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of Engineers**

Construction Engineering  
Research Laboratories

USACERL ADP Report 95/13  
July 1995

# **Land Condition Trend Analysis (LCTA) Data Collection Software Users Manual: Version 1.0**

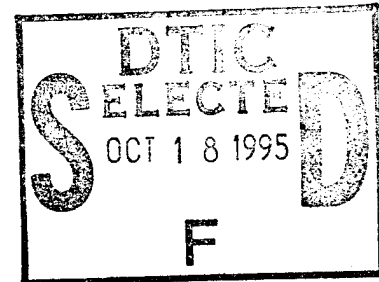
by  
Alan B. Anderson, William Sprouse, David Kowalski, and Robert Brozka

The U.S. Army Construction Engineering Research Laboratories (USACERL) developed the Land Condition-Trend Analysis (LCTA) program, a component of the Integrated Training Area Management program (ITAM). LCTA involves the inventory and monitoring of natural resources to document resource condition and assess the ability of the land to withstand impacts from training and testing. LCTA is currently in use at more than 40 installations with more than 7,200 permanent field plots installed.

LCTA entails extensive data collection from field plots on military installations. Data is gathered annually on vegetation cover and composition, land use, and surface disturbance. Originally, this information was recorded on paper field sheets and later transcribed to a computer for storage and analysis. Each plot surveyed in the field required 16 sheets of paper with approximately 200 plots located on each installation.

Data accuracy and integrity are primary considerations in LCTA data collection. In recording and transcribing such vast amounts of information, there is a high probability for error.

Handheld field computers and customized LCTA data collection software can reduce data collection and transcription errors while eliminating manual processing and verification. This manual details the installation and use of customized LCTA data collection, database loading, and editing software. Each chapter covering the four software programs lists minimum system requirements for running the programs.



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## Foreword

This study was conducted for the Office of the Directorate of Environmental Programs (DAIM), Assistant Chief of Staff (Installation Management) (ACS(IM)) under Project 4A162720A896, "Environmental Quality Technology"; Work Unit EN-TT4, "LCTA Systems Analysis and Reporting of Land Inventory Data." The technical monitor was Dr. V. E. Diersing, DAIM-ED-N.

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# 1 Introduction

## Background

The U.S. Army Construction Engineering Research Laboratories (USACERL) developed the Land Condition-Trend Analysis (LCTA) program, a component of the Integrated Training Area Management program (ITAM). LCTA involves the inventory and monitoring of natural resources to document resource condition and assess the ability of the land to withstand impacts from training and testing. LCTA is currently in use at more than 40 installations with more than 7,200 permanent field plots installed.

LCTA entails extensive data collection from field plots on military installations. Data are gathered annually on vegetation cover and composition, land use, and surface disturbance. Originally, this information was recorded on paper field sheets and later transcribed to a computer for storage and analysis. Each plot surveyed in the field required 16 sheets of paper with approximately 200 plots located on each installation.

Data accuracy and integrity are priority considerations in LCTA data collection. In recording and transcribing such vast amounts of information, human error is a high probability.

This manual details the installation and use of customized LCTA data collection software. The four major sections of this manual represent four integrated software programs that each have a distinct role in the LCTA data collection process. The first section describes use of the LCTA Handheld Options Compiler Program that allows an installation to create and customize the field data recording software. The second section describes how to use the customized field data recording software. The third section describes software for loading the handheld software data files into the installation LCTA database. The fourth section describes data entry and editing software that allows the user to enter data recorded on paper sheets directly into the installation LCTA database.

## Objective

The objective of this manual is to provide the necessary information for users of the LCTA database to install and use LCTA data collection software to reduce data collection and transcription errors while eliminating manual processing and verification.

## System Requirements

All programs require an IBM-compatible 386 computer.

To install and run the LCTA Handheld Options Compiler Program, the following are required:

- 4 MB RAM
- 200 MB hard drive
- Microsoft Windows version 3.1 or higher
- LCTA handheld Compiler installation disks
- Turbo Pascal for DOS version 5.0 or higher.

The LCTA Handheld Field Computer Data Recording Program requires:

1. MSDOS version 3 or higher (or compatible operating system)
2. 384K of conventional memory
3. 256K of disk space
4. IBM-compatible computer or handheld data recorder.

To install and run the LCTA Handheld Field Computer Data Recording Program, the following are required:

- 4 MB RAM
- 200 MB hard drive
- Microsoft Windows, version 3.1 or higher
- LCTA Program Installation disks
- Gupta Technologies SQLBase, version 5.0 or higher
- LCTA database

Installing and running the LCTA Data Entry and Editing Program requires the following:

- 4 MB RAM

- 200 MB hard drive
- Microsoft Windows, version 3.1 or higher
- LCTA Program Installation disks
- Gupta Technologies Inc. SQLBase, version 5.0 or higher
- LCTA database.

## Document Syntax

This manual uses the following syntax conventions to describe user interaction with the program.

- Italic text written between brackets < > is text that is entered at the computer.
- Normal text written between brackets < > is menu options.

## Mode of Technology Transfer

Software can be obtained from USACERL. For technical support when using the LCTA users interface program or for further information about the program or the LCTA databases, contact the USACERL LL-N Division at 217-373-4420 or (outside Illinois) 1-800-USA-CERL, or write to USACERL, LL-N Division, P.O. Box 9005, Champaign, IL 61826-9005.

## 2 LCTA Handheld Options Compiler Program

### Introduction

The LCTA handheld Options Compiler program (WNMAKEHH.EXE) is designed to produce pascal source code for the LCTA data recording programs for inventory and monitoring data collection using the options specified by the user. Once the source code has been produced the Borland Turbo Pascal command line compiler is used to generate executable files that can be loaded onto the handheld computers for data collection.

Although a standard set of data must be collected for the LCTA program, many installations need to collect supplementary data for regional differences or installation specific needs. The LCTA handheld Options Compiler program allows installation personnel to customize the handheld program to their needs by adding additional variables. In addition, with the LCTA handheld Options Compiler program fielded at the installation, there is no delay in getting the programs from the LCTA installation support center before data collection begins.

### System Requirements

To install and run the LCTA handheld Options Compiler program, the following are required:

- IBM-compatible 386 computer
- 4 MB RAM
- 200 MB hard drive
- Microsoft Windows version 3.1 or higher
- LCTA handheld Compiler installation disks
- Turbo Pascal for DOS version 5.0 or higher.

## Installation

The program files are supplied on 3.5 in. or 5.25 in. diskette(s) in a compressed format with an installation program included. To install these files, Microsoft Windows must be running on the computer. Follow the steps below.

1. Select "File" from the Program Manager menu.
2. Select "Run" from the popup menu.
3. In the command line field type `<B:\Instalit>` or `<A:\Instalit>` depending on the drive where the disk is located.
4. Follow the installation program's instructions.

If the programs are to be installed on the D: drive, the installation program will create the following directory structure:

D:\LCTA\PRGMS\HHCMP (LCTA Handheld Compiler files)

Once the files have been installed and the Windows group created or updated, four icons will be found in the group (Figure 1). To start the LCTA handheld Options Compiler program, double click on the HH Compiler icon. Double click on the Kermit icon to start MS-Kermit. Double click on the Help icons to start a Windows Help session for the handheld compiler and data collection programs.

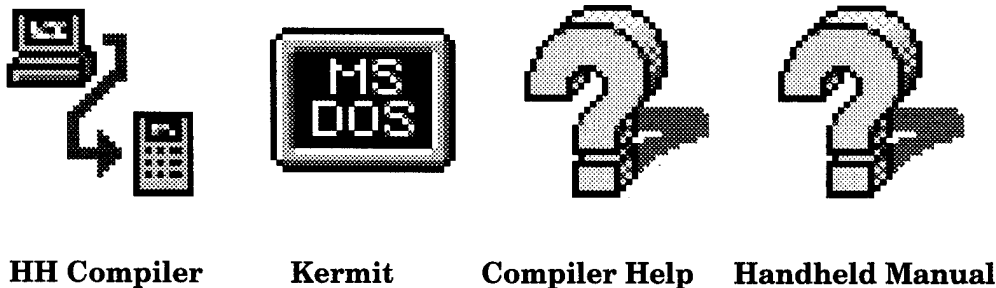


Figure 1. LCTA handheld Options Compiler program icons.

## Program Features and Menu Options

When the LCTA handheld Options Compiler program is started, the handheld Compiler Program window will display the following menu options: Quit, Options, Kermit, History, About, Test, and Help. Each command is discussed below. As with any Windows program, this program can be minimized to an icon by selecting the down arrow in the upper right corner of the program window. To restore the

minimized program, select the HH Compiler icon at the bottom of the screen. Notice that when the cursor is moved into the handheld Compiler Program window the pointer is changed to a small handheld computer.

### **Quit**

This menu command terminates the program. If no source code has been written, the program will terminate; if source code has been written, the compile process will begin. Refer to the section *Compiling Source Code* on page 20 for further information.

### **Options**

This menu command allows the user to select or enter an installation name and select the options desired for the inventory and monitoring programs. When an installation name has not been selected, the Inventory and Monitoring menu commands in the pull down menu are not available. An installation name must be entered before these options are available. Refer to *Selecting Handheld Options* on page 17 for further information.

### **Kermit**

This menu command starts the MS-Kermit program in a window. MS-Kermit is used to upload and download files from the PC to the handheld recorder. This command is not available until an installation name has been entered and options for inventory and/or monitoring have been selected. For information about using MS-Kermit, refer to the text file MSKERMIT.HLP, refer to the section *Loading Files onto the CMT MC-V* on page 47 or enter the handheld Compiler Help session.

### **History**

This menu command allows the user to view files written by the handheld compiler.

### **About**

This menu command displays program information including the program version number.

### Test

This menu command allows testing of the handheld programs that have been compiled. Initially this command is unavailable until the compile process has created the executable program files INV2.EXE or MON2.EXE.

### Help

This menu command starts the help session for the program.

## General Program Use

### Selecting Handheld Options

To begin selecting the options to be used in the handheld programs, select the <Options> command from the menu. The Installation command is the only command initially enabled. Select the <Installation> command from the popup menu; this displays the installation list dialog box (Figure 2). To check for the installation in the list box, place the pointer on the list box scroll bar arrows and hold down the left mouse button. Once the installation name is found, click once on the installation name, then click on the OK button.

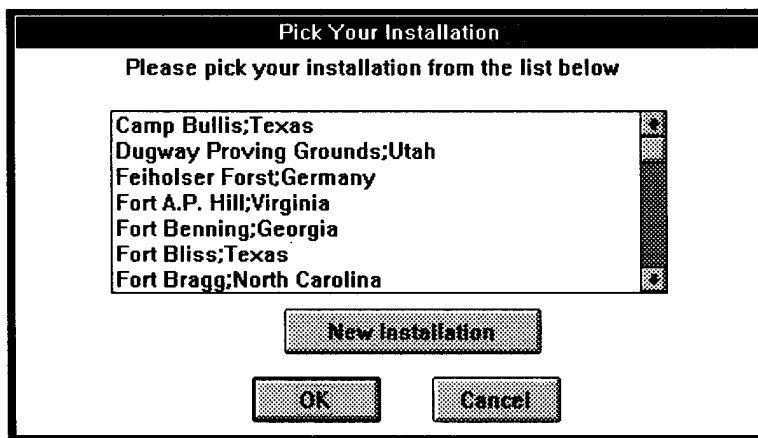
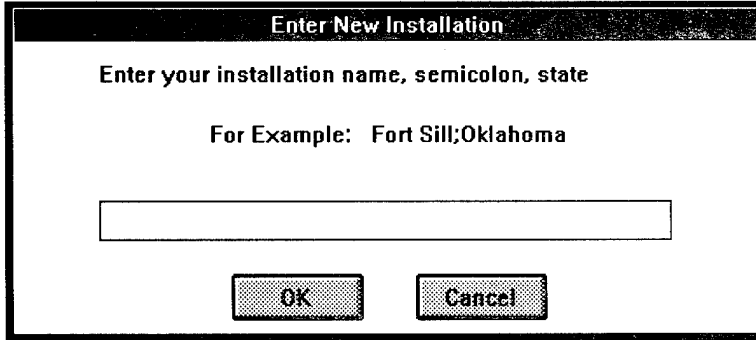


Figure 2. Installation list box.

If the installation name does not appear in the dialog box, select the New Installation button, which will display the new installation dialog box (Figure 3). In the edit field, type the name of the installation and the location in the same format shown in Figure 2. The format must be *installation name;location* with no spaces between the name, semi-colon, and location. Once the name is entered, click the OK button.



**Enter New Installation**

Enter your installation name, semicolon, state

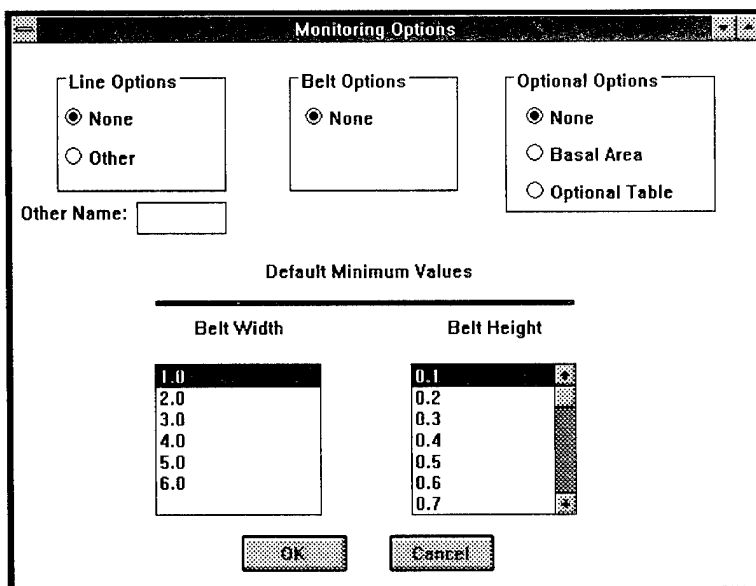
For Example: Fort Sill;Oklahoma

\_\_\_\_\_

Figure 3. Enter new installation dialog box.

After the installation name is chosen from the list box or entered in the name field, the <Inventory> and <Monitoring> commands under the <Options> menu command will be enabled. The <Inventory> or <Monitoring> options must be selected before any code can be compiled. If the default settings are to be used, the options dialog box must still be activated in order to store the results. Figure 4 shows the dialog box for the inventory options, and Figure 5 shows the dialog box for the monitoring dialog box. The only difference between these two forms is the absence of the diameter at breast height (DBH) option in the monitoring options. This difference is because woody species are only tallied during monitoring years.

If an additional variable is desired for the line transect data, select the optional button under the Line Options box. Place the pointer in the Other Name edit field and click the left mouse button once. The text entered in this field is limited to six characters and will be displayed in the ground data screens on the handheld computers.



**Monitoring Options**

**Line Options**

None

Other

**Belt Options**

None

**Optional Options**

None

Basal Area

Optional Table

Other Name: \_\_\_\_\_

**Default Minimum Values**

Belt Width	Belt Height
1.0	0.1
2.0	0.2
3.0	0.3
4.0	0.4
5.0	0.5
6.0	0.6
	0.7

Figure 4. Monitoring options dialog box.

The 'Inventory Options' dialog box contains three sections: 'Line Options' with radio buttons for 'None' (selected) and 'Other'; 'Belt Options' with radio buttons for 'None' (selected) and 'DBH'; and 'Optional Options' with radio buttons for 'None' (selected), 'Basal Area', and 'Optional Table'. Below these is an 'Other Name:' text field. A section titled 'Default Minimum Values' contains two list boxes: 'Belt Width' with values 1.0, 2.0, 3.0, 4.0, 5.0, 6.0; and 'Belt Height' with values 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7. At the bottom are 'OK' and 'Cancel' buttons.

Figure 5. Inventory options dialog box.

Five additional variables can be entered by selecting the Optional Table button in the Optional Options dialog box. The optional variables dialog box is displayed (Figure 6). Enter the text in the edit field as described above for the Other Name field. When all text is entered, select the OK button. These variables will be displayed on an additional screen in the handheld program, and the data will be stored in an optional table in the database.

The 'F\_Count Table Optional Variable Names...' dialog box has a title bar and a main area with the text: 'Please enter the optional names of the variables for the table F\_count.' followed by '\*\* Leave unused variable names blank! \*\*'. Below this are five rows, each with a label 'Optional Variable #1' through '#5' and an adjacent empty text input field. At the bottom is an 'OK' button.

Figure 6. Optional variables dialog box.

The <History> menu command displays the history (Figure 7) and allows the user to view files written by the program. This includes HISTORY.HH (a log of options picked), OPTIONAL.INV (source code for the inventory options), OPTIONAL.MON (source code for the monitoring options), and RUNMAKE.BAT (a batch file used to compile the handheld programs). To view one of these files, either double click on the file name in the file list box or single click on the name and click on the Read button. The HISTORY.HH file is always appended to and may become too large for the editor to display. If this occurs, a message will appear in the File Text box. Note that the RUNMAKE.BAT file is written for compiling both the inventory and monitoring programs; only the last copy written will be displayed. To leave this dialog box, click the Cancel button.

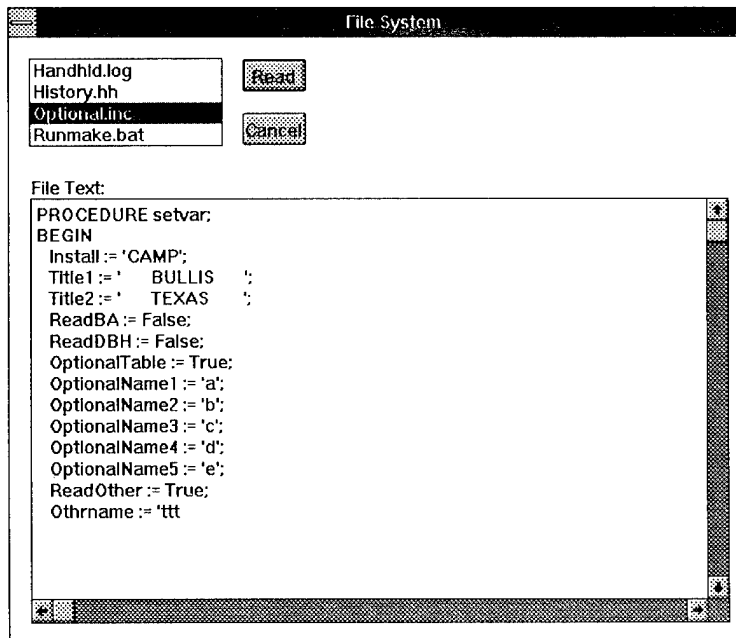


Figure 7. History dialog box.

### **Compiling Source Code**

When an installation name has been entered and the options for inventory or monitoring have been chosen, Turbo Pascal source code files will be written to the current subdirectory.

Once the <Quit> menu command is selected, the compile dialog box will be displayed (Figure 8). The program requires the location of the Turbo Pascal command line compiler TPC.EXE. If this file is found in one of the directories listed in the DOS path statement, the directory will be displayed in the location field of the compile dialog. If the file is not found, the user is required to enter the path of the TPC.EXE in the location field and then select the compile button. If the user supplied path is invalid

or the file can not be found, a message will be displayed. If the file is located, the inventory or monitoring source code will be compiled into executable files with the names INV2.EXE and MON2.EXE.

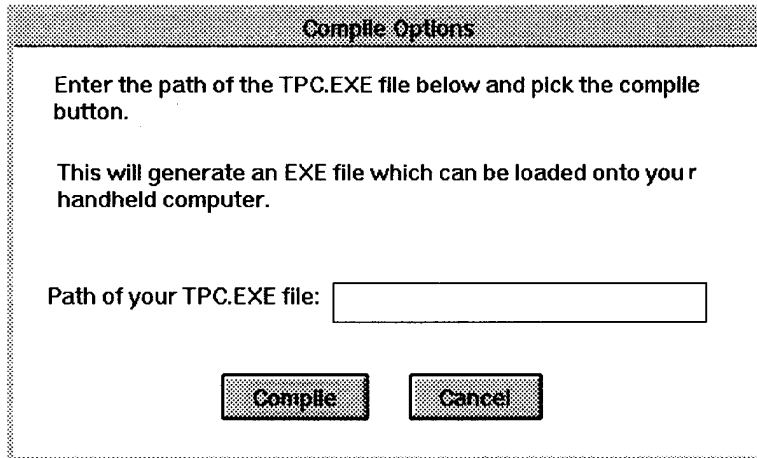


Figure 8. Compile options dialog box.

### ***Testing the Executable File***

Once an executable handheld program has been compiled, it can be tested by using the <Test> menu command. Initially this command will be grayed out and unavailable until the compile process has created INV2.EXE or MON2.EXE. To test the INV2.EXE file, click on <Inventory> under Test, which will bring up the program in full screen mode. Even though the program is being run on the PC, the output display is written for the handheld screen, so the program screen will only appear in the upper left corner of the PC screen.

### ***Installing Files on the Handheld Data Recorder***

MS-Kermit is used to transfer files from the PC to the CMT MC-V\* handheld computer. This section describes the use of the MS-Kermit program with the CMT MC-V handheld computer. If the Micropalm\*\* handheld computer is being used, the connection program and bootable Connect disk supplied with the handheld computer must be used. For information on loading files onto the Micropalm handheld computer, refer to the Micropalm manufacturer documentation or read the section Micropalm PC/4000 Handheld Computer Specific Information on page 40.

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\*CMT, Inc., 413 SW Jefferson Avenue, Corvallis, OR 97333.  
\*\*Micropalm, 13100-701 56th Court North, Clearwater, FL 34620.

To run the MS-Kermit communications program, select <Kermit> from the menu. This command is grayed out and unavailable until an installation name has been entered and options for inventory or monitoring have been selected.

Use MS-Kermit to copy all handheld program files to drive D:. To avoid confusion, delete any old program files (i.e., LCTA.EXE, MON.EXE, LCTA2.EXE, or MON2.EXE) from the handheld computer before copying new ones. Use the CHMOD command on the handheld computer to change the access rights of the file if required. After changing to drive D:, use the following commands for CHMOD:

```
CHMOD *.EXE
at the prompt type: RWX
```

It is suggested that only one program be used on the handheld computer (i.e., INV2.EXE or MON2.EXE) so there is more room for data files; however, both programs can be put on the handheld without problem.

To each end of the coiled cable, connect two black adapters, both supplied with the CMT MC-V. Insert one end of the cable into the CMT MC-V's COM 1 slot and the other end into the PC's COM1, or Serial 1 slot. Type Kermit on both the CMT MC-V and the PC. The Kerm> prompt is displayed on the CMT MC-V and a MS-Kermit> prompt on the PC. To transfer files from the PC to the CMT MC-V:

```
type R on the CMT MC-V and press ENTER
type S on the PC and press ENTER
type the name of the file to be transferred to the PC
(wildcards such as *.exe can be used).
```

When the transfer is complete, the program beeps. To transfer more files, repeat the previous steps.

## Getting Help

To get help with the Handheld Compiler program or the handheld program itself, select the <Help> menu command. Clicking on any green text with a dotted underline will bring up a definition box. When the solid-underlined green text is clicked on, the program will jump to that subject. Topics can be browsed by clicking on the left and right arrows in the menu bar. The help session contains a copy of the handheld program manual. For further information on using a Windows help session, please consult the Windows users manual.

## 3 LCTA Handheld Field Computer Data Recording Program

### Introduction

LCTA methodology entails extensive data collection from field plots on military installations. Data accuracy and integrity are priority considerations in LCTA data collection. In recording and transcribing such vast amounts of information, human error is a high probability. Handheld field computers combined with the LCTA Handheld Field Computer Data Recording Program can reduce data collection and transcription errors while eliminating manual data processing and data verification.

### System Requirements

The LCTA Handheld Field Computer Data Recording Program requires:

1. MSDOS version 3 or higher (or compatible operating system)
2. 384K of conventional memory
3. 256K of disk space
4. IBM-compatible computer or handheld data recorder.

### Installation

If the handheld data recorder was setup by the LCTA installation support center, the program should already be installed on the handheld data recorder. If the handheld data recorder was not properly setup, see section *Installing Files On The Handheld Data Recorder*, on page 21.

To set up a handheld recorder or computer, copy the executable program files to the computer. See handheld computer documentation for instructions on copying files to the handheld computer.

## Starting the Program

For the handheld data recorders, turn the computer on by pressing the button on the left side of the unit. This button also serves as the Shift key once the unit is on. The button on the right side of the unit backlights the screen for use in low light conditions.

If the PC 4000 handheld recorder was set up by the LCTA installation support center, the menu in Figure 9 will appear on the screen. If the computer was turned off before properly exiting the program the last time it was used, it will return to the same point in the program as when the computer was turned off.

```

Enter Purpose
-----
LCTA  LCTA program
MON   Monitor LCTA
CONN  PC/4000 to PC

B>

```

LCTA—initial or long-term program  
 MON—short-term monitoring program  
 CONN—connects unit to desktop PC

To start a program, enter the appropriate command at the computer prompt.

Figure 9. Start up window.

If the data recorder was not set up by the LCTA installation support center, the startup window will not appear. Enter the program executable file name (MON.EXE or INV.EXE) from the computer command prompt.

## Using the Program

The computer keys and associated functions listed in Table 1 are used throughout each version of the handheld data recording program.

Table 1. LCTA Handheld Field Computer Data Recording Program computer key and function key use.

Key	Function
ESC	Return to the main menu.
F1	Copy the previous cover or species value within the transect windows In the short-term monitoring program (MON.EXE), F1 also increments by 1 the belt transect species/height number count.
F2	Backspace over the character to the left of the cursor.
F3	In the short-term monitoring program MON, F3 subtracts 1 from the belt transect species/height number count.
F4	Move to the previous window.
F5	Go to the next window (or generate random azimuth in Main Menu option number 1).
Cursor keys	Move within a value or between cells (current value is saved).
SHIFT-↑/↓	Move up or down 10 meters in the Line transect ground window or move 10 entries in the Belt transect data window.
F8	Toggle prostrate plant value on/off in Ground data window.
F9	Update the species list with the highlighted species code. The time needed for an update may be up to 20 seconds.
F10	Sort the Line transect vertical data by height within a plot. This option is useful for inserting a missed vertical entry into its correct position.
ENTER	Save the value within the cell.

### ***LCTA Initial and Long-term Monitoring Program***

This section describes use of the handheld data recording program for initial/long-term and short-term monitoring versions of the program. Each section highlights the features, use, and valid data values for each program window. Program windows (Figures 10 through 50) are shown in the order that they appear in the program. The program windows shown are for the standard LCTA data collection methods listed in the LCTA field manual without additional data collection options. At the end of each section, additional program windows or modified program windows showing optional data collection fields are provided.

Window and Title

```

Land Condition
Trend Analysis
Inventory Program

Fort Hood
Texas

USACERL-EN 01 May 94

```

Figure 10. Title window.

```

LCTA Inventory
1) Random azimuth
2) Enter plot
3) Edit past plot
4) Enter comments
5) Save data
6) Exit
Option: x

```

Figure 11. Main menu window.

```

Date: MM/DD/YYYY
Plot #: xxx
Plot type: xxxxx
Surveyor
XXXXXXXXXXXXXXXXXXXXX
Recorder
XXXXXXXXXXXXXXXXXXXXX
ESC Exit F5 Plot2

```

Figure 12. First plot information window.

Window Instructions and Valid Entries

This screen appears for a few seconds and automatically moves to the Main menu.

The name will vary for each installation.

The date in the lower right hand corner remains constant (date of last program update).

Press 1 to generate a random azimuth.

Press 2 to enter a new plot or edit current plot.

Press 3 to read a past plot file from disk. This option will not work if changes to the current data have not been saved.

Press 4 to enter comments.

Press 5 to save the current data to disk. A warning will appear if the data file exists.

Press 6 to exit. A warning will appear if changes to the current data have not been saved.

Use the up and down cursor keys (↑ ↓) to move between the five available fields.

Use the left and right cursor keys (← →) to move through an individual field.

Press F2 to backspace within a field.

Press ESC to return to the main menu.

Press F5 to go to the plot info 2 window.

Plot # can consist of up to three numbers.

Plot type: press C for Core, S for Special use.

Surveyor and recorder can be up to 18 characters.

```

Plot#      MM/DD/YYYY
      PLOT INFO
Easting:  xxxxxxxx
Northing: xxxxxxxx
Azimuth:  xxx.x
Declination: xx.x
So.Series: xxxxxxxxxx
F4 Plot1  F5 Plot2

```

Figure 13. Second plot information window.

```

Plot#      MM/DD/YYYY
      PLOT INFO
Tr. Area:  xxxxxxxxxx
USGS:      xxxxxxxxxxxxxx
           xxxxxxxxxxxxxx
Veg:       xxxxxxxxxxxxxx
           xxxxxxxxxxxxxx
F4 Plot1  F5 Plot3

```

Figure 14. Third plot information window.

```

Plot#      MM/DD/YYYY
      ASPECT
N   x      S      x
NE  x      SW     x
E   x      W      x
SE  x      NW     x
           Level  x
F4 Plot3  F5 Slope

```

Figure 15. Aspect window.

Use the up and down cursor keys (↑↓) to move between the five available fields.

Use the left and right cursor keys (←→) to move through an individual field.

Press F2 to backspace within a field.

Press F4 to return to the plot info 1 window.

Press F5 to go to the plot info 3 window.

Use the up and down cursor keys (↑↓) to move between the three available fields.

Use the left and right cursor keys (←→) to move through an individual field.

Two entry lines are available for U.S. Geological Survey (USGS) quad and vegetation type fields.

Press F2 to backspace within a field.

Press F4 to return to the plot info 2 window.

Press F5 to go to the aspect window.

Use the four cursor keys (↑↓←→) to move between the nine available fields.

Press X to check or SPACE to clear a field.

Checking a field will erase any previous check.

Press F4 to return to the plot info 3 window.

Press F5 to go to the slope window.

```

Plot#      MM/DD/YYYY
          SLOPE
Loc      PctSl  Len
0m       xx.x  xxx.x
50m      xx.x  xxx.x
100m     xx.x  xxx.x

F4 Aspect F5 Soil

```

Figure 16. Slope window.

Use the four cursor keys (↑↓←→) to move between the six available fields.

Use the left and right cursor keys (←→) to move between fields and within a field.

Press F4 to return to the aspect window.

Press F5 to go to the soil depth window.

```

Plot#      MM/DD/YYYY
          SOIL DEPTH
0  x      2-3  x
0-1 x     3-4  x
1-2 x     >4   x

F4 Slope  F5 Land1

```

Figure 17. Soil depth window.

Use the four cursor keys (↑↓←→) to move between the six available fields.

Press X to check or SPACE to clear a field.

Checking a field will erase any previous check.

Press F4 to return to the slope window.

Press F5 to go to the military land use window.

```

Plot#      MM/DD/YYYY
Military land uses
None  x  Foot  x
Wh'led x Bivou x
Tr'ked x Demol x
Excav  x Other x
>XXXXXXXXXXXXXXXXXXXX
F4 Soil  F5 Land2

```

Figure 18. Military land use window.

Use the four cursor keys (↑↓←→) to move between the nine available fields.

Use the left and right cursor keys (←→) to move within the Other entry field.

Press X to check or SPACE to clear a land use field. Leave blank if not applicable.

For unspecified land uses, enter X in Other and specify in the bottom entry field (≤ 18 characters).

Press F4 to return to the soil depth window.

Press F5 to go to the non-military land use window.

```

Plot#      MM/DD/YYYY
Non-military uses
None      x  Row cr x
Sheep     x  Forest x
Cattle    x  Hay     x
OthrGr   x  Other   x
>XXXXXXXXXXXXXXXXXXXXX
F4 Land1  F5 Activ
    
```

Figure 19. Non-military land use window.

Use the four cursor keys (↑↓←→) to move between the nine available fields.

Use the left and right cursor keys (← →) to move within the Other entry field.

Press X to check or SPACE to clear a land use field. Leave blank if not applicable.

For unspecified land uses, enter X in Other and specify in the bottom entry field (≤ 18 characters).

Press F4 to return to military land use window.

Press F5 to go to the maintenance activity window.

```

Plot#      MM/DD/YYYY
Maintenance Activity
None      x  Mowing x
PrBurn    x  Seedng x
AcBurn    x  Plant' x
Till      x  ChemAp x

F4 Land   F5 Act2
    
```

Figure 20. Standard maintenance activity window.

Use the four cursor keys (↑↓←→) to move between the eight available fields.

Press X to check a land use field or SPACE to clear an activity field. Leave the field blank if it does not apply.

Press F4 to return to the non-military land use window.

Press F5 to go to the other maintenance window.

```

Plot#      MM/DD/YYYY
Maintenance Activity
ChemAp (type)
>XXXXXXXXXXXXXXXXXXXXX
Other
>XXXXXXXXXXXXXXXXXXXXX

F4 Act1   F5 Erosn
    
```

Figure 21. Other maintenance activity window.

Use the up and down cursor keys (↑↓) to move between the two available fields.

Use the left and right cursor keys (←→) to move within an individual field. Specify the type of chemical or other applications (≤ 18 characters).

Press F2 to backspace within a field.

Press F4 to return to the standard maintenance window.

Press F5 to go to the erosion window.

Plot#	MM/DD/YYYY		
<u>Wind</u>	<u>Ero</u>	<u>Water</u>	<u>Er</u>
NoEvd	x	NoEvd	x
Drift	x	Sheet	x
Scour	x	ActGul	x
PedPl	x	PedPl	x
		DbrDam	x
F4	Activ	F5	Line

Figure 22. Erosion evidence window.

Plot#	MM/DD/YYYY		
		Ground data	
<u>Loc</u>	<u>D</u>	<u>Cover</u>	
0.5	x	xxxxxxx	
1.5	x	xxxxxxx	
2.5	x	xxxxxxx	
3.5	x	xxxxxxx	
F4	Erosn	F5	Line2

Figure 23. Line transect ground cover data window.

Use the four cursor keys (↑ ↓ ← →) to move between the nine available fields.

Press X to check a land use field or SPACE to clear an erosion field. Leave the field blank if it does not apply.

Press F4 to return to the other maintenance window.

Press F5 to go to the line transect ground window.

Use the up and down cursor keys (↑ ↓) to move between the available fields.

Use the left and right cursor keys (← →) to move between fields and within Cover (← will move to the vertical window from the Cover field).

Press ENTER in Cover to move to next D.

Press SHIFT-↑/SHIFT-↓ to move up/down ten entries.

Press F1 to copy the previous Cover value.

Press F2 to backspace within a field.

Press F8 to toggle on/off prostrate plant value.

Press F9 (SHIFT-F4) to add a species to the list.

Press F4 to return to the erosion window.

Press F5 to go to the line transect vertical window.

Installations recording nearest neighbor can enter data to right of Cover.

D: N, R, P, T, or O.

Cover: Species code, LICHEN, MOSS, ALGAE, DG, DF, DS, DT, DW, LG, LF, LS, LT, G, F, S, T, RO, GR, or BG.

Press F8 to toggle on/off prostrate plant value ("p" appears after the species name when on).

Plot#	MM/DD/YYYY
Vertical data	
<u>Loc</u>	<u>Species</u> <u>Ht</u>
xxxx	xxxxxxx    xxx
xxxx	xxxxxxx    xxx
xxxx	xxxxxxx    xxx
xxxx	xxxxxxx    xxx
F4 Line1	F5 Belt

Figure 24. Line transect vertical data window.

Use the up and down cursor keys (↑↓) to move between the available fields.

Use the left and right cursor keys (←→) to move between fields and within individual fields.

Press SHIFT-↑/SHIFT-↓ to move up/down ten entries.

Press ENTER in Ht to move to the next Species.

Press F1 to copy the previous Species value.

Press F2 to backspace within a field.

Press F9 (SHIFT-F4) to add a species to the list.

Press F10 (SHIFT-F5) to sort height within plot.

Press F4 to return to the line transect ground cover data window.

Press F5 to go to the belt transect plot window.

Loc: 0.5 to 99.5 in 1.0 meter increments.

Species: Species code, LG, LF, LS, LT, DW, G, F, S, or T.

Ht: 0.1 to 8.6 in 0.1 meter increments from 0.1 to 2.0, and in 0.5 meter increments from 2.0 to 8.5. 8.6 represents heights above 8.5 m.

Plot#	MM/DD/YYYY
Min height:	xxx
Trans width:	x
<u>ExcSpps</u>	<u>Width</u>
xxxxxxx	x
xxxxxxx	x
xxxxxxx	x
F4 Line	F5 Belt2

Figure 25. Belt transect plot dimensions window.

Use the up and down cursor keys (↑↓) to move between the available fields.

Use the left and right cursor keys (←→) to move between fields and within individual fields.

Press F2 to backspace within a field.

Press F9 (SHIFT-F4) to add a highlighted species code to the species list.

Press F4 to return to the line transect vertical data window.

Press F5 to go to the belt transect entry window.

Min height: 0.1 or 1.0 meters only.

Trans width: 1.0 to 6.0 in 1 meter increments only.

ExcSpps: Species code.

Width: 1.0 to 6.0 in 1 meter increments only.

```

Plot#      MM/DD/YYYY
TransLoc: xxx.x
SideDis:  x.x
          Side:  x
Species:  xxxxxxxx
Height:   x.x
Status:   x
F4 Belt1  ESC exit

```

Figure 26. Belt transect data entry window.

Use the up and down cursor keys (↑↓) to move between the available fields.

Use the left and right cursor keys (←→) to move to other entries and within individual fields.

Press SHIFT-↑/SHIFT-↓ to move ten entries.

Press F1 to copy the previous Species value.

Press F2 to backspace within a field.

Press F9 (SHIFT-F4) to add a highlighted species code to the species list.

Press F4 to return to the belt transect plot window.

Press ESC to go to the main menu.

TransLoc: 0.0 to 100.0 to the nearest 0.1 meter.

SideDis: 0.0 to 3.0 to the nearest 0.1 meter.

Side: L (left) or R (right).

Species: Species code.

Height: 0.1 to 8.6 (meters).

Status: L (live) or S (snag) [or D for dead]. L is the default status value.

```

Random azimuth value

Left azimuth: 0.0
Right azimuth: 360.0

Random azimuth: xxx

ESC Exit   F5 Random

```

Figure 27. Random azimuth generator window.

Use the up and down cursor keys (↑↓) to move between the two azimuth values.

Use the left and right cursor keys (←→) to move within an azimuth.

Press F2 to backspace within a field.

Press F5 to generate a random azimuth between the left and right azimuth values.

Press ESC to return to the main menu.

```

*
*
*
*
*
*
*
*

```

Figure 28. Plot comments window.

Use the up and down cursor keys (↑↓) to move between the comment lines.

Use the left and right cursor keys (←→) to move within a comment.

Press F2 to backspace within a comment.

Press SHIFT-↑/SHIFT-↓ to move up/down one page.

Press ESC to return to the main menu.

Each comment line can be up to 18 characters long.

```
4 plots
  WS-4-5.47
  WS-4-5.48
  WS-4-6.49
  WS-4-6.50

ESC Exit  ENTER Read
```

Figure 29. Retrieve existing plot data window.

Use the up and down cursor keys (↑↓) to move between the files.

Press ENTER to retrieve the highlighted file and return to the main menu.

Press ESC to return to the main menu without retrieving a file.

Use the cursor (↑↓) keys to move down the screen for other files (when more than six files are available).

```
PLOT FILE EXISTS!

Do you want to
overwrite this
file (y/n)?
```

Figure 30. File overwrite warning message window.

This window appears if the data file already exists on the computer.

Press Y to overwrite the data file.

Press N to not overwrite (and not save) the data file.

```
File cannot be saved
because plot number
is not defined.
Press ENTER to
continue.
```

Figure 31. Plot number not entered warning message window.

This window appears while trying to save data to a disk file when the plot number is not specified. The plot number can be defined in the plot data window.

Press ENTER to continue.

```

Changes made.
Do you want to
save these changes
to disk (y/n)?

```

Figure 32. Save changes warning message window.

This window appears when exiting the program and changes have been made to the plot data. Press Y to save the LCTA handheld Options Compiler program changes to a disk file. Press N to not save the data.

```

Do you want to
exit (y/n)?

```

Figure 33. Program exit window.

This window appears as the last prompt before leaving the program.

Press Y to exit to DOS. Press N to return to the main menu. Data previously entered is still available for editing and saving.

If data is missing from the land use, maintenance, or erosion windows, a message noting this will appear.

```

Plot#      MM/DD/YYYY
          SLOPE
Loc PctSl Len BA
  0m xx.x  xx.x xx.x
  50m xx.x  xx.x xx.x
 100m xx.x  xx.x xx.x

F4 Aspect F5 Soil

```

Figure 34. Modified slope window for basal area option.

Use the four cursor keys (↑↓←→) to move between the six available fields.

Use the left and right cursor keys (←→) to move between fields and within a field.

Press F4 to return to the aspect window.

Press F5 to go to the soil depth window.

Plot#	MM/DD/YYYY		
Ground data			
Loc	D	Cover	Near
0.5	x	xxxxxxx	xxxxxxx
1.5	x	xxxxxxx	xxxxxxx
2.5	x	xxxxxxx	xxxxxxx
3.5	x	xxxxxxx	xxxxxxx
F4 Erosn		F5 Line2	

Figure 35. Modified line transect ground cover window for user defined option.

Use the up and down cursor keys (↑↓) to move between the available fields.

Use the left and right cursor keys (←→) to move between fields and within Cover (→ will move to the vertical window from the Cover field).

Press ENTER in Cover to move to next D.

Press SHIFT-↑/SHIFT-↓ to move up/down ten entries.

Press F1 to copy the previous Cover value.

Press F2 to backspace within a field.

Press F8 to toggle on/off prostrate plant value.

Press F9 (SHIFT-F4) to add a species to the list.

Press F4 to return to the erosion window.

Press F5 to go to the line transect vertical window.

Installations recording optional user defined values can enter data to right of Cover.

D: N, R, P, T, or O.

Cover: Species code, LICHEN, MOSS, ALGAE, DG, DF, DS, DT, DW, LG, LF, LS, LT, G, F, S, T, RO, GR, or BG.

Press F8 to toggle on/off prostrate plant value ("p" appears after the species name when on).

Near: Species code or other text values.

Plot#	MM/DD/YYY	
Loc	Form	Num
xx.x	xxxxxxx	xxxxx
xx.x	xxxxxxx	xxxxx
xx.x	xxxxxxx	xxxxx
xx.x	xxxxxxx	xxxxx
xx.x	xxxxxxx	xxxxx
F4 Line2		F5 Belt

Figure 36. Optional table and user defined variables window.

Use the up and down cursor keys (↑↓) to move between the available fields.

Use the left and right cursor keys (←→) to move between fields and within Form.

Press F2 to backspace within a field.

Press F4 to return to the line2 window.

Press F5 to go to the belt window.

Location: values are filled by the program.

Form: values are filled by the program.

Num: Integer number.

## LCTA Short-term Monitoring Program

### Window and Title

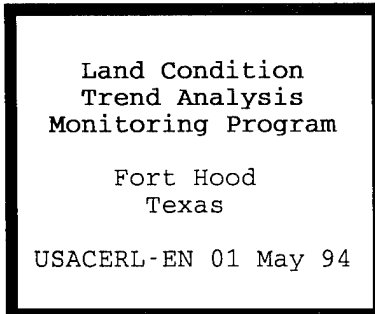


Figure 37. Title window.

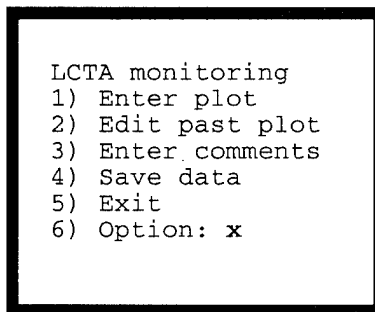


Figure 38. Main menu window.

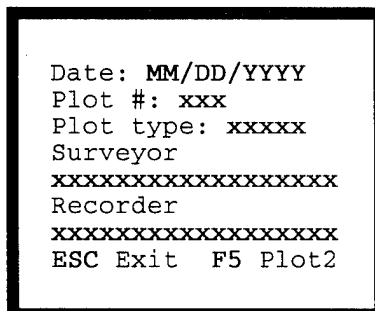


Figure 39. First plot information window.

### Window Instructions and Valid Entries

This screen appears for a few seconds and automatically moves to the Main menu.

The name will vary for each installation.

Press 1 to enter a new plot or edit current plot.

Press 2 to read a past plot file from disk. This option will not work if changes to the current data have not been saved.

Press 3 to enter comments.

Press 4 to save the current data to disk. A warning will appear if the data file exists.

Press 5 to exit. A warning will appear if changes to the current data have not been saved.

Use the up and down cursor keys (↑ ↓) to move between the five available fields.

Use the left and right cursor keys (← →) to move through an individual field.

Press F2 to backspace within a field.

Press ESC to return to the main menu.

Press F5 to go to the plot info 2 window.

Plot # can consist of up to three numbers.

Plot type: press C for Core, S for Special use.

Surveyor and recorder can be up to 18 characters.

```

Plot#      MM/DD/YYYY
          PLOT INFO

Tr.Area:  xxxxxxxxxx
Veg:      xxxxxxxxxxxxxx
          xxxxxxxxxxxxxx

F4 Plot1  F5 Land
    
```

Figure 40. Second plot information window.

Use the up and down cursor keys (↑↓) to move between the four available fields.  
 Use the left and right cursor keys (←→) to move through an individual field.  
 Press F2 to backspace within a field.  
 Press F4 to return to the plot info 1 window.  
 Press F5 to go to the land use window.

```

Plot#      MM/DD/YYYY
          Military land uses
None      x Foot   x
Wh'led    x Bivou  x
Tr'ked    x Demol  x
Excav     x Other  x
>xxxxxxxxxxxxxxxxxxxx
F4 Soil   F5 Land2
    
```

Figure 41. Military land use window.

Use the four cursor keys (↑↓←→) to move between the nine available fields.  
 Use the left and right cursor keys (←→) to move within the Other entry field.  
 Press X to check or SPACE to clear a land use field. Leave blank if not applicable.  
 For unspecified land uses, enter X in Other and specify in the bottom entry field (≤ 18 characters).  
 Press F4 to return to the plot data window.  
 Press F5 to go to the non-military land use window.

```

Plot#      MM/DD/YYYY
          Non-military uses
None      x Row cr x
Sheep     x Forest x
Cattle    x Hay     x
OthrGr   x Other   x
>xxxxxxxxxxxxxxxxxxxx
F4 Land1  F5 Activ
    
```

Figure 42. Non-military land use window.

Use the four cursor keys (↑↓←→) to move between the nine available fields.  
 Use the left and right cursor keys (←→) to move within the Other entry field.  
 Press X to check or SPACE to clear a land use field. Leave blank if not applicable.  
 For unspecified land uses, enter X in Other and specify in the bottom entry field (≤ 18 characters).  
 Press F4 to return to the military land use window.  
 Press F5 to go to the maintenance activity window.

```

Plot#      MM/DD/YYYY
Maintenance Activity
None      x  Mowing  x
PrBurn   x  Seedng  x
AcBurn   x  Plant'  x
Till     x  ChemAp  x

F4 Land   F5 Act2

```

**Figure 43. Standard maintenance activities window.**

Use the four cursor keys (↑↓←→) to move between the eight available fields.

Press X to check a land use field or SPACE to clear an activity field. Leave the field blank if it does not apply.

Press F4 to return to the non-military land use window.

Press F5 to go to the other maintenance window.

```

Plot#      MM/DD/YYYY
Maintenance Activity
ChemAp (type)
>xxxxxxxxxxxxxxxxxxxxx
Other
>xxxxxxxxxxxxxxxxxxxxx

F4 Act1   F5 Erosn

```

**Figure 44. Other maintenance activities window.**

Use the up and down cursor keys (↑↓) to move between the two available fields.

Use the left and right cursor keys (←→) to move within an individual field. Specify the type of chemical or other applications (≤ 18 characters).

Press F2 to backspace the cursor within a field.

Press F4 to return to the maintenance window.

Press F5 to go to the erosion window.

```

Plot#      MM/DD/YYYY
Wind Ero  Water Er
NoEvd x   NoEvd  x
Drift x   Sheet  x
Scour x   ActGul x
PedPl x   PedPl  x
          DbrDam x
F4 Activ  F5 Line

```

**Figure 45. Erosion evidence window.**

Use the four cursor keys (↑↓←→) to move between the nine available fields.

Press X to check a land use field or SPACE to clear an erosion field. Leave the field blank if it does not apply.

Press F4 to return to the other maintenance window.

Press F5 to go to the line transect ground window.

Plot#	MM/DD/YYYY	LINE TRANSECT		
<u>Loc</u>	<u>D</u>	<u>Cover</u>	<u>Canopy</u>	
0.5	x	x	xx	
1.5	x	x	xx	
2.5	x	x	xx	
3.5	x	x	xx	
F4 Erosn		F5 Line2		

Figure 46. Monitoring line transect window.

Use the up and down cursor keys (↑↓) to move between the available fields.

Use the left and right cursor keys (←→) to move between fields (→ will move to the nearest neighbor window from the Canopy field).

Press ENTER in Cover or Canopy to move to next D.

Press SHIFT-↑/SHIFT-↓ to move up/down ten entries.

Press F1 to copy the previous Cover value.

Valid Disturbance entries are N, R, P, T, O.

Valid Cover entries are B, L, R, P.

Valid Canopy entries are N, A, P, AP.

Press F4 to return to the erosion window.

Press F5 to go to the belt transect window.

Installations recording nearest neighbor can enter data in subsequent optional window.

Plot#	MM/DD/YYYY	Belt Transect	
Min height: xxx		Trans width: x	
<u>ExcSpps</u>	<u>Width</u>		
xxxxxxx	x		
xxxxxxx	x		
xxxxxxx	x		
F4 Line		F5 Belt2	

Figure 47. Belt transect plot dimensions window.

Use the up and down cursor keys (↑↓) to move between the available fields.

Use the left and right cursor keys (←→) to move between fields and within individual fields.

Press F2 to backspace within a field.

Press F9 (SHIFT-F4) to add a highlighted species code to the species list.

Press F4 to return to line transect vertical data window.

Press F5 to go to the belt transect entry window.

Plot#	MM/DD/YYYY	BELT TRANSECT		
Spp	Cond	Ht	Num	
xxxxxxx	x	xxx	xxx	
xxxxxxx	x	xxx	xxx	
xxxxxxx	x	xxx	xxx	
xxxxxxx	x	xxx	xxx	
F4 Belt1		ESC Exit		

Figure 48. Monitoring belt transect data window.

Use the up and down cursor keys (↑↓) to move between the available fields.

Use the left and right cursor keys (←→) to move to other entries and within individual fields.

Press SHIFT-↑/SHIFT-↓ to move four entries.

Press F2 to backspace within a field.

Press F1 to add 1 to the Num (frequency) value.

Press F3 to subtract 1 from the Num value.

Press F9 (SHIFT-F4) to add species to list.

Plot#	MM/DD/YYYY	
LOC	Form	Num
xx.x	xxxxxxxx	xxxxxx
xx.x	xxxxxxxx	xxxxxx
xx.x	xxxxxxxx	xxxxxx
xx.x	xxxxxxxx	xxxxxx
xx.x	xxxxxxxx	xxxxxx
F4	Line2	F5 Belt

Figure 49. Optional table and user defined variables window.

Plot#	MM/DD/YYYY	
LINE TRANSECT		
<u>Loc</u>	<u>Gopher</u>	
0.5	xx	
1.5	xx	
2.5	xx	
3.5	xx	
F4	Line1	F5 Line3

Figure 50. Optional line transect user defined data window.

Press F4 to return to the belt trans options window.

Press ESC to go to the Main menu.

Cond: values are L (live), S (snag).

Ht: values are 1 (Min-1.0), 2 (1.0-2.0), 3 (2.0-3.0),

4 (3.0-4.0), 4.1 (>4.0).

Use the up and down cursor keys (↑↓) to move between the available fields.

Use the left and right cursor keys (←→) to move between fields and within Form.

Press F2 to backspace within a field.

Press F4 to return to the line2 window.

Press F5 to go to the belt window.

Location: values are filled by the program.

Form: values are filled by the program.

Num: Integer number.

Use the up and down cursor keys (↑↓) to move between the available fields.

Use the left and right cursor keys (←→) to move between fields.

Press F4 to return to the line1 window.

Press F5 to go to the next data type window.

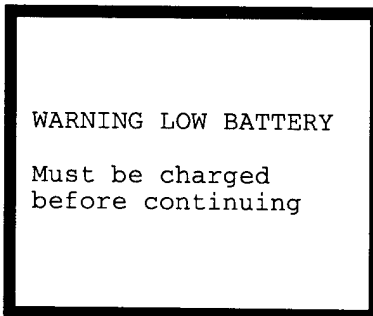
Installations recording nearest neighbor can enter data in subsequent optional window.

## Micropalm PC/4000 Handheld Computer

### General Information

The PC/4000 will operate for approximately 8 to 12 hours on one charge. The unit must be charged overnight following every field day to prevent down time or data loss in the field. The 50-pin receptacle must be screwed tightly to the computer to ensure good electrical contact for an adequate charge. The PC/4000 will shut off automatically after 5 minutes of inactivity to lengthen battery life.

When the batteries become too weak to operate reliably, the computer displays the warning message in Figure 51.



**Figure 51. Battery warning message window.**

The computer saves the current program and data and turns power off automatically after approximately 10 seconds. Do not attempt to operate the computer during low battery conditions; doing so can corrupt programs and data. After the power is off, replace the batteries with alkaline cells until the nickel cadmium batteries can be recharged.

If the computer is being used for only a few hours a day, it is important to occasionally let the unit discharge completely before recharging the batteries. Although the PC/4000 is set to turn off automatically after 5 minutes without input from the keyboard, this can be disabled and the computer left on to discharge completely. To disable the automatic shutoff, type SHELL at the DOS prompt. Scroll down to "Go To Monitor." Then press F5, F3, F5, and F3. After the unit has recharged, reset the automatic shutoff with the same sequence of commands, substituting F2 for the last F3 and entering 300. Press ESC four times to return to the SHELL menu.

If the program halts or the computer rejects keyboard input, press the processor Reset switch. The Reset switch is located in a recess within the battery compartment. Pressing the Reset switch forces a warm boot and is equivalent to pressing Ctrl+Alt+Del on a PC.

Handheld data recorders are DOS-based handheld computers designed to withstand environmental extremes that typical computer systems do not tolerate. Frequent backups of plot data are crucial to guarantee the integrity and safety of the collected data. Plot data files *must* be backed up to several sources as frequently as possible. Daily backups are preferred, but less frequent backups can occur. As a rule, backups should be made no more than 3 days apart. Copy the data files to a hard disk and at least two floppy disks. If a hard disk is not available, copy the data files to three floppy disks.

### ***PC/4000 Connection to Personal Computers***

Table 2 describes connecting and communicating between the PC/4000 and a desktop PC.

Table 2. File transfer procedure for PC/4000 handheld computers.

Step	Description
1	Plug the supplied cable into the top of the PC/4000 and into the serial port in the back of the PC.
2	Enter <b>CONN</b> at the PC/4000 DOS prompt to start the PC/4000 communication program.
3	From the COMMAND SHELL menu, use the down cursor key to select the "Set COM ports" option.
4	Press ENTER twice.
5	Use the right cursor key to set the baud rate to "19200."
6	Press ENTER four times to return to the COMMAND SHELL menu.
7	With the down cursor key, highlight the "Go to Monitor" option. Press ENTER.
8	Press "F5" for Miscellaneous.
9	Press "F6" (SHIFT-F1) for Comm link.
10	PC/4000 is ready for connection when the window reads: SERIAL COMMUNICATIONS IN PROGRESS. If the window reads PARALLEL COMMUNICATIONS IN PROGRESS, connect the cable between the PC/4000 and the PC. Run the PC program CONNECT.EXE from the boot floppy. At this point the serial communications should be available.
11	If starting from the boot diskette, go to step 12. If starting from the desktop boot disk go to step 13.
12	Place the BOOT DISK in drive A and turn on the desktop PC. If the PC is already on, press Ctrl-Alt-Del with the BOOT DISK in drive A. Go to step 17.
13	Check that the two files MPCLINK.SYS and CONNECT.EXE are copied to the PC's boot disk (hard disk or floppy) from the PC/4000 Utilities disk.
14	Add the following line to the boot disk file CONFIG.SYS: DEVICE = C:\MPCLINK.SYS
15	Re-start the PC by pressing CTL-ALT-DEL.
16	If problems occur, check for memory resident programs such as CLOCK or SideKick started within AUTOEXEC.BAT.
17	Enter <b>CONNECT</b> at the PC DOS prompt. Press ENTER at the program's prompt. Connection between the PC/4000 and the PC should be established at this point. A comment is displayed noting which drive the PC/4000 is emulating. Access the PC/4000 by entering the DOS change drive command: <b>X:</b> , where <b>X</b> is the drive letter PC/4000 is emulating. Issue all commands in step 13 from the desktop PC.
18	For initial or long-term monitoring files, move to the PC/4000 subdirectory \LCTA by entering: <b>CD\LCTA</b> . For short-term monitoring files, move to the PC/4000 subdirectory \MON by entering: <b>CD\MON</b> .
19	Use the DOS <b>DIR</b> command to view the subdirectory for a list of the data files.
20	Use the DOS <b>COPY</b> command to copy the data files to the hard disk and to at least two floppy disks.
21	Use the DOS <b>DEL</b> command to delete the backed-up data files from the PC/4000.
22	When finished, press ESC three times on the PC/4000 to return to the COMMAND SHELL menu.
23	Select "Enter DOS Commands" option. Press ENTER.
24	Type: EXIT <Enter>
25	Communication is now complete. Disconnect the cable, turn off the PC/4000, and store the data disks in separate but secure locations.

Table 3 lists common problems encountered with the PC/4000 and suggested solutions.

Table 3. Common handheld file transfer problems and solutions.

Problem	Solution
<p>A low battery message appears on the screen</p>	<p>The three "C" rechargeable batteries have lost their capacity to power the PC/4000. The computer will have to be connected, via its charging cable, to an AC outlet to power the three nickel cadmium batteries. In the field an AC outlet is often unavailable; therefore, replacement batteries will be needed until the nickel cadmium batteries can be recharged. Follow instructions in the Technical Reference Manual for replacing batteries. Replacement with heavy-duty "C" batteries is recommended. Plot data not saved to a disk file can be recovered once the batteries are replaced <i>if</i> the computer is off before the batteries are removed. Removing a battery with the computer on results in a loss of <i>all</i> data not saved to disk. Be sure the PC/4000 is off before replacing the batteries. The PC/4000 automatically turns off approximately 10 seconds after the warning message appears, or press OFF (SHIFT-E) to manually turn off the computer.</p> <p>To replace low batteries:</p> <ol style="list-style-type: none"> <li>a) let the computer idle for a minute to build up a charge</li> <li>b) turn the computer on and quickly save the data (main menu option #5)</li> <li>c) exit LCTA program and turn computer OFF</li> <li>d) replace batteries</li> <li>e) turn computer ON and reload plot (main menu option #3)</li> </ol>
<p>Plot data lost from RAM</p>	<p>The LCTA program automatically saves plot data to a backup file every 15 minutes. Normally this file is deleted from the disk when the program ends. If a problem keeps the program from ending normally, such as removing a battery before the computer is off, recovery of the data is possible by renaming this backup file.</p> <p>The file naming convention for a data file is:        WS-4-17.47 where:            WS is a two character installation code            4-17 is the month and day of recording            47 is the plot number.</p> <p>The file naming convention for a backup file is:        4-17-47.BAK where:            4-17 is the month and day of recording            47 is the plot number            BAK is the default backup extension.</p> <p>Use the DOS RENAME command to rename the backup file to a data file. In the above example, the renaming command is:        REN 4-17-47.BAK WS-4-17.47</p>

<p>PC-4000 does not connect to PC (1)</p>	<p>On certain personal computers, such as Zenith laptops, the handheld to PC connection will not connect easily. This is due to a hardware setup unique to Zenith laptops. Add steps 5a and 8a to the guidelines in Table 2 of <b>PC/4000 Connection to Personal Computers</b> as a possible solution to this problem:</p> <p style="text-align: center;"><u>STEP</u>    <u>DESCRIPTION</u></p> <p><b>5a</b>    Set the following "COM ports" values:                  Baud rate    "9600"                  Com port    "1"                  Parity        "none"                  Stop bits    "1"                  Word length "8"</p> <p><b>8a</b>    Set the following "Miscellaneous" values                  Unit        "112"                  Group       "1"</p> <p>Another cause of this problem could be the Zenith's hardware configuration, where the number of drives are defined by dip-switches at the back of the PC. The PC must be configured for two more drives for the handheld to PC connection to work. See the Zenith's user's guide for information on re-setting the dip-switches to include two more drives.</p>
<p>PC-4000 does not connect to PC (2)</p>	<p>A second, and perhaps more common, solution is to screw the 50-pin cable connector into the top of the handheld. On some handhelds, the connection of the 50-pin cable does not fit exactly. Using the screws on the cables will solve this problem.</p>
<p>"PARALLEL COMMUNICATIONS IN PROGRESS" prompt when connecting the PC/4000 to a PC</p>	<p>Occasionally the PC/4000 CONN (SHELL) program sets its internal communications to parallel. Because the connection is through the serial port, the PC/4000 has to be switched to serial communications. To fix this, connect the cable between the PC/4000 and the PC. Then start the PC program <b>CONNECT.EXE</b> from the boot floppy. At this point, serial communication should be available.</p>

## CMT MC-V Handheld Computer

### *General Information*

The CMT MC-V uses power much more efficiently than the Micropalm units by automatically shutting off the power between each keystroke. As a result, the CMT MC-V needs to be recharged much less frequently. A unit often can be used for many days on a single charge.

The CMT MC-V has a feature that allows the battery power level to be checked, which should be done before charging the unit. All nickel cadmium batteries have a tendency to develop a "memory." For example, if a unit is used for a few hours only and then recharged overnight, the batteries may fail the next day after only a few hours' use. Do not charge if the power level is greater than 25 percent. To check the power level, simply press SH1, then ENTER, then F1 (F2 shows the power level of the lithium backup battery, which cannot be recharged and must be replaced by the manufacturer).

If the unit is to remain unused for more than a month, the battery power level should be checked and fully recharged every 1 to 3 months. Eventually, the battery pack will have to be replaced. It must be ordered from CMT MC-V, but the replacement can be done by the user.

Screen contrast can be adjusted at any time, even while in the LCTA program, by pressing SH1, then + or - to darken or lighten the screen. SH1 and + or - must be pressed separately, not simultaneously, for this to work, and the sequence must be repeated for each increment of darkening or lightening.

There is a screen backlight that can be turned on and off at any point by pressing SH1, then the space key. However, this back light rapidly consumes battery power and should be used sparingly.

When using the CMT MC-V handheld computer, there are a few differences in the operation of this computer. The LCTA program will be stored on drive D, there are no subdirectories. The INV and MON programs are identical to the previous versions with the exception of the F2 key, there is a backspace key on the CMT MC-V.

The CMT MC-V is capable of running in two screen modes, 21x8 or 80x25. The LCTA and MON programs require the 80x25 mode. If the program is not running correctly, use the following keystrokes to put the computer back into the 80x25 mode (after first exiting the program):

ON

F2

F2

ON (switches to setting mode; options will be displayed on the bottom of the screen)

F2 (to switch to 80x25 modes)

F2 (to switch to NMAP mode)

There are a few differences in the operation of the CMT MC-V handheld computer. The LCTA program will be stored on drive D:, and there are no subdirectories. The LCTA and MON programs are identical to the LCTA Initial and Long-term Monitoring Program section beginning on page 25 with the exception of the F2 key. In place of the F2 key, use the backspace key on the CMT MC-V.

The data downloading process is also different on the CMT MC-V. This handheld uses the program KERMIT, which may be copied onto the desktop computer. There is a KERMIT users guide included with the handheld that explains the program's use. Table 4 briefly describes the downloading procedure.

**Table 4. File transfer procedure for CMT MC-V handheld computers.**

Step	Description
1	Included in the CMT MC-V package is a bag containing two cables and a number of adapters. Place a black 9-pin serial adapter onto each end of one cable. Connect one end of the cable to the CMT MC-V through the COM1 port and the other end to the desktop computer through COM1.
2	On the desktop computer, at the drive containing the Kermit program, type <b>KERMIT R</b> - do not press the enter key. On the CMT MC-V, at the drive containing the data, type <b>KERMIT S *.*</b> . Press enter on the desktop computer and then on the CMT MC-V.
3	When the transfer is complete, the handheld will beep and return to the prompt. The files on the handheld can then be deleted. Always make multiple backup copies on disks to keep at the installation.

The CMT MC-V is capable of running in two screen modes, 21x8 or 80x25. The LCTA and MON programs require the 80x25 mode. If the program does not seem to run correctly, use the following keystrokes to put the computer back into the 80x25 mode. Exit the LCTA or MON program before typing the following keystrokes:

ON

F2

F2

ON (switches setting mode; options will be displayed on the bottom of the screen)

F2 (to switch to 80x25 modes)

F2 (to switch to NMAP mode)

Use the AC Recharger/Adapter enclosed with the CMT MC-V to recharge it overnight before first-time use. Under normal operating conditions, recharge the machine overnight monthly. A special System Status feature allows easy checking of the battery power level for the system.

Table 5 lists the new command key sequences available on the CMT MC-V machines:

**Table 5. New command key sequences for the CMT MC-V handheld computers.**

Operation	Key Sequence	Description
System Status	[SH1] [ENTER]	Display system status screen
Backlight Control	[SH1] [SP]	Toggle back light on/off
Contrast Up	[SH1] [+]	Darkens screen contrast
Contrast Down	[SH1] [-]	Lightens screen contrast

The handhelds will probably come from the factory formatted with drives D: and E: joined to provide 256 K of storage. This configuration allows more plots to be stored on the handheld. To confirm that these drives are joined, type ROS at the F: prompt. Once the file listing appears on the screen, hit the Enter key; this will list a summary of the drive configurations. Press the F5 key to exit. If these drives are not joined, reformat the D: drive for 256 K by typing the following command at the F: prompt:

FORMAT D: 256

### ***Loading Files onto the CMT MC-V***

The process of downloading data is different on the CMT MC-V. This handheld uses the communications program KERMIT, which may be copied onto the desktop computer. There is a KERMIT user's guide included with the CMT MC-V. Below is a brief description of the downloading procedure.

MS-DOS Kermit, or Kermit-MS (MS-Kermit), is a program that implements the Kermit file transfer protocol for the entire IBM PC family, including the PS/2 series, IBM-compatible, and several other machines based on the Intel 8086 processor series (8088, 80286, etc.) and the disk operating system (DOS) family (PC-DOS or MS-DOS, henceforth referred to collectively as MS-DOS or simply DOS). The CMT MC-V handheld computers will come with Kermit already loaded. The MS-Kermit program for the PC will also be supplied with the handheld on a separate disk. Install the MS-Kermit files onto the PC in a separate subdirectory.

Use Kermit to copy all program files to drive D:. Delete old program files (i.e., LCTA.EXE, MON.EXE, LCTA2.EXE, or MON2.EXE) from the handheld. Use the CHMOD command on the handheld to change the file access rights of the file if required. After changing to drive D: use the following commands for CHMOD.

CHMOD \*.EXE

at the prompt type: RWX

It is suggested that only one program is stored on the handheld computer (i.e., INV2.EXE or MON2.EXE) so there is more room for data files; however, both programs can be put on the handheld without problem. Included with the CMT MC-V is a package containing two cables and a number of adapters. Place a black 9-pin serial adapter onto each end of one cable. Connect one end of the cable to the CMT MC-V through the COM1 port and the other end to the desktop computer through COM1.

On the desktop computer, at the directory containing the Kermit program, type KERMIT R - do not press the enter key. On the CMT MC-V, at the directory containing the data, type KERMIT S \*.\*. Press enter on the desktop computer and then on the CMT MC-V.

When the transfer is complete, the handheld computer will beep and return to the DOS prompt. The files on the handheld can then be deleted. Always make multiple backup copies on diskettes to keep at the installation. To transfer more files, follow the same steps above. To transfer files from the PC to the CMT MC-V, follow the steps above reversing the commands for the PC and the CMT MC-V.

Table 6 describes many of the more commonly used MS-DOS Kermit commands. See Kermit documentation for more detailed information.

**Table 6. Common MS-DOS Kermit commands.**

Command	Use
BYE	To remote server, exit from MS-Kermit.
CLEAR	Clear serial port buffer.
CLOSE	Close files and stop logging remote session.
COMMENT	For including comments in command files.
CONNECT	Connect as terminal to remote system.
CWD	Change local working directory.
DEFINE	A macro of Kermit-MS commands.
DELETE	Delete local files.
DIRECTORY	List of local files.
DISABLE	Disable server recognition of selected commands.
DO	A command macro.
ECHO	Echo a line of text on the screen.

ENABLE	Enable server recognition of selected commands.
EXIT	Exit from Kermit-MS.
FINISH	Shut down remote server.
GET	Get remote files from server.
HANGUP	The phone or network connection.
HELP	Information about Kermit-MS.
INPUT	Specified string from serial port, for scripts.
LOG	Remote terminal session and/or packets.
LOGOUT	Logout remote server, do not exit from Kermit-MS
OUTPUT	String out serial port, for scripts.
PAUSE	Pause between commands.
PUSH	Go to MS-DOS command level.
QUIT	Quit from Kermit-MS (same as EXIT).
RECEIVE	Receive files from remote Kermit.
REMOTE	Prefix for remote file management commands.
RUN	Execute a MS-DOS program or command.
SEND	Send files to remote Kermit.
SERVER	Mode of remote operation.
SET	Sets various parameters.
SHOW	Displays various parameters.
SPACE	Inquiry about disk space.
STATUS	Inquiry about settings.
TAKE	Get commands from a file.
TRANSMIT	Transmit a file "raw" (no error checking).
TYPE	Display a local file on the screen.
VERSION	Display Kermit-MS program version number.

### ***CMT MC-V Potential Problems***

Table 7 details common problems encountered by field crews while using CMT MC-V handheld computers. Recommended solutions are provided.

Table 7. Common problems encountered with CMT MC-V handheld computers.

Problem	Solution
Front panel bubbles up	Unscrew the silver airlock screw on the back of the CMT MC-V and push down on the front panel to push the air out. Be sure to tighten the screw again when in the field to keep moisture out.
Keys stick	Unscrew the airlock screw and let the CMT MC-V sit for a few minutes.
Screens do not display correctly	The incorrect display size was used. Press the On key, then F2, then F2 again. When the program is started from the batch file by typing INV or MON, the correct display size will be started.
Kermit not making connection	Make sure the COM1 ports on both the CMT MC-V and the PC are being used.

## Output Data File Information

Each plot is stored on the handheld computer disk as a separate file. Each plot file name is dependent on installation, date, and plot number. The plot file name is automatically generated by the program. The current plot data is automatically backed up every 15 minutes to a separate data file. An asterisk will appear in the lower right of the screen when data backup is in progress. The backup feature saves data to disk in case a problem develops with the computer. *The backup data file is deleted from disk when the program terminates normally.*

### File Naming Convention

The following standard file naming conventions are used by each version of the handheld data recording program to store plot data. The plot file name is automatically generated by the program.

Data File Name Format: XX-MM-DD.PPP

- where: XX is the first two characters of the standard installation code.
- MM is the numeric month of recording (1-12).
- DD is the numeric day of recording (1-31).
- PPP is the numeric plot number (1-999).

Backup File Name Format: XX-MM-DD.BAK

- where: XX is the first two characters of the standard installation code.
- MM is the numeric month of recording (1-12).
- DD is the numeric day of recording (1-31).
- BAK is a fixed value designating backup file.

### Output File Format

Each of the two basic file formats—initial/long-term and short-term—has several variations depending on which data collection options were incorporated into the sampling methodology. Tables 8 and 9 describe the basic components of each file format. Where the file format varies because of sampling methodology options selected, differences are noted. Line numbers are not meant to be absolute line numbers but are provided so that references to specific data are possible.

Handheld data recorder files should generally not be edited. The formats listed below are provided to document the file format. Attempts to edit data in the handheld data files frequently results in corrupted files. To edit data in the handheld files, open the files with the handheld data recording program and edit the files using the program. The handheld data recorder will ensure that the files are in the correct format. An alternative is to load the data in the database and then edit the data using database editing tools. Each line of the output file can only contain certain values. For example species codes require an 8-character value, not genus and species names. If invalid values are added during editing, files can not be loaded in the database.

**Table 8. Initial and long-term monitoring handheld data file formats.**

(Line numbers followed by alphabetic letters indicate optional data lines that may or may not be present depending on data collection options used during sampling.)

Line	File Contents	Comments
1	VERSION 1.0	program version number
2	INVENTORYL	inventory type: INVENTORYI, INVENTORYL
3	HOO	3 character installation code
4	7/31/94	measurement date; mm/dd/yy
5	54	plot number
6	CORE	plot type; CORE, SPECIAL
7	F * BA *	optional basal area recorded? T or F
8	F *DBH *	optional DBH recorded? T or F
9	F * OTHER *	optional other data recorded? T or F
10	* OTHER NAME *	name of optional other data if recorded
11	F * OPT TABLE COUNT *	optional line data recorded? T or F
12	* OPT VAR 1 NAME *	optional variable 1 name if recorded
13	* OPT VAR 2 NAME *	optional variable 2 name if recorded
14	* OPT VAR 3 NAME *	optional variable 3 name if recorded
15	* OPT VAR 4 NAME *	optional variable 4 name if recorded

16	* OPT VAR 5 NAME *	optional variable 5 name if recorded
17	YYYYYYYYY * PM, PS, SLS, BA, LU, GC, AC, BS, BT *	Used by database loading program to determine which database tables to load with data. See section <i>List of Procedures</i> on page 68 for more information on this line.
18	* RESERVED *	saved for future use
19	* RESERVED *	saved for future use
20	* RESERVED *	saved for future use
21	gellenthien	surveyor names
22	leupold	recorder names
23	709722	DMCE
24	3582647	DMCN
25	355	azimuth
26	1.5	declination
27	NanKin	soil series
28	4B9	training area
29	Upatoi	USGS field 1
30		USGS field 2
31	pisy forest	vegetation type field 1
32	dense	vegetation type field 2
33	W	aspect
34	8.5	slope at 0m
35	1.5	slope at 50m
36	4.5	slope at 100m
37	4	slope length at 0m
38	8	slope length at 50m
39	12	slope length at 100m
39a	10	basal area at 0m if option recorded
39b	20	basal area at 50m if option recorded
39c	30	basal area at 100m if option recorded
40	>4	soil depth
41	X	no military disturbance
42	X	wheeled vehicle disturbance
43	X	tracked vehicle disturbance
44	X	excavation disturbance

45	X	foot traffic disturbance
46	X	bivouac disturbance
47	X	demolition disturbance
48	X	other military disturbance
49	X	no non-military disturbance
50	X	sheep grazing evidence
51	X	cattle grazing evidence
52	X	other grazing evidence
53	X	row crop evidence
54	X	forestry activity evidence
55	X	hay production evidence
56	X	other non-military evidence
57	BOMBS	other military disturbance note
58	ORV	other non-military evidence note
59	X	no maintenance activity evidence
60	X	prescribed burn evidence
61	X	accidental burn evidence
62	X	tillage evidence
63	X	mowing evidence
64	X	seeding evidence
65	X	planting evidence
66	X	chemical application evidence
67	FOLIAR	chemical application type
68		other maintenance note
69	X	no wind erosion evidence
70	X	drift erosion evidence
71	X	scouring erosion evidence
72	X	wind caused pedestal plant evidence
73	X	no water erosion evidence
74	X	sheet/rill erosion evidence
75	X	active gully erosion evidence
76	X	water caused pedestal plant evidence
77	X	debris dam evidence
78	366	number of line transect aerial observations

79	151	number of belt transect observations
80	0.5	line obs. 1, line transect location
81	N	line obs. 1, disturbance
82	LT	line obs. 1, ground cover vegetation code
83		line obs. 1, ground cover vegetation condition
83a	XXXXXXXX	line obs. 1, optional line data, gndcover table
83b1	11	line obs. 1, optional line data var. 1, f count table
83b2	22	line obs. 1, optional line data var. 2, f count table
83b3	33	line obs. 1, optional line data var. 3, f count table
83b4	44	line obs. 1, optional line data var. 4, f count table
83b5	55	line obs. 1, optional line data var. 5, f count table
...	...	observations 2 through 99, same format
84	99.5	line obs. 100, line transect location
85	N	line obs. 100, disturbance
86	LT	line obs. 100, ground cover vegetation code
87		line obs. 100, ground cover vegetation condition
87a	XXXXXXXX	line obs. 100, optional line data, gndcover table
87b1	11	line obs. 100, optional line data var. 1, f count table
87b2	22	line obs. 100, optional line data var. 2, f count table
87b3	33	line obs. 100, optional line data var. 3, f count table
87b4	44	line obs. 100, optional line data var. 4, f count table
87b5	55	line obs. 100, optional line data var. 5, f count table
88	0.5	aerial line obs. 1, transect location
89	1.4	aerial line obs. 1, measurement height
90	FASY	aerial line obs. 1, vegetation code
...	...	observations 2 through but not including the value listed on line 77
91	99.5	aerial line obs. listed on line 77, transect location
92	8.6	aerial line obs. listed on line 77, measurement height
93	QURU	aerial line obs. listed on line 77, vegetation code
94	0.1	minimum belt height
95	6.0	default belt width
96	3	number of belt exception species
97	PRSP	exception species 1, vegetation code
98	1.0	exception species 1, belt width

...	...	exception species code and belt width 2 through but not including the value listed on line 95
99	QURU	exception species number listed on line 95, vegetation code
100	3.0	exception species number listed on line 95, belt width
101	0.2	vegetation location of 1st belt transect observation
102	3.0	side distance of 1st belt transect observation
103	R	side of 1st belt transect observation
104	FASY	vegetation code of 1st belt transect observation
105	5.0	plant height of 1st belt transect observation
106	L	vegetation condition of 1st belt transect observation
106a		optional real data value of 1st belt transect observation if recorded
...	...	location, side distance, side, code, height, condition, and optional values of observations 2 through but not including the value listed on line 78
107	0.2	vegetation location of the observation value listed on line 78
108	3.0	side distance of the observation value listed on line 78
109	R	side of the observation value listed on line 78
110	FASY	vegetation code of the observation value listed on line 78
111	5.0	plant height of the observation value listed on line 78
112	L	vegetation condition of the observation value listed on line 78
112a		optional real data value of the observation value listed on line 78
113	This plot was measured ...	plot note messages

**Table 9. Short-term inventory handheld data file formats.**

Line numbers followed by alphabetic letters indicate optional data lines that may or may not be present depending on data collection options used during sampling.

Line	File Contents	Comments
1	VERSION 1.0	program version number
2	MONITORING	inventory type
3	HOO	3 character installation code
4	7/31/94	measurement date; mm/dd/yy
5	54	plot number
6	CORE	plot type; CORE, SPECIAL
7	F * BA *	optional basal area recorded? T or F
8	F * DBH *	optional DBH recorded? T or F
9	F * OTHER *	optional other data recorded? T or F
10	* OTHER NAME *	name of optional other data if recorded
11	F * OPT TABLE COUNT *	optional line data recorded? T or F
12	* OPT VAR 1 NAME *	optional variable 1 name if recorded
13	* OPT VAR 2 NAME *	optional variable 2 name if recorded
14	* OPT VAR 3 NAME *	optional variable 3 name if recorded
15	* OPT VAR 4 NAME *	optional variable 4 name if recorded
16	* OPT VAR 5 NAME *	optional variable 5 name if recorded
17	YYYYYYYYY * PM,PS,SLS,BA,LU,GC,AC,BS,BT *	Used by database loading program to determine which database tables to load with data. See section <i>List of Procedures</i> in this manual for more information on this line.
18	* RESERVED *	saved for future use
19	* RESERVED *	saved for future use
20	* RESERVED *	saved for future use
21	pisy forest	vegetation type field 1
22	dense	vegetation type field 2
23	X	no military disturbance
24	X	wheeled vehicle disturbance
25	X	tracked vehicle disturbance
26	X	excavation disturbance
27	X	foot traffic disturbance
28	X	bivouac disturbance
29	X	demolition disturbance

30	X	other military disturbance
31	X	no non-military disturbance
32	X	sheep grazing evidence
33	X	cattle grazing evidence
34	X	other grazing evidence
35	X	row crop evidence
36	X	forestry activity evidence
37	X	hay production evidence
38	X	other non-military evidence
39	BOMBS	other military disturbance note
40	ORV	other non-military evidence note
41	X	no maintenance activity evidence
42	X	prescribed burn evidence
43	X	accidental burn evidence
44	X	tillage evidence
45	X	mowing evidence
46	X	seeding evidence
47	X	planting evidence
48	X	chemical application evidence
49	FOLIAR	chemical application type
50		other maintenance note
51	X	no wind erosion evidence
52	X	drift erosion evidence
53	X	scouring erosion evidence
54	X	wind caused pedestal plant evidence
55	X	no water erosion evidence
56	X	sheet/rill erosion evidence
57	X	active gully erosion evidence
58	X	water caused pedestal plant evidence
59	X	debris dam evidence
59a	4	basal area at transect location 0 if measured
59b	6	basal area at transect location 50 if measured
59c	8	basal area at transect location 100 if measured
60	151	number of belt transect observations

61	0.5	line obs. 1, line transect location
62	N	line obs. 1, disturbance
63	LT	line obs. 1, ground cover code
64	A	line obs. 1, aerial cover code
64a	XXXXXXXX	line obs. 1, optional line data, linemon table
64b1	11	line obs. 1, optional line data var. 1, f count table
64b2	22	line obs. 1, optional line data var. 2, f count table
64b3	33	line obs. 1, optional line data var. 3, f count table
64b4	44	line obs. 1, optional line data var. 4, f count table
64b5	55	line obs. 1, optional line data var. 5, f count table
...	...	observations 2 through 99, same format
65	99.5	line obs. 100, line transect location
66	N	line obs. 100, disturbance code
67	LT	line obs. 100, ground cover code
68		line obs. 100, aerial cover code
68a	XXXXXXXX	line obs. 100, optional line data, linemon table
68b1	11	line obs. 100, optional line data var. 1, f count table
68b2	22	line obs. 100, optional line data var. 2, f count table
68b3	33	line obs. 100, optional line data var. 3, f count table
68b4	44	line obs. 100, optional line data var. 4, f count table
68b5	55	line obs. 100, optional line data var. 5, f count table
69	0.1	minimum belt height
70	6.0	default belt width
71	3	number of belt exception species
72	PRSP	exception species 1, vegetation code
73	1.0	exception species 1, belt width
...	...	exception species code and belt width 2 through but not including the value listed on line 70
74	QURU	exception species number listed on line 70, vegetation code
75	3.0	exception species number listed on line 70, belt width
76	QURU	species code of 1st belt transect observation
77	L	vegetation condition of 1st belt transect observation
78	3	height class of 1st belt transect observation
79	44	frequency count of 1st belt transect observation

...	...	species code, vegetation condition, height class, and frequency of observations 2 through but not including the value listed on line 70
80	QURA	species code of last belt transect observation value listed on line 70
81	L	vegetation condition of the observation value listed on line 70
82	4	height class of the observation value listed on line 70
83	55	frequency count of the observation value listed on line 70
84	This plot was measured ...	plot note messages

### Relationship Between Program Windows and Database Tables

When summarizing and analyzing LCTA data, users may have difficulty locating data stored in the various database tables. Table 10 identifies the database tables where data is stored for each data entry window of the LCTA Handheld Field Computer Data Recording program. For more detailed information on the LCTA database structure, individual database tables and columns, and valid column values refer to the draft ADP report *Land Condition-Trend Analysis (LCTA) Program Data Dictionary* (Sprouse and Anderson, April 1995).

**Table 10. Relationship between the LCTA Handheld Field Computer Data Recording program windows and the LCTA database storage tables.**

Figure	Window Name	Database Storage Table
12	First plot information	PlotSurv
13	Second plot information	PlotMast
14	Third plot information window	PlotSurv
15	Aspect	PlotSurv
16	Slope	SoiLLS
17	Soil depth	PlotSurv
18	Military land use	LandUse
19	Non-military land use	LandUse
20	Standard maintenance activity	MaintAct
21	Other maintenance activity	MaintAct
22	Erosion evidence	ErosEvid
23	Line transect ground cover	GndCover

24	Line transect vertical data	AerCover
25	Belt transect plot dimensions	BeltSurv
26	Belt transect data	BeltTran
28	Plot comments	PlotSurv
34	Modified slope	SoilLS, BasalA
35	Modified line transect	GndCover
36	Optional table and user defined variables	F Count
39	First plot information	PlotSurv
40	Second plot information	PlotSurv
41	Military land use	LandUse
42	Non-military land use	LandUse
43	Standard maintenance activities	MaintAct
44	Other maintenance activities	MaintAct
45	Erosion evidence	ErosEvid
46	Monitoring line transect	LineMon
47	Belt transect plot dimensions	BeltSurv
48	Monitoring belt transect data	BeltMon
49	Optional table and user defined variables	F Count
50	Optional line transect user defined data	LineMon

## 4 LCTA Field Data Database Loading Program

### Introduction

LCTA field data collected on handheld computers with the LCTA Handheld Field Computer Data Recording program are stored in a special file format. The LCTA Field Data Database Loading program is used to load the handheld plot data files into the LCTA database.

The Load Handheld Files program will load any valid file created by a handheld program with the handheld compiler program. The loading program can handle a variety of data collection methods:

1. The program will load data files created by the handheld program with any variety of options specified.
2. The program will handle data collected on more than one handheld computer and can collect the data in a variety of ways on the computers.
3. The program will handle missing data that the database will not allow into a table.

All loaded files are checked for formatting and other common errors before the data are loaded into the database. All old data for the same plot and measurement data being loaded are removed from the database to prevent duplicate data storage. The program will create an information file on the results of all the files loaded into the database. To view this information open FILES\LOADFILE.TXT. The output file will list each handheld file loaded into the database. Additional information detailing problems encountered loading the handheld files may also be included. A message for each handheld file loaded will indicate if the handheld file was renamed.

### System Requirements

To install and run the LCTA Handheld Field Computer Data Recording program, the following are required:

- IBM-compatible 386 computer

- 4 MB RAM
- 200 MB hard drive
- Microsoft Windows, version 3.1 or higher
- LCTA Program Installation disks
- Gupta Technologies SQLBase, version 5.0 or higher
- LCTA database

## Installation

The program files are supplied on 3.5 in. or 5.25 in. diskette(s) in a compressed format with an installation program included. To install these files, Microsoft Windows 3.1 must be running on the computer. Complete the following steps:

1. Select <File> from the Program Manager menu.
2. Select <Run> from the popup menu.
3. In the command line field type <B:\*Instalit*> or <A:\*Instalit*> depending on the drive where the installation disk is located.
4. Follow the installation program's instructions.

If the D: drive is chosen for installation, the installation program will create the following directory structures:

- D:\LCTA\PRGMS {LCTA Front End Program files}
- D:\LCTA\PRGMS\HHCMP {LCTA Handheld Compiler files}
- D:\LCTA\PRGMS\HHFILES {Handheld data files}
- D:\LCTA\PRGMS\FILES {LCTA Front End Program output files}

Once the files have been installed and the Windows group created or updated, several icons will be found in the group window. To start a program, double click on the icon titled *Data Editor*.

## Program Features and Menu Options

The following menu options will be displayed at the top of the LCTA Field Data Database Loading program window (Figure 52): Database, Load, Cancel, Exit, and About. Each topic is discussed in the following text.

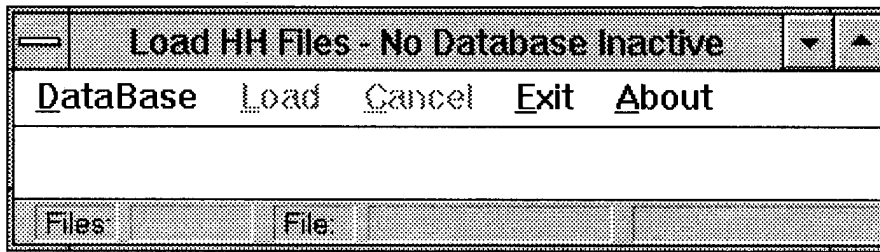


Figure 52. LCTA Field Data Database Loading program window.

**Database**

A dialog box (Figure 53) will appear allowing selection of the desired database server and LCTA database. The current server and database are listed in the main program window title. Select the desired database server. If the data will be loaded into a local database, leave the server selection blank or select *Local*. After selecting a database server, select a database from the drop down database listbox. A user name and password are only required if not using the default user name and password of the SQLBase database. See the SQLBase documentation for more information on the default database user names and passwords. Select the OK button to accept the current values.

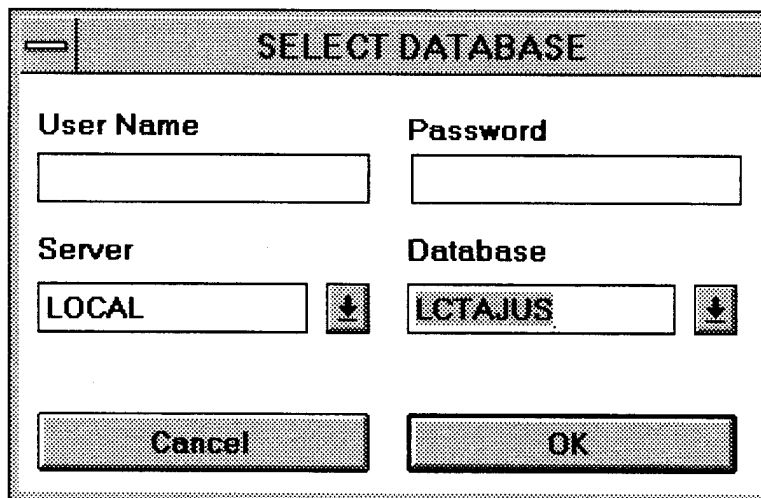


Figure 53. Database selection dialog box.

## Load

To load all handheld files into the database automatically, select the <LOAD> menu option. Only files in the HHFILES directory with the standard LCTA file naming convention for the selected database will be loaded.

After a file has been loaded into the database, the file name is modified to prevent the plot from later being loaded into the database. All hyphens (-) in the file name are converted to underscores (\_). If a loaded file needs to be reloaded into the database, the file must be renamed by converting all underscores (\_) to hyphens (-).

As files are loaded into the database, the name of the file that is loading is displayed in the program window title bar at the top of the window. If the window has icons, the file that is being loaded is displayed under the program icon.

As files are loaded into the database, the percent of the plot loaded into the database and the percent of files processed are displayed in the message bar at the bottom of the program window. A message in the message bar also describes what part of the data files is being loaded.

If the measurement date of a plot is not the same year as the current date, a dialog box (Figure 54) will appear prompting for the correct date. This feature is provided because the handheld computer clocks frequently are incorrect when batteries are low.

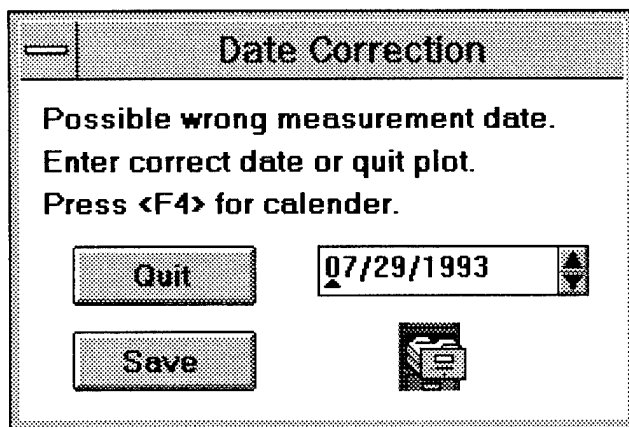


Figure 54. Correct date dialog box.

## Cancel

Select the <CANCEL> option to stop loading files into the database. If <CANCEL> is selected while a file is loading into the database, no data from the file will exist in the database. All data already loaded in the database for the currently loading file are

removed. Data for previous files will still be in the database. Either *all* of a handheld plot data file will be loaded or *no* data will be loaded into the database to maintain database integrity.

### **Exit**

Select the <EXIT> option to terminate the program.

### **About**

Selecting the <ABOUT> option will bring up a dialog box (Figure 55) that shows the program version number.

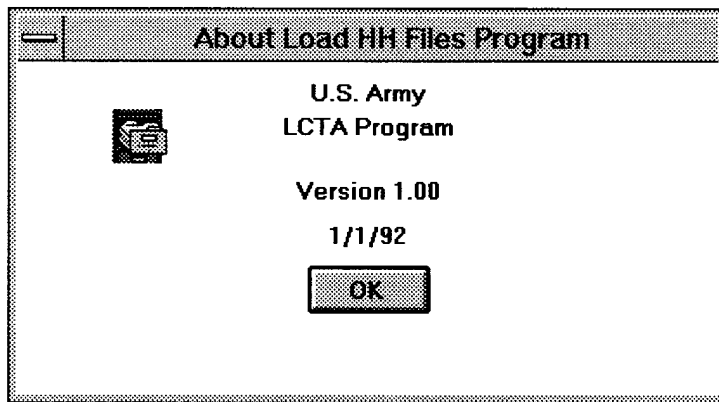


Figure 55. About dialog box.

## **Loading Individual Files**

Frequently there is a need to load files:

- that do not adhere to the standard handheld data file naming convention
- into the database individually or in selected groups
- into the database in a predetermined order
- from a directory other than the default HHFILES directory
- without renaming the handheld data file.

An alternative file loading mechanism has been provided to meet these needs. Individual files or groups of files can be loaded into the database by dragging and dropping files from the Windows file manager. Files do not have to adhere to the standard LCTA data file naming convention since the user selects the desired files.

Data files can be located in any directory or drive when loading data by dragging and dropping. When files are loaded by dragging and dropping, file names are not changed after the file is loaded.

To load files by dragging and dropping, first open the Windows File Manager and the LCTA Field Data Database Loading program (Figure 56). The Windows File Manager is located in the Main group window of the Windows Program Manager. Select a group of files from the File Manager window. Grab the files by pressing the left mouse button when the mouse pointer is on one of the file names. Without releasing the left mouse button, drag the mouse pointer over the LCTA Field Data Database Loading program. Then release the left mouse button. The program will start loading the files. For more information on dragging and dropping, see the Windows user documentation.

If the measurement date of a plot is not the same year as the current date, a dialog box (Figure 54) will appear to prompt for the correct date. This feature is provided because the handheld computer clocks frequently are incorrect when batteries are low.

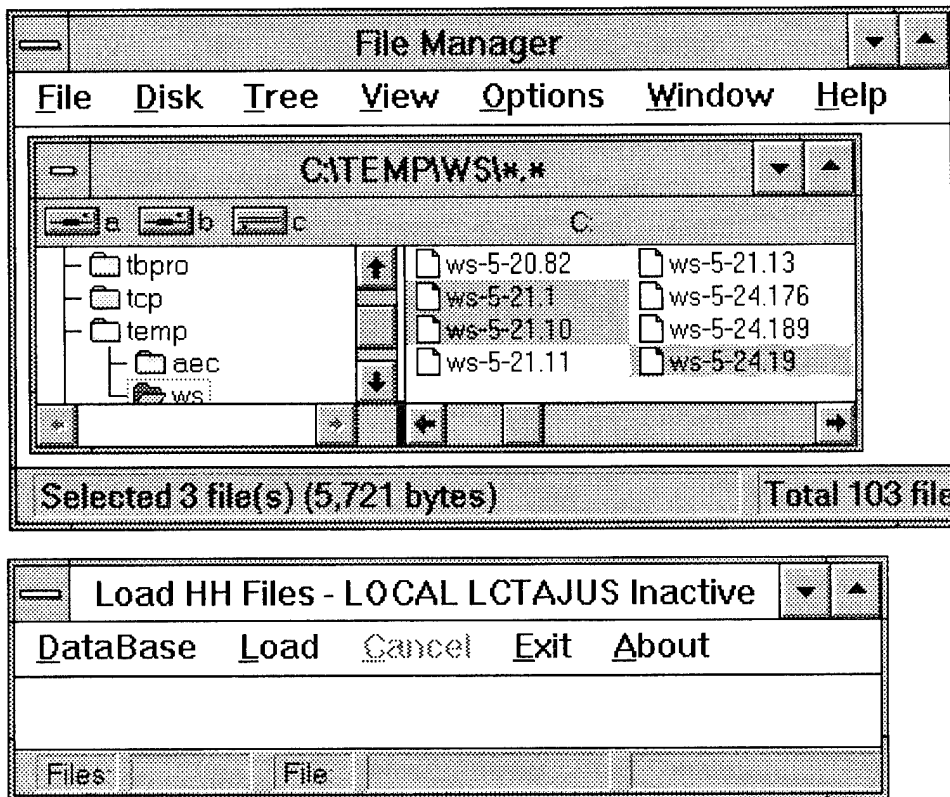


Figure 56. Loading data files by dragging and dropping files from the Windows File Manager into the LCTA Field Data Database Loading program.

## Why Files Do Not Load

Error messages specifying data observations not being added to a database table are common. The messages mean that the handheld file contains missing data that were not loaded into the table. Many database table columns will not accept missing or invalid column values. This database feature is referred to as referential integrity. See the database documentation for more information on these features of the database. To correct the problems, edit and reload the handheld file or edit the data already in the database table. Edit the handheld file by opening the file with the handheld field recording program. Edit the database directly by using the LCTA Users Interface data editing features, Gupta Inc. Quest, or other third-party data editing tools.

If the current date and the date the plot was measured are not in the same year, the program perceives this as a common data recording error, and a dialog box (Figure 54) will be displayed. The dialog box allows the plot measurement date to be changed before data enters the database. Most data files are loaded into the database the same year the data were collected. Field recorders with battery problems frequently have incorrect computer clocks. The program assumes that if the measurement year and current year are not the same, the measurement year is incorrect because of battery problems. If the measurement date is correct, simply quit the dialog box and continue loading the data.

If the handheld data file has been edited and is not in the specified format, a windows error message is often displayed, and the program will crash. If a handheld file must be edited, save a copy of the file before editing. When editing the file, do not change the file structure. Correcting altered data files can be extremely time consuming. For information on the handheld data file format see *OUTPUT FILE FORMAT* on page 51.

## Loading Data From Mixed Data Collection Techniques

Currently LCTA offers two data collection options, initial inventory/long-term monitoring and short-term monitoring. When collecting data with the handheld field computers, two separate programs are used, INV2.EXE and MON2.EXE. In the past, having two programs for each data collection method was acceptable. However, installations have expressed an interest in using both data collection methods for each plot. Many of these installations are collecting inventory line data and monitoring belt data to provide more meaningful data, reduce data collected, and save time in the field. Until new data collection devices and programs are developed, both the inventory and monitoring data collection programs will have to be used to address this situation.

The use of the two programs to record data for a particular plot will require more intensive data management. However, the procedures are fairly simple and can be easily performed by installation personnel. Below is a list of procedures for loading data into the database when using both the inventory/long-term monitoring and short-term monitoring data recording programs for a plot.

### ***Potential Problems***

Handheld files for a particular plot measured on the same day will have the same file name.

*Result: could lose data*

Files for a particular plot may have differing dates.

*Result: data will not be loaded into the database due to referential integrity*

Data recorded for a particular plot on each program (i.e., land use data recorded using the inventory and monitoring program)

*Result: duplicate data or overwriting of the correct data*

The data file has an invalid file name.

*Result: the file will not be loaded with the load command*

An invalid installation code was used to identify the installation.

*Result: the data will not be loaded into the database*

### ***List of Procedures***

1. When downloading files to the PC, keep two separate subdirectories, one each for inventory/long-term monitoring files and for short-term monitoring files.
2. If an older version of the handheld programs was used to collect field data, the output file format will have to be modified before the files can be loaded. The only portion of the file that needs to be modified is the header section (Table 11). Newer file formats contain additional lines of information. These additional lines of information identify the format of the rest of the file. Lines 1 and 7 through 20 may need to be added. If these lines are not in the file, add the lines exactly as shown in Table 11.

Table 11. Handheld file header format.

Line Number	Contents
1	VERSION 1.0
2	MONITOR
3	KNOX
4	10/27/1993
5	2
6	CORE
7	F *BA*
8	F *DBH*
9	F *OTHER*
10	*OTHER NAME*
11	F *OPT TABLE COUNT*
12	*OPT VAR 1 NAME*
13	*OPT VAR 2 NAME*
14	*OPT VAR 3 NAME*
15	*OPT VAR 4 NAME*
16	*OPT VAR 5 NAME*
17	YYYYYYYYY * PM, PS, SLS, BA, LU, GC, AC, BS, BT *
18	*RESERVED*
19	*RESERVED*
20	*RESERVED*

3. Use a text editor to open both the inventory/long-term and monitoring files for a particular plot. With the Windows Notepad program, start the Notepad program twice and arrange the windows so that both files are visible.
4. Check the date in both files on line 4. If they are different, correct one of them.
5. For each file, correct the loading options in line 17. Each Y in the line corresponds to the table listed to the right of the row of Ys. Refer to Table 12 for the table codes. Change the Y to N for those tables that are not to be loaded. If only belt data were collected using the monitoring program, change all but the 8th and 9th Ys to Ns. This assumes all other data were collected using the inventory/long-term program.

**Table 12. Conversion table for handheld header file table codes to LCTA database table names.**

<b>File Header Code</b>	<b>LCTA Database Table Name</b>
PM	PlotMast
PS	PlotSurv
SLS	SoilLS
BA	BasalA
LU	LandUse
GC	GndCover
AC	AerCover
BS	BeltSurv
BT	BeltMon or BeltTran

6. Once all files have been corrected, copy the files containing PLOTMAST or PLOTSURV data to the /LCTA/PRGMS/HHFILES directory. Load these files first, following the procedures for loading handheld files.
7. After the files have been loaded, move those files from the /LCTA/PRGMS/HHFILES directory and copy the rest of the handheld files to this directory. Load these files following the procedures for loading handheld files.

## 5 LCTA Data Entry and Editing Program

### Introduction

While most installation LCTA field data are recorded with handheld data recorders, there are times when data must be recorded on paper. When measuring field plots require camping out for several days without the ability to recharge batteries, handheld recorders fail, and data is more easily recorded on paper. The LCTA Data Entry and Editing program allows the user to enter LCTA field data collected on paper. The edit windows are designed to closely match field sheets to ease data entry.

### System Requirements

Installing and running the LCTA Data Entry and Editing program requires the following:

- IBM-compatible 386 computer
- 4 MB RAM
- 200 MB hard drive
- Microsoft Windows, version 3.1 or higher
- LCTA Program Installation disks
- Gupta Technologies Inc. SQLBase, version 5.0 or higher
- LCTA database.

### Installation

The program files are supplied on 3.5 inch or 5.25 inch diskette(s) in a compressed format with an installation program included. To install these files, Microsoft Windows must be running on the computer. Complete the following steps:

1. Select <File> from the Program Manager menu.
2. Select <Run> from the popup menu.

3. In the command line field type <B:\Instalit> or <A:\Instalit>, depending on the drive where the installation disk is located.
4. Follow the installation program's instructions.

If the D: drive is chosen for installation, the installation program will create the following directory structures:

- D:\LCTA\PRGMS {LCTA Front End Program files}
- D:\LCTA\PRGMS\HHCOMP {LCTA Handheld Compiler files}
- D:\LCTA\PRGMS\HHFILES {Handheld data files}
- D:\LCTA\PRGMS\FILES {LCTA Front End Program output files}

Once the files have been installed and the Windows group created or updated, several icons will be found in the group window. To start a program, double click on the *Data Editor* icon.

## Program Features and Menu Options

The following menu options are displayed at the top of the LCTA Edit Window (Figure 57): About, Database, Basic, Yearly, Help, and Exit. Each topic is discussed in the following text.

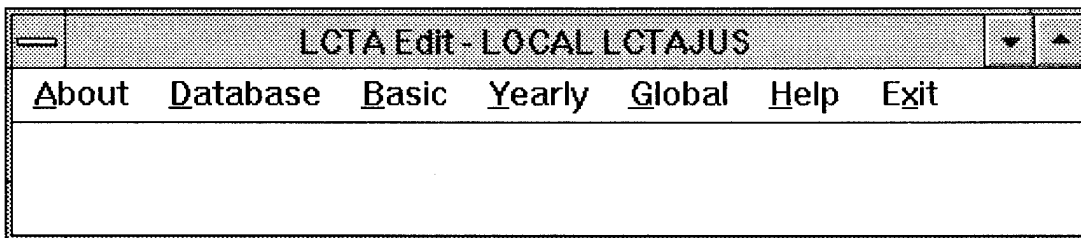


Figure 57. LCTA Data Entry and Editing program window.

### About

Selecting the <About> option will bring up a dialog box (Figure 58) that shows the version number of the program.

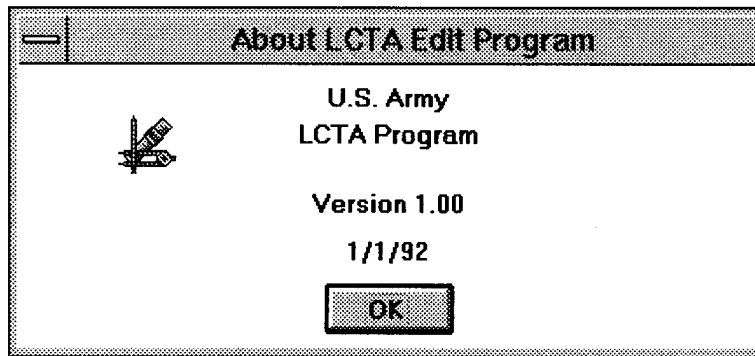


Figure 58. About dialog box.

### Database

A dialog box (Figure 59) will appear allowing selection of the appropriate database server and database. The current server and database are listed in the window title. Select the appropriate database server. If accessing a local server, select local or leave the selection blank. After selecting the database server, select the appropriate database from the drop down list. A user name and password are required if the default database values are not appropriate. See the SQLBase database documentation for more information on default user names and passwords. Select <OK> to accept the selected values.

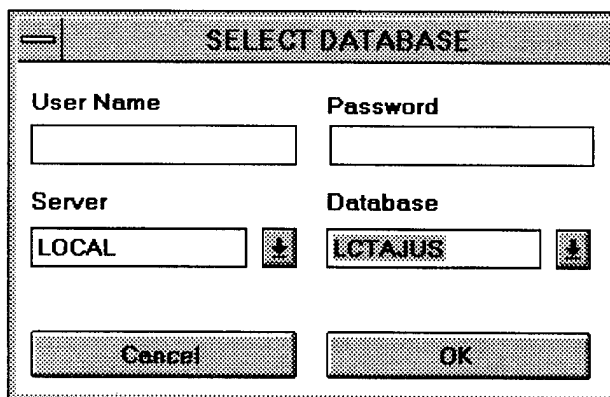


Figure 59. Database selection dialog box.

### Basic

The basic form contains all information on a plot that does not change with each periodic remeasurement. This form should be filled out only when a plot is first established. The data may be edited at any time if found to be inaccurate.

This form should also be filled out (or already exist) before attempting to enter data in the other forms. Data integrity features of the database will not allow certain data to be added to the database unless other data already exists.

A basic form for a plot can be edited, viewed, or a new form added (Figure 60). Viewing a form will only display the plot data, values cannot be changed. Adding a form displays an empty form. Editing a form displays the plot data and allows values to be changed. Select the appropriate menu selection.

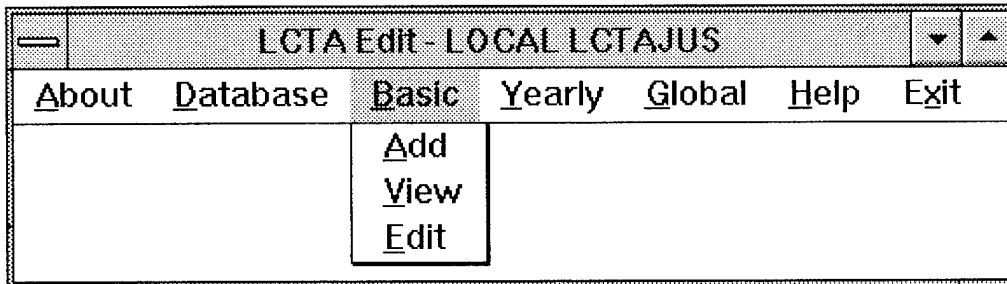


Figure 60. Basic menu subselections.

If <View> or <Edit> was selected, the year-plot dialog box (Figure 61) will appear. Select the appropriate year and the appropriate plot. Select <OK> to use the selected values.

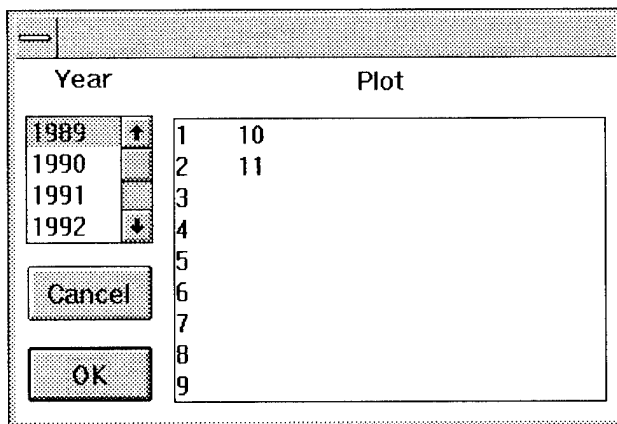


Figure 61. Year-plot selection dialog box.

The basic plot information form will be displayed (Figure 62). Enter all required data. Installation requires the three character installation code. Plot number is a value between 0 and 9999. Date is the date the plot was established. DMC-E is the universal transverse mercator coordinate easting value obtained from the global positioning system (GPS). DMC-N is the Uni-

versal Transverse Mercator coordinate northing value obtained from the GPS. USGS Quad is the U.S. Geological Survey 7.5 minute topographic survey map. Azimuth is the azimuth of the line transect. Declination is the angle between the geographic meridian and the local magnetic meridian. R-Value is the R value for the USLE soil loss equation and is obtained from the Soil Conservation Service (SCS). See the *LCTA Program Data Dictionary* (Sprouse and Anderson, April 1995) and *U.S. Army Land Condition-Trend Analysis (LCTA) Plot Inventory Field Methods* (Tazik et al., February 1992) for more detailed information on valid data values. Double clicking the left mouse button when the cursor is over the date field will display a calendar. The value selected on the calendar will be added to the date field. Use the OK button to save changes to the database. Use the cancel button to discard all data changes.

**Yearly**

The following menu options are displayed in the pull down menu once the Yearly option in the Main menu has been selected. Plot information can be viewed, edited, or a new form added. <View> will only display data; values cannot be changed. <Edit> will display data and allow changes to the data. <Add> will display an empty form selected from the appropriate menu subselection. Yearly forms display data that is collected or changes annually. Land use, plot map, belt transect, and line transect data forms are available. Select the appropriate menu subselection (Figure 63).

The dialog box titled "Basic Plot Information" contains the following fields and controls:

- Installation: [Empty text box]
- Plot Number: [Empty text box]
- Date: 09/JUL/1994 (with a date spinner control)
- DMC-E: [Empty text box]
- DMC-N: [Empty text box]
- USGS Quad: [Empty text box]
- Soil Series: [Empty text box]
- Azimuth: [Empty text box]
- Declination: [Empty text box]
- R-Value: [Empty text box]
- Buttons: OK and Cancel
- Icon: A pencil and eraser icon is located at the bottom left of the dialog box.

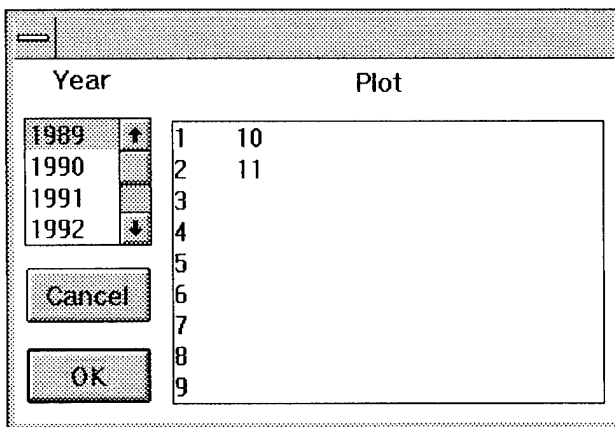
Figure 62. Basic plot information data entry form dialog box.

The menu titled "LCTA Edit - LOCAL LCTAJUS" has the following structure:

- Menu Items: About, Database, Basic, Yearly, Global, Help, Exit
- Submenu for Yearly:
  - Add: Land Use Form
  - View: Plot Map Form
  - Edit: Belt Transect, Line Transect

Figure 63. Yearly menu subselections.

If <View> or <Edit> was selected, the Year-plot dialog box will appear (Figure 64). Select the appropriate year and the appropriate plot. Select <OK> to accept these values.



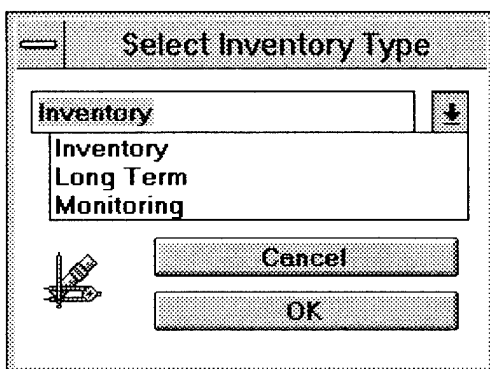
The dialog box is titled "Year-plot selection dialog box". It features a vertical list on the left labeled "Year" with options 1989, 1990, 1991, and 1992. Above 1989 is an upward arrow, and below 1992 is a downward arrow. To the right of this list is a table with a column labeled "Plot" containing numbers 1 through 9. The table contains the following data:

Year	Plot
1989	1 10
1990	2 11
1991	3
1992	4
	5
	6
	7
	8
	9

At the bottom of the dialog are two buttons: "Cancel" and "OK".

Figure 64. Year-plot selection dialog box.

If <Add> was selected for line or belt transect data forms, the select inventory dialog box will appear (Figure 65). Select the appropriate inventory type to determine what data form should be displayed. Select <OK> to use the selected value.



The dialog box is titled "Select Inventory Type". It has a text field containing "Inventory" with a downward arrow to its right. Below the text field is a list with three items: "Inventory", "Long Term", and "Monitoring". At the bottom of the dialog are two buttons: "Cancel" and "OK".

Figure 65. Select inventory type dialog box.

**Land use form.** Enter the required data on the land use plot information form (Figure 66). The land use plot form records all visible evidence of military, non-military, and maintenance use of the 6 m x 100 m plot, as well as erosion evidence. Mark the occurrence of an activity by pressing the left mouse button when the cursor is over the appropriate list item. A text edit box is available to document other activities. See the *LCTA Program Data Dictionary* (Sprouse and Anderson, April 1995) and *U.S. Army Land Condition-Trend Analysis (LCTA) Plot Inventory Field Methods* (Tazik et al., February 1992) for more detailed information on valid data values. Double click the left mouse button when the cursor is over the date field to display a calendar. The value selected on the calendar will be added to the date field. Select <OK> to save changes to the database. Use the cancel button to discard all data changes.

Land Use Plot Form

Plot:

Date: 09/JUL/1994

**Military**

None

Wheeled

Tracked

Excavation

Foot

Demolition

Bivouac

Other

**Non-Military**

None

Grazing

Row Crop

Forestry

Hay

Other

**Maintenance**

None

Prescribed Burn

Accidental Burn

Tillage

Mowing

Seeding

Tree Planting

Other

**Wind Erosion**

No Evidence

Drifting

Scouring

Pedestal Plants

**Water Erosion**

No Evidence

Sheet/Rill

Active Gully

Pedestal Plants

Debris Dams

OK Cancel

Figure 66. Land use data entry form dialog box.

**Plot map form.** Enter all required data on the plot map information form (Figure 67). Installation is the three character installation code. Plot number is a value between 0 and 9999. Survey date is the date the plot was measured. Inventory type lists the type of methodology used. Plot type lists the plot as part of the core allocated plots or special use allocated plots. Surveyor is for the names of the surveyors. Recorder is for the names of the data recorders. Training area is the measurement years training area name. Vegetation type is the installation-defined vegetation type of the plot. Steepness is the slope of the plot. Length is the length of the plot slope. Plot note is used to record general comments about the plot and data measurements. See the *LCTA Program Data Dictionary* (Sprouse and Anderson, April 1995) and *U.S. Army Land Condition-Trend Analysis (LCTA) Plot Inventory Field Methods* (Tazik et al., February 1992) for more detailed information on valid data values. Double click the left mouse button when the cursor is over the date field to display a calendar. The value selected on the calendar will be added to the date field. Select <OK> to save changes to the database. Use the cancel button to discard all data changes.

**Periodic Plot Information**

<b>General Info</b> Installation Plot Number Survey Date: 09/JUL/1994 Inventory Type Plot Type Surveyor Recorder Training Area Vegetation Type		<b>Aspect</b> <input type="radio"/> Level <input checked="" type="radio"/> N <input type="radio"/> NE <input type="radio"/> E <input type="radio"/> SE <input type="radio"/> S <input type="radio"/> SW <input type="radio"/> W <input type="radio"/> NW	<b>Soil Depth</b> <input type="radio"/> 0 <input type="radio"/> 0 to 1 <input type="radio"/> 1 to 2 <input type="radio"/> 2 to 3 <input type="radio"/> 3 to 4 <input type="radio"/> > 4											
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Slope Loc</th> <th style="text-align: center;">Steepness (%)</th> <th style="text-align: center;">Length (m)</th> </tr> </thead> <tbody> <tr> <td>0 m</td> <td></td> <td></td> </tr> <tr> <td>50 m</td> <td></td> <td></td> </tr> <tr> <td>100 m</td> <td></td> <td></td> </tr> </tbody> </table>		Slope Loc	Steepness (%)	Length (m)	0 m			50 m			100 m			<b>PlotNote</b> <div style="border: 1px solid black; height: 100px; width: 100%;"></div>
Slope Loc	Steepness (%)	Length (m)												
0 m														
50 m														
100 m														
<input type="button" value="Cancel"/>		<input type="button" value="OK"/>												

Figure 67. Periodic plot data entry form dialog box.

**Line transect form.** If the initial and long-term inventory line transect plot information form (Figure 68) is displayed, enter all required data. Scroll bars allow the display of various portions of the transect data. Disturb is the disturbance code for the transect location. VegID is the vegetation code or ground cover code. VegCond is the vegetation condition. Opt\_Text is an installation defined variable. The lower half of the form stores vegetation codes. See the *LCTA Program Data Dictionary* (Sprouse and Anderson, April 1995) and *U.S. Army Land Condition-Trend Analysis (LCTA) Plot Inventory Field Methods* (Tazik et al., February 1992) for more detailed information on valid data values. Double click the left mouse button when the cursor is over the date field to display a calendar. The value selected on the calendar will be added to the date field. Use the save-exit button to save changes to the database. Use the cancel-exit button to discard all data changes.

**Line Transect - Inventory Year**

PlotID:  Date:

VegLoc: 0.5 1.5 2.5 3.5 4.5 5.5 6.5 7.5 8.5

Opt_Text									
VegCond									
VegID									
Disturb									
VegHt	[Scroll Bar]								
<1									
1-2									
2-3									
3-4									
5-6									

Buttons: Save - Exit, Cancel - Exit

Figure 68. Inventory and long-term line transect data entry form dialog box.

**Line Transect Information - Monitoring Year**

Plot:  Date:

VegLoc Disturb GndCov AerCov Opt\_Text


Buttons: Delete Line, Add Line, Save - Exit, Cancel - Exit

Figure 69. Monitoring line transect data entry form dialog box.

If the monitoring line transect plot information form (Figure 69) is displayed, enter all required data. Scroll bars allow the display of various portions of the transect data. VegLoc is the vegetation transect location. Disturb is the disturbance code for the transect location. GndCov is the ground cover code. AerCov is the aerial cover code. Opt\_Text is an installation defined variable value. See the *LCTA Program Data Dictionary* (Sprouse and Anderson, April 1995) and *U.S. Army Land Condition-Trend Analysis (LCTA) Plot Inventory Field Methods* (Tazik et al., February 1992) for more detailed information on valid data values. Double click the left mouse button when the cursor is over the date field to display a calendar. The value selected on the calendar will be added to the date field. The delete line button deletes the current line. The add

line button adds a new data line. Use the save-exit button to save changes to the database. Use the cancel-exit button to discard all data changes.

**Belt transect form.** The belt transect form has two versions: monitoring and initial/long-term. The correct form is displayed based on dialog box option selections.

If the initial and long-term inventory belt transect plot information form (Figure 70) is displayed, enter all required data. Scroll bars allow the display of various portions of the transect data. VegID is the vegetation code. Loc is the transect location. Dist is the distance from the transect location. Side is the side of the transect. Ht is the height of the plant. Cond is the condition of the plant. Begin, end, and area define the area occupied by large clumps. Opt\_Real is a real number installation defined variable. See the *LCTA Program Data Dictionary* (Sprouse and Anderson, April 1995) and *U.S. Army Land Condition-Trend Analysis (LCTA) Plot Inventory Field Methods* (Tazik et al., February 1992) for more detailed information on valid data values. Double click the left mouse button when the cursor is over the date field to display a calendar. The value selected on the calendar will be added to the date field. The delete line button deletes the current line. The add line button adds a new data line. Use the save-exit button to save changes to the database. Use the cancel-exit button to discard all data changes.

VegID	Loc	Dist	Side	Ht	Cond	Begin	End	Area	Opt_Real

Figure 70. Initial and long-term inventory belt transect data entry form dialog box.

If the monitoring inventory belt transect plot information form (Figure 71) is displayed, enter all required data. Scroll bars allow the display of various portions of the transect data. VegID is the vegetation code. Cond is the condition of the plant. Min-1m, 1-2m, 2-3m, 3-4m, >4m are the number of plants in each height category. See the

LCTA Program Data Dictionary (Sprouse and Anderson, April 1995) and U.S. Army Land Condition-Trend Analysis (LCTA) Plot Inventory Field Methods (Tazik et al., February 1992) for more detailed information on valid data values. Double click the left mouse button when the cursor is over the date field to display a calendar. The value selected on the calendar will be added to the date field. The delete line button deletes the current line. The add line button adds a new data line. Use the save-exit button to save changes to the database. Use the cancel-exit button to discard all data changes.

Belt Transect Information - Monitoring Year						
Plot	Date					
-1	09/JUL/1994					
VegID	Cond	Min-1m	1-2m	2-3m	3-4m	>4m

Figure 71. Monitoring inventory belt transect data entry form dialog box.

**Global**

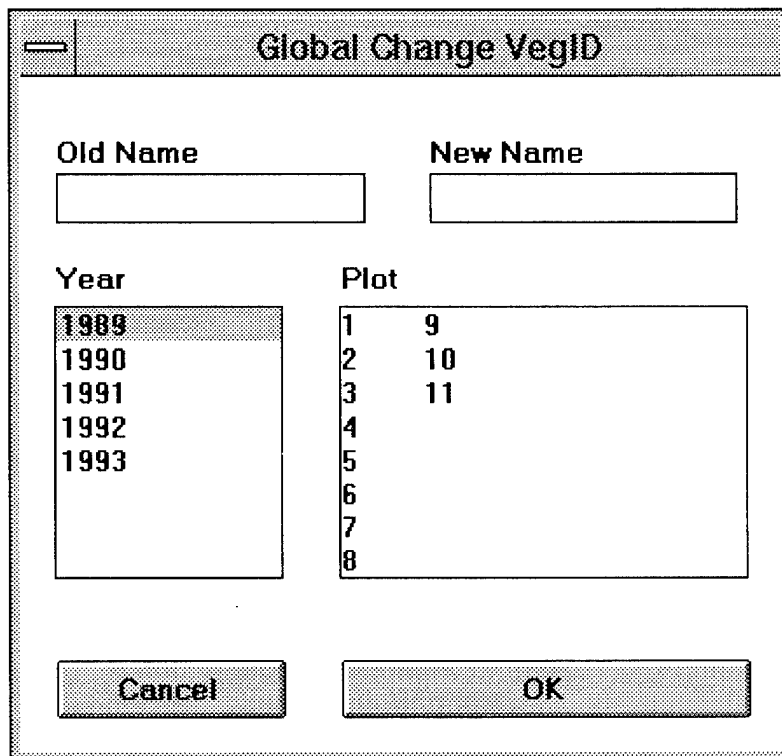
The <Global> menu selection is a utility function that makes certain common complex data changes easier. Two utilities are provided: global vegetation code changes and plot number/plot date changes (Figure 72).

LCTA Edit - LOCAL LCTAJUS						
About	Database	Basic	Yearly	Global	Help	Exit
				VegID		
				Plot-Date		

Figure 72. Global menu subselections.

Frequently plants are misidentified during field data collection. The global change vegid utility (Figure 73) allows vegetation codes to be changed easily. Enter the

incorrect and correct vegetation codes. Select the appropriate year and plot where changes should be made. Select <OK> to make the changes to the database.



The dialog box titled "Global Change VegID" contains the following elements:

- Old Name:** A text input field.
- New Name:** A text input field.
- Year:** A list box containing the years 1989, 1990, 1991, 1992, and 1993. The year 1989 is currently selected.
- Plot:** A list box containing plot numbers 1 through 8. The number 9 is positioned to the right of 1, 10 to the right of 2, and 11 to the right of 3.
- Buttons:** "Cancel" and "OK" buttons at the bottom.

Figure 73. Global vegetation name change dialog box.

The LCTA databases use referential integrity constraints to help maintain the integrity of the data stored in the database. Referential integrity means all references from one table to another table are valid and accurate. For example, plot information cannot be added to the plotsurv table if the plot does not exist in the plotmast table. In other words, plot data cannot exist for a plot that does not exist. While this database feature is important in maintaining the integrity of the data, some types of errors are difficult to correct.

Because of referential integrity constraints in the LCTA databases, changing the plot number and plot measurement dates for data can be difficult. The plot date utility makes these changes easier. Select the existing plot and date value from the drop down list (see Figure 74). Enter the correct plot number and/or plot measurement date. Select <OK> to change the database data values.

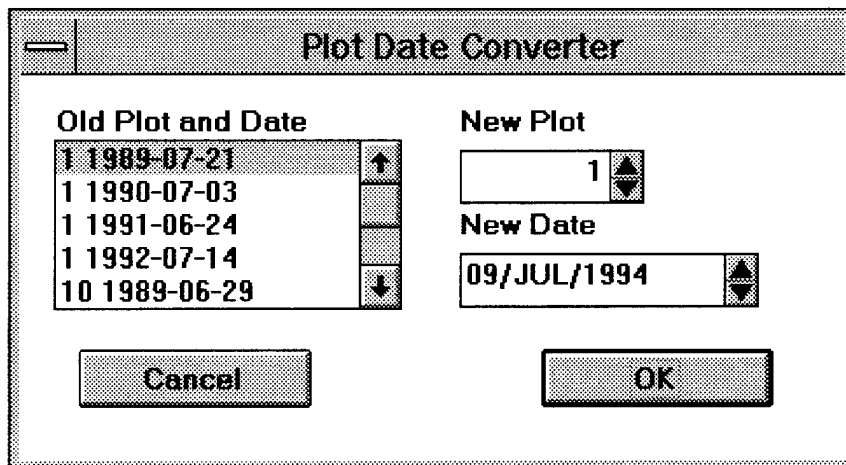


Figure 74. Global plot/date change dialog box.

### **Help**

This menu selection provides access to the help session for the LCTA Edit Data program. This help session works like other Windows help sessions. All green text with dotted underlines will bring up a definition box when the text is clicked on. When the green text with solid underlined is clicked on, the program will jump to that subject. Topics can be browsed by clicking on the left and right arrows in the menu bar. The help session contains a copy of the handheld program manual. For further information on using a Windows help session, consult the Windows user manual.

### **Exit**

Select this menu item to exit the LCTA Edit Data program.

## References

- Sprouse, William L., and Alan B. Anderson, *Land Condition Trend Analysis (LCTA) Program Data Dictionary: Version 1.0*, ADP Report EN-95/03/ADA295608 (U.S. Army Construction Engineering Research Laboratories [USACERL], April 1995).
- Tazik, D.J., S.D. Warren, V.E. Diersing, R.B. Shaw, R.J. Brozka, C.F. Bagley, and W.R. Whitworth, *U.S. Army Land Condition-Trend Analysis (LCTA) Plot Inventory Field Methods*, TR N-92/03/ADA247931 (USACERL, February 1992).

## Appendix: Forms

**Problem Report Form**

User Name:

Date: / /

Database:

Type of Problem:      Major Error:     Minor Error:   
                                 Request for Improvement:     

What error occurred or what would you like improved?

Did any error messages appear on the screen? Yes[ ] No[ ]

If yes, please list the error message:

Under which menu item did the error occur or is an improvement requested?

**Installation Information Form**

User Name:

Installation Name:

Address:

Phone:

FAX:

Date of Installation:

Programs Installed:

LCTA Windows Front End

Version Number

LCTA Handheld Compiler

Version Number

(Version numbers can be found by starting the programs and clicking on the About menu item.)

DOS Version Number:

Windows Version Number:

Computer Brand:

Computer Model:

	YES	NO	Version
Do you have Turbo Pascal for DOS installed?	<input type="checkbox"/>	<input type="checkbox"/>	
Do you have SQLBase installed?	<input type="checkbox"/>	<input type="checkbox"/>	
Do you have Quest for SQLBase installed?	<input type="checkbox"/>	<input type="checkbox"/>	

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 ATTN: AFZW-DE  
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 ATTN: AFZH-DEQ  
 Fort Carson 80913  
 ATTN: AFZC-ECM-NR (2)  
 Fort Bragg 28307-5000  
 ATTN: AFZA-PW-DW  
 Fort Campbell 42223-1291  
 ATTN: AFZB-DPW-E  
 Fort McCoy 54656-5000  
 ATTN: AFZR-DE-E  
 Fort Pickett 23824  
 ATTN: AFZA-FP-E  
 Fort Stewart 31314-5000  
 ATTN: AFZP-DEV  
 Fort Buchanan 00934  
 ATTN: AFZK-B-EHE  
 Fort Devens 01433-5000  
 ATTN: AFZD-DEM  
 Fort Drum 13602-5097  
 ATTN: AFZS-EH-E  
 Fort Irwin 92310-5000  
 ATTN: AFZJ-EHE-EN

Fort Hood 76544-5057  
 ATTN: AFZF-DE-ENV  
 Fort Hunter Liggett 93928  
 ATTN: AFZW-HE-DE  
 Yakima Tng Center 98901-5000  
 ATTN: AFZH-Y-ENR  
 Fort Dix 08640-5500  
 ATTN: ATZD-EHZ

TRADOC  
 Fort Monroe 23651  
 ATTN: ATBO-FE  
 ATTN: ATBO-HE  
 Installations:  
 Fort Lee 23801-5000  
 ATTN: ATZM-E-PE  
 Fort Jackson 29207-5660  
 ATTN: ATZJ-PWN  
 Fort Gordon 30905-5040  
 ATTN: ATZH-DIE  
 Fort Benning 31905-5122  
 ATTN: ATZB-PWN  
 Fort Rucker 36362-5135  
 ATTN: ATZQ-DPW-EN  
 Fort Leonard Wood 65473-5000  
 ATTN: ATZT-DPW-EE  
 Fort Leavenworth 66027-5020  
 ATTN: ATZL-GCE  
 Fort Bliss 79916-6100  
 ATTN: ATZC-DOE  
 Carlisle Barracks 17013-5002  
 ATTN: ATZE-DPW-E  
 Fort Eustis 23604-5306  
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USARPAC 96858  
 ATTN: APOP-TR  
 ATTN: APEN-EV

National Guard Bureau 20310  
 ATTN: NGB-ARE  
 ATTN: NGB-ARI  
 ATTN: NGB-ARO-TS 22204-1382

Army National Guard  
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 North Little Rock, AR 72118-2200  
 Phoenix, AZ 85008-3495  
 Camp Roberts, CA 93451  
 Sacramento, CA 95826-9101  
 Boise, ID 83707-4507  
 Jackson, MS 39209  
 Camp Shelby, MS 39407-5500  
 Oklahoma City, OK 73111-4389  
 Draper, UT 84020-1776  
 Braggs, OK 74423  
 Reading, MA 01867-1999  
 Camp Edwards, MA 02542-5003  
 Richmond, VA 23219  
 Columbia, SC 29201  
 Eastover, SC 29244  
 St. Augustine, FL 32085-1008

Starke, FL 32091-9703  
 Indianapolis, IN 46241-4839  
 Lansing, MI 48913-5101  
 Little Falls, MN 56345-0348  
 Jefferson, MO 65101-9051

US Military Academy 10996-5000  
 ATTN: MAEN-EV  
 ATTN: DOPS

Headquarters, 7th ATC  
 ATTN: AEAGC-TD-MO

Headquarters, AEC  
 ATTN: SFIM-AEC-ECN

Headquarters, Army Tng Spt Ctr  
 ATTN: ATIC-CTS

Headquarters, EUSA  
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