp_cntlmeth
    end function
#########################################################################
FUNCTION cntltyp_choice(stycntlmeth)
    define stycntlmeth  char(1)
    call clear_choice(8,16,50)
    case
        when stycntlmeth = "A"
            display " A1 = Active Agent" at 12,50 attribute(reverse)
            display " A2 = Inactive Agent " at 13,50 attribute(reverse)
            display " A3 = No Agent     " at 14,50 attribute(reverse)
            exit case
        when stycntlmeth = "B"
            display " B1 = Historical     " at 12,50 attribute(reverse)
            display " B2 = Matched Pairs " at 13,50 attribute(reverse)
            exit case
        when stycntlmeth = "N"
            display " N = None " at 12,50 attribute(reverse)
            exit case
        when stycntlmeth = "U"
            display " U = Unknown " at 12,50 attribute(reverse)
            exit case
        end case
    end function
#########################################################################
FUNCTION cntltyp_trans(cntltyp)
    define cntltyp   char(2),
        stycntltyp   char(20)

    let chosen = 1
    case
        when cntltyp = "A1"
            let stycntltyp = "ACTIVE AGENT"
            exit case
        when cntltyp = "A2"
            let stycntltyp  "INACTIVE AGENT"
            exit case
        when cntltyp = "A3"
            let stycntltyp = "NO AGENT"
            exit case
        when cntltyp = "B1"
            let stycntltyp = "HISTORICAL"
            exit case
```

```
        when cntltyp = "B2"
            let stycntltyp = "MATCHED PAIRS"
            exit case
        when cntltyp = "N"
            let stycntltyp = "NONE"
            exit case
        when cntltyp = "U"
            let stycntltyp = "UNKNOWN"
            exit case
        otherwise
            error beep, "Not an acceptable choice!"
            let stycntltyp = " "
            let chosen = 0
            exit case
        end case
    return stycntltyp
    end function
##########################################################################
FUNCTION cntlassgn_choice()
    call clear_choice(8,16,50)
    display " A = Randomized   " at 12, 50 attribute(reverse)
    display " B = Matched Pair  " at 13, 50 attribute(reverse)
    display " C = Arbitrary Assignment " at 14, 50 attribute(reverse)
    display " N = None " at 15, 50 attribute(reverse)
    display " U = Unknown " at 16, 50 attribute(reverse)
    end function
##########################################################################
FUNCTION cntlassgn_trans(cntlassgn)
    define
        cntlassgn    char(2),
        stycntassgn char(20)
    let chosen = 1
    case
        when cntlassgn = "A"
            let stycntassgn = "RANDOMIZED"
            exit case
        when cntlassgn = "B"
            let stycntassgn = "MATCHED PAIR"
            exit case
        when cntlassgn = "C"
            let stycntassgn = "ARBITRARY"
            exit case
        when cntlassgn = "N"
            let stycntassgn = "NONE"
            exit case
        when cntlassgn = "U"
            let stycntassgn = "UNKNOWN"
            exit case
        otherwise
            error beep, "Not an acceptable choice!"
            let stycntassgn = " "
            let chosen = 0
            exit case
        end case
    return stycntassgn
    end Function
##########################################################################
```

```
FUNCTION rte_choice()
    call clear_choice(8,18,52)
    display " PO = Oral "  at 9,52 attribute(reverse)
    display " SK = Dermal "  at 10,52 attribute(reverse)
    display " IH = Inhaled "  at 11,52 attribute(reverse)
    display " IV = IV Inj "  at 12,52 attribute(reverse)
    display " IM = IM Inj "  at 13,52 attribute(reverse)
    display " IA = IA Inj "  at 14,52 attribute(reverse)
    display " SQ = SQ Inj "  at 15,52 attribute(reverse)
    display " OC = Ocular "  at 16,52 attribute(reverse)
    display " BT = Bite-St "  at 17,52 attribute(reverse)
    display " UK = Unk "  at 18,52 attribute(reverse)
    end function
#####################################################################
FUNCTION rte_trans(rte)
    define
        rte like exporegm.exroute,
        hold_rte char(20)
    let chosen = 1
    Case
        when rte = "PO"
            let hold_rte = "ORAL"
            exit case
        when rte = "SK"
            let hold_rte = "DERMAL"
            exit case
        when rte = "IH"
            let hold_rte = "INHALATION"
            exit case
        when rte = "IV"
            let hold_rte = "INTRAVENOUS INJ"
            exit case
        when rte = "IM"
            let hold_rte = "INTRAMUSCULAR INJ"
            exit case
        when rte = "IA"
            let hold_rte = "INTRA-ARTERIAL INJ"
            exit case
        when rte = "SQ"
            let hold_rte = "SUBCUTANEOUS INJ"
            exit case
        when rte = "OC"
            let hold_rte = "OULAR"
            exit case
        when rte = "BT"
            let hold_rte = "BITE-STING"
            exit case
        when rte = "UK"
            let hold_rte = "UNKNOWN"
            exit case
        otherwise
            error beep, "Not an acceptable choice"
            let hold_rte = " "
            let chosen = 0
            exit case
        end case
    return hold_rte
```

```
    end function
#####################################################################
FUNCTION sex_choice()
    call clear_choice(9,13,50)
    display " M = Male  " at 9,50 attribute(reverse)
    display " F = Female      " at 10,50 attribute(reverse)
    display " C = Castrated Male  " at 11,50 attribute(reverse)
    display " B = Both Sexes" at 12,50 attribute(reverse)
    display " N = Neutered Female " at 13,50 attribute(reverse)
    display " U = Unknown Sex " at 14,50 attribute(reverse)
    end function
#####################################################################
FUNCTION sex_trans(sex)
    define
        sex char(1),
        rtn_sex char(20)
    let chosen = 1
    case
        when sex = "M"
            let rtn_sex = "MALE"
            exit case
        when sex = "F"
            let rtn_sex = "FEMALE"
            exit case
        when sex = "N"
            let rtn_sex = "NEUTERED FEMALE"
            exit case
        when sex = "C"
            let rtn_sex = "CASTRATED MALE"
            exit case
        when sex = "B"
            let rtn_sex = "BOTH SEXES"
            exit case
        when sex = "U"
            let rtn_sex = "UNKNOWN"
            exit case
        otherwise
            let chosen = 0
            let rtn_sex = " "
            exit case
        end case
    return rtn_sex
    end function
#####################################################################
FUNCTION date_choice()
    call clear_choice(9,14,50)
    display " D = Days  " at 9,50 attribute(reverse)
    display " W = Weeks     " at 10,50 attribute(reverse)
    display " M = Months  " at 11,50 attribute(reverse)
    display " Y = Years  " at 12,50 attribute(reverse)
    display " U = Unknown " at 13,50 attribute(reverse)
    end function
#####################################################################
FUNCTION date_trans(dte)
    define
        dte like subjgrp.sgageunit,
        rtn_date char(20)
```

```
    let chosen = 1
    case
        when dte = "M"
            let rtn_date = "MONTH(S)"
            exit case
        when dte = "D"
            let rtn_date = "DAY(S)"
            exit case
        when dte = "W"
            let rtn_date = "WEEK(S)"
            exit case
        when dte = "Y"
            let rtn_date = "YEAR(S)"
            exit case
        when dte = "Y"
            let rtn_date = "UNKNOWN"
            exit case
        otherwise
            let chosen = 0
            let rtn_date = " "
            exit case
        end case
    return rtn_date
    end function
#####################################################################
function form_choice()
    call clear_choice(9,18,52)
    display " 01 = Solid " at 9,52 attribute(reverse)
    display " 02 = Slo_rel " at 10,52 attribute(reverse)
    display " 03 = Semisol " at 11,52 attribute(reverse)
    display " 04 = Liquid  " at 12,52 attribute(reverse)
    display " 05 = Spray" at 13,52 attribute(reverse)
    display " 06 = Gas   " at 14,52 attribute(reverse)
    display " 07 = Concent " at 15,52 attribute(reverse)
    display " 08 = Feed  " at 16,52 attribute(reverse)
    display " 09 = Bait   " at 17,52 attribute(reverse)
    display " 00 = Unk   " at 18,52 attribute(reverse)
    end function
#####################################################################
function form_trans(formul)
    define
        formul  like exporegm.exformul,
        hold_formul char(20)
    let chosen = 1
    case
        when formul = "01"
            let hold_formul = "SOLID"
            exit case
        when formul = "02"
            let hold_formul = "SLOW-RELEASE"
            exit case
        when formul = "03"
            let hold_formul = "SEMI-SOLID"
            exit case
        when formul = "04"
            let hold_formul = "LIQUID"
            exit case
```

```
        when formul = "05"
            let hold_formul = "SPRAY"
            exit case
        when formul = "06"
            let hold_formul = "GAS"
            exit case
        when formul = "07"
            let hold_formul = "CONCENTRATE"
            exit case
        when formul = "08"
            let hold_formul = "FEED"
            exit case
        when formul = "09"
            let hold_formul = "BAIT"
            exit case
        when formul = "00"
            let hold_formul = "UNKNOWN"
            exit case
        otherwise
            error beep, "Not an acceptable choice"
            let hold_formul = " "
            let chosen = 0
            exit case
        end case
    return hold_formul
    end function
#################################################################
function severe_trans(hold_severe)
    define
        hold_severe like clinfind.cfsevvalue,
        tmp_severe char(12)
    let chosen = 1
    case
        when hold_severe = 1
            let tmp_severe = "MILD"
            exit case
        when hold_severe = 2
            let tmp_severe = "MODERATE"
            exit case
        when hold_severe = 3
            let tmp_severe = "SEVERE"
            exit case
        otherwise
            let tmp_severe = "UNK SEVERITY"
            let chosen = 1
            exit case
        end case
    return tmp_severe
    end function
#################################################################################
FUNCTION pur_choice()
    call clear_choice(8,18,52)
    display " TOX = Toxic   " at 9,52 attribute(reverse)
    display " TRT = Treat   " at 10,52 attribute(reverse)
    display " CNL = Control " at 11,52 attribute(reverse)
    display " OTH = Other   " at 12,52 attribute(reverse)
    display " NON = None    " at 13,52 attribute(reverse)
```

```
    display " UNK = Unknown " at 14,52 attribute(reverse)
    end function
##########################################################################
FUNCTION pur_trans(tmp_val)
    define
        tmp_val char(3),
        hold_val char(10)
    let chosen = 1
    CASE
        when tmp_val= "TOX"
            let hold_val = "TOXIC"
            exit case
        when tmp_val = "TRT"
            let hold_val = "TREAT"
            exit case
        when tmp_val = "CNL"
            let hold_val = "CONTROL"
            exit case
        when tmp_val = "OTH"
            let hold_val = "OTHER"
            exit case
        when tmp_val = "NON"
            let hold_val = "NONE"
            exit case
        when tmp_val = "UNK"
            let hold_val = "UNK"
            exit case
        otherwise
            let chosen = 0
            let hold_val = " "
            exit case
        end case
    return hold_val
    end FUNCTION
##########################################################################
FUNCTION dose_choice()
    call clear_choice(8,18,52)
    display " MG    = Milligrams     " at 9,52 attribute(reverse)
    display " ML    = Milliliters  " at 10,52 attribute(reverse)
    display " UG    = Micrograms    " at 11,52 attribute(reverse)
    display " MG/KG = Milligram/Kg " at 12,52 attribute(reverse)
    display " UG/KG = Microgram/Kg " at 13,52 attribute(reverse)
    end function
##########################################################################
FUNCTION change_choice()
    call alrt1940open()
    display " 0  = NOS   " at 5,8
    display " 1  = NORMAL" at 6,8
    display " 2  = DISORDER     " at 7,8
    display " 3  = INCREASE     " at 8,8
    display " 4  = DECREASE     " at 9,8
    display " 5  = ABSENCE      " at 10,8
    display " 6  = ABNRM PRESENCE " at 11,8
    display " 7  = ABNRM RATIO    " at 12,8
    prompt "Enter number for change seen > " for answer
        on key(interrupt)
            call alrt1940close()
```

```
            return
        end prompt
    call alrt1940close()
    return answer
    end function
##################################################################
function trans_change(tmp_cng)
    define
        tmp_cng char(1),
        hold_change like clinfind.cfchange
    case
        when tmp_cng = "0"
            let hold_change = "NOS"
            exit case
        when tmp_cng = "1"
            let hold_change = "NORMAL"
            exit case
        when tmp_cng = "2"
            let hold_change = "DISORDER"
            exit case
        when tmp_cng = "3"
            let hold_change = "INCREASE"
            exit case
        when tmp_cng = "4"
            let hold_change = "DECREASE"
            exit case
        when tmp_cng = "5"
            let hold_change = "ABSENCE"
            exit case
        when tmp_cng = "6"
            let hold_change = "ABNRM PRESENCE"
            exit case
        when tmp_cng = "7"
            let hold_change = "ABNRM RATIO"
            exit case
        end case
    return hold_change
    end function
##################################################################
FUNCTION matrix_choice()
    call alrt1940open()
    display"A - Blood    " at 3,4
    display"B - Plasma   " at 4,4
    display"C - Serum    " at 5,4
    display"D - Milk     " at 6,4
    display"E - Saliva   " at 7,4
    display"F - Gastric Cntnt     " at 8,4
    display"G - Feces    " at 9,4
    display"H - Vomitus      " at 10,4
    display"I - Urine    " at 11,4
    display"J - CSF  " at 12,4
    display"Z - Other Matrix      " at 13,4
    display"X - Exit w/o Select " at 15,4
    prompt "Enter letter for sample matrix >" for char answer
        on key (interrupt)
            call alrt1940close()
            let answer = "Z"
```

```
            return answer
            end prompt
    let answer = upshift(answer)
    call alrt1940close()
    return answer
    END FUNCTION
##########################################################################
FUNCTION matrix_trans(tmp_value)
    define
        T_lab record
            loccode char(6),
            locname char(100)
            end record,
        tmp_value  char(1)
    let chosen = 0
    Case
        when answer = "A"
            let T_lab.loccode = "T0X00"
            let T_lab.locname = "BLOOD"
            exit case
        when answer = "B"
            let T_lab.loccode = "T0X40"
            let T_lab.locname = "PLASMA"
            exit case
        when answer = "C"
            let T_lab.loccode = "T0X50"
            let T_lab.locname = "SERUM"
            exit case
        when answer = "D"
            let T_lab.loccode = "T0Y31"
            let T_lab.locname = "MILK"
            exit case
        when answer = "E"
            let T_lab.loccode = "T5X00"
            let T_lab.locname = "SALIVA"
            exit case
        when answer = "F"
            let T_lab.loccode = "T6Y00"
            let T_lab.locname = "GASTRIC CONTENTS"
            exit case
        when answer = "G"
            let T_lab.loccode = "T6Y10"
            let T_lab.locname = "FECES"
            exit case
        when answer = "H"
            let T_lab.loccode = "T6Y10"
            let T_lab.locname = "VOMITUS"
            exit case
        when answer = "I"
            let T_lab.loccode = "T7X10"
            let T_lab.locname = "URINE"
            exit case
        when answer = "J"
            let T_lab.loccode = "TX100"
            let T_lab.locname = "CEREBROSPINAL FLUID"
            exit case
        when answer = "Z"
```

```
            call pick_site() returning T_lab.loccode, T_lab.locname
            exit case
        otherwise
            let chosen = 1
            let T_lab.loccode = "Null"
            let T_lab.locname = "Null"
            exit case
        end case
    return T_lab.loccode, T_lab.locname
    END FUNCTION
##########################################################################
FUNCTION system_choice()
    call alrt1940open()
    display " A - Circulatory      " at 3,4
    display " B - Digestive    " at 4,4
    display " C - Hemato / Lymph / Reticuloen" at 5,4
    display " D - Integumentary / Skin   " at 6,4
    display " E - Musculoskeletal      " at 7,4
    display " F - Nervous / Behavioral   " at 8,4
    display " G - Reproductive   " at 9,4
    display " H - Respiratory      " at 10,4
    display " I - Senses   " at 11,4
    display " J - Urinary" at 12,4
    display " K - General      " at 3,4
    display " L - Endocrine   " at 14,4
    display " M - Other/Immunologic/Metabol   " at 15,4
    display " Z - Exit without choosing   " at 17,4
    prompt "Enter letter for body system >" for char answer
        on key (interrupt)
            call alrt1940close()
            let answer = "Z"
            return answer
            end prompt
    let answer = upshift(answer)
    call alrt1940close()
    return answer
    END FUNCTION
##########################################################################
FUNCTION system_trans(tmp_value)
    define
        T_sys record
            syscode char(8),
            sysname char(100)
            end record,
        tmp_value  char(1)
    let chosen = 0
    Case
        when tmp_value = "A"
            let T_sys.syscode = "A"
            let T_sys.sysname = "CIRCULATORY"
            exit case
        when tmp_value = "B"
            let T_sys.syscode = "B"
            let T_sys.sysname = "DIGESTIVE"
            exit case
        when tmp_value = "C"
            let T_sys.syscode = "C"
```

```
            let T_sys.sysname = "HEMATOPOETIC-LYMPHATIC-RETICULOENDOTHELIC"
            exit case
        when tmp_value = "D"
            let T_sys.syscode = "D"
            let T_sys.sysname = "INTEGUMENTARY-SKIN"
            exit case
        when tmp_value = "E"
            let T_sys.syscode = "E"
            let T_sys.sysname = "MUSCULOSKELETAL"
            exit case
        when tmp_value = "F"
            let T_sys.syscode = "F"
            let T_sys.sysname = "NERVOUS-BEHAVIORAL"
            exit case
        when tmp_value = "G"
            let T_sys.syscode = "G"
            let T_sys.sysname = "REPRODUCTIVE"
            exit case
        when tmp_value = "H"
            let T_sys.syscode = "H"
            let T_sys.sysname = "RESPIRATORY"
            exit case
        when tmp_value = "I"
            let T_sys.syscode = "I"
            let T_sys.sysname = "SENSES"
            exit case
        when tmp_value = "J"
            let T_sys.syscode = "J"
            let T_sys.sysname = "URINARY"
            exit case
        when tmp_value = "K"
            let T_sys.syscode = "K"
            let T_sys.sysname = "GENERAL"
            exit case
        when tmp_value = "L"
            let T_sys.syscode = "L"
            let T_sys.sysname = "ENDOCRINE"
            exit case
        when tmp_value = "M"
            let T_sys.syscode = "M"
            let T_sys.sysname = "OTHER-IMMUNOLOGIC-METABOLISM"
            exit case
        when tmp_value = "Z"
            let T_sys.syscode = "null"
            let T_sys.sysname = "null"
            let chosen = 1
            exit case
        otherwise
            Error "Not acceptable system"
            let chosen = 1
            exit case
        end case
    return T_sys.syscode, T_sys.sysname
    END FUNCTION
##########################################################################
FUNCTION labCatChoice()
    call alrt1940open()
```

```
    display " A - Elements/Ions/Inorganics/Acid-Base " at 3,1
    display " B = Simple Organics/Carbohydrates " at 4,1
    display " C = Proteins/Amino Acids " at 5,1
    display " D = Fatty Acids/Lipids/Lipoproteins " at 6,1
    display " E = Porphyrins/Bilirubin Cmpd/Bile Acids " at 7,1
    display " F = Purines/Pyrimidines/Nucleic Acids " at 8,1
    display " G = Vitamins " at 9,1
    display " H = Hemoglobins " at 10,1
    display " I = Enzymes " at 11,1
    display " J = Endocrine Substances " at 12,1
    display " K = Nervous System Substances " at 13,1
    display " L = Immune System Substances " at 14,1
    display " M = Hematopoetic Functions " at 15,1
    display " Z = Exit without choosing " at 17,1
    prompt "Enter letter for lab test category >" for char answer
        on key (interrupt)
            call alrt1940close()
            let answer = "Z"
            return answer
            end prompt
    let answer = upshift(answer)
    call alrt1940close()
    return answer
    END FUNCTION
##########################################################################
FUNCTION labCatTran(tmp_value)
    define
        tmp_value char(1),
        T_sys record
            syscode char(8),
            sysname char(100)
            end record
    Case
        when tmp_value = "A"
            let T_sys.syscode = "A"
            let T_sys.sysname = "Elements/Ions/Inorganics/Acid-Base"
            exit case
        when tmp_value = "B"
            let T_sys.syscode = "B"
            let T_sys.sysname = "Simple Organics/Carbohydrates"
            exit case
        when tmp_value = "C"
            let T_sys.syscode = "C"
            let T_sys.sysname = "Proteins/Amino Acids"
            exit case
        when tmp_value = "D"
            let T_sys.syscode = "C"
            let T_sys.sysname = "Proteins/Amino Acids"
            exit case
        when tmp_value = "E"
            let T_sys.syscode = "E"
            let T_sys.sysname = "Porphyrins/Bilirubin Cmpd/Bile Acids"
            exit case
        when tmp_value = "F"
            let T_sys.syscode = "F"
            let T_sys.sysname = "Purines/Pyrimidines/Nucleic Acids"
            exit case
```

```
        when tmp_value = "G"
            let T_sys.syscode = "G"
            let T_sys.sysname = "Vitamins"
            exit case
        when tmp_value = "H"
            let T_sys.syscode = "H"
            let T_sys.sysname = "Hemoglobins"
            exit case
        when tmp_value = "I"
            let T_sys.syscode = "I"
            let T_sys.sysname = "Enzymes"
            exit case
        when tmp_value = "J"
            let T_sys.syscode = "J"
            let T_sys.sysname = "Endocrine Substances"
            exit case
        when tmp_value = "K"
            let T_sys.syscode = "K"
            let T_sys.sysname = "Nervous System Substances"
            exit case
        when tmp_value = "L"
            let T_sys.syscode = "L"
            let T_sys.sysname = "Immune System Substances"
            exit case
        when tmp_value = "M"
            let T_sys.syscode = "M"
            let T_sys.sysname = "Hematopoetic Functions"
            exit case
        when tmp_value = "Z"
            let T_sys.syscode = "null"
            let T_sys.sysname = "null"
            let chosen = 1
            exit case
        end case
    return T_sys.syscode, T_sys.sysname
    END FUNCTION
##########################################################################
function agergn_choice()
    call clear_choice(9,14,50)
    display " 1 = Infant  " at 9,50 attribute(reverse)
    display " 2 = Juvenile  " at 10,50 attribute(reverse)
    display " 3 = Adult  " at 11,50 attribute(reverse)
    display " 4 = Elderly     " at 12,50 attribute(reverse)
    display " 0 = Unknown  " at 13,50 attribute(reverse)
    end function
##########################################################################
FUNCTION agergn_tran(t_arange)
    define
        t_arange    char(1),
        tmp_val     char(10)
    let chosen = 1
    case
        when t_arange = "0"
            let tmp_val = "UNKNOWN AGE"
            exit case
        when t_arange = "1"
            let tmp_val = "INFANT"
```

```
            exit case
        when t_arange = "2"
            let tmp_val = "JUVENILE"
            exit case
        when t_arange = "3"
            let tmp_val = "ADULT"
            exit case
        when t_arange = "4"
            let tmp_val = "ELDERLY"
            exit case
        otherwise
            let chosen = 0
            let tmp_val = " "
            exit case
        end case
    return tmp_val
    end FUNCTION
#####################################################################
function wt_choice()
    call clear_choice(9,14,50)
    display " LB = Pounds   " at 9,50 attribute(reverse)
    display " OZ = Ounces   " at 10,50 attribute(reverse)
    display " KG = Kilograms " at 11,50 attribute(reverse)
    display " GM = Grams    " at 12,50 attribute(reverse)
    display " UK = Unknown     " at 13,50 attribute(reverse)
    end function
#####################################################################
FUNCTION wrangeChoice()
    define
        tmp_val char(2)
    open window wrange at 3,3 with 7 rows, 68 columns
         attribute(border, reverse)
    display "00 = None" at 2,1
    display "U = Unk " at 2,20
    display "M = Multi range" at 2,40
    display "01 = < 1 kg (< 2 lb)  " at 3,1
    display "02 = 1 - 2 kg     (>2-4 lb)      " at 4,1
    display "03 = 3 - 5 kg     (>4-11 lb)     " at 5,1
    display "04 = 6 - 10 kg    (>11-22 lb)    " at 6,1
    display "05 = 11 - 25 kg   (>22-55 lb)    " at 7,1
    display "06 = 26 - 50 kg   (>55-110 lb)   " at 3,36
    display "07 = 51 - 100 kg      (>110-220 lb)   " at 4,36
    display "08 = 101 - 200 kg  (>220-440 lb)   " at 5,36
    display "09 = 201 - 500 kg  (>440-1100 lb)  " at 6,36
    display "10 = 501 - 1000 kg (>1120-2200 lb)" at 7,36
    prompt "Enter letter for weight range >" for tmp_val
        on key (interrupt)
            close window wrange
            let tmp_val = "U"
            return answer
            end prompt
    close window wrange
    let tmp_val = upshift(tmp_val)
    return tmp_val
    end FUNCTION
#####################################################################
```

```
FUNCTION wtrgn_tran(t_wrgn)
    define
        t_wrgn char(2),
        tmp_val char(10)
    let chosen = 1
    case
        when t_wrgn = "00"
            let tmp_val = "None"
            exit case
        when t_wrgn = "01"
            let tmp_val = "< 1 kg"
            exit case
        when t_wrgn = "02"
            let tmp_val = "1 - 2 kg"
            exit case
        when t_wrgn = "03"
            let tmp_val = "3 - 5 kg"
            exit case
        when t_wrgn = "04"
            let tmp_val = "5-10 kg"
            exit case
        when t_wrgn = "05"
            let tmp_val = "11-25 kg"
            exit case
        when t_wrgn = "06"
            let tmp_val = "26-50 kg"
            exit case
        when t_wrgn = "07"
            let tmp_val = "51-100 kg"
            exit case
        when t_wrgn = "08"
            let tmp_val = "101-250 kg"
            exit case
        when t_wrgn = "09"
            let tmp_val = "250-500 kg"
            exit case
        when t_wrgn = "10"
            let tmp_val = "501-1000kg"
            exit case
        when t_wrgn = "U"
            let tmp_val = "Weight Unk"
            exit case
        when t_wrgn = "M"
            let tmp_val = ">1 Wt Rgn"
            exit case
        otherwise
            let chosen = 0
            let tmp_val = " "
            exit case
    end case
return tmp_val
end FUNCTION
```

{

PLEASE NOTE: If you make changes in this file let me know! This is the back-up file. If I do not know specifically what you did, I can't identify the changes and insert them into the MASTER copy. Please communicate.

---

universal help, numbers 1-9
tksmain.4gl help, numbers 10-99
tkscit.4gl help, numbers 100-199
tksauth.4gl help, numbers 200-299
tkskey.4gl help, numbers 300-399
tkspapovr.4gl help, numbers 400-499
tksdsgn.4gl help, numbers 500-599
tksgrp.4gl help, numbers 600-699
tksexpo.4gl help, numbers 700-799
tksexgrp.4gl help, numbers 800-899
tksvoc.4gl and tksvoc2.4gl help , numbers 900-999
tksfinding.4gl help, numbers 1000-1099

File changed 02/24/89 RJL

Need to writ helps for
Monograph menu (TKS-MAIN REPORTS Abstract MONOGRAPH
}

UNIVERSAL HELP MESSAGES
.1
No help available for this item.

.2
Exit
Selecting this option will exit the current menu and take you to the previous window.

.3 Hit ESC to leave array.
Hit the "Esc" key (and watch for an on-screen message) in order to begin the next step.

.4

.5

.6

.7

.8

.9

.-1 tksmain.4gl HELP MESSAGES

.10
TKS-MAIN: (Overview)
When the TKS-MAIN window comes up, associated with it are the options available from that window. The first option is selected as indicated by the reverse video (highlighted or funnel enclosure < > on some screens) of "AbstractMgt."

Move through the menu by using the cursor keys. Note that moving through the menu in this fashion brings up brief messages which explain the highlighted option. Also, this method allows access to additional explanatory text available via on-line help messages which are accessed via simultaneously pressing the "control" and "w" keys (Ctrl-w).

You may invoke the desired option by typing (in lower case) the first letter of the option you wish to select, or by hitting "return." For example, typing "e" will select the "Exit" option. This method does not allow you to see the explanatory text which tells what the option will do. It is a short cut to speed up the process.

(Hit "s" or "return to see the help file for AbstractMgt)

TKS-MAIN: AbstractMgt
Selecting this option brings you to the "ABSTRACT" menu where abstracts can be entered, abstracts already entered can be added to (completed), or modified in some other way, or where searches for abstracted information can be performed.

.11
TKS-MAIN: Vocabulary
This option allows access to the lists and codes for journals, books, keywords, clinical findings and chemical vocabulary. These areas can be "browsed" (searches performed, entries modified or added to).

.12
TKS-MAIN: Reports
This section will be used to generate report summaries (monographs), but is not yet "on-line."

.13
TKS-MAIN: Information
This section contains the copyright notes and a summary of the stage of development of the individual programs which form the Toxin Knowledge System.

.14
TKS-MAIN: Exit
Selecting "Exit" removes you from the TKS program if you are in the first menu (TKS-MAIN), and moves you to the previous menu if you are at any other point in the program.

.15
TKS-MAIN ABSTRACT FIND-DATA FIND-CONTENT: Results
Selecting "Results" brings up a menu of the same name with the option ClinicalFindings.

.16
TKS-MAIN ABSTRACT FIND-DATA FIND-CONTENT: Discussion
This option is not yet on-line.

.20
TKS-MAIN ABSTRACT: New
Selecting "New" from this menu starts the process of entering a new citation. The screen which appears after "New" is selected prompts you for the last name of the first author of the article (type in lower case letters).

Please note that if you make a mistake, the "Back Space" key can be used. If you wish to abort an entry, use the "Del" (delete) key.

.21
TKS-MAIN ABSTRACT: Add
"Add" provides a means for adding to incomplete citation entries. For example, one can add descriptions of Designs, Subject Groups, Exposure Regimens and establish Links.

Selecting "Add" brings you to the "SELECT-FILE-BY" screen.

.22
TKS-MAIN ABSTRACT: Find
This option provides the capability of locating citations or any aspect of their associated data, i.e. designs, subject or exposure regimen information, clinical findings, comments, etc. Once the desired area is located, various options are available which allow the user to examine the records, modify or delete them.

.23
TKS-MAIN ABSTRACT SELECT-FILE-BY ADD-DATA ADD-CONTENT:
PaperOverview - Paper Overview data exists for this Paper.
Do you want to update it? (Y/n)
When you have chosen to "Add" paper overview data for a citation and the citation already has it, the system asks if you would like to update what is already there. Typing "y," followed by a "return," brings up the PAPER OVERVIEW SCREEN.

.30
TKS-MAIN VOCABULARY: Journals/Books
This option is used to add new journals or books to the source code list.

.31
TKS-MAIN VOCABULARY: Keywords
Selecting this option brings up the KEYWORD_LISTING menu with options to "Add" keycodes and keywords to the system memory, "Find" the keycode for a specific keyword or the keyword associated with a specific keycode.

.32
TKS-MAIN VOCABULARY: Signs
This function is not yet implemented.

.33
TKS-MAIN VOCABULARY: Chemicals
This function is not yet implemented.

.40
TKS-MAIN REPORTS: Journal-Listing
This option is used to print out the list of journals and source codes currently included in the TKS system file.

DO NOT USE THIS OPTION. It is under development.

.41
TKS-MAIN REPORTS: Abstract
This option is used to generate structured abstracts (monographs) for citations which are selected by the user. Selection of this option brings you to the Select-File-By screen in order to define the citation for which an abstract is to be generated.

THIS OPTION SHOULD NOT BE USED. The monograph section is under development.

.42
TKS-MAIN ABSTRACT SELECT-FILE-BY
From here, one can search for a specific citation by responding to sequential screens which request the author, the journal volume number, the first page number, and last two digits of the year. Alternatively, one can give the Citation No. which consists of the source code of the journal or book, the volume number, first page number, and the year. Note that for the latter, each component must consist of a certain number of characters, for example, J00001-0001-00001-1988.

Completion of the process will result in finding the desired citation, or a message that the citation doesn't exist in the database. If a citation isn't in the system, you can't add anything to it. Enter a new citation by starting from "New" in the "ABSTRACT" screen.

Hit "s" or "return" to see the help file for Author-Name.

TKS-MAIN ABSTRACT SELECT-FILE-BY: Author-Name
Type "a" or hit "return." Enter the first author's last name and hit "return." Now the program prompts you for the volume or chapter number. You must answer all of the questions posed by this path in order to search for a particular citation.

.43
TKS-MAIN ABSTRACT SELECT-FILE-BY: Author's Last Name
Enter only the first author's last name NOT the initials (case doesn't matter).

.44

TKS-MAIN ABSTRACT SELECT-FILE-BY: Volume/Chapter Number
Enter the volume or chapter number followed by "return."

.45
TKS-MAIN ABSTRACT SELECT-FILE-BY: Citation-Number
Selecting this option results in a prompt asking for the citation number on which to do the search.

.46
TKS-MAIN ABSTRACT SELECT-FILE-BY: Which Citation-Number?
Type in the j or b and the following 5 numbers, a hypen and the next 4 numbers, a hypen and 5 numbers for the first page, a hypen and the year, then "return" (remember, the format is J00001-0001-00001-1988).

The program either finds a match and brings up the menu asking what you would like to add, finds a match and tells you all data has been entered, or doesn't find a match and lets you know that too. Make sure you have typed the citation number correctly before trying to enter new citation information (via the "New" path if no match was found).

Respond to the prompts and you will come to the "ADD-DATA" screen if the citation is not already in the system.

.50
TKS-MAIN ABSTRACT FIND-DATA: Citation-Data
This option brings you to the FIND-CITATION-DATA screen where there are multiple methods of locating a particular citation or author.

.51
TKS-MAIN ABSTRACT FIND-DATA: Paper Content
"Paper Content" refers to the paper overview,materials and methods (design, subject, regimen and link information), results (clinical findings) and discussion portions of paper entries. Using this option, one can search for any of those areas of a paper which has already been entered. In addition, selection of this option provides a means of adding one or more of those specific entities if they are found to be missing after a query, by using the "Add-Data" option.

.52
TKS-MAIN ABSTRACT FIND-DATA: Keywords-Notes
Selection of Keywords-Notes brings you to the Find-Keywords-Notes menu where one can search for keywords or comments for a specific citation. The "Query All" option is also available from this window. It allows one to bring up additional details during a search, for example, the author(s) and title of the article.

.53
TKS-MAIN ABSTRACT FIND-DATA FIND-KEYWORDS-NOTES: Keywords
Selection of the "Keywords" option enables one to search for the keywords that have been entered for a particular citation. The screen comes up with the cursor on the "Citation" field and a message asking you to "Enter search criteria and hit ESC to Search." Provide the citation number (or the Citation File

Number, or a Keyword) and hit "Esc." If the citation exists in the system, and if Keycodes/Keywords were assigned, they will appear. When located, they may be modified or deleted. If none have been entered, they may be added to the record.

Watch for messages on-screen indicating what you should do. Typically, a message will come up asking you to hit "ESC" to continue, after which a "BROWSE" menu will appear. There are on-line help messages available for that menu.

.54
TKS-MAIN ABSTRACT FIND-DATA FIND-KEYWORDS-NOTES: Notes
The "Notes" option provides a mechanism for locating the comments entered in association with a particular document. The notes may be modified or deleted, or added if not found.

.55
TKS-MAIN ABSTRACT FIND-DATA FIND-KEYWORDS-NOTES: Query-All
The "Query-All" option enables one to search using citation attributes, the document title, author(s) or keywords. When a search is successful, those other portions of the screen are also provided.

.60
TKS-MAIN ABSTRACT SELECT-FILE-BY ADD-DATA: Citation-Data
One can add citation information to the system using this path. More commonly, this would be done via the "New" option in the "ABSTRACT" window.

Even though this is an "ADD" path, a "Find" option becomes available which allows the user to search for abstract components.

.61
TKS-MAIN ABSTRACT SELECT-FILE-BY ADD-DATA: Paper-Content
The "PAPER-CONTENT" screen which appears next requires that one select the type of data which will be entered. Choose one of the available options.

.62
TKS-MAIN ABSTRACT SELECT-FILE-BY ADD-DATA: Keywords-Notes
Selecting this option allows you to add either additional keywords or notes (comments), depending on what is selected from the next menu.

.63
TKS-MAIN ABSTRACT SELECT-FILE-BY ADD-DATA ADD-CITATION-DATA: Citation
Selecting "Citation" allows you to add citation data to the system. Usually you would do this via the "TKS-MAIN AbstractMgt ABSTRACT New" path. However, if the citation portion of an entry is deleted, leaving the other components, this option can be used to re-enter the citation data.

.64
TKS-MAIN ABSTRACT SELECT-FILE-BY ADD-DATA ADD-CITATION-DATA: Authors
One can add authors to a partially completed list or add authors to a citation that lacks that attribute.

If there are authors already listed for the citation, you can move through them with the cursor keys. You cannot change anything or add names until the "Esc" key is used.

After hitting "Esc" the message at the bottom of the screen changes and the cursor field is in reverse video (dependant on your terminal type). You can now make changes in the fields already entered or add names to the list. Remember, the program will correctly number the authors if you enter them in sequence.

When you are finished with the changes/additions, hit "Esc" to place them in the system memory.

(This help message is also available if you choose "Authors."

.65
TKS-MAIN ABSTRACT SELECT-FILE-BY ADD-DATA ADD-KEYWORDS-NOTES: Keywords

Selecting "Keywords" brings up the keycode/keyword screen which enables one to add keywords to the specified document data.

.66
TKS-MAIN ABSTRACT SELECT-FILE-BY ADD-DATA ADD-KEYWORDS-NOTES: Notes

Selecting "Notes" brings up the TKS "Comments" screen so that comments can be added to the specified document.

.69
TKS-MAIN ABSTRACT SELECT-FILE-BY ADD-DATA ADD-CONTENT: PaperOverview

Selecting "PaperOverview" will enable one to add that portion of the paper content to the citation information in the system. PaperOverview consists of the stated and implied purpose, the paper class, and number of study designs.

.70
TKS-MAIN ABSTRACT SELECT-FILE-BY ADD-DATA ADD-CONTENT: Materials-Methods

If the document entry process is complete through Paper Overview, one can add design, subject, regimen and link information by selecting this option.

Design information includes, the type of study, the number of subject groups and exposure regimens, information on controls and group comparisons.

.71
TKS-MAIN ABSTRACT SELECT-FILE-BY ADD-DATA ADD-CONTENT MATERIALS-METHODS: Design

When you select design, the system checks to see if the number of designs that have been entered matches the number of designs indicated in the PAPER OVERVIEW SCREEN. If they do not, you must change the data in the overview screen to allow for entry of another design.

If there are fewer designs entered than the overview screen indicated there should be, a design screen will come up. Fill in the options as the cursor moves to each field. "Esc" brings up the next design screen.

.72
TKS-MAIN ABSTRACT SELECT-FILE-BY ADD-DATA ADD-CONTENT MATERIALS-METHODS: Subjects

When this option is selected (assuming that the Design(s) have already been entered), the program asks which design you would like to add subjects to. The design(s) are shown mid-screen. Choose a number from the left margin and hit "return."

If you select a design for which all subject group information has been entered, you cannot enter another subject group. The system will return you to the MATERIALS-METHODS menu. If a subject group is lacking for the design you selected, a new SUBJECT GROUP SCREEN comes up and can be completed. Subject data includes information on the species, age, sex, weight and similar attributes.

.73
TKS-MAIN ABSTRACT SELECT-FILE-BY ADD-DATA ADD-CONTENT MATERIALS-METHODS: Subjects-For which design?

If the document entry process is complete through Paper Overview, and all subject groups have not been entered, one can add design information by selecting the appropriate design.

.74
TKS-MAIN ABSTRACT SELECT-FILE-BY ADD-DATA ADD-CONTENT MATERIALS-METHODS: Regimens

Selecting this option allows entry of agent, dose and dosing schedule information via the EXPOSURE REGIMEN DATA SCREEN.

.75
TKS-MAIN ABSTRACT SELECT-FILE-BY ADD-DATA ADD-CONTENT MATERIALS-METHODS: Regimens-For which study design?

The designs already entered are listed numerically mid-screen, along with the number of subject groups already entered for each design, the number of exposure regimens for each, and whether a control group was included.

This option will work only if a regimen description is lacking for a design. Type in the design number that requires additional regimen(s) and hit "return." A new EXPOSURE REGIMEN DATA SCREEN appears.

.76
TKS-MAIN ABSTRACT SELECT-FILE-BY ADD-DATA ADD-CONTENT: FindData

This option provides a mechanism to access the "Find" path from the Add pathway. It brings you to another menu where the type of information you wish to find must be chosen (Citation, Paper Content and Keywords-Notes).

.77
TKS-MAIN ABSTRACT SELECT-FILE-BY ADD-DATA ADD-CONTENT: Links

Once the design, subject and regimen data are complete for a citation, one can establish the relationships between those factors using the "Link" screen. This option provides that capability.

.78
TKS-MAIN ABSTRACT SELECT-FILE-BY ADD-DATA ADD-CONTENT RESULTS:

ClinFindings

The clinical findings reported in a document can be entered using this path. Clinical Findings currently involves describing the site affected, the structural change, functional alteration, causal agent and procedural, preventive, diagnostic and therapeutic measures.

.79

TKS-MAIN ABSTRACT SELECT-FILE-BY ADD-DATA ADD-CONTENT: Discussion

This section is under development. Discussion refers to the "Discussion" portion of manuscripts.

.80

TKS-MAIN ABSTRACT FIND-DATA FIND-CITATION-DATA: Citation

In order to locate a citation, one can specify a citation number, author(s), journal volume number and other attributes, or Query for all of those. The options available in the FIND-CITATION-DATA window allow a choice between those various methods. Also available is an option which presents the citations and associated information in a different format, which is for use by system programmers (Raw-Citation).

Select "Citation" and the familiar citation screen appears. Enter the citation number and hit "return" to initiate the search. If the citation is found, a "BVROWSE" menu appears which allows one to view or modify the matches discovered by the search (Find) process.

.81

TKS-MAIN ABSTRACT FIND-DATA FIND-CITATION-DATA: Authors

Selecting this option allows you to search for an author of a specific citation, or all articles which include a specific person as an author. You can only use one name in the search.

This screen comes up with the cursor on the "Citation No." field. You have indicated that you would like to find an author so you probably don't want to institute the search process based on that number. Move through the fields using the "return" or cursor keys until the cursor is in the first author field. Type in the name of the author (including initials!) whose citations you wish to locate, and hit "Esc" to initiate the search process.

You can search for all "Smith's" regardless of their initials, by using the wild card (*), e.g., "SMITH*." When wishing to find all documents authored or co-authored by a particular individual it may be preferable to use the wild card in place of both initials because some journal articles may not provide the names with both initials. Some system users may not choose to enter both initials. Some may ignore the plea to NOT place spaces between the initials, which means an exact match would need to have both initials matched as well as the spacing! A search using the first initial and a wild card will pick up all the single and double initials, regardless of the spacing. However, be aware that you must pay attention to the initials in order to weed out any matches that aren't exactly the author of interest.

If a match is found, a BROWSE screen appears which provides

you with several options.

.82
TKS-MAIN ABSTRACT FIND-DATA FIND-CITATION-DATA: Query-All
Selection of "Query-All" results in a screen which provides the usual mechanism of searching by use of the citation or file number, an author(s), title, or keyword(s). If a match is found, these other attributes are displayed on the screen too.

.83
TKS-MAIN ABSTRACT FIND-DATA FIND-CITATION-DATA: Raw-Citation
This option invokes another program which provides access to data in the TKS System. It is meant to be used by system developers and consists of data fields and their abbreviations. It is necessary to be familiar with the screens in the TKS System in order to interpret the abbreviations.

One can access citation and other data from the Raw-Citation option (different table types which can be seen by using the "Detail" and "Master" options available in the Perform screen).

.84
TKS-MAIN ABSTRACT FIND-DATA FIND-CITATION-DATA: Data-Add
The addition of this option to the menu provides a ready means of adding citation data to a partially completed system entry. With this option, it is not necessary to exit out to the "Add" option in order to add citation information.

Please note that one cannot finish a partially commpleted data screen using "Data-Add." In order to do that one must first "Find" the entry of interest and then "Update" it via the BROWSE menu.

.90
TKS-MAIN ABSTRACT FIND-DATA FIND-CONTENT: PaperOverview
If a match is found after selection of "PaperOverview," then the stated purpose, implied purpose, paper class and number of study designs will be shown if they were all previously entered. If no match is found, and citation data has been entered, one is given the option to add these parameters to the citation.

.91
TKS-MAIN ABSTRACT FIND-DATA FIND-CONTENT MATERIALS-METHODS: Design
Selection of this option provides a means to search for the experimental design attributes of a pecific paper. This includes such things as the type of study, whether or not controls were used, how experimental groups were compared and assigned, and the number of subject groups and regimens.

One can search for a specific citation or any parameter associated with the data fields. The system will perform multiple matches, that is, you can enter several attributes and the system will search for designs which match all of the specifications.

Move through the data fields using the "return" or cursor keys.

.92

TKS-MAIN ABSTRACT FIND-DATA FIND-CONTENT MATERIALS-METHODS: Subjects

Selecting "Subjects" brings up a blank subject screen and allows a search for a specific citation's subject(s) data If a match is found, the subject data for each group can be examined and modified, if needed. If a match is not found, but the citation data is, subject data can be added via "Add-Data" in the FIND-CONTENT menu.

You can specify several subject features and the system will search for subject groups which match all of the specifications.

Move through the data fields using the "return" or cursor keys.

.93

TKS-MAIN ABSTRACT FIND-DATA FIND-CONTENT MATERIALS-METHODS: Regimens

Selecting "Regimens" brings up a blank regimen screen and allows a search for a specific citation's regimen(s) or citations which have specific regimen attributes. If a match is found, the regimen data for each group can be examined and modified, if needed.

If a citation is found which is missing regimen data, it can be added via "Add-Data" in the FIND-CONTENT menu.

Move through the data fields using the "return" or cursor keys.

.94

TKS-MAIN ABSTRACT FIND-DATA FIND-CONTENT MATERIALS-METHODS: Links

Links define the relationships between the exposure groups, design factors, subject characteristics and regimen parameters. By using the citation or file number, one can locate the links for a specific citation, as long as they are already in the system. Once found they can be updated (modified), or deleted. If not present, they can be added to the system via the Add-Data option in the FIND-CONTENT menu.

.95

TKS-MAIN ABSTRACT FIND-DATA FIND-CONTENT: Add-Data

When attempting to locate a specific portion of a paper (Design, Subject Group, Regimen, etc.), one may get a message that it doesn't exist. If the document is at hand, the missing item(s) can be added using the Add-Data option. Without this capability in the FIND-CONTENT menu, one would have to exit out to the ABSTRACT menu and select the Add path.

.96

TKS-MAIN ABSTRACT FIND-DATA FIND-CONTENT RESULTS: ClinicalFindings

This option allows one to locate the clinical findings associated with a citation. When found, they may be edited or deleted. If not present, they may be added via Add-Data in the FIND_CONTENT menu.

.97

TKS-MAIN ABSTRACT FIND-DATA FIND-CONTENT: Ugly-View

This option is used by the system programmers.

.98

TKS-MAIN ABSTRACT SELECT-FILE-BY ADD-DATA ADD-CONTENT: Results

"Results" refers to Clinical Findings, which can be accessed via this menu choice.

.99
TKS-MAIN ABSTRACT FIND-DATA FIND-CONTENT: Materials-Methods
Selecting this option brings the user to a menu of the same name which provides access to design, subject, regimen and link data.

.-1 tkscit.4gl HELP MESSAGES

.100
CITATION DATA SCREEN: Source
You are asked for the journal (or book) "source code" which is a 5 digit number with a "J" (or "B") prefix. Make sure you begin with a "J" or "B" prefix!! (Please note that if you make a mistake, the "Back Space" key can be used. If you wish to abort an entry, use the "Del" [delete] key.)

You are not likely to know the source code for a particular journal, so the system provides help. (Hit the F5 key [function key 5] if your entry is a journal or the F6 key if it is a book.)

.101
CITATION DATA SCREEN: File Loc.
"File Loc." is an abbreviation for file location. This provides a way to indicate where a specific file may be located, and is particularly useful when files may be stored in several different locations. If one wants to locate a particular file, the TKS CITATION DATA SCREEN can be used to identify where to look (hopefully, it will be there).

Abbreviations can be set-up for particular places or names of individuals, since there is space for only 6 characters. Type in the location of the citation or book and hit "return."

If you do not wish to use this option, hit "return" to move to the next entry point.

.102
CITATION DATA SCREEN: Volume/Chap
Enter the volume of the journal or the number of the book chapter from which the article was taken, then hit "return" to move to the next field.

.103
CITATION DATA SCREEN: Pages
Enter the beginning page number followed by a "return," and the ending page number and "return." If there is only one page, skip the second field by hitting "return."

.104
CITATION DATA SCREEN: Year

Enter the year in which the citation was published, using all four digits, then "return." If you are not in a hurry, try entering just the last two digits of the year then return. See what happens? An error message will occur if the year entered is less than 1000 or greater than the current year.

Completing this field correctly provides the program with the final bit of information necessary to construct the citation number ("Citation No"), which appears after the "return." This consists of the journal source code (6 spaces), the volume or chapter number (4 spaces), the beginning page number (5 spaces) and the year (four digits). All items must be separated by hypens (e.g. J00001-0001-00001-1988).

The Citation No. can be used to locate files in other environments (Paper overview, Subject, Regimen, Links, etc.). When used in this

manner, the number must include characters in all of the spaces allotted, meaning that zero's should be used to fill in blank characters at the beginning of the field. Each field is separated by a hypen (e.g. J00001-0001-00001-1988).

.105
CITATION DATA SCREEN: Title

Enter the title of the article (type in small case) with no period. There is room for even lengthy titles. They will not automatically wrap around the alloted space. As a result, words may be split at the end of lines. Do not try to override this feature.

The program does not correct spelling, so check your entry. Once the title is complete so is this screen, so hit "Esc," which causes what you typed to be written to memory.

.106
TKS-MAIN ABSTRACT FIND-DATA J-LIST: Find.1
JLIST DATA SCREEN

This option is used to help locate the proper source code for the journal in which the article you are abstracting appeared.

Select "Find" and type in what you believe the correct abbreviation would be for that journal. As an example, type TOXICOL APPL PHARM and hit the "escape" key (Esc). The program searches for a match.

NOTE: Return to this help message after trying the above. Do not look at the second screen of this help message now. If you elect to try this, keep refering to the help messages or the hardcopy of the program documentation.

TKS-MAIN ABSTRACT FIND-DATA J-LIST: Find.2
JLIST DATA SCREEN

As you can see, sometimes a match is not found. When this occurs you can try another series of letters or use an aid such as a "wild card" (*). Try typing in "TOX*" and then "return." Note that this time the system found a match, and the correct abbreviation is "TOXICOL APPL PHARM." Notice also that there are several other potential matches. Use the up and down arrow keys to move through the list until you come to the selection you desire.

Hit "Esc" to exit from that window and bring you back to the abstract window, where the system automatically enters the correct journal source code!

.107
TKS-MAIN ABSTRACT FIND-DATA FIND-CITATION-DATA J-LIST: Add JLIST DATA SCREEN

This option is used to add new journals to the source code list and assign them a source code number.

Type "a" and the TKS JOURNAL LIST SCREEN pops up with the cursor on the "Journal Name" field.

.108
TKS-MAIN ABSTRACT FIND-DATA FIND-CITATION-DATA J-LIST: Select JLIST DATA SCREEN

This option can be used after you have a list of journal abbreviations from which one must be selected. Its use requires that you hit delete after a list is generated, and then hit "Select," after which the user must highlight the desired abbeviation, and hit "Esc" as requested on screen.

Note that the same process can be accomplished with fewer steps using the "Find" option.

.109
TKS-MAIN ABSTRACT FIND-DATA FIND-CITATION-DATA B-LIST: Find.1 BLIST DATA SCREEN

This option is used to help locate the proper source code for the book in which the article you are abstracting appeared.

Select "Find," type in what you believe the correct abbreviation would be for that book and hit the "Escape" key (Esc). The program searches for a match.

If you elect to try this, keep refering to the help messages or the hardcopy of the program documentation.

TKS-MAIN ABSTRACT FIND-DATA FIND-CITATION-DATA B-LIST: Find.2 BLIST DATA SCREEN

Sometimes a match is not found. When this occurs you can try another series of letters, or use an aid such as a "wild card" (*). Try typing in a portion of the title, add a "*" and then hit "return."

If there are several matches, use the up and down arrow keys to move throught the list until you come to the selection you desire.

Hit "Esc" to exit from that screen and bring you back to the abstract window, where the system automatically enters the correct journal source code!

.110
TKS-MAIN ABSTRACT FIND-DATA FIND-CITATION-DATA B-LIST: Add

This option is used to add new books to the source code list and assign them a source code number.

Type "a" and the TKS BOOK LIST screen pops up with the cursor on the "Book Title" field.

.111
TKS-MAIN ABSTRACT FIND-DATA FIND-CITATION-DATA B-LIST: Select

This option is to be used after you have a list of book abbreviations from which one must be selected. When this is the case, choose this option, highlight the desired abbreviation, and hit "Esc" as requested on screen.

The same process can be accomplished with fewer steps using the "Find" option.

.112
CITATION DATA SCREEN: Citation No.

Typing "return" again, fills in the "File No." field automatically. It consists of the first four letters of the first author's last name, the journal or chapter number, the beginning page number and last two digits of the year. This number may also be used to find the file after it is entered into the system. It does not consist of extra characters or spaces. There are periods separating portions of the entry (e.g. SMIT.10.23.1988)

If the citation you are attempting to enter is already in the system, you will receive notification of that fact. You may make changes in a file that is already in the system, but not from the "New" citation pathway.

If the citation is a new one, "Exit" back to the "ABSTRACT" window and begin the entry process. If the citation is not in the system, hit "retrun" to move to the title entry field.

.170
TKS-MAIN ABSTRACT FIND-DATA FIND-CITATION-DATA BROWSE:

FIND-CONTENT MATERIALS-METHODS
FIND-CONTENT RESULTS
VOCABULARY JOURNAL-VOCABULARY
VOCABULARY BOOK-VOCABULARY
VOCABULARY KEYWORD-VOCABULARY
SIGN-VOCABULARY

Next, Previous, First, Last

The BROWSE menu appears as a result of a search process. It provides mechanisms for moving between components when more than one is found (Next, Previous, First and Last) a method for changing entries (Update), removing components (Delete), performing another search process (Query-Again) and exiting from the BROWSE menu (Exit).

.171
TKS-MAIN ABSTRACT FIND-DATA FIND-CITATION-DATA BROWSE: Update

FIND-CONTENT MATERIALS-METHODS
FIND-CONTENT RESULTS
VOCABULARY JOURNAL-VOCABULARY
VOCABULARY BOOK-VOCABULARY
VOCABULARY KEYWORD-VOCABULARY

SIGN-VOCABULARY

The "Update" option provides a means for changing any component in a window and, hence, the database entry. This is necessary when a component has been incorrectly or incompletely entered.

"Update" allows you to add or delete data. To add data to the end of a list, scroll through it using the down arrow key until an empty author field is reached. Then, type in the data followed by an "Esc."

If you have a list of data and need to place an entry in the middle of a list, put the cursor on the line below where you would like it added and hit the "F1" key. A new line will be opened and you can type in the new entry followed by an "Esc," which will write it to memory.

To delete an entry you must place the cursor on the line you would like to delete and hit the "F2" key. The line will be deleted, and after an "Esc," the changes will be written to memory.

.172
TKS-MAIN ABSTRACT FIND-DATA FIND-CITATION-DATA BROWSE: Delete
This is a particularly powerful option which should be used carefully. When selected, the DELETE-JOURNAL-CIT menu comes up.

.174
TKS-MAIN ABSTRACT FIND-DATA FIND-CITATION-DATA BROWSE DELETE-JOURNAL-CIT: (Overview)
"Options"
The DELETE-JOURNAL-CIT menu comes up with options to delete a single screen (This-Table) or all screens linked to that citation (All-Tables).

(Hit "return" or "s" to see the help file for "This-Table")

TKS-MAIN ABSTRACT FIND-DATA FIND-CITATION-DATA BROWSE DELETE-JOURNAL-CIT: This-Table
Selecting this option will remove from the database all the data shown on-screen and return the user to the BROWSE menu.

.175
TKS-MAIN ABSTRACT FIND-DATA FIND-CITATION-DATA BROWSE DELETE-JOURNAL-CIT: All-Tables
Selecting this option will remove from the database all of the data shown on screen and all of the data associated with all other screens for this citation (e.g., Paper Overview, Design, Subjects, Regimens, Links, Clinical Findings, Comments, etc.).

The program gives a message on-screen each time a component has

been removed. You can neither reverse the process once it has started nor recover the data once it has been removed.

When the delete process is finished, the user is returned to the BROWSE menu.

.176
TKS-MAIN ABSTRACT FIND-DATA FIND-CITATION-DATA BROWSE: Query-Again

If you would like to perform another search this option will allow immediate access to the screen for entry of another search parameter without having to exit out all the way back to the "Find" option in the ABSTRACT menu.

.-1 tksauth.4gl HELP MESSAGES

.200
AUTHOR DATA SCREEN

Enter the last name, a space and initials (no space between initials) of the first author as requested in the note on the bottom of tthe screen. Hit "return" and the cursor moves to the "sequence" area where you can enter the correct position of the author in the sequence of names on the publication. You can add up to six names to the author list.

When you are finished, hit "Esc" once again. This writes to memory the author list and the keyword screen pops up.

.205
TKS-MAIN ABSTRACT FIND-DATA FIND-CITATION-DATA BROWSE: Delete (Authors)

This is a particularly powerful option which should be used carefully. When selected, a question pops up asking if you would "like to Delete ALL author entries for this Citation." Respond (y for yes, n for no) and hit "return."

If you need to delete one (or fewer than all of the entries) use the "Update" option. Scroll through the author list using the cursor keys, and use the "F2" key to delete a specific author.

.-1 tkskey.4gl Help Messages

.300
TKS-MAIN ABSTRACT: KEYWORD DATA SCREEN (Overview)

Hit "return" TWICE to go directly to the help for KeyCodes.

KeyCodes and Keywords can be used to enter specific information on any aspect of a paper. Clinical signs, physical signs, gross pathology, clinical pathology and histopathology findings, toxin preparation methods, animal treatment information, statistical

analysis or any other similar component of a report.

Keywords provide more than ancillary information. They can be used to search for certain papers that meet particular criteria. Which papers report effects of toxin X in monkeys? Who gave feed contaminated with purified toxin? Cultured extracts? Which papers reported the use of fasted mice and which allowed access to food up until the time of dosing? Do young animals react differently than older ones?

KeyCodes are used to simplify the entry process by decreasing the number of keystrokes needed to enter a description.

The current keycodes were designed primarily for use with journal or book articles describing toxicologic studies with mycotoxins, though they would be suitable for describing work with other toxins. They are arranged by major headings (toxin type, species, exposure route, etc.)

NOTE TO USERS! This portion of the program is under development. We are exploring "cleaner" easier ways to enter and use keywords. We would prefer that the program excerpt pieces of data that are entered as part of the other data modules and generate its own keyword list rather than the user having to look up what keycode goes with each keyword. This will take some effort. Until hat is possible, what is currently available can be used.

Hit "return" to go directly to the help for KeyCodes.

KeyCodes

Enter the appropriate keycode(s) and hit "return." The keywords now appear to the right. Hit "Esc" to write them to memory.

If you do not wish to enter keycodes/keywords at this time, hit the "delete" key.

Since you probably do not know what the keywords are, enter a code of "C02" and press "return." The keyword matching that code is placed in the next field. If one knows the keywords, this is the quickest way to enter them. It may be useful to have a hard copy of the lists in order to look them up "manually" by major heading and group. If an incorrect entry is placed in the keycode field followed by a "return," or you hit the "delete" key, the program assumes you need help, and brings up the KEY-LIST SCREEN.

When you are finished with the KEYWORD DATA SCREEN the next screen has a menu title of "CURRENT PAPER" and has only one option, "Exit." That is because you are finished with the citation portion of the abstract and must begin the next phase of data entry. Hit "E" or "return" to go on. You are then asked if you would like to "add content data for the paper."

If you type "n" then "return," the system goes back to the "Abstract" screen. Typing "y" followed by "return" results in a new screen which begins the paper overview process.

.B 301
TKS-MAIN ABSTRACT FIND-DATA FIND-KEYWORDS-NOTES: Keywords

This pathway provides a means of listing all the keywords that have been entered for a particular citation. The screen comes up with the cursor on the Citation field and a message asking you to "Enter search criteria and hit ESC to search." Provide the citation number (or the Citation file number) and hit "Esc." If the citation exists in the system, and if keycodes/keywords were assigned, they will appear.

Watch for messages on-screen that will indicate what you should do. Typically a message will come up asking you to hit "Esc" to continue, after which a "BROWSE" menu will appear. There are on-line help messages available for that menu.

.302
TKS-MAIN ABSTRACT KEY-LIST: Find

The "Find" option helps you search for particular keywords that are in the keyword list, and identifies their associated keycode.

The following is an example:

Type "f" and the cursor is placed on the first field (keycode). Hit "return" and the cursor goes to the next field. Type in the word "mouse" and hit "Esc." The program searches for that keyword and, if it is found, fills in the keycode number. One can complete those two fields for the paper being abstracted by hitting "Esc" once again. From there the process starts over for the next keyword. (The process can be aborted by hitting the delete key unless "Exit" is available in the menu.)

If a keyword s searched for but not found, the program responds with the message that "There is no keyword matching the first three letters" and returns you to the original screen. If that occurs and you would like to add a keyword to the list, select "Add" in the KEY-LIST menu.

.303
TKS-MAIN ABSTRACT KEY-LIST: Add

The "Add" option allows the freedom to associate new or additional keywords with a citation. If you do not wish to enter keywords at this time, hit the "delete" key when you are in the KEYWORD DATA SCREEN. (If you follow this later path, the screen indicates that it is preparing citation "information.")

.305
TKS-MAIN ABSTRACT FIND-DATA FIND-CITATION-DATA FIND-KEYWORDS-NOTES
BROWSE: Delete (Keywords)

This is a particularly powerful option which should be used carefully. When selected, the user is asked if they would like to "Delete ALL keyword entries for this Citation." Respond (y for yes, "n" for no) and hit "return."

Delete removes ALL of the keywords. If you need to delete one (or fewer than all of the entries) use the "Update" option.

-.1 tkspapovr.4gl Help Messages

.400
PAPER OVERVIEW SCREEN: Stated Purpose

There is room here to succintly identify the stated purpose of the paper or book. That is, the purpose as stated by the authors. There are 50 spaces. Type in the stated purpose followed by "return."

.401
PAPER OVERVIEW SCREEN: Implied Purpose

One can often identify information which hints at a purpose not specifically stated. For example, researchers may study the effects of an expensive toxin on mice, because they do not have enough material to use on a larger animal that may be more closely related to the target population, people. Or, the long term effects of a toxin such as cadmium may be the primary interest, but animals were only fed contaminated diets for 2 weeks because they developed a viral infection and began to die.

Type in the implied purpose followed by "return." If there is none, leave it blank (hit "return").

.402
PAPER OVERVIEW SCREEN: Paper Class

Select one of the descriptors from the pop-up menu on the right side of the screen by typing the indicated letter in the space provided.

Paper Class; First Field (hit "return" TWICE to see the second field help)

E= Experimental: Includes documents which report the results of experiments which have been performed. This category includes both in vivo and in vitro studies.

N= Non-Experimental: Documents in this category may include the following:

1. Clinical case reports which detail circumstances of exposure, results, effects of treatment on the outcome, and suggestions for preventing future exposures.

2. Epidemiology reports which look at causes and effects in either a retrospective or prospective direction.

I= Info Only: These may include literature reviews or comments such as letters to editors.

C= Combination: As the name suggests, this category includes documents which contain more than one type of paper class.

When you complete that field the cursor moves to the next one and the descriptors change. Enter the appropriate classification and the cursor will move to the next field.

Hit "s" or "return to view the help for the second field.

.412
Help 412 Paper Class Choices; Second Field

E10= Toxicity: Refers to the study of the toxic effects of compounds or agents, either in vitro or in vivo.

E20= Mechanisms: The report defines, or is in some way related to, the molecular mechanism(s) of action of the compound.

E30= Kinetics: Related to the pharmacodynamics of a toxic compound or an agent used in treatment.

E40= Treatment: The document reports the effectiveness of one or more therapeutic agents in treating a toxicosis induced by an agent.

E50= Pharmacol: Involves drugs; their actions, toxicity, and effectiveness.

E60= Chemistry: The document is primarily one which is associated with the chemistry of a compound. This category is further broken down into the following:

E61= Analysis: Includes detection, and new methods of detection.

E62= Synthesis: Includes the synthesis of radiolabelled compounds, metabolites and cogeners.

E63= Purific.: Deals with the purification of a compound involving new methods of isolation, improved yields, etc.

N10= Case Report: (described above)
N20= Epidemiology: (described above)

I01= Review: (described above)
I02= Comment: (described above)

C01= Case+Review: (described above)

.403
PAPER OVERVIEW SCREEN: Number of Study Designs in Paper
This may be simply stated in the manuscript, but more often you will have to carefully check the material and methods section (and sometimes the Results and Discussion) to determine the number of designs used in the experiments described. Usually there will be a single study design for each particular question or hypothesis.

Defining the study design goes hand in hand with determining the questions being asked. Good researchers will specifically state their hypotheses and this, in turn, will help you in entering their paper into the database.

You may use the arrow keys or the "return" key to cycle through portions of this screen if the need arises. You might think of a better way to express the implied purpose, or you may have made an error that needs to be corrected.

Remember, useful keys for correcting mispellings are the "Control-x" sequence to erase a letter in an entry, and "Control-a" to insert characters.

Enter the number of designs and hit "Esc," since you are done with this screen. The STUDY DESIGN DATA SCREEN comes up next.

.404
Paper Overview Browse: Delete

Selecting this option will bring up the question "Do you want to delete this paper overview? (y/n)" Type in the appropriate letter and hit "return."

.405
THERE ARE MORE DESIGNS THAN INDICATED: Cancel

In the PAPER OVERVIEW SCREEN there is a field for indicating the number of designs described in this paper. If you attempt to "Add" paper overview data to a citation which already has it you will be given the opportunity to "Update" that data. You can also "Update" that information by following the "Find" path and choosing the "Update" option from the BROWSE menu.

If you update the number of designs to a lower number, the system recognizes that either an error was made in entering the new number, or design data needs to be deleted from the records.

"Cancel" is the option which provides a means to go back to the overview screen and change the number of designs if an error was made during the update.

.406
THERE ARE MORE DESIGNS THAN INDICATED: Delete Design

In the PAPER OVERVIEW SCREEN there is a field for indicating the number of designs described in this paper. If you attempt to "Add" paper overview data to a citation which already has it, you will be given the opportunity to "Update" that data. You can also "Update" that information by following the "Find" path and choosing the "Update" option from the Browse menu.

If you update the number of designs to a lower number, the system recognizes that either an error was made in entering the new number, or design data needs to be deleted from the records.

"Delete-Design" provides a mechanism to search for and delete the designs you wish to remove.

.407

DELETE_PAPER: Paper-Only

Using this option you will delete ONLY the Paper Overview portion of this citation abstract, NOT other data tables linked to it such as designs, subject information, regimens, etc.

You can correct information in the PAPER OVERVIEW SCREEN by doing an "Update," which can be accessed via "find"ing the citation and choosing "Update" from the BROWSE menu.

.408

DELETE_PAPER: All Links

In choosing this option, you will delete not only the information in the PAPER OVERVIEW SCREEN, but also all the data tables linked to it, such as designs, subject information, regimens, clinical findings, etc.

.409

DELETE_PAPER: DO YOOU REALLY WANT TO DELETE ALL CONNECTED TABLES? (No)

This is a safequard against accidentally removing data that someone worked hard to place in the database.

Using this option, which has such broad deletion powers, suggests that there are major problems with the data as entered. The most efficient approach to correcting them is to delete nearly all of the data and start over.

Type "n" followed by "return," if you do not wish to delete all of the tables. Type "y" followed by "return," if you do.

.410

DELETE_PAPER: DO YOOU REALLY WANT TO DELETE ALL CONNECTED TABLES? (Yes)

This is a safeguard against accidentally removing data that someone worked hard to place in the database.

Using this option, which has such broad deletion powers, suggests that there are major problems wth the data as entered. The most effecient approach to correcting them is to delete nearly all of the data and start over.

Type "n" followed by "return," if you do not wish to delete all of the tables. Type "y" followed by "return," if you do.

.411

Which of the design should be deleted?

Below this statement on the data scren are one or more lines representing the design number (left margin), the number of subject groups and regimens in that design, and whether or not control groups were included.

If the numbers are not sufficiently descriptive, you need to go to the "Find" option in the ABSTRACT menu and follow the path to find the design you wish to delete. This method will allow you to directly visualize the data in the design (and potentially theother data tables linked to it). A BRJOWSE menu is available when a data table is foound, and "Delete" is an option in that

menu.

You can abort this process, even at this late stage, by using the "delete" key as your response.

.-1 tksdsgn.4gl Help Messages

.500
STUDY DESIGN DATA SCREEN: Type of Study
Enter a selection from the menu to the right by typing the corresponding abbreviation followed by "return."

Note: You an move through the different fields in this screen by using the arrow and/or return keys. This is particularly useful if you find that an error has been made and you need to edit a previous field.

The type of selection screen which comes up after an entry depends on the response in a previous field. For example, if you indicated earlier in the OVERVIEW screen that the paper being entered was and "Info only" paper," then you wouldn't have been able to indicate there were study designs, since those sorts of papers do not generally include experiments (experiments shcould have designs).

With the current screen, if you do indicate that there are no controls, you won't be able to enter the fields from "comparison Info" on down.

{Do we want to enter stycitfile, dsgncur, dsgntot, dsgncew, dsgntr1??(?}

.501
STUDY DESIGN DATA SCREEN: In Vivo or In Vitro
Again, select from the menu to the right and type in the appropriate classification, followed by a "return."

.503
STUDY DESIGN DATA SCREEN: Controls (y/n)
Enter "y" if negative controls were used in the experimental design and "n" if they were not (followed by "return").

.504
STUDY DESIGN DATA SCREEN: Comparison Info
If the answer to the above is "y," then you will be able to enter information in this and following fields. Type the correct letter from the pop-up menu and hit "return."

.505
STUDY DESIGN DATA SCREEN: Comparison Methods

Type the appropriate letter and number followed by "return."

.506
STUDY DESIGN DATA SCREEN: Control Methods
Type the proper letter (no return necessary).

.507
STUDY DESIGN DATA SCREEN: Control Types
Type the correct letter and then "return."

.508
STUDY DESIGN DATA SCREEN: How were subjects assigned to their groups?
Type the appropriate letter followed by a "return."

.509
STUDY DESGIN DATA SCREEN: Number of Subject Groups
Examination of the report is necessary to determine the appropriate response here. Please note that the number of subject groups encompassing the current design should be entered here (not the total number of subject groups for the entire report)! Enter the number followed by "return." This brings up the first "SUBJECT GROUP DATA SCREEN." It will be followed by additional similar screens if you indicated that there are multiple subject groups. Hit "return" to automatically enter the Citation No. and move the cursor to the first data field.

.510
STUDY DESIGN DATA SCREEN: Number of Exposure Regimens
An exposure regimen encompasses the different types of treatments that have been given. For example, giving a different dose or a longer exposure would constitute a different regimen. Enter the number followed by "return."

.511
BROWSE: Delete this entry from database
The delete option provides different capabilities for different components of the TKS system. The "design" delete function allows deletion of the design screen shown on-screen, as well as all "tables" linked to that design.

.512
BROWSE: Query-Again
If you would like to perform another search this option will allow immediate access to the screen for entry of another search parameter without having to "Exit" all the way back to the "Find" option in the ABSTRACT menu.

You may search for any single entry (such as the citation number or type of study), or use several fields of interest (e.g., Type of Study and In Vivo) to further narrow down the potential matches. In addition, wild cards (*) can be used to help compensate for some differences in terminology.

.513
DELETE-DESIGN: Design Only
Selecting "Design Only" will cause only the design shown on-screen

to be deleted. The remaining "Links" such as the subjects and regimens will be left intact. If one wishes to delete all associated links along with the current design, choose the option "All Links."

.514
DELETE-DESIGN: All Links
If you choose "All Links," the current design, as well as all subjects and regimens linked to it will be deleted. If you only want to delete the current design (the one shown on screen), use the option "Delete Only."

.515
DELETE-DESIGN: ARE YOU REALLY SURE.....: (No)

.516
DELETE-DESIGN: ARE YOU REALLY SURE.....: (Yes)

.-1 tkssgro.4gl HELP MESSAGES

.600
SUBJECT GROUP DATA SCREEN: Group [ ] of [ ] of design [ ].
The screen indicates which group of the design you will entering, the total number of groups, and which particular design.

The designation for the first group (they are assigned sequential numbers) comes up automatically. Hit "return" to go to the "Source" field. If you would like to enter subject data for some other group, enter its number designation followed by "return."

The next two fields are bracketed differently than the others. You cannot change them because they were derived from the design screen. Therefore, a "return" after "Group" brings the cursor to the "Species" field where the common name of the animal used can be entered. Another "return" places the cursor in the "Breed" field.

.601
SUBJECT GROUP DATA SCREEN: Exposure Group
Note that to the right of this heading and the subsequent fields is a statement ExpoGrp < > of < >. These two fields will be filled in and the system usually begins with exposure group 1 of however many groups there are.

The designation for the first group (they are assigned sequential numbers) comes up automatically. If you would like to enter subject data for some other group enter its number designation followed by "return." Note that the next two fields are bracketed differently than the others. You cannot change those fields in this screen because they were derived from the design screen.

Therefore, a return after "Group" brings the cursor to the "Species" field where the common name of the animal used can be entered. "Return"s move you through the screen.

.602

SUBJECT GROUP DATA SCREEN: Source

The "Source" field is meant to be used to identify where the animals came from.

.603

SUBJECT GROUP DATA SCREEN: Number

"Number" refers to the number of animals in the group.

.604

SUBJECT GROUP DATA SCREEN: Sex

The following are suggested abbreviations for "Sex:" F for female; S for a neutered female; P for a pregnant animal; L for a lactating one; M for male; C for a castrated male; and B for both male and female. The program converts lower case letters to upper case so there is no need to use the shift key. There are four spaces in the field so it is possible to use some combinations. If all four spaces are filled, the cursor jumps to the next field.

.605

SUBJECT GROUP DATA SCREEN: Age

Animal age can be represented in any form using numbers in the first field and units of time in the second (when the cursor is in the second field a note at the bottom of the screen requests that units be entered).

We recommend that the age of the subject at the time of study initiation be placed in this field. Since the duration of the study is given in the EXPOSURE REGIMEN DATA SCREEN, the user can calculate the age of the subject at the time of evaluation if it is not specifically given.

.606

SUBJECT GROUP DATA SCREEN: Weight

Subject weights may be entered in any form. Usually they will conform to the article format. The first field is for a number and the second for the units (as indicated by the message at the bottom of the screen when the cursor is in the second field). Metric units are preferred, and in fact, the program converts all entries to a metric format.

The question arises, "what do you enter, a range of weights or a mean, or individual weights?" Currently, there is no provision for providing either individual weights when more than one animal is used, or a range of values. Provide the mean, or an estimate of it.

.607

SUBJECT GROUP DATA SCREEN: Height

As for the above, the first field should be a number and the second a unit of measure. Suggested abbreviations are indicated.

.608
SUBJECT GROUP DATA SCREEN: Occupation
Papers involving people will often provide their occupations.
There are twenty spaces available for this entry.

.609
SUBJECT GROUP DATA SCREEN: Health Status of Subjects
If this is not reported in the publication, leave the space blank, or indicate that no information is available (type in "UNKNOWN"). If it is, try to indicate the status in the space provided or type a more lengthy comment in the comment section and indicate in this field. (THIS COMMENT SECTION IS NOT YET READY FOR USE.)

.610
SUBJECT GROUP DATA SCREEN: Number of Exposures Received
This field can provide more information than just whether there was a single or multiple exposure. What frequently arises is "What about constant exposure diet?" We suggest that this be handled by typing "INDIET" in the spaces provided. Again, special remarks can be made in the comment section.

When the first subject screen is completed, typing return after the last entry will cause the next subject screen to come up. This is indicated by the "Group < >" designation. You can go back and forth between subject screens by using the up and down arrow keys.

.611
BROWSE: Delete this entry from the database
Selecting "Delete" from the BROWSE menu will result in the removal of the current subject group from the citation, and the database.

.612
BROWSE: Query-Again
TKS-MAIN ABSTRACT FIND-DATA FIND-CITATION-DATA BROWSE: Query-Again
If you would like to perform another search this option will allow immediate access to the screen for entry of another search parameter without having to "Exit" out all the way back to the "Find" option in the ABSTRACT window.

You may search for any single entry (such as Rat in the species field), or use several fields of interest (RAT, SPRAGUE-DAWLEY, FEMALE) to further narrow down the potential matches. In addition, wild cards (*) can be used to help compensate for some differences in terminology.

-1
R. Want to add statements for citfile, grp [ ] of [ ], etc?
see tkssubgrp.per

.-1 tksexgrp.4gl HELP MESSAGES

.700
EXPOSURE REGIMEN DATA SCREEN (Overview)

A "return" will fill in the "Citation No." field. Again, you can identify where you are by looking at the description under "Citation No." which tells you how many regimens there are (based on what you typed in previously) and which one you are currently describing. As before, fill in the appropriate data by selecting from the options available at each field. You do not need to fill in every field, only those which are defined in the report. For example, if you indicate that there was only one exposure, then you need not fill in the field "every."

There is no set format for filling in these spaces, try to make the information as descriptive as possible. Filling in the entire field causes the cursor to roli over to the next one. If you do not entirely fill in a field, you must hit "return" to move to the next one.

When you fill in the last field, and assuming there are multiple regimens, the next screen is brought up with the cursor on the "Citation No." field. Hit "return" to fill it in. Once again, the up and down arrow keys enable you to move between the regimen descriptions.

When the regimen screen(s) is/are completed, the next design screen comes up and the cycle begins again. Please note that "return" will fill in the "Citation No." Hit "return" when the cursor moves to the "Group" field.

When all of the design, subject and regimen screens are complete, you can establish the proper links between them. This means placing them within the proper relationships so that, for example, the design for the rabbit portion of the study is properly related to the rabbit subject group and exposure regimen.

.701
EXPOSURE REGIMEN DATA SCREEN: Purpose for Exposure
This field is used for defining the reason for administering (or not administering, in the case of some control groups) the agent. Was it an effort to define some aspect of toxicity or evaluate a therapy? Determine pharmocodynamic characteristics such as plasma disappearance or metabolism (Other)?

.702
EXPOSURE REGIMEN DATA SCREEN: Agent
Enter the name, or a brief description of the agent described in the document. If it is unknown, you could use a description of the presumed agents' action such as "hepatotoxic agent" or "hemolytic agent."

.703
EXPOSURE REGIMEN DATA SCREEN: Dose
Dose refers to the quantity of the agent administered within a given period. Provide the amount and the units of measure.

With airborne exposures to gases and particulates, it is generally not possible to define the dose administered. Instead, the characteristics of the gas or particles, and the concentration, in conjunction with the duration of exposure, and sometimes the rate of breathing and tidal volume, are used to define the exposure.

.704
EXPOSURE REGIMEN DATA SCREEN: Formulation

Insert the numbers from the options provvided to the right, in the space provided.

The options should be largely self explanatory. "Slo_rel" is slow release formulation. "Concent" means concentrate, not concentration. A concentrate is a formulation which is added to a mix which dilutes it out.

.705
EXPOSURE REGIMEN DATA SCREEN: Route

Select the route of administration of the agent from the list provided. The abbreviations should be self-explanatory with the possible exceptions of IA and Bite-St. IA means intra-arterial and St means sting.

.706
EXPOSURE REGIMEN DATA SCREEN: Interval

This and the following field are designed to provide the user with a way to define multiple dosing protocols. If an agent is given every hour, q. 1h would define the interval. The q. is an abbreviation for "quaque" which is latin for "every." It can be used with minutes, hours or days. Everything typed in the Interval field is converted to upper case, so a "q" will be represented by "Q."

Currently, there is no direct mechanism for indicating unequal intervals in the EXPOSURE REGIMEN DATA SCREEN. The comment section could be used for this purpose.

.707
EXPOSURE REGIMEN DATA SCREEN: Duration

This field is to be used for indicating the length of time over which the agent was given. In the case of an IV injection it may be five seconds or 50 minutes, whereas an orally administered compound may be given every 12 hours for six months.

There are no predefined limits on how the information can be represented. The goal is to be as descriptive as possible.

.708
EXPOSURE REGIMEN DATA SCREEN: Administration Method

Indicate the method of giving the agent. The methods are numerous and there is enough space to include a brief description. Was it administered orally via a balling gun, IV via a Harvard infusion pump or as an aerosol by a Lovelace nebulizer? Was it a syringe/needle injection or dietary consumption?

.709
EXPOSURE REGIMEN DATA SCREEN: Scheduled Evaluation Time?

When will blood samples be taken or the animal killed for tissue collection? There may not be room to define some multiple evaluation schedules. Abbreviations that aren't criptic help, e.g. 2, 4, 6, 12, 24H & 2, 4, 7D (the spaces can be removed to offer more flexibility).

.-1 tksexpgrp.4gl HELP MESSAGES

.800
EXPOSURE GROUP LINK ENTRY SCREEN: (Overview)
The EXPOSURE GROUP LINK ENTRY SCREEN provides a means of storing the association of design, subject group, and exposure regimen with the subsequent results. This screen allows the user to form the associations, which then constitute an "Exposure Group." This process creates and stores a derived number and brief descriptions of the design, subject group, and exposure regimen for the "Exposure Group."

Hit "s" or "return" to see the Help for "Citation No."

EXPOSURE GROUP LINK ENTRY SCREEN: Citation No.
The "Citation No." can be filled in using "return" unless you are performing a search.

.801
EXPOSURE GROUP LINK ENTRY SCREEN: Exposure Group (first field)
"Exposure Group" is not asking you to give a number or letter for an exposure group per se. Rather, the first field is for indicating the design for which you are setting up links. The designs are listed and numbered in the middle of the screen. Use the number to the left of the "=" sign to designate the "Dsgn" choice.

Entering a valid design number (followed by "return") will cause the conditions you entered earlier for that design to pop up (in abbreviated form) next to "Dsgn" in the upper portion of the screen. Also note that an abbreviated form of each subject description appears mid-screen.

.802
EXPOSURE GROUP LINK ENTRY SCREEN: Exposure Group (second field)
The cursor is now at the second field where the number for the subject portion of the link can be entered. Select one of the numbers to the right of "Subj:"

Completing that field results in your selection appearing to the right of the "Subj:" heading below. The choices of regimens described previously are now in the middle of the screen, and the cursor is on the "regimen" field.

.803
EXPOSURE GROUP LINK ENTRY SCREEN: Exposure Group (third field)
Select the correct regimen number from those appear to the left

of the "=" sign. Completing this field causes the final field in the "Exposure Group" row to show the abbreviations of the previous three fields with the number of the design (D), subject (S) and regimen (R) linked.

.804
EXPOSURE GROUP LINK ENTRY SCREEN: ExpoGrp (second field)
The cursor is now on the last field of "ExpoGrp < > of < >." This number should match the number of total exposure groups for the design. If the number is incorrect, enter the correct number, followed by "return."

Hit "return" until the fields clear (and the citation number is filled in) and the cursor is on the first field to the right of "Exposure Group" as above.

The process now begins again for the next subject group for the first design. Repeat the steps as described above.

When the first design is complete, and the cursor is on the first field to the right of "Exposure Group," enter 2 for the second design number and repeat the entry steps until all associations are entered for each design, exposure group and regimen.

.805
BROWSE: Delete this entry from database
Select this option when you wish to remove the Link data.

.806
BROWSE: Query-Again
TKS-MAIN ABSTRACT FIND-DATA FIND-CITATION-DATA BROWSE: Query-Again
If you would like to perform another search this option will allow immediate access to the screen for entry of another search parameter without having to exit out all the way back to the "Find" option in the ABSTRACT menu.

You may perform a search using any single entry, or several fields of interest, which will narrow down the potential matches. In addition, wild cards (*) can be used to help compensate for some differences in terminology.

.-1 tksvoc.4gl HELP messages

.900
TKS-MAIN VOCABULARY JOURNAL-VOCABULARY: Add
Selecting "Add," puts the cursor on the "Journal Name" field of the JOURNADD DATA SCREEN. Type in the journal name as given in the National Library of Medicine List of Journals Index. Hit "return" until the "Journal Abbreviation" field is reached and enter the appropriate abbreviation as given by that Index. Hit "Esc" and the journal is assigned a Journal Code Number. The numbers are unique to each journal, and assigned sequentially.

.901

TKS-MAIN VOCABULARY JOURNAL-VOCABULARY: Find

Selecting "Find", puts the cursor in the "Journal Code" field of the JOURNADD DATA SCREEN. More commonly you will need to use the "Journal Name" field, so hit "return" to place the cursor there and type in the EXACT name of the journal (see below). Hit "Esc," in order to find its journal code.

If you typed the name correctly and it is already in the system, the remaining information for that entry is now provided on screen. If there is no match, check your spelling and title. If they are correct, and there is no match, you will have to enter it as a new journal via the "Add" feature. Go back to the JOURNAL-VOCABULARY screen and follow the "Add" path.

You do not have to type in the whole name of the journal, you can use the first few letters of the first word or the first word or two and a "wild card" symbol (*). For example, type in "American*" and hit "Esc." The message at the bottom left corner of the screen tells you how many matches were found. Increasing the length of the search pattern will decrease the number of matches you obtain.

You can now "cycle" through the matches by using the first four options indicated in the BROWSE menu near the top of the screen.

.903

TKS-MAIN VOCABULARY KEYUWORD_LISTING: Add

The ADDKEYS DATA SCREEN provides a mechanism for adding keywords to the system list of keywords, and assigning them a keycode.

.904

TKS-MAIN VOCABULARY KEYWORD_LISTING: Find

This option provides a mechanism for locating keywords and their associated keycodes.

.906

TKS-MAIN VOCABULARY BOOK-VOCABULARY: Add

Selecting "Find," puts the cursor in the "Book Code" field of the BOOKADD DATA SCREEN. Fill in the title and other fields and hit "Esc." The book is assigned an "Aquisition" and Code" number and is entered into the system.

.907

TKS-MAIN VOCABULARY BOOK-VOCABULARY: Find

Selecting "Find," puts the cursor in the "Book Code" field of the BOOKFIND DATA SCREEN. More commmonly you will need to use the "Book Title" field, so hit "return" to place the cursor there and type in the EXACT title (see below). Hit "Esc," in order to perform the search. You can, of course, use any or all of the other descriptive fields in the search process if you wish.

If you typed the title correctly and it is already in the system, the remaining information for that entry is now provided on screen. If there is no match, check your spelling and title. If they are correct, and there is no match, you will have to enter it as a new book via the "Add" feature. Go back to the BOOK-VOCABULARY menu and follow the "Add" path.

.908
BROWSE: Delete (Journal)
Selecting this option will enable you to delete the current on-screen journal from the master system list. Once selected, there is one more query to which you must respond before the journal is deleted from the list.

BROWSE: Delete - Are you sure you want to delete this Journal? (y/n)
Typing a "y" will delete the indicated journal from the master system list. Typing "n" will return you to the BROWSE menu.

.909
BROWSE: Delete (Book)
Selecting this option will enable you to delete the current on-screen book from the master system list. Once selected, there is one more query to which you must respond before the book is deleted from the list.

.910
BROWSE: Delete (Keyword)
Selecting this option will enable you to delete the current on-screen keyword from the master system list. Once selected, there is one more query to which you must respond before the keyword is deleted from the list.

-1 tksvoc2.4gl HELP messages

.911
SIGN-VOCABULARY: Add
You can add new signs to the vocabulary list by selecting "Add.

This function is not yet implemented.

.912
SIGN-VOCABULARY: Find
This function is not yet implemented.

.913
SIGN-VOCABULARY: Site
This function is not yet implemented.

.914
SIGN-VOCABULARY: Rest
This function is not yet implemented.

.915
BROWSE: Delete

-1 tkstinding 4gl HELP messages

.1001
CLINICAL-FINDINGS: OneSign->ManyGroups

.1002
CLINICAL-FINDINGS: ManySigns,-One-Group

.1003
BROWSE: Delete

.1004
BROWSE: Query-Again
TKS-MAIN ABSTRACT FIND-DATA FIND-CITATION-DATA BROWSE: Query-Again

.1005
EFFECTS SEARCH-ALL: FirstWord

.1006
EFFECTS SEARCH-ALL: AnyWord

.1007
EFFECTS: All

.1008
EFFECTS: Morph

.1009
EFFECTS: Funct

.1010
EFFECTS: Disease

.1011
EFFECTS: Procd

-1 tksbrowse 4gl HELP messages

.1100
BROWSE Delete

.1101
BROWSE: Delete

-1 tksmonogrph1 4gl HELP messages

.1200
SELECT-FILE-BY Author-Name

.1201

SELECT-FILE-BY: Citation-Number

-1 tksquery.4gl HELP messages

.1300
BROWSE: Output

.1301
OUTPUT: Printer

.1302
OUTPUT OUT-TO-PRINTER: This-Citation

.1303
OUTPUT OUT-TO-PRINTER: All-Citations

.1304
OUTPUT: File

.1305
OUTPUT OUT-TO-FILE: This Citation

.1306
OUTPUT OUT-TO-FILE FILE-SELECTION: New File

.1307
OUTPUT OUT-TO-FILE FILE-SELECTION: Append-To_File

.1308
OUTPUT OUT-TO-FILE: All-Citations

.1309
OUTPUT OUT-TO-FILE FILE-SELECTION: New-File

.1310
OUTPUT OUT-TO-FILE FILE-SELECTION: Append-To-File

-1 tksshows.4gl HELP messages

.1400
CURRENT-CITATIONS: Next

.1401
CURRENT-CITATIONS: Previous

1402
CURRENT-CITATIONS: Select

1403
CURRENT-CITATIONS: Use-Current

1404
CURRENT-CITATIONS: Next

.1405
CURRENT CITATIONS: Previous

.1406
CURRENT-CITATIONS: Select

.1407
CURRENT-CITATIONS: Use-Current

.1408
CURRENT PAPER: EXIT

-1 Rich's PLAYGROUND

-.0000

Clinical "Findings" is another citation component which can be "searched" from the Browse menu in the Find- pathway. One can search for certain clinical findings or search for a citation and obtain the clinical findings associated with it.

Design
Subjects
Regimens
Links
Delete
Findings
The process of finding these particular portions of the abstract is simular to that described above for Paper Overview. One should be aware that you will frequently encounter multiple matches for such things as Subjects, Regimens and Links since many experimental studies have several of those components. You can switch back and forth between those multiple screens by using the up and down arrow keys. Note that multiple matches may include components from several citations, especially if wild cards (*) are used. Check the Citation No. as the screens change in order to be aware of where you are.

Some screens require that you re-enter data for certain fields in order to cycle through the entire screen. Query-Again is an option in the Browse menu for Design. Deleting a design gives you the option to delete only the design on screen, or the design screen and all of the screens from that point forward (Subjects, Regimens, Links, etc.). The same is true of "Delete" and the other citation components; you can either delete the data on that screen alone, or that screen and all screens linked to it in the forward direction.

-.1001

Subject
The subject screen comes up with the cursor on the "citation No" field. Hit "return" which fills in that field automatically and moves the cursor to the next one. The designation for the first group (they are assigned sequential letters) comes up automatically. If you would like to enter subject data for some other group enter its letter designation followed by "return."

Note that the next two fields are bracketed differently than the others. You cannot change those entries in this screen because they were derived from the design screen. Therefore, a return after "Group" brings the cursor to the "Species" field where the common name of the animal used can be entered. "Return"s move you through the screen. "Source" is meant to be used to identify where the animals came from. "Number" refers to the number of animals in the group.

This goes with the "New Citation" path helps.
Add-Design
A "Return" causes the screen to come up with the Citation Number (No) and File Number sections filled in. Type "return" until the first empty field is reached and then begin filling in the appropriate responses. The possible options are listed as the cursor moves to each new field. When all the data for that screen has been entered, hit "Esc" and the next design screen will come up as indicated by the different "Design No." If the "citation Numb" (No) is not present, hit "return" and it will appear.
option I
When all the design screens have been completed, hit "Esc" followed by "E" until you reach the menu with the "Add" option. Select "Add", and then the "Subject" option from the "FIND-CONTENT" menu.
option II
If the subsequent Subject sections have not been completed, the program will bring you to that section to provide the necessary information. The entry process is similar to that described above under the appropriate screen heading.

.-1 ...This section must be moved to the tksauth.4gl module.....
Last name, first author
Enter the author information (lower case letters are acceptable), then hit the "return" key.

.-1 We need to move the following section.
SELECT-FILE-BY

From here, one can search for a specific citation by responding to sequential screens which request the Author, the journal volume number, the first page number, and last two digits of the year. Alternatively, one can give the Citation No. which consists of the source code of the journal or book, the volume number, first page number, and the year. Note that for the latter, each component must consist of a certain number of characters, for example, J00001-0001-00001-1988.

xxxxxxxxxxx

Completion of the process will result in finding the desired citation, or a message that the citation doesn't exist in the database. If a citation isn't in the system, you can't add anything to it. Enter a new citation by starting from "New" in the "ABSTRACT" screen.

.-1 The following needs to be moved so it is available when the Browse menu is on screen.

Browse

Using the 'Browse" options, one can choose to: view the next citation if more than one match is found in a search; see the previous citation if the "Next" or "Last" options were used; go to the "Last" citation in the list of more than one match (the matches are arranged chronologically in the order in which they were entered into the system); "Update": (modify or change) and entry; "Delete" the entry shown on-screen (with the option of deleting other portions of the data, e.g. Paper Overview, Design, etc.); "Query-Again" which clears the data fields and allows one to search for another citation; or "Exit" from the program.

xxxxxxxxxx

Not all of the options are evident at one time. To see the others, use the right and left (horizontal) arrow keys to move among the selections and see those on the right after the "...." notation. When the first option is highlighted (Next) you can use the left arrow key to see the end of the option list (horizontal wrap around for the Browse option list).

.-1....The following section needs to be moved to PaperOverview.....

.?

PaperOverview

When this option is selected a replica of the Overview screen comes up with the cursor on the Citation No field and a statement: "Enter search criteria and hit ESC to search." One can search via any of the fields represented on the screen, but the Citation No and File fields will be most commonly used.

.24

Update

Selecting "Update" places the cursor on the Source field. You can cycle through the data fields by using the "return" key which functions in only one direction, or the left and right arrow keys. Change the appropriate field and hit "Esc" when you are finished. Wait for the cursor to return to a data field or menu. This procedure writes the updated information to memory.

.-1
VOCABULARY-Keywords
"Selection of this option brings up the "KEYWORD_LISTING" screen from which one can add new keywords and keycodes, or find existing ones. Once found, they can be modified.
xxxxxxxxx
.-1
VOCABULARY-Signs
This option is used to add clinical signs to the Sign Vocabulary list, find a sign which is already in the system (after which it can be modified), obtain site information (system programmer use), and access the SNOMED listings.
xxxxxxxxxx
.24
Update
Selecting "Update" places the cursor on the Source field. You can cycle through the data fields by using the "return" key which functions in only one direction, or the left and right arrow keys. Change the appropriate field and hit "Esc" when you are finished. Wait for the cursor to return to a data field or menu. This procedure writes the updated information to memory.
1
.123
Citation-File No.
Typing "return" again, fills in the "File No" field automatically. It consists of the first four letters of the first author's last name, the journal or chapter number, the beginning page number and last two digits of the year. This number may also be used to find the file after it is entered into the system. It does not consist of extra characters or spaces. There are periods separating portions of the entry (e.g. SMIT.10.23.1988).
xxxxx
Hit "return" again. If the citation you are attempting to enter is already in the system, you will receive notification of that fact. You may make changes in a file that is already in the system, but not from the "New" citation pathway. "Exit" back to the "ABSTRACT" window and begin the entry process again for a new article.
xxxxxxx
If the citation is not in the system, hit "return" to move to the title entry field.
xxxxxxx
.....Below is indeed a copy of part of .123 which should be available after the message indicating that 'information for that citation has already been entered" pops up...I think it goes with the tksshows.4gl file about line 483 because the next place where help would be useable is the Current-Citations (all caps) screen.
xxxxxxx
tksshows.4gl
.124
Duplicate citation
Hit "return" again. If the citation you are attempting to enter is already in the system, you will receive notification of that fact. You may make changes in a file that is already in the system, but not from the "New" citation

pathway. Exit back to the "ABSTRACT" window and begin the entry process again for a new article.

xxxxxxx
.-1 The following goes with the Find path, to the citation and update. It is a "browse" path (update) but the author list portion is in tksauth.4gl, hence the .201 number.
xxxxxxxxx
.201
Find-Update

The "Author" screen comes up next. Hit "Esc" as indicated at the bottom of the screen. The program will ask if you want to update the author list. If you select "n" the keyword list comes up. Selecting "y" places the cursor on the first data field.

xxxxxxxx

Change it if necessary, or use the arrow or return keys to cycle through the fields. Modify the entries or type in new authors, and then hit "Esc." The file is updated and the Keycode/keyword screen comes up.

xxxxxxxx
.203 This should probably be done away with....I'll wait to be sure.

Authors

The author screen can be updated directly as well as indirectly as just described above. Selecting Author from the FIND-CITATION-DATA screen brings up the author screen with the cursor on the citation number field. Enter the citation number and then "Esc." The screen comes up with a message in the lower left corner indictating how many matches were found and asks you to "Esc" to continue. A Browse menu appears with options similar to those described above under "citation."

xxxxxxxx
.-1 This following paragraph is meant to come up when folllowing the New citation-path. after the title and authors, one is asked to insert keywords. Then, 300 should be available.

The "Find" option helps you search for particular keywords that are in the list, and identifies their associated keycode.

xxxxxxx

Type "F" and the cursor is placed on the first field (keycode). Hit "return" and the cursor goes to the next field. Type in the word "mouse" and hit "Esc." The program searches for that keyword and, if it is found, fills in the keycode number. One can complete those two fields for the paper being abstracted by hitting "Esc" once again. From there the process starts over again for the next keyword. If a keyword is searched for but not found, the program returns the message that "There is no keyword matching the first three letters" and returns you to the original screen.

xxxxxxx
.xxx

The "keyword" screen appears next, and the same process occurs again. Refer to the section on keywords for information on this screen. When you are finished modifying this screen hit "Esc." This completes the process of "Update" for citations. You are returned to

the citation screen with the Browse menu. Hit "e" to exit from this environment and return to the FIND-CITATION-DATA screen.

.302

The "Add" option allows the freedom to place new keywords and their accompanying codes into the list. If you do not wish to enter keywords at this time, hit the "delete" key. If you follow this later path, the screen indicates that it is preparing citation "information."

xxxxxxxxx

The next screen is titled "current paper" and has only one option, "Exit." That is because you are finished with the first part of the system and must begin a new phase of data entry for the citation. Hit "E" or "return" to go on. You are then asked if you would like to "add content data for the paper?".

xxxxxxxx

If you type "n" then "return", the system goes back to the "Abstract" screen. Typing "y" followed by "return" results in a new screen which begins the paper overview process.

.404

Enter the Citation No for the paper you wish to find and then "Esc." The program will search and then tell you how many matches were found and a Browse menu will appear. The Browse options are explained under Find-Citation, above. There is no Query-Again option, but there is an Add-Data option which allows one to add a component (Design, Subject group etc.) if none is found during a search. If no match is found, you will still get a Browse menu, and can try again by exiting from the screen ("e") and reselecting, Paper Overview, or return to try another path or option.

Old help .64

Authors may be added to the list generated when the citation was first entered into the system. Select "Authors" and respond to the prompts.

Old—— tksauth.4gl HELP MESSAGES

.A

TKS-MAIN ABSTRACT SELECT-FILE-BY ADD-DATA ADD-CITATION-DATA: Authors

As the menus suggest, one can add authors to a partially completed list or add authors to a citation that lacks that feature.

If there are authors already listed for the citation, you can move through them with the cursor keys. You cannot change anything or add names until the "Esc" key is used.

After hitting "Esc" the message at the bottom of the screen

changes and the cursor field is in reverse video (dependant on your terminal type). You can now make changes in the fields already entered or add names to the list. Remember, the program will correctly number the authors if you enter them in sequence.

When you are finished with the changes/additions, hit "Esc" to place them in the system memory.

.B
TKS-MAIN ABSTRACT FIND-DATA FIND-CITATION-DATA: Authors

This screen comes up with the cursor on the Citation No. You have indicated that you would like to find an author so you probably don't want to institute the search process based on that number. Move through the fields using the "return" or cursor keys until the cursor is in the first author field. Type in the name of the author (including initials!) whose citations you wish to locate, and hit "Esc" to initiate the search process.

You can search for all "Smith's" regardless of their initials, by using the wild card (*), e.g., "SMITH*."
It may be preferable to use the wild card in place of both initials because some journal articles may not provide the names with both initials. Some people may not choose to enter both initials. Some people may ignore the plea to NOT place spaces between the initials, which means an exact match would need to have both initials matched as well as the spacing!
A search using the first initial and a wild card will pick up all the single and double initials, regardless of the spacing. However, be aware that you must pay attention to the initials in order to weed out any matches that aren't exactly the author of interest.

If a match is found, a BROWSE screen appears which provides you with several options.

.-2000
CITATION DATA SCREEN: New-Source - Not a Journal or Book!

This message commonly occurs when the "J" or "B" prefix has not been used.

.-11000
CITATION DATA SCREEN: Year - Not a valid year!

You need to type in all four digits of the year or correct a typing error.

Old tksauth help messages
.C use help .170
BROWSE: Next (Author)

The BROWSE menu appears as a result of a search process. It provides mechanisms for moving between components when more than one is found (Next, Previous, First and Last) a method for changing entries (Update), removing components (Delete), performing another search process (Query-Again) and exiting from the BROWSE menu (Exit).

.D use help .171
BROWSE: Update (Authors)
The "Update" option provides a means for changing any author component in a window and, hence, the database entry. This is necessary when a component has been incorrectly or incompletely entered.

"Update" allows you to add or delete authors. To add authors to the end of a list, scroll through it using the down arrow key until an empty author field is reached. Then, type in the name of the author followed by an "Esc."

If an author needs to be placed in the middle of a list, place the cursor on the line below where you would like the name added and hit the "F1" key. A new line will be opened and you can type in the name followed by an "Esc," which will write it to memory and change the numbering sequence.

To delete authors you must place the cursor on the line you would like to delete and hit the "F2" key. The line will be deleted, and after an "Esc," the numbering sequence will be corrected.

.F
BROWSE: Query-Again
If a search is uneventful, or if one would like to perform another one, this option will allow immediate access to the screen for entry of another number.

Old tkskey helps
.C use .170 as help
BROWSE: Next (Keyword)
The BROWSE menu appears as a result of a search process. It provides mechanisms for moving between components when more than one is found (Next, Previous, First and Last) a method for changing entries (Update), removing components (Delete), performing another search process (Query-Again) and exiting from the BROWSE menu (Exit).

.D use .171 as help
BROWSE: Update (Keyword)
The "Update" option provides a means for adding, modifying or deleting keywords. When it is chosen, the cursor goes to the "Citation" field. Use the arrow or "return" keys to place the cursor on the desired keycode line.

To add keywords to the end of a list, scroll through it using the down arrow key until an empty keycode field is reached. Then, type in the keycode followed by an "Esc."

If a keyword needs to be placed in the middle of a list, place the cursor on the line below where you would like the new keycode added and hit the "F1" key. A new line will be opened and you can type in the keycode. Follow this with a "return," which will write in the keyword. An "Esc" will write the new pair to memory.

To delete keywords you must place the cursor on the line you would like to delete and hit the "F2" key. The line will be deleted, and after an "Esc," the change will be written to memory.

.F use .176 as help
BROWSE: Query-Again

If a search is uneventful, or if one would like to perform another one, this option will allow immediate access to the screen for entry of another number.

.-177
TKS-MAIN ABSTRACT FIND-DATA FIND-CITATION-DATA BROWSE: Update-Authors/Keywords

Author and keyword data are closely associated with the citation information and the system provides an opportunity to modify those sections right after the citation update.

.-178
TKS-MAIN ABSTRACT FIND-DATA FIND-CITATION-DATA BROWSE: Delete-this entry

This question is a safe-guard against accidentally removing something that someone took the time to enter, and which you now want to remove.

Note that you will only remove one entry (the data on the screen), not all the data linked to the citation.

.1000
CITATION DATA SCREEN: J-Source - Not currently in vocabulary

This message indicates that the particular JOURNAL source code which was entered does not exist in the system library of codes and journals. Did you remember to use the "J" prefix?

If a particular journal is not included in the system journal list, it can be added by using the option "Add" in the J-List menu. J-List is accessed by using the F5 key.

.-2200
CITATION DATA SCREEN: B-Source - Not currently in vocabulary

This message indicates that the particular BOOK source code which was entered does not exist in the system library of codes and books. This is likely to be a frequent occurrence, as compared to the frequency with which it is likely to occur with journals.

A book can be added to the system data by accessing the B-List menu using the F6 key. From there one uses the "Add" option.

.V
CITATION DATA SCREEN "Source" J-LIST: Citation information already entered

When this message appears you can follow the "Find" path (accessed via selecting AbstractMgt from the TKS-MAIN menu) to see what has been entered for that citation.

Author

When a citation is new, the Author screen comes up next. Enter the last name, a space and initials (no space between initials) of the first author as requested in the note on the bottom of the screen. Hit "return" and the cursor moves to the "sequence" area where you can enter the position of the author in the sequence of names on the publication. The program will enter the numbers (hit "return") if you enter the names in the proper order. You can add up to six names to the author list.

xxxxxxx

When you are finished, hit "Esc" once again. This writes to memory the author list and the keyword screen pops up.

.G

No CITATION entered with this number

The search process has resulted in the finding that there is no citation entered with the number you used for the search. Check the number you entered, or go to "New" in the AbstractMgt menu to enter the citation.

.H

Author data already exists for this number

You cannot add an author screen if there is already author data entered for a citation. If you wish to add an author follow the "Add" or "Find" paths utilizing the "Update" function in the BROWSE menu.

TKS Screens

#tkscit.per

```
database tkstest
screen
{
CITATION DATA SCREEN
Citation No:[f000                        ] File No:[f002                        ]
Source:[f001  ]        File Loc.:[f003 ]     Entry Date:[fdte      ]
Volume/Chap: [f004]    Pages: [f005a]-[f005b]   Year: [f006]
Title:
[f007                                                                  ]
[f008                                                                  ]
[f009                                                                  ]
[f010                                                                  ]

Journal/Book Title:
[b0                                                                    ]

Authors   [a ]  Keywords [k ]
PaperOver [p ]  Designs [d ]  Subjects [s ]  ExpoRegm [e ] Signs[f ]
}
end
tables
citation

attributes
f001 = citation.citsource, reverse, autonext, upshift;
f003 = citation.citlocata,upshift,reverse,autonext, comments=
  "S = Swanson, L = Lambert, B = Beasley, P = Poison Ctr";
fdte = citation.entrydate, noupdate, reverse, default = today;
f004 = citation.citvol, reverse, autonext,zerofill,right, upshift;
f005a = citation.citpage[1,5], reverse,right, autonext, upshift;
f005b= formonly.cp2,right, reverse, autonext, upshift;
f006 = citation.citdate, reverse, autonext, upshift;
f000 = citation.citnumb, upshift,reverse,autonext;
f002 = citation.citfile, upshift, reverse, queryclear, noentry;
f007 = citation.cittitle[1,63], reverse, upshift, autonext;
f008 = formonly.ct2, reverse, upshift, autonext;
f009 = formonly.ct3, reverse, upshift, autonext;
f010 = formonly.ct4, reverse, upshift, autonext;
b0 = formonly.tmpname, noentry, noupdate;

a     = formonly.authors, noentry, noupdate;
k     = formonly.keywords, noentry, noupdate;
p     = formonly.paperover, noentry, noupdate;
d = formonly.designs, noentry, noupdate;
s = formonly.subjects, noentry, noupdate;
e = formonly.exposures, noentry, noupdate;
f = formonly.signs, noentry, noupdate;
end
```

#jllst.per

```
database tkstest
screen
{
JOURNAL SOURCE LIST
[f001                                                    ][f002  ]
[f001                                                    ][f002  ]
[f001                                                    ][f002  ]
[f001                                                    ][f002  ]
[f001                                                    ][f002  ]
[f001                                                    ][f002  ]
[f001                                                    ][f002  ]
[f001                                                    ][f002  ]
[f001                                                    ][f002  ]
[f001                                                    ][f002  ]
[f001                                                    ][f002  ]
[f001                                                    ][f002  ]
[f001                                                    ][f002  ]
[f001                                                    ][f002  ]
}
end
tables
journlst

attributes
f001 = journlst.jabrv, upshift;
f002 = journlst.jcode, upshift;

Instructions
screen record  j_listing[15] (jabrv, jcode)
end
```

#blist.per

```
database TKSTEST
screen
{

[f001          ][f002                                                    ]
ED# [a0] VOL# [a1] DATE [f004]
EDITOR [f007                                                ]

[f001          ][f002                                                    ]
ED# [a0] VOL# [a1] DATE [f004]
EDITOR [f007                                                ]
}
end
tables
booklst
attributes
f001 = booklst.bcode;
f002 = booklst.bname;
a0 = booklst.bedno;
a1 = booklst.bvol;
f004 = booklst.bdate;
f007 = booklst.beditor;

instructions
screen record b_listing[2](bcode,bname,bedno,bvol,bdate,beditor);
end
```

#tksauth.per

```
database tkstest
screen
{
AUTHOR DATA SCREEN

Citation: [a000                    ] Citfile: [a001            ]
Author:                                                AuthSig:
[a002                                              ]    [a003  ]
[a002                                              ]    [a003  ]
[a002                                              ]    [a003  ]
[a002                                              ]    [a003  ]
}
end
tables
authors

attributes

a000 = authors.aucitnumb, reverse, upshift, autonext;
a001 = authors.aucitfile, reverse, upshift, autonext;
a002 = authors.authname, reverse, upshift, autonext, comments=
  "Last Name, space, Initials; no punctuation";
a003 = authors.authsig, reverse, autonext;

instructions
screen record a_listing[4] (authname, authsig)
end
```

#tkskey.per

```
database tkstest
screen
{
KEYWORD DATA SCREEN

Citation: [k000                    ]
Citfile:  [k001              ]
KeyCode:              Keyword:
[k002       ]   [k003                  ]
[k002       ]   [k003                  ]
[k002       ]   [k003                  ]
[k002       ]   [k003                  ]
[k002       ]   [k003                  ]
[k002       ]   [k003                  ]
[k002       ]   [k003                  ]
[k002       ]   [k003                  ]
[k002       ]   [k003                  ]
[k002       ]   [k003                  ]
}
end
tables
keywords

attributes
k000 = keywords.keycitnumb, upshift, reverse, autonext;
k001 = keywords.keycitfile, upshift, reverse, autonext;
k002 = keywords.keycode, upshift, reverse, autonext;
k003 = keywords.keyword, upshift, reverse, autonext;

instructions
screen record k_listing[10] (keycode,keyword)
end
```

#seekeys.per

```
database tkstest
screen
{
KEYWORD LIST
KeyCode:                Keyword:
[k001       ]     [k002                  ]
[k001       ]     [k002                  ]
[k001       ]     [k002                  ]
[k001       ]     [k002                  ]
[k001       ]     [k002                  ]
[k001       ]     [k002                  ]
[k001       ]     [k002                  ]
[k001       ]     [k002                  ]
[k001       ]     [k002                  ]
[k001       ]     [k002                  ]
}
end
tables
keylist

attributes
k001 = keylist.kcode,upshift,reverse,autonext;
k002 = keylist.kword,upshift,reverse,autonext;

instructions
screen record k_list[10] (kcode,kword)
end
```

#tkspaper.per

```
database tkstest
screen
{
PAPER OVERVIEW SCREEN
Citation Num: [f000                        ]  File No: [f001                ]
[serial]
Stated Purpose:    [f002                                                    ]
Implied Purpose:   [f003                                                    ]
Paper class: [a][a0 ][class                        ]
Number of Study Designs in Paper: [a1]









}
end

tables
paperover

attributes
f000 = paperover.papcitnumb, reverse, upshift, autonext;
f001 = paperover.papcitfile, reverse, upshift, autonext;
serial = paperover.papserial, noentry, noupdate;
f002 = paperover.papstatepur, reverse, upshift, autonext;
f003 = paperover.papimppur, reverse, upshift, autonext;
a  = formonly.aim,upshift, reverse, autonext;
a0 = paperover.papaim, reverse, upshift, autonext;
a1 = paperover.papnumdsgn, reverse, upshift, autonext;
class = formonly.class, upshift;

end
```

#tksdsgn.per

```
database tkstest
screen
{
STUDY DESIGN DATA SCREEN
Citation No:                    File No:                    [serial          ]
[f000                      ]  [f001                ]  Design No. [c ] of [d ]

Type of Study:        [a0] [sty                  ]
In Vivo or In Vitro: [a]  [vivvit    ]

Controls (y/n): [b]

Comparison Info:     [f0] [comp                 ]
Comparison Methods: [f1] [i                    ]
Control Methods:     [f2] [contr                ]
Control Types:       [f3] [j                    ]

How where subjects assigned to their groups? [f4] [k              ]

Numb. of Subject Groups:     [a1]
Numb. of Exposure Regimens: [a2]
}
end

tables
stdydsgn

attributes
f000 = stdydsgn.stycitnumb, reverse, upshift. autonext;
f001 = stdydsgn.stycitfile, reverse, upshift, autonext;
serial = stdydsgn.styserial, noentry, noupdate;
c    = stdydsgn.stydsgncur,reverse;
d    = stdydsgn.stydsgntot, reverse;
a0   = stdydsgn.stytype, reverse, upshift, autonext;
sty  = formonly.study,noentry,noupdate, upshift;
a    = stdydsgn.styvivit, reverse, upshift, autonext;
vivvit = formonly.vivvit,noentry,noupdate, upshift;
b = stdydsgn.stycntl, reverse, upshift,
include =("Y","N"), default = "N";

f0   = stdydsgn.stycntlcmp, reverse, upshift, autonext;
comp = formonly.cntlcmp, upshift;
f1   = stdydsgn.stycmpmeth, reverse, upshift,autonext;
i    = formonly.compmeth, upshift;
f2   = stdydsgn.stycntlmeth, reverse, upshift, autonext;
contr= formonly.cntlmeth, noentry, noupdate, upshift;
f3   = stdydsgn.stycntltyp, reverse, upshift, autonext;
j    = formonly.cntltyp,noentry, noupdate, upshift, autonext;
f4 = stdydsgn.stycntassgn, reverse, upshift, autonext;
k    = formonly.cntlassgn, noentry, noupdate, upshift, autonext;

a1   = stdydsgn.stynumgrp, reverse, upshift, autonext;
a2   = stdydsgn.stynumexp, reverse, upshift, autonext;

instructions
```

```
screen record dsgn_rec[1] (stycitnumb,
 stycitfile,
 styserial,
 stydsgncur,
 stydsgntot
 stytype,
 styvivit,
 stycntl,
 stycntlcmp,
 stycmpmeth,
 stycntlmeth,
 stycntltyp,
 stycntassgn,
 stynumgrp,
 stynumexp);

screen record f_only1[1] (study,
vivvit,
cntlcmp,
compmeth,
cntlmeth,
cntltyp,
cntlassgn);
end
```

#tksexpo.per

```
database tkstest
screen
{
EXPOSURE REGIMEN DATA SCREEN
Citation No.: [f000                          ]                [exserial        ]

Regimen No.: [a2] of [c ] regimens in Study design [de][g        ]

Purpose for Exposure: [f0 ][p                    ]

Agent: [f001                                      ]

Dose: [f002 ] [f003  ]
Formulation: [a0] [d          ]
Route: [a1] [e          ]
Interval: [f004  ]
Duration: [f005       ]

Administration Method: [f006                  ]
Scheduled Evaluation Time: [f007                  ]
}
end
tables exporegm

attributes
f000 = exporegm.excitnumb, reverse, upshift, autonext;
exserial = exporegm.exserial, default = 0, noentry;
a2 = exporegm.exlink, reverse, upshift, autonext;
c  = formonly.tot_numexpo;
de = formonly.dsgnlabel;
g  = exporegm.exdsgnnum, reverse, upshift;
f0 = exporegm.expurpose, reverse, upshift, autonext;
p  = formonly.purpose, noentry, noupdate;
f001 = exporegm.exagent, reverse, upshift, autonext;
f002 = exporegm.exdose, reverse, upshift, autonext;
f003 = exporegm.exdoseunit, reverse, upshift, autonext;
a0 = exporegm.exformul, reverse, upshift, autonext;
d  = formonly.formulation, noentry, noupdate;
a1 = exporegm.exroute, reverse, upshift, autonext;
e  = formonly.route, noentry, noupdate;
f004 = exporegm.exinterval, reverse, upshift, autonext;
f005 = exporegm.exduration, reverse, upshift, autonext;
f006 = exporegm.exadminmeth, reverse, upshift, autonext;
f007 = exporegm.exevaltime, reverse, upshift, autonext;

instructions
screen record exp_rec[1](excitnumb,
      exserial,
       exdsgnnum,
       exlink,
       expurpose,
       exagent,
       exdose,
       exdoseunit,
       exformul,
       exroute,
```

```
        exinterval,
        exduration,
        exadminmeth,
        exevaltime);
screen record frm_only[1](tot_numexpo,
  dsgnlabel,
  purpose,
  formulation,
  route);
end
```

```
#tkssubj.per
database tkstest
screen
{
SUBJECT GROUP DATA SCREEN
Citation No. [f000                    ]                    [sgserial     ]
Group [f ] of [num] of Design [h] [g          ]

Species                    Breed                    Source
[f002                ]     [f003            ]       [f001                ]

Number: [f004  ]
Sex: [x]  [s                        ]

Age:    [f005][a] [au          ][ar][agerange              ]
Weight: [f007][f008] [wr][wtrange                ]
Height: [f009][f010]

Occupation (if appropriate): [f012                ]
Health Status of Subjects:  [f013                ]

Total Number of Exposures Received:  [f014  ]
}
end

tables subjgrp

attributes
f000 = subjgrp.sgcitnumb, upshift, reverse, autonext;
sgserial = subjgrp.sgserial, default= 0, noentry;
f = subjgrp.sglink,upshift, reverse , autonext;
num = formonly.tot_numsubj, noentry, noupdate;
h = formonly.dsgnlabel;
g = subjgrp.sgdsgnnum,reverse;
f002 = subjgrp.sgspecies, upshift, reverse, autonext;
f003 = subjgrp.sgbreed, upshift, reverse, autonext;
f001 = subjgrp.sgsource, upshift, reverse, autonext;
f004 = subjgrp.sgnumb, upshift, reverse, autonext;
x = subjgrp.sgsex, upshift, reverse, autonext;
s    = formonly.sextrans, noentry, noupdate;
f005 = subjgrp.sgage, upshift, reverse, autonext;
a = subjgrp.sgageunit, upshift, reverse,autonext,
comments = "please enter the units in reference";
au    = formonly.ageunit, noentry, noupdate;
ar     = subjgrp.sgagerange, upshift, reverse;
agerange    = formonly.agerange, noentry, noupdate;
f007 = subjgrp.sgwt, upshift, reverse, autonext;
f008 = subjgrp.sgwtunit, upshift, reverse, autonext,
comments = "please enter the units in reference";
wr     = subjgrp.sgwtrange, upshift, reverse;
wtrange    = formonly.wtrange, noentry, noupdate;
f009 = subjgrp.sght, upshift, reverse, autonext;
f010 = subjgrp.sghtunit, upshift, reverse, autonext,
comments = "please enter the units in reference";
f012 = subjgrp.sgoccup, upshift, reverse, autonext;
f013 = subjgrp.sghlthstat, upshift, reverse, autonext;
f014 = subjgrp.sgtotexpo, upshift, reverse, autonext;
```

```
instructions
screen record sgrp_rec[1](sgcitnumb,
       sgserial,
       sgdsgnnum,
       sglink,
       sgspecies,
       sgbreed,
       sgsource,
       sgnumb,
       sgsex,
       sgage,
       sgageunit,
       sgagerange,
       sgwt,
       sgwtunit,
       sgwtrange,
       sght,
       sghtunit,
       sgoccup,
       sghlthstat,
       sgtotexpo);
end
```

```
#tkseg1.per
database tkstest
screen
{
EXPOSURE GROUP LINK ENTRY SCREEN
Citation Num: [f000                    ]  [serial                    ]
Exposure Group:[d ][a ][e ] [sl        ]        ExpoGrp [n ] of [t ]
Dsgn: [s000                                                        ][ds     ]
Subj: [s001                                                        ][sg     ]
Expo: [s002                                                        ][ex     ]

}
end

tables expogrp

attributes
f000 = expogrp.egcitnumb, upshift, reverse;
serial = expogrp.egserial;
d = expogrp.egdsgnlabel, reverse,upshift;
a = expogrp.egsubglabel, reverse,upshift;
e = expogrp.egexpolabel, reverse, upshift;
sl     = expogrp.eglink, upshift, reverse;
s000 = expogrp.egdsgndsc, upshift, reverse;
ds = expogrp.egdsgn;
s001 = expogrp.egsubgdsc, upshift, reverse;
sg = expogrp.egsubg;
s002 = expogrp.egexpodsc, upshift, reverse;
ex = expogrp.egexpo;
n = formonly.egnum, reverse;
t = expogrp.egtotnum, reverse;


instructions
screen record exgp_rec[1](egcitnumb,
  egserial,
  egdsgnlabel,
  egsubglabel,
  egexpolabel,
  eglink,
  egtotnum,
  egdsgndsc,
  egdsgn,
  egsubgdsc,
  egsubg,
  egexpodsc,
```

```
  egexpo);

screen record exgp_rec2[1](egcitnumb,
  egserial,
  egdsgnlabel,
  egsubglabel,
  egexpolabel,
  egtctnum,
  eglink,
  egdsgndsc,
  egdsgn,
  egsubgdsc,
  egsubg,
  egexpodsc,
  egexpo);

screen record f_only[1](egnum);

screen record exgp_1[1](eglink,
egdsgndsc,
egsubgdsc,
egexpodsc);
end
```

#tkseg2.per

```
database tkstest
screen
{
TKSEXGRP DATA SCREEN
Total ExpoGrp:[t ]        Citation Num: [f00                    ]
Exposure Group Code: [a0         ] [serial                    ]
Dsgn:[f000                                                     ]
Subj:[f001                                                     ]
Expo:[f003                                                     ]

Exposure Group Code: [a0         ] [serial                    ]
Dsgn:[f000                                                     ]
Subj:[f001                                                     ]
Expo:[f003                                                     ]

Exposure Group Code: [a0         ] [serial                    ]
Dsgn:[f000                                                     ]
Subj:[f001                                                     ]
Expo:[f003                                                     ]
}
end
tables expogrp

attributes
t = expogrp.egtotnum, reverse, upshift, noentry, noupdate;
f00  = expogrp.egcitnumb, reverse, upshift;
a0 = expogrp.eglink, reverse, upshift;
serial = expogrp.egserial;
f000 = expogrp.egdsgndsc, reverse, upshift, noentry, noupdate;
f001 = expogrp.egsubgdsc, reverse, upshift, noentry, noupdate;
f003 = expogrp.egexpodsc, reverse, upshift, noentry, noupdate;

instructions
screen record exgp_rec[3](eglink,
egserial,
egdsgndsc,
egsubgdsc,
egexpodsc)
end
```

#tkscf.per

```
database tkstest
screen
{
CLINICAL FINDING DATA SCREEN
Citation Number: [f000                          ]  [f0        ]

Expo Grp:  [f005        ]  [f05       ]
[e001                                                                    ]
[e002                                                                    ]
[e003                                                                    ]

Clinical Finding:  Type:[m]    Site [f001     ]     Effect [f003     ]
[f002                                                                    ]
[f004                                                                    ]

Change           Severity   Units
[a][f007       ] [f008     ] [f009     ]

Freq       Onset          Duration
[f011  ]   [f012        ] [f013       ]

}
end
tables
clinfind
attributes
f000 = clinfind.cfcitnumb, upshift, autonext, reverse;
f0   = clinfind.cfserial;
f05  = clinfind.cfeglink;
f005 = clinfind.cfeglabel, upshift, autonext, reverse,
comments = "Exposure Group that produced effect";
m        = clinfind.cftype, upshift, reverse, autonext;
f001 = clinfind.cfsitecode, upshift, autonext, reverse,
comments = "Code for Anatomical site of clinical effect";
f002 = clinfind.cfsite, upshift, autonext, reverse;
f003 = clinfind.cffindcode, upshift, autonext, reverse,
comments = "Code for Clinical effect";
f004 = clinfind.cffinding, upshift, autonext, reverse;
a        = clinfind.cfchange, upshift, autonext, reverse;
f007 = formonly.change, reverse;
f008 = clinfind.cfsevvalue, upshift, autonext, reverse,
comments = "Estimate of severity or lab result value";
f009 = clinfind.cfsevunits, upshift, autonext, reverse,
comments = "Units of lab result";
f011 = clinfind.cffreq, upshift, autonext, reverse,
comments = "Frequency of occurance as Affected/Total, eg. 3/5";
f012 = clinfind.cfonset, upshift, autonext, reverse,
comments = "Time in hours between exposure and onset of signs/findings";
f013 = clinfind.cfduration, upshift, autonext, reverse,
comments = "Duration of signs/finding in hours";

e001= formonly.egdsgndsc, upshift, autonext, reverse, noentry, noupdate;
e002= formonly.egsubgdsc, upshift, autonext, reverse, noentry, noupdate;
e003= formonly.egexpodsc, upshift, autonext, reverse, noentry, noupdate;

instructions
```

```
screen record cf_list[1](
cfcitnumb,
cfserial,
cfeglink,
cfeglabel,
cftype,
cfsitecode,
cfsite,
cffindcode,
cffinding,
cfchange,
cfsevvalue,
cfsevunits,
cffreq,
cfonset,
cfduration)
end
```

#tkssite.per

```
database tkstest
screen
{
System: [a] Organ: [b ] Location: [c     ] ==>> TKS Site: [f000  ]
[f001                                                                ]

[f1      ][f004                                                      ]
[f1      ][f004                                                      ]
[f1      ][f004                                                      ]
[f1      ][f004                                                      ]
[f1      ][f004                                                      ]
[f1      ][f004                                                      ]
[f1      ][f004                                                      ]
[f1      ][f004                                                      ]
[f1      ][f004                                                      ]
[f1      ][f004                                                      ]
[f1      ][f004                                                      ]
[f1      ][f004                                                      ]
[f1      ][f004                                                      ]
[f1      ][f004                                                      ]
[f1      ][f004                                                      ]
[f1      ][f004                                                      ]
}
end
tables
tkssite
attributes
a = formonly.sys, upshift, autonext;
b = formonly.org, upshift, autonext;
c = formonly.loc, upshift, autonext;
f000 = formonly.choice;
f001 = formonly.choicename, noentry, noupdate;
f1 =formonly.holdcode;
f004 =formonly.holdname;

instructions
screen record inputer[1] (sys, org, loc, choice, choicename);
screen record holder[15] (holdcode, holdname);
end
```

#tkssynls.per

```
database tkstest
screen
{
Clinical Finding Synonyn                          TKS FINDING SYNONYM SCREEN
[f001                                                                      ]
_____________________________________________________________________________
[f1      ][f004                                                            ]
[f1      ][f004                                                            ]
[f1      ][f004                                                            ]
[f1      ][f004                                                            ]
[f1      ][f004                                                            ]
[f1      ][f004                                                            ]
[f1      ][f004                                                            ]
[f1      ][f004                                                            ]
[f1      ][f004                                                            ]
[f1      ][f004                                                            ]
[f1      ][f004                                                            ]
[f1      ][f004                                                            ]
[f1      ][f004                                                            ]
[f1      ][f004                                                            ]
[f1      ][f004                                                            ]
}
end
tables
tkssite
attributes
f001 = formonly.finding, noentry, noupdate,upshift;
f1 =formonly.holdcode,upshift;
f004 =formonly.holdname,upshift;

instructions
screen record holder[15] (holdcode, holdname);
end
```

#tkscf1.per

```
database tkstest
screen
{
Clinical Finding:  Site/Matrix [f001     ]  Test/Lesion/Effect [f003     ]
[f002                                                                    ]
[f004                                                                    ]
}
end
tables
clinfind

attributes
f001 = formonly.sitecode, upshift, autonext, reverse,
comments = "Code for Anatomical site of clinical effect";
f002 = formonly.site, upshift, autonext, reverse;
f003 = formonly.findcode, upshift, autonext, reverse,
comments = "Code for Clinical effect";
f004 = formonly.finding, upshift, autonext, reverse;
end
```

#tkscf2.per

```
database tkstest
screen
{
TKSCF2 DATA SCREEN
Citation Number: [f000                    ]
Exposure Group:[f005       ]
[e001                                                              ]
[e002                                                              ]
[e003                                                              ]
_____ _____________________________

Total number of signs:[nmb]

[num]  Clinical Finding:   Site [f001     ]     Effect [f003     ]
[f002                                                              ]
[f004                                                              ]
Change        Severity   Units      Freq     Onset          Duration
[f007      ] [f008     ] [f009     ] [f011  ] [f012       ] [f013      ]
}
end
tables
clinfind
attributes
f000 = clinfind.cfcitnumb, upshift, autonext, reverse;
f005 = clinfind.cfeglink, upshift, autonext, reverse,
comments = "Exposure Group that produced effect";
f001 = clinfind.cfsitecode, upshift, autonext, reverse,
comments = "Code for Anatomical site of clinical effect";
f002 = clinfind.cfsite, upshift, autonext, reverse;
f003 = clinfind.cffindcode, upshift, autonext, reverse,
comments = "Code for Clinical effect";
f004 = clinfind.cffinding, upshift, autonext, reverse;
f007 = clinfind.cfchange, upshift, autonext, reverse,
comments = "0= NOS, 1= NML, 2= DISORD, 3= INC, 4= DEC, 5= ABSC, 6=ABN PRES, 7=
ABN RATIO";
f008 = clinfind.cfsevvalue, upshift, autonext, reverse,
comments = "Estimate of severity or lab result value";
f009 = clinfind.cfsevunits, upshift, autonext, reverse,
comments = "Units of lab result";
f011 = clinfind.cffreq, upshift, autonext, reverse,
comments = "Frequency of occurance as Affected/Total, eg. 3/5";
f012 = clinfind.cfonset, upshift, autonext, reverse,
comments = "Time in hours between exposure and onset of signs/findings";
f013 = clinfind.cfduration, upshift, autonext, reverse,
comments = "Duration of signs/finding in hours";

e001= formonly.egdsgndsc, reverse, noentry, noupdate;
e002= formonly.egsubgdsc, reverse, noentry, noupdate;
e003= formonly.egexpodsc, reverse, noentry, noupdate;
nmb= formonly.totnumber, reverse, noentry, noupdate;
num= formonly.curnumber, reverse, noentry, noupdate;

instructions

screen record effect[1](cfcitnumb,
cfeglink);
```

```
screen record egclinfind[1](cfsitecode,
cfsite,
cffindcode,
cffinding,
curnumber
    cfchange,
cfsevvalue,
cfsevunits,
cffreq,
cfonset,
cfduration);
end
```

#tkscf3.per

```
database tkstest
screen
{
TKSCF3 DATA SCREEN
Citation Number: [f000                    ]

Clinical Finding:   Site [f001     ]     Effect [f003     ]
[f002                                                      ]
[f004                                                      ]

Expo Grp:  [f005        ]
[e001                                                      ]
[e002                                                      ]
[e003                                                      ]

Change        Severity   Units      Freq     Onset          Duration
[f007       ] [f008     ] [f009     ] [f011  ] [f012        ] [f013       ]

}
end
tables
clinfind
attributes
f000 = clinfind.cfcitnumb, upshift, autonext, reverse;
f001 = clinfind.cfsitecode, upshift, autonext, reverse,
comments = "Code for Anatomical site of clinical effect";
f002 = clinfind.cfsite, upshift, autonext, reverse;
f003 = clinfind.cffindcode, upshift, autonext, reverse,
comments = "Code for Clinical effect";
f004 = clinfind.cffinding, upshift, autonext, reverse;
f005 = clinfind.cfeglink, upshift, autonext, reverse,
comments = "Exposure Group that produced effect";
f007 = clinfind.cfchange, upshift, autonext, reverse,
comments = "0= NOS, 1= NML, 2= DISORD, 3= INC, 4= DEC, 5= ABSC, 6=ABN PRES, 7=
ABN RATIO";
f008 = clinfind.cfsevvalue, upshift, autonext, reverse,
comments = "Estimate of severity or lab result value";
f009 = clinfind.cfsevunits, upshift, autonext, reverse,
comments = "Units of lab result";
f011 = clinfind.cffreq, upshift, autonext, reverse,
comments = "Frequency of occurance as Affected/Total, eg. 3/5";
f012 = clinfind.cfonset, upshift, autonext, reverse,
comments = "Time in hours between exposure and onset of signs/findings";
f013 = clinfind.cfduration, upshift, autonext, reverse,
comments = "Duration of signs/finding in hours";

e001= formonly.egdsgndsc, upshift, autonext, reverse, noentry, noupdate;
e002= formonly.egsubgdsc, upshift, autonext, reverse, noentry, noupdate;
e003= formonly.egexpodsc, upshift, autonext, reverse, noentry, noupdate;

instructions

screen record cf_list[1](
cfcitnumb,
cfsitecode,
cfsite,
```

```
cffindcode,
cffinding,
cfeglink,
cfchange,
cfsevvalue,
cfsevunits,
cffreq,
cfonset,
cfduration)
er i
```

#vocbook.per

```
database tkstest
screen
{

BOOK SOURCE DATA SCREEN

Acquistion Number: [f000        ]        Book Code: [f001   ]

Book Title:
[f002                                                          ]

Edition       Volume        Year
[a0]         [a1]        [f004]

Publisher:[f006                  ] Pub. Address:[f007                  ]

Editor Name:        [f008                                              ]

ISBN:               [f009                  ]
}
end
tables
booklst
attributes
f000 = booklst.bacquis,upshift, reverse, autonext;
f001 = booklst.bcode,upshift, reverse, autonext;
f002 = booklst.bname,upshift, reverse, autonext;
a0 = booklst.bedno,right, zerofill, upshift, reverse, autonext;
a1 = booklst.bvol,upshift, reverse,right, zerofill,  autonext;
f004 = booklst.bdate,upshift, reverse, autonext;
f006 = booklst.bpub,upshift, reverse, autonext;
f007 = booklst.bpubplace,upshift, reverse, autonext;
f008 = booklst.beditor,upshift, reverse, autonext;
f009 = booklst.bisbn,upshift, reverse, autonext;
end
```

#vocjourn.per

```
database tkstest
screen
{

JOURNAL SOURCE DATA SCREEN

Acquistion Number: [f000       ]

Journal Code: [f001  ]

Journal Name:
[f002                                                    ]
[f003                                                    ]

Journal Abbreviation:
[f004                                          ]


}
end

tables
journlst

attributes
f000 = formonly.jacquis, reverse, noentry, queryclear, noupdate;
f001 = journlst.jcode,reverse,upshift;
f002 = journlst.jname[1,60], reverse, autonext, upshift;
f003 = formonly.jnm, reverse, autonext, upshift;
f004 = journlst.jabrv, reverse, autonext,upshift;

end
```

#vockeys.per

```
database tkstest
screen
{

KEYWORD VOCABULARY SCREEN

KeyCode:                Keyword:
[k001       ]     [k002                  ]

}
end
tables
keylist

attributes
k001 = keylist.kcode,upshift,reverse, autonext;
k002 = keylist.kword, upshift,reverse,autonext;

end
```

#voclab.per

```
database tkstest
screen
{
TKS LAB TEST VOCABULARY
CodeNum  Preferred Term
[f000    ][f001                                                    ]
Lab Test Category: [f][g                                           ]
Lab Test Definition:
[f003                                                    ]

SNOMED/VET
[f005    ][f006                                                    ]

                              SYNONYMS FOR TERM

[f008    ][f009                                                    ]
[f008    ][f009                                                    ]
[f008    ][f009                                                    ]
[f008    ][f009                                                    ]
[f008    ][f009                                                    ]
}
end
tables
lablst labsynlst

attributes
f000 = lablst.labnum;
f001 = lablst.labterm, upshift,reverse;
f    = lablst.labsys-labsynlst.labsynsys, upshift, reverse;
g           = lablst.labsysname, reverse;
f003 = lablst.labdef, upshift,reverse;
f005 = lablst.labsnocde;
f006 = lablst.labsnotrm, upshift,reverse;

f008 = labsynlst.labcode;
f009 = labsynlst.labsyn, reverse, upshift;

instructions
screen record holder[5] (labcode, labsyn);
end
```

#vocmorph.per

```
database tkstest
screen
{
TKS MORPHOLOGY VOCABULARY
CodeNum  Preferred Term
[f000    ][f001                                                    ]

Morphology Definition:
[f003                                                        ]

SNOMED/VET
[f005    ][f006                                                    ]

_____________________________SYNONYMS FOR TERM_____________________________

[f008    ][f009                                                    ]
[f008    ][f009                                                    ]
[f008    ][f009                                                    ]
[f008    ][f009                                                    ]
[f008    ][f009                                                    ]
}
end
tables
morphlst
morphsynlst
attributes
f000 = morphlst.morphnum;
f001 = morphlst.morphterm, upshift,reverse;
f003 = morphlst.morphdef, upshift,reverse;
f005 = morphlst.morphsnocde;
f006 = morphlst.morphsnotrm, upshift,reverse;

f008 = morphsynlst.morphcode;
f009 = morphsynlst.morphsyn, reverse, upshift;

instructions
screen record holder[5] (morphcode, morphsyn);
end
```

#vocsign.per

```
database tkstest
screen
{
TKS SIGN/DISEASE VOCABULARY
CodeNum  Preferred Term
[f000    ][f001                                                              ]

System Code:[f] System Name:[f002                                  ]
Sign/Disease Definition:
[f003                                                                  ]

SNOMED/VET
[f005    ][f006                                                             ]
_____________________________SYNONYMS FOR TERM_____________________________
[f008    ][f009                                                             ]
[f008    ][f009                                                             ]
[f008    ][f009                                                             ]
[f008    ][f009                                                             ]
[f008    ][f009                                                             ]
}
end
tables
signlst signsynlst

attributes
f000 = signlst.signnum;
f001 = signlst.sign, upshift,reverse;
f    = signlst.systemcode= signsynlst.signsynsys, upshift,reverse;
f002 = signlst.systemname, upshift,reverse;
f003 = signlst.signdef, upshift,reverse;
f005 = signlst.snocode;
f006 = signlst.snoterm, upshift,reverse;

f008 = signsynlst.signcode;
f009 = signsynlst.signsyn, reverse, upshift;

instructions
screen record holder[5] (signcode, signsyn);
end
```

#vocsite.per

```
database tkstest
screen
{

TKS-SITE-DATA-SCREEN
Site Code:    [f000  ]

System Code: [a]
System Name: [f001                              ]

Organ Code:[a0]
Organ Name:[f003                                                    ]

Loc Code:  [a1   ]
Loc Name:  [f005                                                    ]

SNOMED/VET Code:    [f007     ]
}
end
tables
tkssite
attributes
f000 = tkssite.sitecode, reverse, autonext, upshift;
a = tkssite.systemcode, reverse, autonext, upshift:
f001 = tkssite.systemname, reverse, autonext;
a0 = tkssite.organcode, reverse, autonext, upshift;
f003 = tkssite.organname, reverse, autonext,upshift;
a1 = tkssite.locatecode, reverse, autonext, upshift;
f005 = tkssite.locatename, reverse, autonext,upshift;
f007 = tkssite.snotopnum, reverse, autonext, upshift;
end
```

#querybib.per

```
database tkstest
screen
{
QUERY-BY-EXAMPLE DATA SCREEN
Citation Number: [f000                    ] File Code: [f00           ]
Journ/Book Code     Vol       Pages       Year          Location
[f001    ]       [f002]  [f003       ]  [f004]          [f005 ]
[a01                                                                 ]

Title of Article or Chapter:  [f006                                  ]
[f007                                                                ]
[f008                                                                ]
[f009                                                                ]
--------------- Author ------------------
[f010                                                                ]
[f011                                                                ]
--------------- Keyword -----------------
[f013                                                                ]
[f014                                                                ]

Keycode [f016      ][f017      ][f018      ][f019      ]
}
end

tables
citation authors keywords

attributes
f000 = citation.citnumb = authors.aucitnumb = keywords.keycitnumb,upshift, re-
verse;
f00 = citation.citfile,upshift, reverse;
f001 = citation.citsource,upshift, reverse;
f002 = citation.citvol,upshift, reverse;
f003 = citation.citpage,upshift, reverse;
f004 = citation.citdate,upshift, reverse;
f005 = citation.citlocate,upshift, reverse;
f006 = formonly.ct1,upshift, reverse;
f007 = formonly.ct2,upshift, reverse;
f008 = formonly.ct3,upshift, reverse;
f009 = formonly.ct4,upshift, reverse;

f010 = formonly.authname,upshift, reverse;
f011 = formonly.authname2,upshift, reverse;

f013 = formonly.keyword,upshift, reverse;
f014 = formonly.keyword2,upshift, reverse;

f016 = formonly.keycode,upshift, reverse;
f017 = formonly.keycode2,upshift, reverse;
f018 = formonly.keycode3,upshift, reverse;
f019 = formonly.keycode4,upshift, reverse;

a01 = formonly.citname, noentry, noupdate, reverse;
end
```

#allcit.per

```
database tkstest
screen
{

RAW CITATION DATA SCREEN

citnumb          [f000                    ]
citfile          [f011              ]
citserial        [cserial        ]
citsource        [f001                ]
citvol           [f002]
citpage          [f003       ]
citdate          [f004]
cittitle         [f005                                        ]
[f006                                          ]
[f007                                          ]
[f008                                          ]
[f009                                          ]
citlocate        [f010 ]
entrydate        [fdte      ]
}
screen
{

RAW AUTHOR DATA SCREEN

aucitnumb        [f000                    ]
aucitfile        [f013           ]
auserial         [aserial    ]
authname         [f014                                        ]
authsig          [a0]
}
screen
{

RAW KEYWORD DATA SCREEN

keycitnumb       [f000                    ]
keycitfile       [f016           ]
keyserial        [kserial     ]
keyword          [f017                ]
keycode          [f018      ]
}
end
tables
citation
authors
keywords
attributes
f000 = citation.citnumb = authors.aucitnumb= keywords.keycitnumb,upshift;
f011 = citation.citfile,upshift;
cserial = citation.citserial;
f001 = citation.citsource,upshift;
f002 = citation.citvol,upshift;
f003 = citation.citpage,upshift;
f004 = citation.citdate,upshift;
```

```
f005 = citation.cittitle[1,50],upshift;
f006 = citation.cittitle[51,100],upshift;
f007 = citation.cittitle[101,150],upshift;
f008 = citation.cittitle[151,200],upshift;
f009 = citation.cittitle[201,250],upshift;
f010 = citation.citlocate,upshift;
fdte = citation.entrydate;

f013 = authors.aucitfile,upshift;
aserial = authors.auserial;
f014 = authors.authname,upshift;
a0 = authors.authsig,upshift;

f016 = keywords.keycitfile,upshift;
kserial = keywords.keyserial;
f017 = keywords.keyword,upshift;
f018 = keywords.keycode,upshift;

INSTRUCTIONS
CITATION MASTER OF AUTHORS
authors master of keywords

END
```

```
#allpaper.per
database tkstest
screen

(



papcitnumb          [f000                          ]
papcitfile          [f101                  ]
papserial           [papserial     ]
papstatepur         [f102                                                  ]
papimppur           [f103                                                  ]
papaim              [z0 ]
papnumdsgn          [f104   ]
)
screen
(

stycitnumb          [f000                          ]
stycitfile          [f001                  ]
styserial           [styserial     ]
stydsgncur          [f002   ]
stydsgntot          [f003   ]
stytype             [a0]
styvivit            [a ]
stycntl             [b]
stycntlcmp          [c ]
stycmpmeth          [f4]
stycntlmeth         [d ]
stycntltyp          [f5]
stycntassgn         [f6]
stynumgrp           [a1]
stynumexp           [a2]
)
screen
(

sgcitnumb           [sg000                         ]
sgserial            [sgserial      ]
sgdsgnnum           [styserial     ]
sglink              [e             ]
sgspecies           [f009                  ]
sgbreed             [f010                  ]
sgsource            [f011                  ]
sgnumb              [f012   ]
sgsex               [f019]
sgage               [f013]    sgageunit   [s]     sgagerange  [r]
sgwt                [f015   ] sgwtunit    [f7]    sgwtrange   [wr]
sght                [f017]    sghtunit    [f018]
sgoccup             [f020                  ]
sghlthstat          [f021                  ]
sgtotexpo           [f022   ]
)
screen
(
```

```
excitnumb       [ex000                          ]
exserial        [exserial     ]
exdsgnnum       [styserial    ]
exlink          [a3           ]
expurpose       [f025 ]
exagent         [f026                                  ]
exdose          [f027 ]
exdoseunit      [f028  ]
exformul        [a4]
exroute         [a5]
exinterval      [f029  ]
exduration      [f030       ]
exadminmeth     [f031                  ]
exevaltime      [f032                  ]
}
screen
{

egcitnumb       [eg000                          ]
egserial        [egserial     ]
egtotnum        [tn]
eglink          [f041        ]
egdsgn          [styserial    ]
egdsgnlabel     [dsgnlabel    ]
egdsgndsc
[f042                                          ]
egsubg          [sgserial     ]
egsubglabel     [subglabel    ]
egsubgdsc
[f043                                          ]
egexpo          [exserial     ]
egexpolabel     [expolabel    ]
egexpodsc
[f044                                          ]
}
screen
{
cfcitnumb       [c000                           ]
cfserial        [cfserial     ]
cfegserial      [egserial     ]
cfeglabel       [c001a       ]
cfsitecode      [c002     ]
cfsite          [c003                                  ]
[c004                                  ]
cffindcode      [c005     ]
cffinding       [c006                                  ]
[c007                                  ]
cfchange        [c008       ]
cfsevvalue      [c009     ]
cfsevunits      [c010     ]
cffreq          [c011   ]
cfonset         [c012       ]
cfduration      [c013       ]
}
end
```

```
tables paperover stdydsgn subjgrp exporegm expogrp clinfind

attributes
f000 = papcitnumb=stycitnumb, reverse, upshift,queryclear;
f101 = paperover.papcitfile,reverse,upshift,queryclear;
papserial = paperover.papserial,reverse,queryclear;
f102 = paperover.papstatepur,reverse,upshift,queryclear;
f103 = paperover.papimppur,reverse,upshift,queryclear;
z0 = paperover.papaim,reverse,upshift,queryclear;
f104 = paperover.papnumdsgn,reverse,upshift,queryclear;

f001 = stycitfile, reverse, upshift,queryclear;
styserial = stdydsgn.styserial= egdsgn= sgdsgnnum= exdsgnnum,reverse,queryclear;
f002 = stydsgncur, reverse, upshift,queryclear;
f003 = stdydsgn.stydsgntot, reverse, upshift,queryclear;
a0 = stdydsgn.stytype, reverse, upshift,queryclear;
a = stdydsgn.styvivit, reverse, upshift,queryclear;
b = stdydsgn.stycntl, reverse, upshift,queryclear;
c = stdydsgn.stycntlcmp, reverse, upshift,queryclear;
f4 = stdydsgn.stycmpmeth, reverse, upshift,queryclear;
d = stdydsgn.stycntlmeth, reverse, upshift,queryclear;
f5 = stdydsgn.stycntltyp, reverse, upshift,queryclear;
f6 = stdydsgn.stycntassgn, reverse, upshift,queryclear;
a1 = stdydsgn.stynumgrp, reverse, upshift,queryclear;
a2 = stdydsgn.stynumexp, reverse, upshift,queryclear;

sg000 = sgcitnumb, reverse, upshift,queryclear;
sgserial = subjgrp.sgserial=expogrp.egsubg,reverse,queryclear;
e = subjgrp.sglink, reverse, upshift,queryclear;
f009 = subjgrp.sgspecies, reverse, upshift,queryclear;
f010 = subjgrp.sgbreed, reverse, upshift,queryclear;
f011 = subjgrp.sgsource, reverse, upshift,queryclear;
f012 = subjgrp.sgnumb, reverse, upshift,queryclear;
f019 = subjgrp.sgsex, reverse, upshift,queryclear;
f013 = subjgrp.sgage, reverse, upshift,queryclear;
s = subjgrp.sgageunit, reverse, upshift,queryclear;
r = subjgrp.sgagerange, reverse, upshift,queryclear;
f015 = subjgrp.sgwt, reverse, upshift,queryclear;
f7 = subjgrp.sgwtunit, reverse, upshift,queryclear;
wr = subjgrp.sgwtrange, reverse, upshift,queryclear;
f017 = subjgrp.sght, reverse, upshift,queryclear;
f018 = subjgrp.sghtunit, reverse, upshift,queryclear;
f020 = subjgrp.sgoccup, reverse, upshift,queryclear;
f021 = subjgrp.sghlthstat, reverse, upshift,queryclear;
f022 = subjgrp.sgtotexpo, reverse, upshift,queryclear;

ex000 = excitnumb, reverse, upshift,queryclear;
exserial = exporegm.exserial=expogrp.egexpo,reverse,queryclear;
a3 = exporegm.exlink, reverse, upshift,queryclear;
f025 = exporegm.expurpose, reverse, upshift,queryclear;
f026 = exporegm.exagent, reverse, upshift,queryclear;
f027 = exporegm.exdose, reverse, upshift,queryclear;
f028 = exporegm.exdoseunit, reverse, upshift,queryclear;
a4 = exporegm.exformul, reverse, upshift,queryclear;
a5 = exporegm.exroute, reverse, upshift,queryclear;
f029 = exporegm.exinterval, reverse, upshift,queryclear;
f030 = exporegm.exduration, reverse, upshift,queryclear;
```

```
f031 = exporegm.exadminmeth, reverse, upshift,queryclear;
f032 = exporegm.exevaltime, reverse, upshift,queryclear;

eg000 = egcitnumb, reverse, upshift,queryclear;
egserial = expogrp.egserial=clinfind.cfeglink,reverse,queryclear;
tn     = expogrp.egtotnum, reverse,queryclear;
f041 = expogrp.eglink, reverse, upshift,queryclear;
dsgnlabel = expogrp.egdsgnlabel;
f042 = expogrp.egdsgndsc, reverse, upshift,queryclear;
subglabel = expogrp.egsubglabel;
f043 = expogrp.egsubgdsc, reverse, upshift,queryclear;
expolabel = expogrp.egexpolabel;
f044 = expogrp.egexpodsc, reverse, upshift,queryclear;

c000 = cfcitnumb, reverse, upshift,queryclear;
cfserial = clinfind.cfserial,reverse,queryclear;
c001a = clinfind.cfeglabel, reverse, upshift,queryclear;
c002 = clinfind.cfsitecode, reverse, upshift,queryclear;
c003 = clinfind.cfsite[1,35], reverse, upshift,queryclear;
c004 = clinfind.cfsite[36,70], reverse, upshift,queryclear;
c005 = clinfind.cffindcode, reverse, upshift,queryclear;
c006 = clinfind.cffinding[1,35], reverse, upshift,queryclear;
c007 = clinfind.cffinding[36,70], reverse, upshift,queryclear;
c008 = clinfind.cfchange, reverse, upshift,queryclear;
c009 = clinfind.cfsevvalue, reverse, upshift,queryclear;
c010 = clinfind.cfsevunits, reverse, upshift,queryclear;
c011 = clinfind.cffreq, reverse, upshift,queryclear;
c012 = clinfind.cfonset, reverse, upshift,queryclear;
c013 = clinfind.cfduration, reverse, upshift,queryclear;

instructions
paperover master of stdydsgn;
stdydsgn master of subjgrp;
subjgrp master of exporegm;
exporegm master of expogrp;
expogrp master of clinfind;

composites
   <stdydsgn.styserial>
   <subjgrp.sgdsgnnum>
   <exporegm.exdsgnnum>
   <expogrp.egdsgn>;
composites
   <subjgrp.sgserial,subjgrp.sgdsgnnum>
   <expogrp.egsubg,expogrp.egdsgn>;
composites
   <exporegm.exserial,exporegm.exdsgnnum>
   <expogrp.egexpo,expogrp.egdsgn>;
end
```

#rawlab.per

```
database tkstest
screen
{

Lab-Finding Code     [f000  ]

Synonyms
[f001                                                    ]
[f002                                    ]
_____________________________________________________________________
Preferred Term
[f004                                                    ]
[f005                                    ]
Lab Test Category: [f]
Term Definition     [f006                                                ]
[f007                                                ]

SNOMED/VET Code     [f008    ]
[f009                                                    ]
[f010                                    ]
}
end

tables
labsynlst lablst

attributes
f000 = labsynlst.labcode = lablst.labnum, upshift;
f001 = labsynlst.labsyn[1,60], upshift;
f002 = labsynlst.labsyn[61,100], upshift;

f004 = lablst.labterm[1,60], upshift;
f005 = lablst.labterm[61,100], upshift;
f    = lablst.labsys = labsynlst.labsynsys, upshift;
f006 = lablst.labdef[1,50], upshift;
f007 = lablst.labdef[51,100], upshift;
f008 = lablst.labsnocde, upshift;
f009 = lablst.labsnotrm[1,60], upshift;
f010 = lablst.labsnotrm[61,100], upshift;

instructions
composites <lablst.labnum, lablst.labsys>
       <labsynlst.labcode, labsynlst.labsynsys>;
labsynlst master of lablst;
end
```

#rawmorph.per

```
database tkstest
screen
{

Morphology Code     [f000  ]

Synonyms
[f001                                                    ]
[f002                                  ]
_____________________________________________________________________
Preferred Term
[f004                                                    ]
[f005                                  ]

Term Definition     [f006                                          ]
[f007                                          ]

SNOMED/VET Code     [f008    ]
[f009                                                    ]
[f010                                  ]
}
end

tables
morphsynlst morphlst

attributes
f000 = morphsynlst.morphcode = morphlst.morphnum, upshift;
f001 = morphsynlst.morphsyn[1,60], upshift;
f002 = morphsynlst.morphsyn[61,100], upshift;

f004 = morphlst.morphterm[1,60], upshift;
f005 = morphlst.morphterm[61,100], upshift;
f006 = morphlst.morphdef[1,50], upshift;
f007 = morphlst.morphdef[51,100], upshift;
f008 = morphlst.morphsnocde, upshift;
f009 = morphlst.morphsnotrm[1,60], upshift;
f010 = morphlst.morphsnotrm[61,100], upshift;

instructions
morphsynlst master of morphlst;
end
```

```
#rawsign.per
database tkstest
screen
{

Sign-Disease Code     [f000  ]

Synonyms
[f001                                                    ]
[f002                                    ]
_____________________________________________________________________
Preferred Term
[f004                                                    ]
[f005                                    ]

Term Definition     [f006                                          ]
[f007                                              ]

System:[f][f1                            ]
SNOMED/VET Code     [f008     ]
[f009                                                    ]
[f010                                    ]
}
end

tables
signsynlst signlst

attributes
f000 = signsynlst.signcode = signlst.signnum, upshift;
f001 = signsynlst.signsyn[1,60], upshift;
f002 = signsynlst.signsyn[61,100], upshift;

f004 = signlst.sign[1,60], upshift;
f005 = signlst.sign[61,100], upshift;
f006 = signlst.signdef[1,50], upshift;
f007 = signlst.signdef[51,100], upshift;
f    =signlst.systemcode = signsynlst.signsynsys, upshift;
f1   = signlst.systemname;
f008 = signlst.snocode, upshift;
f009 = signlst.snoterm[1,60], upshift;
f010 = signlst.snoterm[61,100], upshift;

instructions
signsynlst master of signlst;
composites <signlst.signnum, signlst.systemcode>
       <signsynlst.signcode, signsynlst.signsynsys>;
end
```

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