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5. Author(s)

1.  
2. F/FRED Global Research Unit, P.O. Box 185, Paia HI 96779 USA  
3.

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# Multipurpose Tree Species Network Research Series

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**IADSS**  
**INFORMATION AND DECISION SUPPORT SYSTEM**  
**Version 1.1**  
**USER'S MANUAL**

Developed by the  
F/FRED Global Research Unit  
P.O. Box 186, Paia HI 96779 USA.  
(808) 579-8481

## **MANUAL NO. 1**



Forestry/Fuelwood Research and Development (F/FRED) Project

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**IADSS**  
**INFORMATION AND DECISION SUPPORT SYSTEM**  
**Version 1.1**

**USER'S MANUAL**

Developed by the  
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April 25, 1988

Winrock International Institute for Agricultural Development

University of Hawaii,  
College of Tropical Agriculture and Human Resources

Forestry/Fuelwood Research and Development (F/FRED) Project

Supported by the U.S. Agency for International Development

## TABLE OF CONTENTS

Preface	
How to use this manual	
Introduction.....	1
Enhancements.....	2
Section I. Installation	
Requirements.....	3
Installing IADSS.....	4
Section II. Quick Start	
Starting IADSS.....	5
Getting Around IADSS.....	8
Using IADSS.....	9
The IADSS Screen Layout.....	10
IADSS Screen Components.....	11
Using the keyboard with IADSS.....	12
IADSS Data Entry.....	13
The Experiment Database.....	15
The MPTS Specialist Database.....	18
The Abstracts Database.....	19
Section III. System Options	
OPTION A: EXPERIMENT DATABASE.....	21
Institution Information, Form A.....	26
Cooperator Information, Form B.....	28
Trial Site Information, Form C.....	30
Site Descriptor - Socioeconomic, Form D.....	32
Site Descriptor - Climate, Form E.....	33
Site Descriptor - Soil, Form F.....	35
Experiment Site Preparation, Form G.....	36
Experiment Description, Form H.....	37
Experiment Factors/Treatment.....	38
Treatment Factors and Levels, Form I-1.....	39
Treatment Combinations, Form I-2.....	46
Experiment Design, Form I-3.....	51
Experiment Planting, Form J.....	56
Tree Species, Form K.....	57
Weather Data.....	60
Weather Station Information, Form L-1.....	61
Daily Weather Measurements, Form L-2.....	63
Soil Measurements.....	68
Preplant Soil Measurements, Form M-1.....	69
Soil Measurements, Form M-2.....	70

Tree Measurements, Form N.....	72
Foliage Biomass Measurements, Form O.....	80
Wood Biomass Measurements, Form P.....	85
Tree Litter Measurements, Form Q.....	90
Tree Phenology Observation, Form R.....	94
Tree Damage Observation, Form S.....	95
Irrigation, Form T.....	77
Log of Experiment Operation, Form U.....	98
General Measurements.....	99
General Measurements Definition, Form X-1.....	100
General Measurements, Form X-2.....	101
Analysis, Option 1.....	103
OPTION B: FARM AND VILLAGE FORESTRY DATABASE (not implemented)	
OPTION C: SUMMARY DATABASE (not implemented)	
OPTION D: MPTS SPECIALIST DATABASE.....	106
OPTION E: ABSTRACTS DATABASE.....	114
OPTION F: SPECIES DATABASE (not implemented)	
OPTION G: SOIL DATABASE (not implemented)	
OPTION H: CLIMATE DATABASE (not implemented)	
OPTION I: DAILY WEATHER DATABASE (not implemented)	
OPTION 1: DATA ANALYSIS PACKAGE (FMOD)... (see FMOD Supplement)	
APPENDIX A. CONFIGURING YOUR SYSTEM FOR IADSS.....	125
APPENDIX B. TROUBLESHOOTING.....	126
APPENDIX C. 1987 HUMID/SUB-HUMID ZONE INSTITUTIONS AND ID'S...	130
APPENDIX D. IDENTIFICATION CODES.....	131
APPENDIX E. TECHNICAL OVERVIEW.....	132
APPENDIX F. Kmod OUTPUT TITLES AND HEADINGS.....	134
APPENDIX G. 1987 HUMID/SUB-HUMID ZONE TRIALS COOPERATORS.....	135
INDEX.....	137

## PREFACE

The Fuelwood/Forestry Research and Development (F/FRED) Project was designed and is funded by the U.S. Agency for International Development (USAID) to provide scientists working with multipurpose tree species (MPTS) with a network for coordination and exchange of research plans, methods, and results. The F/FRED Project is being carried out by Winrock International Institute for Agricultural Development, a private, non-profit organization.

The F/FRED Global Research Unit, located on the island of Maui in Hawaii with the University of Hawaii, has developed the F/FRED Information and Decision Support System (IADSS) to fulfill the need for a user-friendly program that allows easy entry, storage, retrieval, and analysis of experiment data. The data are derived from a number of separate sets of field trials carried out by Asian institutions and scientists. The IADSS system is designed to incorporate further experimental data from Latin America and Africa. It is an integrated software system designed to provide users with all the necessary components to effectively manage a network of field trials. Although the system was designed for a network of trials it is flexible enough to easily handle single experiments.

An F/FRED network of trials is a series of experiments performed with identical or similar experiment designs at various sites. IADSS Version 1.0, accompanied by a users' manual and released in November 1987, was created for the F/FRED 1987 Humid/Sub-humid Zone trials being performed at six sites in Thailand, two in the Philippines, two in Indonesia, three in Taiwan, two in Malaysia, and one in Pakistan. Subsequent versions of IADSS and updated manuals will be issued.

IADSS, distributed to each cooperator, contains the primary databases for storing the experiment information and data, and supplementary databases for storing abstracts of bibliographic references and information on multipurpose tree species (MPTS) specialists. It also contains analysis capabilities within the decision support system to help the experimenter analyze the experiment data contained in the experiment databases.

Overall design of IADSS has involved F/FRED cooperators of the 1987 Humid/Sub-humid zone trials and developers of similar database management systems. The system, including versions 1.0 and 1.1 has been developed by Julie Pak and Ruiz Tabora with assistance from Foster Cady. The data graphics and analysis package is due to David Allen. The major responsibility for the Users' Manual has been assumed by Ruiz Tabora. For F/FRED network trials, this manual is used in coordination with the Standardized Methodology Manual.

Thomas C. Niblock  
Director of Asian Forestry Research Services  
Winrock International

## HOW TO USE THIS MANUAL

This section describes the organization of this manual.

The manual has been divided into three sections, to provide users with quick access to information about and instructions for the Information and Decision Support System (IADSS).

The first section contains the installation procedures. These procedures are used to transfer the system from the original diskettes to your computer's hard disk.

The second section provides a short description of all system functions and databases. It is intended for those users who have prior experience in computer operations. Read this section to familiarize yourself with basic IADSS operations.

The third section provides a more detailed discussion of the system's operations. Read parts of this section when you need more information about specific database operations. This section is divided into the databases and forms within the experiment database.

Appendices are included that provide the user with configuration information, troubleshooting procedures, information on ID's used by the system, a technical overview, and sample output from the analysis package.

## INTRODUCTION

The global research component of the F/FRED Project, located on the island of Maui with the University of Hawaii, is developing the F/FRED Information and Decision Support System. The general formulation of the system has developed by study of existing databases and through discussions and meetings of F/FRED cooperators and specialists from key forestry organizations.

The goal of the F/FRED Information and Decision Support System is ready access and use of the system without user prerequisites of previous computer or database management training. Computer screens are self-explanatory with options common to all the databases. Operational options include ADD, SEARCH, MODIFY, DELETE, and PRINT.

Version 1.1 includes the Experiment, MPTS Specialist, and Abstracts Databases. The system's purpose is to store data from experiments for exchange and analysis, provide cooperators with the most recent literature on priority species, and give users the capability of contacting persons with special skills related to multipurpose tree species. Later versions of the system will include Summary, Farm and Village Forestry, Species, Soil, Climate, and Daily Weather Databases.

The Experiment Database is the prime residence for tree and trial site data collected by the F/FRED research network. The structure of the database is largely defined by the minimum data set (MDS) of the 1987 field trials. However, the database has been designed to allow flexibility for inclusion of other trials by adding tables to the Experiment Database or by linking to external databases within the system. The Experiment Database is ideally suited for comparative trials from a series or network of trials with standardized procedures for collecting site and tree information. The system has incorporated a data analysis package with proven ability to handle intra- and inter-site analyses and also predict MPTS biomass by environmental modeling with site characterization information.

The Abstracts Database contains international citations and abstracts that provide recent information on a select group of multipurpose tree species. Initially, the information for the database will be obtained from a commercial database, CAB Abstracts, which is accessed through Dialog. Cooperators can enter other citations and interact with the system by using the same basic options (add, search, modify, delete, and print).

The MPTS Specialist Database provides cooperators quick access to individuals with specific skills and experience and who are active in MPTS management, research, and training. A secondary function of the database is its use as a network directory. Users will be able to enter names and addresses of people who are not MPTS specialists but are important to their research efforts.

## ENHANCEMENTS

IADSS Version 1.1, scheduled for release in April 1988, contains the following enhancements:

- The Experiment Factors/Treatments (FORM I) now offers more flexibility in experiment design.
- A general purpose tree measurement form.
- Experiments are grouped by networks using NETWORK ID's.
- On-line help windows have been included to aid the user.
  - o A description of each database at the MASTER MENU.
  - o A view of existing networks and experiments in the system.
  - o An explanation of input data required for input fields.
- Error-checking of input data.
- Print option for all experiment forms.
- Generalized data analysis and graphics capabilities within the system for analysis of experiments.

## FUTURE ENHANCEMENTS

- Multiple stem measurements data entry for each tree.
- Data retrieval by treatment.
- Generalized (increased) number of trees/plot.
- Analysis for multiple ages/experiment or multiple experiments/age.

# SECTION I. INSTALLATION

## SYSTEM REQUIREMENTS

This section describes the minimum hardware configuration and software needed to run the F/FRED Information and Decision Support System (IADSS).

### Hardware Requirements:

1. IBM PC/XT/AT or a system that is 100% compatible
2. One hard disk (20 Mb recommended, 2Mb free)
3. 512K bytes of memory installed (300K free)
4. One 360K DS/DD (double sided/double density) drive (for installation and backup)
5. EGA card (Enhanced Graphics Adapter) or compatible
6. Graphics Monitor (color is optional)
7. Graphics Printer (optional but highly recommended)

### Software Requirements:

1. DOS (Disk Operating System):  
PC-DOS v3.1 or higher or MS-DOS v3.2 or higher

The system is distributed for PC-DOS and should be used for IBM and IBM-compatible microcomputers. The MS-DOS version is available upon request.

This program was developed using an IBM PC/AT with 512K RAM (random access memory) installed, a 360K DS/DD floppy disk drive, a 1.2M HD (high density) diskette drive, a Video-7 Enhanced Graphics Adapter (VEGA), a Princeton Color Graphics monitor (HX-12E), and an IBM Proprinter XL. The program was written in dBASE III Plus and compiled using Quicksilver v1.1.

This system will work on computers with MGA (monochrome graphics adapter) or CGA (color graphics adapter) boards. You may experience some washed out displays or snow on the screen using these graphics boards.

This program was tested on a Compaq 286 with a 40MB hard disk, 640K RAM, a Compaq VGA adapter, and a Compaq VGA monitor.

The program's performance is dependent upon the clock speed of your computer, the access time of your hard disk, the access time of your RAM, and the type of display adapter used.

## INSTALLING IADSS

This section describes the steps necessary to install IADSS on your hard disk. The system requires 2Mb of free space on the hard disk for its programs and files. You will need extra free space as you enter information into the system.

The programs and files have been placed on the system diskettes using the DOS COPY command.

NOTE: The text in bold print is what you type at the DOS prompt. [Enter] means press the 'Enter' or 'Return' key.

If your DOS prompt looks like this **C:\>** proceed to step 1.

If your DOS prompt looks like this **C>** then type **PROMPT \$P\$G** [Enter] at the DOS prompt.

1. Make a sub-directory on your hard disk to hold the system's programs and files.
  - a. Log into the root directory of the hard disk drive.  
**C:\>CD\** [Enter]
  - b. Make the sub-directory  
**C:\>MD IADSS** [Enter]
  - c. Log into the newly created sub-directory  
**C:\>CD IADSS** [Enter]
2. Copy the programs and files from the system diskettes by repeating these steps for each diskette.
  - a. Insert the diskette into the floppy disk drive.
  - b. Close the disk drive door or lever.
  - c. **C:\IADSS>COPY A:\*. \* [Enter]**
  - d. When read light goes out, open drive door or lever.
  - e. Remove the diskette.

NOTE: See APPENDIX B if you have problems.

## SECTION II. QUICK START

### STARTING IADSS

After you have installed the programs, databases, and indices on your hard disk you are ready to start. Log into the subdirectory that contains the system and type IADSS then press [Return] to begin program execution.

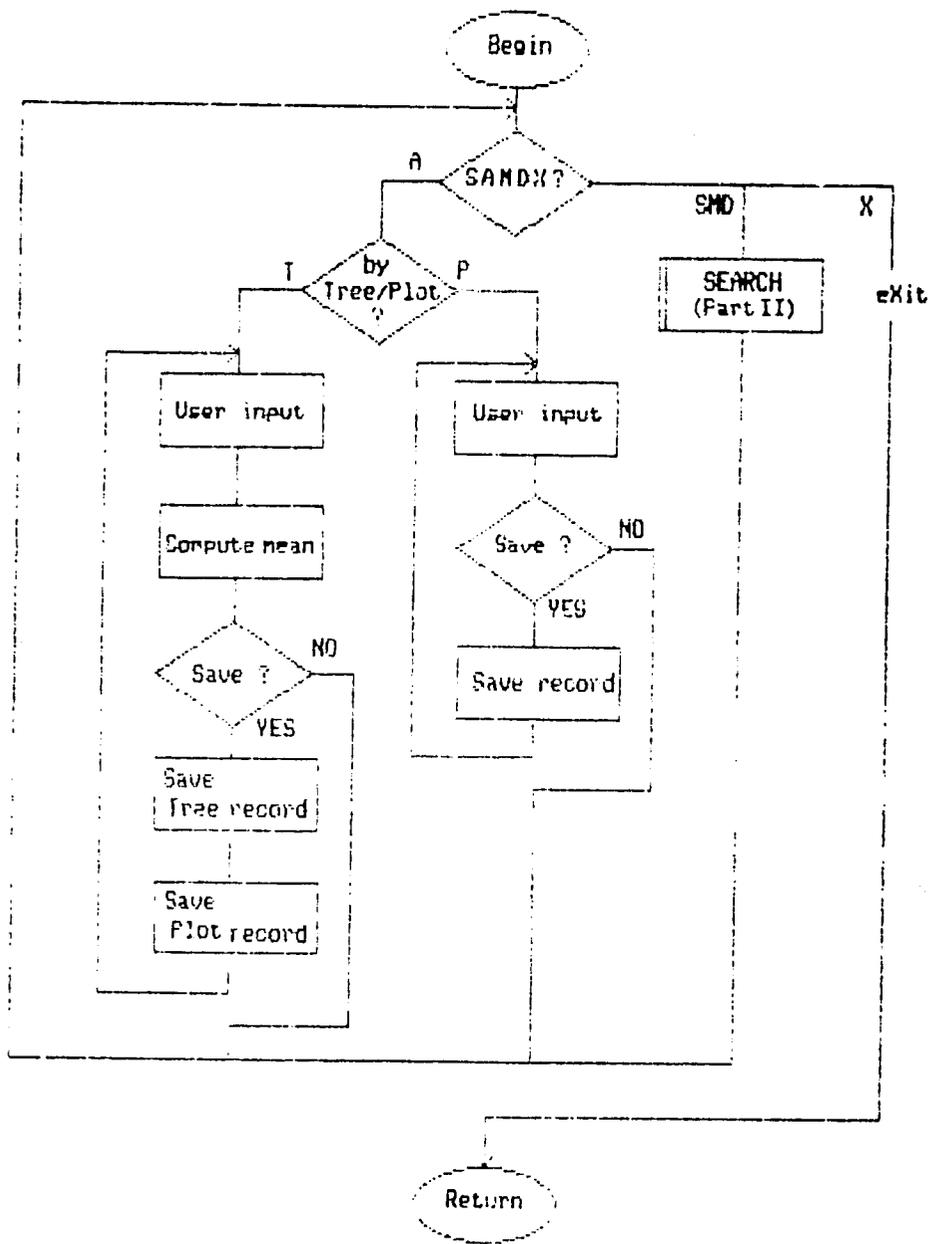
```
C:\IADSS>IADSS [Return]
```

The system will display the Master Menu (Figure 1). To choose one of the options use the cursor keys to move the highlight bar to the the desired option then press [Return] or press the letter corresponding to the desired option.

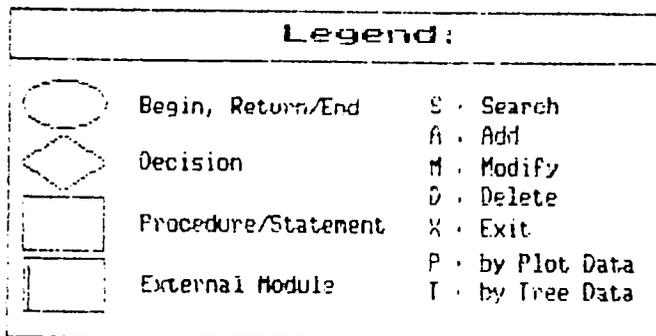
```
===== F/FRED INFORMATION AND DECISION SUPPORT SYSTEM (I) =====  
  
      <<  M A S T E R  M E N U  >>  
  
System Options:  A - EXPERIMENT DATABASE  
                  B - FARM AND VILLAGE FORESTRY DATABASE  
                  C - SUMMARY DATABASE  
                  D - MPTS SPECIALIST DATABASE  
                  E - ABSTRACTS DATABASE  
                  F - SPECIES DATABASE  
                  G - SOIL DATABASE  
                  H - CLIMATE DATABASE  
                  I - DAILY WEATHER DATABASE  
  
                  J - DATA ANALYSIS PACKAGE (FMOD)  
  
Use cursor keys to highlight desired item. Press [Enter] to begin program  
execution. To quit, press the [Esc] key.  
  
[Esc]=Quit, [F1]=Help
```

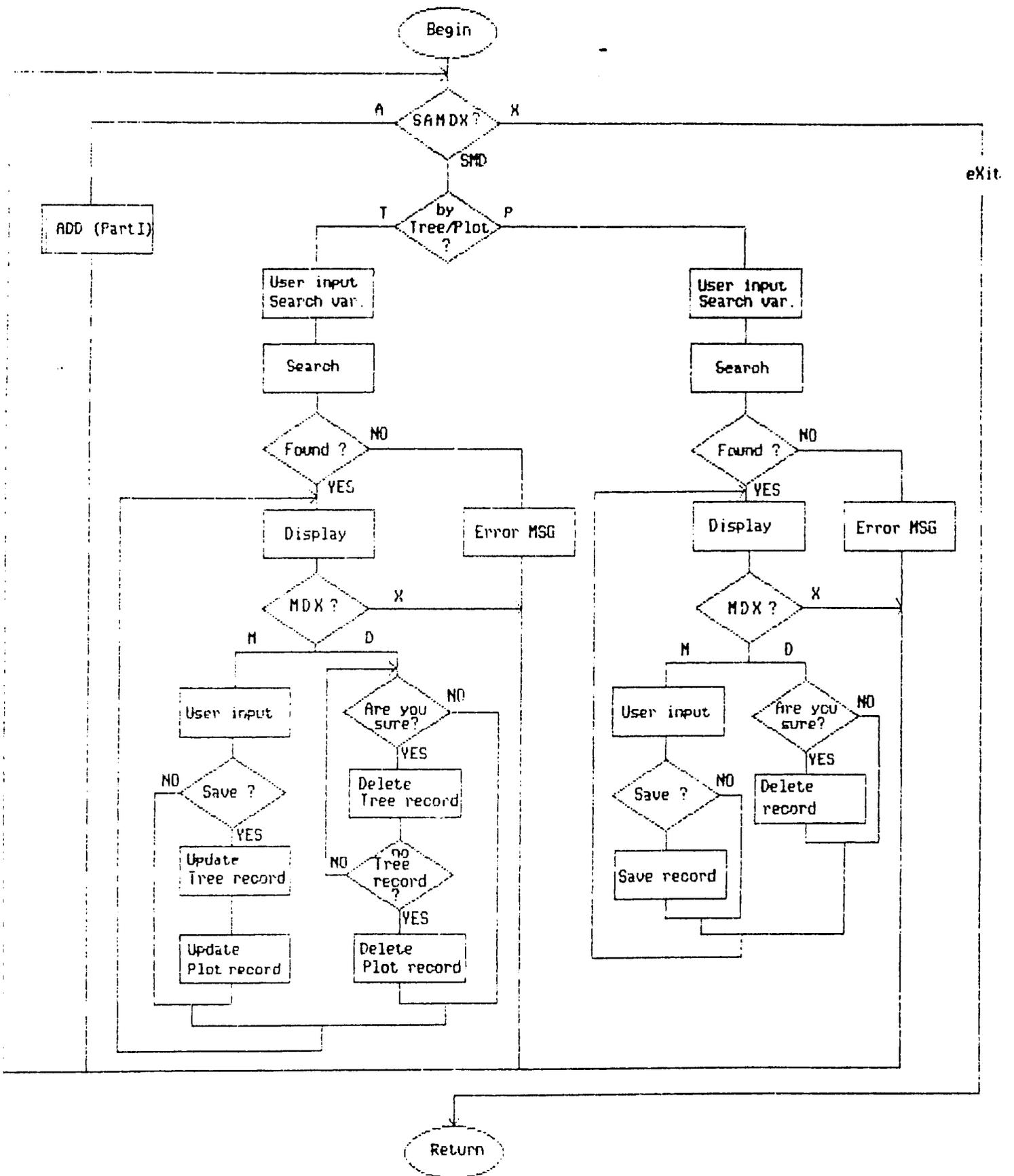
Figure 1.

The following pages show the control flow diagram for the measurement forms. These diagrams illustrate the procedures performed by the IADSS system based on user input.



MEASUREMENT GENERAL FLOW (Part I)





MEASUREMENT GENERAL FLOW (Part II)

## GETTING AROUND IADSS

### CHOOSING OPTIONS

#### The Scrolling Menu

The Master Menu is an example of one type of option screen you will encounter. It is a scrolling menu screen. You move the highlight bar using the [Up Arrow] and [Down Arrow] keys.

Selection is done two ways:

1. Move the highlight bar to the option desired then press [Return].
2. Press the letter or number to the left of the desired option.

Other scrolling menus you will encounter are the Experiment Database Main Menu (Figure 3b), the Experiment Factors/Treatments Sub-Menu (Figure 12), the Weather Data Sub-menu (Figure 18), and the Soil Measurements Sub-menu (Figure 21).

#### The Operation Options

The information in the database are manipulated using the search, add, modify, and delete options. Information can be printed using the print option. Some or all of these options are available, depending on the form, in the Experiment Database. All of these options are available in the MPTS Specialist and Abstracts Database.

The escape key, [Esc], is used throughout the system to abort the current operation and pass control to the previous operation.

```
[S]earch, [A]dd, [M]odify, [D]elete _
```

```
[Esc]=Exit, [F2]=Print
```

These options are shown at the bottom part of the screen. The desired operation is selected by pressing the key shown in intense video. If an option is not shown in intense video it is not available.

## USING IADSS

This covers the basic operations of data retrieval, entry, deletion, and modification. The mode indicator appears at the upper right corner of the screen to show you which mode you are using.

[Return] is used to indicate completion of data entry into a field. It moves the cursor to the next input field.

[Esc] is used to exit the mode or operation you are in. This key leaves the databases unchanged.

### The SEARCH MODE

The Search Mode allows you to specify search criteria to be used in retrieving data from the database. The system will display the search fields in reverse video. Reverse video means dark characters displayed on a bright background.

Press <Ctrl-W> to begin the search. The search cannot be stopped after pressing <Ctrl-W>. The system will display all records found matching the search criteria.

### The ADD MODE

The Add Mode allows you to enter data into the system. The input fields are displayed in reverse video and the cursor is placed in the first input fields.

Press <Ctrl-W> to save the data. In most cases the system stays in Add Mode.

### The MODIFY MODE

The Modify Mode allows you to change existing data in the databases.

Press <Ctrl-W> to save the data as changed.

### The DELETE MODE

The Delete Mode allows you to erase data in the databases. It uses a two-step deletion procedure to guard against accidental deletion. Read the messages carefully and use this mode with care as there is no procedure to recover data once it is deleted.

Press <Ctrl-Y> to delete the record or records shown.

THE IADSS SCREEN LAYOUT

Figure 2 shows the physical organization of the screens you will see while working with the system.

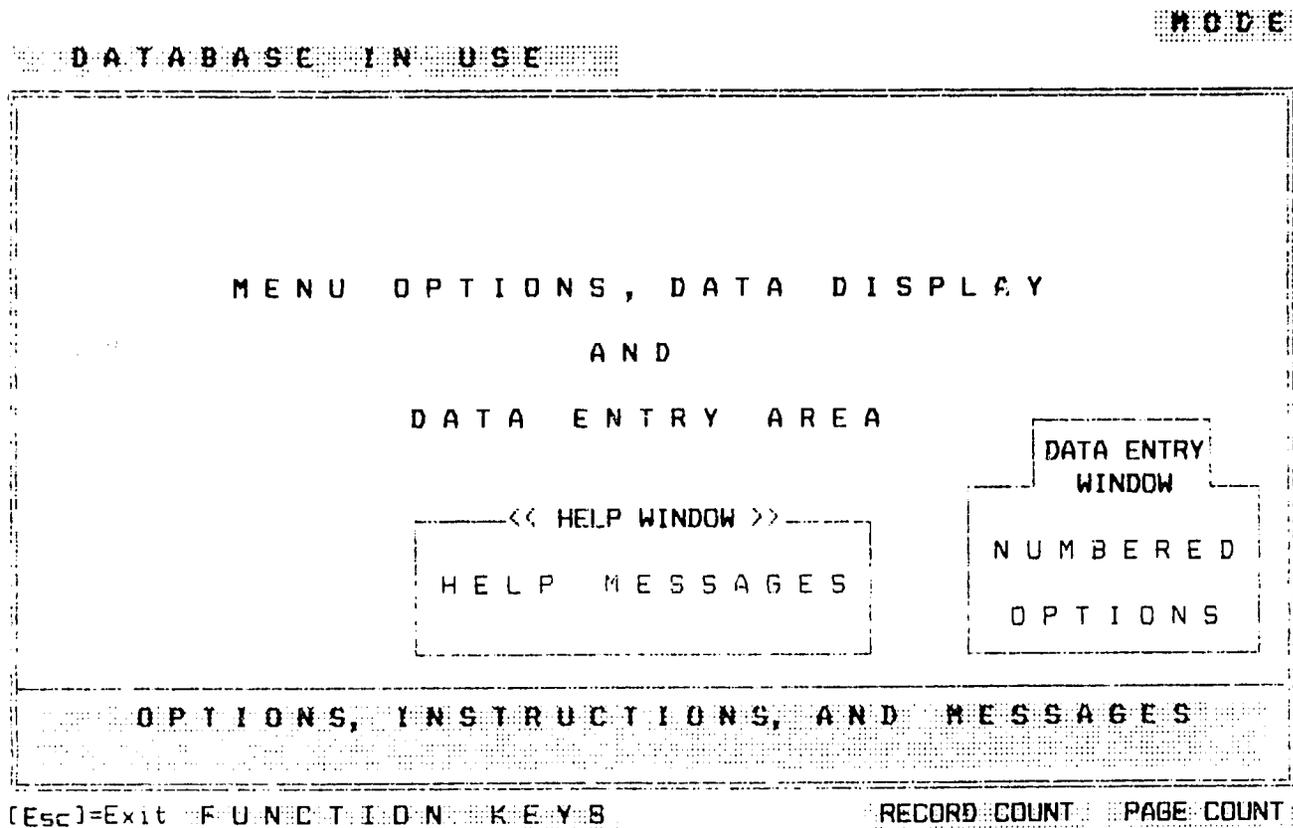


Figure 2.

## THE IADSS SCREEN COMPONENTS

This section defines the different components of the IADSS Screen Layout shown in Figure 2.

### DATABASE IN USE

This indicator shows the current database file in use. In the Experiment Database it shows the form in use.

### MODE

This indicator will show SEARCH, ADD, MODIFY, or DELETE depending on the current mode.

### MENU OPTIONS, DATA DISPLAY, AND DATA ENTRY AREA

This area will show the menu options, display data, or will show the data entry fields.

### WINDOWS

A help window appears when you press [F1]. Data entry windows are on-screen lookup tables to help you select input data.

### OPTIONS, INSTRUCTIONS, AND MESSAGES

This area will show the operational options, instructions for data entry, and system messages.

### FUNCTION KEYS

This will show function keys that are active.

### RECORD COUNT

This indicates the current record being displayed as well as the total records in the active data file.

### PAGE COUNT

This shows the current page being displayed as well as the total number of pages in the record or form.

### [Esc]

This indicates that the [Esc] key is active and is used throughout the system to abort the current operation or exit from a program module. It also clears help windows that appear on the screen.

## USING THE KEYBOARD WITH IADSS

Keys on the keyboard are represented by the label on the key enclosed in square brackets. [Esc] means the key marked 'Esc'. Combinations of keys are enclosed in angle brackets.

[A]...[Z], [0]...[9] : Data is entered using the letter and number keys. Letters can be entered in upper and lower case.

[Enter] or [Return] or [↵] : Use the this key to tell the system that you are finished entering data in a field. You can also use this key to bypass any field that requires no input data.

Cursor Keys: The four cursor keys are marked with arrows. The up and down cursor keys can be used to move the cursor between fields and the left and right cursor keys to move the cursor within fields.

[Backspace] and [Del] : Use the backspace key to erase entries to the left of the cursor. Use the delete key to erase entries at the cursor. Either key will cause the characters to the right of the cursor to shift to the left.

[Insert] : Whenever you are entering data, you can use this key to toggle between insert and overwrite mode. This allows data to be entered between other data. Data to the right of the cursor will be shifted to the right when data is entered.

[Home] : This is used to show the networks and experiments in the Experiment Database.

<Ctrl-W> : This is achieved by pressing [W] while holding down [Ctrl]. The combination of control and w keys <Ctrl-W> is used in two ways. In the ADD and MODIFY modes it tells the system to save the record that you are currently working on. In the SEARCH mode it instructs the system to begin searching.

<Ctrl-Y> : This key combination is used in the DELETE mode and tells the system to delete the current record. It causes the system to ask you for verification before the deletion.

[Esc] : The escape key [Esc] is used throughout the system to exit from the current mode without affecting the database. In the ADD or MODIFY modes using [Esc] will not add a new record to the database nor will it change a field in a record.

[PgUp] and [PgDn] : On some keyboards these keys are the [9] and [3] on the numeric keypad. Newer keyboards have these keys separated and marked [Page Up] and [Page Down]. Use these keys to change pages on the multi-page forms.

[F1] - [F12] : The function keys are used as option keys. [F1] is used as the HELP key. [F2] is used to print. [F3] is used to change experiments while in the Experiment Database.

## IADSS DATA ENTRY

Data is entered into the fields shown in reverse video, i.e., dark characters on a light background, on the screen. The cursor (a blinking underline) appears inside the input fields and indicates where a typed character will appear. The database requires three types of data: alphanumeric, numeric, and date.

### ALPHANUMERIC FIELDS

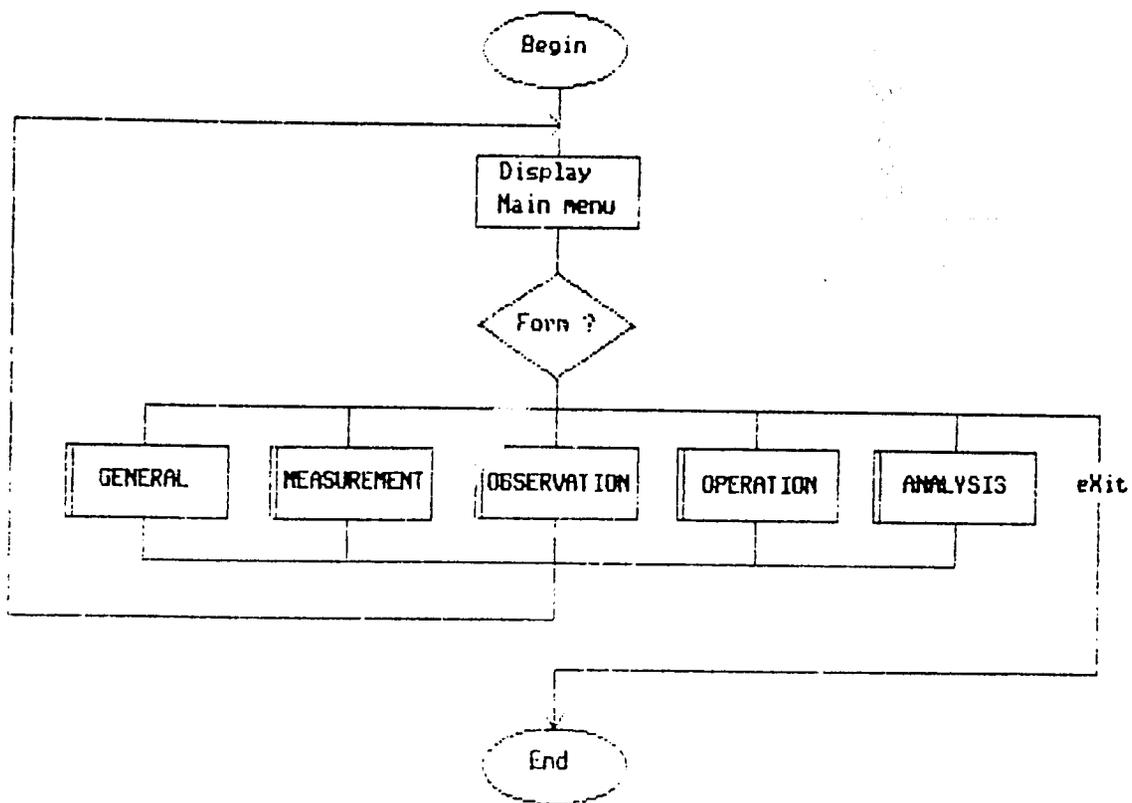
This type of data is entered using the alphabet ([A]...[Z]), number ([0]...[9]), and punctuation keys (e.g. comma [,], period [.] , dash [-], slash [/]). Examples of fields requiring this type of data are the name and address fields, description fields, and comment fields. Some alphanumeric fields have more than one line (e.g., an address). You must press [Enter] to move to the next line when entering data. If you continue entering data after the cursor is at the last character position only the last key pressed will appear at that position. All previous keys pressed will have been overwritten.

### NUMERIC FIELDS

This type of data is entered using the number ([0]...[9]), decimal point [.] , and minus [-] keys. The measurement fields require this type of data. Negative numbers are entered with a leading minus sign [-], all others are assumed to be positive numbers. Decimals may be entered with or without leading zeros. Numbers that exceed the number of digits provided in the field will be truncated. These fields are initialized as '-99' (for temperature measurements) or '-9' (all others) to indicate missing values.

### DATE FIELDS

The format of a date field is mm/dd/yy. MM is the month and has a value between 01 and 12 (01 = January, 02 = February, ..., 12 = December). DD is the date of the month and has a value between 01 and 31. YY is the last two digits of the year and has a value between 00 and 99. When a date is required you will see an input field like this:    /    /    with the cursor in the first position. To enter January 15, 1988 you would use the following keystrokes: [0] [1] [1] [5] [8] [8]. The system automatically skips over the slashes (/). The resulting date field would look like this: 01/15/88. The date can be entered without leading zeros but you have to use the right arrow key [->] to move the cursor to the next field. To enter January 15, 1988 you could also use the following keystrokes: [1] [->] [1] [5] [8] [8]. The resulting date field would look like this: 1/15/88. Either way is acceptable but the first method is preferred because it saves you the trouble of having to use the cursor keys to move after entering a one digit month or day.



EXPERIMENT DATABASE  
MAIN CONTROL FLOW

This control flow diagram illustrates the procedures of the Experiment Database. It shows the separation of forms by their purpose. The following pages discuss the various operations and forms/databases within IADSS.

## THE EXPERIMENT DATABASE

To use the Experiment Database press [A] at the Master Menu. You will see the Experiment Database Main Menu.

### Experiment ID

This database requires an Experiment ID (see Appendix D) before you can access any of the forms. Enter the Experiment ID then press <Ctrl-W>.

If you want to see what networks and experiments are currently in the system press [Home]. The system will display a two-section window showing the Network ID's and Names in the upper section and corresponding experiments for a network in the lower section. Press [Esc] to remove the window.

If the system does not find the ID you entered it will ask you if it is a new experiment. Press [N] then [Enter] to reenter the Experiment ID. Press [Y] then [Enter] if it is a new experiment.

### Network ID

The system will ask you to enter a Network ID (see Appendix D) if you are starting a new experiment. Enter the Network ID then press <Ctrl-W>. Press [Home] to see the networks and experiments window.

Experiment factors and levels, treatment combinations, objective, design, and species are all stored by Network ID. By assigning an experiment to an existing Network ID you are saved the effort of entering this information again.

If your new experiment cannot be assigned to an existing Network ID enter a different Network ID. You will then have to enter the information mentioned above.

After you have specified the Experiment ID and the Network ID the system will activate the Experiment Database Main Menu and you can move the reverse video bar, using the cursor keys, to the desired form and press [Enter] or simply press the letter or number corresponding to your choice.

You can now manipulate the information in the the selected form.

The Experiment Database forms are grouped into four categories: general, measurement, observation, and operation forms.

#### General Forms

The general forms are further divided into information, site descriptor, experiment, and species forms.

Forms A, B, C, and L-1 are information forms. They contain institution, cooperators, trial site, and daily weather station information, respectively.

Forms D, E, and F are site descriptor forms. These forms contain socioeconomic, climate, and soil descriptors of the trial site.

Forms G, H, I, and J are experiment forms. They contain experiment site preparation, description, factors/treatments, and planting data.

Form K is the species form. Information about the trees and seeds used in an experiment are contained in this form.

Information is entered once for each experiment. The only options for these forms are add, modify, and print. These forms automatically display the information they contain, if any.

If a new experiment is assigned to an existing Network ID, Forms I and K will be completely filled by the system. Form H will be partially filled in by the system.

If a new experiment is assigned to a new Network ID, all the the forms will be blank.

## Measurement Forms

Forms L-2 contains the daily weather measurements.

Form M-1 contains the preplant soil measurements. Form M-2 contains subsequent soil measurements.

Forms N, O, P, and Q are the measurement forms. Form N contains nondestructive tree measurements. Forms N, O, and P contain foliage biomass, wood biomass, and tree litter measurements, respectively.

Information is entered into these forms each time a measurement is made. The measurement forms N, O, and P accept either plot or tree data.

A general measurements form, Form X, allows you to specify and store up to 6 measurements. This form is used to collect data that cannot be stored in other forms.

Plot data are measurements for a single plot.

Tree data are measurements for individual trees within a plot. The system will automatically average tree measurements and generate corresponding plot records.

Measurements are entered into these forms by specifying the date of measurement, the age of the trees measured and the plot numbers. For tree data measurements, the number of trees measured and the tree numbers are also required.

## Observation Forms

Forms R and S are the observation forms. Form R contains tree phenology observations. Form S contains tree damage observations. Information is entered into these forms whenever an observation is made. Observations require the date of observation to be entered.

Information entered in the observation forms cannot be analyzed by the analysis package.

## Operation Forms

Forms T and U are the operation forms. Form T is used to record irrigation data. Form U is a log of operations performed during the experiment.

## THE MPTS SPECIALIST DATABASE

To use the MPTS Specialist Database press [D] at the Master Menu. You will see the Options Screen. This shows a blank specialist form with the options displayed at the lower portion of the screen.

Each record in the MPTS Specialist Database contains two pages. The first page contains information about the person's specialty. The second page contains general personal data.

Press the letter corresponding to the option you want to use. The valid keys are [S], [A], [M], [D], and [Esc].

The search option will display the search fields for you to specify a search criteria. Some of the fields will display option windows for quick data entry. Type the number corresponding to the option to enter that option into the field.

To start the search press <Ctrl-W>. The system will find all specialist records that match all the specified search criteria. Blank search fields will match any data in that field. Leaving all the search fields blank will retrieve all the specialist records. If you press [Esc] the system will not initiate the search and pass control back to the Options Screen.

After completing the search the system will display all records found. Use [PgUp] and [PgDn] to look at both pages of the record. If the system finds more than one record use [N] for next and [P] for previous to go from one record to another.

The add option will display all the input fields and you may enter all necessary information about an MPTS specialist. Some of the input fields will display option windows when the cursor is positioned in them. The option is entered into the input field by typing the number corresponding to the option.

To save the record press <Ctrl-W>. The system will save the data entered and display a new add screen. If you press [Esc] the system will clear the input fields and pass control back to the Options Screen without saving the record.

The modify and delete options work both at the Options Screen and after the search option. If you press [M] or [D] at the Options Screen the system will ask you to first search for records to modify or delete. After using the search option you may press [M] to modify or [D] to delete the record being displayed.

The modify mode works like the add mode except that data will already be in the input fields. Press <Ctrl-W> to save any changes or [Esc] to abort the modify mode and leave the data unchanged.

The delete mode will ask you to verify that you want to delete the record. Press [Y] then [Enter] to delete the record.

## THE ABSTRACTS DATABASE

To use the Abstracts Database press [E]~ at the Master Menu. The system will display the Options Screen showing a blank form with the options displayed at the lower part of the screen.

An Abstracts Database record may contain 1 to 7 pages. The first page is the bibliography page and contains the reference information. The rest of the pages contain the abstract.

Press the letter corresponding to the operation you want to perform. The valid keys are [S], [A], [M], [D], and [Esc].

The search option displays the search fields. Specifying search criteria is limited to the first page only. Press <Ctrl-W> to begin searching. The system will display all records matching the search criteria. Pressing [Esc] before searching will pass control to the Options Screen and pressing [Esc] after searching will allow you to enter new search criteria.

The add option begins with a blank first page. Notice the Page Count at the lower right shows 'Page: 1/1' and the 'N' in the Abstract field. This is the default setting in the add mode.

You must first enter a Reference ID for the citation. Any combination of characters can be used but it is advisable to assign the ID's systematically. The system will check for duplication.

Enter information into the input fields and press [Enter] after each field is completed. The Geo. Region, Species, and Main Heading . Sub Heading fields have option windows for quick data entry. You must enter a Main Heading for a citation.

Enter a 'Y' in the Abstract field if you intend to include an abstract. The Page Count will change to 'Page: 1/7' after you have entered the data into the Main Heading . Sub Heading field. Use [PgDn] and [PgUp] to switch between pages.

The abstract must be entered without blank lines. The system stops saving the abstract at the first blank line it encounters.

Press <Ctrl-W>, at any page, after entering data to save the record. The system will then display a new add screen.

The modify and delete options can be chosen at the Options Screen or after performing a search. If you choose either option at the Options Screen the system will ask you to perform a search for records to modify or delete. If chosen after a search the modify works like the add option except the input fields will contain data.

The delete option will ask you to verify that you want to delete the record being displayed. Press [Y] then [Enter] to complete the deletion process.

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## SECTION III. SYSTEM OPTIONS

### F/FRED Information and Decision Support System Options

#### OPTION A: EXPERIMENT DATABASE

Invoking option A causes the Experiment Database Main Menu to appear on the screen (Figure 3a). This shows all the forms of the experiment and are designated by letters A to U. Also shown are the analysis, reports and utilities options numbered 1, 2 and 3, respectively.

The system requires the user to enter the Experiment ID at this screen. The Experiment ID is composed of the Institution ID (two letters) assigned by F/FRED and the trial number (two digits) assigned by the principal investigator. See Appendix C for a list of Institution ID's for the 1987 Humid/Sub-humid Zone Trials.

To enter the Experiment ID type two letters then two digits. After verifying the Experiment ID press <Ctrl-W>. The system will search the database for the specified experiment.

```

      F/FRED EXPERIMENT DATABASE
    << MAIN MENU >>
FORM                                     FORM
A-> Institution Information             M-> Soil Measurements
B-> Cooperator Information             N-> Tree Measurements
C-> Trial Site Information              O-> Foliage Biomass Measurements
D-> Site Descriptor - Socioeconomic   P-> Wood Biomass Measurements
E-> Site Descriptor - Climate         Q-> Tree Litter Measurements
F-> Site Descriptor - Soil            R-> Tree Phenology Observation
G-> Experiment Site Preparation        S-> Tree Damage Observation
H-> Experiment Description            T-> Irrigation
I-> Experiment Factors/Treatment      U-> Log of Experiment Operation
J-> Experiment Planting               X-> General Measurements
K-> Tree Species                      1-> Data Analysis
L-> Weather Data                      2-> Utilities

Please enter Experiment ID: TH-01
Press <Ctrl-W> to begin program execution.

[Esc]=Exit, [F1]=Help

```

Figure 3a.

EXAMPLE: To enter the Experiment ID for TISTR Site 01 use the following sequence: [T] [H] [0] [1] <Ctrl-W>. The screen will appear as above. The underline beneath the '1' represents the cursor.

Press [F1] to see the help window on the screen as shown in Figure 3b. It describes the information needed as input. The screen also indicates how to view the networks and experiments currently residing in your system.

The help window is removed by pressing [Esc]. After the window is removed you can press [Home] to view the networks and experiments in your system. If the cursor is not in the first character position of the Experiment ID input field you will need to press [Home] twice.

See THE EXPERIMENT DATABASE in Section II and Appendix D for more information about Experiment and Network ID's.

**F/FRED EXPERIMENT DATABASE**

<< MAIN MENU >>

FORM	FORM
A-> Institution Information	M-> Soil Measurements
B-> Cooperator Information	N-> Tree Measurements
C-> Trial Site Information	O-> Foliage Biomass Measurements
D-> Site Descriptor - Socioeconomic	P-> Wood Biomass Measurements
E-> Site Descriptor - Climate	Q-> Tree Litter Measurements
F-> Site Descriptor - Soil	R-> Tree Phenology Observation
G-> Experiment Site Preparation	S-> Tree Damage Observation
H-> Expe	
I-> Expe	Experiment ID = Institution ID (2 letters)
J-> Expe	+ Trial Number (2 digits).
K-> Tree	
L-> Weat	Press [Home] to see the Networks and Experiments contained in the database.

Please enter Experiment ID: **TH-01**  
 Press <Ctrl-W> to begin program execution.

[Esc]=Exit, [F1]=Help

Figure 3b.

EXAMPLE: Pressing [F1] while the system is waiting for an Experiment ID to be entered will display the help window shown above. This window explains what type of data is required by the system. It also shows you how to get a list of networks and experiments in your system.

If the system doesn't find an experiment with the Experiment ID you have entered it will ask if this is a new experiment (Figure 3c). The system default answer is 'N'. Answer 'Y' (yes) or 'N' (no) then press [Enter].

```
Is this a NEW experiment [Y/N] ? N
[Esc]=Exit, [F1]=Help
```

Figure 3c.

An 'N' will cause the system to display the message shown below (Figure 3d). Press any key to display the screen shown in Figure 3a to enter a new Experiment ID.

```
The experiment TH-01 does NOT exist.
Press any key to continue.
[Esc]=Exit, [F1]=Help
```

Figure 3d.

A 'Y' response will cause the system to initialize the databases to accept data for the new experiment.

The experiments contained in the system are grouped into networks. A network of experiments is experiments with the same treatment design performed at different locations and/or times.

To begin a new experiment (entering a new Experiment ID) requires you to assign it to a network (Figure 3e). The network can be an existing network or you can create a new network. The Network ID is seven characters and must be unique among other Network ID's.

The Network ID you create may have one or more experiments to accomodate experiments that are not part of an F/FRED network.

```
Enter the Network ID for this experiment: HUN108?
Press <Ctrl-W> to save.
[Esc]=Exit, [F1]=Help
```

Figure 3e.

A window has been provided to show the networks and experiments currently in the system. The window is activated by pressing [Home] while the system is waiting for an Experiment ID or a Network ID and the cursor placed at the first character position.

The upper half shows the Network ID and the Experiment Name. A highlighted network will have its experiments listed in the lower half of the window. The highlight bar is moved up or down using the arrow keys to select a network.

The lower half shows individual experiments that belong to the network highlighted in the upper half of the window. Use the [PgUp] and [PgDn] keys to view the experiments.

```

      F/FRED EXPERIMENT DATABASE
      << NETWORKS >>
      ID          Experiment Name
      HUMID87  1987 Humid/Sub-humid Zone Network Trial
  FORM
  A->
  B->
  C->          Use [Up Arrow] or [Down Arrow] to choose a network.
  D->
  E->          << EXPERIMENTS for HUMID87 >>
  F->  ID      Date  Max.T  Min.T  Rain  Soil Order  Country
  G->  TH-01  01/01/88  31.5   22.8   95   Ultisol   Thailand
  H->
  I->
  J->
  K->
  L->          Use [PgUp] or [PgDn] to see Experiments

  Please enter Experiment ID: TH-01
  Press <Ctrl-W> to begin program execution.
  
```

[Esc]=Exit, [F1]=Help

Figure 3f.

EXAMPLE: Pressing [Home] at the screen shown in Fig. 3a displays the window shown above. It lists the networks in the upper half and the experiments for one network in the lower half. The experiments listed are for the network highlighted in the upper half of the window. Press [Esc] to remove the help window.

Once the system has been initialized for a new experiment or has found an existing experiment the highlighted cursor will appear inside the menu (Figure 3g). There are two ways to make a selection. You can move the cursor to highlight the desired form and press [Enter] or you can simply type the letter or digit of your choice. The second method is faster.

**F/FRED EXPERIMENT DATABASE**

ID: TH-01

<< MAIN MENU >>

FORM	FORM
<b>A-&gt; Institution Information</b>	M-> Soil Measurements
B-> Cooperator Information	N-> Tree Measurements
C-> Trial Site Information	O-> Foliage Biomass Measurements
D-> Site Descriptor - Socioeconomic	P-> Wood Biomass Measurements
E-> Site Descriptor - Climate	Q-> Tree Litter Measurements
F-> Site Descriptor - Soil	R-> Tree Phenology Observation
G-> Experiment Site Preparation	S-> Tree Damage Observation
H-> Experiment Description	T-> Irrigation
I-> Experiment Factors/Treatment	U-> Log of Experiment Operation
J-> Experiment Planting	1-> Analysis
K-> Tree Species	2-> Reports
L-> Weather Data	3-> Utilities

Use cursor keys to highlight desired item. Press [Enter] to begin program execution.

[Esc]=Exit, [F3]=Change Experiment

Figure 3g.

EXAMPLE: The Experiment ID appears in bold type at the upper right corner. The first option is highlighted. Note that [F3] is now active and can be used to change the Experiment ID. Pressing [F3] will cause the screen shown in Figure 3a to appear.

[A] FORM A - Institution Information

This form contains the information about the institution which is responsible for the experiment (Figure 4). This information is the same for all experiments with the same Institution ID.

If the Institution ID (first two characters) of the Experiment ID entered at the Experiment Database Main Menu was not located in the database the system initializes this form as blank, otherwise the system displays the institution information.

Therefore, for an experiment with a new Institution ID the only choice is to add a new record. Press [A] to begin the ADD mode.

After the first entry of Institution Information using ADD the only choice will be to modify the record. You can make corrections to any of the fields by pressing [M] to begin the MODIFY mode.

The input fields will be displayed in reverse video and the cursor will be at the first character position of the first line of the Institution Name field. Use the cursor keys to move the cursor to the desired position on the screen. Use [Backspace], [Del], and [Ins] to effect the necessary changes.

Enter the institution name including as much information as is relevant for identification. Enter the acronym in parentheses after the institution name. Press [Enter] after making entries on each line to go to the next line.

Enter the mailing address including street address and building information, e.g., room number, floor, etc.

Enter the country name completely without abbreviations if possible.

Enter full telex information, including the telex country code.

Enter the telephone number including the telephone country code, city code, and extension. Separate the codes by hyphens and the extension by an 'x'.

Enter the commercial cable identification code in the Cable Address field.

Press <Ctrl-W> to save the record after verifying that all of the information has been entered correctly.

## FORM A: Institution Information

Institution Name: Thailand Institute of Scientific and Technological Research (TISTR)		ID: TH-01
Mailing Address: 196 Phahonyothin Road Bang Khen Bangkok 10900		
Country: Thailand		
Telex: 21392 TISTR TH	Cable: TISTR, BANGKOK	
Telephone: 66-2-5791121 x 30_		

Enter information in form above. Press <Ctrl-W> to save.

[Esc]=Exit, [F1]=Help

Figure 4.

EXAMPLE: This is the ADD mode of Form A. Notice 'ADD' in the upper right corner of the screen. The input fields are shown in reverse video to indicate their locations and sizes. This screen shows the institution information entered for experiment TH-01. This information will be common to all experiments using 'TH' as the Institution ID. The underline after the '30' in the Telephone field represents the cursor.

NOTE: Always use [Enter] when data entry into a field is completed. Press [Enter] after each line of the multi-line input fields, e.g., Institute Name and Mailing Address.

[B] FORM B - Cooperator Information

This form contains the name of the principal investigator of the experiment (Figure 5a). It may also contain the names of other researchers involved in the experiment. This form may also contain institution and address information if the principal investigator is affiliated with an institution different from the institution described in Form A.

**FORM B: Cooperator Information**

Principal Investigator Name:		ID: TH-01
Family: <b>Yantasath</b>	First: <b>Kovith</b>	
Other Researchers:		
Siriphong Patanavibul, Suthijed Chandrasiri, Winai Supatanakul, Piya Charlermklin		
Institution and Address of Principal Investigator (if different from FORM A)		
Institution Name:		
Address:		
Country:		
Telex:		Cable:
Telephone:		
[S]earch, [A]dd, [M]odify, [D]elete _		

[Esc]=Exit, [F2]=Print

Figure 5a.

EXAMPLE: This is an example of a form that already contains data. When you press [B] at the Experiment Database Main Menu the contents of the form is displayed in bold type. The 'M' in [M]odify is also in bold type to indicate one of your valid options, the others are [Esc] to exit and [F2] to print.

From the previous example, when you press [M] to modify you will see the screen below (Figure 5b).

Enter the family name and first name of the principal investigator separately in the fields provided.

Enter the names of other researchers in the fields provided.

Enter the institution and address information as described in Form A if necessary.

MODIFY

FORM B: Cooperator Information

Principal Investigator Name:		ID: TH-01
Family: <b>Yantasath</b>	First: <b>Kovith</b>	
Other Researchers:		
<b>Siriphong Patanavibul, Suthijed Chandrasiri, Winal Supatanakul, Piya Charleraklin</b>		
Institution and Address of Principal Investigator (if different from FORM A)		
Institution Name:		
Address:		
Country:		
Telex:		Cable:
Telephone:		
Enter information in form above. Press <Ctrl-W> to save.		

[Esc]=Exit

Figure 5b.

EXAMPLE: This shows Form B in MODIFY mode. The input fields are highlighted and the contents are displayed. Use the cursor keys to move within and between fields. Use the [Backspace], [Ins], and [Del] keys to modify the data. Press <Ctrl-W> to save the modifications you made or [Esc] to abandon the changes.

[C] FORM C - Trial Site Information

This form contains information about the site where the experiment is being done (Figure 6).

The Site Name and Site ID refer to the experimental area only. There must be a one-to-one correspondence between the Site ID and the area described by the Soil Pedon ID (see Form F). Enter the Site Name as the experiment location is commonly referred to.

Enter the Site ID as seven characters composed of the first 5 letters of the Site Name (if the Site Name has 5 letters or less use the whole name) plus 2 digits to uniquely identify the experiment site.

Enter the site's elevation as meters above sea level.

Enter the position in latitude as degrees and minutes and the direction relative to the equator. Enter the position in longitude as degrees and minutes and the direction relative to the prime meridian or Greenwich meridian.

Enter the aspect as the direction, clockwise from North, which the topography faces (Northeast = 45, East = 90, Southeast = 135, South = 180, Southwest = 225, West = 270, Northwest = 315, and North = 360). If the topography is flat use 0.

Enter the site's topography in terms of the slope and its position on the slope. Enter the slope of the land in which the trial is planted in degrees. If the land is level, enter 0. This can be measured with a clinometer if a more sophisticated instrument is not available. Enter the trial site's position as 'U' for upper, 'M' for middle, or 'L' for lower depending on its position on the slope. If you entered 0 for the slope leave this blank.

Enter the area's general topography in terms of the slope and the length of the slope. The slope is the inclination of the topography surrounding the experiment site. If the area is flat use 0. Enter the length of the slope as 1 if it is less than 100 meters, 2 if it is between 100 and 500 meters, or 3 if it is over 500 meters. If you entered 0 for the slope leave this blank.

## FORM C: Trial Site Information

Site Name: <b>Chumphon</b>	ID: TH-01
Site ID : <b>CHUPPO</b>	
Elevation (m): <b>-9</b>	Aspect (degrees from North): <b>0</b>
Latitude (deg): <b>10</b> (min): <b>58</b>	Direction (N,S): <b>N</b>
Longitude (deg): <b>99</b> (min): <b>29</b>	Direction (W,E): <b>E</b>
Trial Site Topography:	
Slope Gradient (degrees): <b>0</b>	
Slope Position (U=upper, M=middle, L=lower): <b>:</b>	
General Topography:	
Slope Gradient (degrees): <b>0</b>	
Length of Slope (1= <100m, 2= 100-500m, 3= >500m): <b>:</b>	
Enter information in form above. Press <Ctrl-W> to save.	

[Esc]=Exit, [F1]=Help

Figure 6.

EXAMPLE: This is the ADD mode of Form C. Notice 'ADD' in the upper right corner of the screen. The input fields are highlighted showing you where the cursor can be placed for data entry. Missing values are represented by a '-9' as shown in the Elevation field. Also notice the messages at the lower box of the screen. These messages will appear frequently in the ADD and MODIFY modes of many forms.



[E] FORM E - Site Descriptor - Climate

This form contains information that describe the long-term climate of the site (Figure 8a). The information entered here comes from the nearest meteorological station that has been in operation long enough ( $\geq 7$  years) to provide accurate monthly climate patterns for the general area where the experiment is located.

Enter the Climate Station Name as it is commonly referred to. Enter the Climate Station ID as the first 7 characters of the Climate Station Name. Enter the number of years that records have been kept at the station. Enter the station's elevation as meters above sea level. Enter the position in latitude as degrees and minutes and the direction (N or S) relative to the equator. Enter the position in longitude as degrees and minutes and the direction (E or W) relative to the prime or Greenwich meridian. Enter the approximate straight line distance in kilometers (km) from the climate station to the experiment site.

For each month enter the average maximum and minimum temperatures in degrees centigrade ( $^{\circ}\text{C}$ ). The system will calculate and display the means. Monthly values for maximum and minimum temperature should be calculated from the daily values for each of these variables, averaged for the month and then averaged for years by month. Most climate stations will have these values already. If they do not, use the following formulas: sum of daily max T and the sum of min T values divided by the number of days in that month; sum of averages for that month in each year, divided by the total number of years used. For the calculations use these equations:

$$(\sum \text{ daily measurements}) \div \text{ days} = \text{ month average}$$

$$(\sum \text{ month averages}) \div \text{ years} = \text{ monthly average}$$

where daily measurement is either max T or min T, month average is for a single year, and monthly average is for all the years.

For each month enter the average monthly precipitation in millimeters (mm). These values can be obtained from the climate station. If it is not available, enter the rainfall amount for each month by summing the daily readings for each month and computing the monthly average for all of the years by month. For each month use the following formula: sum of monthly precipitation values divided by the total number of years used. For the calculations use these equations:

$$(\sum \text{ month totals}) \div \text{ years} = \text{ monthly average}$$

where month total is the precipitation for one month and monthly average is the average based on the number of years used for that month.

FORM E: Site Descriptor - Climate

Climate Station Name: <b>Prohuap Khiri Khan</b>							ID: TH-01
Climate Station ID : <b>PRACHUA</b>			Years of Record: <b>35</b>				
Latitude (deg): <b>10</b> (min): <b>58</b>		Direction (N,S): <b>N</b>					
Longitude(deg): <b>97</b> (min): <b>29</b>		Direction (E,W): <b>E</b>					
Elevation (m): <b>0</b>		Distance from Experiment Site (km): <b>120</b>					
Mo	MaxT(C)	MinT(C)	Precip(mm)	Mo	MaxT(C)	MinT(C)	Precip(mm)
Jan	29.7	19.2	47	Jul	32.2	24.2	88
Feb	30.8	20.9	56	Aug	31.8	24.2	103
Mar	32.0	22.3	50	Sep	32.0	23.9	74
Apr	33.4	23.9	40	Oct	30.9	23.2	222
May	33.3	24.6	121	Nov	30.0	22.2	174
Jun	32.3	24.3	96	Dec	29.6	20.4	35
Mean							

Enter information in form above. Press <Ctrl-W> to save.

[Esc]=Exit, [F1]=Help

Figure 8a.

EXAMPLE: This is an example of one form that calculates the means and/or totals of the input data. It is shown in the ADD mode. The initial values for the temperature fields, MaxT and MinT are -99 to indicate missing values.

After entering the data into the form, press <Ctrl-W> and the means (for MaxT and MinT) and total (for Precip) will be calculated and displayed on the screen (Figure 8b). The valid options become exit, modify, or print.

Mean	31.5	22.8	1145
[S]earch, [A]dd, [M]odify, [D]elete _			

[Esc]=Exit, [F2]=Print

Figure 8b.

NOTE: If you want to use a Climate Station already defined in the database for another experiment enter the Climate Station Name and ID only then press <Ctrl-W> twice. This will link your experiment with that Climate Station.

[F] FORM F - Site Descriptor - Soil

This form contains the soil site descriptors provided by a complete soil characterization and description using the Soil Taxonomy classification system (Figure 9).

Whenever possible these descriptors should be ascertained before planting. In the event that the information is unavailable before delivery, the cooperators will be provided the information at a later time.

If the soil has been characterized the U.S. National Soils Survey Laboratory, enter the Soil Pedon ID assigned by that laboratory, otherwise leave the Soil Pedon ID blank. There must be a one-to-one correspondence between the Soil Pedon ID and the Site ID described in Form C.

MODIFY

FORM F: Site Descriptors - Soil

Soil Pedon ID: <b>87FN875-4</b>	ID: TH-01
Soil Classification (Family Level of Soil Taxonomy): <b>loamy-skeletal, siliceous, isohyperthermic Oxic Paleustult</b>	
Soil Order: <b>Ultisol</b>	
Soil Moisture Regime...(by Soil Taxonomy): <b>Ustic</b>	
Soil Temperature Regime(by Soil Taxonomy): <b>Isohyperthermic</b>	
Soil Parent-Material: <b>Colluvium from sandstone</b>	
Soil Texture (Surface): <b>Fine sandy loam</b>	
(Subsoil): <b>Clay</b>	
Soil Drainage (Surface): <b>Well drained</b>	
(Subsoil): <b>Well to somewhat poorly</b>	
Soil Color (Surface): <b>Very dark grayish brown</b>	
(Subsoil): <b>Yellowish red</b>	
Special Problems (erosion, salinity, depth to impermeable layer): <b>Slight erosion and low salinity.</b>	

Enter information in form above. Press <Ctrl-W> to save.

[Esc]=Exit, [F1]=Help

Figure 9.

EXAMPLE: The form above is in MODIFY mode. The cursor is at the first character position of the first field. Use the cursor keys to move to the field and position where modifications are to be made. Press <Ctrl-W> to save the changes you have made. Entries into each field are restricted to the number of characters that are allocated for each field. For the fields which have more than one line, use [Enter] when you reach the end of a line. The cursor does not automatically go to the next line when the first line is filled.

[G] FORM G - Experiment Site Preparation

This form contains data that describes the preparation of the site for the trial (Figure 10).

Enter a description of the existing vegetation (species composition and density) just before site preparation. Enter the method of clearing as a description of the procedures used to clear the site.

Enter the disposition of residue as an option (I, R, or B) that best represents what was done with the residue on the site. Enter the percentage of surface free of residues after preparation as an estimate of the percentage of bare or exposed soil (not covered by litter or residue) at planting.

Enter the method of soil cultivation that was done after clearing the site.

ADD

FORM G: Experiment Site Preparation

ID: TH-01
Existing Vegetation (description of biomass): .....
Method of Clearing (sequence of operations): .....
Residue (I=Incorporated, R=removed, B=burned): (% of surface free of residues after preparation): %
Method of Soil Cultivation (sequence, depth and type of implements): .....
Enter information in form above. Press <Ctrl-W> to save.

[Esc]=Exit, [F1]=Help

Figure 10.

EXAMPLE: This form is in ADD mode and it shows the field sizes of the input fields. There are three lines of input for the Existing Vegetation, Method of Clearing, and Method of Soil Cultivation fields. For each of these fields, press [Enter] after entering data on one line to go to the next line. The cursor will not automatically go to the next line when a line has been filled.

[H] FORM H - Experiment Description

This form contains a general description of the experiment (Figure 11).

The Experiment Name, Objective, and Experiment Design fields are common to experiments assigned to a Network ID. An experiment assigned to an existing Network ID will have these fields filled in by the system. If the experiment is assigned to a new Network ID these fields will be blank.

Enter the Weather Station ID (see Form L-1). The Weather Station ID is made up of the first three letters of daily weather station name plus two-digit station number assigned by principal cooperator. Enter the direct-line distance from the experiment plantings to the weather station where daily weather data collection is done. The daily weather variables should be collected at the experiment site to accurately represent conditions where the trees are growing.

ADD

FORM H: Experiment Description

ID: TH-01
Experiment Name: 1987 Humid/Sub-humid Zone Network Trial
Objective: To evaluate the F/FRED Project's priority species under three management regimes in multi-location trials.
Experiment Design: A randomized complete block design with four replications. The treatment design is a 3*2*3 complete factorial with factors of species, genotypes, and cutting management.
Plot Area (m <sup>2</sup> ): 98.0
Weather Station ID: PRA11
Distance from Weather Station (m): -9
Enter information in the form above. Press <Ctrl-W> to save.

[Esc]=Exit

Figure 11.

EXAMPLE: This is the ADD mode of Form H. It shows the field sizes of the input fields. For the fields with more than one line, use [Enter] when you reach the end of the line to go to the next line. The cursor does not automatically go to the next line. The '-9' is the initial value of numeric fields and is used to indicate a missing value.

[I] FORM I - Experiment Factors/Treatment

This form contains information on treatment design and treatment assignments to the plots, and is an important form for most applications of the Experiment Database.

After data collection and entry, tree measurements can be combined immediately with information on the assignment of the treatments to the field plots (Form I-3) for plotting and analysis of the data within IADSS. A more complete interpretation of the data utilizes the treatment design structure contained in Form I-2 where the level of each treatment factor for each treatment is listed. If the treatment design is a factorial, for example, then the analysis can estimate the magnitude and importance of interactions. The treatment factors and levels are described and their names to be used in data plotting and analysis are assigned in Form I-1.

EXPERIMENT FACTORS/TREATMENTS

ID: TH-01

```

<< SUB - MENU >>

FORM
1-> Treatment Factors and Levels
2-> Treatment Combinations
3-> Experiment Design

Use cursor keys to highlight desired item. Press [Enter] to begin program
execution.
```

[Esc]=Exit

Figure 12.

EXAMPLE: This is the Experiment Factors/Treatments Sub-Menu. Choices are made by using the cursor keys to highlight the desired menu item or by pressing the corresponding number of the desired menu item. From the screen as shown in Figure 12, Experiment Design can be chosen by pressing the down arrow key twice then [Enter] or by simply pressing [3]. The second method is faster.

[1] FORM I-1 - Treatment Factors and Levels

This form contains the treatment factors and their levels. The system can accommodate up to 10 factors (A to J). The number of levels for each factor is unlimited.

The system automatically displays information contained in the form (Figure 13a). It will show the first factor (Factor\_A) and its levels. The record count at the lower right corner of the screen indicates the number of factors. The page count indicates how many pages of levels a factor has. Each page can display 8 levels.

If no data has been entered the system will display a blank form. The valid options are highlighted at the lower part of the screen.

FORM I-1: Treatment Factors and Levels

Factor_A	ID: TH-01
Name: SPECIES	
Description: MPTS species for humid environmental zone	
Level of SPECIES	Description
-----	-----
ACACMANG	Acacia mangium
ACACAURI	Acacia auriculiformis
LEUCDIVE	Leucaena diversifolia
[S]earch, [A]dd, [M]odify, [D]elete	
[P]rev. record, [N]ext record, [PgUp]=Page Up, [PgDn]=Page Down	
[Esc]=Exit, [F2]=Print	
Record: 173	Page: 171

Figure 13a.

EXAMPLE: For the 1987 Humid/Sub-humid Zone Trial, the factors (species, genotypes, and cutting managements) and their levels have already been defined. This screen shows Factor A and its levels.

The following describes how a factor and its levels are entered into the system. Figures 13b, 13c, and 13d show the steps taken to enter the factor shown in Figure 13a.

Factors are added to an experiment by pressing [A] at the Options Screen (Figure 13a).

Enter the Factor identifier (A,B,...) then press <Ctrl-W> (Figure 13b). You must use 'A' first, then 'B', and so on. The system will not accept a factor identifier if the previous identifiers are unused.

ADD

FORM I-1: Treatment Factors and Levels

Factor_A	ID: TH-01
Name:	
Description:	

Figure 13b.

Enter the Name (maximum 8 characters) of the factor and a Description (maximum 50 characters) of the factor (Figure 13c). Press <Ctrl-W> to save the name and description and begin entering the factor levels.

ADD

FORM I-1: Treatment Factors and Levels

Factor_A	ID: TH-01
Name: SPECIES	
Description: MPTS species for humid/sub-humid environment zone	

Figure 13c.

Enter each Level (maximum 8 characters) and its Description (maximum 45 characters) into the appropriate columns (Figure 13d). Press [Enter] after each data entry to move to the next input field. Press <Ctrl-W> to save the the levels entered.

The system will display Figure 13b again for entry of more factors or more levels. Press [Esc] to exit the ADD mode and return to the Options Screen shown in Figure 13a.

Repeat the steps above to add another factor and its levels.

If you want to add levels to an existing factor enter the factor identifier and press <Ctrl-W>. The system will bypass the name and description data entry (Figure 13c) and go directly to level and description data entry (Figure 13d).

ADD

FORM I-1: Treatment Factors and Levels

ID: TH-01

Factor\_A

Name: SPECIES

Description: MPTS species for humid/sub-humid environment zone

Level of SPECIES	Description
ACACHANG	Acacia mangium
ACACAURI	Acacia auriculiformis
LEUCDIVE	Leucaena diversifolia

Enter information in form above. Press <Ctrl-W> to save.

[Esc]=Exit

Figure 13d.

Modifying a factor and its levels is done by pressing [M] at the Options Screen (Figure 13a).

The factor identifier cannot be modified.

The system will display the Factor Name and Description input fields (Figure 13e) with their current data in reverse video. Make the necessary changes then press <Ctrl-W> to save the changes. Press [Esc] if you want to abandon the changes.

MODIFY

FORM I-1: Treatment Factors and Levels

Factor_B		ID: TH-01
Name: GENOTYPE		
Description: Two genotypes for each species		
Level of GENOTYPE	Description	
MANG_QLD	Iron Range, Queensland, Australia	
MANG_PNG	Boite, Papua-New Guinea	
AURI_QLD	Morehead River, Queensland, Australia	
AURI_PNG	Bensback-Balamuk, Papua-New Guinea	
DIVE_156	Psyllid resistant	
DIVE_KX3	L. leucocephala x L. diversifolia	

Enter information in form above. Press <Ctrl-W> to save.

[Esc]=Exit, [F2]=Print

Record: 2/3

Page: 1/1

Figure 13e.

After you save the changes to the Factor Name and Description, the existing factor levels will be displayed in reverse video (Figure 13f) and you can make changes to them. Press <Ctrl-W> to save the changes or [Esc] to abandon the changes.

MODIFY

FORM I-1: Treatment Factors and Levels

ID: TH-01

Factor\_B

Name: GENOTYPE

Description: Two genotypes for each species

Level of GENOTYPE	Description
MANG_QLD	Iron Range, Queensland, Australia
MANG_PNG	Boite, Papua-New Guinea
AURI_QLD	Morehead River, Queensland, Australia
AURI_PNG	Bensback-Balamuk, Papua-New Guinea
DIVE_156	Psyllid resistant
DIVE_K13	L. leucocephala x L. diversifolia

Enter information in form above. Press <Ctrl-W> to save.

[Esc]=Exit, [F2]=Print

Record: 2/3

Page: 1/1

Figure 13f.

If a factor and/or its levels need to be deleted from the system press [D] at the Options Screen (Figure 13a).

The 'DELETE' indicator will appear at the upper right corner and a message will ask for the type of delete you want to perform (Figure 13g). Press [1] to delete a single level or press [2] to delete the factor and all its levels.

DELETE

FORM I-1: Treatment Factors and Levels

Factor_C	ID: TH-01
Name: CUT_MGMT	
Description: Cutting management for optimizing fuelwood and forage	

[1] Delete a level \_  
[2] Delete the Factor

[Esc]=Exit Record: 3/3 Page: 1/1

Figure 13g.

If you press [2] to delete the factor the system will ask you to confirm it (Figure 13h).

The system will make the default answer 'N' to safeguard against accidental deletion. Press [Enter] if you do not want to delete.

If you want to delete the factor being displayed press [Y] then [Enter]. There is no provision to undelete (recover) the record.

Are you sure you want to delete this Factor (Y/N) ? N
---

[Esc]=Exit Record: 3/3 Page: 1/1

Figure 13h.

If you press [1] at the screen shown in Figure 13g the system will highlight each level individually. You can move the highlight bar to the level you want to delete using the cursor keys. Press <Ctrl-Y> to delete the highlighted level (Figure 13i).

DELETE

FORM 1-1: Treatment Factors and Levels

ID: TH-01

Factor\_C

Name: CUT\_MGMT

Description: Cutting management for optimizing fuelwood and forage

Level of CUT_MGMT	Description
CONTROL	No cutting management
POLLARD	Cut tree stems at one meter height
PRUNING	Removing branches on lower 1/3 of crown

Move the cursor to the desired record then press <Ctrl-Y> to delete the record.

[Esc]=Exit

Record: 3/3

Page: 1/1

Figure 13i.

After you press <Ctrl-Y> the system will ask you to confirm that you really want to delete the level with a message similar to the message shown in Figure 13h.

## [2] FORM I-2 - Treatment Combinations

This form describes each treatment in the experiment based on a treatment design used (Figure 14a and 14b). Each treatment is described using a level of the factor or factors entered in FORM I-1.

Treatment is a generic term used in comparative trials to describe the effect of a procedure (agent or intervention). Treatments can be physical, as with cutting management, or definitional, as with species or planting date. Each type of treatment is commonly called a treatment factor.

Treatment design is a structural arrangement of treatments.

A single-factor treatment design will normally have two or more categorical states (e.g., provenances or management packages), or three to five quantitative levels (e.g., rates of fertilizer or planting density). The number of treatments is the number of qualitative states or the number of quantitative levels.

A two-factor treatment design is a factorial arrangement of treatments where the number of possible treatments is the product of the number of levels (or states) for each of the two factors. Each treatment is a factorial combination of one level of one factor with one level of the second factor.

Each treatment should be assigned a unique identifier composed of up to 2 characters. The identifiers can be digits (1,2,3,...) or one digit and one character (1A,1B,2A,2B,...) or characters (AA,AB,AC,...).

The treatment combinations on Form I-2 and the factor identifiers on Form I-1 must not be changed after the treatments are assigned to the experimental plots on Form I-3.

FORM I-2: Treatment Combinations

ID: TH-01

Trt. No.	Factor_A	Factor_B	Factor_C	Factor_D	Factor_E
1	ACACMANG	MANG_QLD	CONTROL		
2	ACACMANG	MANG_QLD	POLLARD		
3	ACACMANG	MANG_QLD	PRUNING		
4	ACACMANG	MANG_PNG	CONTROL		
5	ACACMANG	MANG_PNG	POLLARD		
6	ACACMANG	MANG_PNG	PRUNING		
7	ACACAURI	AURI_QLD	CONTROL		
8	ACACAURI	AURI_QLD	POLLARD		
9	ACACAURI	AURI_QLD	PRUNING		
10	ACACAURI	AURI_PNG	CONTROL		
11	ACACAURI	AURI_PNG	POLLARD		
12	ACACAURI	AURI_PNG	PRUNING		

[S]earch, [A]dd, [M]odify, [D]elete  
 [PgUp]=Page Up, [PgDn]=Page Down

[Esc]=Exit, [F2]=Print

Page: 1/2

Figure 14a.

FORM I-2: Treatment Combinations

ID: TH-01

Trt. No.	Factor_A	Factor_B	Factor_C	Factor_D	Factor_E
13	LEUCDIVE	DIVE_156	CONTROL		
14	LEUCDIVE	DIVE_156	POLLARD		
15	LEUCDIVE	DIVE_156	PRUNING		
16	LEUCDIVE	DIVE_KX3	CONTROL		
17	LEUCDIVE	DIVE_KX3	POLLARD		
18	LEUCDIVE	DIVE_KX3	PRUNING		

[S]earch, [A]dd, [M]odify, [D]elete  
 [PgUp]=Page Up, [PgDn]=Page Down

[Esc]=Exit, [F2]=Print

Page: 2/2

Figure 14b.

Form I-2 is accessed by pressing [2] at the Experiment Factors/Treatment Sub Menu.

If the experiment is assigned to an existing Network ID that has its treatments defined it will display the treatment combinations with the options displayed at the bottom of the screen.

Figures 14a and 14b show the treatment design for the F/FRED 1987 Humid/Sub-humid Environmental Zone Trials.

Treatment combinations are entered into the system by pressing [A] at the Options Screen of Form I-2 (Figure 14a).

The system displays 'ADD' at upper right corner of the screen. It displays 12 lines of input. Each input line contains the Treatment No. field and 5 fields for a level for each of up to five factors.

Enter the treatment number as two characters that will uniquely identify a treatment.

Make sure that treatment numbers and level combinations are not repeated and the factor levels for each treatment are the same as those in Form I-1.

ADD

FORM I-2: Treatment Combinations

ID: TH-01					
Trt. No.	Factor_A	Factor_B	Factor_C	Factor_D	Factor_E

Enter information in the form above. Press <Ctrl-W> to save.

[Esc]=Exit, [F1]=Help

Figure 14c.

EXAMPLE: The screen above appears when [A] is pressed at the Options Screen (Figure 14a). The 'ADD' is shown at the upper right corner of the screen and the input fields are shown in reverse video with the cursor at the first character position of the first input field. Enter the data for each field and press [Enter] to move to the next input field.

The MODIFY mode of Form I-2 is used to change treatment numbers and/or treatment combinations. Press [M] at the Options Screen (Figure 14a). The input fields will be displayed in reverse video with their current contents. Use the cursor keys to move the cursor where modifications are to be made. Press <Ctrl-W> to save the changes.

**MODIFY**

**FORM I-2: Treatment Combinations**

ID: TH-01					
-----					
- Trt.	Levels -----				
No.	Factor_A	Factor_B	Factor_C	Factor_D	Factor_E
-----					
13	LEUCDIVE	DIVE_156	CONTROL		
14	LEUCDIVE	DIVE_156	POLLARD		
15	LEUCDIVE	DIVE_156	PRUNING		
16	LEUCDIVE	DIVE_KX3	CONTROL		
17	LEUCDIVE	DIVE_KX3	POLLARD		
18	LEUCDIVE	DIVE_KX3	PRUNING		

Enter information in the form above. Press <Ctrl-W> to save.

[Esc]=Exit, [F1]=Help

Page: 2/2

Figure 14d.

EXAMPLE: This is the second page of FORM I-2 for the 1987 Humid/Sub-humid Zone Trial in MODIFY mode. Note the 'MODIFY' at the upper right of the screen. The [Up Arrow] and [Down Arrow] keys moves the cursor between fields. The [Left Arrow] and [Right Arrow] keys move the cursor within fields.

To delete a record in Form I-2 press [D] at the Options Screen (Figure 14a). The first record will be displayed in reverse video. Deletion is done one record at a time. Move the reverse video line to the record you want to delete by using the [Up Arrow] and [Down Arrow] keys. When you have the desired record to be deleted is displayed in reverse video, press <Ctrl-Y>.

**DELETE**

**FORM I-2: Treatment Combinations**

ID: TH-01

Trt. No.	Factor_A	Factor_B	Factor_C	Factor_D	Factor_E
1	ACACMANG	MANG_GLD	CONTROL		
2	ACACMANG	MANG_GLD	POLLARD		
11	ACACAURI	MANG_PNG	POLLARD		
12	ACACAURI	MANG_PNG	PRUNING		

Move the cursor to the desired record then press <Ctrl-Y> to delete the record.

[Esc]=Exit Page: 1/2

Figure 14e.

EXAMPLE: This is the DELETE mode of Form I-2. It displays 'DELETE' at the upper right corner and displays the first record in reverse video. Move the reverse video line to the record to be deleted. Press <Ctrl-Y> to delete the record.

A message will then appear asking you to verify that you want to proceed with the deletion. Press [Y] then [Enter] to delete the record. If you don't want the record deleted press [N] then [Enter] or press [Esc].

Are you sure you want to delete this record (Y/N) ? **N**

[Esc]=Exit Page: 1/2

Figure 14f.

### [3] FORM I-3 - Experiment Design

This form contains the plot assignments of the experiment. For each plot, the number from Form I-2 of the treatment assigned to the plot and the replication number should be entered. Each combination of plot, treatment, and replication numbers is unique.

The experiment design is a set of rules for allocating (assigning) treatments to the plots.

When all replications of each treatment are assigned to the plots completely at random (no restriction) the design is called a completely randomized design. Replication is repetition of plots with the same treatment. Replication should not be confused with samples (e.g., trees) within a plot. The same or different numbers can be given to replications of each treatment and are entered as Rep. No. in Form I-3.

When the plots are arranged in subgroups or blocks so that the variability among plots within a block is minimized, and the randomization is restricted so that each treatment occurs in each block, the experimental design is called a randomized complete block design (RCBD).

When each treatment is replicated once in each block, the number of blocks is equal to the number of replications. For this RCBD, each replication in Form I-3 can be considered as a block, and the assigned block number should be entered as the replication number.

In augmented randomized block designs, some treatments occur in each block. Other treatments occur only once in the experiment, randomly assigned to one of the blocks. In this case, the block number should be entered as the replication number for each treatment in the block.

For incomplete block designs (the number of plots per block is less than the number of treatments), each incomplete block should be assigned a unique replication number in Form I-3.

Plot assignments for the experiment are automatically displayed (Figures 15a and 15b) when you press [3] at the Sub-Menu (Figure 12). The available options are displayed as well as the page count.

FORM I-3: Experiment Design

ID: TH-01

Plot No.	Trt. No.	Rep. No.	Plot No.	Trt. No.	Rep. No.	Plot No.	Trt. No.	Rep. No.
1	17	1	13	10	1	25	2	2
2	3	1	14	1	1	26	12	2
3	9	1	15	18	1	27	10	2
4	7	1	16	5	1	28	4	2
5	12	1	17	11	1	29	14	2
6	16	1	18	2	1	30	1	2
7	4	1	19	15	2	31	5	2
8	15	1	20	17	2	32	18	2
9	8	1	21	7	2	33	6	2
10	13	1	22	8	2	34	11	2
11	6	1	23	13	2	35	9	2
12	14	1	24	16	2	36	3	2

[S]earch, [A]dd, [M]odify, [D]elete  
 [PgUp]=Page Up, [PgDn]=Page Down

[Esc]=Exit

Page: 1/2

Figure 15a.

FORM I-3: Experiment Design

ID: TH-01

Plot No.	Trt. No.	Rep. No.	Plot No.	Trt. No.	Rep. No.	Plot No.	Trt. No.	Rep. No.
37	17	3	49	10	3			
38	3	3	50	1	3			
39	9	3	51	18	3			
40	7	3	52	5	3			
41	12	3	53	11	3			
42	16	3	54	2	3			
43	4	3						
44	15	3						
45	8	3						
46	13	3						
47	6	3						
48	14	3						

[S]earch, [A]dd, [M]odify, [D]elete  
 [PgUp]=Page Up, [PgDn]=Page Down

[Esc]=Exit

Page: 2/2

Figure 15b.

The ADD mode allows you to enter plot assignments into the system. Press [A] at the Options Screen to go into the ADD mode (Figure 15c).

The Plot Number (Plot No.) column is filled in by the system. You enter the Treatment Number (Trt No.) and the Replication Number (Rep. No.). Use the treatment numbers you entered in FORM I-2. Each combination of treatment number and replication number must be unique.

The system accepts 36 plot assignments per page (screen). The system numbers the plots 1 to 72 then A0 to Z2.

The system accepts additions into plots which have no treatment numbers and replication numbers. The first plot number on the ADD screen will be the first unassigned plot. The input fields will be displayed in reversed video.

Enter the treatment number then press [Enter] to go to the replication number field. Enter the replication number then press [Enter] to go to the next input field.

ADD

FORM I-3: Experiment Design

Plot No. Trt. No. Rep. No.			Plot No. Trt. No. Rep. No.			Plot No. Trt. No. Rep. No.		
55	-		67			A6		
56			68			A7		
57			69			A8		
58			70			A9		
59			71			AA		
60			72			AB		
61			A0			AC		
62			A1			AD		
63			A2			AE		
64			A3			AF		
65			A4			AG		
66			A5			AH		

Enter information in the form above. Press <Ctrl-W> to save.

[Esc]=Exit, [F1]=Help

Figure 15c.

EXAMPLE: This is Form I-3 in ADD mode. Assume that the first three replications (plots 1 through 54) have been assigned treatment numbers. This form appears on the screen after you press [A] at the Options Screen (Figure 15a or 15b).

Modifications can be made by pressing [M] at the Options Screen. The system will display in reverse video the plots with treatments and replications only (Figure 15d).

Move the cursor to the fields that require changes by using the [Up Arrow] and [Down Arrow] keys. Press <Ctrl-W> to save the changes you made.

MODIFY

FORM I-3: Experiment Design

ID: TH-01

Plot No.	Trt. No.	Rep. No.	Plot No.	Trt. No.	Rep. No.	Plot No.	Trt. No.	Rep. No.
37	4	3	49	11	3			
38	14	3	50	8	3			
39	9	3	51	15	3			
40	1	3	52	10	3			
41	12	3	53	3	3			
42	2	3	54	16	3			
43	18	3						
44	6	3						
45	13	3						
46	17	3						
47	5	3						
48	7	3						

Enter information in the form above. Press <Ctrl-W> to save.

[Esc]=Exit Page: E/2

Figure 15d.

EXAMPLE: This is the MODIFY mode of Form I-3. The plots with assigned treatments and replication numbers are displayed in reverse video. Modifications can be made by moving the cursor to the desired field, making the changes, then pressing <Ctrl-W> to save the changes.

To delete plot assignments press [D] at the Options Screen.

The system deletes a range of plot assignments beginning from the one displayed in reverse video to the last plot assignment.

The system will display the first plot record with an assigned treatment number and replication number in reverse video (Figure 15e). You move the cursor to the beginning record you want to delete and then press <Ctrl-Y> to begin the deletion process.

DELETE

FORM I-3: Experiment Design

ID: TH-01

Plot No.	Trt. No.	Rep. No.	Plot No.	Trt. No.	Rep. No.	Plot No.	Trt. No.	Rep. No.
37	4	3	49	11	3			
38	14	3	50	8	3			
39	9	3	51	15	3			
40	1	3	52	10	3			
41	12	3	53	3	3			
42	2	3	54	16	3			
43	18	3						
44	6	3						
45	13	3						
46	17	3						
47	5	3						
48	7	3						

Move the cursor to the desired record then press <Ctrl-Y> to delete the record.

[Esc]=Exit

Page 2/2

Figure 15e.

The system will then ask you to verify that you want the range of plot assignments deleted (Figure 15f). Press [Y] then [Enter] to complete the deletion process. Press [N] then [Enter] or press [Esc] to abort the deletion process.

Are you sure you want to delete the Plot-No 37 to 54 (Y/N) ? N

[Esc]=Exit

Page 2/2

Figure 15f.

[J] FORM J - Experiment Planting

This form contains a description of the initial conditions of the experiment (Figure 16).

Enter the date of planting in mm/dd/yy format, using a 0 where appropriate (January 15, 1987 would be 01/15/87).

Enter the tree spacing between rows and within rows in meters.

Enter a description of the method used to control competing vegetation at planting and its effectiveness. If a herbicide application or mechanical weeding was done at planting in addition to the site preparation work described in FORM G, describe the process here. Enter a description of preplant amendments. If fertilizer, lime, organic matter or other amendments were added to the site at planting, list the types and amounts used. Enter the soil moisture as an option (1, 2, 3, 4, or 5) which best describes the conditions at planting (influenced by weather conditions of previous week) and after planting (over the first three months following planting).

ADD

FORM J: Experiment Planting

ID: TH-01	
Planting Date (mm/dd/yy): <input type="text"/>	
Tree Spacing (if constant for all plots)	
Between Rows (m): <input type="text" value="-9.0"/>	Within Row (m): <input type="text" value="-9.0"/>
Control of competing vegetation at planting (description and estimation of % control):	
<input type="text"/>	
Preplant Amendments (fertilizer, herbicide or others):	
<input type="text"/>	
Soil Moisture (1=dry, 2=damp, 3=moist, 4=wet, 5=very wet)	
Condition At Planting: <input type="text"/>	Condition After Planting: <input type="text"/>
Enter information in the form above. Press <Ctrl-W> to save.	

[Esc]=Exit, [F1]=Help

Figure 16.

EXAMPLE: This form is in the ADD mode and shows the field sizes of the input fields. The initial values of -9.0 are used to indicate missing values.

[K] FORM K - Tree Species

This form contains information about the trees and seeds used in an experiment (Figure 17a).

Where the same seed source is used for several trials in an experiment network, this form will be completed by IADSS, otherwise, fill in as completely as possible.

The system displays the provenances used based on the Network ID assigned to the experiment. The lower right corner displays the page count indicating the total number of pages.

The options available are add, modify, or delete. Use the [PgUp] and [PgDn] keys to view all the provenances used in the experiment.

**FORM K: Tree Species**

Species ID: 1	ID: TH-01
Tree Species: Genus: Acacia Species: auriculiformis Sub-species:	
Seed Origin: Country: Australia State/Territory: Queensland Locality: Moorehead River Elevation (m): 70 Latitude (deg): 15 (min): 20 Direction (N,S): S Longitude (deg): 143 (min): 40 Direction (E,W): E	
Seed Supplier: CSIRO	Lot Number: 15477
[S]earch, [A]dd, [M]odify, [D]elete [PgUp]=Page Up, [PgDn]=Page Down	
[Esc]=Exit, [F2]=Print	Page: 1/4

Figure 17a.

EXAMPLE: This automatically displays the tree species used in the experiment based on the Network ID.

To add more species press [A] at the screen shown in Figure 17a. Enter the Species ID by selecting a number from the window display. The Genus and Species fields will be automatically filled by the system.

ADD

FORM K: Tree Species

		--<< SPECIES >>--	
Species ID:	<u>0</u>		
Tree Species;		1) Acacia auriculiformis	14) Eucalyptus microtheca
Sub-		2) Acacia mangium	15) Gliricidia sepium
Seed Origin;		3) Acacia senegal	16) Leucaena diversifolia
State/Te		4) Acacia nilotica	17) Leucaena leucocephala
L		5) Albizia falcataria	18) Melia azedarach
Elevat		6) Albizia lebbek	19) Morus alba
Latitude (de		7) Albizia procera	20) Populus
Longitude (de		8) Alnus nepalensis	21) Prosopis cineraria
Seed Supplier:		9) Artocarpus	22) Prosopis juliflora
		10) Azadirachta indica	23) Robinia pseudoacacia
		11) Calliandra calothyrsus	24) Sesbania bispinosa
		12) Dalbergia sissoo	25) Sesbania grandiflora
		13) Eucalyptus camaldulensis	26) Sesbania sesban

Enter information in the form above. Press <Ctrl-W> to save.

[Esc]=Exit, [F1]=Help

Figure 17b.

EXAMPLE: The system currently accepts Species ID's as integers from 1 to 26. Entering a number less than 1 or greater than 26 will have no effect on the system. The underline in the first character position represents the cursor.

After entering a valid Species ID the Genus and Species will appear as shown in Figure 17c.

Enter the Sub-species of the species. Enter the Country, State/Territory, and Locality of the origin of the provenance.

Enter the Elevation, Latitude/Direction, and Longitude/Direction of its origin.

Enter the Seed Supplier and the seed Lot Number.

ADD

FORM K: Tree Species

Species ID: 1	ID: TH-01
Tree Species: Genus: Acacia	
Species: auriculiformis	
Sub-species:	
Seed Origin:	
Country: Australia	
State/Territory: Queensland	
Locality: Morehead River	
Elevation (m): 70	
Latitude (deg.,min): 15 2	Direction (N,S): S
Longitude (deg.,min): 143 40	Direction (E,W): E
Seed Supplier: CSIRO	Lot Number: 15477

Enter information in the form above. Press <Ctrl-W> to save.

[Esc]=Exit, [F1]=Help

Figure 17c.

EXAMPLE: Pressing [1] at the screen shown in Figure 17b results in the screen above.

To modify displayed data press [M] at the screen shown in Figure 17a. The input fields will be displayed containing the current values. Make the necessary changes and then press <Ctrl-W> to save the changes.

To delete press [D] at the screen shown in Figure 17a. Delete the record by pressing [Y] then [Enter] when the system asks for confirmation.

[L] FORM L - Weather Data

This option brings up a submenu with two choices, weather station information and daily weather measurements (Figure 18).

**WEATHER DATA**

ID: TH-01

<< SUB - MENU >>

FORM  
1-> Weather Station Information  
**2-> Weather Data Measurements**

Use cursor keys to highlight desired item. Press [Enter] to begin program execution.

[Esc]=Exit

Figure 18.

EXAMPLE: When you press [L] from the Experiment Database Main Menu (Figure 3d) the screen above appears. The second option is highlighted initially. To choose this option simply press [Enter]. To choose the first option press [Up Arrow] then [Enter], or simply press [1].

[1] FORM L-1 - Weather Station Information

This form contains information on the weather station used to collect the daily weather measurements (Figure 19) from planting to the last measurement period.

After choosing Form L-1 from the Sub-Menu (Figure 18), you will see one of the Options Screens shown in Figure 19a. The upper one appears if the form is blank. If the form already contains data, the lower one will appear and the data will be displayed.

[S]earch, [A]dd, [M]odify, [D]elete \_

[Esc]=Exit

[S]earch, [A]dd, [M]odify, [D]elete \_

[Esc]=Exit, [F2]=Print

Figure 19a.

NOTE: If the weather station is located at the site the elevation and position in this form will be the same as the elevation and position in Trial Site Information (Form C), and will be the same as the elevation and position in Site Descriptor - Climate (Form E) if the Climate Station is located near the trial site.

Press [A] to begin the ADD mode (Figure 19b).

Enter the Weather Station ID as five characters made up of the first three letters of the Weather Station Name and a two-digit number assigned by the principal cooperater that uniquely identifies the weather station at the site. Enter the Weather Station Name as it is be commonly referred to.

Enter the name and address of the institution that is operating the weather station.

Enter the observation time using 01 to 24 to designate the hour. It is important that the weather data be collected at the same time each day. 9:00 a.m. is a good time to measure relative humidity, maximum temperature, and minimum temperature as at this time the average of Max T and Min T is approximately the mean daily temperature.

Enter the date that weather data collection began in mm/dd/yy format.

Enter the elevation as meters above sea level. Enter the position in latitude as degrees and minutes and the direction relative to the equator (N or S). Enter the position in longitude as degrees and minutes and the direction (E or W) relative to the prime meridian (Greenwich meridian).

ADD

FORM L-1: Weather Station Information

Weather Station ID : PRATI		ID: TH-01
Weather Station Name: Prachuap Khiri Khan		
Responsible Institution;		
Name: Thailand Institute of Scientific and Technological Research (TISTR)		
Address: 196 Phahonyothin Road		
Bangkhen, Bangkok 10700		
Thailand		
Observation Time (hh): 9		
Start Date of Collecting Data (mm/dd/yy): 7 / 7		
Elevation (m): 0		
Latitude (deg): 10 (min): 58      Direction (N,S): N		
Longitude (deg): 99 (min): 29      Direction (E,W): E		
Enter information in form above. Press <Ctrl-W> to save.		

[Esc]=Exit, [F1]=Help

Figure 19b.



To add daily weather measurements, press [A] at the Options Screen of Form L-2. The system will ask for the year and month for which you want to enter measurement data (Figure 20b).

Enter the year and month of measurement into their respective fields.

ADD

FORM L-2: Daily Weather Measurements

Year: <input type="text"/>	Month: <input type="text"/>	ID: TH-01
----------------------------	-----------------------------	-----------

Figure 20b.

After you've entered the year and month the system will highlight the measurement input fields and place the cursor in the first input field (Figure 20c). The input fields are initialized as missing values (-99 for temp., -9 for others).

For each day of the month enter the maximum and minimum temperature in degrees centigrade, the precipitation in millimeters, and the percent relative humidity.

ADD

FORM L-2: Daily Weather Measurements

Year: 87		Month: 1		ID: TH-01					
Day	MaxT (C)	MinT (C)	Precip (mm)	Humidity (%)	Day	MaxT (C)	MinT (C)	Precip (mm)	Humidity (%)
1	-99.0	-99.0	-9	-9.0	11	-99.0	-99.0	-9	-9.0
2	-99.0	-99.0	-9	-9.0	12	-99.0	-99.0	-9	-9.0
3	-99.0	-99.0	-9	-9.0	13	-99.0	-99.0	-9	-9.0
4	-99.0	-99.0	-9	-9.0	14	-99.0	-99.0	-9	-9.0
5	-99.0	-99.0	-9	-9.0	15	-99.0	-99.0	-9	-9.0
6	-99.0	-99.0	-9	-9.0	16	-99.0	-99.0	-9	-9.0
7	-99.0	-99.0	-9	-9.0	17	-99.0	-99.0	-9	-9.0
8	-99.0	-99.0	-9	-9.0	18	-99.0	-99.0	-9	-9.0
9	-99.0	-99.0	-9	-9.0	19	-99.0	-99.0	-9	-9.0
10	-99.0	-99.0	-9	-9.0	20	-99.0	-99.0	-9	-9.0

Enter information in form above. Press <Ctrl-W> to save.  
[PgUp]=Page Up, [PgDn]=Page Down

[Esc]=Exit

Page: 1/2

Figure 20c.

After completing the first page of FORM L-2, press [PgDn] to go to the second page of the form (Figure 20d). After you have entered the measurements, press <Ctrl-W> to have the system calculate and display the means of the daily weather measurements. Use these values to verify that you have correctly entered the daily weather data.

If you detect any errors in the measurement data, press [M] to go into the modify mode. Use the [PgUp] and [PgDn] keys to go between pages. Use the arrow keys to move the cursor to the fields you want to change. Enter the correct data into the field(s) and then press <Ctrl-W> to display the new calculated means.

ADD

FORM L-2: Daily Weather Measurements

ID: TH-01

Year: 87

Month: 1

Day	MaxT (C)	MinT (C)	Precip (mm)	Humidity (%)	Day	MaxT (C)	MinT (C)	Precip (mm)	Humidity (%)
21	-99.0	-99.0	-9	-9.0	26	-99.0	-99.0	-9	-9.0
22	-99.0	-99.0	-9	-9.0	27	-99.0	-99.0	-9	-9.0
23	-99.0	-99.0	-9	-9.0	28	-99.0	-99.0	-9	-9.0
24	-99.0	-99.0	-9	-9.0	29	-99.0	-99.0	-9	-9.0
25	-99.0	-99.0	-9	-9.0	30	-99.0	-99.0	-9	-9.0
Mean:	99.9	99.9	999	99.9	31	-99.0	-99.0	-9	-9.0

Comments:

Enter information in form above. Press <Ctrl-W> to save.  
 [PgUp]=Page Up, [PgDn]=Page Down

[Esc]=Exit

Page: 2/2

Figure 20d.

EXAMPLE: This is the second page of FORM L-2 in ADD mode. The means of the measurements will be calculated and displayed by the system (indicated by the 9's) after you press <Ctrl-W>. If you want to change any of the data press [M], otherwise press any key to save the measurement data into the database.

To search for daily or monthly weather measurement data, press [S] at the Options Screen (Figure 20a). The search mode begins by asking you how you want the data displayed (Figure 20e). The two ways to display weather data are by monthly or by daily measurements. The monthly display shows the mean temperature (MaxT and MinT), total precipitation, and mean humidity calculated from the daily measurements. The daily measurements display shows these measurements for each day of a month.

SEARCH

FORM L-2: Daily Weather Measurements

```

.
.
.
[1] Display monthly weather data _
[2] Display daily weather data
  
```

[Esc]=Exit

Figure 20e.

You can display a year's weather data by specifying an exact year as the search criteria (Figure 20f). You can also use '>' or '<' to retrieve records after or before a given year, respectively.

SEARCH

FORM L-2: Daily Weather Measurements

```

Year: # 82      Month:
ID: TH-01
-----
  
```

Figure 20f.

The monthly weather data are derived from the daily weather measurement data. The system displays the monthly weather data to help you quickly compare the monthly measurements. You can specify the month to compare that month's data for different years (Figure 20g).

SEARCH

FORM L-2: Monthly Weather Data

```

Year:      Month: 08      ID: TH-01
-----
  
```

Figure 20g.

## FORM L-2: Monthly Weather Data

					ID: TH-01
Year	Month	MaxT (C)	MinT (C)	Precip (mm)	Humidity (%)
1988	March	30.4	22.2	17E	39.2

[PgUp]=Page Up, [PgDn]=Page Down \_

[Esc]=Exit, [F2]=Print

Page: 1/1

Figure 20h.

EXAMPLE: This shows the monthly weather data displayed after a successful search. The MODIFY and DELETE modes cannot be used with monthly weather data.

To modify daily weather measurements, press [M] at the Options Screen. The modify procedure begins by performing a search to find the records that you want to modify. The search procedure is exactly as described above. After you retrieve the desired records the system displays them. Press [M] to highlight the data fields. Use [PgUp] and [PgDn] to move between the two pages of the form. Use the arrow keys to move the cursor between fields and to move within the fields. Change the data by typing over the old data. Press <Ctrl-W> when you are done changing the data in the fields.

To delete daily weather measurements, press [D] at the Options Screen. The delete procedure begins with the search procedure to retrieve the record(s) (1 record = 1 month) you want to delete. The search procedure is exactly as described in the section explaining how to search. If the system finds records matching your search criteria they will be displayed on the screen. Each month's data will be displayed in two pages. Use [N] and [P] to locate the month you want to delete. Once you've located the correct month, press [D] to delete the month.

Before the record is actually deleted, the system will ask for verification by asking you to enter [Y] then [Enter] at the message "Are you sure you want to delete this record?". The system's default answer to this question is 'N'. If you do not want the record deleted you can either press [Enter] (to accept the 'N' answer) or press [Esc] to exit the delete procedure.

[M] FORM M - Soil Measurements

This option brings up a submenu with two choices, preplant soil measurements and soil measurements (Figure 21).

**SOIL MEASUREMENTS**

ID: TH-01

<< SUB - MENU >>

FORM  
1-> Preplant Soil Measurements  
2-> Soil Measurements

Use cursor keys to highlight desired item. Press [Enter] to begin program execution.

[Esc]=Exit

Figure 21.

EXAMPLE: This form shows the Soil Measurements Sub Menu. To choose a form use the cursor keys to highlight the desired item then press [Enter]. Alternatively, press the number corresponding to your choice.

[1] FORM M-1 - Preplant Soil Measurements

This form contains measurements of the condition of the soil at different layers before planting (Figure 22). The system will automatically display existing data.

Enter the date that measurements were made in mm/dd/yy format. For each distinct layer measured enter the upper and lower boundaries in centimeters.

Enter the pH by H2O and KCl, the percent total nitrogen (N (%)), the ppm of extractable phosphorus (P (ppm)), the ppm of extractable potassium (K (ppm)), and the percentage of organic matter (OM (%)).

ADD

FORM M-1: Preplant Soil Measurements

Date (mm/dd/yy): 1 / 1 / 77							ID: TH-01
Layer (cm)		pH		N	P	K	OM
Upper	Lower	(H2O)	(KCl)	(%)	(ppm)	(ppm)	(%)
-9	-9	-9.0	-9.0	-9.00	-9.00	-9.00	-9.00
-9	-9	-9.0	-9.0	-9.00	-9.00	-9.00	-9.00
-9	-9	-9.0	-9.0	-9.00	-9.00	-9.00	-9.00
-9	-9	-9.0	-9.0	-9.00	-9.00	-9.00	-9.00
-9	-9	-9.0	-9.0	-9.00	-9.00	-9.00	-9.00
-9	-9	-9.0	-9.0	-9.00	-9.00	-9.00	-9.00
-9	-9	-9.0	-9.0	-9.00	-9.00	-9.00	-9.00

Enter information in the form above. Press <Ctrl-W> to save.

[Esc]=Exit

Figure 22.

EXAMPLE: This form is in ADD mode. It shows the field sizes of the input fields and their initial values. It also shows the maximum number of lines that can be entered. The Add and Modify options work exactly alike.

[2] FORM M-2 - Soil Measurements

This form contains the soil measurements taken at defined time intervals (Figure 23a).

Enter the date that the soil sample was collected in mm/dd/yy format and the age in months of the trees from which the soil samples were taken. Enter the plot number(s) (up to 12 plots) for which these measurements apply, e.g, if the core samples from replications of the same treatment have been composited for analysis, then the plot numbers would be entered together.

For each layer measured enter the upper and lower boundaries in centimeters. The top layer begins at the point where there is only soil, no litter. The upper depth of the top layer is zero.

Enter the pH levels (H2O and KCl), the percent total nitrogen (N (%)), the parts per million of extractable phosphorus (P (ppm)), the parts per million of extractable potassium (K (ppm)), and the percentage of organic matter (OM (%)) for each layer of the soil sample.

ADD

FORM M-2: Soil Measurements

Date (mm/dd/yy):		Age (months):		ID: TH-01					
Plot(s)									
Date	Age	Layer(cm)		pH		N	P	K	OM
Plot (mm/dd/yy)	(mo)	Upper	Lower	(H2O)	(KCl)	(%)	(ppm)	(ppm)	(%)
-9	-9	-9	-9	-9.0	-9.0	-9.00	-9.00	-9.00	-9.00
-9	-9	-9	-9	-9.0	-9.0	-9.00	-9.00	-9.00	-9.00
-9	-9	-9	-9	-9.0	-9.0	-9.00	-9.00	-9.00	-9.00
-9	-9	-9	-9	-9.0	-9.0	-9.00	-9.00	-9.00	-9.00
-9	-9	-9	-9	-9.0	-9.0	-9.00	-9.00	-9.00	-9.00
-9	-9	-9	-9	-9.0	-9.0	-9.00	-9.00	-9.00	-9.00
-9	-9	-9	-9	-9.0	-9.0	-9.00	-9.00	-9.00	-9.00

Enter information in the form above. Press <Ctrl-W> to save.

[Esc]=Exit

Figure 23a.

EXAMPLE: This form is in ADD mode. It shows the field sizes of the input fields and their initial values. It also shows the maximum number of input lines (7).

To search for soil measurement records press [S] at the Options Screen. The search is accomplished by specifying the age or a range of ages of the trees and/or the plot numbers.

The two age fields can be used several ways in searching. Listed below are possible entries into the age fields. Press [Enter] to move the cursor to the second input field.

- [S] - [ ] : get records with Age variable
- > - 12 : Age >= 12 months
- < - 24 : Age <= 24 months
- 12 - 24 : 12 months <= Age <= 24 months
- 6 - : Age = 6 months
- 18 : Age = 18 months

You may use all or none of the plot fields to specify which plots to retrieve. You may put the plot numbers in any of the four plot search fields.

Figure 23b shows a search for plot records with measurements taken between 6 and 12 months for plots 12 and 13.

**FORM M-2: Soil Measurements**

**SEARCH**

Age (months): 6 - 12

Plot(s): 12 13

ID: TH-01

Date	Age	Layer(cm)		pH		N	P	K	OM
Plot (mm/dd/yy)	(mo)	Upper	Lower	(H2O)	(KCl)	(%)	(ppm)	(ppm)	(%)

Figure 23b.

To modify or delete you must first perform a search. You can press [M] to modify or [D] to delete after retrieving records.

The modify option will allow you to change any data displayed on the screen.

The delete option will allow you to delete one record at a time.

[N] FORM N - Tree Measurements

This form contains the nondestructive tree measurements taken at specified intervals. Tree measurements can be entered in two formats, namely, by individual trees or by plot. Plot measurements generally are means (averages) of individual tree measurements in a plot.

The system initially defaults to plot measurements. Choosing Form N displays the plot measurements form and the options available at the bottom of the screen (Figure 24a).

FORM N: Tree Measurements (by plot)

							ID: TH-01
Date	Age	Survival	Height	Basal(10cm)	DBH(1.3m)	Trees	
Plot (mm/dd/yy)	(mo)	live/total (%)	(m)	-- Diameter(cm)	--	measured	
[S]earch, [A]dd, [M]odify, [D]elete _							

[Esc]=Exit

Figure 24a.

FORM N: Tree Measurements (by tree)

						ID: TH-01
Date (mm/dd/yy):		Age (months):		Plot:		
Survival (live/total):				Trees measured:		
Height	Basal(10cm)	DBH(1.3m)	Height	Basal(10cm)	DBH(1.3m)	
Tree (m)	-- Diameter (cm)	---	Tree (m)	-- Diameter (cm)	---	
[S]earch, [A]dd, [M]odify, [D]elete _						

[Esc]=Exit

Figure 24b.

EXAMPLE: Figures 24a and 24b show the two different data formats available in Form N.

Pressing [S], [A], [M], or [D] will cause the system to ask you to specify which data format you want. Press [1] for tree data or [2] for plot data.

```
[1] Search tree data _  
[2] Search plot data _  
[Esc]=Exit
```

Figure 24c.

```
[1] Add tree data _  
[2] Add plot data _  
[Esc]=Exit
```

Figure 24d.

```
[1] Modify tree data _  
[2] Modify plot data _  
[Esc]=Exit
```

Figure 24e.

```
[1] Delete tree data _  
[2] Delete plot data _  
[Esc]=Exit
```

Figure 24f.

EXAMPLE: After pressing [S], [A], [M], or [D] causes the system to ask you to choose the type of data you want to work with (Figures 24c, 24d, 24e, and 24f respectively).

To add plot records to the database press [A] at the Options Screen, then press [2] at Figure 24d. The Date and Age input fields will appear (Figure 24g).

Enter the date in mm/dd/yy format and the age of the trees in months. Press [Enter] after each entry.

ADD

FORM N: Tree Measurements (by plot)

---

ID: TH-01

Date (mm/dd/yy): 01/01/88      Age (months): 12

---

Date Plot (mm/dd/yy)	Age (mo)	Survival live/total (%)	Height (m)	Basal(10cm) -- Diameter(cm)	DBH(1.3m)	Trees - measured
-------------------------	-------------	----------------------------	---------------	--------------------------------	-----------	---------------------

---

[Esc]=Exit

Figure 24g.

The screen will then fill up with blank records with the Date and Age columns filled in. Enter the plot number in the first column. The date and age can be changed if necessary, otherwise just press [Enter] twice to move the cursor to the Survival column. Enter the current number of live trees and the total number of live trees at the previous measurement period. The system will calculate the survival rate. Enter the height in meters. Enter the basal and DBH diameters in centimeters, and the number of trees measured in the plot. The diameters entered should be the geometric means of the individual tree diameters. Enter as many or as few plot records as necessary.

ADD

FORM N: Tree Measurements (by plot)

---

ID: TH-01

Date Plot (mm/dd/yy)	Age (mo)	Survival live/total (%)	Height (m)	Basal(10cm) -- Diameter(cm)	DBH(1.3m)	Trees - measured
01/01/88	12	/	9.0	9.0	9.0	9
01/01/88	12	/	9.0	9.0	9.0	9

---

Enter information in form above. Press <Ctrl-W> to save.

---

[Esc]=Exit

Figure 24h.

To search by plot, press [S] at the Options Screen then press [2] at Figure 24c. The system will display the search fields.

The two Age search fields can be used in a number of ways. See the section on searching in Form M-2.

Searching can also be done by plot number. Enter the plot numbers that you want to find. Up to 4 plot numbers can be entered. Leave them blank to retrieve all plot numbers.

SEARCH

FORM N: Tree Measurements (by plot)

Age (months): 18 -	Plot(s): 12 45 6 54	ID: TH-01														
<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Date</th> <th style="text-align: left;">Age</th> <th style="text-align: left;">Survival</th> <th style="text-align: left;">Height</th> <th style="text-align: left;">Basal(10cm)</th> <th style="text-align: left;">DBH(1.3m)</th> <th style="text-align: left;">Trees</th> </tr> <tr> <th style="text-align: left;">Plot (mm/dd/yy)</th> <th style="text-align: left;">(mo)</th> <th style="text-align: left;">live/total (%)</th> <th style="text-align: left;">(m)</th> <th style="text-align: left;">-- Diameter(cm)</th> <th style="text-align: left;">-</th> <th style="text-align: left;">measured</th> </tr> </thead> </table>			Date	Age	Survival	Height	Basal(10cm)	DBH(1.3m)	Trees	Plot (mm/dd/yy)	(mo)	live/total (%)	(m)	-- Diameter(cm)	-	measured
Date	Age	Survival	Height	Basal(10cm)	DBH(1.3m)	Trees										
Plot (mm/dd/yy)	(mo)	live/total (%)	(m)	-- Diameter(cm)	-	measured										

Figure 24i.

EXAMPLE: This is the SEARCH mode of Form N (by plot). The criteria specified will retrieve plot records for plots 6, 12, 45, and 54 with ages of 18 months or more.

If the search procedure finds records matching the search criteria the system will display the data found. The system will also display the modify, delete, and print options. The system will also display the page count.

[M]odify, [D]elete \_  
 [PgUp]=Page Up, [PgDn]=Page Down

[Esc]=Exit, [F2]=Print

Page: 1/1

Figure 24j.

EXAMPLE: The system displays up to 12 plot records per screen (page). The valid option will be in intense video.

The modify option is available at the Options Screen or at the Display Screen.

To modify plot records, press [M] while at the Options Screen, press [2] at the screen shown in Figure 24e. The system will take you through the search procedure to locate the records you want to modify. If the system finds the records based on your search criteria they will be displayed and the bottom part of the screen will look like Figure 24j.

If you press [M] at the screen shown in Figure 24j the system will display all the records in reverse video to indicate that you can now edit any field in any record. Use the cursor movement keys (arrow keys) to position the cursor to the correct fields. After you have made the modifications press <Ctrl-W> to save the modifications or press [Esc] to abandon the changes.

The delete option and modify option work similarly. It is also available at the Options Screen or at the Display Screen after a search.

To delete plot records, at the screen shown in Figure 24j press [D]. Only the first line will be in reverse video. Move the reverse video bar to the record you want deleted then press <Ctrl-Y>. After pressing <Ctrl-Y> the system will ask for confirmation before the record is actually deleted. This two step deletion is a safeguard against accidental deletions.

The other format of data entry for Form N is by individual tree. This is the data format used most frequently by the experimenter to enter his data. The data entered in this format is processed to create the corresponding plot data.

Tree measurements entered at the individual tree level will always have corresponding plot record in the system. A plot record, however, may or may not have corresponding tree level measurements.

The operations associated with tree level measurements are similar to the operations discussed in the plot level.

To add tree records press [A] at the Options Screen then press [1].

Enter the date in mm/dd/yy format, the age in months, the plot number, the current number of live trees and the total number of live trees from the previous survival measurement (survival rate will be computed by the system), and the number of trees measured.

ADD

**FORM N: Tree Measurements (by tree)**

---

Date (mm/dd/yy): 01/01/88	Age (months): 36	Plot: 12	ID: TH-01
Survival (live/total): 47/49	Trees measured: 9		
-----		-----	
Height Basal(10cm) DBH(1.3m)	Height Basal(10cm) DBH(1.3m)		
Tree (m) -- Diameter (cm) ---	Tree (m) -- Diameter (cm) ---		
-----		-----	

Figure 24k.

EXAMPLE: This example shows a typical data entry session for a single plot with nine trees measured.



To search by trees, from the screen shown in Figure 24a, press [S]. Then press [1], then [Enter] when the system prompts for tree/plot format (Figure 24b). The search fields are age and plot number (Figure 24m). Searching by age works exactly as described in the search section of Form M-2. The plot number can be specified but you are limited to one plot per search. If you leave the plot number blank the system will find tree data for all plots.

**SEARCH**

**FORM N: Tree Measurements (by tree)**

Age (months): <u>  </u> - <u>  </u>		Plot: <u>  </u>		ID: TH-01
Survival (live/total) :		Trees measured:		
-----		-----		
Height Basal(10cm)	DBH(1.3m)	Height Basal(10cm)	DBH(1.3m)	
Tree (m) --	Diameter (cm) ---	Tree (m) --	Diameter (cm) ---	
-----		-----		

Figure 24m.

EXAMPLE: This is Form N (by tree) in SEARCH mode. Note the search indicator at the upper right corner. The search fields are age and plot number. They are shown in reverse video and the cursor is initially in the first age field.

To modify tree records press [M] from Figure 24a or 24b, then press [1] from Figure 24e. The system will ask you to perform a search for the tree records you want to modify. If the system finds the specified records it will display the tree records. At the Display Screen press [M] to modify any field of the records being displayed. Press <Ctrl-W> to save the modifications you have made.

To delete tree records from Figure 24a or 24b, press [D], then [1]. Perform a search to find the records to delete. Press [D] at the Display Screen and move the reverse video bar to the record to be deleted. Press <Ctrl-Y> after positioning the reverse video bar on the appropriate line. The system will then ask for confirmation. Press [Y] then [Enter] to proceed with the deletion. There is no provision to recover deleted records.



## FORM 0: Foliage Biomass Measurements (by plot)

----- Foliage Dry Wt and Nutrients -----						
Date	Age	Dry Wt	N	P	K	Trees
Plot (mm/dd/yy)	(mo)	(kg/tree)	(---- % of Dry Wt ----)			Measured
01/01/88	12					

ID: TH-01

Date (mm/dd/yy): 01/01/88

Age (months): 12

Figure 25c.

EXAMPLE: This shows the ADD mode of Form 0 (by plot). You are required to enter the date in mm/dd/yy format and age in months. After you have entered the date and age press <Ctrl-W>. The system will then allow you to enter data into the form.

## FORM 0: Foliage Biomass Measurements (by plot)

----- Foliage Dry Wt and Nutrients -----						
Date	Age	Dry Wt	N	P	K	Trees
Plot (mm/dd/yy)	(mo)	(kg/tree)	(---- % of Dry Wt ----)			Measured
01/01/88	12	9.0	9.0	9.0	9.0	9
01/01/88	12	9.0	9.0	9.0	9.0	9

Enter information in form above. Press <Ctrl-W> to save.

ID: TH-01

[Esc]=Exit

Figure 25d.

EXAMPLE: From the example in Figure 25c the screen above appears after the date and age are entered. The date and age are copied into the date and age columns, respectively, and the cursor is placed at the first line of the Plot Number column. You can change the date and/or age by typing over it or use [Enter] or the down arrow key to skip the date and/or age field.

FORM 0: Foliage Biomass Measurements (by plot)

Age (months): 12 - 24		Plot(s): 1 13 44			ID: TH-01	
----- -- Foliage Dry Wt and Nutrients -----						
Date	Age	Dry Wt	N	P	K	Trees
Plot (mm/dd/yy)	(mo)	(kg/tree)	(---- % of Dry Wt ----)			Measured
-----						

Figure 25e.

EXAMPLE: The example show a search for records for plots 1, 13, and 44 with ages between 12 and 24 months.

To modify plot records, press [M] while at the screen shown in Figure 25a or 25b, then press [2]. The system will first take you through the search procedure to locate the records you want to modify. Use the cursor movement keys (arrow keys) to position the cursor to the correct fields. After you have made the modifications press <Ctrl-W> to save the modifications.

To delete plot records, at the screen shown in Figure 25a or 25b, press [D] then [2]. The system will ask you to search for the records you want to modify. The system will search for all records matching your specifications and display them. Move the reverse video bar to the record you want deleted. Press <Ctrl-Y> to delete the record in reverse video. After pressing <Ctrl-Y> the system will ask for confirmation before the record is actually deleted.

## FORM 0: Foliage Biomass Measurements (by tree)

Date (mm/dd/yy): 01/01/88				Age (months): 6	Plot: 24	ID: TH-01
				Trees measured: 2		
----- Foliage Weight -----						
Tree	TWW (g)	SWW (g)	SDW (g)	TDW (g)		
-----						

Figure 25f.

EXAMPLE: This shows Form 0 (by tree) in the ADD mode. The input fields are the date, age, plot number, and the number of trees measured. After you enter this data press <Ctrl-W> and the system will provide data input lines corresponding to the number of trees you entered.

## FORM 0: Foliage Biomass Measurements (by tree)

Date (mm/dd/yy): 01/01/88				Age (months): 6	Plot: 24	ID: TH-01
				Trees measured: 2		
----- Foliage Weight -----						
Tree	TWW (g)	SWW (g)	SDW (g)	TDW (g)		
	9	9	9	999		
	9	9	9	999		
Mean:				99.9 (Kg)		
-----						
Enter information in form above. Press <Ctrl-W> to save and to generate TDW and mean values.						

[Esc]=Exit

Figure 25g.

EXAMPLE: From the example of Figure 25f this form shows the fields sizes of the input fields. Note that there are 2 input lines as specified. The TDW's (tree dry weights) and the mean will be calculated and displayed (at the 9's) by the system after you enter all the data and press <Ctrl-W>.

FORM 0: Foliage Biomass Measurements (by tree)

Age (months): - 18		Plot : 33		ID: TH-01
Trees measured:				
----- Foliage Weight -----				
Tree	TWW (g)	SWW (g)	SDW (g)	TDW (g)
-----				

Figure 25h.

EXAMPLE: This the SEARCH mode of Form 0 (by trees). The search criteria are age and plot numbers.

To modify tree records from Figure 25a or 25b, press [M], then [1]. The system will ask you to search for the tree records you want to modify. The system will then display the tree records for the specified age and plot in reverse video and you can modify any field of any record. Press <Ctrl-W> to save the modifications you have made.

To delete tree records from Figure 25a or 25b, press [D], then [1]. The system will ask you to search for the tree records you want to delete. The system will display the tree records and the first one will be in reverse video. Move the reverse video bar up or down to the record you want to delete. Press <Ctrl-Y> after positioning the reverse video bar on the appropriate line. The system will then ask for confirmation. Press [Y] then [Enter] to proceed with the deletion. There is no provision to recover deleted records.

[P] FORM P - Wood Biomass Measurements

This form contains the measurements for the wood biomass. Its options are search, add, modify, and delete. This form also accepts both tree and plot measurements. Figures 26a and 26b show the two Options Screens.

The procedures for this form are similar to those described for Form N.

**FORM P: Wood Biomass Measurements (by plot)**

ID: TH-01					
	Date	Age	- Wood Dry Wt (kg/tree) -		Specific Trees
Plot (mm/dd/yy)	(mm/dd/yy)	(mo)	Stems	Branches/Twigs	Gravity Measured
-----					
[S]earch, [A]dd, [M]odify, [D]elete _					

[Esc]=Exit

Figure 26a.

**FORM P: Wood Biomass Measurements (by tree)**

								ID: TH-01
Date (mm/dd/yy):		Age (months):			Plot:			
								Trees measured:
-----		Stems			----- Branches and Twigs -----			
	TWW	SWW	SDW	TDW	TWW	SWW	SDW	TDW
Tree	(kg)	(g)	(g)	(kg)	(g)	(g)	(g)	(g)
-----								
[S]earch, [A]dd, [M]odify, [D]elete _								

[Esc]=Exit

Figure 26b.

To add wood biomass measurements for plots press [A] at the Options Screen. Press [2] when prompted for the data type to add.

Enter the date of measurement and the age in months.

ADD

FORM P: Wood Biomass Measurements (by plot)

Date (mm/dd/yy): 12/01/87						Age (months): 6	ID: TH-01
-----							
Date	Age	- Wood Dry Wt (kg/tree) -		Specific	Trees		
Plot (mm/dd/yy)	(mo)	Stems	Branches/Twigs	Gravity	Measured		
-----							

Figure 26c.

Enter the wood dry weight as separate measurements for stems and branches/twigs. The specific gravity is calculated by dividing sample dry weight by wet sample volume. The sample volume is determined by the water immersion method described in the F/FRED 1987 Humid/Sub-humid Zone Trial Standard Methodology Handbook. Enter the calculated specific gravity for the plot. Enter the number of trees sampled.

ADD

FORM P: Wood Biomass Measurements (by plot)

Date (mm/dd/yy): 12/01/87						Age (months): 6	ID: TH-01
-----							
Date	Age	- Wood Dry Wt (kg/tree) -		Specific	Trees		
Plot (mm/dd/yy)	(mo)	Stems	Branches/Twigs	Gravity	Measured		
-----							
12/01/87	6	9.0	9.00	9.00	9		
-----							
12/01/87	6	9.0	9.00	9.00	9		
-----							
Enter information in form above. Press <Ctrl-W> to save.							

[Esc]=Exit

Figure 26d.

EXAMPLE: This is the ADD mode of Form P. This shows the input fields, their sizes, and initial values after the date and age have been entered in Figure 26c. Enter the data in the highlighted fields then press <Ctrl-W>.

To search for records by plot press [S] at Options Screen then press [2] to search plot data.

Enter the age or range of ages and/or the plot(s) to search for. Press <Ctrl-W> to begin the search.

**SEARCH**

**FORM P: Wood Biomass Measurements (by plot)**

Age (months): 24 - Plot(s): 1 24 ID: TH-01

Date	Age	Wood Dry Wt (kg/tree)	Specific	Trees
Plot (mm/dd/yy)	(mo)	Stems Branches/Twigs	Gravity	Measured

Enter search criteria in the fields displayed above. Press <Ctrl-W> to begin search. (Blank = All records will be selected)

[Esc]=Exit

Figure 26e.

EXAMPLE: This screen shows the SEARCH mode of Form P. The search criteria are ages and plot numbers. This search is for plots 1 and 24 with a minimum age of 24 months.

After the system has retrieved the specified records you can press [M] to modify the records or press [D] to delete one record at a time.

The wood biomass measurements will more commonly be entered as measurement data for individual trees. The screen layout is shown in Figure 26b.

To add tree data for the wood biomass measurements press [A] at the Options Screen then press [1] to add tree data.

Enter the date in mm/dd/yy format, the age, the plot number, and the number of trees measured. The maximum number of trees measured is 5.

ADD

FORM P: Wood Biomass Measurements (by tree)

Date (mm/dd/yy): 06/15/87	Age (months): 06	Plot: 16	ID: TH-01
	Trees measured: 2		

Figure 26f.

After you have entered these data the measurement input fields will appear (Figure 26g). There will be input lines corresponding to the number of trees measured. Enter the measurements and then press <Ctrl-W> to display the calculated TDW's and Means. The means are shown below as 9's.

ADD

FORM P: Wood Biomass Measurements (by tree)

Date (mm/dd/yy): 06/15/87	Age (months): 6	Plot: 16	ID: TH-01
	Trees measured: 2		

Tree	Stems				Branches and Twigs			
	TWW (kg)	SWW (g)	SDW (g)	TDW (kg)	TWW (g)	SWW (g)	SDW (g)	TDW (g)
1	9.00	9	9	99.9	9	9	9	9999
2	9.00	9	9	99.9	9	9	9	9999
Mean:				99.9 (kg)				9.99 (kg)

re-[M]odify, any other key to continue

[Esc]=Exit

Figure 26g.

To search for wood biomass measurements by tree press [S] at the Options Screen then press [1] when prompted to choose the data format.

SEARCH

FORM P: Wood Biomass Measurements (by tree)

Age (months): 12 - 36		Plot: 24		ID: TH-01				
Trees measured:								
	----- Stems -----				----- Branches and Twigs -----			
	TWW	SWW	SDW	TDW	TWW	SWW	SDW	TDW
Tree	(kg)	(g)	(g)	(kg)	(g)	(g)	(g)	(g)

Enter the search criteria in the fields displayed above. Press <Ctrl-W> to begin the search. (Blank = All records will be selected)

[Esc]=Exit

Figure 26h.

EXAMPLE: This is Form P (by tree) in SEARCH mode. The search fields are the age and plot number. In this example the search is plot 24 with ages between 12 and 36 months, inclusive.

The modify and delete options function similarly to the modify and delete options for Form O.

[Q] FORM Q - Tree Litter Measurements

This form contains the tree litter measurements. Choosing this option displays a blank tree litter measurement form with the options displayed at the bottom (Figure 27a). The options are search, add, modify, and delete.

The litter that accumulates below the trees represents an important source of nutrients. It can enhance soil structure, retain soil moisture, and provide a favorable environment for microorganisms.

The objective of this measurement for the F/FRED 1987 Humid/Sub-humid Zone Trial is to estimate litter production in two plots for each treatment (1 each in two of the blocks) at six month intervals and to ascertain the nutrient content of the litter layer and the soil.

**FORM Q: Tree Litter Measurements**

							ID: TH-01		
-----									
Date		Age	Layer (mm)		Dry WT	OM	- Nutrients (%) -		
Plot (mm/dd/yy)		(mo)	Upper	Lower	(kg/tree)	(%)	N	P	K
-----									
[S]earch, [A]dd, [M]odify, [D]elete _									

[Esc]=Exit

Figure 27a.

EXAMPLE: This form appears when you press [Q] at the Experiment Database Main Menu. The valid options are displayed in bold type at the bottom of the screen.

To add records to the database, press [A] at the screen shown in Figure 27a. Enter the date in the date field in mm/dd/yy format and the age of the trees in months. Enter up to six plot numbers for which the tree litter measurements apply.

For each layer enter the upper and lower limits in millimeters, as measured by clearing away one or two sides of the 40 cm x 40 cm square so that the litter can be seen in profile.

Enter the dry weight in kilograms per tree (Dry WT (kg/tree)) after the litter is collected, dried, and weighed from the squares of two plots for each treatment.

Enter the percent organic matter (OM (%)), the percentage of nitrogen, phosphorus, and potassium as analyzed from a representative selection of leaves and other materials from the dry litter sample. The system will provide the date and plot columns for the data entered in the upper part of the form.

ADD

FORM 0: Tree Litter Measurements

Date (mm/dd/yy): <u>  </u> / <u>  </u> / <u>  </u>							Age (months): <u>  </u>		ID: TH-01
Plot(s) : <u>  </u> <u>  </u> <u>  </u> <u>  </u> <u>  </u> <u>  </u>									
-----									
Date	Age	Layer (mm)		Dry WT	OM	- Nutrients (%) -			
Plot (mm/dd/yy)	(mo)	Upper	Lower	(kg/tree)	(%)	N	P	K	
-----									
		<u>  </u>	<u>  </u>	<u>  </u>	<u>  </u> . <u>  </u>	<u>  </u> . <u>  </u>	<u>  </u> . <u>  </u>	<u>  </u> . <u>  </u>	
-----									
		<u>  </u>	<u>  </u>	<u>  </u>	<u>  </u> . <u>  </u>	<u>  </u> . <u>  </u>	<u>  </u> . <u>  </u>	<u>  </u> . <u>  </u>	
-----									
Enter information in form above. Press <Ctrl-W> to save.									

[Esc]=Exit

Figure 27b.

EXAMPLE: This form appears when you press [A] at the screen shown in Figure 27a. The input fields are highlighted and their initial values are displayed. The cursor is at the date field.

To search, press [S] at the screen shown in Figure 27a. The system will display the age search fields and six plot fields.

Enter the age or a range of ages as a search criterion. Enter up to six plot numbers in the plot number fields. All the search fields are optional. If you leave them all blank all records will be found. Press <Ctrl-W> to begin the search. After the system locates all records meeting your specifications it will display them on the screen.

**SEARCH**

**FORM G: Tree Litter Measurements**

ID: TH-01

Age (months):  -  Plot(s):

---

Date	Age	Layer (mm)		Dry WT	OM	- Nutrients (%) -		
Plot (mm/dd/yy)	(mo)	Upper	Lower	(kg/tree)	(%)	N	P	K

---

Enter search criteria in the fields displayed above. Press <Ctrl-W> to begin search. (Blank = All records will be selected).

[Esc]=Exit

Figure 27c.

EXAMPLE: This form appears when you press [S] at the screen shown in Figure 27a. The search fields are age and plot numbers. Enter the plot numbers if you want data for specific plots.

To modify records, press [M] at the screen shown in Figure 27a. Enter the age and plot number(s) to specify the records you want to modify (Figure 27c). The system will display the records found, if any, in reverse video format to indicate that you can change any field in any record. Use the cursor keys (arrow keys) to position the cursor to the desired field, make the modifications, then press <Ctrl-W> to save the changes.

To delete records, press [D] at the screen shown in Figure 27a. Enter the age and plot number(s) to specify the records you want to delete (Figure 27c). The system will display the records found, if any, with the first record in reverse video. Move the reverse video line using the cursor keys to the line you want to delete. After position the reverse video line press <Ctrl-Y>. The system will ask for confirmation before deleting the line. If you still want to delete the line press [Y], then [Enter]. The line will then be deleted. There is no provision to undelete records.

[R] FORM R - Tree Phenology Observation

This form contains the observations on tree phenology (Figure 28). The system automatically retrieves all phenology records for the experiment. The options are add, modify, delete, and print.

**FORM R: Tree Phenology Observation**

ID: TH-01

Genotype: ACAC\_PNG

Flowering

    Date (mm/dd/yy) of flower bud appearance (50% of trees): 06/14/87  
    Flower bud abundance (L=light, M=medium, H=heavy): M

    Date (mm/dd/yy) of open flower appearance (50% of trees): 08/06/87  
    Open flower abundance (L=light, M=medium, H=heavy): L

Fruiting

    Date (mm/dd/yy) of fruit appearance  
    (50% of trees > 1 cm length of fruit): 11/01/87

    Date (mm/dd/yy) of mature fruit appearance (50% of trees): 01/13/88

[S]earch, [A]dd, [M]odify, [D]elete \_  
[PgUp]=Page Up, [PgDn]=Page Down

[Esc]=Exit, [F2]=Print Page: 1/4

Figure 28.

To add phenology observations press [A] at the screen shown in Figure 28. Enter the genotype of the species. For the flowering observations enter the date in which 50% of the trees have buds and the abundance. Also enter the date in which 50% of the trees have open flowers and its abundance. For fruiting observations enter the date in which 50% of the trees have fruits at least 1 cm in length. Also enter the date when 50% of the trees have mature fruits. Each date entered must be after the previous date.

To modify an observation press [M] at Figure 28. The input fields will be shown in reverse video and you may change any data. Press <Ctrl-W> to save or [Esc] to abandon the changes.

The delete option will delete an observation record. Press [D] to delete the record being displayed. Press [Y] then [Enter] when prompted to confirm the deletion or [N] then [Enter] to abandon the deletion. Press [Esc] to abort the DELETE mode.

[S] FORM S - Tree Damage Observation

This form contains observations on tree damage (Figure 29a).

FORM S: Tree Damage Observations

			ID: TH-01
Date (mm/dd/yy)	General Health (1=Good,2,3,4)	Comments (Include Plot No, Cause,...)	Damage (%)
[S]earch, [A]dd, [M]odify, [D]elete			

[Esc]=Exit

Figure 29a.

To add tree damage observations press [A] at the screen shown in Figure 29a. The input fields will appear in reverse video. If there are existing tree damage observation records the first line of the screen will be the latest observation and the input fields will begin on the second line.

Enter the date of the observation and the general health (1=good,2,3,4). In Comments, enter the plot or genotype or treatments affected along with the probable cause of any damage. Enter the percentage of damage.

ADD

FORM S: Tree Damage Observations

			ID: TH-01
Date (mm/dd/yy)	General Health (1=Good,2,3,4)	Comments (Include Plot No, Cause,...)	Damage (%)
[S]earch, [A]dd, [M]odify, [D]elete			

Figure 29b.

You can search for records for viewing, modifying, or deleting by using the date limiter and date fields.

**SEARCH**

**FORM 5: Tree Damage Observations**

Date (mm/dd/yy): > 12/31/87			ID: TH-01
Date (mm/dd/yy)	General Health (1=Good,2,3,4)	Comments (Include Plot No, Cause,...)	Damage (%)

Figure 29c.

EXAMPLE: This shows a search for records after December 31, 1987.

After a search has been completed, IADSS will display the number of records found. The data will be displayed in intense video. The options after the search are modify, delete, and print. If there are more than 12 records the [PgUp] and [PgDn] keys will also be active.

To modify press [M] after retrieving some tree damage observation records. The data will be displayed in reverse video and you may make changes to the observations. Press <Ctrl-W> to save or [Esc] to abandon the changes.

To delete press [D] at the Display Screen. One record will be shown in reverse video. Move the reverse video bar to the record you want deleted then press <Ctrl-Y>. Press [Y] then [Enter] when asked to confirm the deletion of the record or press [N] then [Enter] so the record won't be deleted. Press [Esc] to exit the DELETE mode.

[T] FORM T - Irrigation

This form contains the irrigation record of the experiment (Figure 30) and works exactly like Form S. The options are search, add, modify, or delete.

To add records to the database, press [A]. Enter the date of irrigation, the amount used is millimeters, and the method of irrigation. The most recent entry will be displayed.

ADD

FORM T: Irrigation

Date (mm/dd/yy)	Amount (mm)	Method
01/15/88	200	Sprinkler system

Enter information in form above. Press <Ctrl-W> to save.

[Esc]=Exit, [F1]=Help

Figure 30.

EXAMPLE: This is the ADD mode of FORM T. It shows the most recent record as the first line. The input lines start on the second line. It shows the sizes and locations of the input fields.

To search for records, press [S]. Specify which records you want to see by using the date limiter field and the data field. To modify the records, press [M]. Enter the date limiter and date to specify the records you want to modify. The system will display the records found, if any, in reverse video to indicate that you can move the cursor to any field of any line for modification. Press <Ctrl-W> when you are finished modifying to save the modifications. To delete records from the database, press [D]. Again specify the dates of interest if any. The system will display all records found with the first line in reverse video. Move the reverse video line to the record you want to delete. Then press <Ctrl-Y>. The system will ask you to confirm the delete command. Press [Y], then [Enter] to complete the delete command. There is no provision to undelete records.

[U] FORM U - Log of Experiment Operations

This form contains the log of experiment operations (Figure 31). See Form S for a detailed discussion of database operations. This log will be invaluable for future reference.

To add entries to the log press [A]. Enter the date, the management operation, and remarks. In the ADD mode the system displays the most recent entry as the first line on the data entry area.

ADD

FORM U: Log of Experiment Operations

		ID: TH-01
Date (mm/dd/yy)	Management Operation	Remark
01/01/87	clearing	clearing of plots started today
Enter information in form above. Press <Ctrl-W> to save.		

[Esc]=Exit, [F1]=Help

Figure 31.

EXAMPLE: This form shows the field sizes of the input fields. The fields are not actually visible until you choose one of the options displayed at the bottom of the screen.

Searching the database for viewing, modifying, or deleting is accomplished by using the date limiter and date fields to specify the records of interest. Press [S] to search, [M] to modify, or [D] to delete.

[X] FORM X - General Measurements

This form contains general measurements of the experiment. These measurements are made in addition to the minimum data set. It begins with a sub-menu with two options. The definition of the general measurements must be done before any general measurements can be entered.

Press [1] at the screen shown below to define the general measurements you will be entering into the database.

```

          GENERAL MEASUREMENTS
          ID: TH-01
          << SUB - MENU >>
          FORM
          1-> General Measurements Definition
          2-> General Measurements
          Use cursor keys to highlight desired item. Press [Enter] to begin program
          execution.
          (Esc)=Exit

```

Figure 32a.

The general measurements form consists of six data fields used to store data that cannot or should not be entered into the other measurement databases.

Each field is eight digits wide. Four of the fields will hold only whole numbers and two will hold numbers with three decimal places.

[1] FORM X-1 - General Measurements Definition

The general measurements definition screen is shown below in Add mode. The input fields are date and three field for each of the six measurements.

Each measurement is defined by specifying its name, its unit of measurement, and the method used to generate a plot value.

The name given on this form will appear on the data entry screen, a listing of general measurements, and the data set created in the Analysis option. To avoid conflict with the existing data names in other measurement forms, DO NOT USE the following names:

PSURVIV	WT	STEM
HT	N	BRANCH
BASAL	P	GRAVITY
DBH	K	

If you want to use a name listed above, change the name to make it unique. For example, can use DBH1 as a data name.

The unit of measurement is optional and serves as a label only.

The default method of generating the plot value is averaging (AVERAGE) which is the arithmetic mean. You may also enter 'GEO.MEAN' in this field to generate plot values using the geometric mean.

ADD

FORM X-1: General Measurements Definition

Date (mm/dd/yy): 05/06/88					ID: TH-01	
-----						
	Measurements					
	1	2	3	4	5	6
-----						
NAME	HTI	BASAL1	DBH1	SRV		
UNIT	(m)	(cm)	(cm)	(%)		
PLOT VALUE	AVERAGE	GEO.MEAN	GEO.MEAN	AVERAGE	AVERAGE	AVERAGE
-----						
Enter information in form above. Press <Ctrl-W> to save.						

[Esc]=Exit, [F1]=Help

Figure 32b.

12] FORM X-2 - General Measurements

Press [2] at the sub-menu to add, search, modify, delete, or print general measurements.

You can display all data for the experiment by pressing [5] then <Ctrl-W>. For displaying selected data enter age and plot values into the search fields before pressing <Ctrl-W>. See the section on searching in Form M-2 for more information.

Once data has been retrieved you can modify or delete the data currently being displayed. Use the options highlighted on the lower part of the screen to display the desired data.

Plot records that have tree records in the database cannot be deleted from this data format (by plot). Search for the tree data and delete them. The system will erase the plot record once all the tree data has deleted.

Plot records with tree records in the database can be modified only in the plot number. Measurement data displayed are generated from tree records and cannot be changed. To change the plot value modify the tree records to recalculate the plot value.

To enter data, press [A] when the options are highlighted on the screen. Enter the date and age. Enter the plot number and the measurements into the appropriate input fields. Press <Ctrl-W> to save the data. The date and age entered at the top will be used in all the plot records entered on the screen.

FORM X-2: General Measurements (by plot)

ADD

Date (mm/dd/yy): 6/18/88      Age (months): 18      ID: TH-01

Plot	Age	HTI (m)	BASAL1 (cm)	DBH1 (cm)	SRV (%)		
-		-9	-9	-9	-9	-9.000	-9.000
		-9	-9	-9	-9	-9.000	-9.000

Enter information in form above. Press <Ctrl-W> to save.

[Esc]=Exit, [F1]=Help

Figure 32c.

Tree records can be retrieved using the age and plot search fields. You may specify an age or range of ages and a plot number. See the section on searching in Form M-2.

You may add tree measurements to a plot already in the database by increasing the number of trees. The system will display tree data already in the database along with empty data entry fields.

Enter the date, age, plot number, and the number of trees measured. The system will provide data entry lines based on the numbers of trees.

Enter the tree number and the measurements into the appropriate input fields. Data entered into undefined fields will be ignored.

Press <Ctrl-W> after entering data to save. The system will display the calculated mean, ask you if you want to modify the data. Press [M] to change the data and recalculate or any other key to save the data.

ADD

FORM X-2: General Measurements (by tree)

Date (mm/dd/yy): 01/01/88					Age (months): 12		Plot: 23		ID: TH-01
							No. of trees: 2		
Tree	HT1 (m)	BASAL1 (cm)	DBH1 (cm)	SRV (%)					
	-9	-9	-9	-9	-9.000				-9.000
Mean	9	9	9	9	9.000				9.000

re-[M]odify, any other key to save.

[Esc]=Exit, [F1]=Help

Figure 32d.

## [1] Analysis

This option invokes the statistical analysis by using plot data and graphics package incorporated into the system (Figure 33a). If there is a data file associated with this experiment the system will display the first record of the file.

The analysis requires the age or ages of the trees in months and the data to be analyzed. The data to be analyzed is chosen from a list on the screen. The variables are from the Tree Measurements (Form N), Foliage Biomass Measurements (Form O), Wood Biomass Measurements (Form P), and if defined, General Measurements (Form X).

Enter the age or range ages of the trees in months in the Age fields. See the section on searching in Form M-2.

For each of the data items you want included in the analysis enter a 'Y' beside the data item. The [Up Arrow] and [Down Arrow] keys will move the cursor between the input fields.

Press <Ctrl-W> after you have completed the age and data specifications to begin the analysis.

### F/FRED DATA ANALYSIS

Age (months): 12 -	ID: TH-01
TREE MEASUREMENTS	FOLIAGE BIOMASS MEASUREMENTS
Survival Rate...N	Dry Weight.....Y
Height.....N	% N of dry weight...N
Basal Diameter..N	% P of dry weight...N
DBH Diameter....N	% K of dry weight...N
	WOOD BIOMASS MEASUREMENTS
	Stem Dry Weight.....N
	Branch/Twig Weight..N
	Specific Gravity....N
Enter [Y] for those variables to be analyzed. Press <Ctrl-W> to begin.	

[Esc]=Exit

Figure 33a.

EXAMPLE: This shows the specifications for analyzing the 12 month Dry Weight measurements of foliage biomass for Experiment TH-01.

As the analysis begins the system will create the data set based on your specifications. Messages will appear at the lower section of the screen showing the status of the process.

After the data set is created the system will display the filename or data set name (DSN), the number of bytes per record, the number of records, and the date.

A window will appear showing the field names of the data set and the contents of the first record.

```
[C]reate
[F]/Fred 1987 Humid/Sub-humid Zone Analysis _
[Esc]=Exit, [F1]=Help, [F2]=Print, [F3]=Change Experiment, [F4]=Data Analysis
```

Figure 33b.

EXAMPLE: This shows the options available when a data set has been created for the experiment.

Press [C] to create a new data set by specifying different age and/or data search criteria.

If you press [F] the system will display the first ten records of the data set, pause, then proceed to the dedicated analysis for F/FRED 1987 Humid/Sub-humid Zone Trials. The screen will clear and a message will appear indicating the variable(s) included in the data set (Figure 33c).

Merging foster.dat with statistical command file.

Dependent variables in this data set are:

WT

Figure 33c.

Press [F2] to print the data set in either Age \* Treatment order or Treatment \* Age order.

Press [F3] to change the Experiment ID. This allows you to access data from different experiments.

Press [F4] to start the generalized data analysis package.

The analysis begins by clearing the screen and displaying its banner. As the analysis proceeds Kmod will display dots below the banner (Figure 33d). The length and number of rows depends upon the variables being analyzed and the type of analysis being performed.

```
Kmod: A system for the analysis of statistical models.  
      Copyright (c) 1987 by David M. Allen  
      Developmental version, October 25, 1987
```

```
....._
```

Figure 33d.

When the analysis is completed and the results are ready to be displayed, the system will erase the rows of dots and a message will appear (Figure 33e).

```
Kmod: A system for the analysis of statistical models.  
      Copyright (c) 1987 by David M. Allen  
      Developmental version, October 25, 1987  
Press return for more, any other key to quit.
```

Figure 33e.

WARNING: The analysis package requires a [Return] or [Enter] to display its output. Pressing any other key will end the analysis output and control will pass to the screen shown in Figure 33a.

The output (screen images) can be found in Appendix D.

[2] Utilities

THE UTILITIES OPTION IS NOT IMPLEMENTED.

System maintenance can be performed using DOS commands. These commands allow you to format diskettes, copy files, and erase files. These commands will allow you make backup copies of your database files.

F/FRED Information and Decision Support System Options

OPTION B: FARM AND VILLAGE FORESTRY DATABASE

THE SUMMARY DATABASE IS NOT IMPLEMENTED.

OPTION C: SUMMARY DATABASE

THE SUMMARY DATABASE IS NOT IMPLEMENTED.

F/FRED Information and Decision Support System Options

OPTION D: MPTS SPECIALIST DATABASE

Invoking option D causes a blank MPTS Specialist Database Screen to appear with your options indicated at the bottom. An option is chosen by typing the first letter. For example, to add a new specialist to the the database, press [A].

**MPTS Specialist Database**

Name.....	Family Name	First Name	MI
Job Title..			
Institution			
MPT Professional Responsibility:			
MPT Subject Field:		MPT Species:	
1.		1.	
2.		2.	
3.		3.	
MPT Environmental Zone:		MPTS Geographic Regions:	
		1.	
		2.	
Percentage of time working with the above species:			%
[S]earch, [A]dd, [M]odify, [D]elete			

[Esc]=Exit Page: 1/2

Figure 37a.

EXAMPLE: This Options Screen appears when you press [D] at Main Menu. The MPTS Specialist Form has 2 pages. Your options are search, add, modify, delete, or exit back to the Main Menu.

The second page of the form is shown below (Figure 37b). It contains general and address information. This page is can be accessed while in the ADD, SEARCH, MODIFY, or DELETE modes.

In the ADD mode the Update field will automatically contain the system date. The last Directory Code field will have a '99', the code reserved to indicate a specialist record. You may use the Directory Codes to group persons together.

**MPTS Specialist Database**

Name...	Prefix	Family Name	First Name	MI
Job Title.....				
Institution...				
Address.....				
City.....				
State/Province			Postal Code.....	
Country... ..				
Phone.....			Telex..	
Note.....				
Update.....	99/99/99		Directory Code..	99

[Esc]=Exit

Page: 2/2

Figure 37b.

EXAMPLE: This shows the second page of the MPTS Specialist Database.



ON-SCREEN TABLE (WINDOW)

The system provides on-screen lookup tables (windows) to help you select information that is required by some of the record fields. Windows are blocks of choices that appear on the screen when the cursor is placed on one of the following data entry fields while in the the MPTS Specialist Database:

- MPT Professional Responsibility (Figure 37d)
- MPT Subject Field (Figure 37e)
- MPT Species (Figure 37f)
- MPT Environment (Figure 37g)
- MPTS Geographic Regions (Figure 37h)

To use the windows simply enter the number corresponding to your choice. For example, the MPT Professional Responsibility window contains three choices, 1. Project Management, 2. Research, and 3. Training. To choose research as the subject's professional responsibility then you would simply enter 2.

ADD

**MPTS Specialist Database**

Name.....	Family Name	First Name	MI
Job Title..			
Institution	<< RESPONSIBILITY >>		
MPT Professional Responsibility:	1) Project Management		
	2) Research		
	3) Training		
MPT Subject Field:	Select 1		
1.			
2.			
3.			
MPT Environmental Zone:	MPTS Geographic Regions:		
	1.		
	2.		
Percentage of time working with the above species:	0%		

Enter information in above form. Press <Ctrl-W> to save.  
[PgUp]=Page Up, [PgDn]=Page Down

[Esc]=Exit

Page: 1/2

Figure 37d.

Name..... Family Name First Name MI

Job Title..

Institution

-----<< SUBJECT FIELDS >>-----

MPT Profes	1) Agroforestry Systems	12) Land-use Planning
MPT Subjec	2) Biometrics	13) Mensuration
1.	3) Biotechnology/Micorrhyzae	14) Nursery Prod./Planting
2.	4) Climatology	15) Reforestation
3.	5) Computing	16) Seed Collection/Prod.
MPT Enviro	6) Cultivation/Management	17) Silviculture
	7) Economics	18) Sociology
Percentage	8) Genetics/Breeding	19) Soil Relations
	9) Growth/Yield Models	20) Sp./Provenance Trials
Enter infor	10) Insect/Disease	21) Tree Physiology
[PgUp]=Page	11) Irrigation	22) Watershed Management

Select up to 3 by rank (first is greatest expertise)  
Press [Enter] when done

[Esc]=Exit

Figure 37e.

Name..... Family Name First Name MI

Job Title..

-----<< SPECIES >>-----

1) Acacia auriciformis	14) Eucalyptus microtheca
2) Acacia mangium	15) Gliricidia sepium
3) Acacia senegal	16) Leucaena diversifolia
4) Acacia nilotica	17) Leucaena leucocephala
5) Albizia falcataria	18) Melia azedarach
6) Albizia lebbek	19) Morus alba
7) Albizia procera	20) Populus
8) Alnus nepalensis	21) Prosopis cineraria
9) Artocarpus	22) Prosopis juliflora
10) Azadirachta indica	23) Robinia pseudoacacia
11) Calliandra calothyrsus	24) Sesbania bispinosa
12) Dalbergia sissoo	25) Sesbania grandiflora
13) Eucalyptus camaldulensis	26) Sesbania sesban

Select up to 3. Press [Enter] when done.

ons:

Page: 1/2

Figure 37f.

## MPTS Specialist Database

Name.....	Family Name	First Name	MI
Job Title..			
Institution			
MPT Professional Responsibility:			
MPT Subject Field:	MPT Species:		
1.	1.		
2.	2.		
3.	3.		
MPT Envi	S Geographic Regions:		
—	1.		
Percentage	2.		
	species: 0%		
Enter inf	Select 1	rl-w> to save.	
[PgUp]=Pa			

<< ENVIRONMENTAL ZONE >>

1) Arid/Semi-arid Tropics  
2) Highland  
3) Humid/Semi-humid Tropics

[Esc]=Exit Page: 172

Figure 37g.

## MPTS Specialist Database

Name.....	Family Name	First Name	MI
Job Title..			
Institution			
MPT Professional Responsibility:			
MPT Subject Field:	MPT Species:		
1.	1.		
2.	2.		
3.	3.		
MPT Environ	S Geographic Regions:		
—	1.		
Percentage	2.		
	species: 0%		
Enter inform	Select: up to 2	rl-w> to save.	
[PgUp]=Page			

<< REGIONS >>

1) Africa  
2) Australia/New Zealand  
3) Europe  
4) Latin America  
5) North America  
6) Pacific Islands  
7) S. Asia  
8) S.E. Asia

[Esc]=Exit Page: 172

Figure 37h.

To search the MPTS Specialist Database press [S] at the screen shown in Figure 37a. The search option allows you to look through the entire database or a part of it one record at a time. If the highlighted fields are left blank and <Ctrl-W> is pressed then all the records in the database will be displayed. A more common use of the database is to find persons with specific characteristics. The highlighted fields are used to specify one or more desired characteristics to be used in the search. For example, if you entered Soil Relations in the MPT Subject Field then all the records in the database with Soil Relations in their MPT Subject Field will be displayed. Note that multiple fields can be filled. This will serve to narrow the selection of records further. Getting back to the example, if you also entered S.E. Asia in the MPT Regions Field the system will provide you with records that have Soil Relations and S.E. Asia in their respective fields. In other words, the system performs a logical AND of all the parameters you have provided.

SEARCH

**MPTS Specialist Database**

Name.....  
                     Family Name                                    First Name                                    MI

Job Title..  
 Institution

MPT Professional Responsibility:

MPT Subject Field:                                    MPT Species:  
   1.  1.  
   2.  2.  
   3.  3.

MPT Environmental Zone:                                    MPTS Geographic Regions:  
   1.  
   2.

Percentage of time working with the above species:     %

Enter search criteria in the fields displayed above. Press <Ctrl-W> to begin search. (Blank = All records will be selected)

[Esc]=Exit Page: 1/2

Figure 37i.

EXAMPLE: This is the SEARCH mode of the MPTS Specialist Database. The search fields and their sizes are shown. The same windows will appear on the screen when the cursor is placed in the Professional Responsibility, Subject Field, Species, Environmental Zone, and Geographic Regions fields as shown in the previous section.

To modify records in the MPTS Specialist Database you can press [M] at the screen shown in Figure 37a. This option allows you to change an existing specialist record. This procedure involves using the SEARCH mode to locate the record you want to change. If the exact record is known, entering the family name will usually suffice. However, if you are looking for a common family name (like Smith or Jones) then the first name should also be provided to display the record you want. Once you've located the correct record you can use the cursor keys to move between fields and pages. Save the modified record by typing <Ctrl-W> from either page.

To delete records from the MPTS Specialist Database press [D] at the screen shown in Figure 37a. This option allows you to delete (remove) an existing specialist record. This procedure involves using the SEARCH mode to locate a record or group of records to be deleted. You will be asked to provide the search criteria as in the SEARCH and MODIFY modes. This option is helpful in deleting duplicate or incomplete records from the database. After you have located the record you wish to delete the system will ask you if the displayed record is indeed the one you want deleted. This has been added to insure that accidental deletions are avoided.

The MODIFY and DELETE options can also be invoked while the system is displaying a record after a successful search. If you press [M] the system will allow you to modify the record currently on display. If you press [D] the system will ask if you want to delete the record on display.

F/FRED Information and Decision Support System Options

OPTION E: ABSTRACTS DATABASE

Invoking this option causes a blank Abstracts Database Screen to appear with your options indicated at the bottom. An option is chosen by pressing [S] to search, [A] to add citations and abstracts, [M] to modify existing citations and abstracts, or [D] to delete old or irrelevant references.

F/FRED Abstracts Database

Title:		Ref ID:
Author:		
Source:		
Volume:	Date.....:	Geo. Region:
Issue.:	Doc. Type:	Species.....:
Page..:	Language.:	Abstract...:
Main Heading . Sub Heading:		
[S]earch, [A]dd, [M]odify, [D]elete _		

[Esc]=Exit

Page: 1/1

Figure 34a.

EXAMPLE: This is the Abstracts Database Options Screen that appears when you press [C] at the Master Menu (Figure 1).

Ref ID: CB0166808

## Title:

Tropical nitrogen-fixing fuelwood trees.  
Energy conservation and use of renewable energies in the bio-industries.

## -----&lt;&lt; ABSTRACT &gt;&gt;-----

Among several outstanding tropical nitrogen-fixing fuelwood trees described, can be noted *Leucaena leucocephala*, *Acacia mangium*, *Acacia auriculiformis*, *Calliandra calothyrsus*, *Sesbania grandiflora*, *Gliricidia sepium*, and *Casuarina equisetifolia*.

[M]odify, [D]elete, [N]ext, [P]revious

[PgUp]=Page Up, [PgDn]=Page Down

[Esc]=Exit [F2]=Print

Records: 1/1

Page: 2/2

Figure 34b.

EXAMPLE: This is the abstract page in SEARCH mode of the Abstracts Database. The system displays the contents of the record in bold type. The abstract portion of the citation can contain as many as 6 screens. The number of pages in a citation is displayed at the bottom right corner. All citations have at least one page and as many as 7 pages (1 reference page + 6 abstract pages).

To add records to the Abstracts Database press [A] at the Options Screen (Figure 34a). This option allows you to add citations and abstracts to the database. The input fields are highlighted to indicate the places where you can enter data.

The system first asks for a reference ID (Figure 34c) and checks the ID for duplication before the rest of the input fields are highlighted for data entry. The reference ID that you provide for your own citations can be any combination of letters and numbers. We suggest using a two letter code (to indicate country or institution) followed by 8 digits. The CAB Abstracts citations have been given a two letter code of 'CB'. This makes it easier to retrieve using the reference ID.

After you have entered a valid reference ID, the system highlights the citation fields (Figure 34d). Enter the title of the article, its author(s), the publication or journal name, the volume, the issue, the page(s), the publication date, and the language of the original document. Enter the geographic region covered by the citation as a number (1...8) from the window provided (Figure 34e) or you can choose to enter other geographic regions not included in the list. Enter the number of the main species that the citation covers from the window provided (Figure 34f) or enter the species name directly if the species does not appear in the list. To include an abstract enter a 'Y' in the abstract field. Use [PgDn] to go to the next page and enter the abstract. Press <Ctrl-W> to save the citation and abstract.

The main heading and sub headings fields are used to categorize the citation under a specific subject. The 16 main headings appear in a window (Figure 34g). Choose one to indicate the general subject of the citation. If the list does not contain an appropriate heading leave this field blank and use [up arrow] to leave this window. A list of sub headings will appear (Figure 34h) in a window after you have selected a main heading. Choose a sub heading that indicates a specific subject covered by the citation. Some of the sub headings have a second level of sub headings (Figure 34i) and these will appear in windows on the screen. Choose a second level of sub heading to indicate a more specific subject.

An abstract can be included with the citation only if you enter 'Y' in the Abstract field. A maximum of 61 lines (6 pages of abstract) can be included with a citation. Press [PgDn] to go to the abstract screens (pages 2 through 7) and enter the text of the abstract. The system displays 11 lines for data entry per screen. After you have filled a screen press [PgDn] to display the next abstract data entry screen. After the first screen each subsequent screen will show the last line of the previous screen as the first line. Press [PgUp] to go back to previous screens. After you have completed entering the text of the abstract press <Ctrl-W> to save the entry.

Title: Ref ID: XX12345678

Author:

Source:

Volume:            Date.....:            Geo. Region:  
 Issue.:            Doc. Type:            Species.....:  
 Page...:           Language.:            Abstract...:  
 Main Heading . Sub Heading:

Enter information in the form above. Press <Ctrl-W> to save.

[Esc]=Exit

Page: 1/1

Figure 34c.

Title: Ref ID: XX12345678

Author:

Source:

Volume:            Date.....:            Geo. Region:  
 Issue.:            Doc. Type:            Species.....:  
 Page...:           Language.:            Abstract...:  
 Main Heading . Sub Heading:

Enter information in the form above. Press <Ctrl-W> to save.

[Esc]=Exit

Page: 1/1

Figure 34d.

## F/FRED Abstracts Database

Title:	Ref ID: XX12345678	
--<< REGIONS >>--		
Author(s):	1) Africa	
	2) Australia/New Zealand	
	3) Europe	
	4) Latin America	
Source:	5) North America	
	6) Pacific Islands	
	7) S. Asia	
Volume:	8) S.E. Asia	Region:
Issue.:	Enter region number: <u>  </u>	ies.....:
Page..:	0 = none of the above	ract....:
Main Heading		

Enter information in the form above. Press <Ctrl-W> to save.

[Esc]=Exit

Page: 1/1

Figure 34e.

EXAMPLE: This figure shows the Geographic Regions Window of the Abstracts Database in ADD mode. You can include the geographic region covered in the citation by pressing the number corresponding to that region. If the region covered by the citation is not included in the list, enter a '0' and the cursor will be placed in the Region field thus allowing you to manually enter the region (e.g., tropics, Malaysia, Sabah).

<< SPECIES >>

ADD

1) Acacia auriculiformis	14) Eucalyptus microtheca	F ID: XX12345678
2) Acacia magium	15) Gliricidia sepium	
3) Acacia senegal	16) Leucaena diversifolia	
4) Acacia nilotica	17) Leucaena leucocephala	
5) Albizia falcataria	18) Melia azedarach	
6) Albizia lebbek	19) Morus alba	
7) Albizia procera	20) Populus	
8) Alnus nepalensis	21) Prosopis cineraria	
9) Artocarpus	22) Prosopis juliflora	
10) Azadirachta indica	23) Robinia pseudoacacia	
11) Calliandra calothyrsus	24) Sesbania bispinosa	
12) Dalbergia sissoo	25) Sesbania grandiflora	
13) Eucalyptus camaldulensis	26) Sesbania sesban	

Enter species number:

0 = none of the above

Enter information in the form above. Press <Ctrl-W> to save.

[Esc]=Exit

Page: 1/1

Figure 34f.

EXAMPLE: This shows the Species Window of the Abstracts Database in the ADD mode. Choose the species that the citation generally covers. If the citation covers more than one species, choose the species covered most. If the species does not appear in the list, enter a '0' as your choice and the cursor will appear in the Species field. You can then enter the species manually.

<< MAIN HEADINGS >>

- 1) General publications and general techniques
- 2) General aspects of forestry
- 3) Silviculture
- 4) Forest mensuration and management
- 5) Physical environment
- 6) Fire
- 7) Plant biology
- 8) Genetics and breeding. Variation. Evolution
- 9) Mycology and pathology
- 10) Insects and invertebrates
- 11) Range
- 12) Game and wildlife
- 13) Fish
- 14) Protection forests. Watershed/catchment management. Soil conservation
- 15) Other land use. Nature conservation. Arboriculture
- 16) Dendrochronology and dendroclimatology

Enter main heading number:

Enter information in the form above. Press <Ctrl-W> to save.

[Esc]=Exit

Page: 1/1

Figure 34g.

<< SUB HEADINGS >>

- 0) General
- 1) Choice of species. Trials of species, provenances, etc.
- 2) Seed for propagation
- 3) Vegetative propagation. Tissue culture
- 4) Use of fertilizers
- 5) Nursery practice
- 6) Establishment and tending of stands
- 7) Silviculture by species and species groups
- 8) Machinery
- 9) Growing and collection of forest products other than wood

Enter the sub heading number:

ADD

XX12345678

Volume:  Date.....:  Geo. Region:   
 Issue.:  Doc. Type:  Species.....:   
 Page..:  Language.:  Abstract....:

Main Heading . Sub Heading:

**Silviculture**

Enter information in the form above. Press <Ctrl-W> to save.

[Esc]=Exit

Page: 1/1

Figure 34h.

<< SUB HEADINGS >>

ADD

0) General

1) Silvicultural stands

2) Natural and semi natural stands

3) Plantations, including direct sown stands

4) Site preparation

5) Irrigation and drainage

6) Weeds. Weeding. Cleaning. Use of phytocides

7) xxxxx

8) xxxxx

9) Stand characteristics

Enter the sub heading number: 6

XX12345678

Volume:            Date.....:            Geo. Region:

Issue.:            Doc. Type:            Species.....:

Page...:            Language.:            Abstract....:

Main Heading . Sub Heading:

**Silviculture**

**Establishment and tending of stands**

Enter information in the form above. Press <Ctrl-W> to save.

[Esc]=Exit Page: 1/1

Figure 34i.

EXAMPLE: Figures 34g, 34h, and 34i show the categorization of citations in the Abstracts Database. Figure 34g shows the main headings you can use to classify the subject of the citation. Figure 34h shows that Silviculture is the main subject of the citation and the subheadings are shown in the window. Figure 34i shows that subheading number 6 was chosen 'Establishment and tending of stands' and the subheadings are shown in the window.

To search for citations in the Abstracts Database press [5] at the Options Screen. This option allows you to look through the entire database or a subset of it on record at a time. The search fields are highlighted to show you where optional search specifications are allowed. Use the cursor keys (arrow keys) to move the cursor to any one of the search fields to enter data. Press <Ctrl-W> to begin the search process. The search fields are the reference identification number, the title, the author, the source (publication name), the volume, the issue, the date, the document type, the language, the geographic region, the species, and the headings and subheadings. If you leave all the search fields blank then all the records in the database will be selected.

**SEARCH**

**F/FRED Abstracts Database**

Title:	Ref ID: XX12345678	
Author:		
Source:		
Volume:	Date.....:	Geo. Region:
Issue.:	Doc. Type:	Species....:
Page..:	Language.:	Abstract...:
Main Heading . Sub Heading:		
Enter search criteria in the form above. Press <Ctrl-W> to begin		

[Esc]=Exit Page: 1/1

Figure 34g.

EXAMPLE: This shows the Search mode of the Abstracts Database. The same windows appear as show in Figures 34e through 34i when the cursor is placed in those respective fields. You can use the choices shown in the windows to help you search for relevant citations.

To print the any or all citations retrieved press [F2] (Figure 34b). The print command has two options, one to print a reference listing, the other to print the full record. The reference format prints only the author, title, and source information. The full record option includes the species and geographic descriptors, the heading and subheadings of the citation, and the abstract (if any). The default print option is reference listing only. After specifying which print format you would like the system will ask you if you want to print all the records retrieved or just the one being displayed. Answer 'Y' to print all the records. The default is to print the record being displayed only.

To modify records in the Abstracts Database press [M] at the Options Screen. This option allows you to change entries in the citations or abstracts. You must first retrieve the citation by going through the search procedure as described above. Press [M] to go into modify mode. The fields that you can modify will be highlighted. Use the cursor keys to move to the fields to be modified. Press [Enter] after modifying each field. When all the modifications are completed press <Ctrl-W> to save them.

To delete records in the Abstracts Database press [D] at the Options Screen. This option allows you to remove citations and abstracts. First find the citation you want deleted by going through the search procedure described above. After locating the correct citation press <Ctrl-Y>. The system will ask for confirmation before deleting. Press [Y], then [Enter] to complete the delete procedure. If you do not want the citation deleted press [Esc] to exit or press [N], then [Enter].

The MODIFY and DELETE options can also be used while the system is displaying records after a successful search. Press [M] to modify the record being displayed. Press [D] to delete the record being displayed.

F/FRED Information and Decision Support System Options

OPTION F: SPECIES DATABASE

THE SPECIES DATABASE IS NOT IMPLEMENTED.

OPTION G: SOIL DATABASE

THE SOIL DATABASE IS NOT IMPLEMENTED.

OPTION H: CLIMATE DATABASE

THE CLIMATE DATABASE IS NOT IMPLEMENTED.

OPTION I: DAILY WEATHER DATABASE

THE DAILY WEATHER DATABASE IS NOT IMPLEMENTED.

## APPENDIX A. CONFIGURING YOUR SYSTEM FOR IADSS

This appendix describes the configuration file, CONFIG.SYS.

A configuration file contains commands that are used to configure your computer system. Each time you start DOS, DOS searches the root directory of the drive it was started from for the file named CONFIG.SYS.

If the file CONFIG.SYS is found, DOS reads the file and interprets the commands within the file. If the file CONFIG.SYS is not found, DOS assigns default values for the configuration commands. The F/FRED system will not work under the default values.

Before executing the F/FRED Information and Decision Support System you should make sure that the computer is configured correctly to support the program by checking the CONFIG.SYS file of your computer.

Your CONFIG.SYS file must have the following commands:

```
FILES = 22
BUFFERS = 20
```

for the program to work properly. The FILES = command tells your computer how many files can be open at the same time. The BUFFERS = command tells your computer how much memory to use for input/output buffering.

If the CONFIG.SYS file does not exist in the root directory of your hard disk, you can create one quickly by following these steps at the DOS prompt:

```
C:\>COPY CON: CONFIG.SYS [Enter]
FILES = 22 [Enter]
BUFFERS = 20 [Enter]
^Z [Enter]
```

[Enter] means press the [Enter] key (also called Return).

^Z is <Ctrl-Z>. While holding the [Ctrl] key down press the [Z] key. This creates an end of file marker.

The commands in the CONFIG.SYS file do not take effect until the next time you boot your computer. Turn off the computer and then turn it back on to make the commands active.

NOTE: If your prompt looks like this C> instead of C:\>, type PROMPT \$P\$G at the DOS prompt. This command includes the sub-directory in the prompt.

## APPENDIX B. TROUBLESHOOTING

If you have problems installing the system check the following:

1. The system requirements are not satisfied.
2. The hard disk already contains a sub-directory named IADSS.
3. The hard disk does not have enough space to hold the system.
4. The hard disk was not in the IADSS sub-directory.
5. The CONFIG.SYS file is not properly installed (APPENDIX A).
6. The drive names you specified are not correct.

## INSTALLATION PROBLEMS

Problems may be encountered during the installation of IADSS on your hard disk. This section lists some common error messages and their possible solutions.

### 1. Unable to create directory

Check for a duplicate directory name by typing DIR at the DOS prompt. If an IADSS sub-directory exists check the files it contains. If that sub-directory is used for another purpose you can put the system program and database files in a sub-directory of another name.

Check for too many sub-directories. If you have too many sub-directories try to erase some files and remove some sub-directories.

### 2. Insufficient disk space

Check the sub-directory that you are copying the system files into. Erase any unnecessary files in that sub-directory and try to copy the diskette again. If the message persists you will have to erase files in other sub-directories.

### 3. Bad command or filename

Check the spelling of the commands you typed. Make sure that you have entered the commands as shown in the installation procedure.

### 4. Not ready error while I/O reading on drive A:

Check that the diskette is in the drive. Check the locking lever to make sure it is in the closed position.

### 5. type error while I/O reading on drive A:

where type = (Data/Disk/General failure/Read fault)

If you encounter one of these messages check the disk drive by trying to copy another diskette. If the message persists for all other diskettes suspect the disk drive.

If the message appears for one particular diskette only you may have a bad diskette. Try using a different disk drive or try to make a copy of the bad diskette on a different computer.

If you have a bad system diskette contact the F/FRED Project.

If you are not able to install the system successfully consult your DOS manual for error messages not listed here. You may try to have another person try the installation or try the installation on another computer.

## EXECUTION PROBLEMS

You may encounter problems in starting the system or while it is executing. Some common error messages are listed here including possible solutions.

1. Insufficient memory or  
Not enough memory or  
Program too big to fit in memory

You might not have 512K RAM (random access memory) installed on your computer. If this is the case you will need to install more RAM before you can execute IADSS.

You might have too many TSR (Terminate and Stay Resident) programs in memory. If this is the case reboot the computer or unload some of your memory resident programs and try again.

2. Too many files open

Your CONFIG.SYS file may not have the command FILES = 22 included. If the command is missing from your CONFIG.SYS file include it, reboot the computer, and try again.

You may not have a CONFIG.SYS file in the root directory of your hard disk. If the CONFIG.SYS file does not exist see the section 'CONFIGURING YOUR SYSTEM FOR IADSS'.

You may encounter problems during program execution that are not covered here. The system has a built-in recovery system that displays the error number and message before attempting to continue.

If an error occurs repeatedly, note the error number and message and the circumstances under which the error occurred. Complete the Error Report Form and return to:

F/FRED Project  
P.O. Box 186  
Paia, Hawaii 96779  
U.S.A.





## APPENDIX D. IDENTIFICATION CODES

The Experiment Database of IADSS uses identification codes, ID's, to link experiment information contained in separate database files.

### NETWORK ID

The Network ID consists of seven characters and is preassigned by the F/FRED Project for its network trials. It identifies a group of experiments with an identical treatment design.

### EXPERIMENT ID

The Experiment ID consists of a preassigned two-letter Institution ID, plus a two-digit trial number assigned by the principal investigator.

### SITE ID

The Site ID consists of the first five letters of the site name, as it is commonly referred to, plus a unique two-digit site number assigned by the principal investigator.

### SOIL PEDON ID

The Soil Pedon ID is preassigned by the F/FRED Project for its network trials.

### DAILY WEATHER STATION ID

The Daily Weather Station ID consists of the first three letters of the weather station name, usually the first three letters of the site name, plus a unique two-digit daily weather station number assigned by the principal investigator.

### VILLAGE ID

The Village ID consists of the first seven letters of the the village in the Village and Farm Forestry Database. Otherwise, use the nearest village.

### CLIMATE STATION ID

The Climate Station ID consists of the first seven letters of the nearest representative, and usually national, meteorological station with at least seven years of precipitation and maximum and minimum temperature data.

### TREE SPECIES ID

The Tree Species are preassigned by the F/FRED Project for its network trials.

## APPENDIX E. TECHNICAL OVERVIEW

The F/FRED Information and Decision Support System is written in the dBASE language. It is a high level programming language specially designed for efficient database management. It was first introduced by Ashton-Tate as dBASE II. Its evolution includes dBASE III and its current version today is dBASE III Plus version 1.0.

A database is a collection of information or data. A typical database is made up of several files. A file can be visualized as a table with rows and columns. The table below has 5 rows and 4 columns. The first row is a label row and it contains the names that identify the type of information in that column. The actual information is contained in the last 4 rows. In a database file a row is called a record and a column would be called a field. If we consider the table below as a database file we would say that it has 4 records and each record has 4 fields. The label row is not considered a record but is instead implicit in the definition of the structure of the database file.

	1	2	3	4
1	ID	Name	Department	Telephone
2	01	John	Management	661-2364
3	03	Mary	Research	643-3526
4	12	Adam	Training	856-6732
5	33	Joan	Technical	576-9820

Table 1. Supervisors.

A database file structure defines a record of the file. It specifies the number of fields in a record, the type of data that each field contains, and the size of each field. A corresponding file structure for the table above is given below. It shows the filename, the field definitions, and the number of decimal places for the numeric field.

SUPER.DBF

Structure:

Field	Field Name	Type	Width	Dec
1	ID	Numeric	6	0
2	NAME	Character	10	
3	DEPARTMENT	Character	14	
4	TELEPHONE	Character	11	

The dBASE III Plus package is a powerful database management tool. It simplifies the organization, maintenance, and manipulation of related data. The system organizes information in database files as records with multiple fields. Each field has a label that identifies the data contained within it. These labels enable programs to be written without regard to the position of the data within a record. Database files are created by specifying the names of the fields (label), the data types (character, numeric, or logical), and the field widths (number of characters or digits). This information constitutes the structure of a database file.

The F/FRED Information and Decision Support System was created to be exchanged among cooperators. One of its design criteria was that it would be used without the dBASE III Plus package. To achieve this end the system is compiled using Quicksilver Version 1.1. This allows the user to manipulate data in the database without knowledge of the dBASE language. Quicksilver is both a subset and a superset of dBASE III Plus. Some commands are not supported by Quicksilver while other commands have been added to the language. The non-supported commands are those that allow the users to manipulate the database files unguided by the program (interactive commands). The most notable additions to the language are the windowing commands.

Compilation converts the original program to a form that is directly usable by a computer. The compiled system can be executed by the user without having a copy of dBASE III Plus. Compilation protects the source code from unauthorized modification and it allows the system to run faster, to interact directly with the operating system, and to use memory more efficiently.

The system has been designed to give the user flexibility in entering, retrieving, and analyzing data. Users will find that all the system elements contain similar commands and the program flow follows similar paths. The system options are picked using menus or single letter commands. The main menu shows the five main database options. The experiment database menu shows 23 choices. Some choices in the experiment database have sub-menus. The abstracts, specialists, and network directory have single letter choices that control adding, searching, modifying, and deleting records.

APPENDIX F. F/FRED 1987 Humid/Sub-humid Analysis

OUTPUT TITLES AND HEADINGS

SUMMARY OF DATA SET work01

NAME	N	QUANTITATIVE VARIABLES		MINIMUM	MAXIMUM
		MEAN	STANDARD DEVIATION		

NAME	ENUMERATION AND SUBRANGE VARIABLES	
	LEVEL	FREQUENCY

Model  
 Weight variable  
 CONSTANT  
 Explanatory variables  
 CONSTANT REP\_ID SPECIES GENOTYPE CUTTING CUTTING\*SPECIES  
 CUTTING\*GENOTYPE  
 Response variables  
 WT  
 Error degrees of freedom: 34  
 Standard deviation: 0.4786

ANALYSIS OF VARIANCE

RESPONSE VARIABLE: WT

SOURCE	SUM OF SQUARES	D.F.	MEAN SQUARE	P-VALUE
--------	----------------	------	-------------	---------

Model  
 Weight variable  
 CONSTANT  
 Explanatory variables  
 REP\_ID TREAT\_ID  
 Response variables  
 WT  
 Error degrees of freedom: 34  
 Standard deviation: 0.4786

ESTIMATES AND CONTRASTS

TITLE	RESPONSE VARIABLE: WT ESTIMATE	Vc	STANDARD ERROR	P-VALUE
A1:LEU-(MAN+AUR)/2	-0.8056	0.0833333	0.1382	0.0000

DATA, PREDICTED VALUES, AND RESIDUALS

REP_ID	TREAT_ID	WT	WTP	WTR
--------	----------	----	-----	-----

Scatter plot of WTR versus WTP

## APPENDIX G. 1987 HUMID/SUB-HUMID ZONE TRIALS COOPERATORS

This appendix contains information about the cooperators in the F/FRED 1987 Humid/Sub-humid Zone Trials.

Dr. Kamis Awang

Dean, Fakulti Perhutanan  
Universiti Pertanian Malaysia  
Serdang Selangor  
Malaysia  
Telephone: 355-425, 356-101  
Cable: UNIPERTAMA SUNGAIBESI  
Telex: UNIPER MA 37454

Dr. Suree Bhumibhamon

Associate Professor  
Faculty of Forestry  
Kasetsart University  
Bangkhen, Bangkok 10900  
Thailand  
Telephone: 579-0171

Mr. Boonchoob Boontawee

Silviculture Research Sub-Division  
Division of Silviculture  
Royal Forest Department  
Bangkhen, Bangkok 10900  
Thailand  
Telephone: 579-0230-4

Mr. Ike Crisaldo

Director  
Ecosystems Research and Development Bureau (ERDB)  
College, Laguna 3720  
Philippines  
Telephone: 3277

Dr. Ta-Wei Hu

Department of Forestry  
Chinese Cultural University  
Yang-Ming-Shan, Taipei  
Taiwan, Republic of China  
Telephone: 311-6143, Ta-Wei-Hu (02)  
861-0511 x-391

Mr. Mohd. Lokmal B. Hj. Ngah

Forest Research Institute Malaysia (FRIM)  
Kepong  
52109 Kuala Lumpur  
Malaysia  
Telephone: Pejabat Am 626-2633  
Telegram: UTAN  
Telex: FRIM-MA 27007

Dr. Fuh Juinn Pan  
Taiwan Forestry Research Institute (TFRI)  
53 Nan-Hai Road  
Taipei, Taiwan  
Republic of China

Dr. Romeo S. Raros  
Visayas State College of Agriculture (VSCA)  
#8 Lourdes Street  
Pasay City, Metro Manila  
Philippines

Dr. K. M. Siddiqui  
Director  
Forest Products Research  
Pakistan Forest Institute  
Peshawar, Pakistan  
Telephone: 40344  
Telegram: PAKFI

Dr. Komar Soemarna  
Director  
Forest Research & Development Center  
Jl. Gunung Batu  
P.O. Box 66  
Bogor, Indonesia  
Telephone: 25111  
Cable: Puslithut

Dr. Kovith Yantasath  
Thailand Institute of Scientific  
and Technological Research (TISTR)  
196 Phaholyothin Road  
Bangkhen, Bangkok 10900  
Thailand  
Telephone: 579-1121 x-30  
Cable: TISTR, Bangkok

## INDEX

- Abstract
  - Citation, 116
- Abstracts, 114
- Abstracts Database, 114
- Abstracts
  - Printing, 123
- Amendments
  - Preplant, 56
- Analysis, 103
- Analysis Reports, 134
- Analysis
  - Kmod, 105
- Area
  - Plot, 37
- BUFFERS=, 125
- Citations, 114
- Clearing
  - Method of, 36
- Compilation, 133
- CONFIG.SYS, 125
- Count
  - Page, 10, 11
  - Record, 10, 11
- Damage
  - Tree, 95
- Data Entry Area, 10, 11
- Data Set, 104
- Data
  - Deletion, 9
  - Entry, 9, 13
  - Retrieval, 9
  - Weather, 60
- Database, 132
- Database Field, 132
- Database In Use, 10, 11
- Database Record, 132
- Database Structure, 132
- Database
  - Abstracts, 1, 19, 114
  - Experiment, 1, 21
  - Farm and Village Forestry, 105
  - MPTS Specialist, 1, 18, 106
  - Summary, 105
- Date
  - Planting, 56
- DBASE III Plus, 132
- Definition
  - General Measurements, 100
- Dependent Variable, 104
- Diameter
  - Basal, 72
  - DBH, 72
- DOS Commands
  - CD (Change Directory), 4
  - COPY, 4
  - MD (Make Directory), 4
  - PROMPT, 4
- DOS COPY, 125
- DOS Directory, 4
- DOS Error Messages, 127
- DOS PROMPT, 125
- Dry Wt, 90
- Elevation, 30
- Enhancements, 2
- Error Report Form, 129
- Experiment Database Main Control Flow,
- Experiment Description, 37
- Experiment Design, 37, 38, 51, 53
- Experiment Design
  - Completely Randomized, 51
  - Randomized Complete Block, 51
- Experiment Factors/Treatments, 38
- Experiment ID, 21
- Experiment Name, 37
- Experiment Planting, 56
- Experiment Site Preparation, 36
- Experiment
  - Log of Operation, 98
  - New, 23
- Experiments
  - Network of, 23
- Factor
  - Cutting Management, 40
  - Genotype, 40
  - Species, 39
- Farm and Village Forestry Database, 105
- Fields
  - Alphanumeric, 13
  - Date, 13
  - Numeric, 13
- FILES=, 125
- Flowering, 94
- Foliage Biomass Measurements, 80
- Foliage Dry Wt, 80

- Forms
  - Descriptor, 16
  - Error Report, 129
  - Experiment, 16
  - General, 16
  - Information, 16
  - Measurement, 17
  - Observation, 17
  - Operation, 17
  - Species, 16
- Fruiting, 94
- General Health, 95
- General Measurements, 99
- General Measurements Definition, 100
- General Tree Measurements, 101
- Hardware Requirements, 3
- Headings
  - Analysis, 134
  - Citation, 116
- Height, 72
- Help Window, 22
- ID
  - Climate Station, 131
  - Daily Weather Station, 131
  - Experiment, 15, 21, 25, 131
  - Institution, 15, 26, 130
  - Meteorological Station, 33
  - Network, 15, 23, 131
  - Reference, 116
  - Site, 131
  - Soil Pedon, 131
  - Species, 57
  - Tree Species, 131
  - Trial Site, 30
  - Village, 32, 131
  - Weather Station, 37, 61
- Information
  - Citation, 116
  - Cooperator, 28, 135
  - Institution, 26
  - Trial Site, 30
  - Weather Station, 60, 61
- Installation, 3, 4
- Institution Name, 130
- Introduction, 1
- Irrigation, 97
- Keyboard, 12
- Keys
  - Backspace, 12
  - Combinations, 12
  - Ctrl, 12
  - Cursor Control, 12
  - Del, 12
  - Enter, 12
  - Esc, 12
  - F1, 12, 22
  - F2, 12
  - F3, 12, 25
  - Function, 10, 11
  - Home, 12
  - PgUp/PgDn, 12
- Kmod Analysis Package, 105
- Land ownership, 32
- Latitude, 30
- Layer
  - Lower, 90
  - Upper, 90
- Log of Experiment Operation, 98
- Longitude, 30
- Mean
  - Arithmetic, 100
  - Calculated, 33
  - Geometric, 74, 78, 100
- Measured
  - Number of Trees, 72
- Measurement General Flow (Part I), 6
- Measurement General Flow (Part II), 7
- Measurements
  - Branches/Twigs, 86
  - Daily Weather, 60, 63
  - Foliage Biomass, 80
  - General, 99
  - Soil, 68, 70
  - Soil, Preplant, 69
  - Stems, 86
  - Tree, 72
  - Tree Litter, 90
  - Wood Biomass, 85
- Menu
  - Experiment Database Main, 21
  - Master, 5
  - Options, 10, 11
  - Scrolling, 8
  - Sub-Menu, Experiment Factors/Treatment, 38
  - Sub-Menu, Soil Measurements, 68
  - Sub-Menu, Weather Data, 60
- Mode, 10, 11

Mode  
   Add, 9  
   Delete, 9  
   Modify, 9  
   Search, 9  
 MPTS Specialist Database, 106  
  
 Name  
   Institution, 26  
 Network of Experiments, 23  
 Networks and Experiments Window, 24  
 Nutrients, 80, 90  
  
 Objective, 37  
 Observation  
   Tree Damage, 95  
   Tree Phenology, 94  
 OM (Organic Matter), 90  
 Options  
   Choosing, 8  
   Operations, 8  
  
 Plot Assignments, 51  
 Plot  
   Data Format, 73  
   Number, 51  
   Observation, 32  
   Protection, 32  
 Precipitation, 63  
 Preplant Soil Measurements, 68  
 Primary land use, 32  
 Principal Investigator, 28  
 Problems  
   Execution, 128  
   Installation, 127  
  
 Quicksilver, 133  
  
 Rain Gauge, 63  
 Relative Humidity, 63  
 Replication, 51  
 Requirements  
   System, 3  
 Residue, 36  
 Reverse Video, 13  
  
 Screen, 10, 11  
 Seeds  
   Lot Number, 57  
   Origin, 57  
   Supplier, 57  
 Site Descriptor  
   Climate, 33  
   Socioeconomic, 32  
   Soil, 35  
  
 Site Name, 30  
 Software Requirements, 3  
 Soil Cultivation  
   Method of, 36  
 Soil Measurements, 68  
 Soil  
   Classification, 35  
   Color, 35  
   Drainage, 35  
   Layers, 70  
   Moisture, 56  
   Moisture Regime, 35  
   Parent Material, 35  
   Pedin Number, 35  
   Site Descriptor, 35  
   Taxonomy, 35  
 Spacing  
   Between Rows, 56  
   Within Rows, 56  
 Specific Gravity, 85  
 Starting IADSS, 5  
 Station  
   Meteorological, 33  
   Summary Database, 105  
   Survival, 72  
   Survival Rate, 74  
  
 Temperature  
   Maximum, 63  
   Minimum, 63  
 Titles  
   Analysis, 134  
 Topography, 30  
 Treatment, 46  
 Treatment Combinations, 38, 46, 48  
 Treatment Factors and Levels, 38, 39  
 Treatment Number, 48  
 Treatment  
   Single-Factor, 46  
   Two-Factor, 46  
 Tree Age, 74  
 Tree Damage Observation, 95  
 Tree Litter Measurements, 90  
 Tree Measurements, 72  
 Tree Phenology Observation, 94  
 Tree Species, 57  
 Tree  
   Data Format, 73, 77  
   Number, 51  
 Trees Measured, 74  
 Troubleshooting, 126

- Variable
  - Dependent, 104
- Vegetation
  - Control of Competing, 56
  - Existing, 36
- Village
  - ID, 32
  - Name, 32
- Weather Data, 60
- Window, 10, 11
- Window
  - Environmental Zones, 111
  - Geographic Regions, 111, 118
  - Main Headings, 120
  - Networks and Experiments, 24
  - Professional Responsibility, 109
  - Species, 110, 119
  - Sub Headings, 120, 121
  - Subject Fields, 110
- Wood Biomass Measurements, 85
- Wood Dry Wt, 85