USER'S MANUAL
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Credit where credit is due: The species accounts featured in the North American Bird Reference Book were prepared by summarizing information from a variety of sources. These include the 7th edition of the A.O.U. Check-list of North American Birds (A.O.U. 1998), which was the primary source for the habitat and distribution sections of the individual species accounts. The Nest Habits, Eggs, and Incubation sections of the species accounts were prepared using information found in a wide variety of sources, but most often in the works of Terres (1980) and Ehrlich, Dobkin, and Wheye (1988). The range maps featured in the North American Bird Reference Book were prepared by LANIUS Software and are adapted from previously published maps found in the National Geographic Society's Field Guide to the Birds of North America (Scott 1987), the Field Guide to Birds, Eastern & Western Regions (Stokes and Stokes 1996), A Field Guide to Warblers of North America (Dunn and Garrett 1997), and the Birds of North America series (Academy of Natural Sciences 1992-2001). Please consult the Literature Cited section at the end of this manual for a complete list of all references consulted during the development of The North American Bird Reference Book.

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LANIUS SOFTWARE PRESENTS

THE NORTH AMERICAN BIRD REFERENCE BOOK
FEATURING LANIUS® EXCALIBUR™ 2000, THE ORNITHOLOGICAL DATABASE FOR THE NATURAL WORLD!

Lanius

Misunderstood and rather frowned upon by the uninformed, the [shrike] is one of the decidedly beneficial and valuable birds of its range and its activities are a natural asset of no mean proportions.

-- Arthur Cleveland Bent, 1950
on the Loggerhead Shrike

WHAT IS THE NORTH AMERICAN BIRD REFERENCE BOOK?

LANIUS Software's North American Bird Reference Book™ is a true multimedia experience. It is designed for anyone who has at least a general interest in nature, especially birds. With this program, you can learn about the basic life history of birds, including the habitat they use, where they are found, how to identify them, the nesting strategies they employ to raise their young, what they sound like, and what they look like. Intermediate and advanced birders will also find these features of the Reference Book to be useful in helping them further their study of birds.

More specifically, the North American Bird Reference Book is a CD-ROM multimedia computer program that has species accounts for 910 North American birds, including songs, photographs, and maps. Included as an advanced feature with the software is a bird listing or "Life List" utility (called **LANIUS® Excalibur, the Ornithological Database for the Natural World!**), which contains the names of all the birds known to exist in the world today. LANIUS Excalibur is designed to store data about birds that you have observed throughout the world. Its primary purpose is to maintain detailed records of birds seen and places visited by bird enthusiasts such as yourself.

LANIUS Software's North American Bird Reference Book only operates on 32-bit Windows operating systems. The names and sequence of the birds in the multimedia application and in the LANIUS Excalibur bird listing utility are based on the book written by James Clements (1991). This book, which is a world check-list of bird species names, provides a current listing of the nearly 9,700 species of birds recognized by modern-day ornithologists. Included in Clements' book, for each species, is the scientific name, the best-known English name, and a description of the species' world-wide range.

INTRODUCTION

Welcome to LANIUS Software's North American Bird Reference Book™. Simply put, this software will revolutionize the way that you look at birds. With this program, you will be able to learn more than you ever thought possible about the birds that are found in your area. More specifically, you will be able to **see** what the birds in your area look like, **hear**

what they sound like, and **see** the breeding, wintering, and year-round distributional ranges of the birds on a North American map.

But that's not all! In addition to this multi-media experience, you can maintain your own *Life List* (i.e., a list of the birds you have seen in your life time), and you can make an entry into the database that records any bird sightings that you make at any location in the world.

Your successful use of this program will, in large part, be tied directly to how experienced a birder you are and how familiar you are with computers. For this reason, this manual attempts to address users of all skill levels.

It is likely that the only reasons you bought this program were to see pictures of birds found in North America, hear their songs, and see maps of where they live on the North American continent. If that is the case, then all that you need do once you start the program is click on the **REFERENCE <u>BOOK</u>** button at the Main Menu. The tutorial included with this software explains how to use the North American Bird Reference Book portion of this program.

However, after you have used the program for some time, you may decide to join the ranks of birders -- that special group of people who walk around with binoculars, bird books, field notebooks, and spotting scopes in search of birds. Or, it may be that you already are a birder. In either event, you can use the LANIUS Excalibur 2000 portion of this software program to maintain your Life List and record individual bird sightings anywhere in the world! *On the Main Menu, click on the **ADVANCED FEATU<u>RES</u>** button to access the LANIUS Excalibur portion of this software program.*

The final part of this section of the Introduction addresses the use of Windows programs. To start off, we have three recommendations for sustained, enjoyable use of this program and your computer in general:

1.   Always exercise patience.
2.   Never panic.
3.   Always protect yourself by making backup copies of your most important data or program files. Files can be backed up to floppy disks or to a Zip disk or tape drive, depending on your preferences and the available hardware on your computer.

With that as a back drop, let us begin by first acknowledging that using computers can be a frightening experience for some. If that describes you, stop here and re-read the three recommendations that we just listed. Remember, if you follow these recommendations, in most instances your computer problems will be resolved with a happy ending.

It is not the intent of this manual to teach you how to use computers. However, we wish to offer some general guidelines on using Windows-based programs.

All programs are started from an icon. Sometimes, these icons may reside directly on your Windows desktop. Such icons are called **Shortcuts**, because they point to the actual executable file that is responsible for launching the program. If the program you want to start has a shortcut icon located on your desktop, then simply double-clicking the icon will start that program. If the icon that starts your program does not have a shortcut located on your desktop, then you must use the **Start** button in the Windows 95/98 task bar to navigate to the program folder where the name of your application is listed. Click on the application's name to launch the program of your choice.

Once a program has been opened, as described above, you follow the instructions for shutting it down and exiting from it before you turn off your computer. To repeat, your computer should never be turned off while one or more of your programs are open. Doing so may damage or corrupt your files or cause you to lose important data that has not yet been saved to your hard disk.

Once you have opened a program, you will need to learn how to use it to create the documents (e.g., word processor programs) or store the data (e.g., database programs) that you are working with. While most computer programs have many similarities, there are enough differences to offer this sound advice: **always read the user's manual for a program if you want to learn how best to use it.**

To learn how to use Windows 95/98 programs, click on the **Start** button on the Windows task bar and select **<u>Help</u>**. Browse through the contents section of the help file to find the topic you are interested in. Alternatively, depending on how much you need to learn, you may want to sign up for one or more courses that address the use of the Windows

operating system and Windows programs; such courses are often available through local community colleges, computer consulting firms, or from other companies specializing in computer-related technology.

At a minimum, you should learn how to start and quit a program, how to manage the files and folders on your hard disk, and how to access help files (usually by pressing [F1]) when you need assistance on performing a specific task.

INSTALLATION

To use LANIUS Software's North American Bird Reference Book, you will need an IBM-compatible computer (i.e., a 486 or Pentium class microprocessor), 16 megabytes of RAM (32 megabytes RAM recommended), a 6x speed CD-ROM drive, and Microsoft Windows 95 or higher.

To install the Reference Book, insert the CD-ROM into the appropriate drive on your computer, then complete the steps outlined below.

1.   The CD-ROM is not AutoPlay-enabled. Therefore, to begin the installation, click on the Windows **Start** button, and then click on **Run ...**
2.   At the prompt, type --> *x:\install\setup.exe*   where "x" represents the letter of your CD-ROM Drive.
3.   Follow all instructions on the screen (see below).
4.   You may need to restart your computer after the installation is completed.
5.   To use the North American Bird Reference Book, start the program, and at the Main Menu screen click on the **HELP** pull-down menu, select **Print Out Written Documentation ...**, and print out the Tutorial and User's Manual (the program automatically loads these documents into a word processor for your convenience).
6.   **Take the Tutorial** to learn the most about the software in the shortest amount of time.
7.   **Review the User's Manual**.
8.   **Begin using the software on a daily basis** -- you will find LANIUS Software's North American Bird Reference Book to be a limitless source of knowledge and entertainment involving birds!
9.   To access Help anywhere in the Reference Book application, simply press [F1].
10.   *Remember that in order to use the multimedia aspects (i.e., bird pictures, songs, and maps) of the Reference Book, your CD-ROM disk must be inserted in the CD-ROM drive of your computer before you attempt to play songs or view maps and photographs within the Reference Book.*

To start the Reference Book, press the **Start** menu and navigate to the folder where the program was installed; use your mouse to click on **Reference Book 2000**. However, it is strongly recommended that you consider the following paragraphs before proceeding.

First, please remember to register this software by using the registration form on the Main Menu's **HELP** pull-down options.

The North American Bird Reference Book includes many high-resolution scans of bird photographs. When you initially view these images, they may appear blurry or have various blotches of unusual colors. This will most likely be due to your computer screen being set to display only 256 colors at a time. If you have a large amount of video memory, you may want to consider setting your computer screen for 16-bit color. In general, most users have their screen set for an 8-bit color pallette, meaning that only 256 colors at a time can be shown on the screen. Since most photographs contain more than 256 colors, this forces the computer to interpret the colors it can't display as combinations of colors that it can display. To set the computer for 16-bit color, click on **Start**, point to **Settings**, click on **Control Panel**, and double click **Display** to open the Display Properties dialog box. Select "**High Color**" (this is the 16-bit color option) from the Colors list box. Since the 16-bit screen color option uses more memory, you may need to set it back to the original 8-bit (256 colors) color display if you encounter memory problems. Note: you need to restart your computer each time you change the number of colors your screen displays.

LANIUS Excalibur 2000 presents a novel and revolutionary approach to bird sighting database management, and its **Geographic Management System** is smart enough to distinguish between states, counties, provinces, regions, etc. Although the database is quite intuitive, we nevertheless strongly suggest that first-time users of LANIUS Excalibur 2000 take the Tutorial session (see *TUTORIAL.DOC*, which was installed with your program). Using the Tutorial is the best way to quickly grasp the key concepts of using LANIUS Excalibur 2000. The tutorial will take about 40-45 minutes to complete. As you will likely use the LANIUS Excalibur 2000 database for years to come, this will be time well spent.

The North American Bird Reference Book and the LANIUS Excalibur 2000 Ornithological Database for the Natural World! were designed and developed by John C. Robinson.

INTRODUCTION TO THE NORTH AMERICAN BIRD REFERENCE BOOK

Figure 1. The Main Menu for the North American Bird Reference Book.

After you start LANIUS Software's North American Bird Reference Book, you will be at the Main Menu. You will have three basic options while at the Main Menu: select **REFERENCE BOOK** to begin browsing the species accounts (including bird images, bird songs, and distribution maps) stored in the Reference Book; select **EXIT DATABASE** to close the program; or click on **ADVANCED FEATURES** to access menu options for the LANIUS Excalibur 2000 bird listing program.

If you choose **REFERENCE BOOK**, the form shown in Figure 2 will be displayed.

Format of the Species Accounts

In total, 910 written species accounts are included with the North American Bird Reference Book. There are as many as six sections to each species account: (1) **Habitat** summarizes the types of places or plant communities where the species is typically found; (2) **Distribution** provides a written description of the geographical range of the species; (3) **Field Marks** provides a concise summary of the salient plumage, behavior, or vocal features that may be used to identify a species; (4) **Nest Habits** describes, among other things, the height (off the ground) and shape of the nest; the materials used to make the nest; the types of vegetation in which the nest is placed; and whether the species nests in colonies; (5) **Eggs** identifies the range and average number of eggs that are typically laid; the size of the egg (in millimeters), and the diagnostic color and other markings of the eggs; and (6) **Incubation** identifies which sex incubates the eggs and cares for the young, the length of the incubation period, and the length of the fledgling period.

Figure 2. The Reference Book Form.

Basic Features of the North American Bird Reference Book

When the North American Bird Reference Book Form is on display, you can perform the following actions:

Finding Records
Printing Records
Displaying a Species Distribution Map
Displaying a Species' Photograph
Playing a Species Song
Returning to the Main Menu (**Exit**)

Simply use your mouse to click on the intuitive command buttons to invoke these actions. Note that the song of a bird can be played while you are looking at its photograph.

As you use the Reference Book, remember that the distributional range of many bird species are constantly changing, due either to our ever increasing knowledge about a species or to known population expansions or withdrawals that are taking place. For this reason, many ornithological experts differ in the methods they use to interpret the breeding, wintering, and year-round ranges of birds. It is also true that the same bird species may oftentimes have one or more vocal dialects in the different geographic regions of North America where it is found. Therefore, there may be times where the distributional range of a species displayed in the Reference Book does not exactly match the range shown in your field guide; or when the song of a bird in the Reference Book does not sound the same as the birds of that species in your local area.

Click on the appropriate button to move to the next, previous, first, or last record in the current record set. To change record sets, simply access the **SEARCH** menu and select one of the five available *record set* options to query the Reference Book. These options allow you to select a single species, all species, only common or widespread species, species for a particular state or province, or species for a specific family.

LANIUS Software offers little known hints or secrets about many of the species in North America. These secrets may reveal information about the behavior of a species, or provide additional hints on how to identify it. To see a LANIUS Software secret for a species, access the **VIEW** menu and click on **LANIUS Software Secret for This Species**.

The federal status (e.g., endangered, threatened, etc.) for each species, as recognized under the Endangered Species Act, is also available from the **VIEW** menu.

Finally, remember that the most significant advantage that the North American Bird Reference Book gives you is complete and seamless integration between it and the LANIUS Excalibur 2000 bird listing program. If you have recorded individual sightings for the species currently on display in the Reference Book, access the **VIEW** menu and click on **My Bird Sightings for This Species**. The Reference Book will access your LANIUS Excalibur 2000 bird sighting database and display all of the sightings you have recorded for the current species.

Other Features of the North American Bird Reference Book

PHOTO AND SONG QUIZZES

When you think you know a certain number of birds by sight or sound, you can quiz yourself by displaying a random bird sighting or playing a random bird song. Press [CTRL-A] to display a random bird sighting. In response, the Reference Book will display a bird image in the InFlight Field Viewer. Study the bird as long as you want, and attempt to identify it; then press [ENTER] to display the bird's identity.

Press [CTRL-B] to play a random bird song. As the song is playing, attempt to identify the bird. Following the song, the Reference Book will display a message box containing the bird's identity.

CREATING AN EXPORT FILE

As explained above, accessing the **SEARCH** menu allows you to query the Reference Book, at which time you can choose to display a list of birds for a particular family, state, or province. Once this selection has been made, you have the option of exporting the Species ID Codes for the current *record set* to a file for use as a Species Check-List in your LANIUS Excalibur bird sighting database. To do this, simply select **Export Species ID Codes to File ...** from the **FILE** pull-down menu and follow the prompts on the screen; the Species ID Codes will be written to a file called LXEXPORT.TXT. For more information on how to use this export file, see IMPORTING A SPECIES LIST, under **ADVANCED CONCEPTS**, later in this manual.

ACCESSING LANIUS SOFTWARE ON THE INTERNET

When you want to learn the latest news about this software product and the other products available from LANIUS Software, why not visit us on the Web? The North American Bird Reference Book can take you there, with one mouse click! To do this, simply select **Access LANIUS Software's Home Page ...** from the **HELP** pull-down menu. This feature requires Internet Explorer or a Netscape browser to function properly.

INTRODUCTION TO LANIUS EXCALIBUR 2000

What's New in LANIUS Excalibur 2000?

Version 2000 of the LANIUS Excalibur Ornithological Database for the Natural World! offers the following enhancements:

- Saving and opening files is now easier than ever. Standard Windows dialog boxes are used throughout the program.
- The World List of bird species can now be invoked from the Reports Menu, giving you access to species names that are not on your Default Species List.
- Your Life List total can now be displayed on the Main Menu. To do this, simply access the Main Menu's **EDIT** menu and click on **Display Lifelist Total**.
- The report **List Of Species on my Lifelist** can now be printed to a file, to a printer, or to the screen.
- The report **All Records for One or All Species** can now be invoked for a particular species while browsing the species accounts in the North American Bird Reference Book.

•The report **Create a <u>S</u>pecies Check-List ...** now has two reporting options: it can create a check-list based on your Default List, or for any of the North American states or Canadian provinces (excluding Hawaii). (Note: to create an Hawaiian check-list, follow the instructions for importing a species list into the database; use these instructions to import the list of Hawaii birds into the database, make it your Default List, and then run the report **Create a <u>S</u>pecies Check-List ...** and choose the option for creating a check-list based on your Default List.)

•The Tutorial has now been expanded to provide more information for the beginning birder (see *TUTORIAL.DOC*, which was installed with your program).

•The October 1999 update adds a new report which displays the number of days you have spent birding in each of the Minor Areas (e.g., counties) of a selected Major Area (e.g., a state). The January 2000 update also provides additional enhancements to the overall program.

<u>Basic Concepts</u>

Before we can launch into a discussion of the bird sighting database, some basic principles about birding must be covered first. Let's start with Jolene Birder. Jolene is a beginning bird watcher. When Jolene goes out to look at birds, she writes down the species she sees on a list of paper. This list may include such things as: the date of the census or outing, the names of other observers if she was not by herself, the location she visited while looking for birds, and the actual names of the bird species she saw. Depending on her preferences, Jolene may also record the actual number of individuals she saw for each of the bird species she identified (e.g., **3** Red-tailed Hawks, **2** Bald Eagles, etc.).

What Jolene does not realize, however, is that most intermediate and advanced birders maintain many different kinds of lists. The most common kinds of lists that are maintained are Life Lists (i.e., a list of birds that one has seen in his/her lifetime), State Lists, County Lists, and Site Lists (i.e., a list of birds observed at a specific site).

This brings us to our first basic principle.

Basic Principle #1: Birders like to maintain Life Lists, State Lists, County Lists, and Site Lists of the birds they have seen.

LANIUS Excalibur 2000 is designed to mimic the way that birders keep such bird lists. As an example, consider Figure 3, below, which displays a site (Point Reyes National Seashore) that is located within Marin County, California. Many California birders keep a bird list for this site.

Figure 3. Schematic representation of a site within a county.
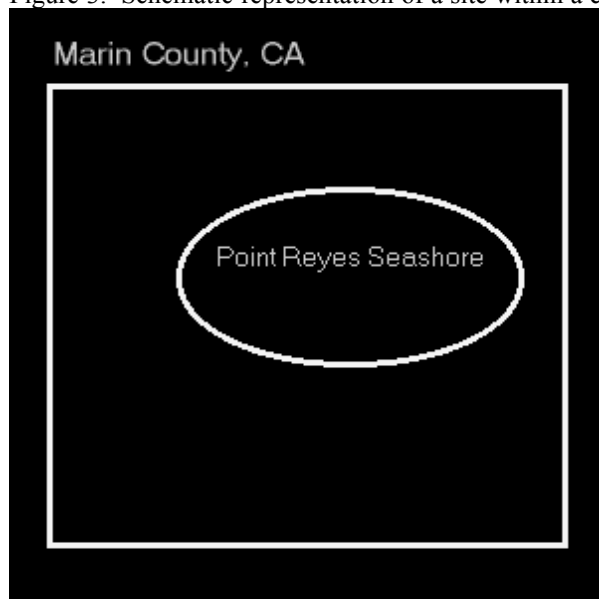
Many birders also want to know how many birds (and the names of those birds) that they have seen in any state or county they have ever birded in. Again, this is readily done with LANIUS Excalibur 2000. However, one may raise the question, "What if I bird in a country that does not have states or counties, as the United States does?" Or, "What if I go birding in Louisiana, where there are Parishes, instead of counties?"

This brings us to our second basic principle:

Basic Principle #2: Although many countries do not have states and counties, any bird listing program designed for use by North American birders must nevertheless maintain the capability of allowing birders to keep State and County lists (see Basic Principle #1).

If you're wondering whether it is feasibly possible to achieve this requirement, you can relax! This is where LANIUS Excalibur 2000's **Geographic Management System** comes into play. Under the Geographic Management System, LANIUS Excalibur can distinguish between states, provinces, regions, parishes, and any other geographic boundaries you choose to use. It does this by categorizing the geographic boundaries of countries into **Major Areas** and **Minor Areas**.

Let's define these two terms. A Major Area is a geographical unit of space that defines a large area of land. *Think of a State (in the United States) as a Major Area*. Major Areas are generally mutually exclusive of one another (i.e., they do not overlap one another).

A Minor Area is a geographical unit of space which represents a subdivision of a Major Area. Each Major Area may have one or more Minor Areas within it. Again, Minor Areas generally do not overlap one another. *Think of a County (in the United States) as a Minor Area.*

Refer again to Figure 3, above. If all of your birding is done in the United States, using the Geographic Management System is very easy. Just remember that states (e.g., California) are Major Areas, and that counties (e.g., Marin County) are Minor Areas.

Now let's tackle the subject of **Sites**. By way of definition, a Site is a geographical unit of land that is visited in search of birds. Looking at Figure 3 once more, we find the site called Point Reyes National Seashore, which is located in Marin County, CA.

Now it is time to introduce our third basic principle.

Basic Principle #3: Unlike Major and Minor Areas, Sites may overlap one another. In addition, sites may span across more than one Minor Area.

To further clarify this last principle, let's take a look at the following two examples.

Figure 4. Example of overlapping sites.
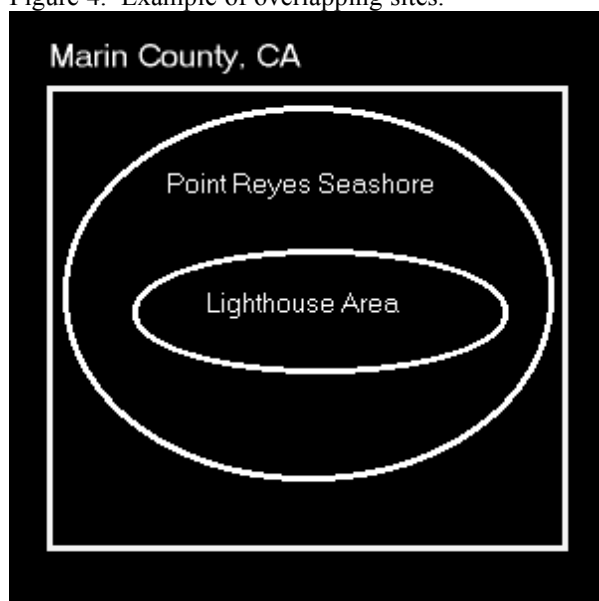
In this first example (Figure 4), let's return to Marin County, where we find that there is a special place at Point Reyes National Seashore that is called The Lighthouse. Many birders visit this area in search of rare vagrants and other species. As a result, some birders may want to specifically assign some of their bird sightings to this particular area. Again, LANIUS Excalibur 2000 allows you to do this; in addition, you can tell the program to link all sightings of a bird found at the Lighthouse Area back to the Point Reyes National Seashore. Now you can query the database for those birds found at Point Reyes (to include the birds specifically found at the Lighthouse Area), or you can simply query the database just for those bird species only found at the Lighthouse Area.

Figure 5. Example of a site that spans across more than one Minor Area.
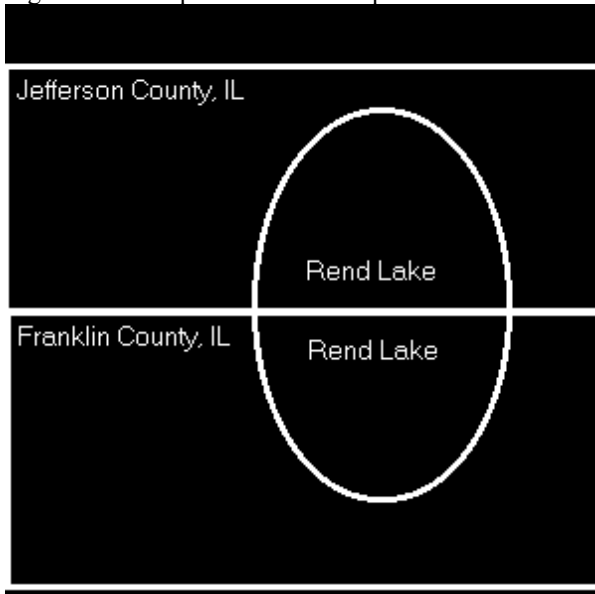
In this last example, we find that one site, Rend Lake, spans across more than one county or Minor Area. As you may now expect, LANIUS Excalibur 2000 can handle this situation as well. When you create the site record for Rend Lake, you can tell the program that it is located both within Jefferson and Franklin Counties, Illinois. What is the advantage to doing this? Well, if you should visit Rend Lake and spend time at both the north and south portions of the lake, you may have records of Red-tailed Hawks in both areas on the same day. LANIUS Excalibur 2000 allows you to enter two separate records (e.g., 3 Red-tailed Hawks at Rend Lake, Jefferson Co., and 5 Red-tailed Hawks at Rend Lake, Franklin Co.) for these observations. This also has the advantage of remaining consistent with the needs of most birders, who want to be able to list birds at a State, County, and Site level (see Basic Principle #1).

The Main Menu

Please review the **OVERVIEW** section of the on-line Help file for a summary of the organization of the database, how to prepare for data entry, and a description of the various reporting options that ship with the database. After you start LANIUS Excalibur, you will be at the Main Menu (see Figure 1, above). You will have three options while at the Main Menu.

If you choose **REFERENCE <u>BOOK</u>**, you will access the North American Bird Reference Book, described earlier in this manual.

If you choose **E<u>X</u>IT DATABASE**, you will be prompted to confirm whether you wish to exit the database program.

If you choose **ADVANCED FEATU<u>RE</u>S**, you will access the menu options for the LANIUS Excalibur bird sighting database; these three options are described below.

If you choose **<u>A</u>DD/EDIT RECORDS**, you will go the Census Form where you can begin adding new data or edit existing data.

If you choose **<u>REPORTS</u>**, you will have an opportunity to execute a variety of powerful reports that organize your bird sightings in a number of different formats. Depending on the type of report you select, the results (output) of the report

are displayed on the screen, sent to a printer, or printed to a file on disk. General reports for reference data are also provided (see the section on **GENERATING REPORTS** later in this manual).

If you choose **REFERENCE DATA** you may view (or edit, with caution) the reference data included with LANIUS Excalibur. These data include the names of bird species and families, the names of all countries and continents, the names of Major and Minor Areas that shipped with LANIUS Excalibur or which you later added, the names of sites that you have defined, and other information that LANIUS Excalibur uses to manage your bird sightings.

Navigation and Key Assignments

While using the LANIUS Excalibur database, you will be able to do many things in one or more ways, depending on how you like to use the computer keyboard, function keys, and your mouse. Always refer to Table 1 or your keyboard template (available from LANIUS Software) when you want to know how to perform a specific function in LANIUS Excalibur 2000.

Table 1. Common key assignments in the LANIUS Excalibur 2000 database (includes the Reference Book)

[F2], "Add New" button, or [ALT]-A	Creates a blank record and waits for you to input data. Applies to all data entry forms.
[F9], "Delete" button, or [ALT]-D	Deletes the current record. Applies to all data entry forms.
[F4]	Accesses the next available form. In the Census Form, pressing [F4] accesses the Observation Form; in the Observation Form, this key accesses the Documentation Form.
[F3], "Save" button, or [ALT]-S	Saves changes to the current record. Applies to all data entry forms.
[CTRL]-C, [CTRL]-X, [CTRL]-V	Copy, cut, and paste text. Applies to text fields in data entry forms.
[F11], "Exit" button, or [ALT]-X	Exit form. Applies to all forms.
"OK" button	Pressing this button when it is shown performs the requested action.
"Find" button, [CTRL]-F	Find desired record; applies to all applicable data entry forms and the Reference Book Form.
[F1]	Provides context-sensitive help. Applies to all forms.
[TAB], [ENTER]	Moves to next available field. Applies to data entry and Reports Menu forms.
[SHIFT-TAB]	Moves to previous available field. Applies to data entry and Reports Menu forms.
[F7], [SHIFT-F7]	Moves to next or previous record. Applies to data entry forms and the Reference Book Form.
Data Control Bar	Use to move to next, previous, first, or last record in table. Applies to all data entry forms.
[SHIFT-F2]	Abandon all current editing changes and restore record to original condition. Applies to all data entry forms.
[F8]	Toggle Life List, to indicate whether you have ("Y") or have not ("N") seen a particular species. Applies to the Reference Form.
[CTRL]-R	Repeat specific comments in Remarks field. Applies to Observation Form.
[CTRL]-Z	Add new record by duplicating the one that is currently shown. Applies to the Census form.
[CTRL]-G	Plays the song and/or call notes of a bird species. Applies to the Reference Book and InFlight Field Viewer forms.
[CTRL]-I	Displays the photograph(s) of a bird species. Applies to the Reference Book Form.
[CTRL]-P	Prints the current record on display. Applies to the Documentation Form and the Reference Book Form.
[CTRL]-M	Displays the distribution map of a bird species. Applies to the Reference Book Form.
[CTRL]-A	Starts the Bird Photo Quiz. Applies to the Reference Book Form.
[CRTL]-B	Starts the Bird Song Quiz. Applies to the Reference Book Form.
[F12]	Accesses the Documentation Field Editor. Applies to the Documentation Form.
[SHIFT-F12], [CTRL-F12]	Incorporates species splits ([SHIFT-F12], Species Split Function) or species mergers ([CTRL-F12], Species Merge Function) into the database. Applies to the Reference Form.

Entering Data

Because all data entry forms work in a similar fashion, a generic description of how to enter new records is provided below. This information can be applied on any of the data entry forms in the LANIUS Excalibur database. For a step-by-step summary of how to enter an entire set of data pertaining to one or more days of bird watching, see the file titled, *SUMMARY AND KEY STEPS OF DATA ENTRY.DOC*, which was installed with your program.

To enter a <u>new</u> record, follow these six steps:

1.   From the Main Menu, choose the option that will access the desired form. Options available include:

   a.   **ADD/EDIT RECORDS**--this option will take you to the Census Form. From the Census Form, you can also access the Observation and Documentation Forms.
   b.   **REFERENCE DATA**--this option will take you to the LANIUS Excalibur Reference Form, where you may add new (or edit existing) records for any of the associated reference tables that ship with the database.

2.   **To add a new record, you must be at a blank screen**. Use the status message on the data control bar to determine if you are adding a new record.
3.   If you are not at a blank screen, then a preexistent record is showing. To get to a blank screen, press the **Add New** button or the [F2] key. Pressing the **Add New** button will clear the previously entered record from the screen so that all available data entry fields will be empty or set to their default values.
4.   **Enter the data in the appropriate data entry fields for the record you want to add**. Be sure to validate all data. Although the database will catch many errors, it is still possible that you may misspell certain words when entering data.
5.   **Data must be entered in all fields that require a value!** Only those fields with a green background may be left blank. If data are not entered into all required fields, you will not be able to save the record.
6.   You have two options to save the record: press the **Save** button or the [F3] key to save the record <u>or</u> press the **Add New** button or the [F2] key to save the record and to clear the screen in preparation for the entry of an additional record.

If you receive any error messages when executing Step 6, please consult the Error Messages listed in Appendix E for more information on how to correct the problem.

Deleting Data

Because all data entry forms work in a similar fashion, a generic description of how to delete existing records is provided below. This information can be applied on any of the data entry forms in the LANIUS Excalibur database.

To delete a record, follow these three steps:

1.   From the Main Menu, choose the option that will access the desired form. Options available include:

   a.   **ADD/EDIT RECORDS**--this option will take you to the Census Form. From the Census Form, you can also access the Observation and Documentation Forms.
   b.   **REFERENCE DATA**--this option will take you to the LANIUS Excalibur Reference Form, where you may add new (or edit existing) records for any of the associated reference tables that ship with the database.

2.   **To delete a record, it must first be shown on the data entry screen**. To find an existing record, use the **Find** button on the form (if it is available) and follow the instructions on the screen. Alternatively, you may also use the data control bar to find an existing record.
3.   Once you have successfully located the desired record, press **Delete** or the [F9] key. You will be prompted to confirm deletion of the record. Press **Yes** to delete the record or **No** to cancel the operation.

In general, you can follow the above steps when deleting records in all of the data entry forms of the LANIUS Excalibur database. However, note that there are several exceptions.

First, reference data records may only be deleted if the codes that identify these records are not used in other tables in the database. Secondly, deleting a record in the Census Form has a cascading effect on records in the SIGHTING table that have data for that census. *In other words, deleting a record in the CENSUS table has a cascading effect on all of the records for the same Census in the SIGHTING table, resulting in the deletion of all associated records in that table*. As a result, you should delete records from the Census Form with caution. To delete <u>individual</u> records only from the SIGHTING table, access the Observation Form and follow the three steps above for deleting a record.

Editing Data

Because all data entry forms work in a similar fashion, a generic description of how to edit existing records is provided below. This information can be applied on any of the data entry forms in the LANIUS Excalibur database.

To edit a record, follow these four steps:

1.   From the Main Menu, choose the option that will access the desired form. Options available include:

  a.   **ADD/EDIT RECORDS**--this option will take you to the Census Form. From the Census Form, you can also access the Observation and Documentation Forms.
  b.   **REFERENCE DATA**--this option will take you to the LANIUS Excalibur Reference Form, where you may add new (or edit existing) records for any of the associated reference tables that ship with the database.

2.   **To edit a record, it must first be shown on the data entry screen**. To find an existing record, use the **Find** button on the form (if it is available) and follow the instructions on the screen. Alternatively, you may also use the data control bar to find an existing record.
3.   Once you have successfully located the desired record, use the [ENTER] key, [TAB] key, or the mouse to move the cursor to the field(s) containing the value you want to change. Make all of the desired editing changes. Note that those fields that require a value (i.e., all fields with a blue background) should not be left blank; it is mandatory that such fields have values in them.
4.   Press the **Save** button or the [F3] key to save your changes to the database.

In general, you can follow the above steps when editing records in all of the data entry forms of the LANIUS Excalibur database. However, there is one exception: the Primary Key values for existing records in nearly all of the tables can not be modified. These records, when shown on the form, will not allow the values for these fields to be changed. This feature serves to maintain referential integrity within the database. **As a result, you will want to validate all data upon data entry to ensure that the information is correct**. This is especially true for reference data, the values of which will be referenced many times in the other tables of the database.

If you receive any error messages when executing Step 4 above, please consult the Error Messages listed in Appendix E for more information on how to correct the problem.

Exiting the Reference Book and LANIUS Excalibur Databases

To quit the North American Bird Reference Book and LANIUS Excalibur 2000 database programs, simply press the **EXIT DATABASE** button on the Main Menu Form. If you are not at the Main Menu, pressing the **Exit** button on the form(s) you are in will eventually return you to the Main Menu; then press the Main menu's **EXIT DATABASE** button to close the database file and leave the program.

GENERATING REPORTS

LANIUS Excalibur 2000 will allow you to prepare a wide variety of reports from your data. In total, 71 different reporting options are available. The on-line help describes each of the reports in detail. This section of the manual presents a general overview of the key concepts behind the report creation process.

When you choose the **REPORTS** option on the Main Menu, you will be taken to the Reports Menu screen. When this menu is displayed, you will have access to all of the reports available in LANIUS Excalibur. Several of these reports

display their results immediately "on the screen", and are available when you choose the **BASIC** reporting option; the results of the other reports are capable of being output to the printer, the screen, and/or to a file on disk.

The four report options are **BASIC**, **SPECIES LISTS**, **CENSUS DATA**, and **DETAILED REPORTS**. These options are available by either clicking on the option with a mouse or using the [ALT]-*x* key combination where "*x*" is equal to any of the four underlined letters (B, S, C, or D) shown above. The reports available to you when you select these options are listed in Tables 2-5. To select any of these reports, use your down- or up-arrow keys to highlight the report name and then press the [ENTER] key. Reports that generate a list of species for subsequent printing or filing will always sort the species in the order that is shown in Clements' (1991) world check-list.

After choosing a report, in most cases you will need to specify criteria that LANIUS Excalibur will use to select the specific rows of data that you are interested in. Specifying report criteria in the Reports Menu Form is very easy, as only a few of the form's many features (see below) will ever be displayed at any one time. Which features will be displayed will depend on the specific report you are executing. Once you specify search criteria, press the **Run Report** button to execute the report. Pressing the **Cancel Report** button returns the Reports Menu to its original state. Pressing the [F1] key displays context-sensitive help at any time for the specific report you wish to execute; use this option when you are not sure how to create any of the reports described in this section of the manual.

Table 2. List of BASIC reports generated by the LANIUS Excalibur database.

Year-to-date Total of Species Seen -- 2 reporting options, output to the screen only.
Life List Total -- 1 reporting option, output to the screen only.
Maximum Number Seen for a Species -- 1 reporting option, output to the screen only.
Number of Species Seen in a Minor Area -- 3 reporting options, output to the screen only.
List of Country Names -- 1 reporting option, output to file only.
List of Major and Minor Areas -- 1 reporting option, output to file only.
List of Species Names -- 1 reporting option, output to file only.
List of Site Names -- 1 reporting option, output to file only.
Create a Species Check-List -- 2 reporting options, output to file or printer.

Table 3. List of SPECIES LISTS reports generated by the LANIUS Excalibur database.

List of Species Seen in a Day -- 2 reporting options, output to screen, file, and printer.
List of Species Seen in a Major Area -- 3 reporting options, output to screen, file, and printer.
List of Species Seen in a Minor Area -- 3 reporting options, output to screen, file, and printer.
List of Species Seen at a Specific Site -- 3 reporting options, output to screen, file, and printer.
List of Species Seen in a Country -- 1 reporting option, output to screen, file, and printer.
List of Species Seen in a Continent -- 1 reporting option, output to screen, file, and printer.
Species Seen During a Specific Period -- 3 reporting options, output to screen, file, and printer.
Species I Have Not Yet Seen -- 1 reporting option, output to screen, file, and printer.
List of Species on My Life List -- 1 reporting option, output to screen, file, and printer.
Number of Species Seen in One or More Years -- 1 reporting option, output to screen, file, and printer.
Number of Days Birded in One or More Years -- 1 reporting option, output to screen, file, and printer.
Number of Days Birded by Minor Area Within a Selected Major Area -- 1 reporting option, output to screen, file, and printer.
Number of Bird Records in One or More Years -- 1 reporting option, output to screen, file, and printer.
Number of Birds Seen in Each Major Area -- 1 reporting option, output to screen, file, and printer.

Table 4. List of CENSUS DATA reports generated by the LANIUS Excalibur database.

Census Data for a Specific Date -- 1 reporting option, output to screen, file, and printer.
Census Data for a Range of Dates -- 1 reporting option, output to screen, file, and printer.
List of Dates a Specific Site Was Visited -- 1 reporting option, output to screen, file, and printer.
List of Dates a Specific Observer Was Present -- 1 reporting option, output to screen, file, and printer.

Table 5. List of DETAILED reports generated by the LANIUS Excalibur database.

All Records for a Specific Family -- 4 reporting options, output to screen, file.

All Records for One or All Species -- 8 reporting options, output to screen, file.
Query Remarks Field in Observation Form -- 2 reporting options, output to screen, file.
All Records for a Specific Month -- 8 reporting options, output to screen, file.
Early and Late Migration Dates for a Species -- 8 reporting options, output to screen, file, and printer.
Print Documentation for a Rare Bird Sighting -- 1 reporting option, output to file, printer.

Specifying search criteria when generating reports is easy, and involves the following steps:

QUERY OPTION	HOW TO SPECIFY SEARCH CRITERIA FOR USE IN A QUERY
Beginning/Ending Dates:	When they are shown, enter values into these fields using an M/D/YYYY format (e.g., 7/21/1994). Values must be entered in both fields.
Beginning/Ending Years:	When they are shown, enter values into these fields using a 4-digit format (e.g., 1995). Valid values range upward from 1800.
Date:	When this is shown, you need to enter a value into this field using an M/D/YYYY format (e.g., 7/21/1994). The database will attempt to execute a report based on this search criterion. For added convenience, you may select any date for which you've entered records from the drop down list box attached to this field.
Month:	When this is shown, you will need to select a month from the displayed list.
Family:	When this is shown, you will need to select the name of a family from the displayed list.
Site:	When this is shown, you may need to select a site from the displayed list; for some reports, this value is optional.
Documentation List Box:	When this is shown you will need to select a Rare Bird Documentation from the displayed list.
Species List Box:	When this is shown, you will be able to select an individual species from a list of valid species names that appear in a list box. The database will attempt to execute a report based on the criteria that you select from this list box and other search criteria that may have been specified on the form.
	When you find the name you want, highlight that name and press the [ENTER] key. You can use this list to tell the database to execute a report just for the selected species. Pressing the "ESCAPE" key ([ESC]) when you are scrolling through the Species list box has the effect of unselecting any species you may have selected. Press the [ESC] key when, for any reason, you do not want to generate a report for a single species. When no species is selected, the Species field will be blank and LANIUS Excalibur will generate a report for all species observed during the specified time period.
Major & Minor Area List Boxes:	These list boxes, when shown, will display the Major and Minor Area names currently stored in the database. After you select a record from one or both of these fields, the database will attempt to execute a report based on the search criteria that you specify.
	To use the Major Area list box, click on the Major Area that you want. If the desired Major Area name is not shown, use a mouse to access the scroll bar and scroll through the list of available Major Area names until the name you want is shown; then click on it.
	If the Minor Area list box is also shown, selecting a Major Area automatically fills the Minor Area list box with a list of available Minor Area names. Use the [TAB] and [SHIFT-TAB] keys to switch back and forth between the two list boxes. To select a Minor Area, click once on the name of your choice. Press the [ESC] key to unselect a selected Minor Area name.
Country/Continent List Boxes:	When this is shown, you will need to select the name of a continent or country from the displayed list.
Report to Screen/File/Printer:	When these options are shown, click on the desired option to print a report to a file on your hard disk, or to print the report to your monitor's screen or to a printer. When "Report to Screen" is specified, the report will be displayed on your monitor, one screen at a time. Use a mouse or the [Page Up/Page Down] keys to scroll through the output of the report; press [ESC] to remove the display of the report from the screen.

When "Report to File" is specified, reports are automatically printed to a subdirectory called "REPORTS", which is located in the same directory where you installed LANIUS Excalibur. For several reports, only the "Report to File" option will be available. A standard Windows dialog box is used to specify the file name you wish to assign to the reported results. At this time, you can also tell LANIUS Excalibur to print the report to a directory other than the REPORTS subdirectory.

Cancel/Run Report: Press Cancel Report to return the Reports Menu to its original state. Press Run Report to execute the report you have selected.

BACKING UP THE DATABASE

The development of a database and the entry of records into the database can represent significant investments of time, money, and energy, especially if many records are involved. For this reason, regular backups of the database should be made to ensure that the database can be restored in the event the original file(s) become damaged or corrupted.

The LANIUS Excalibur database and all of its data are stored in a single file, called "XKALIBUR.DTB". To make a backup copy of your LANIUS Excalibur database, simply copy the "XKALIBUR.DTB" file in the program application directory to a floppy disk or, if it is too large to fit on a floppy disk, to tape, or to another drive or directory on your hard disk. In general, the database should be backed up at regular time intervals (about once a week). Back up the database more frequently when you are entering large numbers of records.

For your convenience, LANIUS Excalibur can automate this process for you, by making a backup copy of your database file on your hard disk. To do this, simply select **Backup Excalibur Database ...** from the **FILE** menu option of the Main Menu Form. Then answer **Yes** to the prompt. The database will be backed up to a file called "XKALIBUR.BUP" in the BACKUP subdirectory of the program application directory.

Please note that, whenever it is feasible to do so, databases should be backed up to alternate files. This ensures that you always have two separate backup copies of your database file stored in different locations. **In particular, the use of a tape backup for the LANIUS Excalibur database and the rest of your important files is strongly recommended.**

Finally, we wish to mention that the data in the North American Bird Reference Book are stored in a separate file, called "XKREF.MDB". You should set the back-up program that came with your computer to periodically back up this file from time to time; there is no command in the Reference Book program to back up this file.

REFERENCE DATA

By now, you have probably observed that everything entered into the CENSUS and SIGHTING tables is raw data collected by you. LANIUS Excalibur is able to organize this raw data by utilizing information that has already been entered into the reference tables. These tables are described below. Entering, modifying, or deleting records in these tables is accomplished via the same processes described in the introductory section of this manual.

CONTINENT Table

Data in the CONTINENT table is pre-entered for you. Records already exist for Antarctica, Asia, Africa, Australia, Europe, North America, South America, and Oceania.

COUNTRY Table

Data in the COUNTRY table is pre-entered for you. Each of the major countries in the world is recorded, along with its unique ISO (International Organization for Standardization) country code. The continent that each country belongs in is also identified for each record.

MAJOR AREA Table

Data in the MAJOR AREA table for the United States and Canada are pre-entered for you. You may need to add additional records to this table if you plan on entering bird records from countries other than the United States or Canada.

MINOR AREA Table

Data in the MINOR AREA table for the United States are pre-entered for you. You may need to add additional records to this table if you plan on entering bird records from countries other than the United States.

MAJOR & MINOR AREA TYPE Tables

Data in these tables for the United States have already been pre-entered for you. You may need to add additional records to this table if you plan on entering bird records from countries other than the United States.

SITE Table

One record has already been entered into this table: **General Location**. It is recommended that you not delete the General Location record. For more discussion on this record, including a discussion of how to add and link sites to one another, please see the **ADVANCED CONCEPTS** section later in this manual.

SPECIES Table

Clements' (1991) world check-list of bird species has been pre-entered into this table for you.

FAMILY Table

The names of all of the bird families, as described in Clements' (1991) world list, have been pre-entered for you.

LIST NAME Table

Records for the names of the various species lists you use are stored in this table. Records for your Life List and North American List have been pre-entered into this table for you. LANIUS Excalibur allows you to create an unlimited number of additional lists. For more information on this topic, please see the **ADVANCED CONCEPTS** section later in this manual.

SPECIES LIST Table

For each record you add to the LIST NAME table, you can identify one or more species that belong to that list in the SPECIES LIST table. The North American species list (excludes Hawaiian species) has been pre-entered for you. LANIUS Excalibur allows you to create an unlimited number of additional lists. For more information on this topic, please see the **ADVANCED CONCEPTS** section later in this manual.

ADVANCED CONCEPTS

But All I Want To Do Is ...

Sometimes, people who buy a software product do so only to perform one or two basic functions. If that describes you, this section of the manual may have the solution to the very problem you are trying to solve.

<u>ENTER MY LIFE LIST</u>

In this scenario, you are a birder who has already seen over 100 species. You have just purchased the North American Bird Reference Book and all that you want to do (at least, for now) is to enter your Life List. The process to do this is actually quite easy, and involves the following simple steps.

If you have been bird watching for some time, **you will certainly want to have the database recognize how many species are on your life list; however, you may not want to spend the time to enter specific database records for <u>all</u>**

of the birds you have seen over the years. The solution is to perform a one-time update of your life list, using the following steps:

1.   At the Main Menu, validate that your Default List is the North American list (access the **EDIT** menu and click on **Edit User Settings ...** to validate or change your Default List setting).
2.   If necessary, click on **ADVANCED FEATURES**; then press **REFERENCE DATA** to access the Reference Form.
3.   Select the **TABLES** pull-down menu and click on **Species Names**. You will be at the first of over 9600 species records.
4.   Select **Invoke Default List** from the **UPDATE LIFELIST** menu (this shortens the list to about 900 species).
5.   Look at the **On Life List? (Y/N)** field. If you have seen this species but the value of this field is "N", simply press [F8] to change the value to "Y" (this adds it to your Life List).
6.   Press [F7] to access the next record in the table.
7.   Perform steps 5 and 6 until you reach the end of the species list (this may take about 30-40 minutes).
8.   Press **Exit** to return to the Main Menu.
9.   Now use the database to enter all of the bird sightings you make from this day forward; LANIUS Excalibur will automatically update your Life List whenever you enter the first record of a species that is not currently on your Life List!

<center>CREATE SITES</center>

The process for creating a site is described in several places in this User's Manual, the Help File, and the Tutorial. See especially Appendix D. Obviously, if you are a lister, you are itching to go and would like to get all of your sites created and begin entering data.

However, we wish to offer a few words of caution. When you begin creating sites, **avoid the temptation to create more sites than are necessary**. As a rule of thumb, if you have been birding for 10 years or less in the same state but find yourself planning to create more than 100 sites, then you may be making your use of the database more complicated than it needs to be. **Keep in mind that it is not necessary to create a site for every place that you have gone bird watching.** Additionally, try to avoid subdividing a large area into too many sub-sites.

One of the best strategies to use when creating sites is to initially define sites for the locations where you go birding the most (e.g., state parks, wildlife refuges, large lakes, National Forests, etc.). If a specific location is large (e.g., the Great Smoky Mountains National Park), be selective about the sub-areas within that location for which you will also define sites. Finally, we recommend that you make use of the General Location site record (which comes installed with the database) to handle birds found at miscellaneous locations for which you do not plan to create sites (see the **Data Entry Strategies** section below for more information and a specific example).

<center>ENTER MY BIRD SIGHTINGS</center>

The process for entering, saving, and deleting data is described earlier in this User's Manual. In addition, we recomend that you consult the document entitled *SUMMARY AND KEY STEPS OF DATA ENTRY.DOC*, which was installed with your software. That document provides a concise overview of the data entry process.

<center>PRINT A BIRD CHECK-LIST FOR A STATE, PROVINCE, OR COUNTRY</center>

To print a bird check-list for any North American state or province (excluding Hawaii), simply enter the Reports Menu form, access the **BASIC** reports pull-down menu, select the **Create a Species Check-List ...** report, and choose the **For a Specific State or Province** option. Select the State or Province of your choice and an output option (printer or file), then click on **Run Report**.

To create an Hawaiian check-list, follow the instructions for importing a species list into the database (see the section IMPORTING A SPECIES LIST under **Special Functions of the LANIUS Excalibur Database**, later in this manual). Use these instructions to import the list of Hawaii birds into the database, make it your Default List, and then run the report **Create a Species Check-List ...** and choose the option for creating a check-list based on your Default List.

To create a check-list for other countries, follow the instructions for importing a species list into the database (see the section IMPORTING A SPECIES LIST under **Special Functions of the LANIUS Excalibur Database**, later in this

manual). Use these instructions to import a list of birds from another country, make it your Default List, and then run the report **Create a <u>S</u>pecies Check-List ...** and choose the option for creating a check-list based on your Default List.

<u>ENTER DETAILED FIELD NOTES FOR A BIRD SIGHTING</u>

Remember that the Remarks field of the Observation Form only allows you to enter text up to 160 characters in length. If you need more room than this to store data collected in the field for a particular species, access the Documentation Form by pressing [F4] when the Observation Form is showing. The Documentation Form allows you to enter extensive notes about an individual bird sighting. The field limatations for many of the database fields on this form are described in Table 6, Appendix A.

<u>ENTER BIRD SIGHTINGS FOR OTHER COUNTRIES</u>

We sometimes get calls from users of the database who want to know how to get started recording the birds they have seen in foreign countries. As you might expect, to record birds in countries other than the United States and Canada, you will have to create one or more Major Areas and related Minor Areas, and then define sites for places located in those areas. The process on how to do this, including a very detailed example for the country of Jamaica, is provided in the section entitled **<u>Using the Geographic Management System</u>**, near the end of this User's Manual.

<u>OPEN A REPORT I PRINTED TO FILE</u>

Oftentimes, we hear of users who create a report and send the output to a file. They later want to open that file in a word processor to edit or print the document; however, they can not locate the file that was created by the report.

This problem is easliy solved. Always remember that LANIUS Excalibur sends all its output report files to the **REPORTS** subdirectory, which is located in the directory where your software was installed. By default, your software would have been installed in **C:\Program Files\LANIUS Software\REFBOOK1**

<u>VIEW BIRD PICTURES AND HEAR THEIR SONGS</u>

This one's easy. Simply click on the **REFERENCE <u>B</u>OOK ...** button on the Main Menu to access the North American Bird Reference Book. Remember that you may have to adjust your computer's volume to an appropriate level to hear the bird songs. In Windows 98, you can start Volume Control by clicking **Start**, pointing to **Programs**, pointing to **Accessories**, pointing to **Entertainment**, and then clicking **Volume Control**. In Windows 95, you can start Volume Control by clicking **Start**, pointing to **Programs**, pointing to **Accessories**, pointing to **Multimedia**, and then clicking **Volume Control**.

Also, if you have a large amount of video memory, you may want to consider setting your computer screen for 16-bit color. In general, most users have their screen set for an 8-bit color pallette, meaning that only 256 colors at a time can be shown on the screen. Since most photographs contain more than 256 colors, this forces the computer to interpret the colors it can't display as combinations of colors that it can display. To set the computer for 16-bit color, click on **Start**, point to **Settings**, click on **Control Panel**, and double click **Display** to open the Display Properties dialog box. Select **"High Color"** (this is the 16-bit color option) from the Colors list box. Since the 16-bit screen color option uses more memory, you may need to set it back to the original 8-bit (256 colors) color display if you encounter memory problems. Note: you need to restart your computer each time you change the number of colors your screen displays.

WARNING: The remaining topics in the ADVANCED CONCEPTS section of this manual cover subjects primarily intended for those people who are using the Advanced Features (i.e., bird listing features) of this software program. In addition, some of the following topics may only be of interest to power users who are intimately familiar with computers and are willing to branch out and explore the depths of the Excalibur database. For ALL users, we recommend that you do not attempt to read all of the topics in the ADVANCED CONCEPTS section of this manual in one sitting. Instead, we offer this sound advice:
1.   Take the time to read one of the following topics.
2.   Spend a day or two working with the concepts covered in this topic (feel free to experiment with the tutorial database while you do this; as a result, you won't inadvertently lose or alter your own bird sightings).
3.   When you feel you have grasped the full meaning of a topic, return to the manual and begin reading the next topic (repeating steps 1 and 2 above).

Copying the Multimedia Files to Your Hard Disk

At one time, when you bought a computer the size of the hard disk was just 20 MB. It is interesting to note that just six of the songs included on the multimedia CD-ROM for the Reference Book may collectively require more than 20 MB of disk storage space!

Fortunately, most new computers purchased today have hard disk storage capacities that are measured in gigabytes. If this is the true for your computer, you may want to take advantage of this extra storage space by copying the song, map, and photograph files that are part of the Reference Book over to your hard disk. You will find that the images, songs, and maps load quicker in the Reference Book when accessed from your hard disk. In addition, by having the multimedia files on your hard disk, you will no longer have to insert the CD-ROM into your CD-ROM drive to use the Reference Book's multimedia features.

To copy the multimedia files to your hard disk, take the following actions:

1.   Confirm that you have at least 650 MB of available disk space on your hard drive.
2.   In the root directory of your hard drive, create three subdirectories called: **SONGS, IMAGES,** and **MAPS**.
3.   Copy the multimedia files from the CD-ROM disk to the appropriate hard disk subdirectory. For example, if your CD-ROM drive is Drive D and your hard disk is Drive C, copy all of the files in **D:\SONGS** to **C:\ SONGS**, and do the same for the image and map files.
4.   At the Main Menu, access the User's Settings dialog box and change the **CD Drive** setting to the drive letter of your hard disk (in this example, Drive C).

Data Entry Strategies

•Prior to using LANIUS Excalibur, you will want to spend some time thinking about the places that you visit most often in search of birds. Before entering actual observation data, these places should be recorded in the SITE table, and links should be established where necessary (see Appendix D for more information about linking sites). However, see our caution above about creating more sites than are necessary; and see our example below about how to make use of the "General Location" site record.

•Prior to using the database, you should access the Reports Menu and run the BASIC reports that print out (to file) the names of Countries, Species, and the names for Major and Minor Areas. (The database will prompt you for a name for each output file.) Although in most cases you will not need to know the Identification Codes for countries, species, and Major or Minor areas, you may on occasion have need to reference the information in these reports. Use your favorite word processor to open up the output files generated by these reports. You can use your word processor to search these files for specific information or to print selected pages on your printer. If you subsequently enter new or modify the names of existing countries, species, or Major/Minor Areas, be sure to re-run these reports to ensure that you have the latest information available. After you have created all of the Sites that you expect to use in the database, you can use the BASIC report called **List of Site <u>N</u>ames** to print out the information (including Site ID codes) for each of your sites. Again, re-run this report after you update or revise the information pertaining to your Site data.

•When creating sites, it is advised that you spend some time thinking about the site called "General Location". This record should be assigned to all Major/Minor Area combinations:

1.   That you frequent on a regular basis; and
2.   Where you anticipate incidental sightings (that won't be specifically assigned to other sites) will be made.

The record for "General Location" ships with the LANIUS Excalibur database. It may be assigned to additional Major/Minor Area combinations as needed to account for birds seen at odd locations that won't be entered as a specific site in the database. There is no limit to the number of Major/Minor Area combinations that can be assigned to the General Location site record.

If the previous two paragraphs initially make no sense to you, review the following process outline and specific example for using the General Location site.

To assign the "General Location" record to one or more Major/Minor Area combinations, take the following steps:

1.   From the Main Menu Form, press the **REFERENCE DATA** button.
2.   The Reference Form will appear. If the record for "General Location" (ID Code 001) is not immediately on display, press **Find** and enter "General Location" at the prompt.
3.   Press the **Places Where This Site is Found ...** button.
4.   When the SITE LOCATION table data appears, specify a Major Area and corresponding Minor Area for each combination of Major and Minor Areas you wish to associate with the General Location site. For instance, if you are an Iowa birder and generally bird in Boone, Story, and Johnson Counties, then create three records for each of those counties. Press [F3] to save each record to the database; then press [F2] to create a new record.

As an example, consider the following scenario: you go bird watching at the Crab Orchard National Wildlife Refuge in Williamson County, Illinois, where you amass a total of 47 species. On your return trip home, you also find an American White Pelican 7 miles north of the refuge along Interstate-57. Obviously, you don't want to record the pelican as being seen on the same census (and therefore at the same site) that all of the other 47 species were recorded. To solve this problem, take the following simple actions:

1.   Follow the four steps shown above to associate Williamson County, Illinois to the site for General Location.
2.   Using the steps shown in the <u>ENTERING BIRD SIGHTING DATA</u> section of the tutorial, create a new census record and enter the records for the 47 species of birds found at Crab Orchard National Wildlife Refuge.
3.   Press **Exit** to return to the Census Form.
4.   Press [CTRL]-Z to create a new Census record by duplicating the fields of the current Census record.
5.   Specify **General Location** as the name of the Site.
6.   Using the steps shown in the <u>ENTERING BIRD SIGHTING DATA</u> section of the tutorial, enter the record for American White Pelican; in the Remarks section of this record, describe the precise location: **I-57, about 7 miles north of Crab Orchard National Wildlife Refuge**.
7.   Press [F3] to save the record.

Why did we do this? Well, the only other alternative would have been to create a site for the location that is along I-57, about 7 miles north of the refuge. Imagine doing this for every bird you find at an odd location! You would quickly have more sites than you know what to do with, which explains our previous caution against creating more sites than are necessary.

World travelers may, for one reason or another, want to create a General Location site record for each continent in which they have recorded birds. Indeed, although it is not necessary, North American birders could also create a General Location site record (e.g., **General Location (GA)** for Georgia or **General Location (TN)** for Tennessee) for each state in which they have birded.

• When the Pick List Form is shown, it displays the species that are on your Default List. Before accessing the Census Form for the first time, you should ensure that the North American list is the Default List (this is the Default List unless you changed it after the installation was completed). This ensures that if the Pick List Form is used, there will at least be some species shown on that form.

• When accessing the Observation Form for the first time, the default mode for identifying species will be by codes. You may want to automatically switch to the mode that allows you to identify species by common or Latin name (see the available user settings on the Observation Form). Begin by typing the name (common or Latin) of the species desired. The database will attempt to locate the name of the species using your input. In most cases, you will not have to type the entire name of the species you are searching for; to enhance the speed of data entry, the search is performed while you are typing. As a result, if you have typed "Mal" for Mallard, you may only have to type an additional "l" to ensure that the search engine successfully finds "Mallard" in the database. Press [ENTER] to select the species.

Note: your Default List will always be used to populate the list box with species names. If you need to enter a bird sighting whose name is not on your Default List, simply access the **EDIT** menu, press **Edit User Settings ...** and click on **Invoke World List**. Follow these same steps and click on **Invoke Default List** when you want to restore your Default List to the list box.

• You may want to record the same remarks for all or most of the bird sightings that were made in a day, but your default data entry mode is by picking species from a list (i.e., the Pick List Form). Under this scenario, you may want to only pick one species from the list when the Pick List Form is showing, press **OK** to access the Observation Form, enter a comment in the Remarks field for the current record, and use the [CTRL]-R feature (available from the **RECORDS** pull-down menu) to repeat these remarks for all additional bird sighting records.

• When using the Observation Form, you will in most cases not need to know the codes for the Minor Areas to which birds are assigned. However, after a record has been saved to the database, you may want to change the Minor Area to which the bird observation has been assigned. To do this, position the cursor on the Change Minor Area field and enter the ID Code for the Minor Area desired. Consult the report of Major and Minor Areas you generated earlier to obtain the ID Code for any Minor Area currently in the database.

• When multiple locations were visited on the same day, use the [CTRL]-Z feature (on the Census Form's **RECORDS** pull-down menu) to duplicate the most recently accessed record. Then choose a site name for the newly created record. Proceed to entering species records as you normally would.

• The database ships with the North American list included by default in the program. You can add an unlimited number of customized lists to the database. To do this, begin by first ensuring that the North American List is your Default List. Then, run the BASIC report called "Create a Species Check-List" (the output is sent to a file). Use your word processor to open this file and delete those names from the report that you don't want on your check-list, then print the check-list out on your printer. The codes for each species now appear to the left of the species names.

You can use this printed list to enter a customized check-list into the LANIUS Excalibur database. To do this, return to the Main Menu and select **REFERENCE DATA**. When the Reference Form is displayed, choose **List Names** from the **TABLES** menu. Press **Add New** and enter a unique ID code and name for your customized list. Then press [F3] to save the record. Next, click on **Add 1 or More Species to This List** from the **RECORDS** pull-down menu. Enter the codes, one at a time, from your printed field check-list. Now, return to the Main Menu Form, choose **Edit User Settings ...** from the **EDIT** menu, and change your Default List to the name of your customized list.

Adding a Species Name to the SPECIES Table

Initially, you will find that you have little or no need to modify the data in the SPECIES table. However, over time, the need to add a new species name record to the SPECIES table may arise. To do this, you must first have an understanding of the fields in the SPECIES table; the following paragraph is intended to provide you with that understanding.

The Common Name and Latin Name fields in the SPECIES table are pretty straightforward and require no further explanation. The Sequence Number field is used to display the birds in proper taxonomic order, according to Clements' (1991) check-list; fractional numbers (e.g, **25.5**) are allowed in this field. The On Life List? (Y/N) field may only accept one of two values: "Y" for Yes, or "N" for No. A taxonomic family must be specified for each record added to the SPECIES table; select a family name from the list provided. An additional field is the Species ID column, which is not shown on the form. Internally, the database generates a unique value for Species ID for each new species added to the database.

To use an example, suppose we needed to add a new species called Purple Jay, and we know that taxonomically it occurs immediately after the record for Green Jay, whose Sequence Number is 5777. To add the record for Purple Jay, take the following actions:

1.   Enter the Reference Form and access the Species Names tables (using the **TABLES** pull-down menu).
2.   With the SPECIES table on display, press **Add New**.

3.   Fill in values for each field. Since we know that the Sequence Number for Green Jay is 5777 and that the Sequence Number for the following species (Brown Jay) is 5778, specify a value of **5777.5** for the Sequence Number column for the Purple Jay.
4.   Press **S̲ave** to save your changes to the database.

The Species ID code for the Purple Jay can be determined by running the report, **List of SP̲ecies Names**. (The output for this report is sent to a file on your hard disk; use your favorite word processor to open this file.) Once you know the Species ID code for the Purple Jay, you can use it to add this species to any of your Default Lists (see the Help File topic "Using the List Name Table").

Special Functions of the LANIUS Excalibur Database

Special functions have been assigned to each of the various forms within the LANIUS Excalibur database. Please see the help file for more information about the special functions that are available on the form of your choice. Several of the most important functions are discussed below.

SPECIES SPLIT FUNCTION

The Species Split function is available on the **UPDATE LIFELIST** menu of the Reference Form when the Species data are on display; this function may be accessed by pressing [SHIFT-F12]. Use this function to address those situations when a species is split into one or more new species. Always back up your database before performing this function.

In the example that follows, the "original" species (Green Jay) will be the species that was split and the "new" species (Purple Jay) will be the species that was formed as a result of the split. Hence, let's assume that the ornithological scientists recently split the Green Jay into two species: the Green Jay (the original species, Species ID code unchanged), and a new species, the Purple Jay (Species ID code 9800).

To use this function to incorporate this kind of change into the LANIUS Excalibur database, you must first enter the record for Purple Jay into the database. A suggested approach is described below:

1.   First you must determine if you have any records in your database for the original species (i.e., for the Green Jay).
2.   If you do have records for the Green Jay, print a report for all records of this species using the **All Records for One or All S̲pecies** report, available from the Detailed Reports Menu option.
3.   Add the new species (Purple Jay) to the SPECIES table, using the instructions provided earlier in this manual. Update the name of the original species, if necessary.
4.   Consult the output from step 2. If you do have records for the Green Jay, determine which of those records actually are records of the new species (Purple Jay); if one or more of these records are actually records for Purple Jay, then take the following actions:
        a.   Choose **REFERENCE DATA** from the Main Menu and access the SPECIES table.
        b.   Press the **Find** button and at the prompt enter **Green Jay**. Then press [ENTER].
        c.   When the species record for Green Jay is displayed, press [SHIFT-F12] and follow the instructions on the screen for the Species Split function. You will be asked to provide the Species ID code for the new species (Purple Jay). Enter **9800** at the prompt and then press [ENTER]. (Note: run the report **List of SP̲ecies Names** to generate a list of all species and their related ID Codes or consult the text or WordPerfect files called **Species Names in LANIUS Excalibur**, which were installed with your program).
        d.   You will be given an opportunity to confirm these settings. Press [ENTER] to continue.
        e.   If there are any records for Green Jay in the SIGHTING table, LANIUS Excalibur will then prompt you to indicate which records should be updated to represent an occurrence of the new species (Purple Jay). Answer **Y̲es** for any record you want to be updated. Press **N̲o** (the default answer) if you don't want the record updated.
5.   When the update process is completed, a message will display the number of records that were updated.
6.   If a species was split into two or more species, repeat steps 1 through 5 for each new species, as needed.

It is important to note that records in the DOCUMENTATION and SPECIES LIST tables are not affected by this function; you must manually update such records one at a time. Similarly, after running the Species Split function, you may need to re-synchronize the North American Bird Reference Book with your LANIUS Excalibur database; for more

information, see the discussion on synchronizing databases in the **Other Features of the North American Bird Reference Book** section of the tutorial (the tutorial is contained in a file called *TUTORIAL.DOC*, which was installed with the program).

Note that in step 4e above, there may be times when updating a record may result in the creation of a duplicate record (i.e., a record with the same combination of Species ID, Major Area, and Minor Area codes on the same date and census as another record in the SIGHTING table). If this happens, you will be notified by a message on the screen. You should note these errors with a pen or pencil and then enter the Observation Form for the date indicated and make a decision on how best to resolve the inconsistency between the two records involved.

<div align="center">SPECIES MERGE FUNCTION</div>

The Species Merge function is available on the **UPDATE LIFELIST** menu of the Reference Form and is accessed by pressing [CTRL-F12]. Use this function to address those situations when two or more species are merged into a single species. Always back up your database before performing this function.

In the example that follows, the Purple Jay will be the species that was "lost" (i.e., merged with another species) and the Green Jay will be the "remaining" species (i.e., the species that remains after the merger). Hence, let's assume that the ornithological scientists recently merged the Purple Jay with the Green Jay, effectively eliminating the Purple Jay as a valid species. A suggested approach for using this function to incorporate this kind of change into the LANIUS Excalibur database is described below:

1. Choose **REFERENCE DATA** from the Main Menu and access the SPECIES table.
2. Press the **Find** button and at the prompt enter **Purple Jay** (the species that was "lost"). Then press [ENTER].
3. When the species record for Purple Jay is displayed, press [CTRL-F12] and follow the instructions on the screen for the Species Merge function. You will be asked to provide the Species ID code for the remaining species (Green Jay). Enter **5777** at the prompt and then press [ENTER]. (Note: run the report **List of SPecies Names** to generate a list of all species and their related ID Codes or consult the text or WordPerfect files called **Species Names in LANIUS Excalibur**, which were installed with your program).
4. You will be given an opportunity to confirm these settings. Press [ENTER] to continue.
5. If there are any records for Purple Jay in the SIGHTING table, LANIUS Excalibur will then ask you if it may update each record to represent an occurrence of the remaining species (Green Jay). Note: as a safeguard against inadvertent changes to the database, the default answer is **No**, but you should always answer **Yes** since the lost species is no longer a valid species.
6. When the update process is completed, a message will display the number of records that were updated.
7. Following this, a message will display telling you that the record for Purple Jay should be deleted (this was the species that was lost as a result of the merger). Press the **Delete** button to delete the record. If there are any remaining records in the database (in the SIGHTING, DOCUMENTATION, or SPECIES LIST tables) that use the Species ID code for Purple Jay, you will be notified and the delete request will fail; use the Species Merge Function again to update any remaining sighting records and then delete the Purple Jay record from the SPECIES table.

It is important to note that records in the DOCUMENTATION and SPECIES LIST tables are not affected by this function; you must manually update such records one at a time. Similarly, after running the Species Merge function, you may need to re-synchronize the North American Bird Reference Book with your LANIUS Excalibur database; for more information, see the discussion on synchronizing databases in the **Other Features of the North American Bird Reference Book** section of the tutorial (the tutorial is contained in a file called *TUTORIAL.DOC*, which was installed with the program).

Note that in step 5 above, there may be times when updating a record may result in the creation of a duplicate record (i.e., a record with the same combination of Species ID, Major Area, and Minor Area codes on the same date and census as another record in the SIGHTING table). If this happens, you will be notified by a message on the screen. You should note these errors with a pen or pencil and then enter the Observation Form for the date indicated and make a decision on how best to resolve the inconsistency between the two records involved.

<div align="center">IMPORTING A SPECIES LIST</div>

LANIUS Excalibur ships with the names of all of the species of the world already included in the SPECIES table. Because there are over 9600 species names, LANIUS Excalibur allows you to work with **subsets** of this species list when running reports or during data entry when using the Pick List or Observation Forms. You do this by making one of these subset lists your Default List.

LANIUS Excalibur ships with two subset species lists already included in the database: your Life List and the list of North American birds. However, you have the capability of adding additional default species lists to the program at any time. The steps to do this are outlined below.

1. Access the Reference Form, and select **List Names** from the **TABLES** pull-down menu.
2. When the List Names data set is on display, select **Import a Default Species List ...** from the **RECORDS** pull-down menu.
3. The names of the species lists that you may import are presented in a list box. You have the option of importing a predefined list of species (i.e., birds for Africa, Argentina, the Southern Ocean area, Costa Rica, the United Kingdom, Australia, or Hawaii) or selecting "Other" from the list; click on your selection.
4. Press the **OK** button to import the selected list of species names (or press [ESC] to cancel the operation).
5. If you selected "Other", you will be asked to specify the file name of the list that you want to import; additionally, you will be prompted for the name and ID Code that should be assigned to this list (e.g., "Back Yard" and "BY" could be the name and ID code that you assign to a default species list for your back yard). *Note: if you are planning to import a species list that was exported from the North American Bird Reference Book, click "Other" in step 3, press **OK**, and select the file called LXEXPORT.TXT as your import file.*

The program will import the list of species names that you selected. You will be notified if any errors are encountered.

Please note that you can create your own customized Default Lists (e.g., lists for the counties in your state, your back yard, or for the State Park that you visit most often). To do this, follow these simple steps:

1. Begin by first asking yourself whether the customized species list that you wish to create would be a subset of one of the default species lists that already exists.
    a. If your answer is yes, ensure that the appropriate Default List has been selected (see UNDERLINE WORKING WITH USER SETTINGS below for more information). Then, run the BASIC report called **Create a Species Check-List Based on My Default List** (the output of this report is sent to a file of your choice). Use your word processor to open this output file and delete those names from the report that you don't want on your check-list, then print the check-list out on your printer. The codes for each species now appear to the left of the species names.
    b. If the answer is no, you will need to generate a report of all species names in the database. To do this, run the report **List of SPecies Names** (the output of this report -- 9,600+ species names -- is sent to a file of your choice) or consult the text or WordPerfect files called **Species Names in LANIUS Excalibur**, which were installed with your program. Open this file using your favorite word processor and delete the names of those species that you don't want on your check-list, then print the check-list out on your printer (use small fonts and landscape orientation to ensure that the list prints out with each species name on a separate line). The species name and **ID Code** will be included in this output.)

2. Using a text editor (e.g., WordPad), create a new file and **enter the Species ID Codes from your printout, placing each code on a separate line**. For example, a list of three species (Black Tern, Least Tern, and Mourning Dove) would appear as follows:

    1638
    1668
    1843

3. **Save the file as a text file** in the directory where LANIUS Excalibur is installed, and give it a name that makes sense to you (e.g., **BACKYARD.TXT**). Then follow the five steps outlined above for importing a species list; select "Other" from the list of available files to import and provide the name of your customized list file (e.g., BACKYARD.TXT).

WORKING WITH USER SETTINGS

On the *Main Menu Form*, access the **EDIT** pull-down menu and click on **Edit User Settings ....**

LANIUS Excalibur responds by pulling up a tabbed dialog box where you can view or change the most important user settings in the program.

1. Note that your default species list is the **North America** (excluding Hawaii) list. To change this setting, click on the data control bar to access a different record. Note that there are over 9600 species names in the database. Your Default Species List controls what species names are on display whenever you access a list of species in the program. The Default List allows you to focus on a specific subset of the more than 9600 species names that are included with the program.
2. Press the **Documentation Info** tab. This setting controls how your name and other information is recorded on the Rare Bird Documentation Form that LANIUS Excalibur can produce for you when you want to document a rare or vagrant bird sighting. If you have not done so yet, take a moment here to fill in the blanks for your name, address, phone number, and E-mail address.
3. Press the **Data Entry Mode** tab. By default, your data entry mode is to select species from a list (using the Pick List Form). Alternatively, you could enter species one at a time using the Observation Form; to do this, click on the option to **Enter Species Records One at a Time**.
4. Press the **CD Drive** tab. If the Drive letter for your CD-ROM or DVD drive is correct (by default, it is set to "D"), then you need not do anything; otherwise, change the Drive letter for your CD-ROM to the correct value (e.g., "E", "F", or "G", depending on your computer's configuration).
5. If you made any changes to your user settings and you want to keep those changes, press the **OK** button.
6. Your new settings are now saved.

Also on the Main Menu is an option to display your Life List Total on the form. This option is found on the **EDIT** pull-down menu. Click this option once to turn this feature on, and again to turn it off.

When adding species records to the database, your data entry mode may specify that you want to select species names from a list. When this setting is invoked, a *Pick List Form* comes up whenever you press the [F2] key to add a new Census record to the database. When the Pick List Form is showing, you can tell LANIUS Excalibur to prompt you for the number of individuals seen (this is the default setting). To do this, check the **Prompt for # of Birds Seen** box in the lower left hand corner of the form. Any changes to this setting are only valid for the current data entry session.

When accessing the *Observation Form* for the first time, the default mode for identifying species will be by codes. You may want to automatically switch to the mode that allows you to identify species by common or Latin name. To do this, access the form's **EDIT** menu, click on **Edit User Settings...** and then select **Specify Species by Typing Common (or Latin) Name**. From now on, the database will expect you to type the common (or Latin) name into this field to identify species when using the Observation Form. Begin by typing the name (common or Latin) of the species desired. The database will attempt to locate the name of the species using your input. In most cases, you will not have to type the entire name of the species you are searching for; to enhance the speed of data entry, the search is performed while you are typing. As a result, if you have typed "Mal" for Mallard, you may only have to type an additional "l" to ensure that the search engine successfully finds "Mallard" in the database. Press [ENTER] to select the species.

Note: your Default List will always be used to populate the list box with species names. If you need to enter a bird sighting whose name is not on your Default List, simply access the **EDIT** menu, press **Edit User Settings ...** and click on **Invoke World List**. Follow these same steps and click on **Invoke Default List** when you want to restore your Default List to the list box.

When generating reports on the *Reports Menu Form*, your Default List of bird names will be used to fill the Species Name list box. If you need to generate a report for a species that is not on your Default List, simply access the **DETAILED REPORTS** pull-down menu and click on **Invoke World List ...**. To redisplay your Default List of bird names, click **Invoke Default List ...** from the **DETAILED REPORTS** pull-down menu. This setting remains active only as long as you are working in the Reports Menu form; if you exit the form and later return to it, your Default List of bird species names will be on display regardless of what your previous settings were.

When accessing the SPECIES table in the *Reference Form*, initially the world list of species names will always be on display. However, you can limit the display to just those species that are on your Default List by clicking **Invoke Default List** on the **UPDATE LIFELIST** pull-down menu. To redisplay the world list of species names, click **Invoke World**

List on the **UPDATE LIFELIST** pull-down menu. This setting remains active only as long as you are working in the Reference Form; if you exit the form and later return to it, the world list of species names will be on display regardless of what your previous settings were.

CREATING A FIELD CHECK-LIST

To create a field check-list similar to the one shown in Appendix B, begin by first ensuring that your Default List is the list that you want to use as the source for your field check-list. If not, change this setting from the Main Menu Form. Then, perform the following simple steps:

1.   Run the BASIC report called **Create a Species Check-List Based on My Default List**. The output is sent to a file.
2.   Use your word processor to open this file; optionally, delete those names from the file that you don't want on your check-list.
3.   Add fonts, column formatting, and page orientation settings to suit your needs. Modify the heading as necessary to meet your requirements.
4.   Print the check-list out on your printer. The codes for each species now appear to the left of the species names.
5.   Make copies of the list at your local photo-duplication store.
6.   Your list is now ready for use on a daily basis in the field, and it will also double as a data entry form.

Using the Geographic Management System

No matter where you are in the world, LANIUS Excalibur's Geographic Management System is smart enough to distinguish between states, counties, provinces, regions, etc., all within the context of the country in which you are birding! This section of the manual explains how to use the Geographic Management System for international birding.

As explained earlier, LANIUS Excalibur divides countries up into Major and Minor Areas. Each Major Area consists of a certain type (e.g., a *state* in the United States or a province in Canada). Likewise, each Minor Area consists of a certain type (e.g., a *county* in the United States). The types of Major or Minor Areas that you work with are predefined in the MAJOR AREA TYPE and MINOR AREA TYPE tables, respectively. LANIUS Excalibur ships with the following records pre-entered into these tables:

MAJOR AREA TYPE TABLE		**MINOR AREA TYPE TABLE**	
ID Code	Name of Type	ID Code	Name of Type
PR	Province	CO	County
ST	State	PA	Parish

To use this system for international birding, consider the following example. In Jamaica, there are three large counties and, within each county, there are several parishes, as shown below:

Cornwall County parishes: Hanover, Westmoreland, St. James, Trelawny, St. Elizabeth
Middlesex County parishes: St. Ann, Clarendon, Manchester, St. Catherine, St. Mary
Surrey County parishes: Portland, St. Thomas, St. Andrew

To begin entering data for birds found in Jamaica, note that a county in Jamaica is similar to a state in the U.S., and that a parish in Jamaica is similar to a county in the U.S. Thus, we have our Major Areas (Counties) and Minor Areas (Parishes) defined for Jamaica. Since we already have a record for "Parish" in the MINOR AREA TYPE table, we only need to add a record for "County" to the MAJOR AREA TYPE table. To begin entering records for Jamaican birds, we must first complete the steps shown below:

1.   Choose **REFERENCE DATA** from the Main Menu.
2.   Select **Major Area Types** from the **TABLES** menu.
3.   Press the **Add New** button and, when the screen is cleared, enter "CO" in the Major Area Type Code field and "County" in the Major Area Type Name field.
4.   Press **Save** to save the record.
5.   Select **Major Areas** from the **TABLES** menu.
6.   While the Major Area table data is showing, press **Add New** and enter a record for Cornwall County, Jamaica: type "Cornwall" in the Major Area Name field, select "Jamaica" from the Country list box, and select "County"

from the Major Area Type list box. (Note: if the name of the Major Area you are adding has the same name as a previously entered record, you may want to annotate (in the Major Area Name field) the country of the Major Area in parentheses: Middlesex (JM). This ensures that you will always be able to distinguish similar Major Area names from one another when you access a list of such names in the database.)

7. Repeat step 6 two more times to enter records for Middlesex and Surrey Counties, Jamaica. After entering the third record, make sure that it is saved.
8. Select **Minor Areas** from the <u>**TABLES**</u> menu.
9. Press <u>**Add New**</u> and begin entering the record for Hanover Parish in Cornwall County, Jamaica: type "Hanover" in the Minor Area Name field, select "Cornwall" from the Major Area list box, and select "Parish" from the Minor Area Type list box.
10. Repeat step 9 for each of the parishes in Cornwall County, Jamaica, and for each of the parishes in the other two Jamaican Counties.
11. Select <u>**Site Names**</u> from the <u>**TABLES**</u> menu; press <u>**Add New**</u> and create one or more sites for Jamaica, following the easy three-step process.
12. Return to the Main Menu and press <u>**ADD/EDIT RECORDS**</u> to begin entering records the way you normally would. Any sites that you defined for Jamaica will appear in the Site Name list box on the Census Form.

Note that from this point forward LANIUS Excalibur will always treat Major Areas as counties and Minor Areas as parishes for the country of Jamaica; yet, LANIUS Excalibur is smart enough to know that Major Areas in the United States are states and Minor Areas are counties. This is one of the most exciting benefits of using the LANIUS Excalibur program.

Finally, note that while it will almost always be easy to define Major Areas for a country, it may not always be easy to identify Minor Areas within each of the Major Areas. When this is the case, we suggest (if you have not already done so) that you add a record to the MINOR AREA TYPE table called "Region" (using "RE" as an ID code for this record); see the Tutorial for more information on how to do this. You can then divide the Major Area in question up into four minor areas (Southwest, Northwest, Southeast, and Northeast), the records for which could be entered as "regions" into the MINOR AREA table.

Appendix A. <u>Field Limitations in the LANIUS Excalibur Database.</u>

When you use the **LANIUS® Excalibur™ Ornithological Database for the Natural World!**, you will find that a record can not be added or saved to the database unless all fields that require a value have been filled in by you. The database identifies these mandatory fields with a blue background. Any field that has a green background is an optional field: these fields may be left blank if you have nothing to enter into them. For example, the Remarks field in the SIGHTING table may be left blank or empty for any particular record that you add to the database.

Any record can not be added or saved to the database if doing so would violate the primary key of the table in question. A primary key is a column (or group of columns) which uniquely identifies an individual row in a table. For example, in the LIST NAME table, no two records can have the same value for the List ID field. If you violate this rule when attempting to add a record to the database, you will receive a DUPLICATE KEY ERROR message.

Each table in the database has one or more columns or fields. Each field, in turn, has certain limitations. For example, number fields can not contain letters or alpha-numeric values. Similarly, date fields can only contain values that are calendar dates in M/D/YYYY format (e.g., 5/21/1997). Some of the most frequently used fields in the database are listed below, along with their constraints.

Table 6. Properties of selected fields in the LANIUS Excalibur database.

TABLE NAME	FIELD NAME	FIELD CONSTRAINT
MAJOR AREA	Maj Area Name	Text field; Maximum length=30
MINOR AREA	Min Area Name	Text field; Maximum length=30
SITE	Site Id	Primary key of table; Text field; Maximum length=5
	Site Name	Text field; Maximum length=35
CENSUS	Weather	Text field; Maximum length=50; optional field
	Observers	Text field; Maximum length=50; optional field
SIGHTING	Number	Number field; Maximum Value=99,999,999
	Remarks	Text field; Maximum length=160; optional field

LIST NAME	List Id	Primary key of table; Text field; Maximum length=4
	List Name	Text field; Maximum length=25
DOCUMENTATION	Date Range	Text field; Maximum length=40
	Number Age Sex	Text field; Maximum length=70
	Location	Text field; Maximum length=255
	Habitat	Text field; Maximum length=255
	Vocal Behavior	Text field; Maximum length=255
	Other Observers	Text field; Maximum length=255
	Experience	Text field; Maximum length=255
	References	Text field; Maximum length=255
	Address	Text field; Maximum length=255
	Light Weather	Text field; Maximum length=255
	Description	Memo field; Maximum length=several thousand characters
	Similar Species	Memo field; Maximum length=several thousand characters

Appendix B. Sample Field Check-List Form.

DATE: _____ WEATHER: _____

OBSERVERS: _____ Major Area: _____ Minor Area: _____

LOCALITY: _____

64   Pied-billed Grebe _____
71   Horned Grebe _____
72   Black-necked Grebe _____
240   Double-crested Cormorant _____
276   American White Pelican _____
293   Ruddy Duck _____
306   Tundra Swan _____
311   Greater White-fronted Goose _____
315   Snow Goose _____
319   Canada Goose _____
352   Wood Duck _____
360   American Wigeon _____
364   Gadwall _____
366   Common Teal _____
375   Mallard _____
388   Northern Pintail _____
397   Blue-winged Teal _____
398   Cinnamon Teal _____
402   Northern Shoveler _____
410   Canvasback _____
411   Redhead _____
412   Ring-necked Duck _____
420   Lesser Scaup _____
431   Common Goldeneye _____
433   Bufflehead _____
435   Hooded Merganser _____
437   Red-breasted Merganser _____
439   Common Merganser _____
457   Snowy Egret _____
463   Great Blue Heron _____
465   Great Egret _____
474   Cattle Egret _____
482   Green Heron _____
485   Yellow-crowned Night-Heron _____
486   Black-crowned Night-Heron _____
503   Least Bittern _____
508   American Bittern _____

567   Turkey Vulture _____
573   Osprey _____
614   Bald Eagle _____
655   Northern Harrier _____
703   Sharp-shinned Hawk _____
707   Cooper's Hawk _____
745   Red-shouldered Hawk _____
758   Red-tailed Hawk _____
766   Rough-legged Hawk _____
783   Golden Eagle _____
841   American Kestrel _____
1089 Common Pheasant _____
1129 California Quail _____
1229 Virginia Rail _____
1264 Sora _____
1304 American Coot _____
1385 Common Snipe _____
1416 Greater Yellowlegs _____
1417 Lesser Yellowlegs _____
1423 Spotted Sandpiper _____
1426 Willet _____
1439 Western Sandpiper _____
1444 Least Sandpiper _____
1446 Baird's Sandpiper _____
1447 Pectoral Sandpiper _____
1451 Dunlin _____
1494 Black-necked Stilt _____
1498 American Avocet _____
1520 American Golden-Plover _____
1521 Gray Plover _____
1524 Semipalmated Plover _____
1528 Killdeer _____
1595 Ring-billed Gull _____
1596 California Gull _____
1599 Glaucous-winged Gull _____
1600 Western Gull _____
1620 Bonaparte's Gull _____
1641 Caspian Tern _____
1656 Forster's Tern _____
1714 Red-throated Loon _____
1716 Pacific Loon _____
1717 Common Loon _____
1738 Rock Dove _____
1772 Band-tailed Pigeon _____
1843 Mourning Dove _____
2565 Greater Roadrunner _____
2583 Barn Owl _____
2623 Western Screech-Owl _____
2645 Great Horned Owl _____
2720 Burrowing Owl _____
2796 Common Nighthawk _____
2944 White-throated Swift _____
3277 Black-chinned Hummingbird _____
3278 Anna's Hummingbird _____
3297 Rufous Hummingbird _____
3298 Allen's Hummingbird _____
3427 Belted Kingfisher _____
3855 Nuttall's Woodpecker _____

3857 Downy Woodpecker _____
3860 Hairy Woodpecker _____
3891 Northern Flicker _____
4941 Olive-sided Flycatcher _____
4946 Western Wood-Pewee _____
4969 Pacific-slope Flycatcher _____
4976 Black Phoebe _____
5072 Ash-throated Flycatcher _____
5090 Western Kingbird _____
5747 Steller's Jay _____
5750 Western Scrub-Jay _____
5806 Yellow-billed Magpie _____
5835 American Crow _____
5856 Common Raven _____
6067 Hutton's Vireo _____
6083 Cassin's Vireo _____
6092 Warbling Vireo _____
6122 Loggerhead Shrike _____
6239 Cedar Waxwing _____
6309 Western Bluebird _____
6338 Hermit Thrush _____
6407 American Robin _____
6426 Northern Mockingbird _____
6449 California Thrasher _____
6538 Common Starling _____
6845 Red-breasted Nuthatch _____
6847 White-breasted Nuthatch _____
6858 Brown Creeper _____
6892 Bewick's Wren _____
6923 House Wren _____
6946 Blue-gray Gnatcatcher _____
6967 Tree Swallow _____
7006 Barn Swallow _____
7036 Cliff Swallow _____
7047 Ruby-crowned Kinglet _____
7052 Golden-crowned Kinglet _____
7630 Wrentit _____
7956 Chestnut-backed Chickadee _____
7992 Oak Titmouse _____
8092 Horned Lark _____
8095 House Sparrow _____
8684 Pine Siskin _____
8698 American Goldfinch _____
8727 House Finch _____
8804 Orange-crowned Warbler _____
8818 Yellow-rumped Warbler _____
8867 Wilson's Warbler _____
8964 Song Sparrow _____
8970 White-crowned Sparrow _____
8971 Golden-crowned Sparrow _____
8973 Dark-eyed Junco _____
9017 Spotted Towhee _____
9019 California Towhee _____
9170 Western Tanager _____
9491 Black-headed Grosbeak _____
9565 Bullock's Oriole _____
9583 Red-winged Blackbird _____
9596 Western Meadowlark _____

9619   Brewer's Blackbird _____
9624   Brown-headed Cowbird _____

Appendix C. <u>Sample of a Seasonal Report Prepared From the LANIUS Excalibur Database</u>.

The report below which displays fictitious data is an example of the kind of report you can prepare for submission to other individuals, organizations, or journals. The report is prepared by first selecting **All Records for One or All <u>S</u>pecies** from the **<u>DE</u>TAILED REPORTS** menu of the Reports Menu Form.

After you specify a range of dates and any other necessary criteria for the report, it is printed to a file. You can then use your favorite word processor to prepare a report similar to the one that follows.

To complete such a report, follow these simple steps:

1.   Prepare the **All Records for One or All <u>S</u>pecies** detailed report, using any desired range of dates; send the output of the report to a file.
2.   Start your word processor.
3.   Open the file you created in Step 1.
4.   Set a font appropriate for your page width (e.g., an 8-point or 10-point font). **Note: Courier fonts work best for this report.**
5.   Define page headings that will appear on each page of the report. This page heading could include column headings and a page number, as in the report that follows.
6.   Delete those species records that you do not wish to include in the final report.
7.   Save and print the report.

Helpful hint: Note that, depending on the type of word processor you use, the settings in steps 4-5 can be saved as a template document in your word processor, thereby saving you the time needed to redo these steps the next time you need to prepare this type of report from the LANIUS Excalibur database.

Here, now, is the sample report:
****

Observer: Jeromy S. Wilson, 1427 Wilson Pl., Concord, CA 94756
Season of Report: Spring 1995   Page 3

Date	No. Seen	Location, Remarks, Etc.

Pied-billed Grebe

05/28/1995 2   Siskiyou County, California at Lower Klamath National
                      Wildlife Refuge

Cinnamon Teal

05/21/1995 10   Contra Costa County, California at Eastern Contra Costa
                      County. Hen and adult male, with five Class I young

Snowy Egret

05/28/1995 1   Siskiyou County, California at Lower Klamath National
                      Wildlife Refuge; uncommon here.

White-faced Ibis

05/28/1995 45   Siskiyou County, California at Lower Klamath National
                      Wildlife Refuge

Sage Grouse

04/23/1995 21   Lassen County, California at General Location. Shaffer
                      Mountain foothills. All birds seen on a lek; 16 displaying
                      males and 5 females. I observed them from 0700-0715.

Wilson's Phalarope

05/28/1995 8   Siskiyou County, California at Lower Klamath National
                      Wildlife Refuge

Pinyon Jay

05/28/1995 7   Siskiyou County, California at Lava Beds National Monument.

California Thrasher

05/06/1995 7   Contra Costa County, California at Mitchell Canyon.

Yellow-breasted Chat

05/21/1995 1   Contra Costa County, California at Eastern Contra Costa
                      County. Singing; very windy; difficult to locate

Rufous-crowned Sparrow

04/22/1995 2   Contra Costa County, California at Mitchell Canyon. Song
                      heard

Lazuli Bunting

```
05/14/1995 15          Contra Costa County, California at Las Trampas Regional
                       Wilderness.
05/21/1995 2           Contra Costa County, California at Eastern Contra Costa
                       County.
```

Appendix D. Linking Sites.

The concepts of linking a specific site to one or more existing sites is described here.

1.   **Why should I link sites to one another?** Sites are nothing more than arbitrary geographic locations that have
        been defined by humans. If the locations of all sites were unique, there would not be a need to link them to one
        another. Unfortunately, some sites may overlap other sites. When the location of one site occurs within the
        geographic boundary of a second site, you can link the first site to the second. Linking sites to one another gives
        you added flexibility in defining sites and creating reports of species observed at those sites.

2.   **After I link one site to another, what happens?** After you have defined a link, you can rest assured that any
        queries made for a specific site will include all observations of birds that have been observed at that site as well
        as at those sites which have been linked to it. For example, consider the city of Ames, Iowa. Let's define that as
        site **IA007**. Within Ames, there are a number of sites at which birds may be observed: Iowa State University
        Campus (site **IA008**), Brookside Park (site **IA009**), and Lake Laverne (site **IA010**), to name just a few. Let's say
        that we create records for each of these sites and link them to the City of Ames. Now, when we generate a report
        for the City of Ames, we get a listing of all species records that have been assigned to that city as well as to the
        ISU campus, Brookside Park, and Lake Laverne. A query based on Lake Laverne would only retrieve those
        species whose records have been assigned to that specific site. Finally, note that Lake Laverne is located on the
        ISU Campus. In addition to linking Lake Laverne to the City of Ames, we could also link it to the ISU Campus
        site. Doing this makes a query of site **IA008** return all observation records for the ISU campus as well as for
        Lake Laverne.

3.   **Are Links permanent?** Links can be added and dropped at any time. To do this, find the name of an existing
        site in the Reference Form; then click on **Linkages for This Site ...**. If any links have been defined for this site,
        they may be deleted using the intuitive command buttons on the screen. Press the [ESC] key at any time to abort
        the action of deleting a link.

4.   **How do I add a Link?** For existing sites, simply find the name of an existing site in the Reference Form; then
        click on **Linkages for This Site ...**. The current site may be linked to other, existing sites using the intuitive
        command buttons on the screen. Press the [ESC] key at any time to abort the action of adding a link.

        For new sites, you will want to follow the 3-step process of Entering a Site Name.

        Entering Site Names--Step 1

        To begin entering a new record for a site, access the Reference Form. If the records for the SITE table are not
        currently on display, select **Site Names** from the **TABLES** pull-down menu.

        Press the **Add New** button to begin the process of adding a new record. Fill in the data for each field. Press [F3]
        to save the record. You will be taken to Step 2.

        Entering Site Names--Step 2

        The second step of the process for entering new sites provides you the opportunity to identify what Major and
        Minor Area(s) the site is located in. For large sites, it is possible that two or more Minor Area records may be
        entered here.

        To enter the name of a Minor Area, simply click on the down arrow of the Major Area list box and use your
        mouse to select the Major Area of your choice. Then select the Minor Area from the resulting list in the Minor
        Area list box. Press [F3] to save the record. You will be prompted to enter additional Minor Area records. If
        you answer yes, the screen will be cleared in preparation for the entry of an additional record; if you answer no,

LANIUS Excalibur will then ask you if you would like to link the new site to one or more existing sites. If you answer yes here, you will be taken to Step 3.

Why should I specify Minor Area names for my sites? By indicating what Minor Area(s) your site is located in, you can enhance the integrity of your database. When observations are added to the SIGHTING table, LANIUS Excalibur checks to ensure that each observation record is being assigned to a Minor Area which is valid for the site at which the observation record was made. The database does not allow observations to be entered if the Minor Area of the observation does not match the records recorded in the SITE LOCATION table.

Entering Site Names--Step 3

The third step in the process of entering a new site provides you with the opportunity to link the new site to other, preexistent sites. To Add a link, simply press the **Add Link** button and follow the instructions on the screen.

Appendix E. Error Messages

This appendix lists the most common error messages that may be encountered while you are using the LANIUS Excalibur database. These error messages are listed in alphabetical order. Therefore, to find the meaning of an error message, note the title of the message box when the error is displayed on the screen. Then, consult this appendix for the message of the same title.

MESSAGE: **ACCESS DENIED**

Cause: You attempted to access another form or table without saving changes to the current record.

Possible Solution: Press [F3] to save changes to the current record, or press [SHIFT-F2] to abandon any changes that have been made to the current record.

MESSAGE: **DATABASE INTEGRITY ERROR**

Cause: An invalid value was supplied during an other-table lookup.

Possible Solution: Provide a valid value or code, then retry the operation.

MESSAGE: **DELETE ERROR**

Cause: You pressed the "Delete" button on a data entry form but you were not positioned on a valid record, or the record had been changed but the changes had not been saved.

Possible Solution: If you are currently positioned on a previously entered record, then press [SHIFT-F2] to abandon all edits on the screen. If you are currently adding a new record, then you must save the record first, before you delete it (if you do not want to add the record to the database, simply press [SHIFT-F2] to abandon all edits on the screen). You will then be able to delete the record.

MESSAGE: **DELETE REQUEST CANCELLED**

Cause: An attempt was made to delete a record but it was not allowed.

Possible Solution: Database referential integrity prevents a record which is referenced by other records in the database from being deleted until the other records are first deleted.

MESSAGE: **DUPLICATE KEY ERROR**

Cause:	An attempt was made to enter a record in a table that has the same values in its primary key as another record already in the table.
Possible Solution:	Change the value(s) in the primary key for the record you are trying to add, then retry the operation.

MESSAGE:	**ERROR: NULL INDEX VALUE**
Cause:	An attempt was made to enter a record in a table, but one or more values for the table's primary key was not provided.
Possible Solution:	Provide values for all primary key fields and retry the operation. Note that a zero is not a valid value for the Number Seen and Sequence Number fields.

MESSAGE:	**ERROR PRINTING REPORT**
Cause:	An error was encountered while generating a report.
Possible Solution:	Read the error accompanying the message to determine what corrective action to take.

MESSAGE:	**FATAL ERROR**
Cause:	An unrecoverable error was encountered during a database report or other operation.
Possible Solution:	Read the error accompanying the message to determine what corrective action to take.

MESSAGE:	**FILE NOT FOUND**
Cause:	A file needed by the database could not be found.
Possible Solution:	Read the error accompanying the message to determine what corrective action to take. If this error occurs while attempting to display a bird photograph or map or while attempting to play a bird song, please note that the Reference Book first attempts to locate the multimedia files on drive D; if that drive is not your CD-ROM drive, you will have an opportunity to specify the correct drive letter.

MESSAGE:	**FILE OPEN ERROR**
Cause:	A report or other operation could not be generated because the file was already open.
Possible Solution:	Switch to the application that currently has access to the file that the database is attempting to write to, close the file, then retry the operation.

MESSAGE:	**FIND CANCELLED**
Cause:	The user cancelled a Find operation or supplied a null or zero value.
Possible Solution:	When attempting to find a record, enter one or more characters or specify a non-zero number.

MESSAGE:	**INVALID DATE VALUE**
Cause:	The value of the date specified was not allowed or not logical.
Possible Solution:	Specify a valid date value and retry the operation.

MESSAGE:	**INVALID DATE FORMAT**
Cause:	The database was passed an invalid date string.

Possible Solution: Re-enter the date value, being sure to specify a valid date in M/D/YYYY format.

MESSAGE: **INVALID NUMBER**

Cause: An invalid value was supplied when a number was expected.

Possible Solution: Enter a number in the appropriate data field and retry the operation.

MESSAGE: **INVALID SQL QUERY**

Cause: An invalid query string was passed to the database.

Possible Solution: Read the error accompanying the message to determine what corrective action to take. If necessary, repeat the operation without using single quotes.

MESSAGE: **MISSING KEY VALUE**

Cause: An expected value was not supplied.

Possible Solution: Enter the missing data value, then retry the operation.

MESSAGE: **NO CHANGES TO COMMIT**

Cause: An attempt was made to save a record to the database, but no changes had been made to the record since it was last saved.

Possible Solution: No corrective action needs to be taken.

MESSAGE: **NO MATCHING RECORDS**

Cause: During an attempt to generate a report or perform a related database operation, the program could not find any records that met the search criteria you supplied.

Possible Solution: Specify different search criteria and retry the operation.

MESSAGE: **OPERATION NOT COMPLETED**

Cause: An error occurred during a database update, compact, or repair operation.

Possible Solution: Read the error accompanying the message to determine what corrective action to take. If the problem is not correctable, replace the damaged database file with a working backup copy.

MESSAGE: **PLEASE NOTE ERROR**

Cause: An error was detected during a database update operation.

Possible Solution: Read the error accompanying the message to determine what records in the database caused the problem.

MESSAGE: **POSSIBLE CD-ROM INCOMPATIBILITY**

Cause: One or more disk read errors may have occurred while the CD-ROM drive attempted to play a song. If you experience this problem on your computer, it will most likely happen to some of the larger sound files.

Possible Solution: All of the sounds, photographs, and maps are accessible from any CD-ROM drive or fixed hard disk. Try running the program from your second CD-ROM drive, if you have one; or copy the

song and image files to your hard disk. If you decide to access the files from your hard disk, the songs (*.wav files) must be placed in a directory called SONGS; the photographs in a directory called IMAGES, and the maps in a directory called MAPS; this ensures that the directory structure on your CD-ROM disk is duplicated on your hard disk. The next time you run the Reference Book, at the Main Menu access the User's Settings dialog box and change the **CD Drive** setting to the drive letter of your hard disk.

MESSAGE:	**PRINTER ERROR**

Cause: The printer was off line, out of paper, or is jammed.

Possible Solution: Correct the problem and then press "OK" to continue printing.

MESSAGE:	**QUERY FAILED**

Cause: An unsuccessful attempt was made to find a record.

Possible Solution: Specify different search criteria and retry the operation.

MESSAGE:	**REQUEST CANCELLED**

Cause: An attempt was made to perform an operation, but it was cancelled by the user or it was not allowed by the database.

Possible Solution: Read the error accompanying the message to determine what corrective action to take.

MESSAGE:	**SEARCH FAILED**

Cause: An unsuccessful attempt was made to find a record.

Possible Solution: When appropriate, specify different search criteria and retry the operation.

MESSAGE:	**SHARE NOT INSTALLED**

Cause: An attempt was made to open the database, but SHARE was not found in the environment.

Possible Solution: If necessary, you may need to add the following line to the [386Enh] section of your SYSTEM.INI file: **device=vshare.386**

MESSAGE:	**TABLE IS EMPTY**

Cause: An attempt was made to move to a record, but there are currently no records in the table.

Possible Solution: One or more records must be added to the table.

MESSAGE:	**TOO MANY FILES**

Cause: The maximum number of files specified in your CONFIG.SYS file has been exceeded.

Possible Solution: Close one or more applications in the Windows environment and then retry the operation. If this is not successful, increase the setting for FILES in your CONFIG.SYS file, restart your computer, and retry the operation.

MESSAGE:	**UHE##** (## represents any range of numbers)

Cause: Many causes.

Possible Solution: Read the error accompanying the message to determine what corrective action to take.

MESSAGE: **UNABLE TO SAVE RECORD**

Cause: One or more invalid or missing values was specified for a database record.

Possible Solution: Read the error accompanying the message to determine what corrective action to take.

MESSAGE: **UNABLE TO SHOW IMAGE**

Cause: An error was encountered during an attempt to read an image file from the disk.

Possible Solution: Read the error accompanying the message to determine what corrective action to take.

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