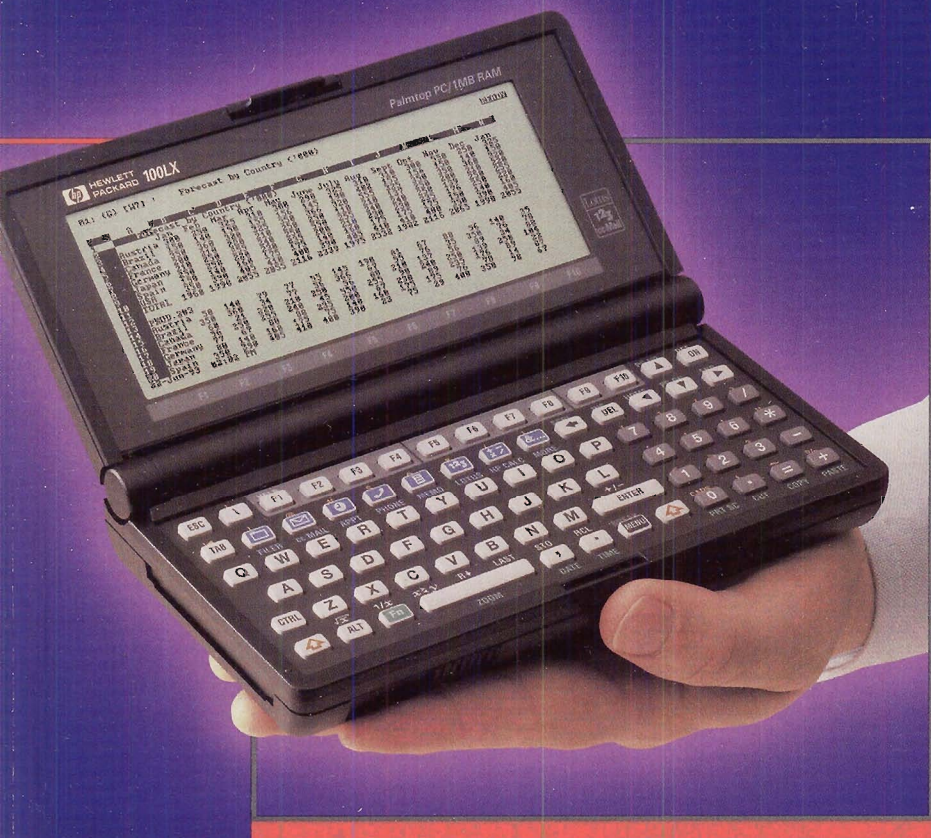




HEWLETT  
PACKARD

# HP 100LX User's Guide



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# **HP 100LX User's Guide**

## **and Examples**



**HEWLETT  
PACKARD**

**HP Part No. F1020-90001  
Printed in U.S.A.**

**Edition 3**

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## **Edition History**

Edition 1 .....	March 1993
Edition 2 .....	May 1993
Edition 3 .....	June 1993

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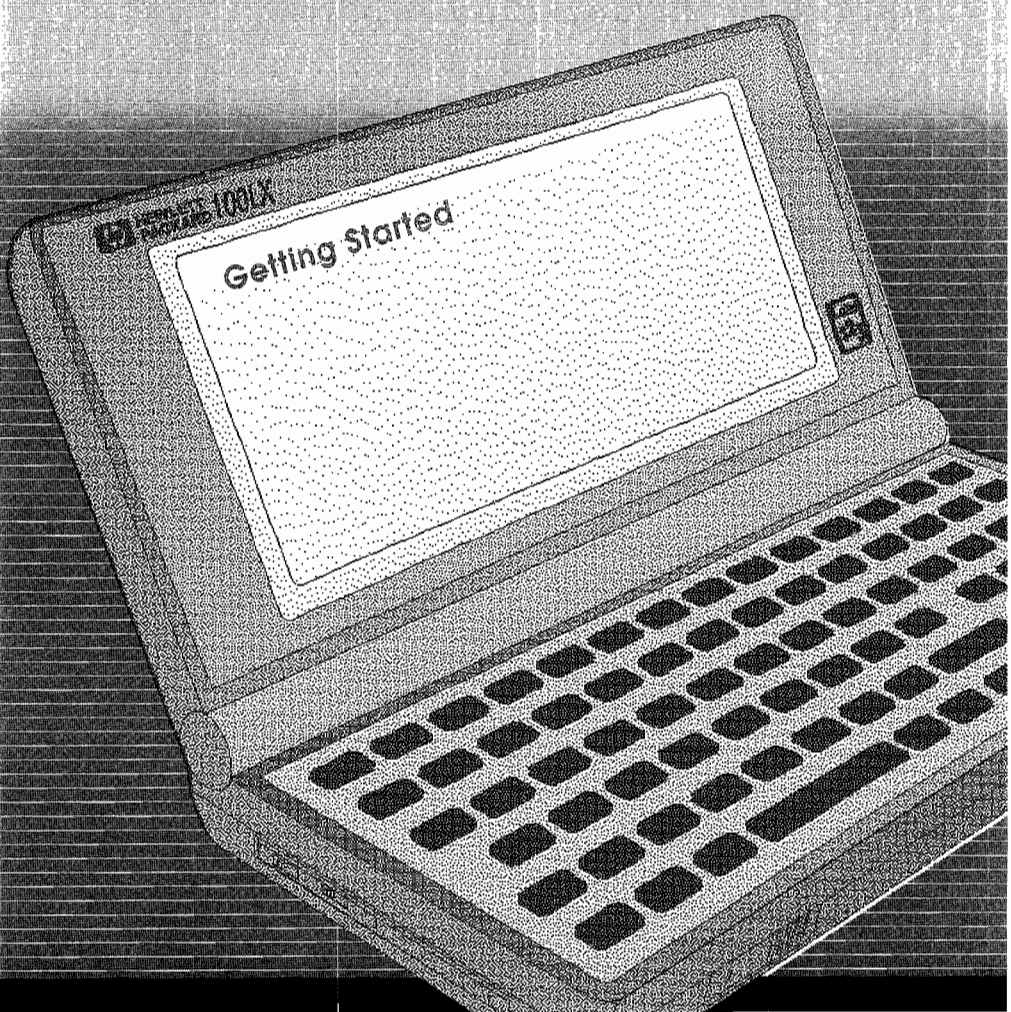
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# PART 1





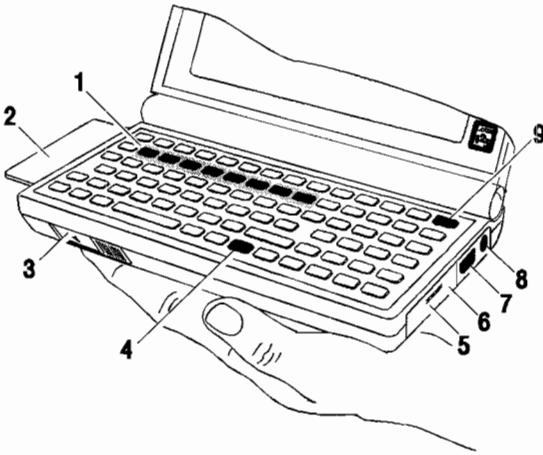
# First Things First

---

**Before You Begin.** Install the batteries, adjust the display contrast, set the time and date, and fill out the business card as described at the beginning of the *HP 100LX Quick Start Guide*.

---


## A Look at the HP 100LX



- |                                |  |
|--------------------------------|--|
| 1. Application keys            | 6. IR port (Infrared radiates through the plastic) |
| 2. Plug-in card slot (drive A) | 7. Serial port                                     |
| 3. Card-eject slide switch     | 8. AC adapter jack                                 |
| 4. Menu key                    | 9. ON/OFF key                                      |
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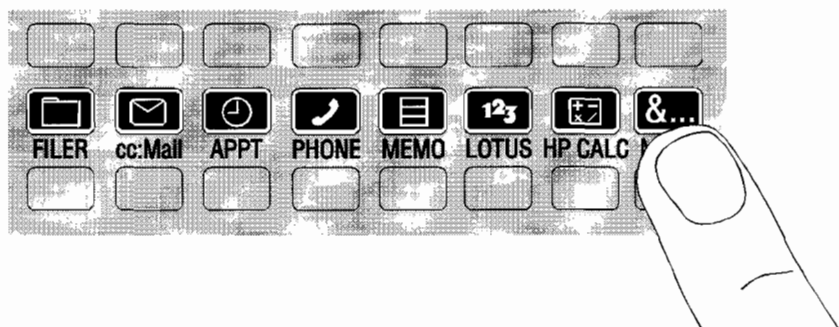
## 1 Hardware Features

Among the HP 100LX's hardware features are:


- A rugged “clamshell” design, which protects the keyboard and display when you're on the go.
- A CGA-compatible, 80× 25 character display with a “zoom” capability for text-based applications.
- A PCMCIA 2.0 compatible plug-in card slot.
- An Infrared (IR) port for wireless HP 100LX to HP 100LX and HP 100LX to HP 95LX communications.
- A serial port for HP 100LX communications to a PC, modem, printer, or other serial device.
- A typewriter keyboard layout with a “sticky” shift key—you don't need to hold down  while you press another key; you press it to activate it and then press the other key. Shifted key definitions are shown in orange on the keyboard.

## Software Features

The second row on the HP 100LX keyboard contains a set of blue application keys.



**Blue Application Keys**

These keys enable you to run the HP 100LX built-in applications. The last key in the row, , gives you access to additional built-in applications that show up in the display.





**More Applications Screen**

**The Built-in Applications**

Press	To Start	Press	To Start
	The Filer	S	The Setup Utility
	cc:Mail	C	Datacomm
	The Appointment Book	W	The Stopwatch
	The Phone Book	B	The Database
	The Memo Editor	N	The Note Taker
	Lotus 1-2-3	D	MS-DOS
	The Calculator	T	World Time
	The App Manager	M	System Macros

**Note**



Help is always available within any application by simply pressing the **F1** key (**CTRL**+**F1** in Datacomm). Because it's built in, the HP 100LX help system is a portable quick-reference guide.

**Switching Applications.** A special feature of the HP 100LX software is the ability to switch from one application to another without having to close the first application. That makes it easy to interrupt your work temporarily and then find your place again with a minimum of disruption. For example, you could find yourself in the middle of editing a 1-2-3 worksheet when you want to check an appointment and phone number. You would simply press to get into the Appointment Book to check your appointment; then press to get into the Phone Book; and then when you're done, press to get back into 1-2-3 *exactly where you left off*.

---

# Managing HP 100LX Memory

## Types of Memory in the HP 100LX

**ROM.** Permanent memory that contains the built-in applications and that cannot be erased or overwritten. ROM contains a permanent ROM disk, which is designated drive D.

**System RAM.** Workspace for open applications. Open spreadsheets and memos that haven't been saved reside here.

**RAM disk.** Storage space for saving files when you're done working on them. The RAM disk is designated drive C and is used just like a hard disk on a PC. (The RAM disk and system RAM share the total amount of built-in RAM. You can view and change their sizes by following the instructions on page 3-6.)

**Memory cards.** Plug-in memory for additional storage space for data and programs. The plug-in slot is designated drive A, and memory cards are used like floppy disks on a PC.

## Saving Data

Data that you enter using most of the HP 100LX applications is saved *automatically* when you enter it. Except in 1-2-3, the Memo Editor, and the Calculator, you do not need to "save" a file or quit the application to make changes to a file permanent. The stored file (either on drive A or C) is changed as you edit it.

However, in 1-2-3, the Memo Editor, and the Calculator a stored file is not changed until you formally save changes. A worksheet or memo is copied into system RAM where it is edited. When it is saved, the changed copy is moved back to drive A or C and, unless you save it under another name or path, it overwrites the original copy.

All HP 100LX applications follow standard MS-DOS conventions for file and path names (described in chapter 7).

---

### Note



Your HP 100LX contains a directory on drive C called `_DAT`. You should not remove or rename this directory because it is used by several of the built-in applications.

---

## Backing Up Data

It's a good idea to regularly back up drive C like you would any PC hard disk. Use the Filer to copy the files to a memory card or, if you have the Connectivity Pack, to a PC. The Filer backup procedure is described on page 4-13 with examples on page 4-28.

## Additional Memory Concepts for the Built-in Applications

**Open application.** An open application (started by pressing its blue application key) is open until you explicitly quit it—even if it is not displayed because other applications are open also. As long as an application is open, it uses system RAM.

**Active application.** The topmost open application—the one being displayed.

**Quitting (or closing) an application.** When you quit an application it is no longer open and therefore uses no system RAM.

**Current file.** The current file in a given application is the open, displayed file.

**Opening a file.** When a stored file is opened in an application, you can view and modify it.

**Saving a file.** When you save a file, it is stored in the directory and with the name you specify.

**Saving changes.** When you save changes to a memo, 1-2-3 worksheet, or Calculator file, any existing file of the same name and path is updated. Changes to files in the other HP 100LX applications are automatically saved as you make them.

## 1 Using Memory Cards

Your HP 100LX supports PCMCIA 2.0 compatible memory cards, which enable you to significantly expand data and program storage. Terms you sometimes hear that refer to memory cards include **mass storage cards**, **PC cards**, **flash cards**, **flash disks**, and **RAM cards**.

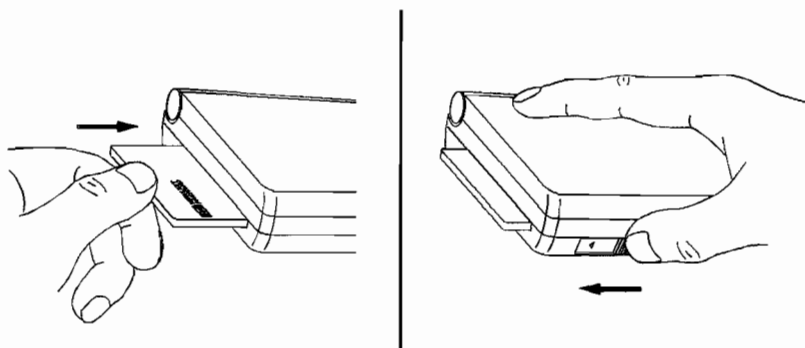
A memory card plugged into your HP 100LX is designated drive A, and you use it just like you would use a floppy disk on your PC.

At the time of this writing, HP provides two flash memory cards (called Flash Disks) for your HP 100LX: the HP F1012A (5 MB card) and the HP F1013A (10 MB card). Flash Disk cards from HP come already formatted and ready to use. See your dealer for purchase information.

### To Insert and Remove a Card

**Important:** Turn off the HP 100LX before inserting or removing a plug-in card. To insert a card, hold it with the logo on top and push it in the slot on the left side of the HP 100LX until you feel that it won't go in any further. A fully-inserted card is flush with the HP 100LX case.

To remove a card, slide the card-eject switch to the left.



Inserting and Removing a Card

---

## Resetting Your HP 100LX

---

### Caution



Resetting the system erases the contents of system RAM (but not the RAM disk). Therefore, any data not already saved will be lost.

---

If your HP 100LX fails to respond to keystrokes or otherwise behaves unusually, you should reset it by doing a **system reset** (also called **rebooting** the computer). You perform a system reset by holding down **CTRL** and **ALT** and then pressing **DEL** (**CTRL**+**ALT**+**DEL**).

(Note that at the point of resetting the system you have the option of changing the default drive and startup file-processing. For more information see “Reboot Options” on page 7-2.)

If a system reset doesn't work, as a last resort you can attempt a **hard reset** by pressing **CTRL**+**↑**+**ON**. You will be asked whether or not you want to initialize the RAM disk, which erases its contents. If you type y (for yes) and press **ENTER**, a hard reset will occur; if you type n (for no) and press **ENTER**, a system reset is attempted.

---

### Caution





A hard reset erases the contents of system RAM *and* the RAM disk. Therefore, you should use this procedure with the understanding that all of your data on drive C (the RAM disk) will be lost.

Also, a hard reset causes any HP 100LX settings you changed via the Setup Utility to revert to their default states. For example, if you previously enabled charging for rechargeable batteries, you'll have to do it again after a hard reset.

---


## 1 Battery-Saving Tips

Here are a few tips to help you get the most out of the batteries in your HP 100LX:

- Use rechargeable batteries as described on page A-3.
- Use the HP F1011A adapter whenever possible—when you're using the HP 100LX and when you're storing it.
- Quit cc:Mail, Datacomm, and the Filer (press  ) when you're not using them. These applications use the serial port and therefore require slightly more power than the other applications.
- When you see the message telling you that the main batteries are low, replace them (or recharge them) as soon as possible. This will make sure that you get the most out of your backup battery. See appendix A for instructions on changing batteries.
- Always install fresh, high quality batteries of the same brand.
- Remove high-current plug-in cards—this does not include memory cards—when you're not using them. For example, plug-in modem cards are notorious for draining batteries quickly, *even when you're not using the modem*. Therefore, be sure to take out a modem card when you're not using it, and when you are using it, try to use the ac adapter.

## Navigating the Keyboard and the Display


---

This chapter explains how to use the keyboard and interpret the display. It answers questions like, “How do I select a menu command?”, “What is a menu command?”, and “What’s that  key for?”

---

### Application Screens

#### To start an application:

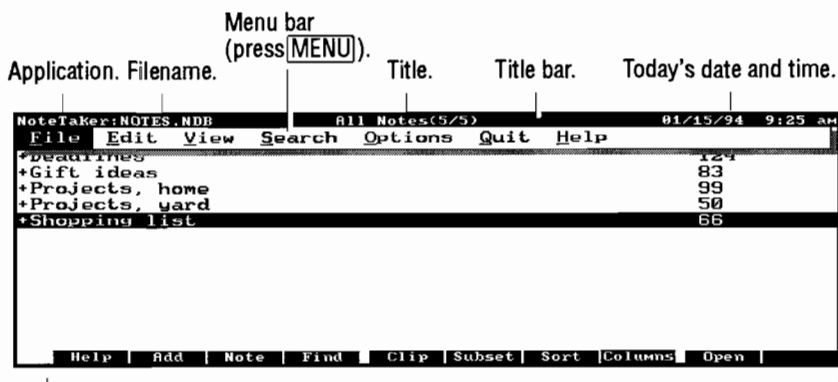
- Press its blue **application key**.
- If the application is not on the keyboard, press , then press the underlined letter as shown.

#### To quit an application:

- Press  .

It is not necessary to quit one application before starting another.

## 2 The Elements of an Application Screen



Function-key labels for top-row keys.

### An Application Screen

- **Title bar:** holds status information.
- **Title:** identifies the particular screen.
- **Menu bar:** displays the menu of commands. Press **MENU** or **ALT** to display the menu bar. (If the computer beeps, you need to press **ESC** first.)
- **Function-key labels:** show current functions for the keys **F1** to **F10**.

## Controlling the Display Size with ZOOM

### To change the size of the characters:

ZOOM affects the size of the displayed characters in text-based applications, such as the Memo Editor and 1-2-3.

- Press **Fn**ZOOM (on the **spacebar**). ZOOM cycles through three different display sizes (1-2-3 uses only the first two):
  - **80 columns × 25 lines.** This fits as much information on the HP 100LX display as on your PC. This is the default size for many PC DOS applications. It produces the smallest characters.
  - **64 columns × 18 lines.** This is the display size for the HP 100LX for the built-in applications *other than* 1-2-3.



- 40 columns × 16 lines. This produces the largest characters.

## PIM Application Views: List and Record

The HP 100LX Personal Information Management (PIM) applications (Appointment Book, Phone Book, Note Taker, Database, World Time) present information in two major **views**:

- The **data list** summarizes each record with a one-line entry.
- The **data record** shows you all the information for one **item** (list entry). For instance, an appointment record contains everything about your 10:00 appointment (when, where, how long, what for, and so on).

### The Data List

This lists the data records in the current application file. Each record has a one-line entry.

Current item in list.

ApptBook: APPT.ADB		Appointments		01/12/94 5:57 PM	
Week 3	Wednesday	January 12, 1994	European office		12/353
8:00a	Teleconference				
9:00					
10:00	Staff meeting				
11:00					
12:00p	Group luncheon				
1:00					
2:00					
3:00	Call MJ				
4:00					
5:00					
6:00					
7:00					
8:00	Fund raiser				
9:00					
10:00					

Help | Add | Note | Find | Goto | 6 Month | Month | Week | ToDo

### An Appointment List

- Use **▲** and **▼** to highlight any item and scroll through the list. To jump further, use **Fn**HOME, **Fn**END, **Fn**PG UP, and **Fn**PG DN.
- Press **ENTER** to display the complete record of the highlighted item.
- Press **F2** (Add) to add a new item.

### The Data Record

The record defines each item in detail. The data appear in labeled fields.

Appt Book: APPT.ADB	Appointment/Event	81/12/94	6:88 pm
Description	Staff meeting		
Start Time	10:00am	Start Date	1/12/1994
End Time	11:30am	No. Consecutive Days	1
Location	West wing		
Alarm	Views		
<input checked="" type="checkbox"/> Enabled	<input checked="" type="checkbox"/> Week <input checked="" type="checkbox"/> Month		
Leadtime: 5	Repeat Status: None		
Note	Bring report on construction		
Help   Add   Note   Find   Clip   Calendar   Repeat   Cancel   Done			

Note field.

Pressing **(F10)** saves the record as is and closes it.

### An Appointment Record

- Use **(TAB)** or **(↑)(TAB)** to move from field to field.
- Press **(ALT)**+underlined letter to move directly to a field. In the above example, **(ALT)**+**(N)** moves the cursor to the Note field.
- Press **(F10)** to save and close the record.
- Press **(ESC)** or **(F9)** to cancel changes or new additions to a record.
- The Note field provides an area for text entry and editing. Pressing **(F3)** (Note) provides a full-screen area for text editing.

## Screen Annunciators

**Annunciators** displayed on the screen indicate certain conditions that are in effect.

Annunciator	Meaning	Location
↑	The <b>(↑)</b> shift is on.	Lower corner. <sup>1</sup>
✳	The <b>(Fn)</b> shift is on.	Lower corner. <sup>1</sup>
⌘	Insert mode. Cursor shows underlying character.	
⌘	Replace mode. Cursor hides underlying character.	
	End of text field.	Cursor.
_ (underscore)	Cursor for 1-2-3.	
▲	Caps Lock is on.	Lower corner. <sup>1</sup>
⌘	Busy. The HP 100LX is processing information.	Center.

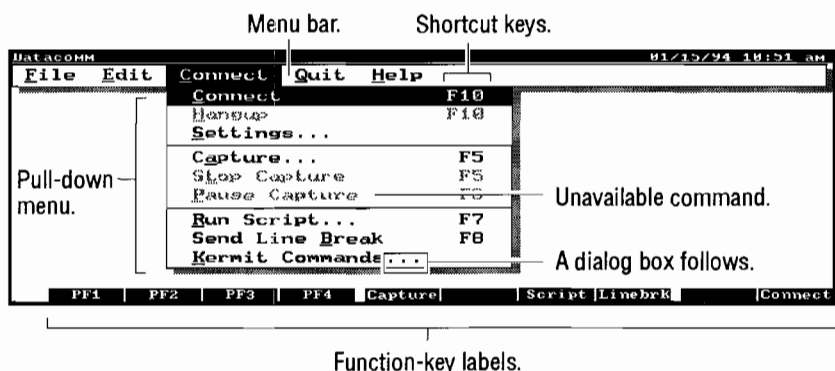
<sup>1</sup> Lower right for 1-2-3 and DOS screens; lower left for other applications.

## Menus

There are three ways to perform HP 100LX operations:

- Using **keys** that perform operations, like **ESC** and **DEL**.
- Using **function keys** (**F1** through **F10**), which perform the operations shown on the current **function-key labels**.
- Using menu **commands**, which appear in **pull-down menus** under the menu bar.

All commands appear in menus. Most of the more common ones also appear on function-key labels. Many others are on the keyboard.



### Menu Commands and Function Keys

- **Menu bar.** Press **MENU** or **ALT** to display it. To select a command, press the underlined letter key (press **F** for File, for example) *or* highlight the command (press an arrow key) and press **ENTER**.
- **Pull-down menu.** Shows the commands under the menu item. To select a command, press its underlined letter.

**Unavailable command.** If a command appears dimmed (“grayed”), then it is not available in this context.

**Ellipsis ( ... ).** This command will display a **dialog box** to solicit more information.

**Shortcut keys (hot keys).** You can press these keys *instead of* displaying menus and selecting commands. For instance, pressing **F5** in Datacomm is a shortcut for **MENU** **C** **A** (Connect Capture).

- **Function-key labels.** The currently active functions for the corresponding top-row keys (F1) through (F10).

### To scan the menu commands:

1. Press (MENU).
2. Press (ENTER) to pull down the first menu.
3. Press (▶) to move across the main menu, displaying each pull-down menu.

This gives you an overview of the features available in an application.

### To cancel a menu:

- Press (ESC).

This returns the previous display.

---

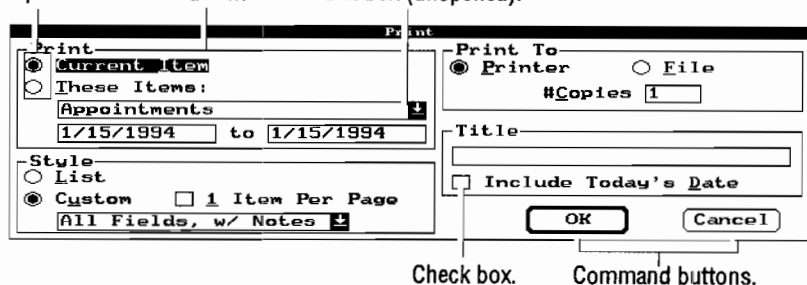
## Using Dialog Boxes

**Dialog boxes** appear in response to certain commands or functions that require more information from you. A dialog box appears shaded and on top of its parent screen, indicating that it arises from a broader context.


If you are asked for information, you can specify it by typing it in or by selecting an option from a list box. Labeled function keys are available for certain standard responses.

## The Elements of a Dialog Box

Option buttons. Current field. List box (unopened).



A Dialog Box: Print Specification

- **Current field.** Your current position is shown by a highlighted field or by a cursor in a box.
- **Option buttons.** Options in the same group box are mutually exclusive, so you can select only one. An option button might include a list box for further choices.
- **List box.** A list box offers a list of choices. **Drop-down** list boxes initially are closed, as in the picture above. A closed list box shows one line—the current selection.
- The  indicates a **list box** that you can open to display more lines. Press **(ALT)+(▼)** simultaneously to open it. **(ALT)+(▲)** closes it.)
- **Check Box.** Select as many check boxes as you want.
- **Text box.** You can type information here. The top box in a list box is also a text box, but some list boxes are not editable (changeable).
- **Function keys.** The functions change with the context, except for **(F1)** (Help), **(F9)**, and **(F10)**. Press **(F10)** (OK) when you are finished filling out the dialog box. Or press **(F9)** (or **(ESC)**) to cancel any changes.
- **Command buttons.** Large, rounded boxes for OK, Cancel, and a few other commands. *All command buttons are also available as function keys.*

## 2 Navigating Dialog Boxes and Records

### To move to a field (in a record or a dialog box):

- From *any* field, simultaneously press **ALT**+underlined letter.  
*Or*
- Tab to the field (**TAB** or **↵** **TAB**).

### To select an option button:

- Simultaneously press **ALT**+underlined letter.  
*Or*
- Tab to the option-button group, and then arrow to the specific option to turn it on.
- If there is a box next to the option button, press **TAB** to move to it and fill it in or make a selection.

### To check and uncheck a box:

- Simultaneously press **ALT**+underlined letter.  
*Or*
- Tab to the check box, and then press **spacebar**.

### To use a command button:

There is always a default, outlined command button, usually the “OK” button.

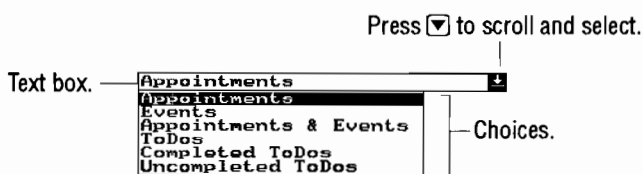
- Press **ENTER** to execute the default command button.  
*Or*
- Press the corresponding function key (e.g. **F10** for OK).  
*Or*
- Press **ALT**+underlined letter simultaneously.  
*Or*
- Tab to a different command button and press **ENTER**.

### To use a list box:

List boxes offer a choice of options. Some list boxes are editable; that is, you can add your own choices.

- Select the list box first, such as by tabbing to it.

- To open a list box, simultaneously press **ALT**+**▼**. (The **\_** under the arrow stands for **ALT**, just as an underlined letter stands for the keystrokes **ALT**+letter.)
- To scroll through a list box, press **▼** or **▲**. This automatically changes the selection shown in the text box on top.
- To quickly locate an item in a *non-editable* list box, type its first letter (or more). The highlight bar moves to the next item starting with that letter. (If the list box is editable, then typing edits it.)
- To close a list box, press **ALT**+**▲** or **ESC**.



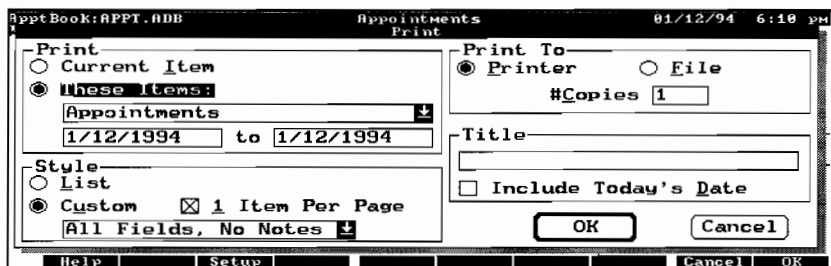
**An Open List Box**

### To complete or exit a dialog box record:

- Press **F10** to save what you've specified.  
*Or*
- Press **ESC** or **F9** (Cancel) to cancel what you've specified.  
*Or—in a dialog box only—*
- Press **ENTER** to execute the command button that is “on” (highlighted). (Record screens have no command buttons.)

**Example: Practice Filling In a Dialog Box.** You can practice the techniques described in this section by calling up a File Print dialog box. Record screens have many of these same elements.

1. Press **⏪** **MENU** **F** **P** for the Appointment Book's File Print dialog box.

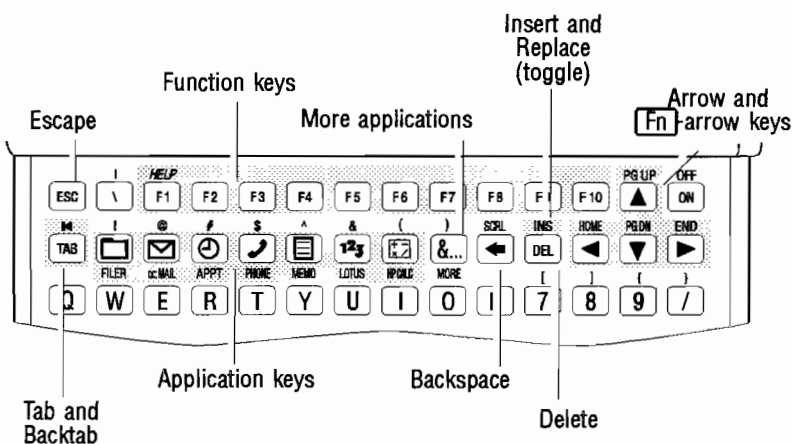


2. Practice navigating and filling in the fields.
3. Practice turning on option buttons, marking check boxes, opening a list box, and scrolling through it.
4. Press **ESC** to cancel what you've done.
5. Press **MENU** **Q** to quit the application.

## A Look at the Keyboard

These diagrams of the keyboard call out keys with special functions.

### Keyboard—Upper Part





**Escape.** Cancels or “backs out” of the current context.

**Function keys.** (F1) is always HELP. The other function keys change their operations according to the labels along the bottom of the screen. (Some external applications may use (F11) and (F12), accessed as (Fn) (1) and (Fn) (2).)

**More.** Provides access to all applications.

**Insert.** Toggles between text-overwrite and text-insert.

**Arrow keys.** Move the cursor in text or move the highlight bar in a list of items. The (Fn)-shifted arrow keys move the cursor or bar further: to the top of the file or the beginning of a line (HOME), to the bottom of a file or end of a line (END), or by pages (PG UP, PG DN).

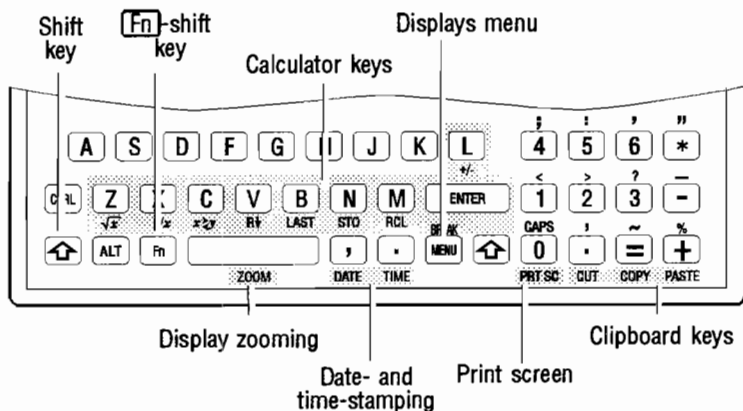
**Tab and backtab.** Move the cursor among data fields, such as when you are filling in fields of information.

**Application keys.** Immediately start the specified application.

**Delete.** Deletes a character at a cursor or a highlighted item in a list.









## Keyboard—Lower Part



**MENU key.** (MENU) displays the current menu of commands. ((ALT) doubles for (MENU) except in 1-2-3, where (//) is used.)

**Calculator keys.** In the Calculator application *only*, these keys are redefined by the symbols underneath them. These are *not* shifted.

**Shift.** Operations and characters printed in orange *above* the keys are shifted. Press  first, then the key. You do *not* need to hold  down while pressing the second key. To cancel the shift mode, press  again.









**Function shift.** Operations printed in green *below or above* the keys are Fn-shifted. Press  first, then the key. You do *not* need to hold  down while pressing the second key. To cancel the shift mode, press  again.

**ZOOM.** Switches the resolution of the display. The effect varies from application to application.

**Date and Time stamping.** Insert the current date and time into the current text line in built-in applications.

**Clipboard keys.** To cut, copy, or paste selected items or text and save them in the Clipboard buffer.

## Cancel and Undo Operations

Function or Command	Purpose
	Cancels the current activity and restores the previous screen.
Cancel (  )	Cancels dialog boxes without taking any action. Also closes open records without saving new information.
Break (  +BREAK)	Sends a standard PC break.
Quit (   )	Closes the current (active) application.
Undo (    )	Reverses the last data-altering or file-altering action, such as deleting, editing, cutting, or pasting records, or merging files. Undo does not work in all situations; check the Edit menu for it. You can also undo an undo operation.

## The Clipboard: Copying, Cutting, and Pasting

The Clipboard is a buffer that saves the last item that was copied or cut. The Clipboard operations are COPY, CUT, and PASTE. The **DEL** operation does not use the Clipboard. The Edit Undo command does not work with the Clipboard.

### Clipboard Operations

Keystrokes	Effect
<b>Fn</b> COPY	Copies the highlighted item or text or field into the Clipboard buffer.
<b>Fn</b> CUT	Deletes the highlighted item or text or field and stores it in the Clipboard buffer. <b>DEL</b> acts like CUT <i>without</i> saving to the Clipboard buffer.
<b>Fn</b> PASTE	Copies the item or text or field from the Clipboard buffer into the list or text field where the cursor is.

### To highlight a range of text:

- Move the cursor to the beginning of the text, then press **↑**+**→** to highlight the range you want.

Pressing any arrow key cancels the highlighting.

### To move or copy a piece of text:

1. Highlight the desired text range.
2. Press **Fn** CUT to move the text, or press **Fn** COPY to copy it.
3. Move the cursor to the new location for the selected text. (This can be in a different application.)
4. Press **Fn** PASTE.

### To move or copy an item in a list:

1. Highlight the item.
2. Press **Fn** CUT to move the item, or press **Fn** COPY to copy it.
3. Move the cursor to the new location for the item. (This can be in a different application.)
4. Press **Fn** PASTE.






You cannot move or copy more than one item at a time.

## About Moving and Copying an Item in a List

Copying or cutting an entry in a list copies its entire data record to the Clipboard buffer. Within an application screen you can move an entire entry (such as an appointment) around. Across applications, however, an entry can be moved or copied only as a piece of text, not as a complete record. For example, you cannot copy a Phone Book record to a Database list. However, you can copy its data fields (as unformatted text) to the Note field of a Database record or to a memo in the Memo Editor.

The format of the item that COPY or CUT copies into the Clipboard buffer is determined by the first Smart Clip definition. (See page 17-18.) By default, COPY and CUT copy all fields of the item into the Clipboard.

### To delete a piece of text:



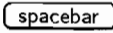


1. Highlight the desired text range. (Press +.)
2. Press CUT or . CUT stores the deleted text in the Clipboard buffer, while  does not.

## Selecting Items in Lists

Some operations can act on more than one item in a list at a time. You can, for instance, delete several Phone Book entries at a time by first **selecting** and then deleting the desired items (names).

You can **select** items in most lists of records or files.

### Selecting and De-Selecting

Keystrokes	Effect
	Selects or de-selects an item in a list, marking it with a ♦.
 	Selects or de-selects <i>all</i> items in a list.
 + 	Selects a range in a text field by highlighting it. (Use any arrow key.)

### To select items in a list:

1. Highlight the item. (Press **▲** or **▼** to move the highlight bar.)
2. Press **spacebar**. This marks the item with a ♦. (This is a toggle: pressing **spacebar** again de-selects.)
3. Repeat to select more items.

To select all items at once, press **⏏ spacebar**. This is also a toggle.

### Deleting Items in Lists

#### To delete items in a list:

1. Highlight the item.
2. If you want to delete more than one item, select each item (press **spacebar**).
3. Press **DEL F10** to delete all selected items.

**Example: Deleting Three Phone Book Items.** Select Austin, Brumal, and Davis. (Arrow to a name, then press **spacebar** to select it.)

```
♦Austin, James           750-9001
  Billings, Jane        912-5538
♦Brumal, George         788-2127
  Cord, Kenneth         555-8761
♦Davis, Charles         763-9967
```

Then press **DEL F10** to delete them. This leaves:

```
Billings, Jane          912-5538
Cord, Kenneth           555-8761
```

---

## 2 Standard Menu Commands

Every application has its own set of menus. However, there is a core group of menus that is common across most applications, particularly those for Personal Information Management. Because of the different purposes of the different applications, not all the standard commands are in every application.

Pressing **⌘** in an application displays its main menu. The **standard menu commands** are:

```
File Edit View Options Quit Help
```

- **File menu:** To manage files, such as opening, copying, and printing.
- **Edit menu:** To edit text or entire records, such as copying, deleting, and undoing.
- **View menu:** To display different portions or perspectives of information, such as subsets, split screens, and mail lists.
- **Options menu:** The options vary widely among applications.
- **Quit:** To exit the current application.
- **Help menu:** To read online Help information.

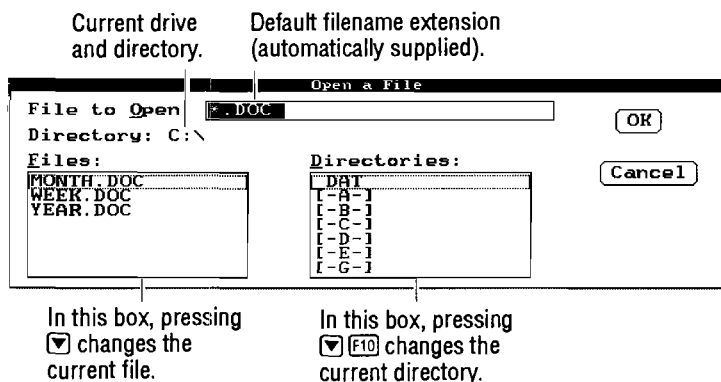
Many menu commands have alternative access on function keys or keyboard keys. For instance, the Edit menu includes Delete, which is the same as pressing **⌫**.

---

## Using File Commands

### Specifying Files

Many File commands in PIM, the Calculator, cc:Mail, and Datacomm ask you to specify a file name to act upon. For more information on file naming, see chapter 7.



**Dialog Box for File Open**

To specify the file name in a dialog box like this, you can either:

- Type in the full file name yourself; or
- Select the file name and/or directory using the Files and Directories list boxes. This is a memory aid if you don't remember all the existing directory and file names. It is also a shortcut to typing.

### To type the file name yourself:

1. Type the file name into the file name text box. If the current directory shown below this box is not correct, then type the full path name (*drive:\directory\... \filename*).
2. Press  F10.

### To select the file using the list boxes:

- If the Files box shows the file you want, tab to the Files box and highlight the file name. Press  F10.
- If Files does not show the file you want, then check other drives and directories:
  1. Tab to the Directories box and highlight the directory or drive you want. Drive specifications appear as [A-], etc. The parent directory appears as ...
  2. Press  F10 (or  ENTER) to change the current directory or drive and display its files.

3. If the file you want appears in the Files box, then select the Files box (press **(ALT)+(F)**), highlight the file you want, and press **(F10)**.

### To view files in the current directory (wildcards):

You can use wildcards to display all files matching a certain name pattern. The wildcard \* stands for any number of characters. The wildcard ? stands for any one character.

1. In the file name text box, type the file names you want to search for. For instance, \*.doc stands for all files with the extension .DOC.
2. Press **(F10)**. This displays a list of matching files in the Files box.

## Translating HP 95LX Files

### To use HP 95LX files in the HP 100LX:

The File Open command automatically copies and translates HP 95LX Appointment Book and Phone Book files to HP 100LX-compatible files. HP 95LX Memo files (.TXT) do not need to be translated.

1. Copy the HP 95LX file to the HP 100LX using the infrared port (using the Filer, chapter 4), or copy the HP 95LX file onto a plug-in memory card that you can plug into the HP 100LX.
2. Open the matching application in the HP 100LX for the HP 95LX file you have: Appointment Book (HP 95LX file .ABK) or Phone Book (HP 95LX file .PBK).
3. Press **(MENU) (F) (O)** (File Open).
4. Type in the exact file name of the HP 95LX file. Be sure to include the full path name. (If the file is in a plug-in card, it is in drive A.)
5. Press **(F10)**.

The computer requires some processing time to copy the HP 95LX file and translate it to a HP 100LX file with a new file name extension (.ADB for Appointment Book and .PDB for Phone Book). The time depends on the size of the file.



## Setting Passwords for Files

You can attach a password to a PIM or 1-2-3 file to protect it. *Once you set a password for a file, the file is not retrievable without the password.*

Rules for the password:

- It will be case-sensitive.
- It can have up to 16 characters.
- Any characters, including spaces, are valid.

### To set or change a PIM file's password:

- Press **Ⓜ** **F** **W** (File Password) and follow the directions.

To password-protect a 1-2-3 file, see “Password Protection,” in chapter 9.

### To delete a PIM file's password:

- Use **Ⓜ** File Password and leave the new password blank. (Do not press **spacebar**.)

---

## Getting Answers Fast: Online Help

The fastest way to get information about how to use any application is to use the built-in **online Help** information.

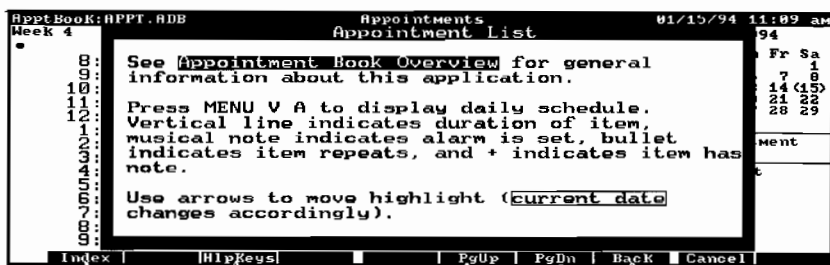
Press **F1** at any time to see **context-sensitive Help**; that is, information regarding your current situation on the HP 100LX (the current menu, display, or pending operation). (In Datacomm application, press **CTRL**+**F1**.)

The Help menu offers different types of Help. Press **Ⓜ** **H** to display it.

## The Help Commands

Command	Description
Index	List of Help topics for the current application.
Getting Started	Basic use of the HP 100LX. Not application-specific. A good place to start learning about the HP 100LX.
How to Use Help	Keystrokes in the Help system.
About <i>application</i>	Copyright and version information.

Here is a typical help screen from the Appointment Book:



Help index. Help instructions.

Other pages of  
the same topic.

Previous Help Exit Help.  
topic.

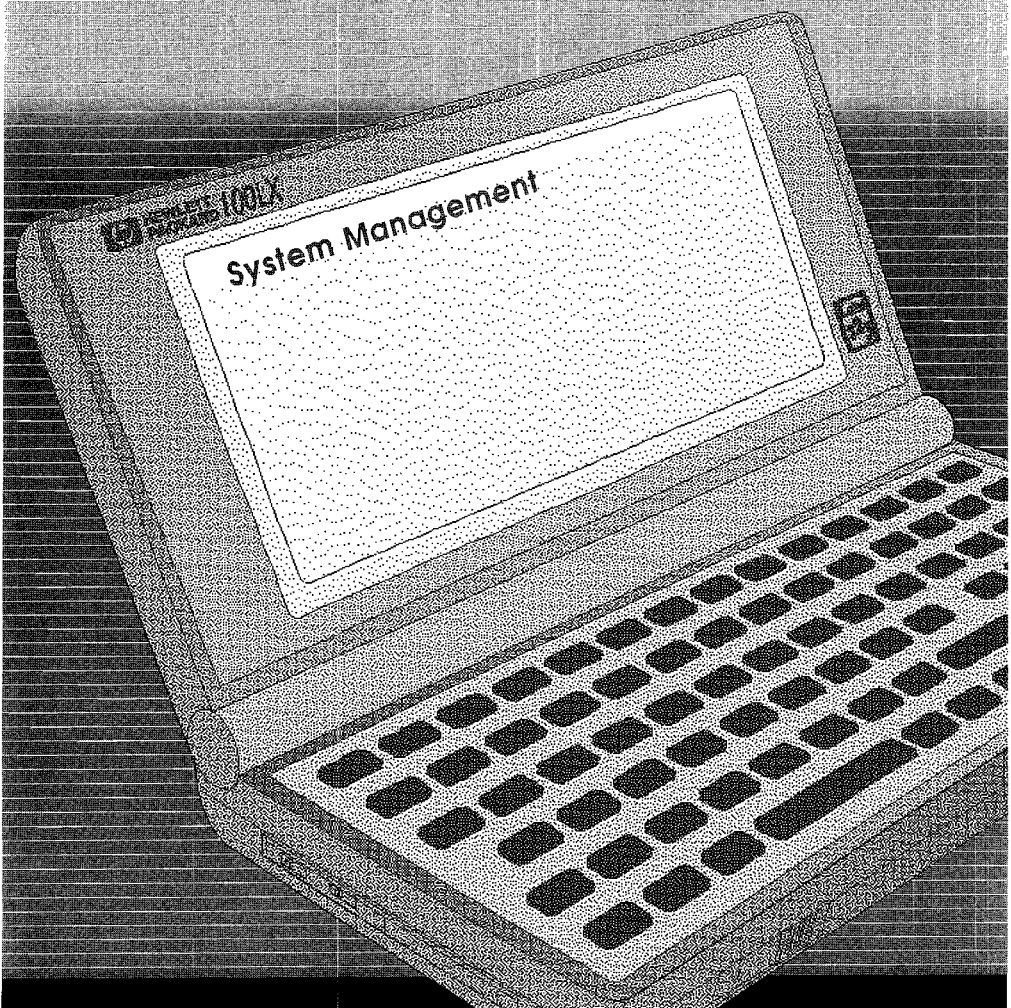
### A Typical Help Screen

The outlined words are **links** to more Help topics. To find out what “current date” means, for instance, press **▼** to move the highlight to current date, then press **ENTER**.

To return to the previously displayed Help topic, press **F8** (Back).

Press **ESC** or **F9** (Cancel) to exit the Help system.

# PART 2



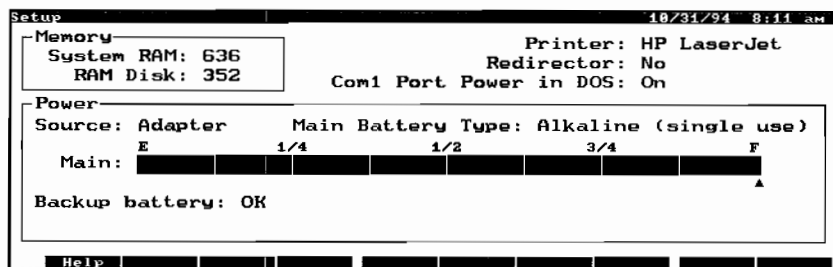


## The Setup Utility

The Setup utility establishes these settings for the HP 100LX:

- Battery type.
- Nickel-Cadmium battery recharging.
- Volume and screen contrast.
- Memory allocation.
- Date, time, and their formats.
- International Default Settings (currency symbols, etc.).
- Character sorting order (collating sequence for 1-2-3).
- Printer configuration.
- Owner display (or other customized image).
- Redirector.

To start Setup, press **CTRL**+**[F2]** or **[F8]**+**S** to see this display:






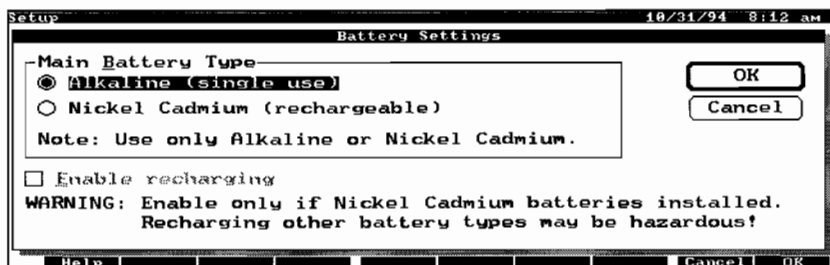
This display shows:

- The current division of RAM between system and disk.
- The power level of the main battery.
- The status of the other batteries (if a card is installed in drive A, the status of the card battery will be shown).
- The current printer type.

- The status of the Redirector, enabled (Yes) or not enabled (No)—the Redirector is available only when the Connectivity Pack, part number HP F1021A is used. See “Using the Redirector” on page 3-21 for more Redirector information.
- The status of Com1-port power when DOS is open. (The status of Com1 power when built-in applications are running is not shown on this screen. These applications turn Com1 power on and off as required.)

## Battery Management

In Setup, press    to see this display:



### Caution



You may damage your HP 100LX if your battery type and battery settings do not correspond. The next two procedures tell you how to avoid trouble.

## Choosing Battery Settings

To choose battery settings that agree with **ALKALINE** batteries:

1. In Setup, press   .
2. Arrow to highlight Alkaline (single use).
3. Press .

To choose battery settings that agree with **NICKEL CADMIUM** batteries:

1. In Setup, press   .
2. Arrow to highlight Nickel Cadmium (rechargeable).
3. Press .

## Recharging Nickel Cadmium Batteries

To recharge **NICKEL CADMIUM** batteries:

### Warning

Attempting to recharge **ALKALINE** or other single-use batteries is hazardous!



### Warning

Do not use **Nickel-Metal Hydride** or other rechargeables that are not Nickel Cadmium!



1. Ensure that nickel-cadmium batteries are installed in your **HP 100LX!**
2. Plug in the AC adapter, part number F1011A.
3. In Setup, press   .
4. If Nickel Cadmium (rechargeable) is not selected, press  to select it.
5. Tab to Enable recharging.
6. Press  to enable recharging (to put a cross in the box).

## Saving Battery Power

You can save battery power when DOS is open by closing Com1 when you're not using it. See the following procedure.

To manage Com1 power when **MS-DOS** is active:

### Note

If you use a DOS communications program, make sure serial port power is on. These programs assume serial port power is on.



When DOS is open, Com1 can either be enabled (powered) or disabled. To either enable or disable Com1, you must leave DOS and open Setup. After performing the operation described below in Setup, return to DOS.

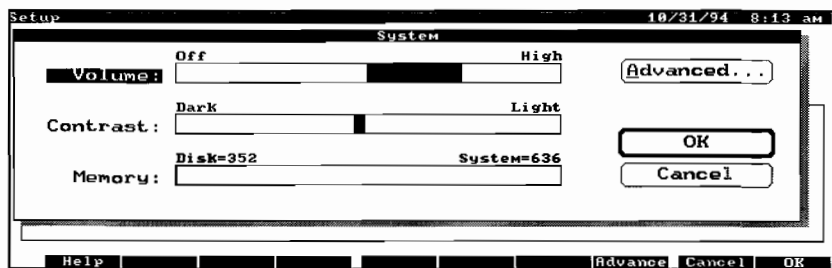
1. From Setup, press **MENU** **O** **C**.
2. Press **ALT**+**E**, then press **spacebar** as necessary to enable Com1 power (put a cross in the box) or disable it (remove the cross).

## Specifying Audio Volume and Display Intensity

In Setup, press **MENU** **O** **S**. You will see the display shown below unless you have other applications open. If other applications are open, you'll see this notice:

Cannot change Memory, Clipboard, or Static Data values while other applications are open.

If you see this notice, press **ENTER** to see this display:



### To adjust the audio volume:

1. In Setup, press **MENU** **O** **S**.
2. Tab to Volume.
3. Press **▶** to increase or **◀** to decrease volume. As you change volume, a beep sounds to demonstrate that volume.
4. Press **F10**.



### To adjust the display contrast from any application:

- To darken: Press **ON** + **+**.
- To lighten: Press **ON** + **-**.
- To invert light and dark: Press **ON** + **/**.

---

## System RAM and RAM Disk

**System RAM** (system random-access memory) is memory used by your System-Manager-compliant applications and by DOS applications. For instance, a 1-2-3 worksheet you are displaying is temporarily located in system RAM. As you change the worksheet, those changes occur in system RAM. To save those changes and release that memory for other uses, you save that worksheet with its changes in a file located in RAM disk, then delete the worksheet in system RAM by quitting 1-2-3.

**RAM disk** (drive C) is used by the HP 100LX to save files just as a hard or floppy disk (drives A, B, or C) is used in a desktop PC. A separate part of HP 100LX's RAM is assigned to this use.

### Choosing the Best Division between System RAM and RAM Disk

There is no exact formula you can follow to determine the best division between system RAM and RAM disk, but here are a few guidelines that might help you.

#### Guidelines for Choosing a System RAM/Ram Disk Division

- If you can't open additional applications because you have run out of memory, either close unused applications or increase system RAM.
- If you can't save additional files in drive C (RAM disk) created by your applications, either delete unneeded files or increase RAM disk.
- If you have a memory card inserted in drive A, you can probably maximize system RAM, since your memory card probably gives you plenty of RAM disk.

## To change RAM memory allocation between system and disk:

### Note



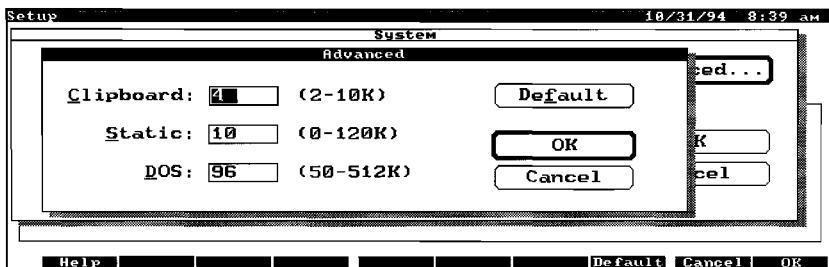
To change memory allocation, all applications (other than Setup and the Applications Manager) must be closed.

3

1. In the Applications Manager, press **[MENU]** **[A]** **[L]** to close all open applications.
2. From Setup, press **[MENU]** **[O]** **[S]**.
3. Tab to **Memory**.
4. Press **[▶]** and **[◀]** to change allocation. As one type of memory increases, the other type decreases because total memory is constant. As you press **[▶]** and **[◀]**, the **Disk** and **System** memory indicators just above the memory bar (see the figure on page 3-4) change to show the memory, in kilobytes, assigned to **Disk** and **System**. You can't decrease RAM disk allocation under what is required to store files currently in disk.
5. Press **[F10]**.

## Changing System RAM Assigned to Clipboard, Static Data, and DOS

Press **[MENU]** **[O]** **[S]** **[F8]** to see this display:



The HP 100LX is shipped with these default memory values:

Clipboard: 4K  
Static data: 10K  
DOS: 96K

**Clipboard system RAM** is the RAM used by the Clipboard to store information. If you get an insufficient memory message when you use the Clipboard, either reduce the size of what you are putting in the Clipboard, or increase the amount of Clipboard system RAM by using the first procedure below.

**Static data system RAM** is the RAM used by some System-Manager compliant applications you can add to your HP 100LX that run like built-in applications. These add-in applications use static RAM to allow them to act just like the built-in applications when you switch from one application to another. Most programs that require static RAM will state the amount of static RAM required. Do not change the static RAM value unless you load a System-Manager compliant program that states it needs a different amount of static RAM, or you find that the loaded program can't run when you switch back to it.

**DOS system RAM** is the RAM available for use by DOS and DOS applications when you run DOS from the Applications Manager (chapter 5). If you set DOS system RAM to 200K bytes of memory, for example, and then press **[E...]** **[D]** or **[CTRL]+[12]** to open DOS, the System Manager will first check to see if 200K is free. If 200K is available, it will launch DOS and display the DOS prompt. Then when you attempt to run your DOS application, it will run successfully if it requires no more than 200K. The remainder of system RAM is then made available to other System-Manager compliant applications. If you set this number too high, you may not be able to get a DOS prompt, or other applications may not have enough remaining memory to run.

---

## Note



To learn how memory management depends on which of the three methods you can use to access DOS, see "Starting Your Program in DOS" on page 7-5.

---

## To allocate system RAM for Clipboard, static data, and DOS:

### Caution



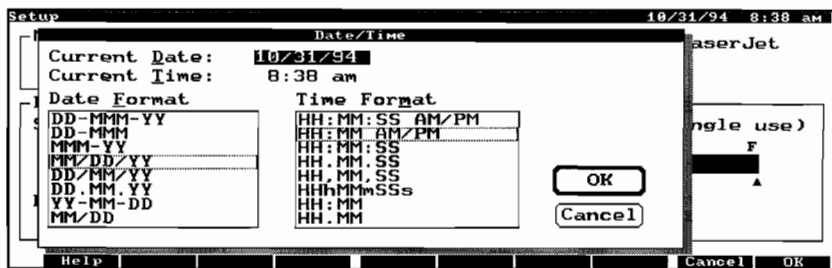
These adjustments are provided only for advanced users. Unless you have a good reason to change a setting, leave the factory settings unchanged for most reliable performance.

3

1. From Setup, press **MENU** **O** **S** **F8**.
2. Tab to the text box for the type of system RAM you want to change.
3. Type a number of kilobytes within the limits shown.
4. Repeat steps 2 and 3 to change other memory allocations.
5. Press **F10**.

## Setting the Date and Time

In Setup, press **MENU** **O** **D** to see this display:



## Changing Date Settings

The current date setting establishes the current date throughout the HP 100LX. The date format setting, however, does not affect 1-2-3 except in the printing of headers and footers. (1-2-3 has its own commands for format settings.)

### To set the current date:

1. In Setup, press **MENU** **O** **D**.
2. Tab to the **Current Date** and edit the highlighted date using the same format to show the new date (you can drop leading zeros).
3. Press **F10**.

The date **delimiters** (punctuation between numerals) can be any one of these: hyphen, slash, space, colon, period, or comma. The current date can be in any year from 1980 through 2099. You can specify years 1980 through 2079 by their last two digits—for example, 1993 can be entered as 93. To specify years 2080 through 2099, you must enter all four digits.

### To set the date format:

1. In Setup, press **MENU** **O** **D**.
2. Tab to the **Date Format** list box.
3. Arrow to your format choice (see the table below). Not all choices are displayed at the same time. Arrow to scroll the complete list.
4. Press **F10**.

The following table shows the available format options, each including an example date of August 14, 1994.

**Date Formats**

Format	Example	Format	Example
DD-MMM-YY	14-AUG-94	YY-MM-DD	94-08-14
DD-MMM	14-AUG	MM/DD	08/14
MMM-YY	AUG-94	DD/MM	14/08
MM/DD/YY	08/14/94	DD.MM	14.08
DD/MM/YY	14/08/94	MM-DD	8-14
DD.MM.YY	14.08.94		

### Note

The format options shown in the table above are the same as those available for 1-2-3.



## Changing Time Settings

The current time setting establishes the current time throughout the HP 100LX. The format setting, however, does not affect 1-2-3. (1-2-3 has its own commands for format settings.)

3

### To set the current time:

1. In Setup, press **MENU** **O** **D**.
2. Tab to the **Current Time** and edit the highlighted time using the same format to show the new time (you can drop leading zeros).
3. Press **F10**.

The time **delimiters** (punctuation between numerals) can be any one of these: hyphen, slash, space, colon, period, comma, or h m s.

### To set the time format:

1. In Setup, press **MENU** **O** **D**.
2. Tab to the **Time Format** list box.
3. Arrow to your format choice (see the table below). Not all choices are displayed at the same time. Arrow to scroll the complete list.
4. Press **F10**.

The following table shows the available format options, each including an example time of 2:03:07 pm.

**Time Formats**

Format	Example	Format	Example
HH:MM:SS (AM/PM)	02:03:07 pm	HH,MM,SS	14,03,07
HH:MM (AM/PM)	02:03 pm	HHhMMmSSs	14h03m07s
HH:MM:SS	14:03:07	HH:MM	14:03
HH.MM.SS	14.03.07	HH.MM	14.03
		HH,MM	14,03
		HHhMMm	14h03m

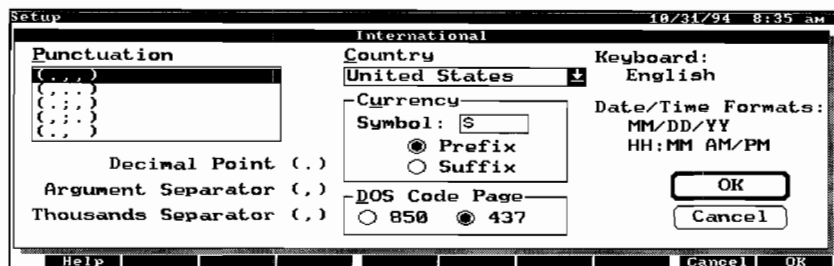
### Note

These format options are the same as those available for 1-2-3.



## Changing Country Defaults, Punctuation, Currency, and Code Page Settings

In Setup, press    to see this display:



### Notes



- HP 100LX units sold in the United States offer only the English keyboard option.
- In order for new punctuation and currency settings to take effect in 1-2-3, you must quit 1-2-3 and then restart it. Also, the settings in any 123.CNF file present at startup take precedence over the settings made here.

### KEYBEZ







- Changes you make in the International dialog box using Setup affect only System Manager Applications. They do not affect DOS applications. To make changes in these settings that affect both System Manager *and* DOS applications, make the changes using the special DOS command KEYBEZ. See "KEYBEZ" on page 7-23.
- When KEYBEZ is active, you can't change Country or DOS Code Page settings in the International dialog box. Those parts of this dialog box will be grayed out.

## Changing Country Defaults

As you execute changes using the special DOS command KEYBEZ (see directly above), the International dialog box (see the previous figure) will reflect those changes.

As you select a country, the defaults for punctuation, date and time formats, currency symbol plus prefix/suffix, character sort order, and the available choices for DOS code page are chosen to agree with those used in the selected country. When new defaults are selected in this way, you are still able to change any setting using the appropriate procedure in this chapter.

### To specify a set of country defaults:

1. In Setup, press   .
2. Tab to the Country list box.
3. Arrow to the country you want.
4. Press .






## Changing Punctuation (Digit and Argument Separators)

The Punctuation command specifies which symbols are used for the decimal point in numbers, the argument separator for @functions and advanced 1-2-3 macro commands, and the thousands separator in numbers.

The Punctuation setting establishes the symbols used by the Calculator and the default symbols used by 1-2-3.

### To specify the symbols for the decimal point, argument separator, and thousands separator:

The table below shows the eight combinations covered by this procedure. These options are also given (and specifiable) in 1-2-3. Be sure to use the current argument separator when entering equations into the Calculator's Solve application.

1. In Setup, press   . The highlight is in the Punctuation list box. Each punctuation set is displayed in this order: decimal point, argument separator, and thousands separator.
2. Arrow to the punctuation symbol set you want. Press  and  to see all the choices.



3. Press **(F10)**. When you next display this screen (by pressing **(MENU)** **(O)** **(I)**) the set you just specified will be displayed in the lower left of this screen after **Decimal Point**, **Argument Separator**, and **Thousands Separator**.

### Punctuation Symbols

Combination	Examples		
	Decimal Point	Argument Separator	Thousands Separator
. , ,	2.3	@PMT(B1,B2/12,B3)	1,234
, . .	2,3	@PMT(B1.B2/12.B3)	1.234
. ; ,	2.3	@PMT(B1;B2/12;B3)	1,234
, ; .	2,3	@PMT(B1;B2/12;B3)	1.234
. , space	2.3	@PMT(B1,B2/12,B3)	1 234
, . space	2,3	@PMT(B1.B2/12.B3)	1 234
. ; space	2.3	@PMT(B1;B2/12;B3)	1 234
, ; space	2,3	@PMT(B1;B2/12;B3)	1 234

## Changing and Displaying Currency Symbols

### To specify the currency symbol:

1. In Setup, press **(MENU)** **(O)** **(I)**.
2. Tab to the **Currency** option box.
3. Enter the currency symbol you want. See the table below.
4. Arrow to either **Prefix** or **Suffix** depending on the location of the symbol.
5. Press **(F10)**.

### How to Display Currency Symbols

Keystrokes	Currency Symbol
Press <b>(↑)</b> <b>(↵)</b>	\$
Press <b>(Fn)</b> <b>(G)</b>	£
Press <b>(Fn)</b> <b>(H)</b>	¥
Press <b>(Fn)</b> <b>(↵)</b>	¢
Press <b>(Fn)</b> <b>(F)</b>	f

## Changing the Code Page for DOS Applications

### Note



A code page change does not affect a DOS task that is already open. A change becomes effective when you open DOS after you make the change.

3

In the International dialog box (press   ), two choices are given for the DOS Code Page, page 850 and another related to your choice of Country. (You select your country in the same International dialog box or by using the special DOS command KEYBEZ—see “KEYBEZ” on page 7-23.) Using this procedure, you can set the code page to agree with that required by a particular DOS application. If you aren't sure what code page your application requires, run your program. If the wrong code page is selected, your program may show incorrect characters. Changing your code page will generally allow it to perform correctly.

### To change the code page for DOS applications:

1. In Setup, press   .
2. Tab to the DOS Code Page option box.
3. Arrow to the code page you want.
4. Press .

## Specifying the Sorting Order for Lotus 1-2-3

The Sort command specifies the sorting order—called the *collating sequence*—used in 1-2-3 by the /Data Sort command. Note that 1-2-3 sorts cells, labels, and values.)

### Sorting Options

3

Collating Sequence	Sorting Order
Numbers-First	<ol style="list-style-type: none"><li>1. Blank cells.</li><li>2. Labels beginning with numbers, in numerical order.</li><li>3. Labels beginning with letters, in alphabetical order. Capitalization is ignored.</li><li>4. Labels beginning with other characters.</li><li>5. Values.</li></ol>
Letters-First	<ol style="list-style-type: none"><li>1. Blank cells.</li><li>2. Labels beginning with letters, in alphabetical order. Capitalization is ignored.</li><li>3. Labels beginning with numbers, in numerical order.</li><li>4. Labels beginning with other characters.</li><li>5. Values.</li></ol>
ASCII	<ol style="list-style-type: none"><li>1. Blank cells.</li><li>2. All labels using their ASCII values. Uppercase letters precede lowercase letters.</li><li>3. Values.</li></ol>

### To change the sorting order:

1. In Setup, press **MENU** **O** **1** (the number 1).
2. Arrow to the sorting order you want.
3. Press **F10**.

## Specifying Printer Configuration Settings

In Setup, press **Ⓜ** **⓪** **Ⓟ** to see this display:



Printer configuration files in the Setup utility control the printing of all information in all files of all applications. You can:

- Choose a baud rate among those displayed.
- Choose an interface among those displayed.
- Choose a printer among those displayed.
- Create and open other configuration files for different printers.

### Configuring for an HP LaserJet, Epson FX-80, or IBM ProPrinter

Most printers are compatible with one of the printers listed in the above figure. For a Kodak Diconix printer, for instance, you need to set the option switches inside the printer for either the IBM or Epson driver, then select either IBM or Epson from the Printer list box in the Printer dialog box—see chapter 36.

#### To configure for a printer compatible with HP LaserJet, Epson FX-80, or IBM ProPrinter:

1. In Setup, press **Ⓜ** **⓪** **Ⓟ**.
2. Arrow to a baud rate acceptable to your printer.
3. Press **Ⓜ**+**Ⓟ**.
4. Arrow to your choice of printer.
5. Press **Ⓛ**.

### To configure for another printer:

The HP 100LX expects any printer to have the following configuration settings:

- Data bits: 8
- Stop bits: 1
- Parity: None
- Handshaking: XON/XOFF

1. Establish the above configuration settings on your printer. See your printer manual.
2. In Setup, press **MENU** **O** **P**.
3. Use **TAB** and an arrow key to highlight your choices for baud and interface.
4. Press **ALT**+**P** and arrow to the printer whose specifications agree most closely with yours. If you're unsure, you might try printing with each of the printers selected that are available in the **Printer** list box—see the previous procedure.
5. To save your configuration, complete the next procedure.
6. Press **F10**.

### To save your printer configuration:

1. In Setup, press **MENU** **O** **P** **F8**.
2. Type or highlight (from the **Files** list box) a name for the file that will hold your configuration settings. Printer configuration files are automatically stored in C:\\_DAT and given a .PCF extension.
3. Press **F10**.

## Selecting a Printer Configuration File

### To select an existing configuration file:

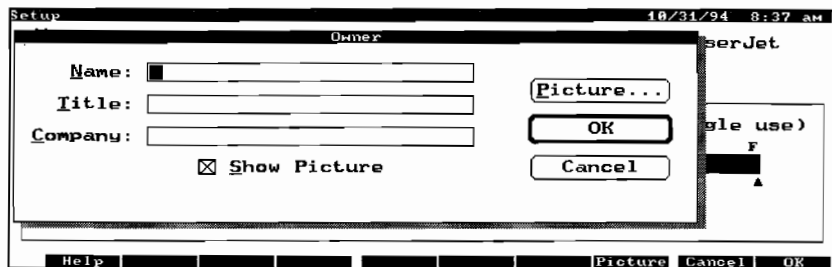
1. In Setup, press **MENU** **O** **P** **F7**.
2. Type or highlight (from the **Files** list box) an existing configuration file.
3. Press **F10**.

## Specifying a Business Card or Picture Display

The Business Card is your personalized display for the HP 100LX. It appears 1) whenever you reboot the system (press simultaneously **CTRL+ALT+DEL**), and 2) whenever you close *all* applications (press **&... MENU A L**).

You can create a monochrome graphics image (a picture) to appear in place of the Business Card if you have PC graphics software that uses the .PCX file format. A picture will appear instead of a business card whenever you reboot the system and whenever you quit all applications.

In Setup, press **MENU O O** to see this display:



### To fill out a new Business Card:

1. In Setup, press **MENU O O**.
2. Tab to **NAME**, **TITLE**, or **COMPANY**.
3. Type the new information in the text box displaying the cursor.
4. To complete another field, repeat steps 2 and 3.
5. To include or omit the built-in figure contained in `D:\_SYS\TOPCARD.PCX` with your business card text, tab to **Show Picture** and do one of the following:
  - To include the figure, press **spacebar** to place an **X** in the box.
  - To omit the figure, press **spacebar** to remove the **X** from the box.
6. Press **F10**.
7. To display your new business card, quit all open applications (press **&... MENU A L**).

## To substitute a customized graphic image for the Business Card:

### Note



You will see a completely empty, blank display if you add, then delete a customized graphic image and then close all applications. You can then open any application in the normal way.

3

1. Create the desired image in a .PCX graphics file on a PC. To just fill the display, the .PCX file should contain a monochrome image (single plane) that is 640 pixels by 200 pixels. If it's larger, the pixels beyond the 640 by 200 frame will not be displayed. If it's smaller, a portion of the display will be blank.
2. Transfer the file to your HP 100LX using one of these methods:
  - Transfer the file from your PC to a memory card, then insert that card into the HP 100LX's drive A. Finally, copy the .PCX file to the C:\\_DAT directory. See "To copy or move files and directories using a split screen" on page 4-17.
  - Transfer the file from your PC to the HP 100LX's C:\\_DAT directory using the Connectivity Pack hardware and software—see "To copy or move one or more files" on page 4-9. You can also use the Datacomm application for transfer via XMODEM, YMODEM, ZMODEM, or Kermit protocol. See the section "Transferring Files" starting on page 35-18 for information.
3. In Setup, press **MENU** **O** **O** **F8**.
4. Type or highlight the path and name of your .PCX file. The first character you type will erase any text in the File name text box and display that character.
5. Press **F10**.
6. If necessary, press **ALT**+**S** to place a cross in the box before Show picture. This will cause the picture to appear in your business card display.
7. Press **F10**.
8. To display your new picture, quit all open applications (press **ESC** **MENU** **A** **L**).

## To remove your graphic image and restore the Business Card:

1. In Setup (press **CTRL**+**ESC**), press **MENU** **O** **O**.
2. Press **ALT**+**S**.
3. Press **F10**.

4. To confirm that the picture is removed, quit all open applications (press **&...** **MENU** **A** **L**). *You will see a completely blank display.*
5. Press **CTRL**+**ESC** **MENU** **O** **O** **F8**.
6. Tab to the Directories list box, arrow to D, and press **ENTER**.
7. Arrow to \_SYS and press **ENTER**.
8. Press **ALT**+**F** and arrow to TOPCARD.PCX.
9. Press **ENTER** **ALT**+**S** **F10**.
10. To confirm that you have the default business card back, quit all applications.

## The Four HP 100LX Communication Ports

In three dialog boxes, you can choose between four communication ports, Com1, Com2, Alternate, and Infrared. The keystrokes to reach these dialog boxes are:

- From the Filer, press **MENU** **C** **R**.
- From cc:Mail, press **MENU** **C** **S**.
- From Datacomm, press **MENU** **C** **S**.

In the HP 100LX, the location of these ports are:

- Com1: The standard port on the right side, next to the AC adapter jack.
- Com2: Reserved for a plug-in communication port that uses the same slot in which a memory card is inserted. The I/O address and the interrupt request line are fixed and are the same as for Com1.
- Alternate: Reserved for the possible future development of plug-in communication ports that use I/O addresses and interrupt request lines that are different from those used for Com1 and Com2. The ability to set the I/O address and interrupt request line for the alternate port is already present in your HP 100LX. See the procedure below.
- Infrared: An IR source and receiver on the right side, next to Com1. This is used to communicate with other devices equipped with a compatible IR port, such as another HP 100LX or an HP 95LX.



## To set the I/O address and interrupt for the alternate port:

### Note



This ability is provided to take advantage of the possible future development of a plug-in communication port using a different address and interrupt from those used for Com1 and Com2.

1. In Setup, press **MENU** **O** **C**.
2. Arrow to choose an I\O address from those offered.
3. Tab to the **Interrupt** scroll box and arrow to choose an interrupt value from those offered.
4. Press **F10**.

## Using the Redirector

When your HP 100LX is connected using the Connectivity Pack, part number HP F1021A, to a desktop personal computer, the **Redirector** allows you to run both your HP 100LX and the other computer as though they were combined into one computer. You can then operate this combined computer from either the HP 100LX's or the other computer's keyboard, depending on which computer you choose to be the client—the computer whose keyboard you use. The other computer becomes the server, and its keyboard is not active.

Instructions for using the Redirector are in the manual included with the Connectivity Pack.





## The Filer

---

To start the Filer, press .

### Battery



To lengthen battery life when using IR, leave the Filer by pressing   rather than by starting another application. When you leave without quitting, the IR port will be left active which draws additional battery power. When you quit the Filer, the IR port is closed.

---

## Managing Memory Cards

---

### Caution



Turn the HP 100LX off before inserting or removing any plug-in memory card. Otherwise, the information on the card may be lost.

---

The HP 100LX supports two types of memory cards, RAM cards and HP Flash Disk Cards (same as SUNDISK solid-state mass storage cards).

### RAM Card

When purchased, they are unformatted. You can format them for use using the procedure below, "To format a plug-in memory card."

### Flash Card

Flash cards normally come formatted and ready for use. Please refer to your flash card user manual for important usage information.

### To format a plug-in memory card:

1. Ensure that no program is running in MS-DOS. (If a DOS program is running, a card cannot be formatted.)
2. Install the memory card into drive A (into the plug-in slot).
3. In the Filer, press **MENU** **O** **C**. *You will lose the present contents of your memory card when you complete the next step.*
4. Press **F10**.

---

## Understanding a Directory List

When the Filer is first started, a listing of the current directory's files is displayed in a File List as shown in the first figure on page 4-3. The **directory path** identifies the **current directory** whose files and subdirectories are currently displayed. The current file is the highlighted file. In the first figure on page 4-3, the directory path is `C:\_dat`, the current directory is `_dat` and the current file is `filer.env`.

The bottom line of a File List (just above the function key labels) shows a status bar. See the next three figures.

If a card is present in drive A, the display shows a split screen (see page 4-17) when the Filer is started. The `C:\` directory is displayed in the left window and the `A:\` directory in the right.

---

## Viewing a Directory

You can view a directory of files and subdirectories in three ways:

- **File List view**, shown in the figure below. This view gives the most information about each file and subdirectory. The bottom line gives the number of subdirectories and files in the directory, the memory (bytes) used by the directory, and the available memory remaining on the system disk (drive C).

C is the current drive.  
 \ (following C:) is the root directory.  
 \_dat is the current directory.  
 C:\\_dat is the path to the current directory  
 \*.\* is the designator for all files in \_dat.

Subdirectories of \_dat. Dates of creation.

File	File List	03/03/94	3:31 am
C:\_dat\*.*			Local
GAMES	<DIR>	02-20-94	11:32a
STOCKS	<DIR>	02-12-94	9:48a
appmgr	dat	8,73b	01-07-94 1:27p
calc	env	1,929	02-11-94 4:17p
ccmail	ini	718	01-24-93 5:15p
filer	env	155	01-07-94 9:16a
memo	env	206	01-19-94 9:16a
setup	env	6,363	01-07-94 9:13a
trip194	doc	372	01-19-94 9:16a
Dirs: 2 Files: 7 Bytes: 18,489 Bytes Free on Disk: 338,248			
Help Copy Move Filter Goto Remote Split View Tree Connect			

Current file.

File size in bytes.

Times of creation.

### File List View

- Directory Tree view**, shown in the figure below. This view gives the most information about the directory/subdirectory structure, but it shows no file names. The bottom line gives the number of subdirectories in the directory and the available memory remaining on the system disk (drive C).

Subdirectory of C:\ These dots mean NASDAQ contains one or more subdirectories.

File	Directory Tree	03/03/94	3:29 am
C:\_dat\*.*			Local
.DAT			
GAMES			
STOCKS			
	NYSE		
	NASDAQ..		
	ASE		
Directories: 6 Bytes Free on Disk: 338,248			
Help Copy Move Filter Goto Remote Split Sync List Connect			

Subdirectories of STOCKS.

### Directory Tree View

- **Sync view**, shown in the figure below. This view combines the advantages of both the List and Tree views. Using a split screen, it shows a Tree view in the left screen. When you highlight a directory in that view, the right screen shows the List view of that directory.

Tree view of C:\\_dat directory.

List view of C:\\_dat directory.

Filer		Directory Tree		03/03/94 3:34 am	
C:\_dat\*. *		Local	C:\_dat\*. *		Local
▲View Up▲ GAMES STOCKS --- NYSE --- NASDAQ --- DAILY --- WEEKLY --- ASE			▲View Up▲ <DIR> <DIR> dat 8,736 calc env 1,929 ini 718 filer env 165 memo env 206 setup env 6,363 trip1-94 doc 372		
Directories: 7		Bytes Free on Disk: 338,248			
Help   Copy   Move   Filter   Goto   Remote   Full   Sync   List   Connect					

### Sync View

To switch between List and Tree views:

- Press **F9**.

To switch between Sync and Unsync views:

- Press **F8**.

## Finding Directory and File Names

### Note



The Filer and all other HP 100LX applications use MS-DOS file names and directory paths. For information on these, see “Files and Directories” starting on page 7-14.

To highlight file and subdirectory names by typing letters:

1. In the Filer, begin typing the name of the file or subdirectory. As you type letters, the highlight moves down to the first file or subdirectory in the current directory beginning with those letters. The status bar (bottom line) displays the characters you type. Continue typing until the desired name is highlighted.

2. Then leave the search process in these ways:
  - Press any operation key: for instance, **[ESC]** or a function key. The highlight remains where it is.
  - Press arrow keys to move the highlight.
  - Press **[ENTER]** to display the files in a directory or to run a .BAT, .EXE, or .COM file.

### To highlight file and subdirectory names without typing letters:

- Use **[▲]**, **[▼]**, **[Fn]PGUP**, **[Fn]PGDN**, **[Fn]HOME**, and **[Fn]END** to move through a directory's list of files and subdirectories.

### Note



A directory list may be too long to fit on the screen. To display the entire list, press **[Fn]PGDN** or **[▼]** repeatedly. To reach the end of the list immediately, press **[Fn]END**.

## Changing the Current Directory

### To reach a higher-level directory:

- Either press **[ESC]**
- Or highlight **▲View Up▲** and press **[ENTER]**.

### To reach a lower-level directory:

1. Highlight the subdirectory name.
2. Press **[ENTER]**.

### To display the directory of a plug-in card in drive A:

1. In the Filer, press **[ESC]** until the drive list is displayed.
2. Press **[F5]**, type **A:**, then press **[F10]**.

## To reach a directory by name:

1. Press **(F5)**.
2. Type the path needed to reach the directory from your present location. The last name in the path—without a final “\”—is the name of the directory you seek. For example, if you’re now viewing a directory in drive C and want to reach a directory named PICTURE in drive A, the path you would type would be `a:\picture`.
3. Press **(F10)**.

---

## Working with Files and Directories

---

### Caution



When an operation is performed on a directory, *all of its contents, including subdirectories and the files within them, are copied, moved or deleted.*

---

### Note



The terms “directory” and “subdirectory” are used interchangeably in this chapter except when referring to a root directory (A:\ or C:\). Except for a root directory, every directory is a subdirectory of a higher-level directory.

---

## Viewing the Contents of Text Files

### To view the contents of text (ASCII) files:

1. In the Filer, highlight the file name and press **(F8)**.
2. Use arrow keys, **(Fn)HOME**, **(Fn)END**, **(Fn)PGUP** and **(Fn)PGDN** to view every part of the file.
3. To return to the directory display, press **(F8)** or **(ESC)**.



## Running Executable Files

Files with file name extensions of .EXE, .COM, or .BAT are executable files.

### To run an executable file:

1. In the Filer's Directory List view, highlight the name of the executable file you want to run.
2. Press **ENTER**.

## Searching for Text in One or More Files

### To search for text:

1. In the Filer, display the directory list that contains the files you want to search.
2. Press **MENU** **O** **E**.
3. In the **Text Search** text box, type the text you want to find.
4. Select the files to search in one of these ways:
  - To search all files in the directory, press **F10** to display the **Text Search Results** dialog box.
  - To search a particular file or set of files, press **TAB** and edit the offered file name (\*.\*) to define the file or files you want to search. You can use the wildcards, \* and ? (see page 7-18), to define a group of files. Then press **F10** to display the **Text Search Results** dialog box.
5. In the **Text Search Results** dialog box, arrow to the file you want to see and press **F8**.
6. To view another file containing the search text, press **F8**, then repeat step 5.
7. To end the search, press **F8** **F10**.

## Identifying (Tagging) Files and Directories

Most Filer operations—copy, move, delete, rename, and print—require you to identify one or more files and/or directories before you can complete the operation.

### To identify a single file or directory:

- In the Filer, highlight the file or directory.

### To tag and untag multiple files and/or subdirectories:

#### Method 1 - Using **[spacebar]**:

1. In the Filer, highlight a file or directory and press **[spacebar]**.
2. Repeat step 1 as often as you want.
3. To untag, highlight the file or directory and press **[spacebar]**.

#### Method 2 - Using Tag Options:

1. In the Filer, display the directory list that includes the subdirectories and files you want to tag.
2. Press **[MENU]** **[O]** **[T]**.
3. Arrow to either **Current**, **Above**, **Below**, **All**, or **None**. For instance, **Above** means tag all files and/or subdirectories above and including the highlighted file or subdirectory, while **Current** means the currently highlighted file or subdirectory.
4. Tab to the **Items** options box and arrow to highlight what will be tagged: **Directories only**, **Files only**, or both **Directories and files**.
5. Press **[F10]**.
6. To untag all files and subdirectories, press **[F4]** **[F8]**.

#### Method 3 - Using Wildcards:

1. In the Filer, press **[F4]**.
2. Enter a file specification using wildcards (?,\*). See "Wildcards" on page 7-18.
3. Press **[F10]**.
4. Press **[MENU]** **[O]** **[T]** and choose **all**.
5. Press **[F10]**.
6. To untag and redisplay the entire directory, press **[F4]** **[F8]**.

## Copying, Moving, and Renaming Files and Directories

When copying or moving a file or directory, you can:

- Keep the original name.
- Give the file or directory a new name.
- Create and name any directories in the destination path that do not exist.

When copying or moving several files or directories, you can:

- Copy or move to an existing directory.
- Copy or move to a new directory. You create and name the new directory plus any directories in the new path that do not exist.

To learn how to perform Filer operations without typing file and directory names, see “Using the Split Screen” on page 4-17.

### Caution



A copy or move operation will select a single highlighted item *only if no other item is tagged*. Otherwise, the tagged item(s) will be selected.

### To copy or move one or more files:

1. In the Filer, highlight the name of the file or tag the files you want to copy or move. (see “Identifying (Tagging) Files and Directories” on page 4-7). Make sure no other items are tagged.
2. Press **F2** (copy) or **F3** (move).
3. Do one of the following:
  - Press **▶** to prepare the current directory and its path for editing. Type to complete the path and include the file name, whether or not that file is new. *Do not type \ at the end the text you type in the text box.*
  - Type a new, complete path. The default path will be cleared automatically as you start typing. Type the entire path starting with the drive and root directory (such as C:\). Include the file name, whether or not the file name is new. *Do not type \ at the end of the text you type in the text box.*
4. Press **F10**.
5. If one or more directories in the destination path do not exist, you’ll be asked if you want to create them. When asked, press **ENTER**.

## Example: Creating a Directory while Moving a File

### Note

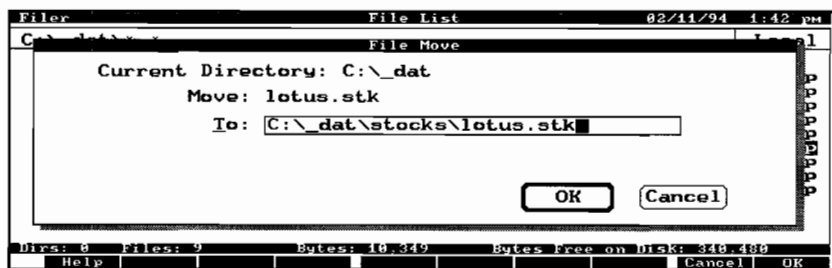


If you want to perform this example and see it develop on your screen, first press the keys and type the characters shown directly below in this note. Then as you read the example, press the keys and perform the operations as the example instructs.

**[E]** **[MENU]** **[F]** **[N]** **[F10]** c:\\_dat\lotus.stk  
**[F10]** **[MENU]** **[Q]**

You have a file `lotus.stk` in the directory `C:\_dat`. You want to move it to a directory "stocks" that does not yet exist. You want this directory to be a subdirectory of `_dat`. You follow these steps to create the directory and move the file.

1. In the `C:\_dat` directory, highlight the file `lotus.stk`.
2. Press **[F3]**.
3. Type **[▶]**, then type `\stocks\lotus.stk` in the `To:` text box. Your display now looks like this figure:



4. Press **[F10]**.
5. You're asked if you want to create `C:\_dat\stocks`. Press **[ENTER]**. Your new `STOCKS` directory is created and contains the file `lotus.stk`.

You could have changed the name of the file during the same procedure. For instance, instead of pressing **[▶]** and typing `\stocks\lotus.stk` in step 3, you could have pressed **[▶]** and typed `\stocks\123.stk`, changing the file name from `lotus.stk` to `123.stk`.

**To copy or move one or more directories:**

1. In the Filer, highlight the name of the directory or tag the directories you want to copy or move (see “Identifying (Tagging) Files and Directories” on page 4-7). Make sure no other items are tagged.
2. Press **(F2)** (copy) or **(F3)** (move).
3. Do one of the following:
  - Press **(▶)** to prepare the current directory and its path for editing. Press **(◀)** as necessary, then type to complete the path. The directories you are copying or moving will be subdirectories of the last directory in the path. *Do not type \ at the end of the text you type in the T☐: text box.*
  - Type a new, complete path. The T☐: text box will be cleared automatically as you start typing. Type the entire path starting with the drive and root directory (such as C:\). The directories you are copying or moving will be subdirectories of the last directory in the path. *Do not type \ at the end of the text you type in the T☐: text box.*
4. Press **(F10)**.
5. If one or more directories in the destination path do not now exist, you'll be asked if you want to create them. When asked, press **(ENTER)**.

**To rename one file or directory:**

1. In the Filer, highlight the name of the file or directory to rename.
2. Press **(MENU)** **(F)** **(N)**.
3. Type a new file or directory name and press **(F10)**.

**Deleting Files and Attempting File Recovery**

**Caution**



When you delete a file or directory, the Filer chooses the highlighted file or directory *only if no file or directory is tagged* (only if no file or directory name is identified by a diamond). If one or more files and/or directories are tagged, the Filer deletes the tagged item(s) rather than the highlighted item.

### To delete one or more files or directories:

1. In the Filer, highlight a single file or directory or tag any combination of files and directories you want to delete.
2. Press **(DEL)**.
3. Press **(F10)**.

4

### To attempt to recover one or more deleted files or directories:

1. In the Filer, display the directory list that contained the deleted files or directories.
2. Press **(MENU)** **(F)** **(U)**.
3. Type a file specification for the files or directories you want to recover. The ? and \* wildcards are allowed. To see all candidates for Undelete, accept \*.\* as the undelete-file specification.
4. Tab to the File Type option box and arrow to your choice.
5. Press **(F10)**.
6. A list of file and directory names are displayed with ? replacing the first characters. Arrow to highlight one of the files or directories you want to undelete and press **(ENTER)**.
7. The name of the highlighted file or directory is displayed. Type the character that should replace the ? and press **(F10)** to attempt recovery. A message will report the success or failure of your attempt.
8. Press **(F10)**.

---

## Working with Directories

### Creating New Directories

When you create a new directory, the current directory continues to display.

#### To create new directories:

1. In the Filer, press **(MENU)** **(F)** **(T)**.
2. Do one of the following:
  - Press **(▶)** to prepare the current directory and its path for editing. The new directories you add to the path will be created

as you complete this procedure. *Do not end the text you type in the To: text box with a \.*

- Type a new, complete path. The default path will be cleared automatically as you start typing. Type the entire path starting with the drive and root directory (such as C:\). The new directories you add to the path will be created as you complete this procedure. *Do not end the text you type in the To: text box with a \.*
3. Press **(F10)**.
  4. If any directories besides the last in the destination path do not exist, you'll be asked if you want to create them. When asked, press **(F10)**.

## Backing Up a Directory's Files

**To back up a directory's files to a new or existing directory:**

1. In the Filer, display the listing of the directory whose files you want to back up. The directory name and its path will be displayed at the top left of your screen.
2. Press **(MENU)** **(F)** **(B)**.
3. Do one of the following:
  - If this *is* your first backup, type a path and name of a new or existing directory that will contain your backup. *Do not end the text you type in the To: text box with a \.*
  - If this is *not* your first backup, either 1) press **(▶)** to prepare the offered path for editing, or 2) type a new path. Type the name of your backup directory as the last element in the path. *Do not end the text you type in the To: text box with a \.*
4. Press **(TAB)** and highlight to select either **All directories and files** or **Files only**.
5. Use **(TAB)** and **(spacebar)** to select neither, one, or both of the choices: **Modified files only** and **Overwrite existing files**. To select, press **(spacebar)** to place an **X** in the box. (To remove the **X**, press **(spacebar)** again.)
6. Press **(F10)**.
7. If any directories in the path do not now exist, you'll be asked if you want to create them. Press **(F10)**.

## Choosing the Order Files Are Listed

A directory lists its subdirectories first, then its files. When you receive your new HP 100LX, files are listed alphabetically by file name, but you can choose between four list ordering schemes. The ordering scheme selected applies to all directory listings, those displayed in a single screen and in a split screen (see page 4-17), both in the HP 100LX and in another computer connected with the Connectivity Pack, part number HP F1021A.

### To choose the way files are sorted in a directory listing:

1. In the Filer, press **MENU** **O** **S** to display the file sorting choices (Filename, Extension, Date, or Size).
2. Use arrows to select your sort choice.
3. To choose between an Ascending and Descending sort, press **TAB** and an arrow key.
4. To make your sort choice the default sort (so that your sort choice will still be in force after you quit and then reopen the Filer), press **TAB** and **spacebar** to select (to put an X in the box) Make sort order default.
5. Press **F10**.

## Displaying a Subset of a Directory's Files

### To display a subset of the current directory:

1. Press **F4**.
2. Using the wildcards ? and \* (see page 7-18), specify the current directory's files you want displayed. For example, the file specification \*.TXT specifies all files in the directory with the .TXT extension.
3. Press **F10**. The subset you choose will remain until you quit the Filer (until you press **MENU** **Q**) or until you change it (press **F4**).

### To display a complete directory listing when viewing a subset:

- Press **F4** **F8**.



---

## Directories and File Name Extensions Used by HP 100LX Applications

The following table will help you identify files that belong to specific applications. It will also help you assign the correct file name extensions to files you create in these applications, and show you in what directory these files should be stored.

While you can give a file any extension you choose, and store it in any directory, using the file extension and directory assignments already established for an application's files will help you keep track of your files, especially as your file structure grows with use.

For more information, see the file name extension entries in the index.

**Standard File Name Extensions**  
**Many Files in C:\\_DAT Directory**

<b>Application</b>	<b>File Name Extension</b>	<b>File Use</b>
Many App's	.ENV	Environment files
Redirector	.RCF	Redirector configuration files
Setup	.PCF	Printer configuration files
Setup	.PCX	Business card graphics
Filer	.FCF	Configuration files
App. Mgr.	.EXM	Sys. mgr. compliant prgms.
System Macros	.MAC	Macro sets (1-10 macros)
DOS	.KIT	Keyboard Information Table files
DOS	.FON	Format files, related to KIT files
1-2-3	.BAK	Backup worksheets
1-2-3	.PIC	Graphs
1-2-3	.PRN	Print or text files
1-2-3	.WK1	Worksheets
App't Book	.ADB	Appointment books
World Time	.WDB	Worldtime files
Phone Book	.PDB	Phone books
Database	.GDB	Databases
Memo Editor	.TXT	Memos
Note Taker	.NDB	Notes
Calculator	.CFL	Cash flow lists
Calculator	.STA	Statistics lists
Calculator	.EQN	Solver equation lists
cc:Mail	.MSG	cc:Mail messages
cc:Mail	.ATT	cc:Mail message attachment
cc:Mail	.FLD	cc:Mail folder
cc:Mail	.CCM	cc:Mail inbox
cc:Mail	.IDX	cc:Mail address book index
cc:Mail	.DRV	cc:Mail communications driver
cc:Mail	.MDM	cc:Mail modem control—comm driver
cc:Mail	.INI	cc:Mail host (Post Of.) config file
Datacomm	.CAP	Capture files
Datacomm	.CTF	Character translation files
Datacomm	.DCF	Configuration files
Datacomm	.LCF	Script files

---

## Using the Split Screen

The split screen (two-window) display showing two different directories makes file transfer and backup much easier. You highlight the file in one window and display the destination directory in the other window. Then press two keys to complete the transfer. You don't have to remember or type the path and file name.

If there is a plug-in card in drive A, a split screen displays when you open the Filer for the first time. The left window displays the root directory C:\ and the right window shows A:\.

### To switch between split and full screen display:

- In the Filer, press **F7**.

### To move the highlight between split windows:

- Press **▶** or **◀**. In either window, you can move the highlight between files and directories just as you can in a single window display.



## Copying and Moving Files and Directories Using a Split Screen

The procedure below will show you how copy and move operations involving one or more files or directories are simplified by using a split screen. To see how a split screen simplifies backup operations, see these examples:

1. "Copying a File from Drive A to Drive C" starting on page 4-27.
2. "Backing Up Your HP 100LX RAM Disk to a Memory Card" starting on page 4-28.
3. "Backing Up Your HP 100LX RAM Disk to a PC" starting on page 4-28.




### To copy or move files and directories using a split screen:

1. In the Filer, press **F7** to display a split screen.
2. In the current window (the window containing the highlight), make the destination directory current. The directory's path will display at the top left of the screen; for instance, C:\\_dat\\*. \*.

- Use  or  to place the highlight in the other window.
- Highlight or tag the files or directories to copy or move. The figure below shows how your screen might look at this point if you were copying `picture2.pcx` from drive A to the directory `C:\_dat`.

4

File		File List		02/11/94 1:37 pm	
C:\_dat\*. *		Local		A:\pictures\*. *	
			Local		
..		▲View	Up▲	picture1.pcx	▲View Up▲
ccmail	ini		718	picture2.pcx	2,118
compusrv	dcf		628	topcard.pcx	5,728
dowjones	dcf		628	topscar.pcx	8,157
filer	env		165		
genie	dcf		628		
mci	dcf		628		
setup	env		6,363		
Dir: 0		Files: 4	Bytes: 22,674	Bytes Free on Disk: 429,856	
Help Copy Move Filter Goto Remote Full View Tree Connect					

- Press either  (copy) or  (move).
- Press . The copy or move operation is performed without typing any letters.

You can use the above procedure for operations between an HP 100LX and a PC using the Connectivity Pack, part number HP F1021A. Using an IR transfer, you can copy or move files and directories between two HP 100LXs and between an HP 100LX and an HP 95LX. See the following section “Transferring Files between Two Computers.”

## Transferring Files between Two Computers

You can copy and move files and directories between your HP 100LX and another computer in several ways:

- Using an IR connection to communicate between two HP 100LXs or between an HP 100LX and an HP 95LX.
- Using a memory card compatible with both computers to transfer files between two computers.
- Using a serial cable and a communications program (see chapter 35) to communicate between an HP 100LX and a portable or desktop computer.

- Using a modem to communicate with another computer by telephone (see chapter 35).
- Using the Connectivity Pack, part number HP F1021A, to communicate between an HP 100LX and another computer.

## Note



You can transfer ASCII files from the HP 95LX to the HP 100LX. However, HP 95LX Appointment Book and Phone Book files require translation when transferred to the HP 100LX. This translation is automatic. A simple procedure covering this translation, titled "To transfer an HP 95LX Appointment Book or Phone Book file to the HP 100LX" is on page 4-23.

## Transferring Files Using an IR Connection

The HP 100LX includes an IR port that enables you to perform, between an HP 95LX and an HP 100LX and between two HP 100LXs, most of the file and directory operations described in this chapter. Only the undelete command is unavailable during IR communication. No cable or additional software is required.

To communicate with each other, the following steps are required:

- Configure each computer for IR communication.
- Position the two computers for IR communication.
- Establish IR communication for file and directory transfer.

These steps are covered by the following procedures.

### To configure an HP 100LX for IR communication:

1. From the Filer, press **MENU** **C** **R**.
2. Arrow to the highest baud rate supported by the two computers:
  - For HP 100LX to HP 95LX IR communication, use 2400 baud.
  - For HP 100LX to HP 100LX IR communication, use 115,200 baud.
3. Tab to *Interface* and arrow to *Infrared*.
4. Press **ALT**+**S** to reach the *Server Mode* option box and highlight *Enabled* on the HP 100LX chosen to be the server. See the figure below.
5. Press **F10**.

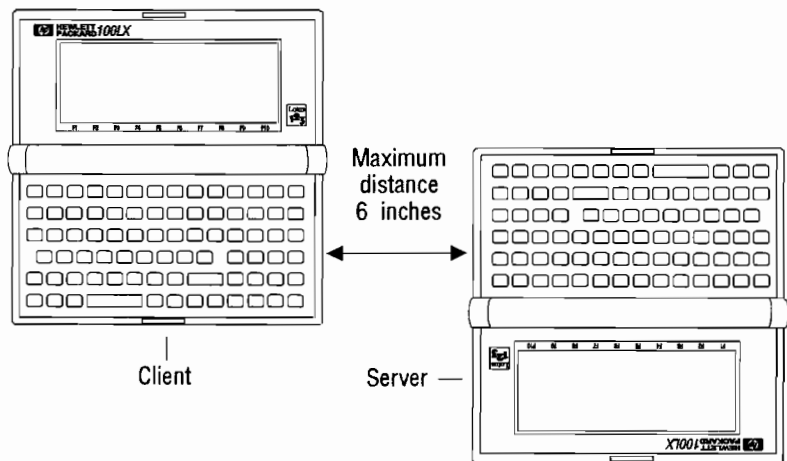
## To configure an HP 95LX for IR communication:

- From the Filer, press **MENU** **R** **C** **I** **3** **Q** **Q**.

If you do not change these configurations, the next time you want to communicate using IR, you can skip these configuration procedures.

## 4 To position the two computers for IR communication:

- Place the two computers with their infrared ports directly opposite each other and separated by less than 6 inches, as shown in the figure below. The **client** (the computer you'll operate) should face you so you can operate it conveniently. The infrared port is lined up with the third row of keys, counting from the top (the third row contains the **7**, **8**, and **9** keys).



## To transfer files and directories by IR between two HP 100LXs:

1. Complete these procedures:
  - a. "To configure an HP 100LX for IR communication" on page 4-19. (Perform this procedure on both HP 100LXs.)
  - b. "To position the two computers for IR communication" directly above.

**All the following steps are performed on the client (see the previous figure).**

2. Press **(F6)** to establish IR communication between both HP 100LXs. The left window (labeled **REMOTE** in the upper-right corner) shows the other HP 100LX's directory list. The right window (labeled **LOCAL** in the upper-right corner of its window) shows your HP 100LX's directory list.
3. Arrow, if necessary, to move the highlight to the destination computer's window.
4. Display the listing of the destination directory to make that directory the **current directory**. The directory's path will display at the top-left of the window. For instance, the path `C:\_dat\*. *` shows that `_dat` is the current directory.
5. Arrow to move the highlight to the other window.
6. Highlight the file or directory or tag the files/directories to copy or move.
7. Press either **(F2)** (copy) or **(F3)** (move).
8. The **File Copy** or **File Move** dialog box should show the local destination directory name in the **TO:** text box. If not, type the path and name of the destination directory. *Do not type \ as the final character.*
9. Press **(F10)**.
10. Press **(F10)** to break the IR connection.

## To transfer files and directories by IR between an HP 95LX and an HP 100LX:

1. Complete these procedures:
  - a. "To configure an HP 100LX for IR communication" on page 4-19. Complete step 4 to make the HP 100LX the server.
  - b. "To configure an HP 95LX for IR communication" on page 4-20.
  - c. Position the HP 100LX as the client as you complete the procedure "To position the two computers for IR communication" on page 4-20.

### All the following steps are performed on the HP 100LX.

2. Press **F6** to establish IR communication. The left window (labeled **Remote** in the upper-right corner) shows the HP 95LX's directory list. The right window (labeled **Local** in the upper-right corner of its window) shows the HP 100LX's directory list.
3. Arrow, if necessary, to move the highlight to the destination computer's window.
4. Display the listing of the destination directory to make that directory the **current directory**. The directory's path will display at the top-left of the window. For instance, the path `C:\_dat\*. *` shows that `_dat` is the current directory.
5. Arrow to move the highlight to the other window.
6. Highlight the file or directory or tag the files/directories to copy or move.
7. Press either **F2** (copy) or **F3** (move).
8. The File Copy or File Move dialog box should show the local destination directory name in the **To:** text box. If not, type the path and name of the destination directory. *Do not type \ as the final character.*
9. Press **F10**.
10. Press **F10** to break the IR connection.

### To switch a window between local and remote directory displays:

- Press **F6**. The Local/Remote indicator at the top-left of the window indicates whether the displayed directories are local or remote.



---

**Note**

The Filer will not display two remote directories simultaneously.

---

**To turn an HP 100LX's IR connection off:**

- Press **(F10)** (disconnect). (When no connection is active, **(F10)** is labelled **Connect**.)

**Transferring Files and Directories Using a Memory Card**

This method of file transfer requires that both computers accept PCMCIA 2.0 memory cards. You copy or move from one computer to a memory card, then insert that card into the other computer and copy or move from card to computer.

**To transfer an HP 95LX Appointment Book or Phone Book file to the HP 100LX:**

HP 95LX Appointment Book and Phone Book files are not usable directly by the HP 100LX since file formats differ. However, the necessary translation occurs automatically when such an HP 95LX file is transferred to an HP 100LX using the following procedure. The copy or move operation for an Appointment Book will take 1 to 3 minutes for a book of average size. A Phone Book should take less than a minute.

1. Copy or move the HP 95LX file to your HP 100LX in one of these ways:
  - By memory card. See the previous section, "Transferring Files and Directories Using A Memory Card."
  - By IR. See the procedure "To transfer files and directories by IR between an HP 95LX and an HP 100LX" on page 4-22.
2. When you press **(MENU)** **(F)** **(O)** in your HP 100LX's Appointment Book or Phone Book, you'll be asked for a file name. After providing the name, two things will happen automatically:
  - 1) a translation of the HP 95LX file will be made and saved in the file you specified, then 2) the file (book) will be opened. When you quit the Phone Book or Appointment Book, the translated HP 95LX book will be automatically saved in the file you specified.

## Transferring Files Using the Connectivity Pack

Using the Connectivity Pack accessory, part number HP F1021A, you can perform all the file and directory operations described in this chapter between the HP 100LX and another computer. The Connectivity Pack consists of a serial cable and disk-based software that duplicates the Filer on the other computer plus all the other HP 100LX applications except 1-2-3, Datacomm, cc:Mail, Stopwatch, and World Time. Using a modem with the Connectivity Pack, you can perform these file and directory operations between the HP 100LX and another computer thousands of miles apart.

In addition, the Connectivity Pack allows you to operate a remote PC from the HP 100LX's keyboard and vice versa.

Instructions for using the HP 100LX with the Connectivity Pack are included with the Connectivity Pack accessory.

---

## Printing Filer Information

Before you print the screen, files, and directories, your HP 100LX must be properly connected to a printer and properly configured. The Filer and all other applications use the printer configuration settings established in Setup. See "Specifying Printer Configuration Settings" on page 3-16. Also see chapter 36.

You can print one or more files or directories using the Filer's Print command. For files created by other HP 100LX applications, such as NoteTaker, that application's Print command offers more printing choices than does the Filer's command.

### To print a screen image from any application:

- Press **Fn**PRTSC (**Fn** **0**).

### To print one or more files:

1. Turn on your printer. Then in the Filer, do one of the following:
  - For one file, highlight the file name.
  - For more than one file, tag each file. (To tag each file, highlight, then press **spacebar**).
2. Press **MENU** **F** **P**.

### To print a directory listing:

1. Highlight the directory name in the file list.
2. Press **MENU** **F** **P**.

### To terminate a print operation in progress:

- Press **CTRL**-**BREAK** (**CTRL**+**MENU**).

---

## Accessing MS-DOS

For a more complete discussion of the HP 100LX's MS-DOS, see chapter 7, "MS-DOS in the HP 100LX." To learn more about how available memory depends on the way you access DOS, see "Starting Your Program in DOS" on page 7-5.

You can display the DOS prompt from the Filer, and also in two other ways:

### To access and leave MS-DOS 5.0:

- **Method 1:** To access DOS from the Filer, press **MENU** **O** **D**. The Filer and any other open applications remain open. To leave DOS and return to the Filer, type `exit` at the DOS prompt and press **ENTER**.
- **Method 2:** To access DOS from any HP 100LX screen, press **CTRL**+**123**. Any open application remains open. To leave DOS and return to the same screen, type `exit` at the DOS prompt and press **ENTER**.

- Method 3:** To quit the System Manager, access DOS, and provide maximum system RAM for applications running in DOS, press **&...**, **MENU**, **A**, **T**. Carefully read the displayed message. Then press **F10** to close all open applications, close the System Manager, and display the DOS prompt. To leave DOS, open the System Manager, and return to the opening HP 100LX screen, type **100** at the DOS prompt and press **ENTER**. You may now open any HP 100LX application.

## Filer Examples

**Example: Moving Selected Files to a New Directory** You have 10 files with the extension .YOM plus many other files in a large directory C:\GENERAL. You want to move those 10 files to a new directory named YOMAN. You want YOMAN to be a subdirectory of C:\.

Use the Filter (press **F4**) to select only \*.YOM files. Tag all the selected files, then move them to a directory YOMAN, creating that directory in the process.




See the procedure "To tag and untag multiple files and/or subdirectories, Method 3, Using Wildcards," on page 4-8

Also, see the example, "Creating a Directory while Moving a File" on page 4-10.

**Example: Copying a Directory and Its Files to Another HP 100LX** Your friend has 14 files in the directory C:\LOTUS\MATH. You want to copy her MATH directory with its files to your C:\ root directory.

Open the Filer in each of the two HP 100LXs, then initiate an IR connection from your HP 100LX. You see your files on your local window and her files on your remote window. In your local window, you display your C:\ directory. In your remote window, you highlight her subdirectory name MATH. Finally you press **F2** **F10**. The directory MATH and its 14 files are now located in both HP 100LXs.

See the procedure "To copy or move files and directories using a split screen" on page 4-17.

**Example: Renaming a Directory** To change the name of a directory that already has a number of files in it, all you need to do is change the name of the directory using File Rename (  ). The newly named directory will now contain all the files it had under its old name.

See the procedure “To rename one file or directory” on page 4-11.

**Example: Copying a File from Drive A to Drive C** With the card in drive A, open the Filer. Since a card is in drive A, a split screen is displayed automatically, C:\ in the left window, A:\ in the right. The split screen makes the copy operation easier.

See the procedure “To copy or move files and directories using a split screen” on page 4-17.

**Example: Updating a PC File from Your HP 100LX** You must purchase a Connectivity Pack, part number HP F1021A, before you can perform this example.

Before leaving for your Tokyo business trip, you used your new Connectivity Pack to copy from your PC into your HP 100LX a 1-2-3 file. You changed this file in Tokyo.

You’ve now returned to your Seattle office, and you want to update the PC copy of this 1-2-3 file. You do this by again using the Connectivity Pack to copy the HP 100LX version of this file to your PC.

**Example: Copying a File Using a Modem** You must purchase a Connectivity Pack, part number HP F1021A, before you can perform this example.

While on a business trip in London, you need to use a 1-2-3 spreadsheet located on your office PC in Chicago. You have with you your HP 100LX and a portable modem.

You call on voice phone your co-worker in Chicago and ask him to turn on your PC, set its modem for autoanswer, and start its Connectivity Pack program. You then call your PC in Chicago from your HP 100LX and copy the 1-2-3 spreadsheet to your HP 100LX in London.

**Example: Backing Up Your HP 100LX RAM Disk to a Memory Card** With a memory card inserted in drive A, open the Filer and automatically get a split screen with directory C:\'s listing on the left and directory A:\'s listing on the right. Move the highlight to the screen showing A drive's root directory listing. Now initiate your backup procedure. If your backup directory does not exist, it will be created during the backup.

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See these two procedures, "To back up a directory's files to a new or existing directory" on page 4-13 and "To copy or move files and directories using a split screen" on page 4-17.

**Example: Backing Up Your HP 100LX RAM Disk to a PC** You must purchase a Connectivity Pack, part number HP F1021A, before you can perform this example.

With the Connectivity Pack installed and connected between your HP 100LX and your PC, open the Filer in your HP 100LX and display a split screen. In the Local screen, display the highlight and directory C:\'s listing. You may show any PC directory in the remote screen. Now initiate your backup procedure.

## Managing Your Applications

---

To open the Applications Manager, press .

This chapter tells you

- How to add applications.
- How to open, close, and delete applications.
- How to manage memory.

---

### Adding Applications

There are two types of applications you can add to your HP 100LX:

- An MS-DOS application—an application that will run on an MS-DOS 5.0 computer equipped with a CGA monitor.
- A **System-Manager-compliant** (SMC) application. You can manage an SMC application in the same way you manage the HP 100LX's built-in applications. For instance, when you are using an SMC application, you can open another SMC application without closing the first. You can then return to the first application later to find it in the same state in which you left it. These special applications are being developed by a number of vendors specifically for the HP 100LX.

Many of the System-Manager-compliant applications developed for the HP 95LX will also run in the HP 100LX.

## Assigning Icons and Program-Starting Keys to Applications

5

You can assign an icon and a single program-starting key (a “shortcut key”) to both DOS programs and SMC programs. These shortcut keys work only from within the System Manager application. You can also assign *only to SMC programs* universal program-starting key combinations that work when pressed from any HP 100LX application, DOS or SMC.

For a DOS application, you perform three operations:

- Install the application into the HP 100LX as you would into any DOS PC, often using an installation procedure provided as part of the application package.
- Assign an icon to the application.
- Assign a shortcut key to the application.

For an SMC application, you perform four operations:

- Install the application.
- Assign an icon.
- Assign a shortcut key.
- Assign a universal program-starting key combination.

### To begin installing a DOS application into the System Manager:

1. Follow the instructions in the section “How to Install, Run, and Control a DOS Application” on page 7-8.
2. Return to this chapter when told to do so by that chapter 7 procedure.
3. Follow the second procedure below, “To continue installing a DOS or SMC application into the System Manager.”

### To begin installing an SMC application into the System Manager:

Do one of the following:

- If the application is supplied on a memory card, *first turn off your HP 100LX to protect the card’s contents*, then insert the card into your HP 100LX’s drive A (see “To Insert and Remove a Card” on page 1-6).
- If the application is supplied on a floppy disk, perform the following steps:
  1. Load the application into your IBM-compatible PC.



2. Transfer it to your HP 100LX using the Connectivity Pack, part number HP F1021A (see "Transferring Files Using the Connectivity Pack" on page 4-24).
3. Continue with the following procedure.

### To continue installing a DOS or SMC application into the System Manager:

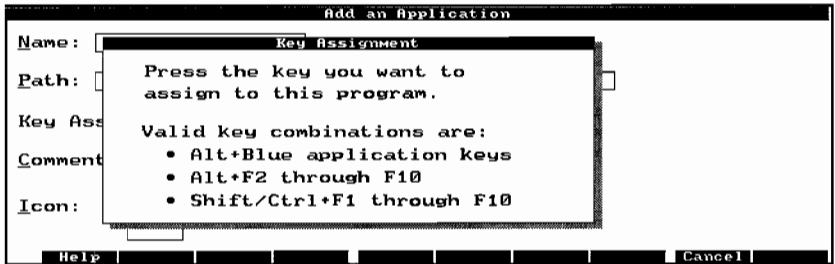
After completing the instructions in one of the two procedures above, continue with these steps:

1. Press **[&...]** **[F2]** to display the screen shown below:

#### Add an Application Screen

2. (Optional) Select a letter for a shortcut key. You'll use your selected letter in the next step. The built-in applications already use some letters, leaving these for your use: G, J, K, O, Q, R, U, V, X, Y, Z. You can also use number keys as well the letters already assigned to "blue key" applications. Since you press blue keys, the letters are available. To use them, see the next procedure "To use a built-in application's shortcut key for your added application."
3. Type a name (up to 14 characters) for the application. This name will appear in the Icons and List Views shown together starting on page 5-6. (A new HP 100LX will display the Icons View when you press **[&...]**.) If you precede any character with an **&**, that character will be underlined in the Icons View identifying that letter as a shortcut key. When the Icons View is displayed, pressing the shortcut key will start the application. For instance, if the name of your program is "Dragon" and you want **[G]** to start the program, type **Dr&a&gon**.

4. Tab to **Path** and type the complete path and file name of your application's executable file (63 characters maximum). Example: C:\\_DAT\CHESS.EXM. For a System-Manager-compliant (SMC) program, this file name should have an .EXM extension. For a DOS application, this file should have a .BAT, .COM, or .EXE extension. If you type .EXM, the label **Set Key** will appear for **(F4)**, preparing you for the next step.
5. **Note:** *Perform this step only if you're installing an SMC application.* You can start an SMC application by pressing a key combination from any built-in program or from any other SMC program. To define this key combination, press **(F4)** to display the "Key Assignment" instruction box (see the figure below). Follow the displayed instructions. After defining the key combination, you'll return automatically to the previous "Add an Application" screen.



**Key Assignment Instruction Box**

6. Tab to **Comments** and type an optional comment, 24 characters maximum. The first 17 of these characters are displayed in the Comments column of the List View.
7. Tab to **Icon:** and arrow to the icon you want displayed for your new application. If your purchased application includes its own icon stored in a file with the extension .ICN, you'll see this icon as you arrow through the choices. For a DOS application, you might choose the "C:>\_" icon. For an SMC application that does not have its own icon, the blank icon might be suitable. The icon's name would identify it.
8. Press **(F10)**.

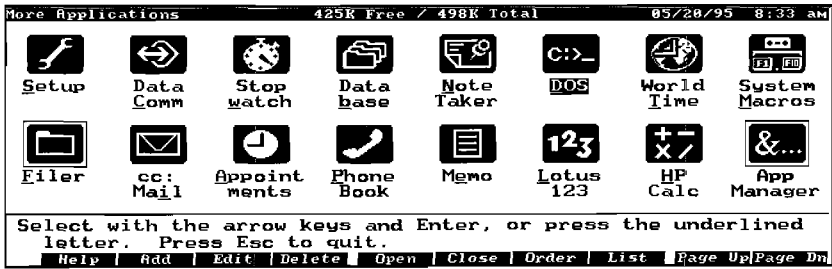
**To use a built-in application's shortcut key for your added application:**

When a shortcut key is pressed (say **A**), the HP 100LX searches the List from top to bottom. When it finds the first application using "A" as its shortcut key, it stops its search and opens that application. Perform the following procedure to move to the bottom of the list the name of the application whose shortcut key you want to use.

1. Complete steps 1 and 2 of the previous application, "To continue installing a DOS or SMC application into the System Manager."
2. Press **F8**, if necessary, to display the List View.
3. Arrow to highlight the application's listing whose key you want to use. (For instance, arrow to **Appointments** so you can use **A** as your key.)
4. Press **F7**.
5. Arrow to move the listing to the bottom of the list. Note that the list extends beyond the bottom of the display.
6. Press **F7** again.
7. Continue with step 3 of the previous procedure, "To continue installing a DOS or SMC application into the System Manager."

**Icons View and List View**

Each System-Manager-compliant and built-in application is represented in both the Icons View and List View shown below. To see all the listings and all the icons, press **▼** or **F10**.



**Icons View**  
(press **F8** from the List View)

More Applications		425K Free / 498K Total	05/28/95 8:34 am
Application	Status	Memory	Key
Setup	Closed		Ctrl+Filer
Data Comm	Closed		Ctrl+cc:Mail
Stopwatch	Closed		Ctrl+Appt
Database	Closed		Ctrl+Phone
Note Taker	Closed		Ctrl+Memo
DOS	Closed		Ctrl+123
World Time	Closed		Ctrl+Calc
System Macros	Closed		Ctrl+More
Filer	Asleep	56K	Filer
cc:Mail	Closed		cc:Mail
Appointments	Closed		Appt
Phone Book	Closed		Phone

Help | Add | Edit | Delete | Open | Close | Order | Icons | Page Up | Page Dn

### List View

(press **F8** from the Icons View)

## Editing the Applications List

Each application represented by an entry in the List View has a corresponding “Edit an Application” dialog box. For applications you’ve added, all text boxes in this dialog box can be edited. For built-in applications, only the “Comments” text box can be edited.

You can also change the position of an application’s entry in this list.

### To edit an application’s listing:

1. In either the List or Icons view, arrow to highlight the name of the application whose listing you want to edit.
2. Press **F3**.
3. Edit the fields you want to change.
4. Press **F10**.

### To change an application’s position in both the List and Icons Views:

1. In the Applications Manager, display either the List or Icons View.
2. Arrow to highlight the application whose position in both views you want to change.
3. Press **F7**.
4. Arrow to move the application’s listing or icon to a new position.
5. Press **ENTER**. The positions in both the List and Icons Views is changed.

## Opening, Leaving, and Deleting Applications

### To open an application:

- If the application *is* represented by a blue key, such as Filer or Phone Book, press the appropriate blue key from any other System-Manager-compliant application.
- If the application is *not* represented by a blue key, do one of the following:
  - Press the key combination that opens the application from any other System-Manager-compliant application. See the table below.
  - In the List View of the Applications Manager, highlight the name of the application and press **F5**. (You may have to press **▼** or **F10** to see all the application names.)
  - In the Icons View of the Applications Manager, either press the letter-key whose letter is underlined in the applications name, or highlight the icon and press **F5**. (You may have to press **▼** or **F10** to see all the icons.)
- If an added application is not represented by an icon, press **CTRL**+**12** to display the DOS prompt, then type the path and name of the application's executable file and press **ENTER**.

#### **CTRL**+Key Combinations that Open Built-in Applications

Application	Key Combination
Setup	<b>CTRL</b> + <b>Ⓜ</b>
Data Com	<b>CTRL</b> + <b>Ⓜ</b>
Stopwatch	<b>CTRL</b> + <b>Ⓜ</b>
Database	<b>CTRL</b> + <b>Ⓜ</b>
Note Taker	<b>CTRL</b> + <b>Ⓜ</b>
DOS	<b>CTRL</b> + <b>12</b>
World Time	<b>CTRL</b> + <b>17</b>
System Macros	<b>CTRL</b> + <b>&amp;...</b>

### To quit an application:

- For 1-2-3, press **MENU** **Q** **Y**.
- For other built-in applications, press **MENU** **Q**.

- For added applications represented by an icon, arrow to the application's name in either the List or Icons View and press **(F6)**.
- For added applications not represented by an icon, type at the DOS prompt the application's command that closes the application ("quit," "exit," or some similar command). See your application's instructions.

### To delete an added application:

You cannot delete built-in applications. You can delete only those applications you've added.

1. In the Applications Manager, press if necessary **(F8)** to display the List View.
2. Arrow to highlight the application you want to delete.
3. Press **(F4)** **(ENTER)**.

---

## Managing Memory

### Types of Memory

There are three main types of HP 100LX memory:

- System RAM, commonly called RAM in a desktop or portable PC. You would use HP 100LX's RAM as you would a desktop PC's RAM (except you can't add RAM to the HP 100LX as you can to a PC).
- RAM disk (drive C), a portion of RAM corresponding to the hard disk in a desk-top PC. You would use HP 100LX's drive C as you would use a PC's hard disk.
- ROM (drive D), containing files that you cannot change. They may only be read and copied. The HP 100LX uses some of these files to start itself when you first install batteries and press **(ON)** or when you press **(CTRL)+(ALT)+(DEL)** (reboot) or **(CTRL)+(↑)+(ON)** (hard reset). Other files in drive D are used when you open various applications.

## Determining Memory Usage

### To determine free and total system RAM memory:

- The top line of both the List and Icons Views show the free and total memory in system RAM. Note that “total memory” includes that used by the System Manager—about 85K.

### To determine the memory used by a single application:

- In the Applications Manager, press if necessary **F8** to display the List View. The third column shows the memory being used by each open application. The following section explains the two-figure memory usage shown by an open Lotus 1-2-3.

### Memory Used by Lotus 1-2-3

Normally when 1-2-3 is open, it takes all available memory to allow the largest possible spreadsheet to be created. The amount of that memory is given by the *second* figure in the List View memory column (shown when 1-2-3 is open). But when the memory usage of other applications increases, 1-2-3 reduces its memory demands accordingly, down to the minimum required by the current spreadsheet. The amount of that minimum memory is given by the *first* figure in the List View.

## Maximizing System RAM

Normally, available memory is maximized by closing all open applications. The fastest way to do this is shown below (“To close all applications while leaving the System Manager open”). However, additional memory can be released by closing the System Manager. See the third procedure below, “To maximize application memory by closing the System Manager.”

### To check the amount of available memory:

- At the DOS prompt, type `CHKDSK` and press **ENTER**. The number of bytes free will be displayed.

### To close all applications while leaving the System Manager open:

1. In Applications Manager (**&...**), press **F8** (if necessary) to display the List View.
2. Arrow to view all application listings and press **F6** to close any open applications *except Applications Manager*. (You may leave Setup open.)
3. In Setup (**CTRL**+**ESC**), press **MENU** **O** **S**.
4. Tab to **Memory**.
5. Press **◀** to give maximum System RAM memory.
6. In Applications Manager, press **MENU** **A** **L** to close all open applications.
7. Press **CTRL**+**123** to get the DOS prompt. Three character sizes are available. Press **Fn**ZOOM several times to see them.

### To maximize application memory by closing the System Manager:

After completing this procedure, no built-in or added System-Manager-compliant programs will be available until you reopen the System Manager. You will be able to run only DOS programs.

1. In the Applications Manager, press **MENU** **A** **T**.
2. Read carefully the displayed text.
3. Press **ENTER**.

### To open the System Manager:

- From the DOS prompt, type **100** and press **ENTER**.



## System Macros

---

To start System Macros, press **CTRL**+**&...** or **&...** **M**.

You create a system macro by recording keystrokes as you press keys to perform a task. A macro can perform a task within one or several applications. When you want to perform this task again, you can run your macro program and let it “press” the keys for you.

When you create a macro, you assign it to one of the function keys **F1** through **F10**.

To run a macro, press **Fn** plus the function key to which the macro was assigned. Press these keys from the Business Card display or from any application except DOS or System Macros.

---

## Creating System Macros

### Notes



- You cannot record or execute a system macro within DOS or System Macros.
- A macro can contain a maximum of 255 keystrokes. But this limit can be overcome. See “Creating Macros That Execute Other Macros” on page 6-6.

---

There are three ways you can create a system macro. Below are procedures for each of these methods. An example illustrates the first method.

## To create a system macro from the System Macro application:

1. Press **&...** **M** to open System Macros.
2. If necessary, arrow to a line that does not have a macro assigned to it.
3. Press **F8** **F10** to initiate macro recording. You are automatically switched back to your previous application.
4. Press the keys that constitute your macro. As each key is pressed, a low beep indicates the key is recorded. A macro can contain up to 255 keystroke or keystroke combinations (like **Fn**HOME).
5. End macro recording by pressing **⏏**+**Fn** **F?**, where **F?** is any function key, regardless of whether or not a macro is assigned to it.
6. To enter an optional description or name for your macro, press **F2** from the System Macros application, then type your description in the `DESCRIPTION` text box.
7. Press **F10**.

### Example: Creating a system macro from the System Macro

**Application** This macro will display the currency conversions editing screen so you can easily enter the current conversion factor when you cross another country's border.

#### Keys:

**&...** **M**

**F8**

**F10**


#### Description:

Opens the System Macro application. If any macros were listed, you would press **▼** to reach a **Fn** function-key line (like **Fn+F4**) that was available. This example assumes you are assigning this macro to **Fn** **F1**.

Displays the Record Macro screen. It tells you how to finish recording a macro.

Your display now shows your previous application. As you press keys, each press will cause a low-toned beep to sound, telling you the keystroke is being recorded.




This macro step will display the main Calculator menu. (If you were already in the Calculator application when you pressed , you would hear a high-pitched beep indicating a redundant keystroke. However, the keystroke would still be recorded.)



These steps will display the Currency Conversions Edit screen.



Ends macro recording. (You could press any function key other than ) to end macro recording.) The end of macro recording is indicated by two short-duration beeps, the first high, the second low. The Currency Conversions Edit screen is still displayed.



Quits the calculator and displays the System Macros list of macros. The keystrokes you recorded are displayed after  $Fn+F1$ . See the figure below.



**F2**

Displays the `Edit macros: Fn+F1` dialog box.

Currency conversion

Type this phrase as the description for your macro.

**F10**

The `System Macros` list of macros is again displayed. Your description has replaced the keystrokes you recorded.

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To run this macro from the Business Card or from any application except System Macros or DOS, press **Fn** followed by the function key you assigned this macro to (for instance, **Fn** **F1**).

### To create a system macro from another application:

#### Note



*Except for System Macros and DOS, you can record a system macro from any application. You can also record from the Business Card.*

1. From the Business Card or from any application except System Macros and DOS, press three keys. The first two, **Fn** and **F3**, are pressed together. The last is the function key you want your macro assigned to. For instance, to assign your macro to **F3**, you'd press **Fn**+**F3**. Your HP 100LX protects you against inadvertently using a key that is already assigned to another macro. A two-tone beep, the first low, the second high, indicates the start of macro recording.
2. Press the keys that constitute your macro. As each key is pressed, a low-tone beep indicates the key is recorded.
3. End macro recording by pressing **Fn**+**F3** (or any function key other than **F3**). You remain in the same screen. For instance, in the above example, you remained in the `Currency Conversions Edit` screen.
4. To enter an optional description or name for your macro, press **F2** and type your description in the `Description` text box.

To run your macro from the Business Card or from any application except System Macros and DOS, press **Fn** followed by the function key you assigned your macro to. For instance, press **Fn** **F3**.

### To create a system macro while displaying each key symbol:

1. Press **&...** **M** to open System Macros.
2. Arrow to the function key you want your macro assigned to.
3. Press **F2**.
4. Optional: type a name or description for your macro.
5. Tab to the **Content**s dialog box. This box contains symbols for the keys you want your macro to “press”.
6. Press the text keys or generate the symbols for other keys in the order you want your macro to “press” them. To generate those symbols, press **F6**, then the key or key combination that normally would produce the operation you want your macro to perform. (If you know the symbol, you can type it rather than have **F6** generate it for you.) If you're not sure if you need to use **F6** to generate the symbol (rather than press the key directly), use **F6**, since it always works. (For instance, pressing **F6** **Menu** displays {MENU}.)
7. Press **F10**.

### To edit a system macro:

1. Press **&...** **M** to open System Macros.
2. If the macro you want to edit is not in the current macro file, press **Menu** **F** **O** and type the path and name of the file containing the macro. Then press **F10**. Your macro is now the current macro file.
3. Arrow to the macro (or the description of the macro) you want to edit.
4. Press **F2**.
5. If you want, edit the description of your macro.
6. To edit the contents of your macro, tab to the **Content**s dialog box and edit the text and key symbols of your macro. If you don't know a key symbol for a non-text key, press **F6**, then press the non-text key. The HP 100LX will enter the symbol for you.
7. To enter your editing changes, **do not press** **ENTER** while the cursor is in the **Content**s text box, since **ENTER** is used as a text key (as a line feed, carriage return character). Do press **F10** to enter your editing changes.

## Creating Macros That Execute Other Macros

The last step of your macro can execute a second macro. And the last step of that second macro can execute (can **chain** to) a third macro. And so on. Also, these chained macros can be in different macro files (in different sets of 10 macros). So you can write a set of instructions, spread among a series of chained macros in different macro files, whose length is limited only by RAM disk size. (See “System RAM and RAM Disk” on page 3-5). In this way, you can overcome the 255 keystroke limit on the size of one macro.

---

### Caution



During macro execution, if you chain from a macro whose file has not been saved, the changes to that file will be lost. If the file has never been saved, all macros in that file will be lost.

---

### To instruct a macro to run another existing system macro:

---

### Note



When you write a macro that chains to another macro file, that other macro file must already exist. Otherwise, you'll get an error.

---

### Note



When a macro chains to another macro in another file, that other file becomes the current file. The macro represented by **[Fn]** **[F1]** is now a different macro.

---

1. *Make sure that the file containing the macro you're chaining from is saved.* See the Caution above.
2. Start to create your macro in one of these ways:
  - Begin writing your macro using Macro Edit. See “To create a system macro while displaying each key symbol” on page 6-5. When you reach the end of your macro and want to insert a chain instruction, proceed with step 3 of this procedure. Note that the chain instruction must be the last instruction of your macro.
  - Edit an existing macro. See “To edit a system macro” on page 6-5. Edit your macro so the chain instruction will be the last instruction of your macro. Now proceed with step 3 of this procedure.

3. Press **F7**. (Your cursor must be in the **Contents** text box for the **Chain** (**F7**) function key label to appear.)
4. If the macro you want to chain to is not one of those displayed, tab to **Select File**, press **F10**, and open the macro file containing the macro you want.
5. Arrow to the macro you want to chain to.
6. Press **F10**. The identification for the macro you've selected (for instance, **{Fn+F4}**) will appear as the last step in your macro.
7. Press **F10**.

---

## Running System Macros

### To run a system macro:

- From the Business Card or from any application except DOS or System Macros, press **Fn** followed by the function key to which the macro is assigned. If the macro was assigned to **F5**, you'd press **Fn F5**.

---

## Saving and Opening Sets of System Macros

### Note



The System Macro application will automatically save up to 10 macros. If you want to save more than 10, you need to save the first set of 10 in a file. Only RAM disk size limits the number of sets of macros you can save in files.

---

### To save a set of 10 or fewer macros:

1. In the System Macros application, press **Menu F A**.
2. Type a file name. The file name extension **.MFC** will be added automatically. The file will be saved in the **C:\\_DAT** directory. To save your macro in another directory, type both path and file name.
3. Press **F10**.

If you add macros to a set that has already been saved, you can save this new version of the same set by pressing **⌘ F S**.

### To open an existing set of macros:

1. In the System Macros application, press **⌘ F O**.
2. Tab to the **Files** list box.
3. Arrow if necessary to highlight the file you want to open.
4. Press **F10**.

### To open a new blank set of macros:

- In the System Macros application, press **⌘ F N**. If the present set of macros is not saved in a file, or if it has been modified since it was last saved, you'll be asked **Save changes?**. You can then respond to the three offered options as follows:
  - To save the changes, press **F10**.
  - To erase the current macro set without saving, press **F5**.
  - To cancel your request, press **F9**.

---

## Deleting (Clearing) System Macros

### To clear a single system macro:

1. In the System Macros application, open, if necessary, the file containing the macro you want to delete. See "To open an existing set of macros" on page 6-8.
2. Arrow to the macro you want to delete.
3. Press **F7 F10**.
4. If you have saved this macro set, save this new version (if you want) under the same name by pressing **⌘ F S**.

### To clear a set of system macros:

- See "To delete one or more files or directories" on page 4-12. Follow the chapter 4 procedure to delete the file containing the set of macros.



---

## System Macros and Lotus 1-2-3

- You can write and run a System Macro while in the 1-2-3 application.
- You can cause a System Macro to execute a 1-2-3 macro.
- You *cannot* cause a 1-2-3 macro to execute a System Macro, since there is no 1-2-3 macro instruction for this action.

This first example below shows how to write a System Macro that starts a 1-2-3 macro.

---

## System Macros Examples

### Example: Writing a Macro that Starts a 1-2-3 Macro

You want to be able to run a 1-2-3 macro, not just from 1-2-3, but also from as many other locations within the HP 100LX as possible. (These other locations are the Business Card display shown when no applications are open and any open application except System Macros or DOS.)

Assuming the 1-2-3 macro is assigned to **ALT+A**, you follow these steps to write this system macro.

1. Display the Business Card or open any application except System Macros or DOS.
2. Press **↑** **Fn** **F1** to start recording (assuming **F1** has no macro already assigned to it).
3. Press **12f** **ALT** **A**.
4. Press **↑** **Fn** **F1** to stop recording. (Instead of **F1**, any function key may be used to stop recording, even if a macro is assigned to it.)

Now, when you press **Fn** **F1** from any application except System Macros or DOS, the 1-2-3 application will start followed by the **ALT+A** 1-2-3 macro.

## Example: Printing Today's Appointments from the Appointment Book

At the start of each day, you want to have a printed list of your appointments. You can execute this macro to print this list, provided these conditions exist:

- 6
- No Appointment Book record is open.
  - Your printer is turned on.

Create this macro as follows:

1. Display the Business Card or open any application except System Macros or DOS.
2. Press **↑**+**Fn** **F1** to start recording (assuming **F1** has no macro already assigned to it).
3. Press **⏻** **F5** **F4** **☰** **F** **P** **ALT**+**T** **TAB** **ALT**+**L** **ALT**+**P** **F10**.
4. Press **↑**+**Fn** **F1** to stop recording. (Instead of **F1**, any function key may be used to stop recording, even if a macro is assigned to it.)

**Example: Updating a PC File from Your HP 100LX** You must purchase a Connectivity Pack, part number HP F1021A, before you can perform this example.

You are an investor in common stocks, and you travel often. When not traveling, you update the 1-2-3 spreadsheet on your PC that contains the daily closing prices of the stocks you own. When traveling, you update in your HP 100LX a copy of that PC file. Then when you return, you copy your HP 100LX spreadsheet back to your PC. You could perform these copy operations using the Connectivity Pack.

Rather than performing these file transfers by pressing the required series of keys, you combine those keystrokes into two macros. The actual keystrokes that define these two macros depends on your file names and file structure.

These are the system macros you create:

- Copy the PC spreadsheet to your HP 100LX.
- Copy the HP 100LX spreadsheet to your PC.

## MS-DOS in the HP 100LX

---

To display the DOS prompt, press **CTRL**+**F12** or **CTRL**+**D**. To leave DOS, type `exit` at the DOS prompt and press **ENTER**. Other ways to display the DOS prompt and leave DOS are described in “Starting Your Program in DOS” on page 7-5.

This chapter describes:

- The version of DOS 5.0 that is the disk operating system for the HP 100LX.
- The various ways you can access DOS.
- How to install and run a DOS application.
- The available DOS commands.

Many file and directory operations performed by commands described in this chapter can also be performed in the Filer application (see chapter 4).

---

### The HP 100LX's DOS 5.0

The HP 100LX's disk operating system is a version of MS-DOS 5.0 in ROM that:

- Minimizes the use of system RAM by the operating system.
- Omits some of the external commands available in the standard DOS 5.0. See “Standard MS-DOS 5.0 Commands Available in the HP 100LX” on page 7-28.
- Adds some important utility commands unique to the HP 100LX. See “Utility Commands Created for the HP 100LX” on page 7-21.

## The MS-DOS Startup Procedure

The actions listed below occur when:

- All batteries are removed at the same time, then replaced, and then **ON** is pressed, or
- A hard reset (**CTRL**+**↑**+**ON**) is performed, or
- A reboot (**CTRL**+**ALT**+**DEL**) is performed.

These actions are:

1. A search is made for the CONFIG.SYS file in the directory structures of HP 100LX's drives in this order: A, C, D. The CONFIG.SYS file in a new HP 100LX is on drive D.
2. As soon as the CONFIG.SYS file is found, the drive on which CONFIG.SYS was found is defined as the default drive. In a new HP 100LX, the default drive is defined as D.
3. The commands found in CONFIG.SYS are executed.
4. A search is made in the newly-defined default drive for an AUTOEXEC.BAT file. In a new HP 100LX, this file is on drive D.
5. If an AUTOEXEC.BAT file is found on the default drive, the commands in that file are executed. If an AUTOEXEC.BAT file exists but is not found on the default drive, the commands in that file are *not* executed.

## Boot (Reset) Options

When you first start your HP 100LX or when you perform a reboot (press **CTRL**+**ALT**+**DEL**) or a hard reset (press **CTRL**+**↑**+**ON**), the message **Press ALT for Boot Options...** is displayed briefly, then disappears automatically as the boot process continues. If you press **ALT** during the brief time that message is displayed, you'll see the following text message titled **\*\*\* Select Default Drive Option \*\*\***.

### \*\*\* Select Default Drive Option \*\*\*

Unless changed at this screen, the default drive will be the first of drives A, C, and D found to contain a config.sys file in the root directory. The options below allow control of default drive and startup file processing. This selection controls this reboot only.

1. Make A default drive; process startup files.
2. Make C default drive; process startup files.
3. Make D default drive; process startup files.
4. Make A default drive; do not process startup files.
5. Make C default drive; do not process startup files.
6. Make D default drive; do not process startup files.
7. Use normal default drive determination.

Enter selection [7]:

### Why These Options Are Offered

It might help to give an example showing the usefulness of one of the options. Say you load on drive C a DOS application plus a special driver required by that application. You copy your startup files, CONFIG.SYS and AUTOEXEC.BAT, from drive D to C and modify the copies on C incorrectly in an attempt to satisfy the requirements of the special driver. When you boot, the system locks, since the first start-up files it found as it searched drives A, C, and D were on C. You try to boot again, but this time you press **[ALT]** to display the **\*\*\* Select Default Drive Option \*\*\*** screen. You select option 3, *Make D default drive; process startup files*. When you press **[3]**, the boot continues successfully, since the original startup files on drive D were executed. Now you can inspect the modified copies of the startup files on drive C and attempt a fix.

### To select a default drive option:

1. Press **[CTRL]+[ALT]+[DEL]** (reboot) or **[CTRL]+[↑]+[ON]** (hard reset) and then press **[ALT]** immediately (during the brief time the message *Press ALT for Boot Options...* is displayed). The **\*\*\* Select Default Drive Option \*\*\*** screen appears.

2. Press the number key of the option you want. You need not press **ENTER**. To select the default option 7, press **ENTER**. After you select your option, the boot continues.

---

## The System Manager Program

On a new HP 100LX, the System Manager is opened automatically when you:

- Press **ON** after you remove all batteries at the same time and install new ones.
- Press **CTRL**+**ALT**+**DEL** to perform a reboot.
- Press **CTRL**+**↑**+**ON** to perform a hard reset.

The System Manager opens automatically because the last command in the AUTOEXEC.BAT file on drive D loads the System Manager program.

This program controls:

- All built-in applications.
- All SMC (System-Manager compliant) programs you add.
- A DOS shell or task that can be accessed through the Applications Manager or the Filer application.

A program or application operating under the control of the System Manager operates in a unique way:

- You can leave the program without closing it, open and use another program, then switch back to the first program and find it in the same situation as when you left it. The program has remained in a suspended state, waiting for the next keystroke. When you switch back to that program, you can then enter that next keystroke.

### To close and open the System Manager program:

- To close the System Manager, press **&...** to open the Application Manager, then press **MENU** **A** **T** **ENTER**.
- To open the System Manager, type **100** at the DOS prompt and press **ENTER**.

## Starting Your Program in DOS

Starting your DOS program in the HP 100LX involves more than displaying the C:\> prompt and entering the command that launches your program. Since there are three principle ways to access DOS, differing in the amount of memory available for DOS applications and in other ways, you want to choose the way that's best for you and your program. The three ways are:

- Press **CTRL**+**F10** or **MENU** **D** to open DOS as a shell that acts as though it were an SMC (System-Manager compliant) application—one you can leave, then return to exactly where you left off.
- From the Filer:
  - Press **MENU** **O** **D** to open DOS as a shell that acts as though it were an SMC program.
  - Highlight the name of an executable file, then press **ENTER** to run the program. This opens the same DOS shell that's opened when you press **MENU** **O** **D** (as stated above), and in addition, the executable file is executed.

### Note



If the DOS shell is already open, the you cannot return to DOS through the Filer. Use **CTRL**+**F10** or **ALT** **D** to return.

- Press **ALT** to open the Applications Manager, then press **MENU** **A** **T** **ENTER** (Terminate All) to close all open files, to close all open applications, and to close the System Manager program itself. Since System Manager is a program running in DOS, when you close System Manager, you see the DOS prompt. All built-in applications (such as 1-2-3, the Filer, and the Appointment Book) are unavailable until you launch the System Manager program by entering 100 at the DOS prompt.

## Deciding Which Way to Access DOS

The choice between the three principle ways to display the DOS prompt involves convenience and the memory you'll need to perform your operations within DOS.

7 The total memory available to perform your operations within DOS is determined by the boundary between RAM used by the RAM disk (used like a hard disk is used on a desk PC) and system RAM (used like RAM on a desk PC). You change this boundary between drive C and system RAM in Setup's **S**Y**S**T**E**M**S** screen (**C** **O** **S**). See "System RAM and RAM Disk" on page 3-5.

The three ways to display the DOS prompt differ primarily in how much of the total system RAM is allocated to DOS when DOS is accessed.

The advantages and disadvantages of each way are discussed below.

### Accessing DOS by Pressing **CTRL**+**F8**

Using this method, the amount of memory allocated to DOS is specified by the DOS setting in Setup's **A**D**V**A**N****C****E****D** screen (**M****E****N****U** **O** **S** **F****8**). See "Changing System RAM Assigned to Clipboard, Static Data, and DOS" on page 3-6.

#### Advantages

- You can run any DOS application in a manner similar to a System-Manager compliant application. You can leave by exiting the DOS shell, then return where you left off by accessing DOS again.
- You can allocate a specific amount of memory for DOS system memory rather than taking all available memory. By adjusting DOS System Memory to a particular value, you can make memory available to open additional applications.
- Alarms you have set (in the Appointment Book) can go off as scheduled while you're in DOS running a DOS application.

#### Disadvantages

- The amount of memory allocated to DOS in Setup may not be enough to run your application. You would then have to go into Setup, change the DOS memory value, then try again.





- If the amount of memory specified for DOS in Setup is not currently available, you cannot access DOS using this method without first closing some applications.

## Accessing DOS from the Filer

Using this method, you have available all system memory not being used by open System-Manager-compliant (SMC) applications and by the System Manager program itself.

### Advantages

- You can run any DOS application in a manner similar to an SMC application. You can leave by exiting the DOS shell, then return where you left off by accessing DOS again.
- Compared to accessing by pressing  + , you have greater assurance of having enough memory to run your DOS application, provided that the same SMC applications were open in each case.

### Disadvantage

- You cannot open any additional SMC applications without first leaving DOS or without first closing other SMC applications.

## Accessing DOS by pressing

This method gives you the maximum amount of memory for DOS applications since the System Manager program is no longer running.

### Advantage

- You can run applications requiring more memory than is available in the other two methods.

### Disadvantages

- You cannot run any SMC application without first running the System Manager program.
- You cannot run a DOS application in a manner similar to an SMC application.
- Alarms you have set will not go off.

---

# How To Install, Run, and Control a DOS Application

## Installing a DOS Application

---

### Note



The procedure below uses the Redirector application provided with the Connectivity Pack, part number HP F1021A.

---

### Caution







The following procedure asks you to install a memory card. **Turn off the HP 100LX before inserting a memory card into drive A.** Otherwise, a system lock-up may occur requiring a hard reset (possible loss of system RAM contents).

---

### To install a DOS application:



1. Using the instructions supplied with the Connectivity Pack, launch the Redirector. Refer to the Redirector's instructions as you proceed.
2. Assign the HP 100LX as the client and the PC as the server. This means the HP 100LX will use the PC's drives as though they were additional drives within the HP 100LX.
3. You can install your application on the HP 100LX's drive C or A. While drive C may not have enough memory for your application, you can get memory cards (drive A) with several megabytes of memory, considerably more than is available on drive C.
4. If you plan to use a memory card, obtain one with enough memory to run your application plus enough memory to hold all files of your application following the execution of that application's installation program. Refer to "Using Memory Cards" on page 1-6.
5. *To protect memory, turn off your HP 100LX before you install your memory card.*
6. Install your memory card into your HP 100LX's drive A. Refer to the section "To Insert and Remove a Card" on page 1-6.
7. The drive name used in this procedure depends on the name you assigned to the PC drive that holds your application's files. Refer







to the Connectivity Pack manual for more information. This procedure assumes that H is mapped to that drive. If your drive name is other than H, substitute that name for H below.

8. Display the DOS prompt by pressing    .
9. Execute your application's installation instructions, substituting H for your PC's drive name. For instance, if your instructions told you to insert the application's floppy disk into your PC's drive A and type at the DOS prompt, A:INSTALL, you would type H:INSTALL at the DOS prompt. Refer to the Connectivity Pack manual for more information. Another technique is to install the application on a PC first, then move the files to the HP 100LX using the Filer or Redirector.
10. If you want to assign an icon and a program-starting key (a shortcut key), continue with "To continue installing a DOS or SMC application into the System Manager" on page 5-3.

## Tips on Running a DOS Application on the HP 100LX

### How to Press and on the HP 100LX

If your program designed for an IBM-compatible PC asks you to press  or , press instead the keys shown in the following table to get the same result:

To execute:	Press:
	 
	 

### How to Press IBM Numeric Keypad Keys on the HP 100LX

While the HP 100LX has a numeric keypad, the keycodes associated with those keys correspond to the top-row number keys on an IBM-compatible PC keyboard. If your program asks you to press either an unshifted or shifted key on the number pad of an IBM-compatible PC keyboard, press instead the keys shown in the following table to get the same result.

## How to Execute IBM Numeric Keypad Keys

To execute IBM key:	Press on HP 100LX:	To execute IBM key:	Press on HP 100LX:
0	+ 0	End	+ 1
1	+ 1		+ 2
2	+ 2	PgDn	+ 3
3	+ 3		+ 4
4	+ 4		+ 6
5	+ 5	Home	+ 7
6	+ 6		+ 8
7	+ 7	PgUp	+ 9
8	+ 8	+ (plus)	+ +
9	+ 9	- (minus)	+ -
.	+ .	* (asterisk)	+ *
DEL	+ .	/ (forward slash)	+ /
Ins	+ 0		

### How to Press

To assist one-hand typing, the key on the HP 100LX's keyboard is sticky; that is, when you press and release , the shift function stays on. To turn it off, you press again. Be aware of this action when running DOS applications, especially TSRs.

### Loading and Running Terminate-and-Stay-Resident Programs (TSRs)

#### Note



Do *not* run a TSR in the DOS shell accessed from the Applications Manager or from the Filer.

## To load a TSR:

1. Make sure the System Manager is closed (press **&...** **MENU** **A** **T** **ENTER**).
2. Run the TSR.
3. Open the System Manager (at the DOS prompt, type `100` and press **ENTER**).
4. If you want the TSR to load each time you boot the HP 100LX, add a line to your AUTOEXEC.BAT file that invokes it. The AUTOEXEC.BAT file is in drive D's root directory, D:\.

## To run a TSR:

- If your TSR requires a keystroke sequence like **CTRL**+**↑** to become active, press **CTRL**+**↑**; then press **↑** again. See "How to Press **↑**" on page 7-10.

## How to Display Characters by Typing in ASCII Codes

### To display a character by entering its ASCII code:

- Press and hold down **ALT**+**MENU** while pressing and releasing in turn the three digits of that character's base 10 (decimal) character code for the current code page. The current code page is defined in Setup (press **MENU** **O** **I** **ALT**+**D**).

For instance, in code page 437, to display the character *¿*, you would hold down **ALT**+**MENU** while typing `168`.

## How to Run Programs from Drive A

Most programs run from drive A in the normal way. But some will not because they think it's a floppy drive. In that case, make use of this command included in AUTOEXEC.BAT: `assign e:=a:`, which means a reference to drive E is translated as a reference to drive A. So if you have trouble running your program from drive A, try running your program from drive E instead of drive A.

If trouble persists, try reinstalling your program to drive E, and then run the program from drive E.

## Controlling the Appearance of a DOS Display

You can control a DOS or DOS application screen in these ways:

- Change the position of the annunciators.
- Enlarge characters (ZOOM in on the display).
- Move around in an enlarged-character display by moving the cursor or by moving the window.
- Change black to white and white to black.
- Change shades of gray.

Details about these methods of control follow.

### To change the position of the annunciators:

- Press **ON**+**≡** to cycle through three states (left, right, off).

### To zoom on a DOS display:

1. Press **Fn**ZOOM to see an enlarged portion of the original 80-character by 25 line display. If the cursor was at the lower-left corner, it is still at the lower-left corner after enlargement.
2. Press **Fn**ZOOM two more times to cycle through the zoom options and return to the original unenlarged display.

ZOOM does not work on applications operating in graphics mode, but does work in text mode.

### Viewing All Parts of a Zoomed Display

When characters are enlarged, you can view all parts of the screen. The following two examples demonstrate this.

#### Example: Moving Around in a Zoomed DOS Display—CURSOR STATIONARY

1. At the DOS prompt, type `format /?` and press **ENTER**. Information about the FORMAT command is displayed.
2. Press **Fn**ZOOM to display enlarged characters.
3. Press **MENU**+**▶** repeatedly to move the window to the right.
4. Press **MENU**+**▲** repeatedly to move the window up.
5. Use **MENU**+**◀** and **MENU**+**▼** to redisplay the cursor (the lower-left corner of the enlarged display).

### **Example: Moving Around in a Zoomed DOS Display—CURSOR MOVING**

- Press **FN**ZOOM to display enlarged characters.
- At the DOS prompt, press and hold one or several character keys to fill several lines with characters. As the cursor reaches a window boundary, the window moves in a direction to keep the cursor visible.
- Press **FN**ZOOM as necessary to display the standard character size.
- Press **ENTER** to display a new DOS prompt.

### **Inverting DOS Display Colors in Text and Graphics Screens**

You can invert a DOS or other text screens as well as graphic screens to make black white and white black.

#### **To invert a DOS display:**

1. Press **ON**+**/**.
2. To return to the original display, press **ON**+**/** again.

### **Changing Shades of Gray**

Applications that use a number of shades of gray to enhance their graphics can be run in the HP 100LX's DOS. However, the HP 100LX offers four shades of gray for such applications rather than the larger number provided by other PCs. The HP 100LX allows you to choose between two sets of these four shades that might produce a more pleasing graphic image.

In general, however, it might be best to run such programs with their options set to either CGA mono, LCD, monochrome, or else change the color settings to make them easier to read.

#### **To switch between two sets of gray shades:**

- Press **ON**+**\*** to toggle between two settings.

---

## General Information

### Online Help with DOS Commands

7 You can display information on any of the HP 100LX's standard DOS 5.0 commands. For information on the HP 100LX's special DOS commands, see "Utility Commands Created for the HP 100LX" on page 7-21.

#### To display information about standard MS-DOS 5.0 commands:

- Type the command name followed with `/?`, then press **ENTER**.

For example, to display information on the MORE command, you type `MORE/?` and press **ENTER**.

### Obtaining Additional Information about DOS

There are many good sources of information about MS-DOS 5.0 written for readers of various levels of computer knowledge. Ask your local bookstore to recommend a book that meets your needs. For instance, you might ask for a book that gives many examples of how DOS commands are used.

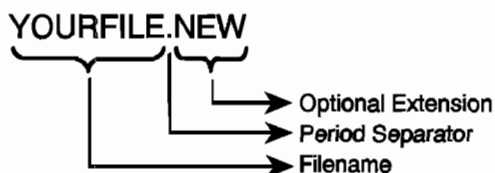
---

## Files and Directories

### Naming Files and Directories

A name for a file or directory has from one to eight characters. An *extension* to a file or directory name is one to three additional characters separated from the file name by a period. For example:





There is no distinction between uppercase and lowercase characters in file and directory names and extensions.

### Valid Characters for File and Directory Names

Names and extensions for files and directories can include only the characters in the list below.

Letters A through Z	Numbers 0 through 9	Underscore (_)
Caret (^)	Dollar sign (\$)	Tilde (~)
Exclamation point (!)	Number sign (#)	Percent sign (%)
Ampersand (&)	Hyphen (-)	Braces ({} )
Parentheses ( )	At sign (@)	Apostrophe (')
Grave accent (`)		

### Reserved File Names

Avoid using the following file names. They are already used by the operating system:

AUX	CLOCK\$	Com1	Com2
Com3	Com4	CON	LPT1
LPT2	LPT3	NUL	PRN

### Reserved Extensions

The following extensions are reserved. You can use them if you're creating any of the indicated file types:

### Reserved Filename Extensions

Extension	File Type
BAK	Backup files
BAT	DOS batch files
CHK	Assigned to files recovered by CHKDSK
COM, .EXE	Program files
OVL	DOS uses this extension for overlay files
REC	DOS uses this extension for RECOVERed files
SYS	Used for device drivers
\$\$\$	DOS uses this extension for temporary files

### Special HP 100LX Extensions

The following extensions are used by certain types of files associated with the built-in applications. These extensions appear in the right column "Chapters."

#### Special HP 100LX Filename Extensions

Extension	File Type	Chapters
ADB	Appointment Book files	2,4,13,17
ATT	cc:Mail message attachment	33, 34
BAK	1-2-3 backup worksheets	4,8,9
CAP	Datacomm capture files	4,35
CCM	cc:Mail inbox	33, 34
CFL	Calculator cash flow lists	4,25
CTF	Character translation files for Datacomm	4,35
<b>Continued on next page</b>		

### Special HP 100LX Filename Extensions (continued)

Extension	File Type	Chapters
DCF	Datacomm configuration files	4,35
DOC	Memo Editor memo files	2,17,18
DRV	cc:Mail communications driver	33, 34
ENV	Holds application info between sessions	Many
EQN	Solver equation files	4,29
EXM	System Manager compliant programs	4,5
FCF	Filer configuration files	4
FLD	cc:Mail folder	33, 34
FON	MS Windows format files	7,E
GDB	Database files	4,17
ICN	Purchased SMC application's icon file	5
IDX	cc:Mail address book index	33, 34
INI	cc:Mail host (Post Office) config file	33, 34
KIT	Keyboard Information files	4,7
LCF	Script (logon configuration) files for Datacomm	4,35
MAC	System Macros files (1-10 macros/file)	4,6
MDM	Modem control file for comm driver	33, 34
MSG	cc:Mail messages	33, 34
NDB	Note Taker note files	4,17
PCF	Printer configuration files	3,4,36
PCX	Graphics (business card) files	3,4
PDB	Phone Book files	2,4,16,17
PIC	1-2-3 graphs	4,8,9
PRN	1-2-3 print or text files	4,8
STA	Calculator statistics lists	4,27
TMP	Temporary files	Many
WDB	World Time files	4,17
WK1	1-2-3 worksheet files	4,8

## Wildcards

The *wildcard* symbols are \* and ?.

Use \* to substitute for an entire file name or extension, or for no character, one character, or several characters anywhere in a file name or extension.

7

Use ? to substitute for a single character anywhere in a file name or extension. (You can use up to eight ? symbols in a file name and up to three in an extension.)

### Uses of Wildcards

Option	Interpretation
*.*	All file names in the directory.
*.AAA	All file names that have AAA for an extension.
MYFILE?	Any file name(s) beginning with MYFILE followed by any other single character or no character (but with no extension).
MYFILE*.*?	Any file name(s) beginning with MYFILE followed by no character, one character, or two characters, and a two-character extension.
??FILE*.ABC	Any file name(s) beginning with any two characters followed by FILE and no character, one character, or two characters, and an extension of ABC.

## Directories

### Limitations

A directory can contain any mixture of files and other directories. The path from the root directory to a file can contain up to 64 characters.

The only characters you can use in a directory name are shown in the "Valid Characters for File and Directory Names" list on page 7-15.

## Definition of Terms

Term	Meaning
drive designator	The letter assigned to a disk drive, for example, A, or C.
root directory	The "main" directory on any disk created by the DOS operating system. The root directory is indicated by a backslash (\) and is separated from the drive designator by a colon (:). For example, A:\ is the root directory on drive A.
subdirectory	Any directory contained in another directory.
parent directory	Any directory that contains subdirectories.
path	The list of directories that DOS has to go through to reach a specific file or directory.

### Creating Directories

The root directory is automatically created when you format a disk. To create other directories, use the DOS MKDIR (or MD) command.

### The Active Root Directory

This is the root directory (often called drive) that DOS accesses for commands and file names unless you specify otherwise. Change from one root directory to another by entering the corresponding drive designator followed by a colon (:), such as A: or C:, at the DOS prompt.

### The Current Directory

This is the directory (or subdirectory) in the active drive that DOS accesses for commands and file names unless you specify otherwise. To change from one directory to another, use the DOS CHDIR (or CD) command.

---

## Customizing Your System

You might want to modify your AUTOEXEC.BAT and CONFIG.SYS files to customize the way your HP 100LX works. The HP 100LX is shipped with those two files located in the root directory of drive D. While you cannot modify files on drive D using the DOS application, you can modify them using the Memo Editor (chapter 18), then save them on drive C or A (since you can't save them on drive D—a ROM drive).

### To modify AUTOEXEC.BAT and CONFIG.SYS files:

1. Press **⏏** **(F9)**.
2. Type in the File to open: text box: D:\autoexec.bat or D:\config.sys.
3. Press **(F10)**.
4. Edit the file.
5. Press **(F10)** and type in the Save File As text box: C:\autoexec.bat or C:\config.sys.
6. Press **(F10)**. Your modified AUTOEXEC.BAT or CONFIG.SYS file is saved in the root directory C:\. The next time you reboot the HP 100LX (by pressing **(CTRL)+(ALT)+(DEL)**), your modified files will be executed, since the HP 100LX, when booted, will find a CONFIG.SYS file on drive C. See "The MS-DOS Startup Procedure" on page 7-2.

---

## DOS Commands in the HP 100LX

The HP 100LX's operating system contains two types of commands:

- Utility commands created specifically for the HP 100LX or included for compatibility with the HP 95LX. The utility commands are located in D:\BIN.
- CONFIG.SYS, MS-DOS, and Batch commands selected from those provided with MS-DOS 5.0. The external MS-DOS commands are located in D:\DOS.

Command descriptions follow.

## Understanding DOS Command Syntax

The following table explains common syntax symbols used in the utility command descriptions that follow. You also see these symbols when you display information on MS-DOS commands by typing the command followed by `/?` (for example, `MORE/?`). Command arguments and options are case insensitive.

**Syntax Symbols**

Symbol	Meaning
SAMPLE	Command name.
[ ]	Word or letter enclosed in brackets is optional.
	Indicates a choice must be made between two entries (ON   OFF).
<i>drive:</i>	Drive designator.
<i>path</i>	List of directories that DOS must go through to get to a specific file or directory.
<i>filename</i>	Name of a file.
...	Indicates an entry may be repeated.

## Utility Commands Created for the HP 100LX

### CIC100 /GEN 1

#### Note



The correct name for this command is "CIC100 /GEN 1." However, in this manual, it will be referred to as "CIC100."

CIC100 (Card Installation Client) is a TSR (terminate and stay resident) program that performs recognition and configuration of PCMCIA modem cards.

If CIC100 recognizes a given modem card, the modem and the plug-in slot will be configured as Com2.

For more information on this command and on PCMCIA modem cards, see "Connecting to a Card Modem" on page 37-3.

## FDISK100

Performs a low-level initialization operation on an HP Flash Disk in drive A. It is not applicable to memory cards.

### Caution

FDISK100 causes access to any files on the disk to be lost.






HP Flash Disks are organized like standard hard disks. They must be partitioned and formatted before they can be used. FDISK100 performs the partition step analogous to the function of the standard DOS FDISK command.

HP Flash Disks are shipped partitioned and formatted and it is unlikely that FDISK100 will ever be needed. However, FDISK100 should be used if an HP Flash Disk requires reformatting and the FORMAT command is not successful. FDISK100 will create a single DOS partition using the entire disk. After using FDISK100, the disk must be formatted with the FORMAT command prior to use.


## DISPCTL

DISPCTL [+C | -C] [+K | -K]

Enables or disables the +arrow key movement and/or the automatic cursor tracking while in the MS-DOS command processor.

- +C Enables cursor tracking.
- C Disables cursor tracking.
- +K Enables +arrow key movement.
- K Disables +arrow key movement.

Both options can be used together, but you must use at least one of them with the command.

For more information on cursor tracking and +arrow key movement, see "To Zoom on a DOS Display" on page 7-12.



## SERCTL

SERCTL [/O | /W | /I]

Controls power to the infrared (IR) and wired serial ports. This command is for use when running programs from the DOS prompt; the built-in applications handle powering the ports automatically.

- /O Turns off power to the active port. Turning off the I/O ports while in the MS-DOS command processor results in significant power savings, thus extending battery life.
- /W Powers up and activates the wired serial port. Does not affect the baud setting.
- /I Powers up and activates the infrared (IR) port. Changes the baud setting to 2400.

## KEYBEZ

KEYBEZ [*filename.kit*] [*kitfile option*]

- [*filename.kit*] Specifies the name of the .KIT file to be loaded.
- [*kitfile option*] Specifies one of the supported options available in the selected .KIT file.

---

### Lotus



Lotus 1-2-3 only supports code page 850. If KEYBEZ is used to configure any code page other than page 850, your printer must be configured for that other code page.

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### Note



Files you create may become inaccessible when you use another code page.

If you name a file when using one code page, then switch to another code page whose characters are not compatible, you may not be able to recover the file. To recover it, you may have to switch back to the code page you used when you named the file.

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**Note**

If KEYBEZ is active and Terminate-All is executed to quit the System Manager (**E...** **MENU** **A** **T**), restart the System Manager by pressing **CTRL+ALT+DEL** rather than by entering 100 at the DOS prompt. This will ensure that KEYBEZ is reconnected correctly to the System Manager.

---

**Note**

For more information on Eastern European language support, see Appendix E.

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This is an HP 100LX specific NLS (National Language Support) utility command. With KEYBEZ you can change the country-specific defaults for displaying dates, times and currency. You can also use KEYBEZ to change character sort order, filename characters and uppercase/lowercase conversion information. KEYBEZ can also be used to load keyboard mapping support from one of the available KIT (Keyboard Information Table) files.

KEYBEZ includes NLS information as well as Extended Country Information and Code Page support. The language/country selection is determined by which KIT file is chosen and which option is selected from the available options in that particular KIT file.

KEYBEZ will enforce the selected Country defaults within System Manager applications if the System Manager is active. While KEYBEZ is loaded, the Options International dialog box in the Setup application (see page 3-11) is modified to display the defaults selected by KEYBEZ. The Country and DOS Code Page sections of the Setup International screen are deactivated since KEYBEZ controls these choices.

The first time KEYBEZ is executed, if given no arguments, it will expand the default KEYBEZ.KIT file and the default KEYBEZ.FON file from D:\BIN. These files are placed in C:\ as HP100LX.KIT and HP100LX.FON. The next time KEYBEZ is executed with no arguments, it will refer to information in C:\HP100LX.KIT for options to display. The languages supported by these files are described in Appendix F.

The .FON (font) file is a standard Microsoft Windows .FON format file containing 4 bit-mapped fonts in the sizes needed by the

HP 100LX (6x8, 8x8, 10x11, and 16x12). The built-in .FON file provides additional characters to support Cyrillic, Greek and Turkish.

KEYBEZ replaces or enhances the functionality of the following MS-DOS Commands:

- COUNTRY
- KEYB
- MODE
- NLSFUNC

KIT files built into the HP 100LX include:

- KEYBEZ.KIT with KEYBEZ.FON (South & East European Country Support. *See Appendix F.*)
- COUNTRY.KIT (Selections with Default Code Page)
- ACOUNTRY.KIT (Selections with Alternate Code Page)
- LATIN.KIT (Selections with Default Code Page)
- ALATIN.KIT (Selections with Alternate Code Page)
- NORDIC.KIT (Selections with Default Code Page)
- ANORDIC.KIT (Selections with Alternate Code Page)

## Supported Country NLS defaults

Country	Code	Default Code Page	Alternate Code Page
<b>Kit Files: country.kit-Def.CP, acountry.kit-Alt.CP</b>			
Australia	au	437	850
Canada—English	ca	437	850
French	fr	850	437
Germany	gr	850	437
Italy	it	850	437
United Kingdom	uk	437	850
United States	au	437	850
<b>Kit Files: latin.kit-Def.CP, alatin.kit-Alt.CP</b>			
Brazil	br	850	437
Latin America	la	850	437
Portugal	po	850	860
Spain	sp	850	437
<b>Kit Files: nordic.kit-Def.CP, anordic.kit-Alt.CP</b>			
Denmark	dk	850	865
Finland	su	850	437
Iceland	ic	850	n/a
Netherlands	nl	850	437
Norway	no	850	437
Sweden	sv	850	437

### How To Use KEYBEZ

The general process is to expand the compressed .KIT file and place it on the C drive as HP100LX.KIT. This will give KEYBEZ access to all information in the .KIT file without needing to expand it each time before accessing it.

#### To expand a KIT file:

Say you want to expand `d:\bin\nordic.kit` before loading the support for Denmark.

1. Use the compress/expand utility XINE to expand the .KIT file and install it onto the C drive.
2. To expand, type the following command at the DOS prompt:

```
XINE D:\BIN\NORDIC.KIT C:\HP100LX.KIT
```

## To create a modified AUTOEXEC.BAT file:

The following assumes that you want to use the default NLS values for Denmark and that you have already expanded the .KIT file.

1. Use the Memo Editor to open your AUTOEXEC.BAT file (located in the root directory C:\ or D:\)
2. Add the line `KEYBEZ DK` just before the 100 line.
3. Save your new version of the AUTOEXEC.BAT file in the root directory C:\.
4. Ensure that your CONFIG.SYS file is in the root directory C:\. Copy it from D:\ if necessary.
5. Close all open applications in preparation to reboot.
6. Reboot by pressing **CTRL+ALT+DEL**.

This AUTOEXEC.BAT file will set up the following configuration:

- Danish conventions for date, time, currency, character sort order, and lowercase/uppercase.
- Default Code Page 850

If you want to install the default NLS values for Denmark with the Alternate Code Page, expand the .KIT file by executing `XINE D:\BIN\ANORDIC.KIT C:\HP100LX.KIT`.

The modified AUTOEXEC.BAT file created above will now provide:

- Danish conventions for date, time, currency, character sort order, and valid filenames.
- Alternate Code Page 865

## KIT Country Options

You may see which countries are supported by a particular KIT file by typing `KEYBEZ` followed by the .KIT filename. (e.g. `KEYBEZ D:\BIN\ACOUNTRY.KIT`) This will replace any existing `C:\HP100LX.KIT` file with the expanded version of the .KIT file you specify.

## KIT File Format

Documentation of the KIT file format is included in the `KEYBEZ.KIT` file which is built into the HP 100LX. You may view this file by executing `XINE D:\BIN\KEYBEZ.KIT C:\HP100LX.KIT` and then viewing the file `C:\HP100LX.KIT`.

## CONFIG.SYS, MS-DOS, and Batch Commands Available in the HP 100LX

These standard MS-DOS 5.0 commands are listed in two tables. The first lists only CONFIG.SYS commands, and the second lists MS-DOS and Batch commands.

7

### CONFIG.SYS Commands Available in the HP 100LX

Command	Description
BUFFERS	Allocates memory at system start for a specified number of disk buffers.
DEVICE	Specifies the location and name of the device driver you want to load.
FCBS	Specifies the number of file control blocks that DOS can have open at the same time.
FILES	Sets the number of files that DOS can access at one time.
INSTALL	Loads a memory-resident program into memory when you start DOS.
LASTDRIVE	Specifies the maximum number of drives you can access.
SHELL	Specifies the location and name of the command interpreter used by DOS.
STACKS	Supports the dynamic use of data stacks to handle hardware interrupts.
SWITCHES	Forces an enhanced keyboard to behave like a conventional keyboard.

### Help



To get information on any DOS command in the following list, type the command followed by `/?`, then press **ENTER**. For instance, to get help on the `FORMAT` command, type `format/?` and press **ENTER**.

## MS-DOS and Batch Commands Available in the HP 100LX

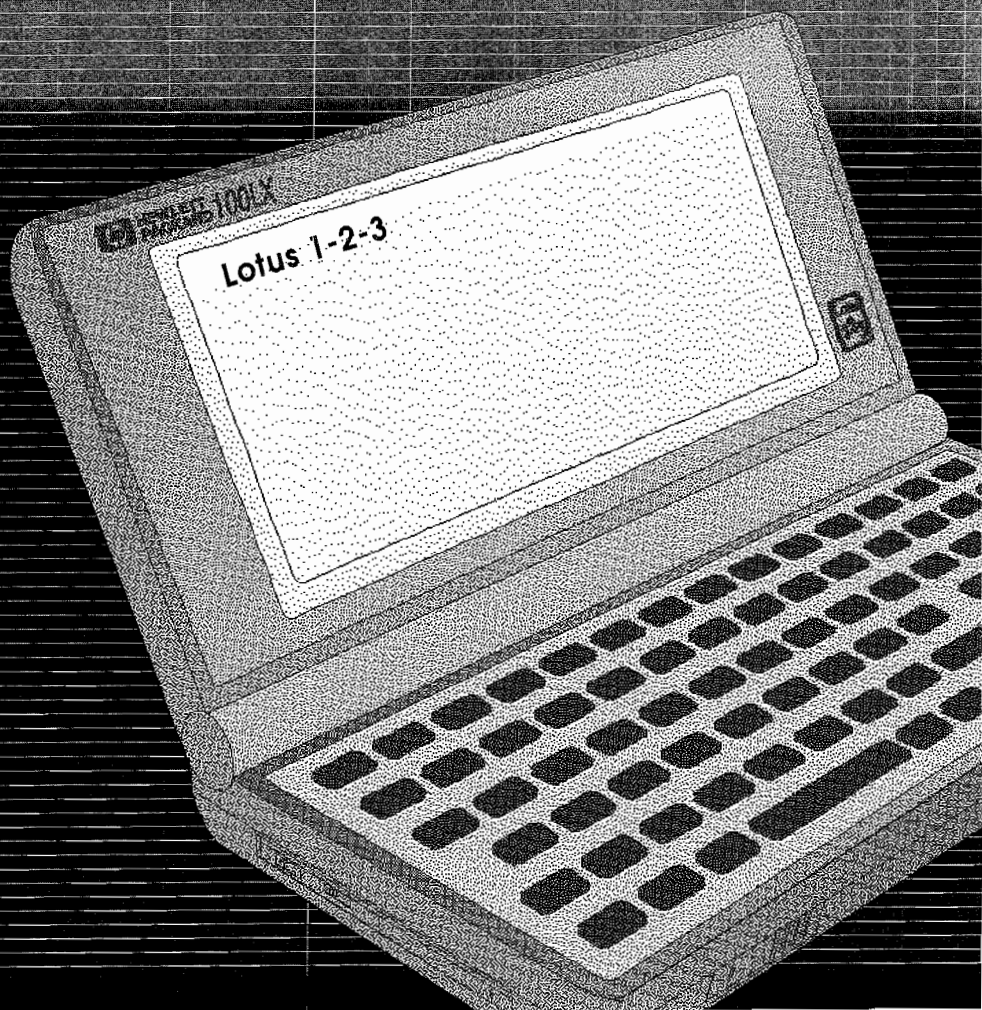
Command	Description
ASSIGN	Redirects requests for disk operations on one drive to a different drive.
ATTRIB	Displays or changes file attributes.
BREAK	Sets or clears extended <b>(CTRL)+C</b> checking.
CALL	Calls one batch program from another.
CHDIR or CD	Displays the name of or changes the current directory.
CHKDSK	Checks a disk and displays a status report.
CLS	Moves the cursor to the upper left corner and clears the screen.
COMMAND	Starts a new instance of the DOS command interpreter.
COPY	Copies one or more files to another location.
CTTY	Changes the terminal device used to control your system.
DATE	Displays or sets the date.
DEBUG	Runs Debug, a program testing and editing tool.
DEL or ERASE	Deletes one or more files.
DIR	Displays a list of files and subdirectories in a directory.
DOSKEY	Edits command lines, recalls DOS commands, and creates macros.
ECHO	Displays messages, or turns command-echoing on or off.
EXIT	Quits the COMMAND.COM program (command interpreter).
FOR	Runs a specified command for each file in a set of files.
FORMAT	Formats a disk for use with DOS.
GOTO	Directs DOS to a labelled line in a batch program.

**MS-DOS and Batch Commands Available in the HP 100LX  
(continued)**

Command	Description
IF	Performs conditional processing in batch programs.
MKDIR or MD	Creates a directory.
MODE	Configures system devices.
MORE	Displays output one screen at a time.
PATH	Displays or sets a search path for executable files.
PAUSE	Suspends processing of a batch program and displays the message <code>Press any key to continue . . . .</code>
PROMPT	Changes the DOS command prompt.
REM	Records comments (remarks) in a batch file or in a CONFIG.SYS file.
RENAME or REN	Renames a file or files.
RMDIR or RD	Removes (deletes) a directory.
SET	Displays, sets, or removes DOS environment variables.
SHARE	Installs file-sharing and locking capabilities on your hard disk.
SHIFT	Changes the position of replaceable parameters in a batch file.
TIME	Displays or sets the system time.
TYPE	Displays the contents of a text file.
VER	Displays the DOS version.
VERIFY	Tells DOS whether to verify that your files are written correctly to a disk.
VOL	Displays the disk volume label and serial number, if they exist.
XCOPY	Copies files (except hidden and system files) and directory trees.



# PART 3





## Reviewing Lotus 1-2-3

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Because the vast majority of our customers are already Lotus® 1-2-3® users and have requested *less* product documentation, this 1-2-3 section is designed as a review and quick reference. It's for those people who are already familiar with 1-2-3 but perhaps need to refresh their memory about specific details, such as what keys to use to edit an entry or what the syntax is for a specific macro or @function. If you want additional documentation, there are excellent books about using 1-2-3 available—visit your local bookstore for a recommendation.

And remember, **HELP** is available all of the time—just press **[F1]** (**HELP**) to get online information about the 1-2-3 command you are using.

---

### Differences Between 1-2-3 on the HP 100LX and on the PC

Although the HP 100LX version of the 1-2-3 Release 2.4 is essentially the same as the packaged version for your PC, there are some important differences. Even if you're a 1-2-3 expert, please read the following descriptions of the additions, deletions, and modifications to your HP 100LX 1-2-3.

#### Note



The HP 100LX default display size is 64 columns × 18 lines. To see as much information on your HP 100LX as on your PC screen, press **[Fn]ZOOM** to switch to the 80-column × 25-line display. **[Fn]ZOOM** switches between the two display modes in 1-2-3. *For complete macro compatibility in 1-2-3, use the 80 × 25 display.*

## Additions to 1-2-3 on the HP 100LX

- Backsolving 1-2-3 values using the Calculator.
- Clipboard functions for copying material from one location to another: **[Fn]**COPY copies a defined range to the Clipboard, and **[Fn]**PASTE inserts this material (formatted as labels) into the current location.

## Deletions from 1-2-3 on the HP 100LX

- The Install utility: No installation is necessary on the HP 100LX. The collating sequence (sorting order) is set by the International Sort command in the HP 100LX Setup utility; the printer driver is set by the Printer Config Name command in Setup.
- The landscape printing option.
- WYSIWYG and color support.
- Mouse support.
- The Tutorial Add-in and the tutorial files.
- The Translate utility.
- The Access system (to access PrintGraph, Translate, and 1-2-3).
- The SmartIcons add-in.
- The SmartPics<sup>TM</sup> files.
- The Backsolver add-in.
- The Background printing option.
- The PrintGraph program. (However, you can print a displayed graph by pressing **[Fn]**PRTSC.)
- The Viewer and Auditor add-ins.
- The Macro Library Manager.

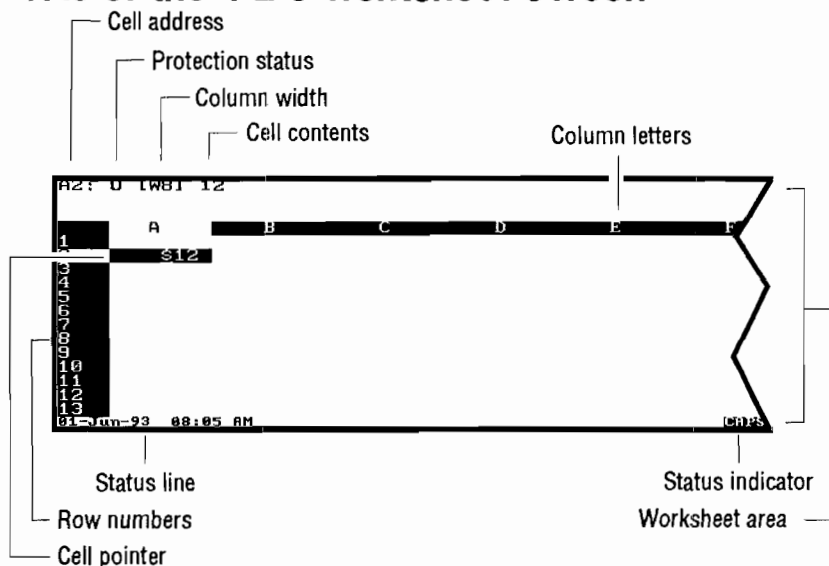
## Modifications to 1-2-3 for the HP 100LX

- Write-protected cells appear the same as other cells. The PR protection indicator appears in the control panel when a protected cell is highlighted.
- Because of ROM memory constraints, the Help text is less extensive.
- There is no 123.EXE file, so you cannot start 1-2-3 from DOS.
- To save memory, the default status for the Undo feature is off (disabled). Select /Worksheet Global Default Other Undo Enable to turn Undo on.
- Add-ins must be run from RAM. To work, therefore, an add-in must fit in RAM, must work with any size screen in MDA or CGA

mode, and must have been developed using the Add-In Toolkit specifications.

- The collating sequence is selected in the Setup utility.



## Parts of the 1-2-3 Worksheet Screen



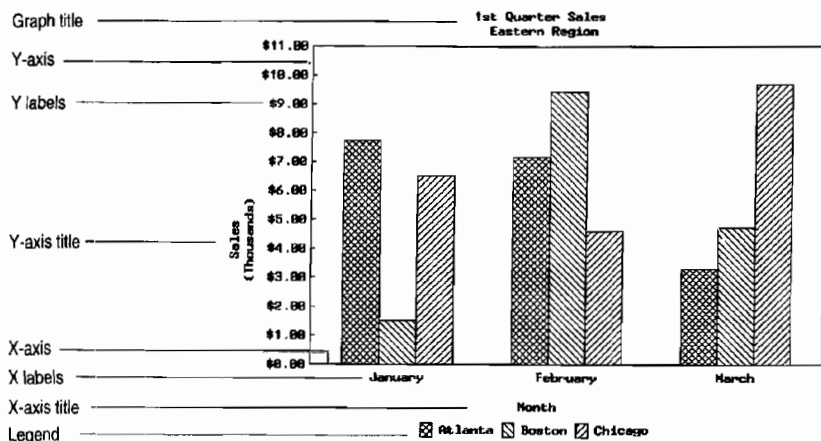
The 1-2-3 worksheet is the tool for all the work you do with 1-2-3—you develop spreadsheets, graphs, and databases using the worksheet. The worksheet area is the grid of 256 columns (labeled A to IV) and 8,192 rows (labeled 1 to 8192) in which you store data. Each intersection of a row and column forms a cell. Each cell is identified by a cell address, which consists of a column letter and row number. The cell pointer highlights the current cell—the current cell is where you enter data.

The **control panel** displays information as you enter data and use commands.

- The first line of the control panel displays the cell address, the contents and settings of the current cell, and the mode indicator.

- The second line of the control panel displays data as you enter or edit it in the current cell, or it displays the 1-2-3 menu if you press , , or < (less-than symbol).
- The third line of the control panel displays either submenu commands for the highlighted command, a description of the highlighted command, or a prompt.
- The **status line** at the bottom of the screen displays status indicators (such as CAPS).

## Parts of a Graph



### 1-2-3 Graph Prompts

You use the Graph commands to graph ranges in your worksheet. To create graphs, 1-2-3 prompts you for the following:

- **Axis title:** describes an x-axis or y-axis.
- **Data range:** identifies the set of worksheet values that you plot in a graph.
- **Graph title:** identifies the graph. Usually located at the top of the graph, the title can consist of up to two lines.
- **Legend:** a caption that identifies each data range in a graph.

- X-axis: a horizontal line along the bottom of a graph. (In a horizontal bar graph, the x-axis is a vertical line.) The x-axis can be described by X labels or a numeric scale.
- X labels: describe the data points in an x-axis scale. For XY graphs, the X labels describe a numeric scale.
- Y-axis: provides a numeric scale on a vertical line along the left side of a graph. (In a horizontal bar graph, the y-axis is a horizontal line.)
- Y labels: describe the data points in a y-axis scale.

## Note



When you're using /Graph View, you can print the displayed graph by pressing **[Fn] PRTSC**.

## Parts of a Database

Field						
A	B	C	D	E	F	G
LAST	FIRST	DEPT	Field names			
Ambridge	Glaeser	Sherry	na	na	na	
AutoFinder	Sanderson	Lee	na	na	na	
Thomas of Calif	Thomas	Lucy	na	na	na	
Canning Ent	Candra	Candice	na	na	na	
Christmas Vill	Susk	Todd	na	na	na	
Counsel Quik	Harkee	Mick	na	na	na	
Emu To You	O'Shea	Patricia	na	na	na	
Jay Allen Co	Crowson	Margaret	na	na	na	
Koib Toys	Ellen	Rebecca	na	na	na	
Mercedes High	Hoss	Ellen	na	na	na	
SepticSmart	Koib	Lourtney	na	na	na	
Software PI	Genne	Whitney	na	na	na	
Soogy's	Fries	Thomas	na	na	na	
Nov-93	Haberman	Gary	na	na	na	
03:34 PM	Stewart	Jason	na	na	na	
		Karla	na	na	na	

Records

Database

A 1-2-3 database can contain any kind of related information you want to store and use together. For example, a typical business database might include employee telephone numbers, names, departments, locations, and IDs. (Any collection of data that you organize in rows and columns can be a database.)

To create a database, you should be familiar with the following terms:

- **Database** is any range of related data that you organize in contiguous rows and columns in a worksheet.
- **Field** is a column in the worksheet that contains one category of information that each record in the database has in common, such as telephone number. The top cell of each column contains a field name that identifies the contents of the field.
- **Field name** identifies the data in one column of a database table. Each field name must be a label (not a number or formula) and must be unique.
- **Record** is a single row that contains information for each field in a database.

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## 1-2-3 Keys

This section describes the key conventions and some of the keys used for editing, for moving around the worksheet (pointer-movement keys), and as function keys.





















### Key Conventions

1-2-3 documentation uses the following conventions when indicating keys for you to press:

- When there is a hyphen between two keys, such as **ALT-F3**, press and hold down the first key, press the second key, and then release both keys.
- When keys are *not* separated by spaces, such as **FnEND**, press the first key then release it, and then press the second key and release it.

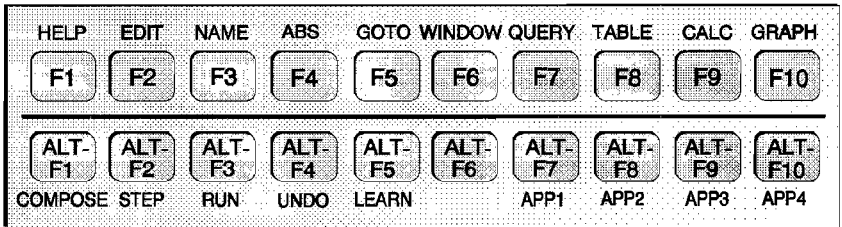


## Keys for Moving Around the Worksheet (Pointer-Movement Keys)

Press	To
 ,  ,  , 	Move the cell pointer left or right one column, or up or down one row.
 <b>TAB</b> or <b>CTRL</b> - 	Move the cell pointer left one screen.
<b>TAB</b> or <b>CTRL</b> - 	Move the cell pointer right one screen.
 <b>END</b> with  ,  ,  , or 	Move the cell pointer to the intersection of a blank and a nonblank cell (a blank cell contains no data and/or label prefixes).
 <b>END</b>  <b>HOME</b>	Move the cell pointer to the lower right corner of active area (the rectangular area between cell A1 and the lowest and rightmost nonblank cell in the worksheet).
 <b>HOME</b>	Move the cell pointer to cell A1 unless A1 contains a worksheet title. (Pressing <b>HOME</b> moves the cell pointer to the upper leftmost corner of the active area.)
 <b>PGUP</b> or  <b>PGDN</b>	Move the cell pointer up or down one screen.
 <b>SCRL</b> and any pointer-movement key	Move the view of the worksheet without moving the cell pointer.
 ( <b>GOTO</b> ) and then enter the range name or cell address.	Move the cell pointer directly to the cell or named range you specified.
 ( <b>WINDOW</b> )	Move the cell pointer between the two windows created with /Worksheet Window.

## 1-2-3 Function Keys

The 1-2-3 function keys perform special operations. Each function key, except (F6), performs two operations: one when you press only the function key, and another when you hold down (ALT) and then press the function key.



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### Name

### Description

(F1) (HELP)

In most 1-2-3 modes, displays a Help screen related to the task you are performing or explains an error message.

**ERROR mode:** Displays a Help screen that explains the error message 1-2-3 is displaying.

**MENU mode:** Displays a 1-2-3 Help screen related to the task you are performing.

(F2) (EDIT)

**EDIT mode:** Switches between EDIT mode and LABEL mode, if entry displayed in control panel is a label; or VALUE mode, if entry displayed in control panel is a value.

**MENU mode:** Activates the dialog box, if a dialog box is on the screen.

**READY mode:** Puts 1-2-3 in EDIT mode and displays contents of the current cell in control panel, so you can edit it.

(F3) (NAME)

**POINT mode:** Displays a menu of named ranges.

**FILES and NAMES modes:** Switches between displaying a menu of names in the third line of

control panel and displaying a full-screen menu of names.

**SETTINGS mode:** Displays (in an active dialog box, when a range text box is selected) a popup dialog box that contains a list of the range names in the current worksheet.

**VALUE mode:** When pressed after typing + - / ^ ( or \* in a formula), displays a menu of named ranges.

**F4** (ABS)

**POINT and EDIT modes:** Cycles a cell or range address between relative, absolute, and mixed.

**READY mode:** Switches 1-2-3 to POINT mode so you can specify a range before you select a command.

**F5** (GOTO)

**READY mode:** Moves the cell pointer directly to cell or named range you specify.

**F6** (WINDOW)

**MENU mode:** Toggles the display of dialog boxes on or off.

**READY mode:** Moves the cell pointer between two windows.

**F7** (QUERY)

**READY mode:** Repeats last /Data Query command or operation you specified.

**FIND mode:** Switches 1-2-3 between FIND mode and READY mode.

**F8** (TABLE)

**READY mode:** Repeats the most recent /Data Table operation.

**F9** (CALC)

**READY mode:** Recalculates all formulas in worksheet.

**VALUE and EDIT modes:** Converts a formula to its current value.

**F10** (GRAPH)

Displays the current graph.

**ALT-F1**  
(COMPOSE)

**READY, EDIT, and LABEL modes:** When used in combination with alphanumeric keys, creates

international characters and other characters you cannot enter directly from keyboard.

- ALT-F2 (STEP)** Turns on STEP mode, which executes macros one step at a time for debugging. Press **ALT-F2 (STEP)** again to turn off STEP mode.
- ALT-F3 (RUN)** **READY mode:** Displays a list of range names so you can select the name of the macro you want to run. If you press **ESC** after pressing **ALT-F3 (RUN)**, 1-2-3 switches to POINT mode so you can highlight the first cell of the macro to run.
- ALT-F4 (UNDO)** Cancels any changes made to the worksheet since 1-2-3 was last in READY mode. Press again to restore changes.
- ALT-F5 (LEARN)** Turns on the learn feature and records subsequent keystrokes in the learn range. Press **ALT-F5 (LEARN)** again to turn off the learn feature.
- ALT-F7 (APP1)** **READY mode:** Activates the add-in program assigned to this key, if any.
- ALT-F8 (APP2)** **READY mode:** Activates the add-in program assigned to this key, if any.
- ALT-F9 (APP3)** **READY mode:** Activates the add-in program assigned to this key, if any.
- ALT-F10 (APP4)** **READY mode:** Activates the add-in program assigned to this key; or, displays the Add-In menu.
- CTRL-F1 (Bookmark)** Displays the last Help screen viewed, regardless of the context.

## 1-2-3 Indicators

An indicator is a highlighted word that 1-2-3 displays to provide you with information about the program or special keys. 1-2-3 has two types of indicators: mode and status.

### Mode Indicators

During a 1-2-3 work session, a mode indicator is always visible at the far right of the first line of the control panel. It tells you what mode, or state, 1-2-3 is currently in.

Mode indicator	Meaning
EDIT	You pressed <b>F2</b> (EDIT) to edit an entry or you entered a formula incorrectly; you are entering text in a dialog box.
ERROR	1-2-3 is displaying an error message: Press <b>F1</b> (HELP) to display a Help screen that describes the error; or press <b>ESC</b> or <b>ENTER</b> to clear the error message.
FILES	1-2-3 is displaying a menu of file names in the control panel. Press <b>F3</b> (NAME) to display a full-screen menu of file names.
FIND	You selected /Data Query Find, or pressed <b>F7</b> (QUERY) to repeat the last /Data Query Find you specified, and 1-2-3 is highlighting a database record that matches your criteria.
FRMT	You selected /Data Parse Format-Line Edit to edit a format line.
HELP	You pressed <b>F1</b> (HELP) and 1-2-3 is displaying a Help screen.
LABEL	You are entering a label.
MENU	You pressed <b>MENU</b> (or <b>/</b> or <b>&lt;</b> ) and 1-2-3 is displaying a menu of commands.
NAMES	1-2-3 is displaying a menu of range names, graph names, or attached add-in names.

POINT	1-2-3 is prompting you to specify a range, or you are creating a formula by highlighting a range.
READY	1-2-3 is ready for you to enter data or select a command.
SETTINGS	You pressed <b>F2</b> (EDIT) which activated a dialog box.
STAT	You selected /Worksheet Status or /Worksheet Global Default Status and 1-2-3 is displaying the corresponding status screen.
VALUE	You are entering a value (a number or formula).
WAIT	1-2-3 is completing a command or process.

## Status Indicators

Status indicators display in the status line at the bottom of your screen when you use certain 1-2-3 keys and when particular program conditions exist.

### Status indicator    Meaning

CALC	Formulas in the worksheet need to be recalculated; press <b>F9</b> (CALC).
CAPS	The CAPS LOCK key is on.
CIRC	The worksheet contains a formula that refers to itself (occurs only when the recalculation order is Natural, the default setting). Use /Worksheet Status to get information about the circular reference.
CMD	1-2-3 is running a macro.
END	The END key is on.
LEARN	You pressed <b>ALT-F5</b> (LEARN) to turn on the learn feature, and 1-2-3 is recording your keystrokes in the learn range.
MEM	The amount of computer memory available for entering new data has fallen below a minimum number of bytes. If you continue to enter data without first increasing the amount of available memory, you may get a MEMORY full error.

OVR	The INS key is off. Instead of inserting the character you type, 1-2-3 replaces the character at the cursor with the character you type.
RO	The worksheet has read-only status, which means you don't save any changes unless you save the worksheet with a new file name.
SCROLL	The SCROLL LOCK key is on. Using the pointer-movement keys scrolls the worksheet in the direction indicated, instead of moving the cell pointer.
SST	A macro being executed in single-step mode is waiting for user input.
STEP	Single-step mode has been turned on; once invoked, macros are processed one step at a time.
UNDO	The undo feature is on; you can press <b>ALT-F4</b> (UNDO) to cancel any changes made to the worksheet since 1-2-3 was last in READY mode.

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## 1-2-3 Menus

To tell 1-2-3 what you want to do, you select a series of commands from menus. Some 1-2-3 commands such as /Worksheet Global and /Graph require you to select additional options for a number of settings. In such cases, Release 2.4 of Lotus 1-2-3 displays a dialog box. A dialog box helps you keep track of the choices you are making. It shows you the current settings for all the options associated with a task. To activate the dialog box, press **F2** (EDIT). The mode indicator changes to SETTINGS when you activate the dialog box. For more information on dialog boxes, see "What Dialog Boxes Are," in chapter 2.

(For summary information about specific commands, see chapter 9, "1-2-3 Command Summary;" to trace the path of a specific command or setting, see chapter 10, "1-2-3 Command Trees.")

## Selecting and Responding To Commands

To	Do this
Activate the 1-2-3 main menu	Press <b>MENU</b> (or <b>/</b> or <b>&lt;</b> ).
Move the menu pointer	Press <b>←</b> , <b>→</b> , or the <b>spacebar</b> to move left or right, or <b>Fn</b> HOME or <b>END</b> to move to the first or last command.
Select a command	Move the menu pointer to the command and press <b>ENTER</b> to choose the highlighted command or type the first character of the command.
Respond to a prompt by selecting a name from a list	Move the menu pointer to the name and press <b>ENTER</b> or type the name and press <b>ENTER</b> . (To display a full-screen list of names in FILES mode, press <b>F3</b> (NAME).)
Accept a response to a prompt	Press <b>ENTER</b> .
Enter a response to a prompt	Type the response and press <b>ENTER</b> . You may need to press <b>ESC</b> one or more times to clear a suggested response before you can type a new one.
Specify a range	Type the address or range name and press <b>ENTER</b> or use the arrow keys to highlight the range and press <b>ENTER</b> .
Select dialog box options	Select the menu options or press <b>F2</b> (EDIT) to activate the dialog box and then type the highlighted character, or press <b>←</b> , <b>→</b> , <b>↑</b> , <b>↓</b> , <b>TAB</b> , <b>⇧</b> TAB, <b>Fn</b> HOME or <b>END</b> to move to an option and press <b>spacebar</b> or <b>ENTER</b> to select it.
Select an item from a list box in a dialog box	Use <b>←</b> , <b>→</b> , <b>↑</b> , <b>↓</b> , <b>Fn</b> PGUP, <b>Fn</b> PGDN, <b>Fn</b> HOME or <b>END</b> to highlight an item and then press <b>ENTER</b> to select it.
Back up one menu level	Press <b>ESC</b> .



## Canceling a Command

After selecting a command, if you change your mind or make a mistake, press **ESC** to back up one menu level or command step at a time.

If you want to completely stop a procedure and return to READY mode, press **CTRL**-BREAK.

---

## Entering and Editing Data

When you enter data in a cell, 1-2-3 classifies every entry as one of two types: labels or values. **Labels** are text entries; **values** are number and formula entries.

### Entering Values and Labels

To enter	Do this
Text	Type the text (up to 239 characters). To confirm the entry, press <b>ENTER</b> or press a pointer-movement key. The mode indicator says LABEL.
A number	Type a number from $10^{-99}$ to $10^{99}$ , up to 240 characters long. To confirm the entry, press <b>ENTER</b> or press a pointer-movement key. Don't enter spaces, commas, or other punctuation (except for a single decimal separator). The mode indicator says VALUE.
A label, adjusting its position in the cell	Type the label prefix that corresponds to the alignment you want (see "1-2-3 Label Prefixes" later in this chapter). Then type the text. To confirm the entry, press <b>ENTER</b> or press a pointer-movement key. The mode indicator says LABEL.
A label that begins with a number or a number as a label	Type a label prefix and the number (and any text). To confirm the entry, press <b>ENTER</b> or press a pointer-movement key. The mode indicator says LABEL.

- A formula      Type **+** or **-** to start the formula (if it begins with a cell address, range name, or file reference); you can also enclose a formula in parentheses. Type the first operand or specify the cell. Type the operator. Type the next operand, and then type operators and operands until the formula is complete. To confirm the entry, press **ENTER** or press a pointer-movement key. The mode indicator says VALUE. Valid formulas include  $27+1$ ,  $+NAME-27$ ,  $-A7+A3$ ,  $(ACTUAL-BUDGET)$ , and  $+A1-B1*C1$ .
- An @function      Enter **@**, the function name, and enclose any arguments in parentheses. To confirm the entry, press **ENTER** or press a pointer-movement key. The result of the @function appears in the cell.
- A date      Enter **@DATE**(*year, month, day*), (using 2-digit year, month, and day values for the day you want) to create a date number. To confirm the entry, press **ENTER** or press a pointer-movement key. Then use **/Range Format Date** to display the date rather than the date number. The mode indicator says VALUE.
- A time      Enter **@TIME**(*hour, minutes, seconds*) (using the hour, minutes, and seconds values, in 24-hour form, for the time you want) to create a time number. To confirm the entry, press **ENTER** or press a pointer-movement key. Then use **/Range Format Date Time** to display the time rather than the time number. The time appears in the format you select.
- Copies of the same data      Enter the data once. Select **/Copy**. Specify the cell or range to copy at the **Copy what?** prompt and press **ENTER**. Specify the cell or range to copy to at the **To where?** prompt and press **ENTER**. If the source contains a formula or @function that contains relative cell addresses, the cell addresses in the destination change to reflect the new location.

---

## Note



If you want the value in a cell to be preceded by a currency symbol, you must format the worksheet with **/Worksheet Global Default Other International Currency**.

---

## 1-2-3 Label Prefixes

When you enter a label (text entry) in a cell, 1-2-3 automatically inserts a label prefix to control alignment. The default is ' (left aligned). If you want to change the default setting, select /Worksheet Global Label or, for a range, select /Range Label. You can also override 1-2-3 by inserting the label prefix you prefer as the first character in a cell. (If you were editing a cell, remember to delete the automatic 1-2-3 prefix.) The following table lists 1-2-3 label prefixes and their effects on labels.

Prefix	Result
' (apostrophe)	1-2-3 aligns the label with the left edge of the cell (the default alignment).
" (quotation mark)	1-2-3 aligns the label with the right edge of the cell.
^ (caret)	1-2-3 centers the label in the cell.
\ (backslash)	1-2-3 repeats the characters in the label to fill the cell.

In 1-2-3, the | (split vertical bar) is also a label prefix, used primarily for embedded setup strings, page breaks, and /Data Parse format lines. If used as a label prefix for a label that is located at the beginning of a row of data, the | tells 1-2-3 not to print the row. If, however, the label is located elsewhere in a row (such as between other labels), the label is left-aligned and will print.

## Long Labels and Values

If your label or value is longer than the cell's column width, it is called a **long label** or a **long value**. 1-2-3 displays long labels and long values differently.

If a **label** is longer than the cell, 1-2-3 displays it if cells to the right are blank, or displays what fits in the cell if the cells to the right contain data.




If a **value** is longer than the cell, 1-2-3 displays the value in scientific notation if the cell format is General or displays asterisks (\*\*\*) in the cell if the cell has another format. 1-2-3 stores the entire entry in the cell, even if it cannot display the entire entry.

## Editing Data



Editing an entry means altering existing data rather than replacing it with entirely new data. You can edit an entry either as you type it or after you have entered it in the cell.

### Editing As You Type

You can edit an entry in three ways as you type it:

- To erase characters to the left of the cursor, press  (backspace).
- To erase everything you typed and start again, press .
- To change part of what you typed, press EDIT () to enter Edit mode and use the editing keys to change your entry.



### Editing a Completed Entry

Move the cell pointer to the cell and press EDIT (); use the editing keys in the following table to change the entry, and then press .

## Keys for Editing Data

### Note



If you change your mind when you're editing (and the Undo feature is turned on), press - (UNDO) immediately to restore your entry to its previous state.

#### Press

#### To



Move the cursor left one character.



Move the cursor right one character.



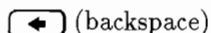
Complete editing and move the cell pointer up one row.






Complete editing and move the cell pointer down one row.

-  
(COMPOSE)

Create characters unavailable on the keyboard.



Erase the character to the left of the cursor.

<b>CTRL</b> -  or <b>TAB</b>	Move the cursor right five characters.
<b>CTRL</b> -  or  <b>TAB</b>	Move the cursor left five characters.
<b>DEL</b>	Erase the current character.
<b>Fn</b> <b>END</b>	Move to the right of the last character.
<b>ENTER</b>	Complete editing.
<b>ESC</b>	Clear the entry from the control panel.
<b>F2</b> (EDIT)	Switch to VALUE or LABEL mode.
<b>F4</b> (ABS)	Cycle the cell or range address between relative, absolute, and mixed.
<b>F9</b> (CALC)	Convert a formula to its current value.
<b>Fn</b> <b>HOME</b>	Move to the first character in the entry.
<b>Fn</b> <b>INS</b>	Switch between inserting text (INS) and writing over existing text (OVR).
<b>Fn</b> <b>PGUP</b>	Complete editing and move the cell pointer up one screen.
<b>Fn</b> <b>PGDN</b>	Complete editing and move the cell pointer down one screen.

## Rearranging Data

As you add information to a worksheet or develop new models, you often need to rearrange the worksheet by copying, moving, and transposing data, or by inserting or deleting columns and rows.

### Note



The destination for moved, copied, or transposed data should be blank or contain unimportant data; 1-2-3 writes over existing data when it puts data in the range you specify. To avoid possible data loss from writing over data, save the worksheet first. If you make a mistake and you want to restore the worksheet to its original state, immediately retrieve the file or press **ALT**-**F4** (UNDO) (if undo is on).

<b>To</b>	<b>Do this</b>
Duplicate a single cell entry in another cell	Select /Copy. Specify the cell you want to copy at the <b>COPY what?</b> prompt by highlighting or typing the cell address and pressing <b>ENTER</b> . Specify a single-cell destination for the copy at the <b>To where?</b> prompt by highlighting or typing the cell address and pressing <b>ENTER</b> .
Duplicate data in one cell so it fills a range	Select /Copy. Specify the cell you want to copy at the <b>COPY what?</b> prompt by typing the cell address or pressing <b>ENTER</b> , if the cell pointer is highlighting the desired cell. Specify the entire destination range at the <b>To where?</b> prompt by typing the address or by anchoring the cell pointer in the first cell (by pressing <b>..</b> ) and then moving the pointer to highlight the desired range.
Duplicate data from one range to another range	Select /Copy. Specify the range you want to copy at the <b>COPY what?</b> prompt by typing the range name or address or highlighting the range with the cell pointer. Specify the upper left corner cell of the destination range at the <b>To where?</b> prompt. (If source and destination ranges overlap, you may get unexpected results.)
Duplicate formulas in cells or ranges	Select /Copy. Specify the range you want to copy at the <b>COPY what?</b> prompt by typing the range name or address or highlighting the range with the cell pointer. Specify the upper left corner cell of the destination range at the <b>To where?</b> prompt.
Transfer data, range names, and 1-2-3 formats and graphics to another area of the worksheet	Select /Move. Specify the range that contains the data or formats you want to move at the <b>MOVE what?</b> prompt by either typing the range name or address or highlighting the range with the cell pointer. Specify the destination range at the <b>To where?</b> prompt (you need specify only the upper left corner cell of the destination).

- Copy column to row or row to column, and convert formulas to values      Select /Range Trans. Specify the range whose data you want to transpose at the **Transpose what?** prompt. Specify the first cell of the destination at the **To where?** prompt. If the **CALC** indicator is on, update formulas with **F9** (**CALC**) first (or your values may not be accurate). If any of the formulas refers to data in a file on disk, use /File Admin Link-Refresh to update those values.
- Remove one or more columns or rows from the worksheet (closing up the space left by the deletion)      Select /Worksheet Delete. Select **Column** to delete one or more columns or **Row** to delete one or more rows. Specify the range of columns or rows you want to delete.
- Insert one or more blank columns or rows in the worksheet      Select /Worksheet Insert. Select **Column** to insert one or more columns or **Row** to insert one or more rows. Specify a range that includes at least one cell in each of the columns or rows you are inserting.
- Copy a range and convert formulas to values      Select /Range Value. Specify the range to convert at the **Convert what?** prompt. Specify the first cell of the destination at the **To where?** prompt. If the **CALC** indicator appears at the bottom of the screen, update formulas with **F9** (**CALC**) first (or your values may not be accurate). If any of the formulas refers to data in a file on disk, use /File Admin Link-Refresh to update those values.
- Erase a range      Select /Range Erase. Specify the range to erase.
- Erase a single cell      Move the cell pointer to the cell. Press **DEL**.

## Note



Each cell in the destination range inherits the cell format and protection status of the corresponding cell in the source range. When you use /Move to move data from a formatted range, 1-2-3 moves the cell format with the data, and the source range reverts to the global cell format.

---

## Working with Ranges

Specifying a range is a convenient way to perform the same action on several cells at once. Some formulas and @functions require a range of data. A **range** is any rectangular block of adjacent cells. It can be a single cell, several cells that are in adjacent rows and columns, a row, a column, or several adjacent rows and columns.

You can specify a range either before or after you select a command. Specifying a range before you select a command leaves the range specified after the command is complete; specifying a range during a command does not.

---

### Note



If you specify a range before you select /Range Erase, /Worksheet Delete Row, or /Worksheet Delete Column, 1-2-3 deletes the contents of the range immediately. To restore the worksheet to its original state (if Undo is turned on), press **ALT-F4** (UNDO) immediately.

---

## To Specify a Range

- Type the range address in a formula or in response to a prompt. A range address consists of the cell addresses of the upper left and lower right cells in the range, separated by one or two periods (for example, A1..B4).
- Use a range name in a formula, in the Range text box in a dialog box, or in response to a prompt. **F3** (NAME) displays a list of all range names in the worksheet.
- Highlight a range before you select a command. Moving the cell pointer or pressing **ESC** in READY mode cancels the preselected range.
- Highlight a range when 1-2-3 is in POINT mode. 1-2-3 enters POINT mode when you press **F4**, when you must specify a range for a command, or when you are highlighting a range for a formula or @function. (To enter POINT mode in a dialog box, press F4.)

The following table describes the keys you use to highlight a range in POINT mode.



Key	Unanchored range	Anchored range
<b>.</b> (period)	Makes the current cell the anchor cell.	Moves the anchor cell clockwise from one corner of highlighted range to next.
<b>←</b> (backspace)	Returns the cell pointer to its position before 1-2-3 entered POINT mode.	Removes highlighting, unanchors the cell pointer, and returns the cell pointer to its position before 1-2-3 entered POINT mode.
<b>ESC</b>	If you are using a command, returns you to the previous menu or prompt. If you are entering a formula, clears the last cell address in the formula and returns 1-2-3 to VALUE or EDIT mode.	Removes highlighting and unanchors the cell pointer.
Pointer-movement keys	Moves the cell pointer (and thus the anchor cell).	Extends the range highlight.


## To Name Ranges

Use /Range Name Create to assign a name to a range or to modify a range name. Range names are names of up to 15 characters that you use in commands and formulas instead of cell or range addresses. For example, if you have assigned the name SALES to A5..D9, you can move the cell pointer to A5 by pressing GOTO (**F5**), typing sales, and pressing **ENTER**; you can add the values in A5..D9 with the formula @SUM(SALES); and you can print the data in A5..D9 by specifying SALES as the print range. Range names are generally easier to remember than the range addresses to which they correspond.

Follow these guidelines when you create range names:

- Do not include spaces, commas, semicolons, or the characters + \* # / & > < { @ and # in range names because they may be interpreted as formulas by 1-2-3.
- Do not create names that look like cell addresses, such as Q2 or EX100.
- Do not use @function names, macro commands, or 1-2-3 key names as range names.
- Do not create range names that begin with a number, such as 20DEC, or consist entirely of numbers, such as 1989. You cannot use such range names in a formula.

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When you name a range, formulas that refer by address to the range automatically change to refer to the range name. For example, formula @SUM(A1..A5) can become @SUM(TOTALS). Conversely, when you delete a range name, 1-2-3 automatically replaces the name with the range address. Use  (NAME) to specify a named range for a command or a formula.

When you move the upper left or lower right cell of a named range, 1-2-3 adjusts the range name's definition. If you move data into the upper left or lower right cell of a named range or delete the column or row that contains the upper left or lower right cell, the range name becomes undefined. Formulas that used that range evaluate to ERR (error). When you copy formulas that contain range names, 1-2-3 treats the range names as relative references and replaces the names with addresses in the copied formulas.

---

## Note



If you create a range name that is identical to an existing range name, 1-2-3 reassigns the range name to the new range.

---

## Working with Formulas

A formula is an entry that performs a calculation using numbers, other formulas, or text (strings). The calculation can be a simple mathematical operation, such as subtracting one number from another, or a more complicated operation, such as determining the net present value of a series of future cash flows.

When you enter a formula, 1-2-3 displays the value that results from the calculation in the cell. For example, if you enter the formula  $25+5$ , 1-2-3 displays the value 30 in the cell. When the cell pointer is in the cell, however, 1-2-3 displays  $25+5$  in the first line of the control panel. (To display formulas in cells instead of their results, use /Range Format Text or /Worksheet Global Format Text.)

You can use range addresses and range names in formulas to include worksheet data in your calculations. When you create a formula this way, 1-2-3 automatically changes the value of the formula if you change any value in the referenced cells.

## Types of Formulas

1-2-3 lets you enter three types of formulas: numeric, text, and logical. You can also enter **@functions**, which are built-in formulas in 1-2-3 that perform numeric, text, or logical calculations. For a list of the 1-2-3 @functions, see chapter 11.

- **Numeric formulas** calculate numeric values using one or more of the arithmetic operators ( + - \* / and ^ ) and/or @functions. 1-2-3 can calculate any numeric formula whose value is between  $10^{-308}$  and  $10^{308}$ , but the value must be between  $10^{-99}$  and  $10^{99}$  for 1-2-3 to display it in the worksheet. When a formula's value is less than  $10^{-99}$  or greater than  $10^{99}$ , 1-2-3 displays asterisks across the cell that contains the formula.

The formula  $+2*H16$  multiplies the value in cell H16 by 2.

- **Text formulas** calculate text values, using the text operator ampersand (&) and/or @functions.

If D4 contains the label *Robinson*, the formula  $+“Dear Mr. and Mrs. ”&D4$  produces the string value *Dear Mr. and Mrs. Robinson* by concatenating the text in quotation marks (called a literal string) with the contents of D4.

- **Logical formulas** are statements that return either 1 (the statement is true) or 0 (the statement is false). Logical formulas use the logical operators = < > <= >= <> #AND# #OR# and #NOT# and/or @functions.

The formula `+A12>=500` returns 1 (true) if cell A12 contains a value greater than or equal to 500; otherwise, the formula returns 0 (false).

## Entering Formulas

Use the following guidelines when entering a formula:

- A formula can begin with a number or one of the numeric symbols + - @ . ( or \$ . The # symbol can be used to begin a logical formula.
- When the first element in a formula is a cell address, range name, or file reference, begin the formula with + - ( or \$ .
- When a text formula starts with text, begin the formula with + or (
- A formula cannot contain spaces except within text in text formulas.
- A formula can contain up to 240 characters.

You can use the following types of data in a formula:

- Numbers (For example, 450, 7.1E12, date and time numbers).
- Text (for example, "Budget for" or "TOTAL").
- @Functions (for example, @SUM(A4..A8)).
- Cell and range addresses (for example, B12, FF23..FH35).
- Range names (for example, JANSALLES, BUDGET\_93).

## Operators and Order of Precedence

The following table shows the arithmetic, text, and logical operators you can use in formulas. Precedence numbers represent the order in which 1-2-3 performs operations in a formula. The lower the precedence number, the earlier 1-2-3 performs the operation. Operations with the same precedence number are performed sequentially from left to right.

Operator	Operation	Precedence
^	Exponentiation	1
- or +	Identification negative or positive values	2
* or /	Multiplication or division	3
+ or -	Addition or subtraction	4
= or <>	Equal-to or not-equal-to tests	5
< or >	Less-than or greater-than tests	5
< =	Less-than-or-equal-to test	5
> =	Greater-than-or-equal-to test	5
#NOT#	Logical-NOT test	6
#AND# or #OR#	Logical-AND or logical-OR tests	7
&	Text concatenation (joining text together)	7

To override the order of precedence, enclose an operation in parentheses. 1-2-3 performs operations inside parentheses first. Within each set of parentheses, precedence numbers apply. You can nest one set of parentheses inside another set to create as many nesting levels as you need.

## Relative, Absolute, and Mixed References

You can use three types of cell and range references in a formula: relative, absolute, and mixed. The reference you use determines what happens when you copy the formula with /Copy.

### Relative References

A relative reference is a cell or range reference that 1-2-3 interprets as a location relative to the current cell. For example, when you enter the formula +B1+B2 in cell B4, 1-2-3 interprets the formula as “add the contents of the cell three rows above to the contents of the cell two rows above.”

If you copy the formula  $+B1+B2$  from B4 to C4, 1-2-3 still interprets the formula as “add the contents of the cell three rows above to the contents of the cell two rows above.” Therefore, 1-2-3 adjusts the relative cell references so the formula becomes  $+C1+C2$ .

### **Absolute References**

To keep a specific cell or range referenced in a formula, regardless of where that formula is copied, use an absolute reference.

An absolute reference can be an address or range name. To create an absolute address, type a \$ in front of both the column letter and row number of the address (for example,  $\$F\$2$  or  $\$A\$5..\$B\$10$ ). To create an absolute range name, type a \$ in front of the range name ( $\$RATE$ ).

### **Mixed References**

Use a mixed cell address if you want part of the cell address to stay the same and part of the address to change in a copied formula.

Mixed references can be created only with addresses, not with range names. To create a mixed reference, precede the absolute part of the address (the column letter or the row number) with a \$ (for example,  $\$C4$  or  $C\$4$ ).

Press **F4** to toggle between the different types of mixed references after typing the cell address.

---

## **Working with Files**

To keep a permanent record of the work you do during a 1-2-3 session, you must **save** your worksheet. You can save your file on the built-in RAM, on a plug-in card, or on a peripheral. Unless you save a worksheet in a file, your work is preserved only as long as the worksheet remains in memory.

## Types of Files

**Worksheet files** (.WK1), created with /File Save or /File Extract, store the data you have entered in 1-2-3.

**Text or print files** (.PRN), which you create with /Print File, store worksheet data in text or ASCII format.

**Graph files** (.PIC), which you create with /Graph Save, store 1-2-3 graphs in a picture format for use with other programs.

**Backup files** (.BAK) store previous versions of worksheets. When you select /File Save or /File Xtract, specify the name of an existing worksheet file, and then select Backup from the menu 1-2-3 displays. 1-2-3 creates a backup file of the version of the worksheet stored on disk before writing over the existing worksheet (.WK1) file with your changes.

**Encoded files** (.ENC), created with /Print Encoded, store printer codes, text, and other information for printing a formatted worksheet.

**Configuration files** (.CNF), created with /Worksheet Global Default Update, store default settings (such as printer and directory settings) that affect every 1-2-3 session.

## Specifying a File

When you use a 1-2-3 command that prompts you for a file name, 1-2-3 displays a list of files in the current directory (the directory specified with /File Directory or /Worksheet Global Default Directory) that are of the appropriate type. For example, if you select /File Retrieve, 1-2-3 displays a menu of worksheet files in the current directory; or if you select /Graph Save, 1-2-3 displays a menu of graph files in the current directory. To see a full-screen menu of file names instead of just one line, press NAME (**F3**).

You can specify a file by highlighting a file name and pressing **ENTER** to select it or by typing a file name.

If you want to use a file in another directory, you need to specify a path. To specify a worksheet file named *BOSTON* that is stored on drive C in the subdirectory named *1989* in the directory named *BUDGETS*, type

```
C:\BUDGETS\1989\BOSTON.WK1
```

## Path

The **path** supplies two pieces of information: the drive name and the directory name where the file is located.

The drive name tells 1-2-3 where the file is located. A drive name always consists of a letter followed by a colon, for example, A: or C:. If the file is located on the current drive, you do not need to specify a drive name. For example, if drive C is the current drive, you can specify the file using the path \BUDGETS\1989\BOSTON.WK1.

---

### Note



- Drive C: is the internal RAM disk.
- Drive A: is the plug-in card.
- Drive B: refers to a peripheral.

---

The directory name tells 1-2-3 in which directory the file is located. If the file you are specifying is in a subdirectory (a directory included in another directory), the path will include more than one directory name. You must use a backslash (\) to separate each directory name from the next. In addition, you must use a \ to separate the last directory name from the file name.

If the file is located in the current directory, you do not need to specify a directory name.

## File Name

Every file in a directory has a unique name, which you assign when you first create the file. It is a good idea to try to use file names that are descriptive so you can easily remember them.

- Use any combination of letters, numbers, underscores ( \_ ), and hyphens ( - ) in file names. Upper and lowercase letters are equivalent.
- Do not use more than eight characters to name a file (1-2-3 ignores the extra characters).
- Do not use the names AUX, CON, COM1, COM2, LPT1, NUL, or PRN. (These names are reserved by the system.)
- Do not include spaces in a file name.





## File Extension

A file extension is an optional suffix you can add to a file name. It consists of a period ( . ) followed by one to three characters. File extensions let you group files into categories by giving more information about what is in a file. If you do not provide your own extension, 1-2-3 automatically adds an extension to the file name depending on the file type:

File Type	Extension	File Type	Extension
Backup worksheet file	.BAK	Graph file	.PIC
Configuration file	.CNF	Print or text file	.PRN
Encoded file	.ENC	Worksheet file	.WK1

## Password Protection

To increase your file security, you can save a file with a password

### To save your file with a password:

1. Select /File Save. 1-2-3 displays the current directory and the default file extension; if the file has been saved before, 1-2-3 also displays the file name.
2. After you've selected the file name, press the space bar once—do *not* press **ENTER**.
3. Type P and then press **ENTER**.
4. Type a password (any combination of up to 15 characters) and press **ENTER**.
5. Type the same password again at the *Verify password* prompt and press **ENTER**. (You must enter the exact combination of uppercase and lowercase letters.)
6. Save the file with the password.

### To change a password:

1. Select /File Save.
2. Press **←** once to clear the PASSWORD PROTECTED prompt.
3. Press the space bar once.
4. Follow steps 3 through 5 in the preceding procedure.

## To delete a password:

1. Select /File Save.
2. Press  once to clear the PASSWORD PROTECTED prompt and press .
3. Save the file.

## Linking Files

The 1-2-3 file linking feature allows you to use values from cells in other worksheets (**source**) in the current worksheet in memory (**target**). You create a link between two files by entering a linking formula in the target worksheet that copies the values in the source worksheet to the target worksheet. So instead of creating one huge worksheet, you can conveniently divide your data among several more manageable worksheets.

The linking formula uses the following format:

*+<<source file>> cell reference*

### Creating a Linking Formula

1. Move the cell pointer to the target cell.
2. Type a + (plus) to begin the formula.
3. Enter the source file enclosed in << >> (double angle brackets). If the source file is not located in the default path or does not have the default .WK1 extension, you must include that information in the source file reference. (For example: +<<C:\123DATA\UKSALES.WKS>>).
4. Enter a cell reference: either the address of the source cell or its range name.
5. Press  to complete the formula. If 1-2-3 cannot read or find the source file, an error message is displayed.
6. To make a link permanent, use /File Save to save the worksheet.

### Restrictions for Linking Files

- Not all file formats can be linked.
- You cannot include a linking formula in another formula.
- If you erase or rename the source file, or delete or reset the source file range name, 1-2-3 displays ERR in the target cell the next time you retrieve the target file.

- If you move the source cell of a linked formula, 1-2-3 does not adjust the linking formula in the target worksheet.
- If you have a large number of links in a worksheet, it may take longer than usual to retrieve the file because 1-2-3 must update each link.
- If the data you are linking to depends on linked cells, you can get incorrect results unless you update the files in an “upward” order (start updating at the level where you are making the changes, and work to the top level).

---

## Using the Clipboard with 1-2-3

The Clipboard enables you to copy and paste text in 1-2-3. Once on the clipboard, data can also be pasted to other applications or data from other applications can be pasted to 1-2-3.

Follow these steps to copy worksheet data:

1. In READY mode, press **Fn** **POINT**. 1-2-3 invokes POINT mode.
2. Move the cell pointer cell by cell in the worksheet to specify the range you wish to copy. Please note the following when you specify a range:
  - Row and column headings cannot be copied.
  - Each row of 1-2-3 information is copied as one line of text even if it traverses data in cells in multiple columns.
  - There is no utility for viewing the Clipboard contents separately.
3. Press **ENTER**. (The original range remains on the screen, and a copy is stored in the Clipboard buffer.)
4. Move the cell pointer to the upper-left corner of the destination location, either in the same worksheet or in another file.

---

### Caution



Make sure the area is empty or contains unimportant data. The Clipboard contents overwrite any data in the destination location.

---

5. Press **Fn** **PASTE**.

---

**Note**

The Clipboard contents will be written as text; to convert the pasted numbers to values, use /Data Parse.

---

---

## Using the UNDO Feature

When the Undo feature is on, you can press UNDO (**ALT-F4**) when 1-2-3 is in READY mode to cancel the most recent operation that changed worksheet data and/or settings. In addition, if you change your mind about what you just undid, you can press UNDO again and 1-2-3 will undo the effect of the undo operation! Remember, UNDO must be turned on if you want to use it.

Initially the UNDO feature is off. You can turn it on with /Worksheet Global Default Other Undo Enable.

---

**Note**

UNDO consumes memory, so turning it off if you don't need it permits you to have a larger worksheet in memory.

---


You can tell whether or not you can use the undo feature by looking for the **Undo** indicator on the status line at the bottom of your screen. If the **Undo** indicator is not displayed, pressing UNDO will have no effect.

## What You Need To Know To Use UNDO

Although the undo feature is a valuable tool, you should not use it until you read the remainder of this section. This section provides important details about how the undo feature works; unless you are familiar with these details, you may get unexpected results when you use UNDO.

- UNDO works only when you are working in 1-2-3 and 1-2-3 is in READY mode.
- Initially, the UNDO feature is off, but you can turn it on with /Worksheet Global Default Other Undo Enable. If you then

use /Worksheet Global Default Update to modify the 1-2-3 configuration file, UNDO will automatically be turned on whenever you start 1-2-3.

- Any series of 1-2-3 commands performed after you press  to display the main menu and before 1-2-3 returns to READY mode is a single undoable operation. For example, if you select /Graph, complete a series of Graph commands without leaving the /Graph menu and then return 1-2-3 to READY mode, pressing UNDO cancels the entire series of Graph commands you completed.
- If you press UNDO after running a macro, 1-2-3 returns your worksheet data and settings to the state they were in prior to running the macro, regardless of how many individual changes the macro made. If you did not run the macro from READY mode, 1-2-3 returns the worksheet data and settings to the state they were in when you last left READY mode, before running the macro.
- If you turn off the UNDO feature, retrieve a worksheet or attach an add-in, and then try to turn on UNDO, you will not be able to do so if any part of the UNDO buffer is in conventional memory. 1-2-3 cannot reserve the memory it needs for the UNDO buffer once you have retrieved a worksheet or attached an add-in. To turn on UNDO in this situation, save the worksheet with /File Save, erase it with /Worksheet Erase or detach the add-in with /Add-In Detach, turn on UNDO with /Worksheet Global Default Other Undo Enable, and then retrieve the worksheet or attach the add-in again.

## What Operations Can't You Undo?

Some 1-2-3 commands (such as /File Save and /File Erase) create, modify, or delete files on disk. When you press UNDO to undo one of these commands, 1-2-3 undoes any changes to the state of the worksheet (this includes worksheet data, range names, and settings). 1-2-3 cannot, however, undo the changes the command made to files on disk. Similarly, if you press UNDO after using /Print Printer Go, 1-2-3 undoes any changes you made to 1-2-3 print settings with the Print [Printer, Encoded, or File] commands, but it cannot undo any changes the command had on your printer's internal settings.

---


## Basic Steps for Printing in 1-2-3

Printing HP 100LX 1-2-3 files is just like printing your PC 1-2-3 files. You can print your worksheet data directly to a printer, to an encoded file or to a standard ASCII text file (a file with a .PRN extension).

---

### Note




You can quickly and easily print what is displayed on your screen (text or graphics) by pressing  PRTSC.

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For information on connecting your HP 100LX to a printer, see chapter 36, "Using a Printer with the HP 100LX."

### Printing To a Printer (/Print Printer)

(1-2-3 uses the printer configured in the Setup utility. For additional information, see chapter 36.)

1. Select /Print Printer. 1-2-3 displays the Print commands and the /Print settings sheet to control the appearance and format of the print output.
2. Select Range. Specify the range you want to print and press .
3. If you want to change any of the current print settings, select Options.

If you do not change the margins or page length, 1-2-3 uses the following default settings when it prints the range:

Left margin	4 characters from left edge of the paper
Right margin	76 characters from left edge of the paper
Top margin	2 lines from the top of the paper
Bottom margin	2 lines from the bottom of the paper
Page length	66 lines

When you have specified the print options, select Quit as many times as necessary to return 1-2-3 to the /Print [Printer, File, or Encoded] menu.

4. Select Align to tell 1-2-3 the paper in the printer is correctly positioned at the top of a page and ready for printing.

5. Select Go to print the range on the printer.
6. If you are printing several pages, select Page to advance the paper to the top of the next page and to include the footer (if you have specified one) on the last line of the page.
7. Select Quit to complete the print job and return 1-2-3 to READY mode.

## Printing To a Text File (/Print File)

You can also print a worksheet range to a text (.PRN) file on either the internal disk or an installed ram card.

1. Select /Print File. 1-2-3 displays files with a .PRN extension in the current directory.
2. If you want to display files in a different drive and/or directory or with a different extension, do one of the following:
  - To display files with a different extension, type \*. followed by another extension and press **ENTER** (for example, \*.txt).
  - To display all files in the current directory, type \*.\* and press **ENTER**.
  - To display files in a different drive and/or directory, press **ESC** to clear the file names, edit the drive and/or directory, and then press **ENTER**.
3. Specify the name of the text file you want 1-2-3 to create and press **ENTER**. 1-2-3 automatically uses the extension .PRN for text files, unless you specify a different extension.
4. If you specify the name of a text file that already exists, select one of the following options:

Cancel                      Returns 1-2-3 to READY mode without specifying a text file as the print destination.

Replace                     Writes over the existing text file on disk when you select /Print File Go.

1-2-3 displays the Print commands and the /Print settings sheet after you specify the file name. These commands offer you a number of options that control the appearance and format of the print output. The only option that must be specified is the range.

5. Select Range. Specify the range you want to print and press

**ENTER**.

6. If you want to change any of the current print settings, select Options. If you are creating a text file on disk so you can use 1-2-3 data with another program, you may want to change the following print options:
  - To eliminate headers, footers, and page breaks from the text file 1-2-3 will create, select Options Other Unformatted.
  - To set the left margin to 0, select Options Margins Left and enter 0.
  - To set the right margin, select Options Margins Right and enter a number for the right margin that is appropriate for the program in which you are going to use the text file.

When you have specified the print options, select Quit as many times as necessary to return 1-2-3 to the /Print [Printer, File, or Encoded] menu.

7. Select Align to set the internal line count 1-2-3 maintains to zero, which represents the top of a page.
8. Select Go to print the range to a text file.
9. If you want to include other worksheet ranges in the same text file, repeat steps 6, 7, and 10. (1-2-3 appends the new range to the end of the previous range in the text file.)
10. If you specified a footer and you want it to appear on the last line of the page, select Page.
11. Select Quit to complete the print job and return 1-2-3 to READY mode.

## **Printing To an Encoded File (/Print Encoded)**

1. Select /Print Encoded.
2. Enter the name of your file at the prompt.
3. Select Range. Specify the range you want to print and press **ENTER**.
4. If you want to change any of the current print settings, select Options. When you have specified the print options, select Quit as many times as necessary to return 1-2-3 to the /Print [Printer, File, or Encoded] menu.



5. Select Go to print the range to an encoded file.
6. Select Quit to return 1-2-3 to READY mode.

## Using 1-2-3 Help

1-2-3 provides Help screens that you can view any time during a 1-2-3 session by pressing HELP (**F1**). The 1-2-3 Help system is context-sensitive—when you press HELP, 1-2-3 displays a screen related to what you are currently doing.

Each Help screen includes **links** to additional Help topics. The links appear in outline boxes. Use the pointer-movement keys to select a topic, and press **ENTER**.

To exit HELP, press **ESC** or **F9**. You will return to the worksheet at the same place you left it.

The following table lists the keys you use to move through Help screens and to other Help topics.


Key	Description	Key	Description
<b>▶</b> , <b>▼</b> , or <b>TAB</b>	Highlights next cross-reference or scrolls down one line.	<b>F1</b>	Displays 1-2-3 Main Help Index.
<b>◀</b> , <b>▲</b> , or <b>⇧-TAB</b>	Highlights previous cross-reference or scrolls up one line.	<b>F6</b> or <b>Fn-PGUP</b>	Scrolls up through Help topic.
<b>Fn-END</b>	Moves to bottom of Help topic.	<b>F7</b> or <b>Fn-PGDN</b>	Scrolls down through Help topic.
<b>ENTER</b>	Displays Help topic for highlighted cross-reference.	<b>F8</b>	Displays previous Help topic.
<b>ESC</b> or <b>F9</b>	Leaves Help.	<b>Fn-HOME</b>	Moves to top of Help topic.



## 1-2-3 Command Summary

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Chapter 9 presents a summary of each command in the 1-2-3 main menu. We have described the commands through the first two levels; to see how all levels of the commands branch or to trace all options available, see chapter 10, “1-2-3 Command Trees.”

To make the 1-2-3 main menu appear in the control panel of your HP 100LX, press . The text underneath each menu item is called a long prompt and gives a brief description of each command.

*And remember, for more information on any command, highlight the command with the menu pointer and press F1 (HELP).*

Some of the 1-2-3 commands are marked with an \* (asterisk). The following caution applies to all commands in this chapter that are marked with an \*—please read it carefully.

---

### Caution



\*To avoid possible data loss, save your worksheet before you use this command. If you make a mistake (and Undo is on), press ALT-F4 (UNDO) immediately to restore the worksheet. If Undo is off and the file is saved, use /File Retrieve to restore your worksheet.

---

**Add-In commands** let you use 1-2-3 add-in programs.

/Add-In Attach	Loads an add-in program into memory.
/Add-In Clear	Removes all attached add-in programs.
/Add-In Detach	Removes an attached add-in program.
/Add-In Invoke	Activates an attached add-in program.
/Add-In Quit	Returns 1-2-3 to READY mode.

**Copy commands** let you copy a single cell to other cells or ranges, copy ranges to ranges, or copy formulas to other cells or ranges (relative references remain intact).

/Copy*	Copies data in a cell or range of cells and its formats to another cell or range in the worksheet; duplicates data in one cell so it fills a range; makes one copy or multiple copies of a cell or range of data; applies a formula that refers to a single column or row to multiple columns or rows.
--------	--

**Data commands** let you create, analyze, and manipulate data in ranges and in 1-2-3 databases.

/Data Distribution	Calculates the frequency with which values in a range fall within specified numeric intervals.
/Data Fill*	Enters a sequence of values, column by column, from left to right, in a specified range. (The values you enter can be numbers, percentages, or formulas.)
/Data Matrix	Inverts or multiplies matrices to solve problems that involve simultaneous equations.
Invert*	Creates the inverse of a matrix; the inverted matrix contains the same number of rows and columns as the original.
Multiply*	Multiplies the columns of one matrix by the rows of a second matrix to create a third matrix that is the result of the multiplication.

<code>/Data Parse*</code>	Separates a single column of long labels into multiple columns and assigns data types to each column.
<code>Format-Line</code>	Creates or edits a format line to define how 1-2-3 will separate a long label into individual cell entries, one per column.
<code>Go</code>	Parses the labels in the input column and places them in the output range.
<code>Input-Column</code>	Specifies the entire single-column range that contains the format line and data you want to parse. (The first cell in the input column must contain a format line.)
<code>Output-Range</code>	Specifies the range in which you want 1-2-3 to place the parsed data. If you specify one cell, 1-2-3 uses that cell as the upper left cell in the output range.
<code>Reset</code>	Clears the range address settings for the input column and the output range.
<code>/Data Query</code>	Locates and edits selected records in a 1-2-3 database based on criteria you specify. Before you can use <code>/Data Query</code> to locate or work with records in a 1-2-3 database, you must create the input, criteria, and (for <code>/Data Query Extract</code> and <code>/Data Query Unique</code> ) output ranges.
<code>Criteria</code>	Specifies the criteria range, which contains the selection criteria for records in the 1-2-3 database.
<code>Delete</code>	Deletes the records in the input range that match the criteria you specified in the criteria range and shrinks the input range to remove the blank rows.
<code>Extract*</code>	Copies to the output range the records in the input range that match the criteria you specified in the criteria range.

Find	Highlights and lets you edit the records in the input range that match the criteria you specified in the criteria range.
Input	Specifies the range that contains the records you want to search. The first row of the input range must include the field names.
Output	Specifies the range where you want to place the results of /Data Query Extract or /Data Query Unique. The first row of the output range must include the field names.
Reset	Clears the range address settings for the specified input, criteria, and output ranges.
Unique*	Copies to the output range (eliminating any duplicates) the records in the input range that match the criteria you specified in the criteria range.
/Data Regression*	Describes statistically the association between one data range and another; calculates the slope of the line that best illustrates the data; or predicts future trends based on current data.
Go	Calculates a data regression for the selected X range, Y range, and output range.
Intercept	Determines whether 1-2-3 calculates the y-axis intercept automatically (default) or uses zero as the intercept. The y-axis intercept appears in the results as the constant.
Output-Range	Specifies the range in which 1-2-3 places the results of the regression analysis.
Reset	Clears the range addresses for the X, Y, and output ranges; resets Intercept to Compute.
X-Range	Specifies the independent variables.
Y-Range	Specifies the dependent variable.

/Data Sort	Rearranges the data in a range in the order you specify. The range can be records in a 1-2-3 database or rows in the worksheet.
Data-Range	Specifies the range you want to sort (either records in a database or rows in a worksheet).
Go	Sorts the data in the data range according to the primary key and secondary key settings, and returns 1-2-3 to READY mode. You must specify a data range and a primary sort key; the secondary sort key is optional.
Primary-Key	Determines the primary field for sorting records or rows. (The data can be in either ascending or descending order.) You must specify a primary key and sort order before you can perform a sort.
Reset	Clears range address settings and sort keys.
Secondary-Key	Determines the order for records or rows that have the same primary sort key entries. (The data can be in ascending or descending order.)
/Data Table	Records the effect of changing the values of one or more variables in one or more formulas; performs "what-if" analyses.
1	Creates a table that calculates the results of one or more formulas, each of which uses one variable; analyzes or cross-tabulates the data in a 1-2-3 database.
2	Creates a table that calculates the results of one formula that uses two variables.
Reset	Clears all of the table range and input cell settings you specified in the worksheet. Use /Data Table Reset before you save a file if you do not want to save table range and input cell settings with the file.

**File commands** let you retrieve files, organize and maintain the information you store in files, and consolidate data from different files.

/File Admin	Creates a table of information about files, updates file links in the current worksheet, and controls access to a worksheet file reservation.
Link-Refresh	Recalculates formulas in the current worksheet that include references to files on disk by retrieving the current contents of the linked cells. <i>You cannot include a linking formula in another formula.</i>
Table*	Creates a table of information about the files and directories on disk.
/File Combine	Incorporates data from a worksheet file on disk into the current worksheet.
Add*	Consolidates numeric data from several files by adding incoming numeric data to numbers or blank cells in the current worksheet.
Copy*	Copies all incoming data (labels and values) from a worksheet file on disk to the current worksheet.
Subtract*	Subtracts incoming numeric data from numbers or blank cells in the current worksheet.
/File Directory	Changes the default directory for the current 1-2-3 session. The default directory is the path (drive and directory names) 1-2-3 uses if you do not specify a path and file name when you save, retrieve, or list files.
/File Erase	Deletes a worksheet file, text file, graph file, or any other file on disk; erases the current file in memory. <i>Remember, ALT-F4 (UNDO) cannot recover the erased file.</i>



/File Import*	Copies data (text and/or numbers) from an ASCII file on disk (created with 1-2-3 or another program) into the current worksheet.
/File List	Displays a list of information about worksheet, text, graph, linked, or all files currently on disk.
/File Retrieve*	Reads a worksheet file into memory. The retrieved file replaces the current worksheet.
/File Save	Saves the current worksheet to a worksheet file on disk; creates new files on disk and replaces existing files. (Use /File Save Backup with .BAK extension to keep a copy of the last version of a file on disk.)
/File View	Not available in the HP 100LX.
/File Xtract	Copies a range of data including labels, numbers, and formulas (or the values of formulas) from the current worksheet and saves it in a worksheet file on disk. All settings associated with the worksheet are also saved.


**Graph commands** convert numeric data from the worksheet into visual representations in seven graph types: bar, HLCO (high-low-close-open), line, mixed, pie, stacked bar, and XY.

(Remember, you can print a displayed graph by pressing **Fn** PRTSC.)

/Graph A-F	Specifies the ranges (A-F) that contain the numeric data you want to graph.
/Graph Group	Specifies multiple graph data ranges (X and A-F) at once, when the ranges are located in consecutive columns or rows.
/Graph Name	Creates, modifies, and deletes named graphs in the current worksheet and creates tables of the named graphs.

Create*	Creates or modifies a named graph by storing the current graph settings with the name you specify. (If you enter a preexisting graph name, 1-2-3 reassigns the graph name to the new graph settings.)
Delete	Deletes a named graph. (If undo is on, and you want to restore the graph, select Quit to return to the worksheet, then press (ALT-F4) UNDO.)
Reset*	Deletes all named graphs in the worksheet.
Table*	Creates a three-column table in the worksheet that alphabetically lists all named graphs, graph types, and titles.
Use	Makes a named graph the current graph so you can view and use it.
/Graph Options	Adds enhancements such as titles, legends, and grid lines to a graph and determines the scaling method for the axes of the graph.
B&W	Sets graph display to black and white; displays bars and pie slices (if you selected data range B for the pie chart) in contrasting hatch patterns.
Color	Not available in the HP 100LX.
Data-Labels	Uses the contents of a range (data label ranges A-F) as labels for the points or bars in a graph.
Format	In XY and line graphs, sets whether 1-2-3 connects the data points with lines, uses symbols to mark the points, uses both symbols and lines, or uses neither.

Grid	Adds or removes grid lines in a graph.
Legend	Creates legends to identify data ranges A-F represented by symbols, colors, or hatch patterns.
Scale	Determines the axis scaling method and sets the format of the numbers that appear along each axis; sets which entries appear along the x-axis; sets the display of y-axis labels and tick marks; formats the x-axis for XY graphs and y-axis labels in graphs.
Titles	Adds graph and axis titles to a graph.
/Graph Reset	Resets some or all of the current graph settings to the default graph settings.
/Graph Save	Saves the current graph in a graph file (.PIC).
/Graph Type	Specifies the kind of graph to create (bar, HLCO, line, mixed, pie, stacked bar, or XY) and adds features (stacked data ranges, frames, margins, 3-D effects, and choice of horizontal or vertical graph orientation).
Bar	Graphs one or more data ranges (X, A-F) as bars.
Features	Rotates the graph so the x-axis is horizontal or vertical or the y-axis is vertical or horizontal; places values in data ranges on top of each other in bar, line, mixed, and XY graphs; adds or removes a frame around part or all of the graph, adds or removes margins, or adds or removes the zero line; creates 3-D effects in bar, stacked bar, and mixed graphs.
HLCO	Creates an HLCO (high-low-close-open) graph showing each set of four values as a vertical line with tick marks in the graph. The line extends from the high value to the low value. (A tick mark on the right side of the line shows the closing value; a tick mark on the left side shows the opening value.)

Line	Graphs data ranges A-F with lines, symbols, both, or neither. The X range is used for x-axis labels.
Mixed	Creates a graph in which data ranges are represented with bars and lines. Ranges A-C are represented as bars, and ranges D-F are represented as lines. The X range is used for x-axis labels.
Pie	Graphs the A data range as slices of a pie labeled with the percentage (rounded off) it represents of the whole pie. Entries in the X data range appear as labels; values in the B data range specify exploded slices and hatch patterns.
Stack-Bar	Graphs one or more data ranges (X, A-F) as stacked bars.
XY	Graphs the X data range and one or more other data ranges (A-F). The X data range determines the numeric scale of the x-axis; the other data ranges are paired with values for the X data range and plotted as coordinates along the x and y axes.
/Graph View	Temporarily removes the current worksheet from the screen to display the current graph. (To print this displayed screen, press  PRTSC.)
/Graph X	Specifies the range that contains the x-axis labels, the x-axis values for an XY graph, or the pie slice labels.

The **move command** lets you transfer a range of data, formulas, range names, and cell formats to another range in the worksheet.

/Move*	Removes data from one location and enters it in another location in the same worksheet.
--------	---

**Print commands** control basic printing operations and create printed copies of your work. You can send print output to a printer, to an encoded file, or to a text file.

/Print [Printer, File, or Encoded] Align	Tells 1-2-3 that the paper in the printer is correctly positioned at the top of a page; resets the page number to 1.
/Print Background	Not available in the HP 100LX.
/Print [Printer, File, or Encoded] Clear	Returns the current print settings to the default settings.
/Print Encoded	Sends print output you specify to an encoded file (.ENC) on disk so you can print later. The encoded file contains printer codes and setup strings in addition to text.
/Print File	Selects a text (ASCII) file on disk as the print destination, then lets you select print options.
/Print [Printer, Encoded, or File] Go	Starts the print job. Sends your worksheet data to a printer or to a file on disk.
/Print [Printer, Encoded, or File] Line	Advances the paper in the printer one line.
/Print [Printer, Encoded, or File] Options	Establishes printing settings.
Borders	Prints descriptive information from specified columns and rows in your worksheet to the left and top edges of every page of print output.
Footer	Prints a line of text just above the bottom margin of every page.
Header	Prints a line of text just below the top margin of every page.

Margins	Sets left, right, top, and bottom margins for the print output.
Other	Determines whether 1-2-3 prints the worksheet data or the formulas, and whether 1-2-3 prints headers and footers and inserts page breaks.
Pg-Length	Overrides the default number of lines (66) to be printed on a page (set with /Worksheet Global Default Printer Pg-Length), and lets you set the number of lines (which becomes the new default).
Setup	Specifies additional printer attributes available on your printer. <i>Don't use setup strings to control print settings that you can control through 1-2-3 commands (such as page length or margins).</i>
/Print [Printer, Encoded, or File] Page	Advances the paper in the printer to the top of the next page or inserts blank lines in a text file on disk.
/Print Printer	Prints a range on a printer.
/Print [Printer, Encoded, or File] Quit	Ends the current print job and returns 1-2-3 to READY mode.
/Print [Printer, Encoded, or File] Range	Specifies the range to print either to a printer or to a file.

The **quit command** lets you end the current 1-2-3 session. *Before you use the Quit command, select /File Save if you want to save your work.*

/Quit  
Ends the current 1-2-3 work session. To return 1-2-3 to READY mode, select No; to end the 1-2-3 session, select Yes.

**Range commands** let you work with a group of cells rather than a single cell. A range is any rectangular block of cells—including a single cell or an entire worksheet.

/Range Erase	Erases data in a range without changing the format or protection status.
/Range Format	Changes how 1-2-3 displays data in a range.
/Range Input	Restricts cell-pointer movement and data entry to unprotected cells in a range used along with /Range Unprotect.
/Range Justify	Rearranges a column of labels as a paragraph to fit within a specified width. <i>Do not use this command on a column whose contents are used in macros or text formulas; if you do, the macros may not work.</i>
/Range Label	Left or right-aligns, or centers labels within cells in a range.
/Range Name	Creates, modifies, deletes, or generates tables of range names.
Create	Creates (or modifies) a range name. If you enter a preexisting range name, 1-2-3 assigns the name to the new range name location or address.
Delete	Deletes a range name; the data remains unchanged.
Labels	Creates range names for single cell ranges using labels in adjacent cells as the range names.
Reset	Deletes all range names in the current worksheet; the data remains unchanged.
Table*	Creates a two-column table in the worksheet that lists range names and their addresses alphabetically.
/Range Prot	Reprotects cells in a range (that have been unprotected with /Range Unprotect) when global worksheet protection is on.

/Range Search	Finds or replaces a specified string in a range.
/Range Trans*	Copies a range of data to a new location and transposes it from rows to columns, replacing any copied formulas with their current values.
/Range Unprot	Unprotects and allows changes to cells in a range when global worksheet protection is on; allows changes to cells that will be used with /Range Input.
/Range Value*	Copies a range of data, replacing formulas with their current values.

The **system command** lets you suspend the current 1-2-3 session temporarily and return to the operating system without clearing the worksheet from memory.

/System	Exits to MS-DOS. Type <code>exit</code> <input type="text" value="ENTER"/> to return to 1-2-3. (You cannot run 1-2-3 from the operating system prompt.)
---------	---

**Worksheet commands** let you control the global settings that affect the display and organization of your work.

/Worksheet Column	Sets the width of one or more columns, resets columns to the global column width, and hides or redisplay columns.
Column-Range	Changes the column width of a range of columns, or resets a range of columns to the global default (9 characters).
Display	Redisplays one or more hidden columns.
Hide	Hides one or more columns without erasing the data in the columns.
Reset-Width	Resets the current column width to the default (9 characters).
Set-Width	Changes the width of the current column.



/Worksheet Delete	Permanently removes one or more columns or rows from the worksheet. <i>If you make a mistake (and undo is on), press ALT-F4 (UNDO) immediately to restore the worksheet.</i> (You cannot delete columns or rows if /Worksheet Global Protection is enabled.)
/Worksheet Erase*	Removes the current worksheet from memory and replaces it with a blank worksheet.
/Worksheet Global	Sets the global worksheet attributes; also sets 1-2-3 default settings.
Column-Width	Sets the global column width (does not affect the columns widths set individually) .
Default	Changes the default settings for the current 1-2-3 session, such as printer instructions, the current directory, undo, international and clock display formats, auto-execute macros, and auto-attach add-ins; changes the default file directory. If you select /Worksheet Global Default Update, the current default settings become the settings for all subsequent 1-2-3 sessions.
Protection	Turns global protection on or off for the worksheet; works in conjunction with /Range Prot and /Range Unprot to prevent changes from being made to specified cells.
Recalculation	Sets when and in what order 1-2-3 recalculates formulas, and how many passes 1-2-3 performs each time it recalculates. (This setting is saved with the file.)
Zero	Specifies whether 1-2-3 displays a zero, a label, or nothing in cells that contain either the number zero or a formula that evaluates to zero. (This setting is saved with the file.)

/Worksheet Insert	Inserts one or more blank columns or rows in the worksheet. <i>Inserting rows may insert blank cells in macros making them inoperable.</i>
/Worksheet Learn	Specifies a range in which to record keystrokes to run as a macro.
Cancel	Cancels the current learn range.
Erase	Clears the contents of all cells in the current learn range without canceling the learn range.
Range	Specifies the range where 1-2-3 will record keystrokes as labels.
9 /Worksheet Page	Inserts a row and creates a page break (::) in a worksheet.
/Worksheet Status	Displays, in a dialog box, information about memory, hardware, and circular references.
/Worksheet Titles	Freezes columns and/or rows along the top and left edges of a worksheet so they remain in view as you scroll through the worksheet.
/Worksheet Window	Splits the screen into two horizontal or vertical windows, turns synchronized scrolling on or off, and restores single-window display.

## 1-2-3 Command Trees

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### Add-In Commands

Worksheet Range Copy Move File Print Graph Data System **Add-in** Quit

Attach Detach Invoke Clear Quit

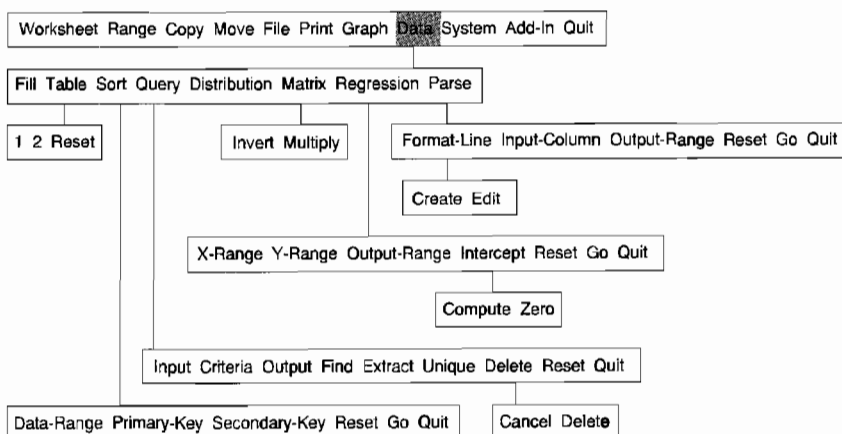
10

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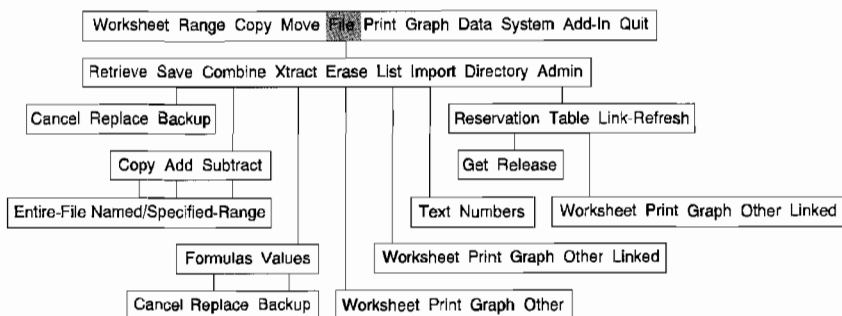
### Copy Commands

Worksheet Range **Copy** Move File Print Graph Data System Add-in Quit

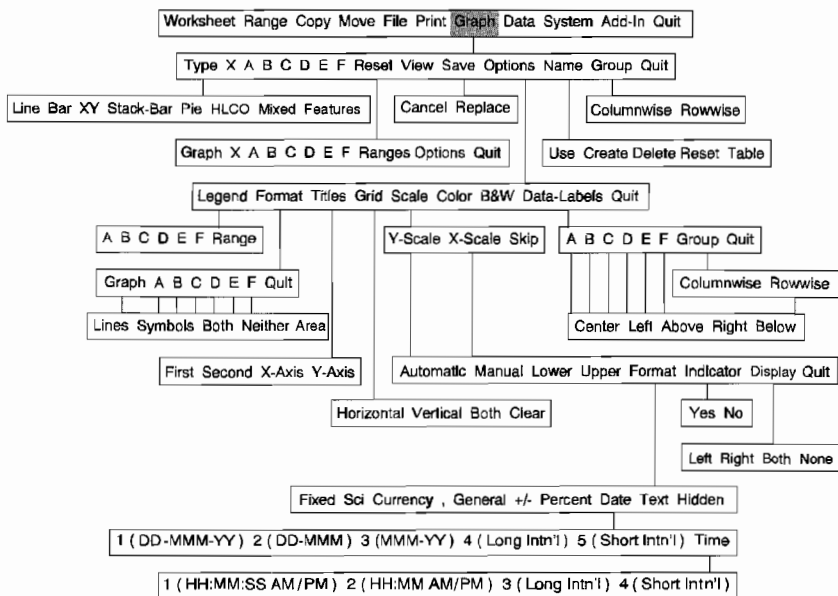
## Data Commands



## File Commands



## Graph Commands



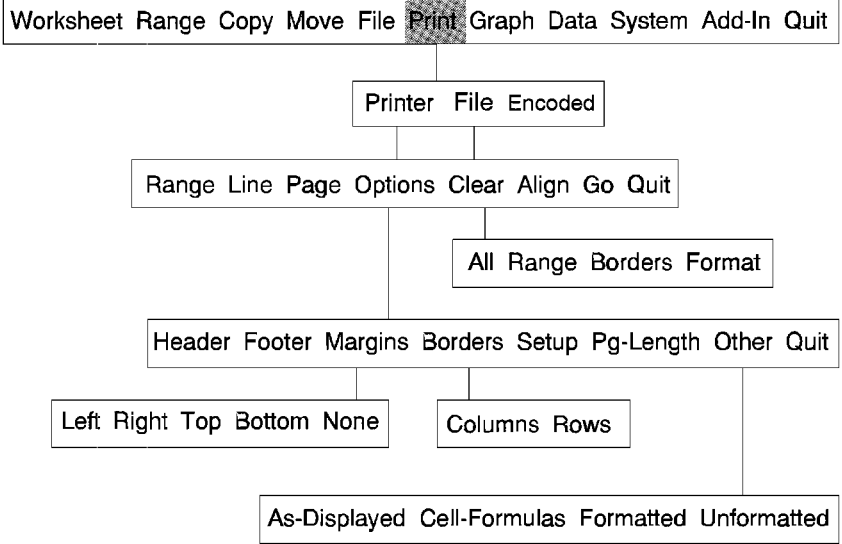
10

## Move Command

Worksheet Range Copy Move File Print Graph Data System Add-in Quit

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## Print Commands

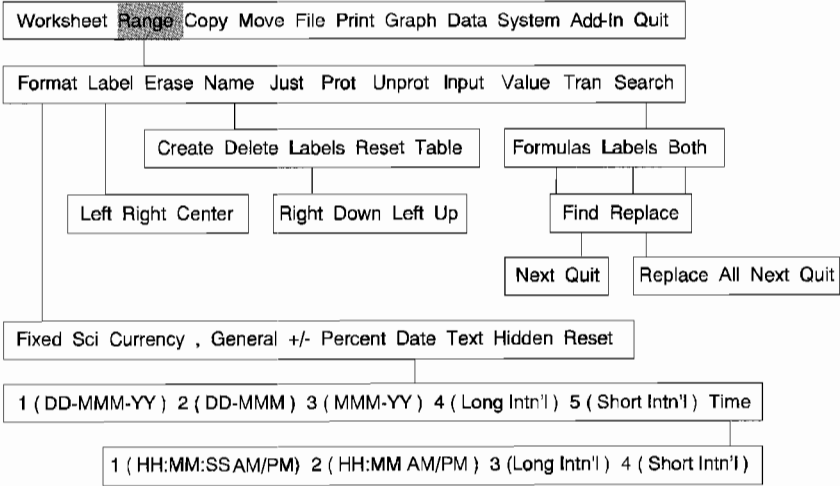


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## Quit Command

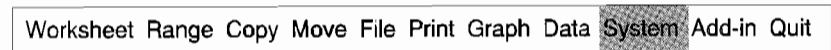


# Range Commands

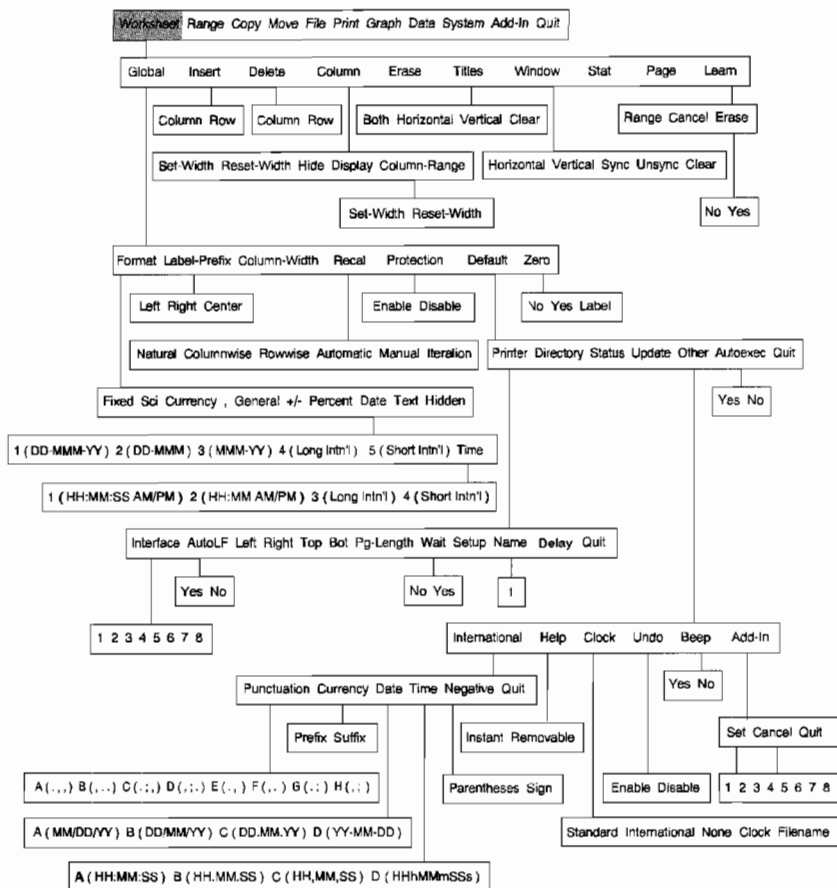


10

# System Command



# Worksheet Commands





## Reviewing 1-2-3 @Functions

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An @function is a built-in formula that performs a calculation. All @functions begin with an @ (at sign), have a name, and most use arguments. You can use an @function by itself as a formula, combine it with other @functions and formulas, or use it in a macro. This chapter provides basic information about @functions and briefly describes the @functions available in 1-2-3 for DOS.

And remember, you can press **F1** (HELP) when you are entering an @function to get information about that @function.

---

### 1-2-3 @Function Conventions

The following conventions are used throughout this chapter:

- @Function names are shown in uppercase letters (and 1-2-3 actually displays them in upper case), but you can enter either uppercase or lowercase letters.
- Arguments are data you provide for @functions; they are shown in lowercase italics.
- Optional arguments for @functions are shown in [ ] (brackets).
- Offset number corresponds to the position of a character in text or a field or row in a database. Offset numbers start at zero. For example, in the label MAHER, the offset number of M is 0, of A is 1, and so on. A field's offset number corresponds to the position of the column the field occupies in the input range (or database). The first (leftmost) field of the input range (or database) has an offset number of 0; the second field, an offset number of 1; and so on. String and database statistical @functions use offset numbers.

- Criteria is a range name or address of at least two rows that specifies selection requirements. The first row contains some or all the field names in the input range. The second row (and any subsequent rows) contains criteria that determine what records 1-2-3 selects. Enter criteria directly below the field name of the field to which they apply.

---

## 1-2-3 @Function Rules

11 Observe the following rules when you write an @function:

- Enter each @function in a single cell. The @function and its arguments cannot exceed 240 characters. Remember to enclose the arguments in parentheses.
- Do not type spaces between arguments.
- Argument separators separate two or more arguments. You can use either a comma ( , ), semicolon ( ; ), or period ( . ). (You can use the semicolon regardless of the setting you have chosen for numeric punctuation in /Worksheet Global Default Other International Punctuation).
- Double quotation marks ( " " ) enclose text in arguments in string @functions. 1-2-3 assumes that text not in double quotation marks is a range name.
- Do not use a comma, semicolon, period, or parenthesis as part of an argument, unless you enclose the argument in double quotation marks.
- You don't need to use + (plus) to enter an @function—just begin by typing the @.
- Parentheses enclose arguments. If you use an @function as an argument for another @function, you must nest the parentheses.

---

## 1-2-3 @Function Argument Types

1-2-3 @functions accept four types of arguments:

Type	Description
Condition	An expression that uses a relational or logical operator (< > = <> >= <= #NOT# #AND# and #OR#). The @function evaluates the condition argument and proceeds according to whether it is true or false. You can also use a formula or @function, a number, text, or a range name or cell address as a condition argument.
Location	The address or name of a cell or range, or a formula or @function that returns a range address or name. A location argument can refer to a single-cell or a multiple-cell range.
String	Text (any sequence of letters, numbers, and symbols) enclosed in double quotation marks, the range address or name of a cell that contains a label, or a formula or @function that returns a label. String @functions use text arguments.
Value	A number, the address or name of a cell that contains a number, or a formula or @function that returns a number.

11

Keep the following information in mind when you use @functions that require arguments:

- Use range names to ensure that location arguments are correct even if you insert or delete rows or columns.
- If the argument you specify for an @function is a single-cell range and the cell is blank, 1-2-3 uses zero as the argument (except for @COUNT, where 1-2-3 uses the value 1 as the argument). Statistical @functions ignore blank cells in multiple-cell range arguments. (A **blank** cell is a cell that does not contain an entry or a label-prefix character.)
- Several @functions require a range for a location argument, but they use only the cell in the upper left corner. Other @functions that require a single cell allow a range only if it is a single-cell range.

- Two @functions (@CELL and @CELLPOINTER) require specific attributes, one of which you must use as the argument. Enclose the attribute in " " (double quotation marks), as you do with all text used as arguments.

---

## 1-2-3 @Function Descriptions

The 1-2-3 for DOS @functions are listed alphabetically. Each @function is briefly described and the required arguments are shown.

11

### @@(location)

Returns the cell or range address produced by *location*. *location* is the address or name of a cell that contains a cell address or name, or a text formula that returns the address or name of a cell. If *location* is not valid, @@ returns ERR. @@ is useful as an indirect cell reference.

### @?

Indicates the location of an unknown add-in @function that is referred to by a formula in a worksheet. If you retrieve a worksheet that contains add-in @functions without first attaching the appropriate add-in, 1-2-3 translates the @function name to @? and interprets the @function as NA. You cannot enter @? directly in a worksheet.

### @ABS( x )

Calculates the absolute value of *x*. *x* is a value, the address or name of a cell that contains a value, or a formula that returns a value. Use -@ABS to force the result of the @function to be negative.

### @ACOS(*x*)

Calculates the arc cosine using the cosine *x* of an angle. The result is an angle, in radians, from 0 through  $\pi$  (between  $0^\circ$  and  $180^\circ$ ). *x* is the cosine of an angle and can be any value from -1 through 1. To convert radians to degrees, multiply by  $180/@PI$ .

### @ASIN(*x*)

Calculates the arc sine using the sine *x* of the angle. The result of @SIN is an angle, in radians, from  $-\pi/2$  through  $\pi/2$  (representing

an angle between  $-90^\circ$  and  $90^\circ$ . To convert radians to degrees, multiply by  $180/\text{@PI}$ .

### **@ATAN(*x*)**

Calculates the arc tangent using the tangent *x* of an angle. The result is an angle, in radians, from  $-\pi/2$  through  $\pi/2$  (between  $-90^\circ$  and  $90^\circ$ ). *x* is the tangent of an angle and can be any value. To convert radians to degrees, multiply by  $180/\text{@PI}$ .

### **@ATAN2(*x,y*)**

Calculates the arc tangent using the tangent *y/x* of an angle. The result is an angle, in radians, from  $-\pi$  through  $\pi$  (between  $-180^\circ$  and  $180^\circ$ , depending on the sign of *x* and *y*. *x* and *y* are values: If *y* is 0, @TAN2 returns 0; if both *x* and *y* are 0, it returns ERR. To convert radians to degrees, multiply by  $180/\text{@PI}$ .

### **@AVG(*list*)**

Calculates the average (mean) of a list of values. *list* can be a series of values separated by argument separators. (Labels and blank cells count as zero, but increase the total number of items in *list*, so your results may not be what you're expecting.)

### **@CELL(*attribute,range*)**

Returns information about the first cell in *range*. *attribute* can be any of the following 10 items enclosed in double quotation marks (or the cell address of the cell containing the items):

<b>Attribute</b>	<b>Result</b>
address	The absolute cell address ( $\$A\$1$ ).
col	The column letter, as a value from 1 through 256 (1 for column A, etc.)
contents	The contents of the cell.
filename	The name of the current file including the path.

format

The cell format:

- C0 through C15 if Currency, 0 to 15 decimal places.
- F0 through F15 if Fixed, 0 to 15 decimal places.
- G if General.
- P0 through P15 if Percent, 0 to 15 decimal places.
- S0 through S15 if Sci (Scientific), 0 to 15 decimal places.
- ,0 to ,15 if , (Comma), 0 to 15 decimal places.
- + if ± format.
- D1 if DD-MMM-YY.
- D2 if DD-MMM.
- D3 if MMM-YY.
- D4 if MM/DD/YY, DD/MM/YY, DD.MM.YY, or YY-MM-DD.
- D5 if MM/DD, DD/MM, DD.MM, or MM-DD.
- D6 if HH:MM:SS AM/PM.
- D7 if HH:MM AM/PM.
- D8 if HH:MM:SS (24 hour), HH.MM.SS (24 hour), HH,MM,SS (24 hour), or HHhMMmSSs.
- D9 if HH:MM (24 hour), HH.MM (24 hour), HH,MM (24 hour), or HHhMMm.
- T if Text format.
- H if Hidden format.

prefix

The label prefix:

- ' if the cell contains a left-aligned label.
- " if the cell contains a right-aligned label.
- ^ if the cell contains a centered label.
- \ if the cell contains a repeating label.
- | if the cell contains a nonprinting label.
- Blank (no symbol) if the cell is empty or contains a value.

protect

The protection status:

- 1 if the cell is protected (default).
- 0 if the cell is unprotected (by /Range Unprotect).

row

The row number, from 1 through 8192.

type	The type data in the cell: b if the cell is blank. v if the cell contains a numeric value or formula. l if the cell contains a label.
width	The column width:

*range* is the address or name of the range. Recalculate with **CTRL+ALT+R** before you use @CELL to be sure the results are correct.

### @CELLPOINTER(*attribute*)

Returns information about the current cell. The information depends on the *attribute* you specify. *attribute* can be any of the 10 attribute arguments for @CELL, enclosed in double quotation marks (or a cell that contains one of the items).

### @CHAR(*x*)

Returns the Lotus International Character Set (LICS) code character that corresponds to the number *x*. For information on LICS, see Appendix C. *x* is an integer. Values that do not correspond to character codes return ERR. If *x* is not an integer, @CHAR truncates it to an integer.

### @CHOOSE(*x,list*)

Returns the *x*th value or label from list. *x* represents an offset number (see “@Function Conventions” at the beginning of this chapter). *list* is a group of values and labels separated by argument separators.

### @CLEAN(*string*)

Removes the following control characters from string:

Control characters with ASCII codes below 32.

The begin attribute character (LICS code 151), as well as the attribute character itself.

The end attribute character (LICS code 152).

The merge character (LICS code 155) and the character following.

*string* is text enclosed in double quotation marks. If string refers to a blank cell or a value, @CLEAN returns ERR.

### @CODE(*string*)

Returns the Lotus International Character Set (LICS) code that corresponds to the first character in *string*. For information on LICS, see appendix C. *string!* is text (enclosed in double quotation marks). If *string* refers to a blank cell or a value, @CODE returns ERR.

### @COLS(*range*)

Counts the number of columns in *range*. *range* is a range address or name.

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### @COS(*z*)

Calculates the cosine of an angle expressed in radians. The result is a value from  $-1$  through  $1$ . *z* is a value in radians between  $-01.35^{10}$  through  $1.35^{10}$ . You must enter the angle *z* in radians. To convert from degrees to radians, multiply degrees by @PI/180.

### @COUNT(*list*)

Counts the number of cells in a *list* of cells or ranges. *list* is a series of cell ranges or addresses, separated by argument separators.

### @CTERM(*interest, future-value, present-value*)

Calculates the number of compounding periods it takes for an investment (*present-value*) to grow to a *future-value*, earning a fixed *interest* rate per compounding period. *interest* is a value for the periodic interest rate expressed as a decimal or percentage (.1 or 10%). (Remember to divide the *interest* by the number of compounding periods.) *future-value* and *present-value* are values—both must be either positive or negative.

### @DATE(*year, month, day*)

Calculates the date number for the specified *year, month, and day*. Use @DATE to create date entries to use in calculations. *year* is an integer from 0 (the year 1900) to 199 (the year 2099). *month* is an integer from 1 to 12. *day* is an integer from 1 to 31 (the *day* value must be valid for that month). If *year, month, or day* is not a value, @DATE returns ERR.

### @DATEVALUE(*string*)

Calculates the date number for the date specified in *string*. *string* is a label or text that is in one of the five 1-2-3 date formats.



**@DAVG**(*input,field,criteria*)

Finds the average value in a *field* of a database for all values that meet the criteria in the *criteria* range. *input* is the address or name of the database range. *field* is the field's offset number (see “@Function Conventions” at the beginning of this chapter.) *criteria* is a range of at least two rows (see “@Function Conventions” at the beginning of this chapter.)

**@DAY**(*date-number*)

Calculates the day of the month (1 through 31) using the value of *date-number*. *date-number* is a value from 1 (January 1, 1900) through 73050 (December 31, 2099).

**@DCOUNT**(*input,field,criteria*)

Counts the records (nonblank) in a *field* of a database table that meet the criteria in the *criteria* range. *input* is the address or range name that contains a database. *field* is the field's offset number and *criteria* is a range of at least two rows (see “@Function Conventions” at the beginning of this chapter).

**@DDB**(*cost,salvage,life,period*)

Calculates the depreciation allowance of an asset with an initial value of *cost*, an expected useful *life*, and a final *salvage* value for a specified *period* of time, using the double-declining balance method. *cost* is the amount paid for the asset, and must be  $\geq$  *salvage*. *salvage* is the estimated value of the asset at the end of its useful life, and can be any value. *life* is the number of periods the asset takes to depreciate to its salvage value, and must be  $\geq$  *period*. *period* is the time period for which you want to find the depreciation allowance, and must be a value  $\geq$  1.

**@DMAX**(*input,field,criteria*)

Finds the greatest value in a *field* of a database that meets the criteria in the *criteria* range. *input* is the address or name of a range that contains a database. *field* is the field's offset number and *criteria* is a range of at least two rows (see “@Function Conventions” at the beginning of this chapter).

**DMIN**(*input,field,criteria*)

Finds the least value in a *field* of a database that meets the criteria in the *criteria* range. *input* is the address or name of a range that

contains a database. *field* is the field's offset number and *criteria* is a range of at least two rows (see “@Function Conventions” at the beginning of this chapter).

#### **@DSTD(*input,field,criteria*)**

Calculates the standard deviation of the values in a *field* of a database that meet the criteria in the *criteria* range. *input* is the address or name of a range that contains a database. *field* is the field's offset number and *criteria* is a range of at least two rows (see “@Function Conventions” at the beginning of this chapter).

#### **@DSUM(*input,field,criteria*)**

Calculates the sum of the values in a *field* of a database that meet the criteria in the *criteria* range. *input* is the address or name of a range that contains a database. *field* is the field's offset number and *criteria* is a range of at least two rows (see “@Function Conventions” at the beginning of this chapter).

#### **@DVAR(*input,field,criteria*)**

Calculates the population variance of the values in a *field* of a database that meet the criteria in the *criteria* range. *input* is the address or name of a range that contains a database. *field* is the field's offset number and *criteria* is a range of at least two rows (see “@Function Conventions” at the beginning of this chapter).

#### **@ERR**

Produces the value ERR and is useful in flagging errors in calculations. @ERR is seldom used by itself and produces ERR when certain conditions are met. ERR is a special value that either 1-2-3 generates to indicate an error in a formula, or you generate with @ERR. When you correct the formula that contains ERR, the results of dependent formulas also become correct. The label ERR and the value ERR are not equivalent in formulas. For example, the formula  $+A2+34 = \text{ERR}$  if cell A2 contains @ERR, but equals 34 if cell A2 contains the label ERR.

#### **@EXACT(*string1,string2*)**

Compares two sets of characters. If the two sets match exactly, @EXACT returns 1 (true); if the two sets are not exactly the same, @EXACT returns 0 (false). *string1* and *string2* are text or text formulas.

**@EXP(*x*)**

Calculates the value of the constant  $e$  (approximately 2.718282) raised to the power  $x$ .  $x$  is a value  $\leq 709$ . If  $x$  is greater than 709, the calculation is too large for 1-2-3 to store, and @EXP returns ERR.

**@FALSE**

Returns the logical value 0 (false). Use @FALSE with @functions such as @IF and @CHOOSE that require a logical value of 0 (false). @FALSE is useful as the  $y$  argument for @IF, which is the value returned if the condition is not met.

**@FIND(*search-string*,*string*,*start-number*)**

Calculates the position in *string* at which 1-2-3 finds the first occurrence of *search-string*. @FIND begins searching string at the position indicated by *start-number*, which represents the offset number of a character in string. *search-string* and *string* are text or text formulas. *start-number* is a value and must be a positive value or 0. @FIND is case-sensitive and accent-sensitive.

**@FV(*payments*,*interest*,*term*)**

Calculates the future value of an investment, based on a series of equal *payments*, earning a periodic *interest* rate, over the number of payment periods in *term*. *payment* is a value; *interest* is a value and must be a decimal or percentage value; *term* is a value. @FV assumes the investment you are calculating is an ordinary annuity in which equal payments are made at the end of each period in the term.

**@HLOOKUP(*x*,*range*,*row-offset*)**

Returns the contents of a cell in a specified row of a horizontal lookup table.  $x$  is a value or text. If  $x$  is a value that is less than the first value in range, @HLOOKUP returns ERR; if  $x$  is greater than the last value in range, @HLOOKUP stops at the last cell in the row and returns the row number of the greatest value. If  $x$  is text, it must be an exact match of the text in range. *range* identifies the range that contains the table, including the first row. When 1-2-3 locates a cell in the index row (the first row in range) that contains the value  $x$  (or the value closest to, but not greater than,  $x$ ), it moves down that column the number of rows specified by *row-offset* and returns the contents of the cell as the answer.

*row-offset* is a value from 0 through 8,191 which represents an offset number (see “@Function Conventions” earlier in this chapter). Use @HLOOKUP to choose items from a table or to automate data selection for formulas or in macros. @HLOOKUP is case-sensitive and accent-sensitive.

### @HOUR(*time-number*)

Returns the hour portion, a value from 0 (midnight) through 23 (23:00 or 11:00 P.M.), of *time-number*. *time-number* is a value from .000000 (midnight) through .999988 (11:59:59 P.M.) that is usually supplied by another @function.

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### @IF(*condition*,*x*,*y*)

Evaluates *condition* and returns either *x* if *condition* is true or *y* if condition is false. *condition* is a logical formula. *x* and *y* are values or labels.

### @INDEX(*range*,*column-offset*,*row-offset*)

Returns the contents of the cell located at the intersection of a specified *column-offset* and *row-offset* of a range. *range* is a cell address or range name. *column-offset* is the offset number (see “@Function Conventions” earlier in this chapter) of the column that @INDEX uses. *row-offset* is the offset number of the row that @INDEX uses. *column-offset* and *row-offset* are values from 0 through 8,191.

### @INT(*x*)

Returns the integer portion of *x*. *x* is a value, the address or name of a cell that contains a value, or a formula that returns a value.

### @IRR(*guess*,*range*)

Calculates the **internal rate of return** expected from cash flows generated by an investment. The internal rate of return (IRR) is the percentage rate that equates the present value of an expected future series of cash flows to the initial investment. *guess* should be a decimal or percentage value between 0 (0%) and 1 (100%) representing your estimate of the IRR. *range* is the address or name of a range that contains the cash flows. 1-2-3 considers negative numbers as cash outflows and positive numbers as cash inflows. Normally, the first cash-flow amount in the range is a negative number (a cash outflow) that represents the investment. 1-2-3

ignores empty cells in the range, and treats cells that contain labels as 0. If @IRR cannot approximate the result to within 0.0000001 after 30 calculation iterations, the result is ERR. If your guesses continue to return ERR, use @NPV to determine a better IRR guess.

### **@ISAAC(*name*)**

Tests *name* for an attached add-in @function: if *name* is an attached add-in @function, @ISAAC returns 1 (true); if *name* is not a defined add-in @function, @ISAAC returns 0 (false). *name* is a literal string, a text formula, or a reference to a cell that contains a label naming the add-in @function you want to test. (Don't include the @ in *name*.)

### **@ISAPP(*name*)**

Tests *name* for an attached add-in: if *name* is an attached add-in, @ISAPP returns 1 (true); if *name* is not an attached add-in, @ISAPP returns 0 (false). *name* is a literal string, a text formula, or a reference to a cell that contains a label naming the add-in you want to test. (Don't include the .ADN extension in *name*.)

### **@ISERR(*x*)**

Tests *x* for the value ERR. If *x* is the value ERR, @ISERR returns 1 (true); if not, @ISERR returns 0 (false). *x* can be any value, single-cell location, text, or condition.

### **@ISNA(*x*)**

Tests *x* for the value NA. If *x* is the value NA, @ISNA returns 1 (true); if not, @ISNA returns 0 (false). *x* can be any value, single-cell location, text, or condition.

### **@ISNUMBER(*x*)**

Tests *x* to see if it contains a value. If *x* is a value, NA, ERR, or blank, @ISNUMBER returns 1 (true); if *x* is a string or a range, @ISNUMBER returns 0 (false). *x* can be any value, single-cell location, text, or condition.

### **@ISSTRING(*x*)**

Tests *x* to see if it is text or a label. If *x* is text or a cell that contains a label, @ISSTRING returns 1 (true); if *x* is a value, NA,

ERR, or blank, @ISSTRING returns 0 (false). *x* can be any value, single-cell location, text, or condition.

**@LEFT(*string*,*n*)**

Returns the first *n* characters in *string*. *string* is text or a label. *n* is a positive integer or 0. If *n* is 0, the result is an empty string. If *n* is greater than the length of *string*, @LEFT returns the entire *string*.

**@LENGTH(*string*)**

Counts the number of characters in *string*. *string* is a label or text formula.

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**@LN(*x*)**

Calculates the natural logarithm (base *e*) of *x*. *x* is a value greater than 0.

**@LOG(*x*)**

Calculates the common logarithm (base 10) of *x*. *x* is a value greater than 0.

**@LOWER(*string*)**

Converts all uppercase letters in *string* to lowercase. *string* is a label or text.

**@MAX(*list*)**

Finds the greatest value in *list*. *list* is a series of values separated by argument separators.

**@MID(*string*,*start-number*,*n*)**

Returns *n* characters from *string*, beginning with the character at *start-number*. *string* is a label or text. *start-number* is any positive value or 0. *start-number* is the offset number of a character in *string*. If *start-number* is greater than the length of *string*, the result of @MID is an empty string. *n* is a positive integer or 0. If *n* is 0, the result of @MID is an empty string. If *n* is greater than the length of *string*, 1-2-3 returns all the characters from *start-number* to the end of *string*.

**@MIN**(*list*)

Finds the least value in *list*. *list* is a series of values separated by argument separators.

**@MINUTE**(*time-number*)

Extracts the minutes, a value from 0 through 59, from *time-number*. *time-number* is a value from .000000 (midnight) through .999988 (11:59:59 P.M.). Usually, another time @function supplies *time-number*.

**@MOD**(*x,y*)

Calculates the remainder (modulus) of  $x/y$ . *x* and *y* are values.

**@MONTH**(*date-number*)

Extracts the month (1 to 12) from *date-number*. *date-number* is a value from 1 (January 1, 1900) through 73050 (December 31, 2099).

**@N**(*range*)

Returns the entry in the first cell of *range* as a value. If the cell contains a label, @N returns the value 0. *range* is a cell or range address, or a range name.

**@NA**

Returns the value NA (not available). NA is a special value that either 1-2-3 or you generate to indicate that a value needed to complete a formula is not available.

**@NOW**

Calculates the number that corresponds to the current date and time. This includes both a date number (integer portion) and a time number (decimal portion). Format the value of @NOW in any of the date or time formats. If you format @NOW as a date, 1-2-3 displays only the date (integer) portion of the date and time number. If you format @NOW as time, 1-2-3 displays only the time (decimal) portion of the date and time number. In both cases, 1-2-3 stores the entire date and time number.

**@NPV**(*interest,range*)

Calculates the net present value of a series of future cash-flow values (*range*), discounted at a fixed periodic interest rate. *interest*

is a decimal or percentage value. *range* is the single-row or single-column range that contains the cash flows.

#### **@PI**

Produces the value  $\pi$ , which 1-2-3 approximates as 3.1415926536.  $\pi$  is the ratio of the circumference of a circle to its diameter.

#### **@PMT(*principal,interest,term*)**

Calculates the payment on a loan (*principal*) at a given *interest* rate for a specified number of payment periods (*term*). *principal* is the value of the loan; *interest* is the periodic interest rate; *term* is the number of payment periods. *principal* and *term* are values. *interest* is a decimal or percentage value. (The period used to calculate interest must be the same period used for term; for example, if you are calculating a monthly payment, enter the interest and term in monthly increments. Usually, this means you must divide the interest by 12 and multiply the number of years in term by 12.)

#### **@PROPER(*string*)**

Capitalizes the first letter of each word in *string* and converts the remaining letters to lowercase. *string* is a label or text.

#### **@PV(*payments,interest,term*)**

Determines the present value of an investment based on a series of equal *payments*, discounted at a periodic *interest* rate over the number of periods in *term*. *payments* is the value of the equal investments; *interest* is the periodic interest rate; *term* is the number of payment periods. *payments* and *term* are values. *interest* is a decimal or percentage value.

#### **@RAND**

Generates a random value between 0 and 1. 1-2-3 calculates @RAND to 17 decimal places. Each time 1-2-3 recalculates the worksheet, @RAND generates a new random value.

#### **@RATE(*future-value,present-value,term*)**

Returns the periodic interest rate necessary for an investment (*present-value*) to grow to a *future-value* over the number of compounding periods in term. *future-value*, *present-value*, and *term* are values.



**@REPEAT**(*string*,*n*)

Duplicates *string* the number of times specified by *n*. *string* is a label or text. *n* is a positive integer.

**@REPLACE**(*original-string*,*start-number*,*n*,*new-string*)

Replaces *n* characters in *original-string* with *new-string*, beginning at *start-number*. *original-string* and *new-string* are labels or text. *start-number* is the offset number (see “@Function Conventions” earlier in this chapter) of a character in *original-string*. If *start-number* is greater than the length of *original-string*, @REPLACE appends *new-string* to *original-string*. *n* is a positive integer or 0. If *n* is 0, @REPLACE appends *new-string* to *original-string*.

**@RIGHT**(*string*,*n*)

Returns the last *n* characters in *string*. *string* is a label or text. *n* is a positive integer or 0. If *n* is 0, the result is an empty string; if *n* is greater than the length of *string*, @RIGHT returns the entire string.

**@ROUND**(*x*,*n*)

Rounds the value *x* to the nearest multiple of the power of 10 specified by *n*. *x* is a value. *n* is a value from -15 through 15.

**@ROWS**(*range*)

Counts the number of rows in *range*. *range* is a cell address or range name.

**@S**(*range*)

Produces the entry in the upper left cell in *range* as a label. If the cell contains a label, @S returns that label; if the cell contains a value or is blank, @S returns an empty string. *range* is a cell address or range name.

**@SECOND**(*time-number*)

Extracts the seconds, an integer from 0 through 59, from *time-number*. *time-number* is a value from .000000 (midnight) through .999988 (11:59:59 P.M.). @SECOND uses only the decimal portion of *time-number*.

**@SIN(*z*)**

Calculates the sine of an angle. *z* is a value of an angle measured in radians. To convert from degrees to radians, multiply degrees by @PI/180.

**@SLN(*cost,salvage,life*)**

Calculates the straight-line depreciation allowance of an asset with an initial value of *cost*, an expected useful *life*, and a final value of *salvage*, for one period. *cost* is the amount paid for the asset, *salvage* is the value of the asset at the end of its life, and *life* is the number of periods the asset takes to depreciate to its *salvage* value. All three are values.

**@SQRT(*x*)**

Returns the positive square root of *x*. *x* is a positive value.

**@STD(*list*)**

Calculates the standard deviation in a list of values. *list* is a series of values separated by argument separators.

**@STRING(*x,n*)**

Converts the value *x* to a label with *n* decimal places. *x* is a value; *n* is an integer from 0 through 15.

**@SUM(*list*)**

Adds the values in *list*. *list* is a series of values separated by argument separators.

**@SYD(*cost,salvage,life,period*)**

Calculates the sum-of-the-years'-digits depreciation allowance of an asset with an initial value of *cost*, an expected useful *life*, and a final *salvage* value, for a specified *period*. *cost* is the amount paid for the asset. *salvage* is the value of the asset at the end of its *life*. *life* is the number of periods (typically years) the asset takes to depreciate to its *salvage* value. *period* is the time for which you want to find the depreciation allowance. They are all values.

**@TAN(*z*)**

Calculates the tangent of angle *z*. *z* is a value of an angle measured in radians. To convert from degrees to radians, multiply degrees by @PI/180.

**@TERM**(*payments, interest, future-value*)

Calculates the number of compounding periods (payments) required for an investment to accumulate to a future-value at a periodic interest rate. *payments* is a value that represents the value of the equal investments. *interest* is the periodic interest rate and is a decimal or percentage value. *future-value* is a value representing the amount you want to accumulate.

**@TIME**(*hour, minutes, seconds*)

Calculates the time number for the specified hour, minutes, and seconds. *hour* is a value from 0 (midnight) through 23 (11:00 P.M.). *minutes* is a value from 0 through 59. *seconds* is a value from 0 through 59. If hour, minutes, or seconds is not a value, @TIME returns ERR.

**@TIMEVALUE**(*string*)

Calculates the time number specified in string. *string* is text in one of the four 1-2-3 time formats: HH:MM:SS AM/PM, HH:MM AM/PM, HH:MM:SS (24 hour), or HH:MM (24 hour).

**@TRIM**(*string*)

Removes leading, trailing, and consecutive space characters from string. *string* is a label or text.

**@TRUE**

Returns the logical value 1.

**@UPPER**(*string*)

Converts all the letters in string to uppercase. *string* is a label or text.

**@VALUE**(*string*)

Converts a number entered as a string to its corresponding value. *string* is text or a label that contains only numbers.

**@VAR**(*list*)

Calculates the population variance in a list of values. *list* is a series of values separated by argument separators.

**@VLOOKUP**(*x, range, column-offset*)

Produces the contents of a cell in a specified column of a vertical

lookup table.  $x$  is a value or text. If  $x$  is a value that is less than the first value in range, @VLOOKUP returns ERR; if it's greater than the last value in range, @VLOOKUP stops at the last cell in column-offset. If  $x$  is text, it must be an exact match of the text in range. *range* is a cell address or range name. The values in the first column of the table (range) must be in ascending order. 1-2-3 compares the value  $x$  to each cell in the first column. When 1-2-3 locates a cell in the first column that contains  $x$  (or the value closest to, but not greater than  $x$ ), it moves across that row the number of columns specified by column-offset and returns the contents of that cell as the answer. *column-offset* is a value from 0 through 255. The column-offset number corresponds to the position the column occupies in range. The first column has an offset number of 0, the second column has an offset number of 1, and so on. If column-offset is positive, 1-2-3 moves across the row the specified number of columns; if column-offset is 0, 1-2-3 stays in the first column.

**@YEAR(*date-number*)**

Extracts the year, an integer from 0 (1900) through 199 (2099), from a date number. *date-number* is a value from 1 (January 1, 1900) through 73050 (December 31, 2099).

## Reviewing 1-2-3 Macros

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### 1-2-3 Macro Format and Rules

A macro is a set of instructions that automate tasks in 1-2-3. 1-2-3 macros save time otherwise spent performing simple but repetitive tasks, and they streamline complex procedures. You enter the macro in a worksheet (as one or more labels in a column) and assign it a range name. Then, whenever you run the macro, 1-2-3 reads and executes the instructions automatically.

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### Keystroke Macros

The simplest macros use only **keystrokes** and using **ALT-F5** (LEARN) is the easiest way to create them. You can also type the macro in a single column in the worksheet. Keystrokes consist of keyboard characters (letters, numbers, symbols) and commands. To enter keystrokes in a macro, type (as labels) the keystrokes you want 1-2-3 to perform. Type the keystrokes in a single cell or in adjacent cells in a single column. A label-prefix character ( ' ^ or " ) is required if the macro instruction begins with slash (/), backslash (\), a number, or one of the numeric symbols < + <> <= - @ . ( # or \$ . Specify consecutive keystroke instructions by following the key name with a number. For example, {UP 5} moves the cell pointer up five rows. Separate the number from the key name with a space.

If you use keystrokes for every action, 1-2-3 can record the keystrokes if you specify a learn range (/Worksheet Learn Range) and press **ALT-F5** (LEARN). You can view the column that contains the learn range, copy the keystrokes you need, and use them in the worksheet as a macro (see "Creating a Macro with the Learn Feature" later in this chapter).

## Macro Commands

Other macros automate tasks with **macro commands**—macro commands are an easy-to-use programming language within 1-2-3. You can combine macro commands and keystrokes in a macro.

Macros may also contain key names that represent keyboard keys (such as TAB, DOWN, and **F5** (GOTO)), and commands similar to those found in programming languages. When you enter these macro commands and key names, use the correct syntax or 1-2-3 cannot perform the macro instruction.

The format for macro commands and key names is

{KEYWORD}

or

{KEYWORD *argument1,argument2,...,argumentn*}

**KEYWORD** is the name of a macro command or a key name and is always preceded by { (open brace). Key names and commands that have no arguments must be followed by } (close brace). The keyword tells 1-2-3 what action to perform. You can type keywords in uppercase or lowercase letters, but this documentation refers to macro keywords in uppercase letters.

*argument1,argument2,...,argumentn* are arguments for the macro command, where *argumentn* is the last of several arguments in a list. Arguments provide information 1-2-3 needs to complete the command and perform its task. You can type arguments in uppercase or lowercase letters; we show the arguments in italics. If commands have optional arguments (arguments you can omit), we show them in [ ] (brackets). The last argument must be followed by } (close brace).

## Macro Command Rules

To include a macro command in a macro, follow these guidelines:

- Start and end the macro command in the same cell. (The macro itself can span many cells in the same column.)
- Start the command with { (open brace) and end it with } (close brace).
- Type the keyword immediately after the open brace. You can type it in uppercase or lowercase letters.

- Separate the keyword from the first argument (if any) with one space, but do not type spaces between arguments.
- If the command includes two or more arguments, separate the arguments from one another with argument separators. By default, semicolons and commas are valid argument separators for macro commands.
- Enter any combination of macro commands and keystroke instructions in the same cell, as long as the total number of characters does not exceed 240.
- With the exception of specifying a range address, do not use a comma, semicolon, or period as part of an argument, unless you enclose the argument in double quotation marks. Also, do not use a colon or brace as part of an argument, unless you enclose the argument in double quotation marks (" ").

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## 1-2-3 Macro Argument Types

1-2-3 macro commands accept four types of arguments: condition, location, string, and value.

Type	Description
Condition	An expression that evaluates to true or false, or the cell address or range name of a cell that contains such an expression. The macro evaluates the condition argument and proceeds according to whether it is true or false. You can also use a formula or @function, a number, or a range name or cell address as a condition argument.
Location	The address or name of a cell or range, or a formula or @function that returns a range address or name. A location argument can refer to a single-cell or multiple-cell range.
String	Text (any sequence of letters, numbers, and symbols) enclosed in double quotation marks, the range address or name of a cell that contains a label, or a formula or @function that returns a label.

**Value** A number, the address or name of a cell that contains a number, or a formula or @function that returns a number.

The following rules apply to argument types:

- Use range names to ensure that location arguments are correct even if you insert or delete rows or columns.
- To make sure that 1-2-3 uses an argument as a string, not a value, add :s or :string to the end of the argument. To make sure that 1-2-3 uses an argument as a value, add :v or :value to the end of the argument.
- Macro commands that require a single cell use the upper left corner cell of a multiple-cell range.

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## 1-2-3 Macro Location

- You can save macros in a worksheet with other data.
- If the macro calls subroutines or branches, put the subroutines or branches near the calling macro in the worksheet so that you can see both at once, if possible.
- If you enter macros in the same worksheet that contains data, enter the macros below and to the right of the data to keep you from writing over data.
- Enter all instructions for a single macro as labels in successive cells in the same column (unless the macro uses branches or subroutines).

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## Creating a 1-2-3 Macro

1. Try the procedure the macro automates to determine what keystrokes are necessary (you may want to use the learn feature).
2. Move to a worksheet location away from data.
3. Enter the macro name in an empty cell.



4. Enter the first macro instruction as a label in the cell to the right of the name. (If the macro is short, enter the entire macro in this cell.) Use keystrokes, or macro commands, or both.

**Keystrokes:** Type a label-prefix character if the first keystroke is a menu command, number, numeric character, \ &/ < + <> <= \$ # @ - . ( \$ ; then type the keystrokes.

**Macro commands:** Enter the macro keyword using the syntax described in “Macro Format and Rules” at the beginning of this chapter. You can also press **F1** (HELP) for an explanation of the macro command’s syntax. For example, type `LET` **F1**.

5. Enter subsequent instructions in the cells immediately below.
6. Enter subroutines and branch macros as necessary in adjacent columns or below the end of the macro. Provide a blank row between the end of the macro and the first cell of the subroutine. Enter the name of each subroutine or branch macro in the cell to the left of its top cell.
7. Enter the keyword `{QUIT}` or leave a blank cell after the last line of the macro to end the macro. (If you are creating a macro subroutine, enter the keyword `{RETURN}` after the last line of the subroutine.)
8. Name the macro and the subroutines and branch macros.
9. Document the macro’s name and the macro instructions to identify the macro (useful in a worksheet that contains many) and describe the macro’s steps.
  - Document the macro’s range name by entering the name as a label to the left of the first cell of macro instructions. If the name starts with a backslash, such as `\N`, type a label prefix ( ' " or ^ ) before you type the range name.
  - Document the macro instructions by entering comments to the right of the cell or cells that contain the macro.

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## Naming a 1-2-3 Macro

Macro range names can consist of any combination of up to 15 characters. Like any other range name, however, they should not duplicate cell addresses; they should not include spaces, commas, semicolons, periods, or mathematical symbols; and they should not duplicate @function names, macro command keywords, or 1-2-3 key names.

1. Select /Range Name Create.
2. Specify the macro's name (up to 15 characters) as the range name. 1-2-3 accepts two kinds of macro names:
  - Backslash names consist of a backslash followed by a single letter, such as \D. You start this macro by pressing **ALT** and the letter that follows the backslash.
  - Multiple-character names are ordinary range names. Specify a name that reminds you of what the macro does.
3. Specify the first cell of the macro as the range to name.

If you will later move the macro around the worksheet, specify the entire macro as the range, not just the first cell. You can then use the range name when moving the macro.

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## Running a 1-2-3 Macro

You run a macro in one of two ways: with **ALT** or with **ALT-F3** (RUN). The method you use depends on the macro's name. You can run any backslash macro with **ALT** when 1-2-3 is in READY mode, EDIT mode, or during a command (MENU or POINT mode). However, **ALT-F3** (RUN) only works in READY mode.

### Caution



Use /File Save to save your work before you run the macro. If the macro produces unexpected results, you can then use /File Retrieve to retrieve the original version of the worksheet. If Undo is on and no add-in program is attached, you can press **ALT-F4** (UNDO) immediately after the macro is finished to restore your original worksheet.

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### To Run a Backslash Macro:

Hold down **(ALT)** and then press the letter of the macro range name. For example, to run a macro named \N, press **(ALT)-(N)**. 1-2-3 runs the macro.

### To Run a Range Name Macro:

1. Make sure that 1-2-3 is in READY mode.

2. Press **(ALT)-(F3)** (RUN).

1-2-3 displays a menu of all range names in the worksheet (including macro range names and backslash macros). If you have many range names, press **(F3)** (NAME) to see a full-screen menu. Highlight the macro range name in the full-screen menu to see the range address.

3. To specify the macro to run, do one of the following:

- Type the macro range name or address and press **(ENTER)**.
- Highlight the macro range name in the list of range names and press **(ENTER)**.
- Press **(ESC)** to switch 1-2-3 to POINT mode, move the cell pointer to the first cell of the macro, and press **(ENTER)**.

### Canceling a Macro

Press **(CTRL)-BREAK** to cancel a macro while it is running. Unless the macro contains a {BREAKOFF} or an {ONERROR} command, 1-2-3 stops the macro after it completes the current macro instruction. After interrupting a macro, press **(ESC)** or **(ENTER)** to clear the error message and return 1-2-3 to READY mode.

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## Debugging a 1-2-3 Macro

If 1-2-3 displays an error message when you run a macro, press **F1** (HELP) while the error message is on the screen to get an explanation of the message. When you are finished using the Help system, press **ESC** or **ENTER** to clear the error message. Then move to the macro and look for the problem.

## Troubleshooting Checklist

Here are some common mistakes made when entering macro instructions:

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- Typing or spelling errors, including incorrect spelling of keywords and range names.
- Spaces where they shouldn't be, especially between arguments; or missing spaces between keywords and arguments.
- Incorrect or incomplete menu command sequences, for example a missing tilde in `/rfp0~` instead of `/rfp0~~`
- Missing braces, or brackets or parentheses instead of braces.
- A blank cell or a cell that contains a number before the end of the macro.
- Missing or incorrect arguments or argument separators.
- Incorrect cell or range references, such as undefined or unacceptable range names.
- Range names that duplicate keyword names or function-key names.

If you find no problems in the referenced cell, check to see if a macro instruction in a cell above it could have caused the problem.

When you find the error, move the cell pointer to the appropriate cell, press **F2** (EDIT), correct the error, and press **ENTER**.

## Debugging a Macro in STEP Mode

To help you diagnose problems in a lengthy or complicated macro, 1-2-3 has a feature called STEP mode. STEP mode lets you run a macro one instruction at a time, until you locate the error.

1. Press **ALT-F2** (STEP) to turn on STEP mode. (The STEP indicator appears in the status line at the bottom of the screen.)

2. Start the macro (see “Running a Macro,” earlier in this chapter). 1-2-3 displays the cell address of the current macro instruction and the contents of the cell in the status line.
3. Press **[spacebar]** (or any key) to run the first macro instruction. Repeat step 3 to run successive instructions until you find the part of the macro that contains the error. (If the instruction is not enclosed in { } (braces), such as an @function or label, when you press a key, 1-2-3 steps through one *character* at a time.)
4. Once you find the error, press **[CTRL]-BREAK** to end (then edit) the macro. (You do not need to turn off STEP mode to edit the macro.)
5. Edit the macro to correct the problem.
6. Run the macro in STEP mode again if you are looking for additional errors.
7. Press **[ALT]-F2** (STEP) to turn off STEP mode.
8. Press any key to continue the macro.

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### Note



You can turn STEP mode on or off during a macro. To do so, press **[ALT]-F2** (STEP) when 1-2-3 is waiting for input during an interactive command.

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## Creating a 1-2-3 Macro with the Learn Feature

Use the learn feature to record a macro and test it at the same time. Because you are performing the procedure that the macro will automate, you can see on the screen exactly what will happen when the macro runs.

1-2-3 records keystrokes in macro instruction format. For example, when you press **[F5]** (GOTO), type a5, and press **[ENTER]**, 1-2-3 records {GOTO}a5~. 1-2-3 abbreviates keystrokes (for example, {D} instead of {DOWN}), and uses a number for duplicate keystrokes (for example {D 2}, instead of {D}{D}).

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**Note**

1-2-3 does not record the following keys in the learn range: **ALT-F1** (COMPOSE), **ALT-F2** (STEP), **ALT-F3** (RUN), **ALT-F4** (UNDO), **ALT-F5** (LEARN), **CTRL-F1** (BOOKMARK), **CTRL-BREAK**, SHIFT, CAPS LOCK, PRINT SCREEN, or SCROLL LOCK. Learn records **HELP (F1)**, but it will not record any keystrokes you enter while using Help.

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The learn range does not use any memory until you start recording keystrokes.

**12****To Record Keystrokes:**

1. Specify a learn range
  - a. Select /Worksheet Learn Range.
  - b. Specify a single column range in an empty part of the worksheet where the macro cannot interfere with data.

Specify a column with a large number of blank cells for the learn range so 1-2-3 doesn't run out of space when recording your keystrokes. If you do run out of space, just increase the learn range with /Worksheet Learn Range.

2. Move the cell pointer to the cell where you want to start the task.
3. Press **ALT-F5** (LEARN) to turn on the learn feature.

The LEARN indicator appears at the bottom of the screen. As long as the LEARN indicator remains on the screen, 1-2-3 records each of your keystrokes in the learn range.

4. Perform the task or series of tasks you want to record.

If you want to include another macro in the one you're recording, enter its range name in { } (braces).

5. When you finish the task, press **ALT-F5** (LEARN) again to stop recording keystrokes.

## To Edit Keystrokes:

When you finish recording keystrokes, move the cell pointer to the learn range and examine the recorded keystrokes. If there are errors, edit them before going any further. Be sure not to leave any empty cells or values in the middle of the macro or 1-2-3 will interpret them as the end of the macro.

If you made many mistakes and want to start over, erase the learn range with /Worksheet Learn Erase and record the keystrokes again.

## To Name and Run a Macro Created with Learn:

1. Name the macro by assigning it a range name.
2. Depending on how you named the macro, run it by pressing either **ALT** or **ALT-F3** (RUN).
3. If the macro isn't working as you expected it to, debug and edit it.
4. Save the worksheet to save the macro.

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## 1-2-3 Macro Keyword Key Names

The table below lists the macro keywords that correspond to the standard keyboard keys and the 1-2-3 function keys.

Key	Macro key name
<b>▼</b>	{DOWN} or {D}
<b>▲</b>	{UP} or {U}
<b>◀</b>	{LEFT} or {L}
<b>▶</b>	{RIGHT} or {R}
} (close brace)	{ }
{ (open brace)	{ { }
&/ (slash) or < (less-than symbol)	&/, <, or {MENU}
~ (tilde)	{~}
<b>ALT-F7</b> (APP1)	{APP1}
<b>ALT-F8</b> (APP2)	{APP2}

<b>ALT</b> - <b>F9</b> (APP3)	{APP3}
<b>ALT</b> - <b>F10</b> (APP4)	{APP4}
<b>←</b> (backspace)	{BACKSPACE} or {BS}
<b>CTRL</b> - <b>←</b> (BIG LEFT) or <b>↑</b> <b>TAB</b> (BACKTAB)	{BIGLEFT}
<b>CTRL</b> - <b>→</b> (BIG RIGHT) or <b>TAB</b>	{BIGRIGHT}
<b>DEL</b>	{DELETE} or {DEL}
END	{END}
<b>ENTER</b>	~ (tilde)
<b>ESC</b>	{ESCAPE} or {ESC}
<b>F1</b> (HELP)	{HELP}
<b>F2</b> (EDIT)	{EDIT}
<b>F3</b> (NAME)	{NAME}
<b>F4</b> (ABS)	{ABS}
<b>F5</b> (GOTO)	{GOTO}
<b>F6</b> (WINDOW)	{WINDOW}
<b>F7</b> (QUERY)	{QUERY}
<b>F8</b> (TABLE)	{TABLE}
<b>F9</b> (CALC)	{CALC}
<b>F10</b> (GRAPH)	{GRAPH}
HOME	{HOME}
INS	{INSERT} or {INS}
PGUP	{PGUP}
PGDN	{PGDN}



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## 1-2-3 Macro Commands

The 1-2-3 for DOS macro commands are listed alphabetically by keyword and described briefly below. The macro conventions that we have used in the documentation are listed first to help you understand and easily identify the information that you must supply so that your macro will run properly.

### Macro Description Conventions

- Macro commands appear in uppercase letters except for the *{subroutine}* command (subroutine is not the keyword; you must replace subroutine with the name of the subroutine you want to run). You can use either uppercase or lowercase letters when you enter a macro command.
- Argument names for which you must supply information appear in lowercase italics. Optional arguments (arguments you can omit) are shown in [ ] (brackets).
- Range names appear in uppercase.
- An argument that requires a number can be either a value, the address or name of a cell that contains a value, or a formula that returns a value.
- A string argument can be either text, a text formula, or the address or name of a cell that contains a label or a text formula.
- A location argument can be a cell or a range name or address, or a formula that results in a range name or address.
- An offset number is any positive number, starting with 0, that corresponds to an item's position in a list. The first item has offset number 0, the second item has offset number 1, and so on.

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### Macro Command Descriptions

{?} (pause)

Suspends further execution of the macro until you press **ENTER**, letting you type any number of keystrokes.

{~} (tilde)

Lets you enter a ~ (tilde) that 1-2-3 does not interpret as ENTER.

## **{{}} and {}**

Let you enter { (open brace) and } (close brace) without 1-2-3 interpreting them as a macro command.

## **{ABS}**

{ABS[*number*]} is equivalent to pressing **F4** (ABS). *number* is a value that tells 1-2-3 how many times to press **F4** (ABS). {ABS} without an argument is equivalent to {ABS 1}.

## **{APP1}, {APP2}, {APP3}, and {APP4}**

Invokes the add-in programs assigned to ALT-F7, ALT-F8, ALT-F9, ALT-F10 respectively. If no add-in is assigned to ALT-F10, {APP4} displays the Add-In menu.

## **{APPENDBELOW} and {APPENDRIGHT}**

{APPENDBELOW *target-location,source-location*} copies the contents of *source-location* to the rows immediately below the bottom row of *target-location*. {APPENDRIGHT *target-location,source-location*} copies the contents of *source-location* to the columns immediately to the right of *target-location*. *source-location* and *target-location* are named ranges or range addresses.

## **{BACKSPACE} and {BS}**

{BACKSPACE [*number*]} and {BS [*number*]} are equivalent to pressing **←** (backspace). *number* is a value that tells 1-2-3 how many times to press BACKSPACE. {BACKSPACE} without an argument is equivalent to {BACKSPACE 1}.

## **{BEEP}**

{BEEP [*tone-number*]} sounds one of four tones. *tone-number* is a value that tells 1-2-3 which of four tones to sound. {BEEP} without an argument is equivalent to {BEEP 1}. {BEEP} does not produce a tone when /Worksheet Global Default Other Beep No is selected.

## **{BIGLEFT} and {BIGRIGHT}**

{BIGLEFT [*number*]} is equivalent to pressing **CTRL-←** or **↑-TAB**. {BIGRIGHT [*number*]} is equivalent to pressing **TAB** or **CTRL-→**. *number* is a value that tells 1-2-3 how many times to press **CTRL-←** or **TAB**. {BIGLEFT} or

{BIGRIGHT} without an argument is equivalent to {BIGLEFT 1} or {BIGRIGHT 1}.

### {BLANK}

{BLANK *location*} erases the contents of *location*. {BLANK} does not change the format of the cells in *location*. *location* is the address or name of a cell or range.

### {BORDERSOFF} and {BORDERSON}

{BORDERSOFF} and {BORDERSON} are identical to {FRAMEOFF} and {FRAMEON}. Refer to the descriptions of {FRAMEOFF} and {FRAMEON}.

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### {BRANCH}

{BRANCH *location*} transfers macro control from the current macro instruction to *location* and does not return to the calling macro. *location* is the address or name of another macro or subroutine. {BRANCH} is not the same as {GOTO}. {GOTO} moves the cell pointer to another cell. {BRANCH} transfers macro execution to the commands that begin in *location*. {BRANCH} is one-way; you can return from a {BRANCH} to the calling macro only by branching back to it with a {BRANCH} command.

### {BREAK}

{BREAK} clears the control panel and returns 1-2-3 to READY mode. (It's the same as pressing **ESC** several times to leave a menu.)



### {BREAKOFF} and {BREAKON}

{BREAKOFF} prevents you from canceling a macro with **CTRL-BREAK**. {BREAKON} restores the operation of **CTRL-BREAK**, undoing a {BREAKOFF} command.

### {CALC}

{CALC [*number*]} is equivalent to pressing **F9** (CALC). *number* is a value that tells 1-2-3 how many times to press **F9** (CALC). {CALC} without an argument is equivalent to {CALC 1}.

### {CLOSE}

{CLOSE} closes a text file that you opened with {OPEN} (if one is open) and saves any changes made to the file.

## {CONTENTS}

{CONTENTS *target-location,source-location,[width],[cell-format]*} copies a value from *source-location* to *target-location* as a label. *source-location* and *target-location* are the names or addresses of cells or ranges. If you specify ranges, 1-2-3 uses the first cells of the ranges. *width* is a value that specifies the width of the label that 1-2-3 creates. *cell-format* is a value corresponding to a code number that specifies the format of the label 1-2-3 creates.

<b>Code number</b>	<b>Format</b>
0 through 15	Fixed, 0 through 15 decimal places
12 16 through 31	Scientific, 0 through 15 decimal places
32 through 47	Currency, 0 through 15 decimal places
48 through 63	Percent, 0 through 15 decimal places
64 through 79	Comma, 0 through 15 decimal places
112	±
113	General
114	D1 (DD- <i>MMM</i> -YY)
115	D2 (DD- <i>MMM</i> )
116	D3 ( <i>MMM</i> -YY)
117	Text
118	Hidden
119	D6 (HH:MM:SS AM/PM)
120	D7 (HH:MM AM/PM)
121	D4 (Long International date format)
122	D5 (Short International date format)
123	D8 (Long International date format)
124	D9 (Short International date format)
127	Global cell format (specified with /Worksheet Global Format)

**{DEFINE}**

{DEFINE *location1,location2,...locationn*} specifies where to store arguments for a {*subroutine*} command where *locationn* is the last of several arguments in a list. *location* is the address or name of a cell or range that is unprotected. If *location* is a range, 1-2-3 uses the first cell of the range as the storage location. Specify a *location* argument for each argument in the {*subroutine*} command. If you don't, 1-2-3 ends the macro when it reaches the {DEFINE} command and displays an error message.

{DEFINE} must be the first macro command in the subroutine. You can specify the type of data (string or value) that 1-2-3 is to store in location. 1-2-3 stores the subroutine arguments as labels unless you add the suffix :value (or :v) to the location arguments. Use :s or :string to store the argument as a label, even if the argument looks like a number, formula, or cell or range address.



**{DELETE} and {DEL}**

{DELETE [*number*]} and {DEL [*number*]} are equivalent to pressing DEL. *number* is a value that tells 1-2-3 how many times to press DEL. {DELETE} without an argument is equivalent to {DELETE 1}.


**{DISPATCH}**

{DISPATCH *location*} transfers macro control to the cell whose address or name you specify in the location cell. *location* is a single cell that contains the address or name of the cell to which macro control is transferred.


**{DOWN} and {D}**

{DOWN [*number*]} and {D [*number*]} are equivalent to pressing . *number* is a value that tells 1-2-3 how many times to press . {DOWN} without an argument is equivalent to {DOWN 1}.

**{EDIT}**

{EDIT} is equivalent to pressing  (EDIT).

**{END}**

{END} is equivalent to pressing END.

## **{ESCAPE} and {ESC}**

*number* is a value that tells 1-2-3 how many times to press **ESC**.  
{ESCAPE} without an argument is equivalent to {ESCAPE 1}.

## **{FILESIZE}**

{FILESIZE *location*} counts the number of bytes in the open text file and stores that number in *location*. *location* is the address or name of a cell or range. If you specify a range, 1-2-3 enters the number in the first cell of the range. Before you use {FILESIZE}, use {OPEN} to retrieve the text file that you want to use.

## **{FOR}**

{FOR *counter,start,stop,step,subroutine*} creates a for-next loop—it repeatedly performs a call to *subroutine*. The *start*, *stop*, and *step* numbers determine the total number of repetitions, and *counter* keeps a running count of the repetitions. *counter* is the address or name of a blank cell where 1-2-3 keeps track of the number of times the subroutine will run during the for-next loop. *start* is the initial value for counter. *stop* is the value that tells 1-2-3 when to terminate the for-next loop. *step* is the value added to counter each time 1-2-3 runs the subroutine. *subroutine* is the range address or name of the subroutine that 1-2-3 runs in the for-next loop.

## **{FORBREAK}**

{FORBREAK} cancels a for-next loop created by a {FOR} command. Use {FORBREAK} only within a for-next loop. Using {FORBREAK} anywhere else ends the macro and causes 1-2-3 to display an error message.

## **{FORM}**

{FORM *input-location*,[*call-table*],[*include-list*],[*exclude-list*]} suspends a macro temporarily so you can enter and edit data in the unprotected cells in *input-location*. *input-location* is a range of any size that contains at least one unprotected cell where you enter data. *call-table* is a two-column range. *include-list* is a range that lists allowable keystrokes. *exclude-list* is a range that lists unacceptable keystrokes. If you specify an include-list, do not specify an exclude-list, and vice-versa.

## **{FORMBREAK}**

{FORMBREAK} ends a {FORM} command canceling the current

form. If you use {FORMBREAK} without first using a {FORM} command, 1-2-3 ends the macro and displays an error.

### **{FRAMEOFF} and {FRAMEON}**

{FRAMEOFF} suppresses display of the worksheet frame (column letters and row numbers). The frame is suppressed until 1-2-3 performs a {FRAMEON} command or the macro ends. {FRAMEON} redisplayes the worksheet frame hidden by a {FRAMEOFF} command. {FRAMEOFF} and {FRAMEON} are identical to {BORDERSOFF} and {BORDERSON}.

### **{GET}**

{GET *location*} suspends a macro until you press a key, and then records the keystroke in *location*. *location* is the address or name of a cell or range. If you specify a range, 1-2-3 records the keystroke in the first cell in the range.

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### **{GETLABEL}**

{GETLABEL *prompt,location*} prompts you to type information, suspends the macro while you type a response, and stores the response as a label in *location*. *prompt* is text (up to 72 characters can be displayed). *location* is the address or name of a cell or a range. If you specify a range, 1-2-3 stores the user's response in the first cell of the range.

### **{GETNUMBER}**

{GETNUMBER *prompt,location*} prompts you to type a number, suspends the macro while you respond, and stores the response in *location*. *prompt* is text (up to 72 characters can be displayed). *location* can be the address or name of a cell or a range. If you specify a range, 1-2-3 stores the user's response in the first cell of the range.

### **{GETPOS}**

{GETPOS *location*} retrieves the character offset position of the byte pointer (the pointer that moves character by character through an open text file) and enters the number of characters between the beginning of the file and the byte pointer in *location*. *location* is the address or name of a cell or a range. If you specify a range, 1-2-3 enters the number in the first cell in the range. You must use {OPEN} before you can use {GETPOS}.

## {GOTO}

{GOTO} is equivalent to pressing **F5** (GOTO). Use ~ (tilde) after a {GOTO} command (for example, {GOTO}C1~).

## {GRAPH}

{GRAPH} is equivalent to pressing **F10** (GRAPH).

## {GRAPHOFF} and {GRAPHON}

{GRAPHON [*named-graph*],[*nodisplay*]} displays a graph using the current settings, or makes *named-graph* the current graph and optionally displays it. {GRAPHOFF} removes a graph displayed by a {GRAPHON} command and redisplay the worksheet.

*named-graph* is a label that matches an available named graph. If *named-graph* is not a graph name, the macro terminates with an error. **nodisplay** is the optional label you specify if you want to use the *named-graph* settings, but you do not want to display the graph.

## {HELP}

{HELP} is equivalent to pressing **F1** (HELP).

## {HOME}

{HOME} is equivalent to pressing **Fn** HOME.

## {IF}

{IF *condition*} evaluates *condition* to determine if it is true or false. If *condition* is true, the macro continues with the next instruction in the same cell as the {IF} command. If *condition* is false, the macro continues with the first instruction in the cell below the {IF} command. *condition* is a logical expression. (A logical expression uses one of the logical operators = <> < > <= >= #AND# #NOT# or #OR#.)


## {INDICATE}

{INDICATE [*string*]} replaces READY (or another mode indicator) with *string* as the mode indicator. The mode indicator continues to display *string* until 1-2-3 reaches another {INDICATE} command or until you retrieve another file, select /Worksheet Erase Yes, or leave 1-2-3. {INDICATE} with no argument restores the mode indicator that reflects the current mode (READY or WAIT, for example). *string* is any text that fits in the first line of the control





panel. Using an empty string as *string* (`{INDICATE ""}`) removes the mode indicator from the control panel.

### **{INSERT} and {INS}**

`{INSERT}` and `{INS}` are equivalent to pressing INS.

### **{LEFT} and {L}**

`{LEFT [number]}` and `{L [number]}` are equivalent to pressing . *number* is a value that tells 1-2-3 how many times to press . `{LEFT}` without an argument is equivalent to `{LEFT 1}`.




### **{LET}**

`{LET location,entry}` enters a number or label in *location*. *location* is the address or name of a cell or a range. If you specify a range, 1-2-3 enters *entry* in the first cell of the range. *entry* can be a number, text, or a formula.

### **{LOOK}**

`{LOOK location}` checks the typeahead buffer for keystrokes and then records the first keystroke it contains (if any) as a label in *location*. *location* is the address or name of a cell or range. If you specify a range, 1-2-3 records the keystroke in the first cell in the range.

### **{MENU}**

`{MENU}` is equivalent to pressing  or   (less-than symbol).

### **{MENUBRANCH} and {MENUCALL}**

`{MENUBRANCH location}` displays in the control panel the macro menu that starts in the first cell of *location*. 1-2-3 waits for you to select an item from the menu and then branches to the macro instructions associated with that item. `{MENUCALL location}` displays in the control panel the macro menu in *location*. 1-2-3 waits until you select an item from the menu and then calls the subroutine associated with that menu item. *location* is the address or name of a cell and must be the first cell of a row that contains the macro menu items (branch or subroutine names).

### **{NAME}**

`{NAME [number]}` is equivalent to pressing  (NAME). *number*

is a value that tells 1-2-3 how many times to press **F3** (NAME). {NAME} without an argument is equivalent to {NAME 1}.

### {ONERROR}

{ONERROR *branch-location*, [*message-location*]} transfers a macro to *branch-location* if certain 1-2-3 errors occur while a macro is running. If you use the optional argument, {ONERROR} records the error message in *message-location*. *branch-location* is the address or name of a cell or range. *branch-location* contains the macro instructions to which 1-2-3 branches after an error occurs. If you specify a range, 1-2-3 branches to the first cell in the range. *message-location* is the address or name of a cell or range where 1-2-3 is to store the error message. If you specify a range, 1-2-3 uses the first cell in the range.

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### {OPEN}

{OPEN *file-name*, *access-type*} makes a text file available for reading, writing, or both, depending on *access-type*. An open text file does not appear on the screen. It is open only in the sense that 1-2-3 can use it. *file-name* is the full name of a text file, including the extension. If the text file is not in the working directory, specify the path as part of *file-name* and enclose the argument in double quotation marks. *access-type* is one of the four characters r (read), w (write), m (modify), or a (append). Enclose the character in quotation marks so it is not confused with a range name.

### {PANELOFF} and {PANELON}

{PANELOFF [*clear*]} freezes the status line and control panel until 1-2-3 encounters a {PANELON} command or the macro ends.

{PANELON} unfreezes and displays the status line and control panel. *clear* clears the control panel and status line before freezing them.

### {PGDN} and {PGUP}

{PGDN [*number*]} and {PGUP [*number*]} are equivalent to pressing PGDN and PGUP. *number* is a value that tells 1-2-3 how many times to press PG DN or PG UP. {PGUP} and {PGDN} without arguments are equivalent to {PGUP 1} and {PGDN 1}.

### {PUT}

{PUT *location*, *column-offset*, *row-offset*, *entry*} enters a number or a

label in a cell within *location*. *location* is the address or name of a range of any size where you want to enter data. *column-offset* and *row-offset* are numbers that identify the column and row position of a cell within *location* (see “Macro Description Conventions” earlier in the chapter). *entry* is a number, text, or a formula. If *entry* is a text formula that begins with double quotation marks, precede it with a + (plus).

### {QUERY}

{QUERY} is equivalent to pressing **F7** (QUERY).

### {QUIT}

{QUIT} ends a macro immediately, returning control to the user. 1-2-3 never performs instructions that follow a {QUIT} command.

### {READ}

{READ *byte-count,location*} copies the number of characters specified in *byte-count* from an open text file to *location*. *byte-count* is a value from 0 through 240. *location* is the address or name of a cell or range. If you specify a range, 1-2-3 enters the data in the first cell of the range. Before you use {READ}, use {OPEN} to specify the text file that you want to use.

### {READLN}

{READLN *location*} copies a line from an open text file and stores the characters in *location*. *location* is a single cell or a range. If you specify a range, 1-2-3 enters the data in the first cell of the range. Before you use {READLN}, use {OPEN} to specify the text file that you want to use.

### {RECALC} and {RECALCCOL}

{RECALC *location,[condition],[iterations]*} recalculates the values in *location*, proceeding row-by-row. {RECALCCOL *location,[condition],[iterations]*} recalculates the values in *location*, proceeding column-by-column. *location* is the address or name of the cell or range to recalculate. *condition* tells 1-2-3 to recalculate once and then repeat the recalculation until *condition* is true. *condition* is usually a logical expression or the address or name of a cell that contains a logical expression, but it can be any formula, number, or address or name of a cell. 1-2-3 evaluates any condition that does not equal 0 (zero) as true and any condition that does

equal 0 (zero) as false. *iterations* is a value that tells 1-2-3 to perform the specified number of recalculation passes. If *iterations* is 0 (zero), 1-2-3 performs the recalculation once. If you specify the *iterations* argument, you must specify the *condition* argument.

### {RESTART}



{RESTART} cancels the return sequence of nested subroutines, ending the macro when the current subroutine ends.

### {RETURN}

{RETURN} returns macro control from a subroutine to the calling macro.

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### {RIGHT} and {R}

{RIGHT [*number*]} and {R [*number*]} are equivalent to pressing . *number* is a value that tells 1-2-3 how many times to press . {RIGHT} without an argument is equivalent to {RIGHT 1}.

### {SETPOS}

{SETPOS *offset-number*} moves the byte pointer to the *offset-number* position in an open text file. *offset-number* is a value that specifies the character position in the file to which you want to move the byte pointer, relative to the first byte in the file (see "Macro Description Conventions" earlier in the chapter).

### { subroutine }

{*subroutine*[*arg1*],[*arg2*], ... [*argn*]} calls a subroutine. *subroutine* is the range name or address of the subroutine that you want the macro to call. *arg1* to *argn* are optional arguments. You can include up to 31 optional arguments. Arguments can be values or text, including formulas and the names or addresses of cells. {*subroutine*} passes the arguments to the subroutine, which must begin with a {DEFINE} command if arguments are specified. {DEFINE} evaluates and stores the optional arguments in worksheet cells.

### {SYSTEM}

{SYSTEM *command*} temporarily suspends the 1-2-3 session and performs the specified DOS command. *command* is any DOS command, including batch commands, up to 128 characters.

**{TABLE}**

{TABLE} is equivalent to pressing **F8** (TABLE).

**{UP}** and **{U}**

{UP [*number*]} and {U [*number*]} are equivalent to pressing **▲**.  
*number* is a value that tells 1-2-3 how many times to press **▲**.  
 {UP} without an argument is equivalent to {UP 1}.

**{WAIT}**

{WAIT *time-number*} suspends a macro and displays the WAIT mode indicator until the time specified by *time-number*. At that time, 1-2-3 continues the macro. *time-number* is a value that represents a future time as a 1-2-3 date and time number. If the value represents a nonexistent time or a time that has already passed, 1-2-3 ignores the {WAIT} command and continues to the next macro instruction in the same cell. You can use the @functions @NOW, @TIME, and @TIMEVALUE to specify time-number.

**{WINDOW}**

{WINDOW} is equivalent to pressing **F6** (WINDOW).

**{WINDOWSOFF}** and **{WINDOWSON}**

{WINDOWSOFF} stops screen updates while a macro is running.  
 {WINDOWSON} cancels {WINDOWSOFF} and resumes normal worksheet display.

**{WRITE}**

{WRITE *string*} copies *string* to the current byte pointer position in the open text file. *string* is a label or text. {WRITE} works only if the text file was opened with write, append, or modify access (see {OPEN}).

**{WRITELN}**

{WRITELN *string*} writes *string* at the byte pointer position in the open text file, adding a carriage return and line feed. *string* is a label or text. If you use an empty string ("") as *string*, 1-2-3 writes a carriage return and line feed.

**The /X Macro Commands**

For compatibility, 1-2-3 in your HP 100LX recognizes the /X commands originally used in 1-2-3 Release 1A.



# PART 4







## The Appointment Book: Appointments and To-Do Lists

Press **[F2]** to start the Appointment Book.

### Types of Appointment Lists

There are daily, weekly, and monthly **appointment lists** (schedules), as well as a six-month calendar.

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Week no. in year.

Days remaining in year.

Today's date.

App Book: APPT_APP		Appointments		01/15/94 12:16 PM						
Week 3	8:00a	Friday January 14, 1994	14/351	January 1994						
	9:00	Take final measurements		Su	Mo	Tu	We	Th	Fr	Sa
+>	10:00	Call Boston		2	3	4	5	6	7	8
	11:00			9	10	11	12	13	14	15
	12:00p	Lunch w/ interviewee @Cafeteria		16	17	18	19	20	21	22
	1:00			23	24	25	26	27	28	29
	2:00			30	31					
	3:00			Next Appointment						
	4:00	Dentist		1/16	7:00a	Swimming				
+>	4:30			ToDo List						
	5:00			2	Pay	Diebre				1/18
	5:30	Meet w/ nominating committee @Libra		2	Pay	Diebre				1/18
	6:00									
	7:00									
Help   Add   Note   Find   Goto   6 Month   Month   Week   To Do										

Current appointment.

Current date.

**[▲]** and **[▼]** move highlight bar. **[ENTER]** opens appointment record.

### Daily Appointment List (Appt)

#### Symbol

•	Repeating appointment.
+	Appointment includes Note.
b	Alarm.
[	Duration of appointment.

Current appointment.

Overlapping appointments.

Today's date.

Appt Book: APPT. ADB			Week				01/15/94 11:56 AM	
Jan '94	Sun 9	Mon 10	Tue 11	Wed 12	Thu 13	Fri 14	<Sat 15>	
9:00a			Book Fai	Book Fai	Help at	Take fin		
10:00						Call Bos		
11:00		Evaluati	Pick up		Pick up	Lunch w/		
12:00p		session						
1:00	Lap swim							
2:00								
3:00					Project			
4:00					meeting			
5:00		Soccer p				Dentist		
6:00						Meet w/		
7:00								

### Weekly Appointment List (Week)

A multiple-day event.

Today's date.

Appt Book: APPT. ADB		January 1994						01/15/94 12:04 PM	
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday			
	*Staff Retr	*Staff Retr	*Staff Retr	*Staff Retr					
*Lap swim	Swimming	*Book Fair	*Book Fair	Swimming	Swimming	Swimming			
	Evaluation	Swimming	Swimming	Help at	Take final				
	Soccer pra	Pick up	Pick up	Pick up	Call Boska				
					Lunch ...				
Swimming	Swimming	Swimming	Swimming	Project	Swimming	Swimming			
		Pick up		Help at	Meet w/ no				
				Pick up					
Swimming	Swimming	Swimming	Swimming	Project	Swimming	Swimming			
		Pick up		Help at	Meet w/ no				
				Pick up					
				Project					

Current date.

### Monthly Appointment List (Month)

Symbol

Meaning

-

p.m. appointment.

x

Event.

...

More appointments.

Current date. Today's date.

ApptBook:APPT.ADB							6 Month Calendar							01/15/94 12:07 pm						
January 1994							February 1994							March 1994						
Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa
2	3	4	5	6	7	8	6	7	8	9	10	11	12	6	7	8	9	10	11	12
9	10	11	12	13	14	15	13	14	15	16	17	18	19	13	14	15	16	17	18	19
16	17	18	19	20	21	22	20	21	22	23	24	25	26	20	21	22	23	24	25	26
23	24	25	26	27	28	29	27	28						27	28	29	30	31		
30	31																			
April 1994							May 1994							June 1994						
Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa
						1	8	9	10	11	12	13	14	5	6	7	8	9	10	11
3	4	5	6	7	8	9	15	16	17	18	19	20	21	12	13	14	15	16	17	18
10	11	12	13	14	15	16	22	23	24	25	26	27	28	19	20	21	22	23	24	25
17	18	19	20	21	22	23	29	30	31					26	27	28	29	30		
24	25	26	27	28	29	30														
Help							Month							Month						
Goto							Month							Week						
Appt							To Do													

### Six-Month Calendar (6 Month) — No Appointments

### Moving Around Appointment Lists

Keys	Effect
,	Moves the highlight bar through times, days, weeks, or months, depending on the display. If the highlight moves to a different day, that becomes the current date.
,	Moves the highlight to the previous/next week.
,	Moves the highlight to the previous or next day.
PG UP, PG DN	Moves the highlight to the previous/next day part, month, or half-year (depending on the context).
HOME, END	Moves the highlight to the beginning/end of the current day, or to the first/last displayed date (depending on the context).
+  , +	Moves the highlight to the previous or next day that has an appointment or event.
+  , +	Moves the highlight to the previous or next appointment or event.
	Moves the highlight between the appointments and the events.

## To open an appointment record:

- In an appointment list, highlight an item and press **ENTER**.
  - While displaying a record, press **CTRL**+**◀** or **CTRL**+**▶** to display the first appointment record on the previous or next day.
  - While displaying a record, press **CTRL**+**▲** or **CTRL**+**▼** to display the previous or next appointment record.

The screenshot shows a window titled "Appt Book: APPT.ADB" with a sub-header "Appointment/Event" and a timestamp "01/15/94 12:09 PM". The form contains the following fields and options:

- Description: Meet w/ nominating committee
- Start Time: 5:30pm
- Start Date: 1/14/1994
- End Time: 6:30pm
- No. Consecutive Days: 1
- Location: Library
- Alarm:  Enabled, Leadtime: 5
- Views:  Week,  Month
- Repeat Status: Weekly
- Note: (empty text area)

At the bottom, there is a menu bar with the following items: Help, Add, Note, Find, Clip, Calendr, Repeat, Cancel, Done.

An Appointment Record

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## Changing the Current Appointment Book Date

### Note



The **current date** is the date currently displayed or highlighted. This is *not* the same as **today's date** (the **system date**), which can be changed only via the Setup utility.

### To change the current date to today's date:

1. Start from any appointment list (schedule) or to-do list.
2. Press **F5** (Goto).
3. Press **F4** (Today).

### To change the current date to a nearby date:

- Press **◀** or **▶** to change to the previous or next day.

### To change the current date to another date:

1. Start from any appointment list (schedule) or to-do list.
2. Press **F5** (Goto).

3. You can specify the date in three ways:
  - a. Move the cursor on the calendar (using arrow and **[Fn]** arrow keys).
  - b. Type in the date. (Pressing **[+]** or **[-]** moves the date forward or backward one day.)
  - c. Use the function keys to change the date. Pressing **[TAB]** moves the cursor between the calendar and the date box.
4. Press **[F10]** or **[ESC]** to put away the Goto calendar.

Current date.    Today's date.

a. Calendar. \_\_\_\_\_

b. Date box. \_\_\_\_\_

c. Function keys.

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### Function Keys for Goto (**[F5]**)

Key Label	Changes the Current Date
<b>nDay-</b> , <b>nDay+</b>	Backward or forward <i>n</i> number of days, which you specify.
<b>Today</b>	To today's date.
<b>Month-</b> , <b>Month+</b>	Backward or forward one month.
<b>Year-</b> , <b>Year+</b>	Backward or forward one year.

## Scheduling Appointments and Events

The **Appointment/Event** screen is the template for defining or editing an appointment record.

### Adding Appointments and Events

Enter time as  
*hours:minutes.*

Type any delimiter (., : /) to  
separate the parts of time or date.

ApptBook: APPT. ADB Appointment/Event 01/15/9 12:09 pm

Description Meet w/ nominating committee

Start Time 5:30pm Start Date 1/14/1994

End Time 6:30pm No. Consecutive Days 1

Location Library

Alarm  
 Enabled Views  
 Week  Month

Leadtime: 5 Repeat Status: Weekly

Note

Help Add Note Find Clip Calendr Repeat Cancel Done

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Includes this appointment  
in week and month displays.

Information only.  
Press **[F8]** to change.

### To add an appointment:

1. In the Appointment Book, press **[MENU]** **[A]** **[A]**.
  - Or press **[F2]** (Add) while displaying any appointment screen (not a ToDo screen.)
2. Fill in the fields. (Use **[TAB]** or **[ALT]**+letter to move among them.)

**Description.** This text provides the entry for the appointment list.

**Start and End Times.** The End Time is optional. Pressing **[+]** or **[-]** changes the time by fifteen minutes. (**[↑]** **[+]** and **[↑]** **[-]** change the time by one minute.)

**Location.** Optional. This information also appears in the appointment list, following an @.

**Alarm.** If the alarm is enabled (box checked), the HP 100LX will beep for the appointment. The **leadtime** sets how far ahead of the appointment time the alarm will go off.

**Note.** Optional. The Note field provides a large field for any additional information. Pressing **[F3]** (Note) displays a full-screen note.

**Start Date.** Pressing  or  changes the date by one day.

**No. Consecutive Days.** If the appointment or event goes for more than one day, fill in No. of Consecutive Days (or set a Daily Repeat Option).

**Views.** If these boxes are checked, this appointment shows up in the weekly and monthly appointment lists (schedules).

3. Press  when done. Or press  to cancel the information.

### To add an event (a day-long appointment):

An **event** is an appointment associated with a day but not a time.

1. In the Appointment Book, press   .
2. Fill in the fields as for adding an appointment.
  - To change an event to an appointment, tab to the Start Time field and enter a time.
  - To change an appointment to an event, tab to the Start Time field and press . None appears in both time fields.
3. Press  when done.

To highlight an event in the appointment list, press .

**Example: A Multiple-Day Event.** You can schedule a multiple-day event like a conference or vacation in your Appointment Book so that all the affected dates will be marked in the week and month appointment views. Here is an event that runs for three consecutive days and repeats annually.

Alarm not available.

ApptBook: APT.ADB		Appointment/Event		01/15/94 11:08 AM	
Description	Northwest Conference				
Start Time	None	Start Date	1/19/1994		
End Time	None	No. Consecutive Days	3		
Location	Timberline Lodge				
Alarm		Views			
<input type="checkbox"/> Enabled		<input checked="" type="checkbox"/> Week		<input checked="" type="checkbox"/> Month	
Leadtime	5	Repeat Status: Yearly			
Note					
Help   Add   Note   Find   Clip   Calendr   Repeat   Cancel   Done					

An Annual 3-Day Event

Timeline.	Event description.	Appointment descriptions.
Appt Book: APPT: ABB	Appointments	01/15/94 12:38 pm
Week 4	Wednesday January 19 1994	January 1994
	Northwest Conference @Timberline	Su Mo Tu We Th Fr Sa
7:00a	Registration	2 3 4 5 6 7 8
8:00	Seminars	9 10 11 12 13 14 15
9:00		16 17 18 19 20 21 22
10:00		23 24 25 26 27 28 29
11:00		30 31
12:00p	No-host lunch	
1:00		
1:30	Lecture @Main Hall	
2:00		
3:00	Poster session	
4:00		
5:00	Discussion groups	
6:00		
7:00		
Help   Add   Note   Find   Goto   6 Month   Month   Week   ToDo		Next Appointment 1/16 7:00a SWIMMING ToDo List

### List with Appointments and Events

To view all the events for a month:

- In the Appointment Book, press **MENU** **V** **E** (View All-Events).

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Appointment	Book:main	November 1993 All Events					
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
31	1	2	3	4	5	6	
			xAnniversar				
7	8	9	10	11	12	13	
14	15	16	17	18	19	20	
xVacation	xVacation	xVacation	xVacation	xThanksgivi xVacation	xVacation	xVacation	
21	22	23	24	25	26	27	
28	29	30	31				
Help   Add   Note   Find   Goto   6 Month   Month   Week   Appt   ToDo							

### Displaying All Events for the Month

To view the daily appointment list again:

- Press **F9** (Appt).

### Tips for scheduling:

- Check your schedule before adding a new appointment. Check your monthly (**Month**), then weekly (**Week**), then daily schedules for successive overviews of available days and times.
- Another way to start adding an appointment: When an appointment list is displayed, any typed character will automatically open the appointment record and start filling in the Description field.



- An alternative to filling in the Start Date field in the appointment record is to change the current date *before* executing Add. Use the arrow keys or Goto function to change the current date.
- Filling out the appointment record: Another way to fill in the Date fields is to call up the small, one-month calendar (press **F6**). Use arrow keys to highlight a date in the calendar. When you press **ENTER**, the calendar's date will be recorded in the Date field.
- Filling out the appointment record: The Time and Date fields accept any delimiter characters ( :, /, ., or ) for the date and time. For example, typing 11.3 in the Time field enters 11:30AM, and typing 9P enters 9:00PM. Typing 11.3 in the Date field enters November 3 (in the current or next year, as appropriate).
- Filling out the appointment record: To enter an afternoon time, type P, PM, or use 24-hour time.
- To change the displayed time intervals in a daily or weekly appointment list (schedule), press **Fn**ZOOM.

**Example: Scheduling an Event and Appointment.** Schedule an event for a teaching conference that takes place all day on 25 June 1994 at Oregon State University. Also schedule an appointment (with an alarm) for a 2-hour seminar that day at 2:00 p.m. in Milam Hall on undergraduate science research. Note that L. Brown will also be attending.

**Keys:****[O]****Description:**

Starts Appointment Book.

**[MENU]** **[A]** **[E]**

Opens up a new appointment record and fills the time fields with NONE (for an event).

Teaching conference

Fills in the Description field.

**[TAB]** **[TAB]** **[TAB]** Ore.  
St. Univ.

Highlights and fills in the Location field.

**[ALT]**+**[D]** 6.25.94

Highlights and fills in the Start Date field.

**[F2]**

Saves and closes the appointment record; opens up a new appointment record.

Seminar: U.G.  
Science Research

Fills in Description.

**[TAB]** 2p **[TAB]** 4p

Fills in starting (2:00 p.m.) and ending (4:00 p.m.) times. If the first hour in the appointment list is 8:00 a.m., then 2 and 4 are automatically interpreted as p.m. times.

**[TAB]** Milam Hall

Fills in Location.

**[ALT]**+**[N]** L. Brown  
attending

Fills in Note. The other fields are already correctly filled.

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Appt Book: APPT.ADB		Appointment/Event		01/15/94 1:03 pm	
<b>Description</b> Seminar: U.G. Science Research					
Start Time	<input type="text" value="2:00pm"/>	Start Date	<input type="text" value="6/25/1994"/>		
End Time	<input type="text" value="4:00pm"/>	No. Consecutive Days	<input type="text" value="1"/>		
Location	<input type="text" value="Milam Hall"/>				
Alarm			Views		
<input checked="" type="checkbox"/> Enabled			<input checked="" type="checkbox"/> Week <input checked="" type="checkbox"/> Month		
Leadtime:	<input type="text" value="5"/>		Repeat Status: None		
Note L. Brown attending					
Help   Add   Note   Find   Clip   Calendr   Repeat   Cancel   Done					

**[F10]**

Saves this appointment and displays the appointment list for 25 June 1994.

**[F5]** **[F4]**

Restores today as the current date.

## Setting Alarms

### To set an alarm:

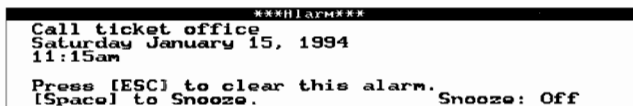
An **alarm** is simply an appointment with the alarm set. Alarms will go off regardless of the computer's current activity.

1. Follow the procedure for adding an appointment.
2. Make sure that the Alarm field has the Enabled box checked.  
(Press **[ALT]+[B]** if it is not, or highlight it and press **[spacebar]**.)
3. Change the leadtime, if necessary. This is how far ahead of the appointment time that the alarm will go off. Enter minutes or hours and minutes. For  $1/2$  hour, enter 30. For  $1\frac{1}{2}$  hours, enter 1.30 or 90.

### To acknowledge (clear) an alarm:

Each time an alarm goes off, a dialog box shows you its appointment information. When you **acknowledge** an alarm, you clear its dialog box. If there are any **past-due** (unacknowledged) alarms, their dialog boxes reappear one by one as you acknowledge more recent alarms. Clearing an alarm does *not* delete the appointment itself from the appointment list.

- Press **[ESC]** to acknowledge the current alarm.
- Press **[DEL]** to acknowledge simultaneously the current alarm and all past-due alarms.
- Press any other key to stop an alarm *without acknowledging the appointment*. The appointment becomes past due.



### To set a snooze alarm:

- When the alarm goes off, press **[spacebar]** to set a **snooze alarm**. This sets the alarm to recur in 5 minutes. Any past-due alarm then appears.

- To postpone the display of past-due alarms until after the snooze interval, press **Fn** **spacebar**.
- For a longer snooze interval, press **spacebar** up to 11 times total. Each press equals 5 minutes. Press **←** to decrease the snooze interval by 5 minutes.

## Using Repeating Appointments

A **repeating appointment** is one that recurs at regular intervals. For instance, a weekly staff meeting and a semi-annual productivity review are repeating appointments. The first has an interval of one week, the second has an interval of six months. You can define almost any interval you want.

The **Repeat** function offers several options:

### Repeat Options

Frequency	Other Specifications	Examples
No Repeat	Cancels the existing repeat option, if any.	
Daily	Interval can be any number of days.	Every 5th day; every 30th day.
Weekly	Interval can be any number of weeks.	Every Wednesday; every other Friday.
Monthly	Interval can be any number of months. Can specify by date or by position in the month.	The 7th of every month; the first Wednesday every 3 months.
Yearly	Interval can be any number of years. Can specify by date or by position in the year.	August 7th every 2 years; the first Wednesday in August every year.
Custom	Can specify by date or by day position in specified month(s).	The 7th of January, April, and October every year; the first and third Monday and Wednesday in June, July, and August every year.

## To set a repeating appointment:

1. Press **F2** (Add) and fill in the fields to add an appointment (see page 13-6).
2. Press **F8** (Repeat).
3. Select the desired repeat option: Daily, Weekly, Monthly, Yearly, or Custom (you define).
4. Fill in the fields. (Use **TAB** or **ALT**+letter to move among them.)
  - Frequency.** (Not in Custom option.) Specifies the number of days, weeks, months, or years between appointments.
  - Day of Week.** (Weekly only) Specifies the day for a weekly appointment.
  - Duration.** The first occurrence of the repeating appointment will be *on or after* the Duration Starting Date, and the last occurrence will be *on or before* the Duration Ending Date. By default, the time frame extends 5 years from the appointment's Start Date.
  - Repeat Type.** (For Monthly, Yearly, and Custom options.) Press **▼** to turn on the option button you want. Tab to the text box.
    - **By Day Number (Date):** If you'd like the appointment to repeat on a specific date (the 13th, etc.), enter a number for the date. Specify the month, if applicable.
    - **By Day Position:** If you'd like the appointment to repeat on a given day of a given week (in a given month). Example: first Thursday (in June).
5. Press **F10** to save the repeat option.
6. Press **F10** again to save the appointment as is.

**Example: Setting Repeating Appointments.** The following screens show the Repeat Options for:

1. An appointment for a staff meeting that occurs every Monday. (You set the time in the appointment record, not the Repeat Options screen.) The repeating appointment will start on the next Monday after 1/15/1994.

**Weekly Repeat Options**

No Repeat  
 Daily  
 **Weekly**  
 Monthly  
 Yearly  
 Custom

**Frequency**  
Repeat every  week(s)

**Duration**  
Starting:       
Ending:    

**Day of Week**

**Weekly Repeat: Staff Meeting**

2. An appointment for a board meeting that occurs every third Thursday of every month. This is a Monthly repeat set for five years. The repeat will start on the next occurring third Thursday after 1/15/1994.

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**Monthly Repeat Options**

No Repeat  
 Daily  
 Weekly  
 **Monthly**  
 Yearly  
 Custom

**Frequency**  
Repeat every  month(s)

**Duration**  
Starting:       
Ending:    

**Monthly Repeat Type**  
 By Day Number   
 **By Day Position**

**Monthly Repeat: Board Meeting**

3. An appointment for an anniversary that falls on June 25th. This is a yearly repeat set by default for 5 years. The Duration Starting Date uses the Start Date (from the appointment record) by default.

**Yearly Repeat Options**

No Repeat  
 Daily  
 Weekly  
 Monthly  
 **Yearly**  
 Custom

**Frequency**  
Repeat every  year(s)

**Duration**  
Starting:       
Ending:    

**Yearly Repeat Type**  
 **By Date**   
 By Day Position   in

**Yearly Repeat: Anniversary**

4. An appointment for a board meeting that occurs every first and third Thursday of the month *except* in December, July, and August.

Custom Repeat Options	
<input type="radio"/> No Repeat <input type="radio"/> Daily <input type="radio"/> Weekly <input type="radio"/> Monthly <input type="radio"/> Yearly <input checked="" type="radio"/> Custom	
Custom Repeat Type	
<input type="radio"/> By Day Number <input type="text" value="15"/>	
<input checked="" type="radio"/> By Day Position	
Week	<input checked="" type="checkbox"/> 1st <input type="checkbox"/> 2nd <input checked="" type="checkbox"/> 3rd <input type="checkbox"/> 4th <input type="checkbox"/> Last
Day	<input type="checkbox"/> Mon <input type="checkbox"/> Tue <input type="checkbox"/> Wed <input checked="" type="checkbox"/> Thu <input type="checkbox"/> Fri <input type="checkbox"/> Sat <input type="checkbox"/> Sun
Months	
<input checked="" type="checkbox"/> Jan	<input checked="" type="checkbox"/> Feb <input checked="" type="checkbox"/> Mar
<input checked="" type="checkbox"/> Apr	<input checked="" type="checkbox"/> May <input checked="" type="checkbox"/> Jun
<input type="checkbox"/> Jul	<input type="checkbox"/> Aug <input checked="" type="checkbox"/> Sep
<input checked="" type="checkbox"/> Oct	<input checked="" type="checkbox"/> Nov <input type="checkbox"/> Dec
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

**Custom Repeat: Board Meeting**

Function Key	Effect on Custom Repeat Check Boxes
All	Automatically selects (checks) all days or weeks or months.
None	Automatically clears (removes checks from) all days/weeks/months.
Wkdays	Automatically selects (checks) Monday through Friday.

**To change a repeating appointment to a one-time appointment:**

1. Open the record for the date that you want to keep. Highlight the repeating appointment you want to change.
2. Press **F8** to display Repeat Options.
3. Arrow to the option button No Repeat.
4. Press **F10** three times (to confirm the change).

---

## Editing or Deleting Appointments

### To edit (change) an appointment:

1. Display the daily (or weekly) appointment list for the desired date. (Press **Appt**, if necessary.)
2. Highlight the appointment you want to edit.
3. Press **ENTER** to display the appointment record.
4. Edit the field(s). (Use **TAB** or **ALT**+underlined letter to move among fields.)
  - To clear a field, highlight it and press **DEL**.
  - To restore a field's previous contents, press **ESC**.
  - You can use **+** and **-** to edit the time, date, and number fields.
5. Press **F10** to save your changes. Or press **ESC** to cancel them.

You can also use the Clipboard functions (Copy, Cut, Paste) to move or copy an appointment from one appointment list (daily, weekly, or monthly schedule) to another. Its time is determined by where in the new list you paste it.

To restore an edited appointment to its previous version, press **MENU** **E** **U** (Edit Undo) before doing another operation.

### To delete an appointment:

**Deleting** an appointment removes its record from the Appointment Book. You can delete only one appointment at a time.

1. Display an appointment list (daily or weekly schedule).
2. Highlight the appointment to delete.
3. Press **DEL**.

To restore a deleted appointment, press **MENU** **E** **U** (Edit Undo) before doing another operation.

## Deleting Repeating Appointments

### To delete a repeating appointment:

You can delete one, some, or all occurrences of a repeating appointment.



1. In an appointment list, highlight any occurrence of the repeating appointment.
2. Press **DEL**.
  - To delete *one* occurrence, highlight One Occurrence and specify the date, if necessary. (The current date is given.)
  - To delete *all* occurrences, highlight All Occurrences. The given date range is all-inclusive.
  - To delete *more than one* but not all (consecutive) occurrences, highlight All Occurrences, tab to the date fields, and fill them in.
3. Press **F10**.

### To restore deleted occurrences of a repeating appointment:

This actually copies the remaining repeating appointment to the dates you specify. Therefore, at least one occurrence of the appointment must be available to restore other occurrences.

1. Display an appointment list that still has the repeating appointment.
2. Highlight the repeating appointment that you want to restore to other dates.
3. Press **MENU** **E** **R**.
4. Specify the date range within which you would like this appointment restored. (The default dates are the current Starting and Ending dates.)
5. Press **F10**.

## About Editing Repeating Appointments

You can edit one, some, or all occurrences of a repeating appointment. Edit the repeating appointment like any other appointment, and when you are done, a dialog box will ask you to specify which dates to change. Keep in mind that if you don't specify the entire date range, this will create two separate appointment items: those within the range and those outside it. For the purposes of further editing, copying, etc., the two versions are no longer part of the same appointment.

### To change the starting date of a repeating appointment:

- Display the Repeat Options screen and edit the Duration Starting Date. This automatically adjusts the Start Date.

---

## Running a Program or System Macro at a Certain Time

You can set an appointment to run a program or a system macro rather than set off an alarm.

For example, you could use this feature to set the HP 100LX to use a macro to automatically open Datacomm and log onto an information service (using a script file) during a low-use, low-cost time of night.

### To set an appointment that runs a program or macro:

1. Press **F2** or **MENU** **A** **A** to add a new appointment.
2. Start the Description field with **|** for a program or **||** for a system macro.

**For a program:** Follow the **|** with the full **pathname** (file name and directory names) of the program to run. The program must have a **.EXE**, **.COM**, or **.BAT** extension, and it must exist already. An example of a Description to run the program **SALESFIG** (subdirectory **SALES**, subdirectory **\_DAT**) is:

```
|C:\_DAT\SALES\SALESFIG.EXE
```

**For a system macro:** Follow the **||** with the number (1-10) of the macro to run.

3. Fill out the other fields as for other appointments, except for these fields, which have special meanings:

**Alarm.** Must be enabled (checked) to run the program.

**Location.** Specifying **Q** (quiet) in this field suppresses any error message that might result from running the specified program or macro.

4. Press **F10**.

When the time comes and the program or macro runs, the screen displays the result of the program or macro. A program ends with the message, **Press any key to exit from DOS...**

Specifying **Q** for the Location suppresses this message and returns the display automatically to the context that preceded this "appointment".

---

### Note

A program cannot run if the DOS application is open when the appointment comes due.



## To-Do Lists

Press **F10** (ToDo) from an appointment list to display the current day's to-do list.

Priority. Due date. Current item.

```

App Book: APPT.ADB To Do List 01/15/94 9:01 am
New 1 3 Saturday January 15 1994 15/358
      Pay Distro @1/15/1994
      *Get receipts
      +2 Pick up tax
      •+1A Type minutes
      2A @Call for estimates @1/14/1994
      1 ✓Catalog order
      1 ✓Return library books
  
```

January 1994						
Su	Mo	Tu	We	Th	Fr	Sa
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Next Appointment  
1/15 12:00p No-host lu

Appointments

```

•+J 3:00a IC:\BACKUP.B
• 7:00 Swimming
• 9:00 Seminars
J 12:00p No-host lunc
J 12:45 Pick up page
J 12:45 Pick up deli
  
```

Help Add Note Find Goto 6 Month Month Week Appt

Press **☐** to check or uncheck.

### A To-Do List

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Symbol	Meaning
✱	Item new today (its first occurrence).
✓	Completed item (checked off).
!	Item due today (and not yet checked off).
☹	Item past-due (and not yet checked off).
+	Item includes Note.
•	Repeating item.

### To open a to-do item's record:

- In a to-do list, highlight an item and press **ENTER**.

## Moving Around To-Do Lists

Keys	Effect
,	Move the highlight bar through the list of items.
,	Move the highlight to the previous/next day's to-do list.
PG UP, PG DN	Move the highlight to the previous/next page of the list.
HOME, END	Move the highlight to the beginning/end of the to-do list.
CTRL +	Displays the previous/next day with to-do items.
CTRL +	
CTRL +	Displays the previous/next to-do item.
CTRL +	

## 13 Creating a To-Do List

The first date the item appears. Carries forward an item that is not checked off.

Appt Bo	K:APPT.ADB	To Do	01/15/94 9:05 am
Description	Ray Dieder		
Start Date	1/14/1994		
Due Date	1/15/1994	<input checked="" type="checkbox"/> Carry Forward	
Priority	1		
		Repeat Status: Weekly	
Note	Extra for snow days		
Help   Add   Note   Find   Clip   Calendr   Repeat   Cancel   Done			

### A To-Do Item's Record

To add a to-do item:

- In the Appointment Book, press .
  - Or press (Add) while displaying the ToDo screen (not an appointment screen).
- Fill in the fields. (Use or +letter to move among them.)
 

**Description.** This will appear in the to-do list.

**Start Date.** The first date a to-do item appears. Pressing or changes the date by one day.

**Due Date.** Optional. Appears in the to-do list following @. If an item is not completed by its due date, it appears with ! or ⚠.

**Priority.** Every to-do item has a priority number (one or two digits and/or letters), which you can type in. Press  or  to increment or decrement the priority. The items are sorted by priority; numbers are sorted in the list before letters, and a blank (null) is sorted last. Items can have the same priority, meaning they have the same level of importance.

**Note.** Optional. The Note field provides a large field for any additional information. Pressing **Note** displays a full-screen note. You can use this field to make helpful categorizations, such as “personal” or “business”.

**Carry Forward.** If this box is checked, then the to-do item re-appears in each day’s list until the item is checked off.

3. Press  when done. Or press  to cancel the information.

### Tips for to-do items:

- Another way to start adding a to-do item: When the to-do list is displayed, any typed character will automatically open the to-do item and start filling in the Description field.
- An alternative to filling in the Start Date field in the to-do item is to use the **Goto** function *before* executing Add. Goto changes the current date.
- Another way to fill in the date fields is to call up the small, one-month calendar (). Use arrow keys to highlight the date in the calendar. When you press , the calendar’s date will be recorded in the Date field.
- The Date field accepts any delimiter characters (:, /, ., or ) for the date. For example, typing 8.3 enters August 3 (in the current or next year).

### To check off a completed to-do item:

- Press  to check it off and move it to the bottom of the list.
- Highlighting it and pressing  again clears the checkmark.

**Example: Adding and Completing a To-Do Item.** Add and then check off a to-do item to start writing a grant application today that is due on April 28. Note that J.K. has offered to help. The item should carry forward (re-appear each day) until it is done. Give it first priority. This is not a repeating item.

**Keys:****[F2]****[F10]****[F5]** **[F4]****[F2]**

Write grant application

**[TAB]****[TAB]** 4.28**[TAB]****[TAB]** J.K. offered help**[TAB]****[F10]****[ ]****Description:**

Starts Appointment Book.

Displays the to-do list (if it is not already displayed).

Makes today the current date (if it wasn't already).

Opens up a blank to-do record.

Fills in the Description field.

Highlights the Start Date field. The default date is the current date, so no entry is necessary.

Fills in the Due Date field. The default year is this year (or next year, if the today's date is after 4/28).

Highlights the Priority field. The default (unless changed) is 1, so no entry is necessary.

Fills in the Note field.

Highlights the Carry Forward box, which is already checked (by default).

Saves this to-do item in the Appointment Book and displays the to-do list for the current date. The display highlights the new to-do item, shown with **\***.

Checks off this item.

## Editing or Deleting To-Do Items

### To edit (change) a to-do item:

1. Press **[F2]** to start the Appointment Book.
2. In the Appointment Book, display the to-do list for the desired date. (Press **[TO DO]**, if necessary.)
3. Highlight the to-do item you want to edit.
4. Press **[ENTER]** to display the to-do item.

5. Edit the field(s). (Remember that you can also use **[+]** and **[-]** to edit the date and priority fields.)
6. Press **[F10]** to save your changes. Or press **[ESC]** to cancel them.

You can also use the Clipboard functions (Copy, Cut, Paste) to move or copy a to-do item from one date to another. Its priority is determined by where in the new list you paste it.

### To delete a to-do item:

**Deleting** a to-do item removes its record from the Appointment Book. You can delete one or all occurrences of a repeating item.

1. Start from the to-do list in the Appointment Book.
2. Highlight the item to delete.
3. Press **[DEL]**.
4. If it is a repeating to-do item, select One or All Occurrences. You can specify a date range for All Occurrences. (The date range considers the original occurrence of a to-do item only, not its carried-forward dates.)

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### Repeating To-Do Items

You can set a to-do item to recur at regular intervals. For instance, every Monday you might have a delivery of samples to pick up. You can define this as a repeating weekly (Monday) to-do item by using the **Repeat** function (**[F8]**) in a to-do item record. This to-do item then appears automatically on every Monday's to-do list.

You define repeating to-do items in the same way as you define repeating appointments. See "To set a repeating appointment," on page 13-13.

---

## Searching for Specific Text in the Appointment Book (Find)

### To find a text string in your appointments:

1. While displaying an appointment list or record, press **F4** (Find).
2. Fill in the box with the characters or text to search for.
3. Optional: Tab to and select the check boxes you want (press **spacebar** to change). One makes the search include the Note fields, and the other discriminates upper from lower case letters.
4. Press **F10** or **F4** (Next) to search forward from the current position.
  - Or press **F3** (Previous) to search *backward* from the current position.

To repeat the search, press **↶** **F4**.

A successful search stops when it finds the first instance of matching text. Either the matching text or the list item containing the matching text will be highlighted, depending on the current display (lists do not display all the text that the full records do, so the matching text might not appear in the list).

If your records include extensive notes in the Note field, you can speed up a search by not checking Include Notes for the search.

### To find a text string in your to-do items:

1. While displaying a to-do list or item, press **F4**.
2. Follow the steps from 2 on (above) for searching an appointment.



---

## Copying or Moving Information

### Using the Clipboard to Copy or Move

You can use the Clipboard functions to copy and move information within the Appointment Book, as well as to and from other applications.

- From an appointment or to-do record, you can highlight a field and copy or move it. You can also select just part of the text in a field to copy or move.
- From an appointment list or a to-do list, you can highlight an item and copy or move it to another list of the same type (from one to-do list to another or from one appointment list to another). You can also move or copy an item into a memo or into a Note field in another application.

#### To copy or move the contents of a field:

1. Open the desired appointment or to-do record and tab to the desired field.
2. Press **Fn** COPY (to copy) or **Fn** CUT (to move).
  - To copy just part of the text in a field, select the range of text first (by pressing **⇧**+arrow key).
3. Open the destination record, if different. (It can even be in a different application.)
4. Highlight the destination field.
5. Press **Fn** PASTE.

#### To copy or move an item:

You can copy or move an appointment or to-do item within the Appointment Book. You can also copy the text of an item into a memo or a Note field.

1. Display an appointment or to-do list.
2. Highlight the desired item.
3. Press **Fn** COPY to copy it, or **Fn** CUT to move it.
4. Display the list you would like to put the item into. Or display the memo or Note you want to copy to.
5. Highlight the spot in the list you want, or place the cursor where you want.

6. Press **[Fn]**PASTE.
7. Check and edit, if necessary, the starting time (appointment) or priority (to-do item).

To undo a cut or paste operation, press **[MENU]** **[E]** **[U]** (Edit Undo) before doing another operation.

A copied or moved appointment assumes the same starting time as the highlighted destination. However, if the timeline in the destination list includes only those times that have appointments (Appointments Only timeline), then the transferred appointment keeps its original starting time.

A copied or moved to-do item assumes the same priority as the highlighted item at the destination. However, if there are no other items in the destination list, then the transferred item keeps its original priority.

## 13 **Smart Clip: Copying Multiple Data Fields from a Record**

Smart Clip uses the Clipboard to copy formatted information quickly from *predefined fields* in the current application to another location. You might want, for example, to quickly copy information about an appointment to a note in the Note Taker or a memo in the Memo Editor.

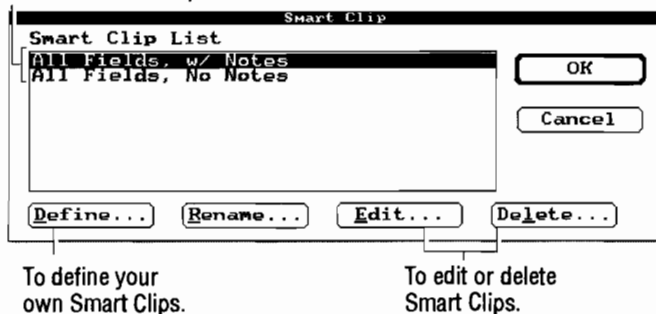
**CLIP** provides predefined choices of fields to copy, and lets you define others yourself. You can also control the **formatting** (the lay-out) of Smart Clip fields. The predefined Smart Clip options from the Appointment Book are:

- All Fields, w/ Notes.
- All Fields, No Notes.

### **To smart-clip information from the Appointment Book:**

1. In the Appointment Book, open the record whose information you want to smart-clip. (You cannot smart-clip more than one Appointment Book record at a time.)
2. Press **[F5]** (Clip).
3. Highlight the Smart Clip option you want and press **[F10]**.

### Names of Smart Clip definitions.



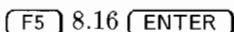
4. Open the memo (in Memo Editor) or other record into which you'd like to copy this information. This can be in another application.
5. Move the cursor or the highlight to where you want to insert this information. (You can insert into any part of a memo, or into any text field in other applications).
6. Press **Fn**PASTE.

You can also smart-clip from another application *into* the Appointment Book, such as smart-clipping a name and phone number from the Phone Book to the Description field of an appointment. The instructions are the same, but you would do the smart clipping in the Phone Book and the pasting in the Appointment Book.

**Example: Copying from the Appointment Book to a Memo.** You are writing a memo in the Memo Editor to a colleague. You want to include information about an appointment you are inviting him to. You can do this using either **Fn**COPY or **Clip**. Assume the appointment you want is on August 16.

**Keys:****Description:**

Opens the Appointment Book. (If a to-do list is displayed, press **F9** (Appt) to display appointments.)



Goes to the appointments for August 16.

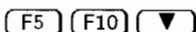
*Highlight the appointment* **ENTER**

Opens the appointment record.



Copies this appointment to the Clipboard buffer.

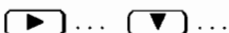
*Or*



Highlights the option "All Fields, No Notes".



Opens the Memo Editor. *If the memo you want is not open, use **MENU** File Open.*



Place the cursor where you want the appointment copied.



Inserts the appointment information.

The memo now contains a copy of the appointment in it.

### Defining a New Smart Clip or Editing an Existing One

You can define your own Smart Clips for each application. See "To define your own Smart Clip," page 17-19. You can also edit any existing Smart Clip, whether you created it or it was built in. See "To edit an existing Smart Clip," page 17-22.

---

#### Note



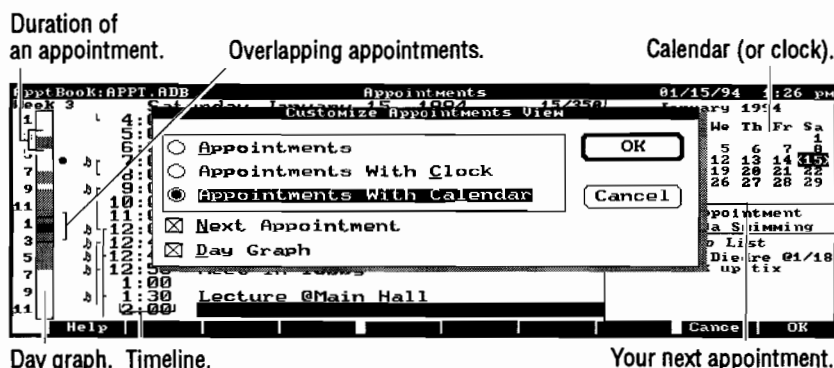
You should not edit the first built-in Smart Clip (All Fields, w/ Notes). By default, it is used by the Clipboard and the Print command to format information.

---

## Setting Options and Defaults for the Appointment Book

The options and defaults that you can set for appointments and to-do items are:

- Clock display (in appointment list; in to-do list).
- Calendar display (in appointment list; in to-do list).
- Next-appointment display (in appointment list; in to-do list).
- Graph of appointments (in appointment list; in to-do list).
- Timeline—the time intervals shown for the daily appointment list.
- Default appointment and to-do settings.
- Alarm volume and sound.



### Possible Components of an Appointment List

**To change the clock, calendar, Next Appointment, or Day Graph in an appointment or to-do list:**

1. For the appointment list, press **MENU** **O** **A** (Options Customize-Appointments-View). For the to-do list, press **MENU** **O** **O** (Options Customize-ToDo-List-View).
2. Highlight the option button for the desired display: with a clock in the corner, a calendar, or neither.
3. Check the relevant check boxes if you would like to see the Next Appointment called out in a side box and/or see a vertical Day Graph that shades in the times and durations of the current day's appointments. (Next Appointment can appear only in conjunction with the clock or calendar.)

4. Press **[F10]** when done (or **[ESC]** to cancel).

### To change the appointment timeline setting:

1. In the Appointment Book, press **[MENU]** **[O]** **[T]** (Options Timeline).
2. Select the timeline option you prefer: displaying no times except those for scheduled appointments (Appointments Only), or displaying regular times at intervals of 15, 30, or 60 minutes.
3. Enter the first hour of the day for the timeline. (This affects times you fill in when adding an appointment: If you don't specify a.m. or p.m. when filling in a time field, then the time is assumed to be *after* the first hour of the day.)
4. Select whether the calendars and the weekly and monthly timelines should start with Sunday or Monday.
5. Press **[F10]** when done (or **[ESC]** to cancel).

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### To change the time intervals in the daily/weekly timeline:

1. Display the timeline, which appears in the daily and weekly appointment lists (schedules).
2. Press **[Fn]** ZOOM. ZOOM cycles through the time intervals: 60 minutes, 30 minutes, 15 minutes, and no intervals (just appointments).

### To change the default settings for appointments:

1. In the Appointment Book, press **[MENU]** **[O]** **[D]** (Options Appointment-Defaults).
2. Set the default values for:
  - Appointment Duration.** This determines the default End Time for a new appointment.
  - Alarm.** Enabled or not (on or off), and Leadtime (how long before the appointment the alarm goes off).
  - Items to See in Week/Month View.** Whether appointments and events should appear in the weekly and monthly appointment lists. (They always appear in the daily list.)
3. Press **[F10]** when done (or **[ESC]** to cancel).

### To change the default settings for to-do items:

1. In the Appointment Book, press **[MENU]** **[O]** **[E]** (Options ToDo-Defaults).

- Set the default values for:

**Carry Forward.** Uncompleted to-do items are carried forward to today if Carry Forward is set.

**Priority.** The default priority for a to-do item. The priority can have one or two letters/numbers; numbers sorted first.

- Press **F10** when done (or **ESC** to cancel).

### To change the alarm volume and sound:

- In the Appointment Book, press **MENU** **O** **B** (Options Alarm-BEEP).
- Checking Mute overrides the volume level. You might choose to mute all alarms when going into a meeting, for example.
- Select (by tabbing and arrowing) the volume level and the sound.
  - The Custom choice requires the presence of a programming statement in a file named C:\\_DAT\ALARM.SND. (Create this file as an ASCII file using the Memo Editor.)
- To test the volume and sound, press **F3**. To cancel the test, press any key.
- Press **F10** when done (or **ESC** to cancel).

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### Commands for Custom Alarm Programming

Command	Parameters	Meaning
A..G	+ # (sharp) - (flat)	Plays this note in current octave, length, and tempo.
K	0 (disabled) 1 (enabled)	Any keystroke can terminate the alarm sound. Default is 0.
L	1 to 64 (8 is whole, 16 is half, etc.)	Sets length of following notes. Default is 8.
M	N (normal) L (legato) S (staccato)	Playing style. Default is N.
O	0 to 7	Sets current octave. Default is 4.
P	1 to 64	Sets one pause of length <i>n</i> . 64 is shortest.
T	0 to 255	Sets tempo. Higher is faster. Default is 150.
V	0 to 3	Sets volume. Higher is louder.
period		Extends a note's duration by half.
space or comma		Affects readability only.

Parameters follow the commands. For example, the beginning of Mary Had a Little Lamb can be written as:  
T230 K1 EDCDEEE. DDDP10 EGG.

## Deleting or Backing Up a Range of Appointments or Items

You can delete or **extract** (copy to a file) all appointments and to-do items that occur before or after a certain date. Since your appointment records use RAM disk memory (drive C), you should periodically (e.g. quarterly) delete your old appointments to regain RAM disk memory.

### To delete all appointments and to-do items before or after a date:

- 13** This deletes *all* Appointment Book entries for the given period. If you want, you can save the removed items in an **archive** (back-up) file.

1. Press **(MENU)** **(F)** **(R)** (File Remove).

Specify a filename here *only* if you check here.

Remove Items

Remove All Apts, Events, and ToDos:

Before 1/15/1994  Save Removed Items in Archive

After 1/15/1994

Archive to \*.ADB

Directory: C:\\_DAT

Files: APPT.ADB Directories: [A-]  
[B-]

OK Cancel

Dialog Box for File Remove

2. Highlight Before or After and specify the date.
3. If you want to save the deleted items in an archive file, check the appropriate box and specify the name of the archive file.
4. Press **(F10)** when done.



### To back up (“extract”) all items before or after a date:

This copies *all* Appointment Book entries for the given period into another file.

1. Press **MENU** **F** **E** (File Extract).
2. Highlight Before or After and specify the date range.
3. Specify the name of the file in which to save the extracted records.
4. Press **F10** when done.

---

## Limits While Using the Appointment Book

- Maximum number of appointments and to-do items in an Appointment Book file: limited by available RAM disk space. Theoretical maximum: about 3500, if no more than 650 items have multiple occurrences (repeating appointments and to-do items, to-do items with Carry Forward enabled, and/or multiple-day appointments/events).
- Maximum number of data characters per field: the same as the visible length.
- Maximum number of data characters in a Note: 32 KB (about 30 screens).

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---

## Using Multiple Appointment Books

An Appointment Book is actually a file of appointments and to-do items. You can create a separate Appointment Book file if, for instance, you would like to keep a copy of your spouse’s schedule for reference.


If another Appointment Book file exists on another HP 100LX or PC, you can transfer it over the infrared link (between two palmtop computers) or a PC Link to your HP 100LX.

---


### Note





Alarms will sound for the appointments in the current (the open or the last opened) Appointment Book only.


The  File commands are for manipulating different Appointment Book (or other) files. See “Using Multiple Files” on page 17-27 for a discussion of creating, opening, copying, merging, and backing up PIM files.

### **Example: Creating and Using a Second Appointment Book.**

Use one file for your own appointments and to-do lists, and name it MINE.ADB. You can rename your current Appointment Book using the Filer ().


Create a second file for your spouse’s appointments, and name it HIS.ADB. To create a new, separate Appointment Book, use  File New and name it HIS. (The .ADB appears automatically.)


To switch between the MINE.ADB and HIS.ADB Appointment Book files, use  File Open, and specify the name of the file you want.

If you later decide you want to merge separate Appointment Book files, you can do so using  File Merge. (Merge file HIS.ADB into file MINE.ADB, for example.)

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## **Translating an HP 95LX Appointment Book to an HP 100LX Appointment Book**

You can copy an HP 95LX file to the HP 100LX (using the Filer, chapter 4) via the infrared serial port or via a plug-in memory card. The  File Open command in the appropriate application can then read the file.

The  File Open command automatically converts an HP 95LX Appointment Book file to an HP 100LX Appointment Book file. File Open actually copies the file, then translates it to an HP 100LX Appointment Book file, giving it the name you specify (with default file extension .ADB). This operation can take 1 to 3 minutes for an average-sized Appointment Book.

---

## More Appointment Book Examples

**Example: Scheduling Annual Events—Mother’s Day and Daylight Savings Time.** Many holidays and events occur annually at a certain time of the month, but not on a certain date. To schedule Mother’s Day and Daylight Savings Time as repeating appointments, use the Yearly Repeat Option. The Yearly Repeat Option for Mother’s Day is **By Position: 2nd Sunday in May**. The Yearly Repeat Option for the beginning of Daylight Savings Time (U.S. and Canada) is **By Position: 1st Sunday in April**; for the ending of DST, it is **By Position: Last Sunday in October**.

**Example: An Overview of Special Occasions.** To see a month’s overview of your special occasions (events like birthdays), open the Appointment Book and select **VIEW** View All-Events. (To return to the usual display, press **APPT** or **TO-DO**.)

### Example: Displaying Monthly Events Without Appointments.

Since the space for each day in a monthly appointment list is limited, you might choose to have only **events** (occurrences that cover whole days without regard to time) and not appointments show up in the monthly view (**MONTH**). (Times don’t show up in the monthly list anyway.) Select **VIEW** Options Appointment-Defaults. In the field called “Items to See in Month View,” remove the check from the Appointment check box.

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Once you make this change, it becomes the default setting for new appointments.

### Example: Running a Back-up Program “By Appointment”.

You can use an appointment to automatically back up your RAM disk (drive C) to a memory card (in drive A). Set up a repeating appointment to run a batch file called BACKUP.BAT every night at 3 a.m. The program BACKUP.BAT, which you must create, should contain COPY commands for all your subdirectories.

These two commands back up the root directory and the subdirectory `_DAT` from drive C. *This requires that the subdirectory `_DAT` already exists on drive A, too.*

```
COPY C:\*.* A:\*.*
COPY C:\_DAT\*.* A:\_DAT\*.*
:
```

ApptBook:APPT.ADB		Appointment/Event		01/15/94 9:18 am	
Description	Ic:\Nbackup.bat				
Start Time	3:00am	Start Date	1/15/1994		
End Time	4:00am	No. Consecutive Days	1		
Location					
-Alarm		-Views			
<input checked="" type="checkbox"/> Enabled		<input type="checkbox"/> Week <input type="checkbox"/> Month			
Leadtime:	0	Repeat Status: Daily			
Note	Automatically backs up RAM disk nightly.				
Help   Add   Note   Find   Clip   Calendr   Repeat   Cancel   Done					

### Example: Copying from the Phone Book to the Appointment

**Book.** You want to make an appointment to call Jane Nelson, who is listed in the Phone Book. Copy her name and home phone number from the Phone Book to the Description field of the appointment record.

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Use **Clip** in the Phone Book and select the Smart Clip option "Name and Business Phone." Then open up the Appointment Book and an appointment record, make sure the cursor is in the Description field, and press **(Fn)PASTE**.

## Function Keys

What the function keys do depends on whether the current list is an appointment list or a to-do list.

### Function Keys for an Appointment or To-Do List

Key Label	Description
Add	Opens a template to define a new appointment or to-do item.
Note	Shows you the contents of the Note field for the highlighted item.
Find	Searches for the specified text (a character string).
Goto	Changes the current (displayed) date to the one specified.
6 Month	Displays the six-month calendar.
Month	Displays the current month's appointments and events.
Week	Displays the current week's appointments and events.
Appt	Displays the current day's appointments and events.
ToDo	Displays the current day's to-do list.

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### Function Keys for an Appointment or To-Do Record

Key Label	Description
Add	Opens a template to define a new appointment or to-do item.
Note	Provides a full-screen note field.
Find	Searches for the specified text (a character string).
Clip	To copy predefined fields (a Smart Clip) from the Appointment Book to the Clipboard. Also to define new Smart Clips. Smart Clip definitions are also used in Custom Style printing.
Calendr	Displays a small calendar for reference and date entry.
Repeat	Defines a repeat interval for an appointment or to-do item.

---

## Menu Commands

<u>File</u>	<u>Edit</u>	<u>Add</u>	<u>View</u>	<u>Search</u>	<u>Options</u>
New...	Current Item	Appointment	Appointments	Prev Item	Timeline...
Open...	Delete	Event	ToDo List	Next Item	Customize
Copy...	Undo	ToDo	Week	Prev Day	Appointment
Merge...	Cut		Month	w/ Items	View...
Extract...	Copy		6 Month	Next Day	Customize ToDo
Remove...	Paste		Calendar	w/ Items	List View...
Password...	Restore Repeating		All Events	Goto...	Appointment
Print...	Occurrences...		Full Screen	Find...	Defaults...
Exit	Check Off ToDo		Note...	Repeat Last	ToDo Defaults...
				Find	Alarm Beep...
					Set Repeat
					Interval...
					Smart Clip...

## World Time

Press **[&...]** **[T]** to start World Time. World Time is a database of cities, including information about:

- Local time and Daylight Savings Time.
- Location on a map, with latitude and longitude.
- Telephone dialing prefixes.

You can also create your own list of cities, called Custom Cities.

## City Lists

You define this.

If this is ?? : ??, define the local city.

WorldTime:WORLD.WDB		All Cities(1/478)	01/18/94	:42 pm
<b>Local City</b>				
Greenwich	United Kingdom			1:42 pm
<b>All Cities</b>				
*Aarhus	Denmark	✓		2:42 pm
Abadan	Iran			5:12 pm
Abidjan	Ivory Coast, R. of			1:42 pm
Abu Dhabi	United Arab Emirates			5:42 pm
Acapulco	Mexico	✓		7:42 am
Accra	Ghana			1:42 pm
Addis Ababa	Ethiopia			4:42 pm
Adelaide	Australia	*		+12:12 am
Aden	Yemen A.R.			4:42 pm

Current city. **[↑]** and **[↓]** move the highlight bar. **[ENTER]** opens the record.

### List of All Cities (F11)

#### Symbol

\*

+

-

✓

#### Meaning

Daylight Savings Time is on.

Time is tomorrow. (+ next to the city's name means a Note is included.)

Time is yesterday.

City is also in Custom Cities list.

## To open a city's record:

- In a city list, highlight a city and press **ENTER**.

The screenshot shows the 'WorldTime: WORLD.WDB' application window. The title bar includes 'City' and the date/time '01/15/94 11:33 am'. The main window contains several fields: 'City' (Aarhus), 'Country' (Denmark), 'Int'l Access' (009), 'City Prefix' (45 6), 'Category' (ROM), 'Time Offset From' (Hours: 1:00, System, Universal), 'Daylight Savings' (Automatic, European), and 'Location' (Latitude: 55.00, Longitude: -10.3). A 'Note' field is at the bottom. A menu bar at the very bottom includes 'Help', 'Add', 'Note', 'Find', 'Clip', 'Prev', 'Next', 'Locate', 'Cancel', and 'Done'. A line from the text 'A built-in city.' points to the 'City' field. Another line from the text 'Press to see the previous or next city record.' points to the 'Prev' and 'Next' menu items.

A built-in city.

Press to see the previous or next city record.

## A City Record

## To specify your local city:

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Your **local city** is the reference point for the World Time application. It also affects the HP 100LX's clock setting, which is called the **system time**.

1. Press **&... T** to start World Time.
2. Display the list for All Cities or Custom Cities. If not currently displayed, press **F9** (All or Custom).
3. Highlight (by arrowing or using speed-locate, below) the city in the list that you want to make the local city. If the city you want is not in the list, then you can add it. (See "Adding a City," page 14-4.)
4. Press **F7** (→Local) **F10**.
5. If necessary, press **F10** again to update the system time to the time of the new local city. (Or press **F9** to change the time of the local city to the system time instead.)

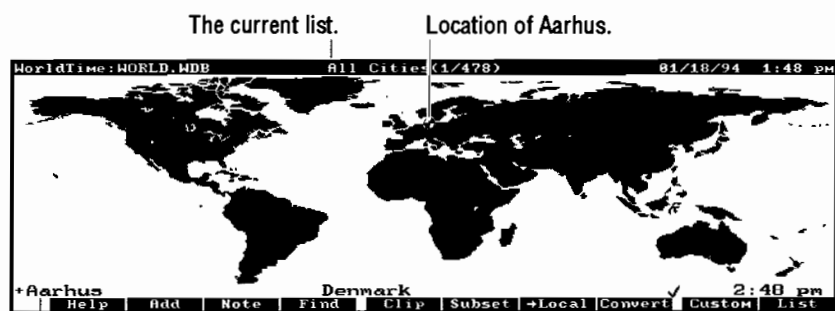


---

## Using the Map

### To see a city on the map:

1. In a city list, highlight the city.
2. Press **(F10)** (Map).
3. To open the city's record, press **(ENTER)**.



Pressing **(↑)** or **(↓)** changes cities.

### Pinpointing a City on a Map (**(Map)**)

To display a list again, press **(F10)** again.

---

## Searching Through and For Cities

### To look up a city (speed-locate):

1. Display a city list. (Press **(ESC)** or **(F10)**, if necessary.)
2. Start typing the name of the city. The list scrolls as you type, highlighting the first matching city.
3. Press **(ENTER)** when done, or arrow to the city you want.

The speed-locate operates as it does in the Database and the Phone Book.

### To find any piece of text in the city records:

1. From a city list or city record, press **F4** (Find).
2. Fill in the box with the characters or text to search for.
3. Optional: Tab to and select the check boxes you want (press **spacebar** to change). One makes the search include the Note fields, and the other discriminates upper from lower case letters.
4. Press **F10** to search forwards from the beginning of the list.
  - Or press **F4** (Next) to search forwards from the current (highlighted) position.
  - Or press **F3** (Previous) to search *backwards* from the current position.

To repeat the search, press **↵** **F4**.

A successful search stops when it finds the first instance of matching text. Either the matching text or the list item containing the matching text will be highlighted, depending on the current display (lists do not display all the text that the full records do, so the matching text might not appear in the list).

If your records include extensive notes in the Note field, you can speed up a search by not checking Include Notes for the search.

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---

## Adding a City to World Time

Since the All Cities list does not include every location in the world, you can add other cities to the list.

### To add a city:

1. In World Time, press **F2** (Add).

WorldTime: WORLD.MDB City 01/18/94 1:47 PM

City  Country

Int'l Access  City Prefix   Custom List

Category

Daylight Savings  
 Yes  No  
 Automatic

Time Offset From  
 Hours   System  Universal

Location  
 Latitude  Longitude

Note

Help | Add | Note | Find | Clip | Prev | Next | Locate | Cancel | Done

2. Fill in the fields. (Use **(TAB)** or **(ALT)+letter** to move among fields.)

**City** and **Country**.

**International Prefix.** Optional. The international telephone access code *out of* this city.

**City Prefix.** Optional. Telephone dialing prefixes to reach this country and city.

**Custom List.** Check this box (press **(spacebar)**) to include this city in the Custom Cities list, as well as the All Cities list.

**Category.** Optional. Includes a list of any categories used for other cities. You can enter a new category or press **(v)** to see the full list and select an existing category. (See "Using the Category Field," page 16-3.) You can categorize the cities in any way you want, and use this information later to view a **subset** of cities. The category "ROM" means that that city record is built into ROM and belongs to the original All Cities list.

**Time Offset From.** Number of hours' difference between this city's time and either the current HP 100LX time ("System") or Greenwich Mean Time ("Universal"). If the offset is *positive*, then the city's time is *later than* System or Universal time; if the offset is *negative*, then the time is *earlier*. The time offset is for *standard time* only, not daylight savings time.

**Daylight Savings.** Can be set to be always on (Yes), always off (No), or to automatically switch. The Automatic schedules available are for North America, Southern Hemisphere, and Europe. (See page 14-10.)

**Location.** Optional. The easiest way to fill this in is to use the **Locate** function (**(F8)**). Use the arrow keys to pinpoint the city's location, then press **(F10)**. (The values shown are degrees and decimal fractions thereof, *not* degrees and minutes.)

**Note.** The Note field provides a large field for any additional information. Pressing **Note** displays a full-screen note.

3. Press **F10** when done. Or press **ESC** to cancel the information.

### Tips:

- If you are adding a series of records, press just **F2** instead of **F10** **F2** between records. This saves the current record *and* opens a new template.
- The fields can hold more than the window displays. Press **▶** or **◀** to view long fields.
- If you don't know a new city's time offset, then look up a city of the same time zone in the All Cities list and note its time difference from Universal time.
- The Category field is useful for categorization and viewing subsets. For example, you could indicate here the official language, and later display a list of Spanish-speaking locales.

**14 Example: Adding a New City.** Add Boeblingen, Germany to the All Cities list. You can use the nearby city of Stuttgart to provide information on time offset, daylight savings time, and location.

#### Keys:

**&...** **T**

**MENU** **V** **A**

stu

**ENTER** **ENTER**

**F2**

Boeblingen **TAB**  
Germany

#### Description:

Starts World Time.

If necessary, displays All Cities list.

Goes to and highlights Stuttgart.

Displays the record for Stuttgart. Note that the time offset is 1 hour from Universal time and the Daylight Savings setting is Automatic (European).

Opens a blank template to add a city.

**TAB** 00 **TAB**  
49 7031

The international access code *out of* Germany and the dialing prefix *into* Boeblingen.

**TAB** **spacebar**

Includes Boeblingen in your Custom Cities.

**TAB** **TAB** 1 **TAB**  
**▶**

Sets Time Offset to 1 hour after Universal.

**TAB** **TAB** **▼**

Sets Automatic DST, European schedule.

**TAB** **F8**

Displays the map with crosshairs.

*arrow keys*

Set the crosshairs over southern Germany.

**F10** **F10**

Saves the record for Boeblingen. The checkmark in the list means that Boeblingen is also in Custom Cities.

---

## Editing or Deleting a City

### To edit (change) a city:

1. Display a city list: if necessary, press **F9** (Custom or All).
2. Highlight the city you want to edit.
3. Press **ENTER** to open the record.
4. Edit the field(s). (Use **TAB** or **ALT**+underlined letter to move among fields.)
  - To clear a field, highlight it and press **DEL**.
  - To restore a field's previous contents, press **ESC**.
5. Press **F10** to save your changes. Or press **ESC** to cancel them.

### To restore the original version of an edited city:

You can restore the original version of a city that you have edited, if the city belongs to the original All Cities list.

1. In a city list, highlight the edited city you want to restore.
2. Press **DEL**. This deletes the edited version and restores the original one.

## To delete an added (non-ROM) city:

You can delete a city that you have added. You *cannot* delete a built-in (ROM) city (although you can modify its record).

1. Display a city list: if necessary, press **F9** (Custom or All).
2. Highlight the city to delete.
  - If you want to delete several cities, select each one by highlighting it and then pressing **spacebar**.
3. Press **DEL**. This deletes the city record from *both* city lists.

To restore the just-deleted city(s), press **MENU** **E** **U** (Edit Undo).

## Creating Your Own City List (Custom Cities)

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The Custom Cities list is for you to define your own list of cities. You can compile this list by checkmarking cities in the All Cities list or by checking the Custom List box in a city's record.

Press **F9** (Custom) to display your Custom Cities List.

WorldTime:WORLD.WDB		Custom Cities(1/25)		11/16/93 11:00 am	
Local City		Greenwich		United Kingdom 11:00 am	
Custom Cities					
Aarhus	Denmark	✓		12:00	pm
Baghdad	Iraq	✓		2:00	pm
Cadiz	Spain	✓		12:00	pm
Dakar	Senegal R.	✓		11:00	am
Easter Is.	Chile	*	✓	6:00	am
Faisalabad	Pakistan	✓		4:00	pm
Gaborone	Botswana	✓		1:00	pm
Haifa	Israel	✓		1:00	pm
Indianapolis, IN	USA	✓		6:00	am

A List of Custom Cities (Custom)

## To put a city in the Custom Cities list:

1. Display the All Cities list (press **ALL**, if necessary).
2. Highlight the city you want to put in the Custom Cities list.
3. Press **+**. This places a checkmark after the name, indicating that this city is now in the Custom Cities list, as well.

Albuquerque, NM                      USA                      ✓                      12:19 pm

If a city you want is not in the All Cities list, then you can add it as explained on page 14-4. Check the Custom List box.

### To remove a city from the Custom Cities list:

1. Display a city list: if necessary, press **F9** (or **MENU** View All-Cities).
2. Highlight the city to remove. (Remember that a custom city appears with a checkmark in the All Cities list.)
3. Press **-**.

---

## Converting Times Across Time Zones

Time conversions let you pick any time in a city and find out the corresponding time elsewhere. For instance, you can find out what time it is here when it is 5:00 p.m. in Barcelona. Actually, you can see what time it is *in any city* when it is 5:00 p.m. in Barcelona.

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### To specify a time in a city and temporarily convert the time for all other cities:

1. Select the city: either highlight it in a city list or display it on the map.
2. Press **F8** (Convert).
3. Type in the time as *hours.minutes*. (A period serves as well as a colon.) In the 12-hour time format, typing **a** indicates a.m., **p** p.m.

Time Conversion

Enter a time for the city below  
to see what the corresponding  
times are around the world.

City : Barcelona

Time 5:00pm

OK

Cancel

4. Press **F10**. This displays the corresponding times in your local city and in all other cities. A + before the time means the time is *tomorrow*, while a - means the time is *yesterday*.
5. Press **ESC** to return to the normal display (current times).

---

## About the Settings for Daylight Savings Time

The three daylight savings time (DST) settings are:

- **Yes:** For locations that are always on DST. Also for cities that are currently on DST, but will go off it on an irregular schedule. (You then change the setting yourself.)
- **No:** For locations that do not use DST. Also for cities that are currently off DST, but will go onto it on an irregular schedule. (You then change the setting yourself.)
- **Automatic:** For locations that go onto and off of DST on a regular schedule. These schedules are provided:
  - Northern:** The schedule used in most of North America (first Sunday in April to last Sunday in October).
  - Southern:** The schedule used in most of the southern hemisphere (last Sunday in October to first Sunday in March).
  - European:** The schedule used in most of Europe (last Sunday in March to Last Sunday in September).
  - None:** The same as No DST.

---

### Note



For convenience' sake, some countries have an Automatic DST setting even if their schedule does not exactly match the defined one. This is because of the convenience of having the time changes automatic, and also because some of these schedules are changeable. For example, the DST schedule for the United Kingdom is currently March (last Sunday) to October (last Sunday) instead of March to September, but the World Time city records use DST Automatic (European). If you prefer, you can change the setting and keep track yourself of the DST transitions.

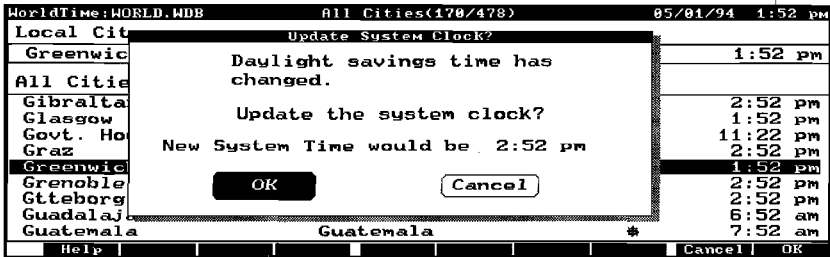
---

## How the Automatic DST Setting Affects the Local City

If you select the Automatic setting, the transitions into and out of daylight savings time can be automatic. When the time comes, the World Time application will prompt you before actually changing the system clock (whose time appears in the upper right corner) and the Local City's time.



## System time.



- Selecting “OK” will update the time automatically.
- Selecting “Cancel” will leave the system time unchanged, in case you have already changed it or you wish to change it at a different time.

## Note

To see this notification, you must open World Time.



## A Shortcut for Changing the DST Setting

If you want to change the DST setting for several cities, it is faster to use this shortcut than to change the city’s record.

- Display a city list and highlight the city.
- Press **[\*]** to change the setting. **[\*]** cycles through the three settings: Yes (Y), No (N), and Automatic (A).
- Repeat for the next city. The change is made to the city’s record, and so it affects both city lists (All Cities and Custom Cities).

## Using Subsets of the City List

Using **Subset**, you can display a **subset** of the All Cities list that meets any criteria you specify. For example, you could display just those cities in a certain country. Or just those cities that don't use daylight savings time.

To define and view subsets, follow the instructions under "Defining Subsets of a Database," page 17-13.

**Example: To Define the Subset: All Cities in Mexico.** Create a subset that displays all the cities in Mexico.

1. Press **(F6)** (Subset) **(F2)** (Define). Fill in just the Country field, leaving all other fields neutral. (The dimmed Custom List check box is neutral.)

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Define Subset

City  Country

Int'l Access  City Prefix   Custom List

Category

Time Offset From

Hours   System  Universal

Daylight Savings

Yes  No

Automatic

Location

Latitude  Longitude

Note

Help | General | Cancel | OK

The Subset Definition: Cities in Mexico

2. Press **(F10)**, name the subset, then view it: Mexico **(F10)** **(F10)**.

Name of subset.

WorldTime:WORLD.WDB Mexico(1/17) 01/18/94 1:57 pm		
Local City		
Greenwich	United Kingdom	1:57 pm
Mexico		
Acapulco	Mexico	7:57 am
Campeche	Mexico	7:57 am
Cancun	Mexico	7:57 am
Ciudad Victoria	Mexico	7:57 am
Durango	Mexico	7:57 am
Ensenada	Mexico	5:57 am
Guadalajara	Mexico	7:57 am
Hermosillo	Mexico	6:57 am
La Paz	Mexico	6:57 am

Help | Add | Note | Find | Clip | Subset | +Local | Convert | All | Map

The List of Cities in Mexico

3. To display the All Cities list again, press **F9**.

---

## Copying or Moving Information

### Using the Clipboard to Copy or Move

You can use the Clipboard functions to copy and move information within World Time, as well as to and from other applications.

#### To copy or move the contents of a field:

1. Open the desired city record and tab to the desired field.
2. Press **Fn**COPY (to copy) or **Fn**CUT (to move).
  - To copy just part of the text in a field, select the range of text first (by pressing **↑**+arrow key).
3. Open the destination record, if different. (It can even be in a different application.)
4. Highlight the destination field.
5. Press **Fn**PASTE.

#### To copy a city's record:

You might want to copy a record, for instance, when creating a new one similar to an existing one. You can also copy the text of a record into a memo or a Note field.

1. Display a city list: if necessary, press **F9** (Custom or All).
2. Highlight the record you want to copy.
3. Press **Fn**COPY.
4. Press **Fn**PASTE.

### Smart Clip: Copying Multiple Fields from Records

Smart Clip uses the Clipboard to copy formatted information quickly from *predefined fields* in the current application to another location.

**Clip** provides predefined choices of fields to copy, and lets you define others yourself. You can also control the **formatting** (the lay-out) of Smart Clip fields. The only predefined Smart Clip from World Time is "All fields".

Instructions for clipping information appear on page 17-18, "Smart Clip: Copying Multiple Data Fields from Records."

---

## Limits While Using World Time

- Maximum number of cities in a list: limited by available RAM disk space. Theoretical maximum: about 5,000. (All Cities list has about 480 cities to begin with.)
- The association of some cities with certain countries is currently in flux, such as in eastern Europe and the former Soviet Union. The countries given in World Time were correct at the time of this writing, but could change. You can edit a city's record if its country changes.
- The latitude and longitude values are accurate to one-third of a degree. The values are given with decimal fractions of a degree, rather than minutes.
- Maximum number of data characters in a Note: 32 KB (about 30 screens).

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## More World Time Examples

**Example: Time Conversions.** Suppose you want to place a business call to Bombay no later than 6:00 p.m. local Bombay time. To quickly determine what time that is in your locality, highlight Bombay, press **F8** (Convert), enter 6:00 p.m., and press **F10**. (Press **ESC** when done.)

Suppose a reverse case: you want to know what time it is in Bombay when it is 6:00 p.m. your time. Since you cannot highlight the Local City box, highlight the same city in the list, or highlight a nearby city in the same time zone. Then press **F8**, enter 6:00 p.m., press **F10**, and highlight Bombay. (Press **ESC** when done.)

**Example: Displaying a Subset of the City List: EEC Cities.**

Create a subset of the city list that displays only those cities *in your Custom Cities list* that are in countries belonging to the European

Economic Community. This requires that each relevant city's Category field indicates "EEC" if it belongs.

Using **Subset**, fill out the Subset Specification screen as follows:

Define Subset

City  Country

Int'l Access  City Prefix   Custom List

Category **EEC**

Daylight Savings  
 Yes  No  
 Automatic **None**

Time Offset From  
Hours   System  Universal

Location  
Latitude  Longitude

Note

Help | General | Cancel | OK

### Example: Changing the DST Setting for All the Cities in Egypt.

The daylight savings time schedule for Egypt is approximately the first Sunday in May to the last Sunday in September. Although this does not exactly match the European schedule (which runs March to September), the Egyptian cities in the All Cities list have been assigned the DST setting for Europe for the convenience of automatic time changes. Suppose you want to change all Egyptian cities' daylight savings time from the Automatic (European) setting to On (or Off, depending on the time of year).

To view a list of Egyptian cities, define a subset that displays cities in Egypt. One at a time, highlight each city in that list and press **\*** to quickly change its DST setting as needed. (Another way to effect these changes would be to **Find** each city containing "Egypt" and then press **\***, or open each record and change the DST setting.)

# Function Keys

## Function Keys for a City List or Map

Key Label	Description
<b>Add</b>	Opens a template to define a new city.
<b>Note</b>	Displays the full-screen Note for the highlighted city.
<b>Find</b>	Searches for the specified character string (letters or other characters).
<b>Clip</b>	To copy predefined fields (a Smart Clip) from World Time to the Clipboard. Also to define new Smart Clips. Smart Clip definitions are also used in Custom Style printing.
<b>Subset</b>	To display and/or define a specified subset of the city list. See “Defining Subsets of the Database,” page 17-13.
<b>+Local</b>	Sets the highlighted city as the local city.
<b>Convert</b>	Converts times across time zones.
<b>Custom</b>	Displays the Custom Cities list. (Toggles with <b>All</b> .)
<b>All</b>	Displays the All Cities list. (Toggles with <b>Custom</b> .)
<b>Map</b>	Displays the map if a list is visible. (Toggles with <b>List</b> .)
<b>List</b>	Displays the current list if the map is visible. (Toggles with <b>Map</b> .)

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## Function Keys for a City Record (an Item)

Key Label	Description
Add	Opens a template to define a new city.
Note	Displays the full-screen note field for this record.
Find	Searches for the specified character string (letters or other characters).
Clip	To copy predefined fields (a Smart Clip) from World Time to the Clipboard. Also to define new Smart Clips.
Prev	Displays the previous city's record.
Next	Displays the next city's record.
Locate	Pinpoints the location of the current city on the map. Moving the cross hairs changes the latitude and longitude specified for the current city.

## Menu Commands

### File

Merge...  
Extract...  
Password...  
Print...  
Exit

### Edit

Current Item  
Add New Item  
Delete  
Undo  
Cut  
Copy  
Paste  
Select Item  
Select All/None

### View

City List  
Map  
Custom Cities  
All Cities  
Subset...  
Sort...  
Arrange Columns...  
Full Screen Note...

### Search

Find...  
Repeat Last Find  
Prev Item  
Next Item

### Options

Set Local City...  
Add to Custom Cities  
Remove from Custom Cities  
Time Conversions...  
Locate City...  
Smart Clip...



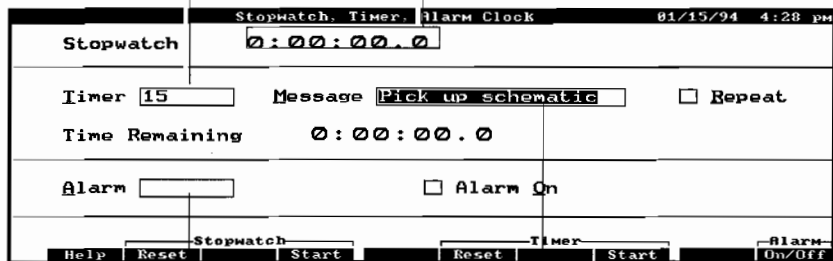


## The Stopwatch

Press **[&...]** **[W]** to start the Stopwatch application.

Countdown time in minutes  
(or hours:minutes).

Time elapsed for stopwatch.



Clock time for alarm.

Optional. Displayed when  
countdown time = zero.

### The Stopwatch, Countdown Timer, and Alarm Clock

The Stopwatch application has three parts:

- **The Stopwatch** can measure elapsed time up to 24 hours.
- **The Countdown Timer** counts down from the given time to zero, at which point it beeps and displays a message, regardless of the application that is open.
- **The Alarm Clock** beeps at the specified time and displays The Alarm Clock has gone off, regardless of the application that is open.

### To use the Stopwatch:

1. Press **[&...]** **[W]** to start the Stopwatch application.
2. Press **[F2]** to reset the time to zero, if necessary.

3. Press **F4** to start time counting.
4. Press **F4** to stop time counting. (Press **F4** again to continue counting.)

If the stopwatch reaches 24 hours, it resets itself to zero and continues to run.

### To use the Countdown Timer:

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1. Press **R...** **W** to start the Stopwatch application.
2. In the Timer field, enter the number of minutes (or *hours:minutes*) to count down.
3. Optional: tab to the Message field and enter a message to be displayed when the countdown reaches zero. The default message is *The Timer has reached zero.*
4. If you want the Timer to continue repeating the countdown until you stop it, tab to the Repeat check box and select it by pressing **spacebar**.
5. Press **F8** to start the countdown.
6. Press **F8** to stop the countdown, if necessary.
7. Press **ENTER** or **ESC** to erase the message at the end of the countdown.

The countdown either stops at zero or continues counting negatively, depending on the setting of **MENU** **T** **Z** Timer Stop-Timer-at-Zero.

### To stop the Countdown Timer automatically at zero (instead of counting negative time):

This is a setting that remains in effect until you change it.

- Press **MENU** **T** **Z**. This places a checkmark next to the setting command.

Repeat these steps to un-check the setting, letting the Timer count negatively past zero.

### To stop the Countdown Timer at any time:

1. Press **F8**.
2. Press **F6** to reset the Timer's countdown time as specified. (This does not *start* the countdown.)

**Example: Using the Countdown Timer.** Set the timer for 15 minutes to remind you to pick up a schematic you're printing.

**Keys:**

**Description:**

**[&...]** **[W]**

Opens the Stopwatch application.

**[MENU]** **[T]**

Check that the setting "Stop Timer at Zero" is checked.

**[ESC]** **[ESC]**

Cancels menu bar. (Or: press **[Z]** to add the checkmark to the setting.)

**[ALT]+[T]**

Highlights the Timer field.

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Sets the timer for 15 minutes.

**[TAB]** Check the printer.

Tabs to the Message field and enters the reminder to check the printer.

**[F8]**

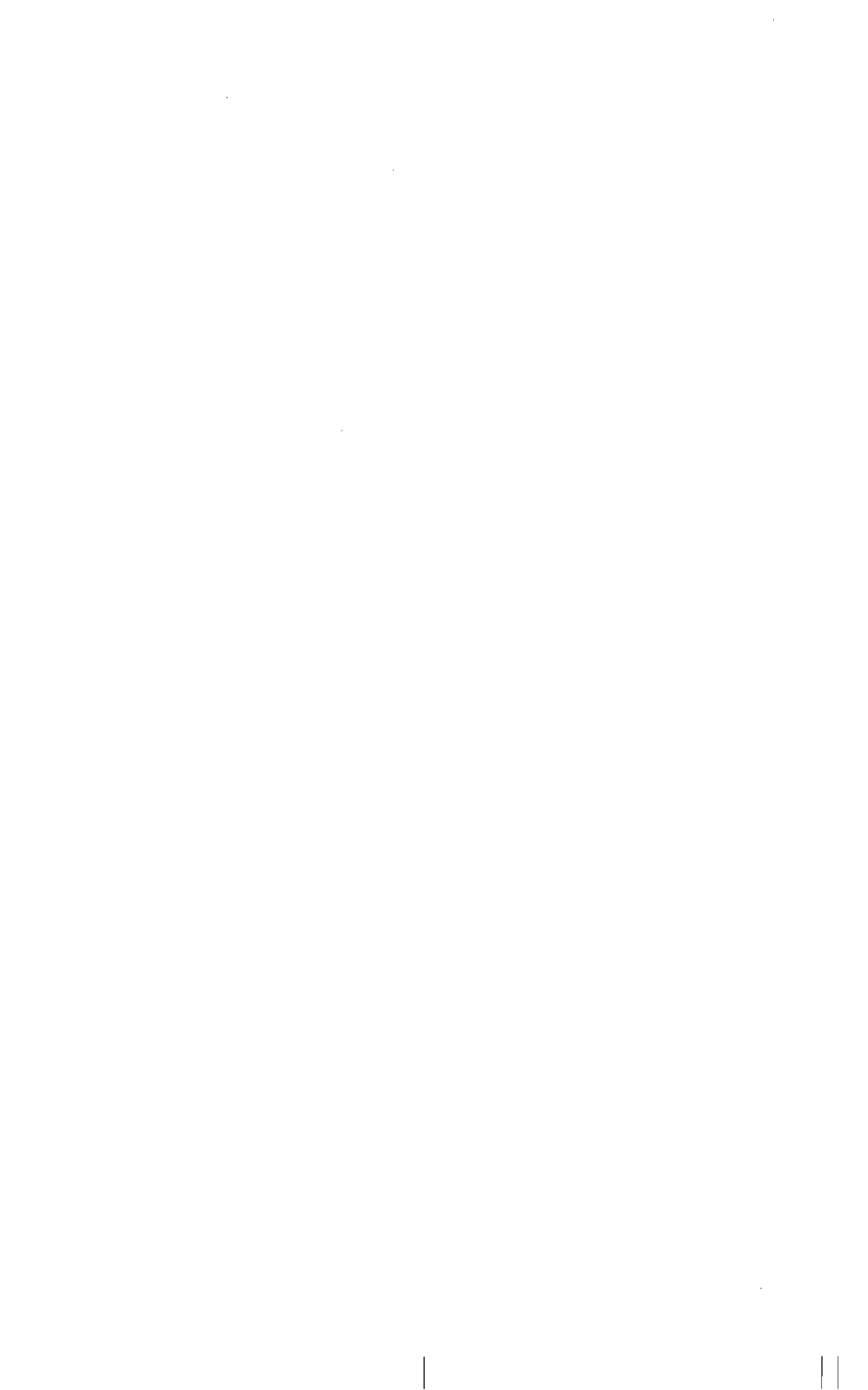
Starts the countdown.

**To use the Alarm Clock:**


1. Press **[&...]** **[W]** to start the Stopwatch application.
2. Press **[ALT]+[A]** (simultaneously) and enter the clock time for the alarm.
3. Press **[F10]** to set the alarm. This checks the Alarm On check box.

When the alarm goes off, press any key to stop the alarm.

To cancel an alarm that is set, press **[F10]**. This removes the check from the Alarm On check box.



## The Phone Book

Press  to start the Phone Book.

The Phone Book is a database that has been defined to hold records of people or businesses. All you do is enter their names, phone numbers, and so on, into the appropriate **fields**.

### Note



To define a new type of database (with different types of fields), use the Database application.

Current record.  and  move the highlight bar.  opens the phone record.


Today's date and time.

Phone:PHONE.PDB	All Phone Book Items(6/12)		01/16/94 10:10 am
Name	Business	Home	
Blascow, Stan	(812) 555-0987	(812) 555-6543	
Evott, Eric	700-1111	701-0001	
Gilbert, Jean	800-1234	800-4321	
Grouch, Oscar	(800) 123-4567	(800) 123-1234	
Gray, Andy	(416) 700-7634	(416) 555-7634	
Harding, John W.	701-0011	710-1000	
Johnson, Bill	701-2127	710-1272	
Kaser, Everett	(206) 555-5676	(206) 555-0123	
Megowan, Pat	(212) 555-8761	(212) 555-8866	
Roy, Diana	555-0987	(311) 554-6543	
Wechsler, Susan	801-5457	801-0100	
Winter, Lynn	901-5538	901-0010	

Help | Add | Note | Find | Clip | Subset | Sort | Columns | Open

### A Filled Phone Book List

To open a phone record:

- In the phone list, highlight an item and press .

These fields appear in the phone list as the columns Name, Business, and Home.

Phone: PHONE.PD	Phone Item	01/16/94 10:11 AM
Name	Harding, John W.	
Phone: Business	701-0811	Home 710-1000
Alternate		Fax
Title	Balladeer	Category
Company	Volk Musik	
Address1	123 Memory Lane	
Address2		
City	Sublimity	State OR Zip 97385
Note		
Help	Add	Note Find Clip Prev Next Cancel Done

For additional information.

Press to see the previous or next record.

### A Phone Book Record

## 16 Creating Phone Book Records

### Adding Records

To add a phone record:

1. In the Phone Book, press **F2** (Add).
2. Fill in the fields. (Use **TAB** or **ALT**+letter to move among fields.)
  - a. Some fields can hold more than the window shows. Press **▶** or **◀** to view long fields.
  - b. The Note field provides a large field for any additional information. Pressing **Note** displays a full-screen note. If you include a note in the record, the item will have a + next to it in the Phone list at the left edge of the display.
  - c. The Category field includes a list of any categories used for other records. See "Using the Category Field," page 16-3.
3. Press **F10** when done or press **F2** to open a new record. Or press **ESC** to cancel the information.

## Using the Category Field

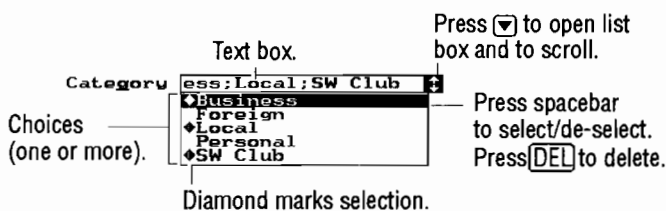
A **category field** is a list box that is editable and allows *multiple selections*. For instance, you can compose the multiple category “Business;SW Club;Local”.

The list box maintains a list of all possible categories used in other records; you select from the list (or add to it) the category choice(s) you want for each individual record, if any.

Information in the Category field of a record is often used to define a **subset**. The Phone Book has two built-in (predefined) categories in the Category field: “Business” and “Personal”. You could specify one of these categories in each record to distinguish between business and personal Phone Book records.

### To use a Category list box:

- To open a category list box, tab to it (or press **ALT**+**G**) and press **▼**.
- To make a selection from the choices given, highlight the choice and press **spacebar**. The choice will be added to the text box. A semi-colon separates multiple selections in the text box.
- To remove a selection, highlight the choice and press **spacebar** again.
- To close a category list box, press **ALT**+**▲** or **ESC**.



**An Open Category Box**

### To edit a category list box:

- To add a category choice to the list, close the list box and type the new entry.
- To delete a category choice from the list, highlight it and press **DEL**.

- To de-select a category choice, highlight it in the list and press **spacebar**.

---

## Editing or Deleting Records

### To edit (change) a phone record:

1. Display the phone list.
2. Highlight the item you want to edit.
3. Press **ENTER** to open the phone record.
4. Edit the field(s).
  - To clear a field, highlight it and press **DEL**.
  - To restore a field's previous contents, press **ESC**.
5. Press **F10** to save your changes. Or press **ESC** to cancel them.

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### To delete a phone record:

1. Display the phone list.
2. Highlight the item to delete.
  - If you want to delete several items, select each one by highlighting it and then pressing **spacebar**.
3. Press **DEL**.

### To restore the last deleted or edited record(s):

- Press **MENU** **E** **U** (Edit Undo) before doing another operation.

### To erase a phone book:

1. Display the phone list.
2. Press **MENU** **E** **A** (Edit Select-All) to select all the records.
3. Press **DEL** **F10** to delete them.

This deletes all the records from the current Phone Book file.



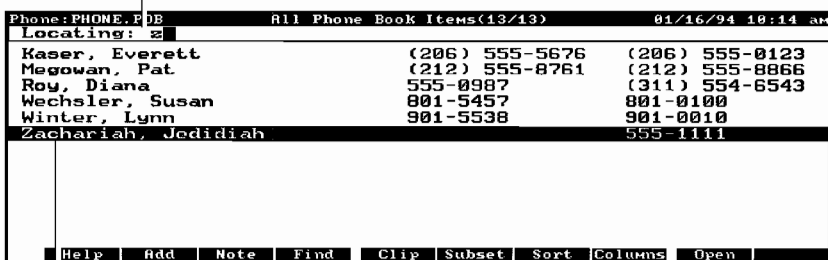
## Searching the Phone Book

You can casually scan the Phone Book by scrolling through the phone list (**▲**, **▼**) or by looking through sequential phone records (**Next**, **Prev**). For specific searches, use speed-locate (for a name) or Find (for text anywhere).

### To look up a name (speed-locate):

1. Display the phone list.
2. Start typing the name. The list scrolls as you type, highlighting the first matching item.
3. Press **ENTER** when done, or arrow to the name you want.

Searches for 'z.' Pressing **ENTER** or an arrow ends the search.



Phone:PHONE.PDB		All Phone Book Items(13/13)		81/16/94 10:14 am	
Locating: z					
Kaser, Everett	(206) 555-5676	(206) 555-0123			
Megowan, Pat	(212) 555-8761	(212) 555-8866			
Roy, Diana	555-0987	(311) 554-6543			
Wechsler, Susan	801-5457	801-0100			
Winter, Lynn	901-5538	901-0010			
Zachariah, Jedidiah		555-1111			

Help | Add | Note | Find | Clip | Subset | Sort | Columns | Open

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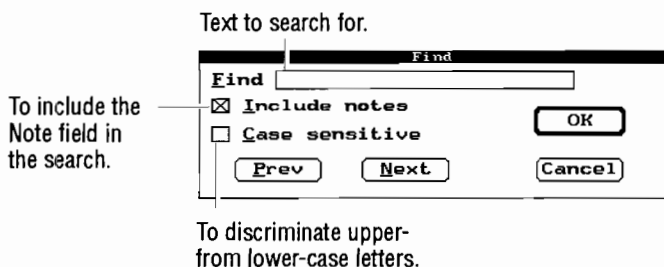
First match found.

### A Speed-Locate Search

Speed-locate searches the first field of the Phone Book, which is Name—unless you have rearranged the columns.

### To find any piece of text:

1. While displaying a phone list or record, press **F4** (Find).
2. Fill in the box with the characters or text to search for.
3. Optional: Tab to and select the check boxes (press **spacebar**) to change) for the search options:



4. Press **(F10)** to search forward from the beginning of the list.
  - Or press **(F4)** (Next) to search forward from the current (highlighted) position.
  - Or press **(F3)** (Previous) to search *backward* from the current position.

**16** To repeat the search, press **(↑) (F4)**.

A successful search stops when it finds the first instance of matching text. Either the matching text or the list item containing the matching text will be highlighted, depending on the current display (lists do not display all the text that the full records do, so the matching text might not appear in the list).

If your records include extensive notes in the Note field, you can speed up a search by not checking Include Notes for the search.

---

## Using Subsets of the Phone Book

The **Subset** function displays a specified subset of your Phone Book. You determine the subset by filling out data fields according to the contents you want to select for. For example, you could create a Phone Book subset of all business contacts that work for company XYZ by selecting all phone records that have XYZ in the Company field.

Defining subsets does not affect the original, complete list of records. The Subset function does *not* create new or separate databases. It

defines and displays a *subset of the current database*. Subsets have names, but they are not separate files.

For complete instructions on defining and viewing subsets, see “Defining Subsets of a Database” on page 17-13 in the Database chapter. (The Phone Book is a type of database.)

### Function Keys for Defining Subsets (Subset)

Key Label	Operation
Define	To define a new subset by filling in data fields.
Rename	To rename the highlighted subset.
Edit	To edit the highlighted subset.
Delete	To delete the highlighted subset.

For more options and flexibility in defining subsets, you can use **Subset Define General** and type in a selection statement. For information, see appendix D, “The Subset Selection Language.”

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### To display the complete phone list again:

1. While displaying the list, press **F6** (Subset).
2. Highlight “All Phone Book Items”.
3. Press **F10**.

**Example: Displaying a Subset of the Phone Book.** Define a subset of your current Phone Book that displays all foreign phone records. Assume all foreign records include the access code (011) in the Business and Home phone fields. Save this subset under the name “International.”

#### Keys:



**F6** **F2**

**TAB** (011)

**TAB** (011)

#### Description:

Opens the Phone Book.

Opens the Define Subset screen, which is identical to the phone record’s template.

Highlights the Business phone field and fills in the international access code.

Fills in the Home phone field, also.

- (F10)** International      Names this subset “International”.
- (F10)**
- (F10)**                      Saves and displays the subset.
- (F6)** **(▲)** ... **(F10)**      Selects and displays the original phone list (“All Phone Book Items”).

**Example: Using the Category Field to Define Subsets.** Create a personal phone list and a business phone list by defining two subsets based on each record’s Category field.

For a record to appear in one of these lists, it must contain “Personal” or “Business” in its Category field. If a record belongs in *both* categories, then select (press **(spacebar)**) both categories.

The subset definition (**Subset Define**) for the personal phone list would look like this:

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**Define Subset Screen for a Personal Phone List**

Name this subset “Personal” and a corresponding one “Business”.

When you want to display one of these subsets, press **Subset**, highlight the subset name, and press **(F10)**. (To display the original list again, select the subset named All Phone Book Items.)

---

## Copying or Moving Information

### Using the Clipboard to Copy or Move

You can use the Clipboard functions to copy and move information within the Phone Book, as well as to and from other applications.

#### To copy or move the contents of a field:

1. Display the phone list and highlight the desired item.
2. Open the phone record and tab to the desired field.
3. Press **[Fn]COPY** (to copy) or **[Fn]CUT** (to move).
  - To copy just part of the text in a field, select (hold **[↑]** and press an arrow key to highlight) the range of text first.
4. Open the destination field, if different. (It can even be in a different application).
5. Highlight the destination field.
6. Press **[Fn]PASTE**.

#### To copy a phone record:

You can copy a record within the same Phone Book file or to another HP 100LX Phone Book file. You might want to copy a record, for instance, when creating a new one similar to an existing one. You can also copy the text of a record into a memo or a Note field.

1. Display the phone list and highlight the record you want to copy.
2. Press **[Fn]COPY**.
3. If you want to copy to a different Phone Book file, open that file (**[MENU]** File Open) and display its list.
4. Press **[Fn]PASTE**. The new record will be sorted with the other records.

### Smart Clip: Copying Multiple Fields from Records

Smart Clip uses the Clipboard to copy formatted information quickly from *predefined fields* in the current application to another location. You might want, for example, to quickly copy names and phone numbers from the Phone Book to the Description field of an appointment.

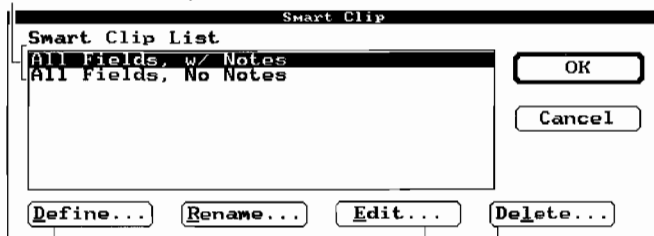
Smart Clip (**Clip** on **F5**) provides predefined choices of fields to copy, and lets you define others yourself. You can also control the **formatting** (the layout) of Smart Clip fields. The predefined Smart Clips from the Phone Book are:

- All fields.
- Name and Business Phone.
- Name and Address.

### To clip information from the Phone Book:

1. In the Phone Book, select the record(s) whose information you want to clip:
  - To select one record, highlight that entry in the phone list.
  - To select more than one record, mark each desired record by highlighting it in the list and pressing **spacebar**.
  - To select (or de-select) all records in the current list, press **CTRL** **E** **A**. (Clipboard Error results if there is not enough Clipboard memory to clip all the names.)
2. Press **F5** to display the Smart Clip list.
3. Highlight the Smart Clip you want and press **F10**.

Names of Smart Clip definitions.



To define your own Smart Clips.

To edit or delete Smart Clips.

4. Open the memo or record into which you'd like to copy this information. This can be in another application.
5. Tab to the text field that should receive this information. A *text field* includes any part of a memo, as well as fields in other applications that are meant for entering text, like an appointment Description or a Note field.

6. Press **Fn** PASTE.

**Example: Clipping from the Phone Book to the Appointment Book.** You are making an appointment to call Jane Nelson. Clip her name and business phone number from the Phone Book and copy them to the Description field of a new appointment record.

**Keys:**



**F2** Call



nel **ENTER**

**F5** **F10**



**Fn** PASTE

... **F10**

**Description:**

Opens the Appointment Book. *Display an appointment list or record, not a to-do list.*

Opens a new template to add an appointment, and enters the beginning of the appointment's description ("Call").

Opens the Phone Book.

Automatically locates and highlights Nelson, the first name that starts with "Nel". (Assuming that last names are first, and that no other name begins with "Nel".)

Selects the Smart Clip "Name and Business Phone" to clip, and saves this information for Jane Nelson in the Clipboard.

Opens the appointment record again.

Copies Jane Nelson's name and home phone into the rest of the Description field.

Finish entering the appointment.

**To define a new Smart Clip or edit an existing one:**

You can define your own Smart Clips for each application. See "To define your own Smart Clip," page 17-19. You can also edit any existing Smart Clip, whether you created it or it was built in. See "To edit an existing Smart Clip," page 17-22.

---

## Sorting and Rearranging a Phone List

You can change the sorting method for the phone list using the **Sort** function. The methods are explained in the Database chapter under “Sorting Data Lists,” page 17-23.

You can rearrange the appearance of the phone lists by rearranging the columns using the **Columns** functions. The methods are explained in the Database chapter under “Rearranging the Columns in Data Lists,” page 17-24.)

---

## Using Multiple Phone Books

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You can create more than one Phone Book file, thereby creating more than one phone list in this application. The **File** commands are for manipulating different Phone Book (or other) files. See “Using Multiple Files” on page 17-27 for a discussion of creating, opening, copying, merging, and backing up PIM files.

### Translating a HP 95LX Phone Book to an HP 100LX Phone Book

You can copy an HP 95LX file to the HP 100LX (using the Filer, chapter 4) via the infrared serial port, a serial cable, or a plug-in memory card. The **File Open** command in the appropriate application can then read the file.

The **File Open** command automatically converts an HP 95LX Phone Book file to an HP 100LX Phone Book file. File Open actually copies the file, then translates it to an HP 100LX Phone Book file, giving it the name you specify (with default file extension .PDB). This operation should take less than 1 minute for an average-sized Phone Book.

Since the two types of phone records do not have exactly the same fields, this is how the information will be distributed:



### Phone Book Translation

HP 95LX Field	becomes	HP 100LX Field
Name		Name
Phone		Business Phone
Address		Note

If you want, you can then use the Clipboard functions (**Fn** CUT and **Fn** PASTE) to move the information from one HP 100LX field (like Note) to another (like Address1).

---

## Limits While Using the Phone Book

- Maximum number of records (items) in a Phone Book file: limited by available disk space. Theoretical maximum: about 5,000.
- Maximum number of data characters per text field:  $1\frac{1}{2}$  times the visible length, but not less than 10.
- Maximum number of data characters in a Note: 32 KB (about 30 screens).

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## More Phone Book Examples

**Example: Displaying Selected Parts of a Phone List.** Define a subset of your phone list to display only those records that are business contacts in Quebec (PQ) and Ontario (ON). To be able to do this, each record's Category field must indicate "Business" or "Personal."

Using the **Subset** function, fill out the Define Subset screen as follows:



The sought text.

Phone: PHONE.PDB		Phone Item		01/16/94 12:17 pm	
Name	Studio 200				
Phone:	Business	750-1000	Home		
	Alternate		Fax		
Title	Marilee Johansen		Category	Business Hair	
Company					
Address1	200 Second St.				
Address2					
City		State		Zip	
Note					
Help   Add   Note   Find   Clip   Prev   Next   Cancel   Done					

### The Record

If you know for sure the Name field of the item you're searching for, then it is faster to use the speed-locate function. (Just start typing the name.)

## Function Keys

### Function Keys for the Phone List

Key Label	Description
Add	Opens a template to define a new Phone Book record.
Note	Displays the full-screen Note for the highlighted item.
Find	Searches for the specified character string (letters or other characters).
Clip	To copy predefined fields (a Smart Clip) from the Phone Book to the Clipboard. Also to define new Smart Clips. Smart Clip definitions are also used in Custom Style printing.
Subset	To display and/or define a specified subset of the phone list. See "Defining Subsets of the Database," page 17-13.

### Function Keys for the Phone List (continued)

Key Label	Description
Sort	Specifies how to sort the records for the list. See "Sorting Data Lists," page 17-23.
Columns	Specifies how many columns appear in a list, how wide they are, and which fields they display. See "Rearranging the Columns in Data Lists," page 17-24.
Open	To open a different Phone Book file.

### Function Keys for a Phone Record (an Item)

Key Label	Description
Add	Opens a template to define a new Phone Book record.
Note	Displays the full-screen note field.
Find	Searches for the specified character string (letters or other characters).
Clip	To copy predefined fields (a Smart Clip) from the Phone Book to the Clipboard. Also to define new Smart Clips.
Prev	Displays the previous record.
Next	Displays the next record.

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## Menu Commands

### **File**

New...  
Open...  
Copy...  
Merge...  
Extract...  
Password...  
Print...  
Exit

### **Edit**

Current Item  
Add New Item  
Delete  
Undo  
Cut  
Copy  
Paste  
Select Item  
Select All/None

### **View**

Subset...  
Sort...  
Arrange Columns...  
Full Screen Note...

### **Search**

Find...  
Repeat Last Find  
Prev Item  
Next Item

### **Options**

Smart Clip...

## The Database

Press **(F3)** **(B)** to start the Database application. A database has two distinct parts:

- A **structure** (or **template**) that defines the **fields** the database has. The fields will hold data and are labeled by **field names**.
- The data **records**. Each record contains its data values in the defined fields. The database **list** lists all the records in a database.

The Database application comes with one prepared database file for information about restaurants. You can use this built-in database structure (filename RESTR.GDB) to see what the Database application is like and practice using it. The Phone Book application (**(F3)**) is another example of a built-in database structure.

Column headers for database list.

Database: R				STR.GDB		All Database		Items(0/0)		01/21/94 10:54 AM	
Restaurant				Phone						Category	

Help | Add | Note | Find | Clip | Subset | Sort | Columns | Open

A Database List with No Data Records

In addition, you can define a database to contain the data fields you want, with any size and placement of fields.

### To open a data record:

- In a data list, highlight an entry and press **(ENTER)**.

- A record can have up to four “pages”; if there is more than one page, press **[Fn] PG DN** or **[Fn] PG UP** to see them.

---

## Creating Data Records

### To add a record to the current database:

1. Press **[&...]** **[B]** to open the Database application.
2. Press **[F2]** (Add).
3. Fill in the fields. (Use **[TAB]** or **[ALT]**+underlined letter to move among fields.) Press **[▶]** or **[◀]** to view text that is longer than the box.
4. Press **[F10]** when done or press **[F2]** to add another record. Or press **[ESC]** to cancel the information.

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---

## Editing or Deleting Records

### To edit (change) a record in the current database:

1. Display the database list. (Press **[ESC]** or **[F10]**, if necessary.)
2. Highlight the item you want to edit.
3. Press **[ENTER]** to open the record.
4. Edit the field(s).
  - To clear a field, highlight it and press **[DEL]**.
  - To restore a field's previous contents, press **[ESC]**.
5. Press **[F10]** to save your changes. Or press **[ESC]** to cancel them.

To restore an edited record to its previous version, press **[MENU]** **[E]** **[U]** (Edit Undo) before doing another operation.

### To delete a data record:

1. Display the database list. (Press **[ESC]** or **[F10]**, if necessary.)
2. Highlight the item to delete.
  - If you want to delete several items, select each one by highlighting it and then pressing **[spacebar]**.
3. Press **[DEL]**.

To restore a deleted record to its previous version, press **Ⓜ E** **Ⓜ U** (Edit Undo) before doing another operation.

### To erase a database:

1. Display the database list.
2. Press **Ⓜ E** **Ⓜ A** (Edit Select-All) to select all the records.
3. Press **Ⓜ DEL** **Ⓜ F10** to delete them.

This deletes all the records from the current database file. To restore an erased database, use **Ⓜ E** Edit Undo before doing another operation.

---

## New Database Structures

You can create a new database by:

- Defining a new database structure, then filling out records for it.
- Copying an existing database structure, then filling out new records for it. You can also modify this structure before filling out the data records.

### File Commands for Defining Databases

<b>Ⓜ</b> File Commands	Use
Define-New-Database	To define a new database structure.
File New	To copy the current database structure but not its data. (Use for a new set of data.)
Modify-Database	To modify the current database structure.

A **database** is made up of a structure and many records of data. The **structure** defines the **data fields** by **field name**, **field type**, and visual arrangement.





### Field Types for Database Structures (continued)

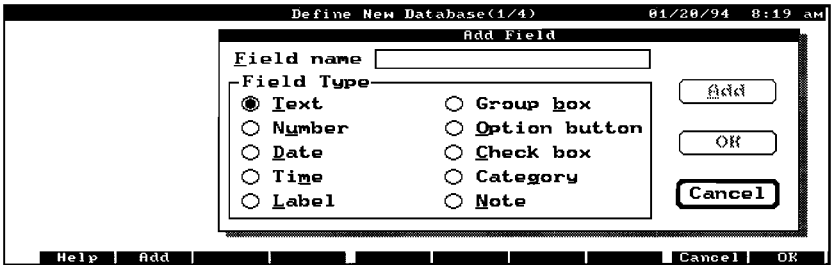
Field Type	Description
Option button	To indicate one choice from a set of choices. <i>The option set must appear in a group box.</i> Option buttons in the same group box are mutually exclusive.
Check box	To indicate yes/no (on/off) choices. Check boxes can be grouped together into a group box for appearance, but each one must be checked or unchecked independently of the others.
Category	For categorizing records. You can create a data subset based on a category of records. Limit: one Category field per database structure. The Category field is a special kind of drop-down list box that is editable. (See “Using the Category Field,” page 16-3.) The same category choices are available from all records of the same database. You cannot add category choices while defining the database structure.
Note	For adding notes in a large field with text-editing features (as explained in chapter 19). Limit: one Note field per database structure.

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## Defining a New Database Structure

### To add and define the new fields:

1. In the Database application, press    (File Define-New-Database). You see a dialog box to add a field to a database structure:



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2. Type in the name for a data field. A field name can have up to 20 characters. However, names are not case-sensitive, and they ignore non-alphanumeric characters and leading digits.
3. Tab to the **Field type** group box and select the type of field. (Refer to the preceding table and figure for descriptions.)
4. To add another field, press **(F2)**. All fields will appear on one screen (**page**) initially, eventually overlying one another. You can move the fields apart at any time.
5. When done adding fields, press **(F10)**. If one field disappears under another one, just press **(TAB)** until the hidden field is highlighted. Use arrow keys to move it.

### To move or size a database field:

Keys	Effect
, ,	Moves the current (highlighted) field up, down, right, left. To move to a previous or following page, use CUT and PASTE.
arrow	Moves the current field by finer increments.
<b>(CTRL)</b> + , <b>(CTRL)</b> +	Adjusts the width of the current field. (You can also adjust the height of Group boxes and Note fields.)
<b>(Fn)</b> CUT and <b>(Fn)</b> PASTE	For moving the current field to another page. (Use PG UP or PG DN before pasting.) Option buttons or Check boxes inside a Group box can move with the group box.

### To add a group box with option buttons (or check boxes):

Option buttons *must* exist inside a group box.

1. Add the group box first.
2. Add the option buttons (or check boxes). They automatically appear inside the current group box. (You can move check boxes out.)
3. To hold more than three buttons, enlarge the group box. (Otherwise, additional option buttons will overlie the bottom button.)
4. Add any additional option buttons. Highlight any overlapping buttons—one at a time—and move them apart.

### To give a field a shortcut key:

You can always select a field in a database structure by tabbing to it. You can also create a **shortcut key** (as part of the database definition) to select a field quickly in an open record.

- Include an ampersand in the field name. The letter it precedes will be underlined. For instance, specifying a field name as &Name makes the field name appear as Name. Its shortcut is **ALT+N**.
- To use the shortcut, simultaneously press **ALT**+*underlined letter*.

### To edit or delete a field in the Define New Database screen:

Key Label	Description
<b>Edit</b>	To change the name or the type of the current field. <i>You can change the type only if you have not yet saved this field in the database structure (by saving it with a filename).</i>
<b>Delete</b>	To delete the current field.

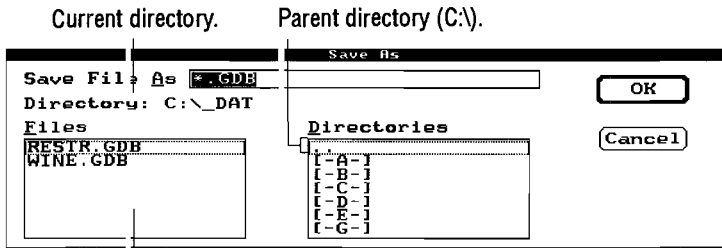
### Caution



If you delete a field from a database structure, *this will also delete any Smart Clip definition or Subset definition that contained this field.*

## To save and name the new database:

1. Press **(F10)** to save the database structure. (Or press **(ESC)** **(F5)** (No) to cancel the new database structure.)
2. Name the new database. The default file extension is **.GDB** (for *General Data Base*). You do not need to type in the extension.



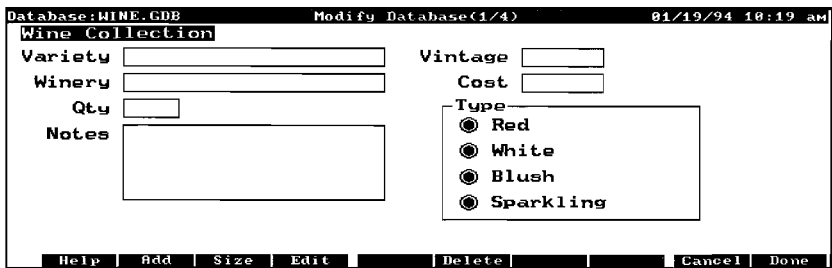
All of the files in the current directory ending in **.GDB**.

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The list boxes provide shortcuts for changing directories and viewing filenames. For more information about this type of dialog box, see “Specifying Files” on page 2-16.

3. Press **(F10)** when done.
4. This displays the list for the newly defined database. Since there are no records entered yet, the list is empty except for column headers for some fields. You can now enter data into this database using **Add**.

**Example: Defining a Database for a Wine Collection.** Define a database structure like this and name it **WINE.GDB**.



The keystrokes below illustrate how to begin each step in defining this database.

**Keys:**

**[&...] [B]**

**Description:**

Opens the Database application.

**[MENU] [F] [D]**

Starts the Define New Database procedure with an Add Field dialog box.

Wine Collection

Adds the label "Wine Collection". Pressing

**[ALT]+[L] [ENTER]**

**[ENTER]** is the same as pressing **[F2]**.

Variety **[ALT]+[T]**

Adds a text field for the Variety.

**[ENTER]**

Winery **[ENTER]**

Adds a Winery text field and moves it over to align with the previous field. **[ENTER]**

**[ENTER] [▶]**

**[ENTER]** are the same as **[F10]**.

**[F2]** Vintage

Adds a Vintage number field.

**[ALT]+[U] [F10]**

**[▶] ... [▲] [▲]**

Moves Vintage field to right of Variety field.

**[F2]** Cost **[F10]**

Adds a Cost number field.

**[▶] ... [▲]**

Moves Cost field to right of Winery.

**[F2]** Qty **[F10]**

Adds and aligns a Qty number field.

**[▶] ...**

**[F2]** Notes

Adds, narrows, moves, and deepens a Notes note field.

**[ALT]+[N] [F10]**

**[CTRL]+[◀] ... [▶]**

**[▶]**

**[CTRL]+[▼] ...**

**[F2]** Type

Adds a Type group box.

**[ALT]+[B] [ENTER]**

Red (ALT)+(O)  
(ENTER)

Adds a Red option button.

White (ENTER)

Blush (ENTER)

Sparkling (F10)

(▼)

Moves last option button down.

(↑) (TAB)

Backtab to highlight the Type group box.

(CTRL)+(▼) ...

Enlarges Type box to hold all buttons.

(F10)

Saves new structure definition.

wine (F10)

Names this database file WINE.GDB in the current directory. Displays the new, empty database list, ready for data entry.



## Modifying a Database Definition

Follow these instructions to edit the definition of a database structure that has already been saved and named. The data set (if any) is not affected by a change to the name or position of a field.

### To edit the database structure:

1. Display the database list of the file you want to edit. If the file is *not* currently displayed, use (F9) (Open) to display it. (Type in or select the database filename and press (F10).)
  - Do *not* open a record or display a database structure.
2. Press (MENU) (F) (F) (File Modify-Database).

- Use the same techniques you used while defining the new database structure. When done, press **(F10)** to save the modified structure, or press **(ESC)** to cancel the modifications.

Key Label	Description
<b>Add</b>	Adds a new field.
<b>Size</b>	Size mode. Pressing arrow keys now changes the size of the current field. Shortcut: <b>(CTRL)+arrow</b> key. Press <b>Move</b> to cancel Size mode.
<b>Edit</b>	To rename the current field.
<b>Delete</b>	Deletes the current field.
arrow keys,	Moves the current field, unless Size mode is on.
<b>(↑)</b> arrow keys	

## Note



In order to protect any existing data, you cannot edit the field type once it has been saved in a database structure.

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### To restore the original database structure:

- Select **(MENU)** **Edit Undo** before doing another operation. You can also undo an undo operation.

### To duplicate a database structure:

This duplicates a database definition without its data (if any). Do this if you want an identical or similar database definition for a new set of data.

- If the database you want to copy is *not* currently displayed, use **(F9)** (Open) to display it.
- Press **(MENU)** **(F)** **(N)** (File New).
- Name the new database file and press **(F10)**.
- The new database is now ready for you to enter data or modify its structure.

## Searching a Database

You can scan the Database by scrolling through the database list (**▲**, **▼**) or by looking through sequential data records (**Next**, **Prev**). For specific searches, use **speed-locate** or **Find**.

### To look up an item (speed-locate):

Speed-locate searches the first field of the database records.

1. Display the database list. (Press **ESC** or **F10**, if necessary.)
2. Start typing the entry that appears in the first (leftmost) column of the record you want. The list scrolls as you type, highlighting the first matching item.
3. Press **ENTER** when done, or arrow to the item you want.

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Database:WINE.GDB All Database Items(6/12) 01/19/94 10:55 AM		
Locating: r		
Muscat Cannelli	1985	Red River
Muscato Amabile	1992	Louis M
Petite Syrah	1985	Iron Mountain
Petite Syrah	1986	Scarlett
Petite Syrah	1990	Le Roi
Riesling	1989	Sun Valley
Riesling	1987	Werner
Riesling	1988	Alpine
Riesling	1990	Chinook
Riesling, Dry	1991	Stevenson
Riesling, Dry	1989	Sonnenuhr
Riesling, Dry	1990	Macadam Bros.

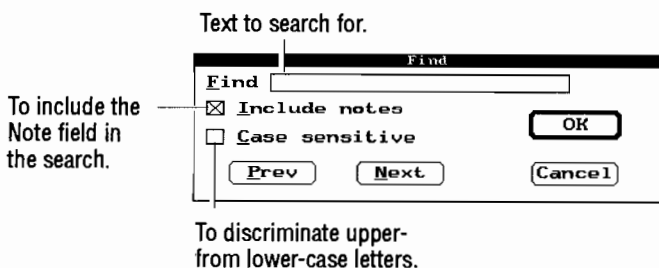
Help Add Note Find Clip Subset Sort Columns Open

### Speed-Locate R(iesling)

### To find text in any field:

1. From a database list or data record, press **F4** (Find).
2. Fill in the box with the characters or text to search for.
3. Optional: Tab to and select the check boxes (press **spacebar** to change) for the search options:





4. Press **F10** to search forward from the beginning of the list.
  - Or press **F4** (Next) to search forward from the current (highlighted) position.
  - Or press **F3** (Previous) to search *backward* from the current position.

To repeat the search, press **↑ F4**.

A successful search stops when it finds the first instance of matching text. Either the matching text or the list item containing the matching text will be highlighted, depending on the current display. (Lists do not display all the text that the full records do, so the matching text might not appear in the list.)

If your records include extensive notes in the Note field, you can speed up a search by not checking Include Notes for the search.

---

## Defining Subsets of a Database

The **Subset** function displays a specified subset of your Database. You define the subset by filling out a database template according to the field contents you want to select for. For example, you could define a subset of the wine database that selects and displays only the white wines.

---

## Note



Defining subsets does not affect the original, complete list of records.

The **Subset** function does *not* create new or separate databases. It defines and displays a *subset of the current database*. Subsets have names, but they are not separate files.

---

## Displaying Existing Subsets

### To display an existing subset:

1. While displaying a database list, press **(F6)** (Subset).
2. Highlight the desired subset name and press **(F10)**.

### To display the complete database list again:

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1. While displaying the database list, press **(F6)** (Subset).
  2. Highlight “All (Database, Phone Book, etc.) Items” in the list of subset choices and press **(F10)**.

## Defining a New Subset

### To define a subset:

1. While displaying the database list, press **(F6)** (Subset).
2. Press **(F2)** (Define). The Define Subset screen displays a copy of the current database structure.
3. Fill in one or more fields with the contents you want to select for.
4. Press **(F10)**.
5. Type a name for the new subset and press **(F10)**. This displays the subset list with the new name highlighted. If you do not type in a name, then the new subset is named “Unnamed Subset”. However, the next unnamed subset will overwrite (replace) the previous one.
6. Press **(F10)**. This displays the new subset (whose name appears in the title bar).

### Using Check Boxes and Option Buttons in a Subset Definition

- By default, check boxes in the Define Subset screen are dimmed. This means they are **neutral**; that is, either status (checked or not) in a record will qualify for the subset.

- By default, option buttons are not on. This means they are **neutral**; that is, either status (on or off) in a record will qualify for the subset. (To specify that an option button *must* be off to qualify for the subset, you must use an SSL statement. See appendix D.)
- If a check box is checked or an option button is on, then a record that matches this state will qualify for the subset.

### To set an option button in a subset definition:

- Tab and/or arrow to the option button you want and press the . (This is different from the usual way of setting an option button *without* .)
- You cannot turn on more than one option button.

**Example: Defining a Database Subset.** Define a subset of the restaurant database (RESTR.GDB) that displays only restaurants that are open all night. Save this subset under the name “All-Night Places.” To define this subset, check the All Night check box in the Meals group box.

#### Keys:

restr

+

#### Description:

Opens the Database. If RESTR.GDB is not displayed, do the next step:

Displays the built-in restaurant database (though the list is empty if you haven't added data records).

Opens the Define Subset screen, which is identical to the database structure.

Highlights the All Night check box and turns it on. The other check boxes remain dimmed (neutral).

**F10** All-Night Places Names this subset "All-Night Places".

**F10**

**F10** Displays this subset.

**F6** **▲** **F10** Selects and displays the complete database list again ("All Database Items").

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## Using Multiple Criteria in a Subset Definition

### To define a subset with multiple criteria:

You can make a subset definition more sophisticated by filling out more than one field and/or by including more than one possible entry in a field. In the Define Subset screen:

1. If you want more than one field searched to compile the subset, then fill in as many fields as you want. *The subset will include only records for which all the specified fields qualify.*
2. If you want to specify more than one possible match for a field, then separate those possible matches with a comma. (A logical OR.)
3. If you want a subset to exclude a certain field entry, then precede that entry by a hyphen. (A logical NOT.)
4. If you want to specify a range of numbers, precede a number by <, >, =, <=, >=, or <> (*not equal to*).
5. If you want to specify a criterion that could appear in *any* field, precede it with \*. For example, entering \*English in the Restaurant field will select for "English" in any field in the record.

For more options and flexibility in defining subsets, you can also use **Subset Define General** and type in a selection statement. See appendix D, “The Subset Selection Language.”

A complete list of relational operators (AND, OR, NOT, equality, and inequality) for the Define Subset screen appears under “Using the Define Subset Screen” in appendix D.

**Example: Defining a Subset with Multiple Criteria.** The subset definition below will display a subset of the restaurant database. The subset will comprise restaurants in Paris that serve Algerian or Moroccan food of excellent quality and have a vegetarian menu.

Restaurant  Define Subset  
Phone  Category   
Address   
Meals  Breakfast  Lunch  Dinner  Brunch  All Night  
Food Quality  Excellent  Good  Fair  
Cost  Expensive  Moderate  Inexpensive  
 Serves Liquor  Good for Kids  Vegetarian Menu  
Note   
Help | General | Cancel | OK

Subset Definition with Multiple Criteria

## Editing or Deleting Subset Definitions

**To edit or rename a subset definition:**

1. While displaying the database list, press **F6** (Subset).
2. Highlight the desired subset.
3. Press **F4** (Edit) or **F3** (Rename).
4. Make the changes and press **F10** when done.
5. Press **F10** again. This displays the edited subset.

**To delete a subset definition:**

1. While displaying the database list, press **F6**.
2. Highlight the subset you want to delete.
3. Press **F7** **F10** (Delete OK).

To restore a subset definition you have just deleted (or edited), escape the subset list, then select **MENU** Edit Undo. Use undo before doing another operation.

---

## Copying or Moving Information

### Using the Clipboard to Copy or Move

You can use the Clipboard functions to copy and move information within the Database application, as well as to and from other applications.

#### To copy or move the contents of a field:

1. Open the desired data record and tab to the desired field.
2. Press **(Fn) COPY** (to copy) or **(Fn) CUT** (to move).
  - To copy just part of the text in a field, select the range of text first (by pressing **(↑)+arrow key**).
3. Open the destination record, if different. (It can even be in a different application.)
4. Highlight the destination field.
5. Press **(Fn) PASTE**.

#### To copy a data record:

You can copy a record within the same Database file. You might want to copy a record, for instance, when creating a new one similar to an existing one. You can also copy the text of a record into a memo or a Note field.

1. Display the database list and highlight the record you want to copy.
2. Press **(Fn) COPY**.
3. If you want to copy to a different database file, open that file (**(MENU) File Open**).
4. Press **(Fn) PASTE**. The new record will be sorted with the other records.

### Smart Clip: Copying Multiple Data Fields from Records

Smart Clip uses the Clipboard to copy formatted information quickly from *predefined fields* in the current application to another location (a memo or a text field). You might want, for example, to quickly copy several fields of information from a database to a memo in the Memo Editor or to a note in the Note Taker.

For the built-in restaurant database, **CLIP** provides two predefined field-copying choice:

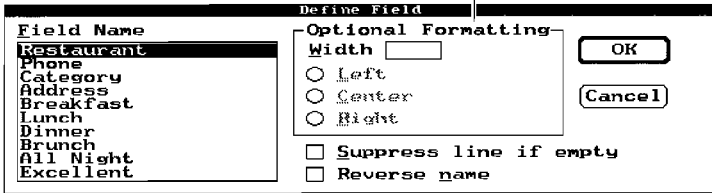
- All Fields.
- Restaurant and Phone.

For your own databases, as well as the built-in one, you can define your own Smart Clips. You can also control the **formatting** (the layout) of Smart Clip fields.

### To define your own Smart Clip:

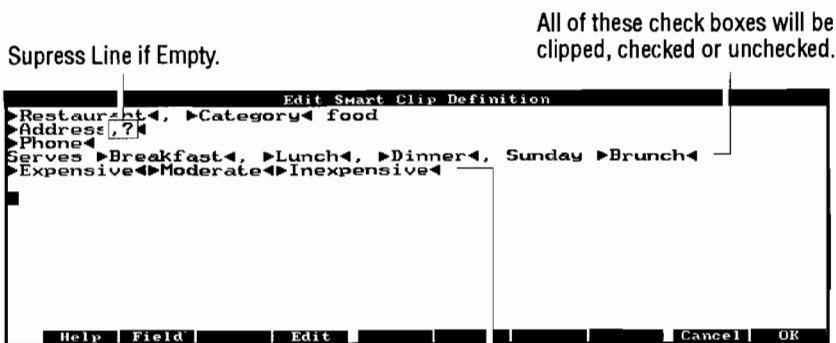
1. In a database, press **(F5)** (Clip).
2. Press **(F2)** **(F2)** (Define Field). Select a field name.
  - **Optional Formatting.** This group box is only for arranging fields in columns. Otherwise, leave this field blank and the correct width is automatically determined.
  - **Suppress Line if Empty.** If checked, this suppresses a carriage return after the specified field *if* the selected record has no data for that field. This prevents missing data from producing a blank line in the clipped output. This option inserts the code ; ? into the Smart Clip definition.
  - **Reverse Name.** If checked, this reverses the order of the names in a field, such as the Name field in the Phone Book. Names usually appear in a record last name first. Reverse Name would switch Doe, Jane to Jane Doe.

For columnar formatting - otherwise leave blank.



3. Press **(F10)** when done defining the field.
4. To add another field, add space (press **(spacebar)**) or start a new line (press **(ENTER)**). Press **(F2)** again and fill out the dialog box as above. You can add as many fields as you want. Press **(F10)** when done. To use clip boxes and option buttons, see page 17-21.

- You can also enter text or punctuation among the fields, including a final carriage return (**ENTER**) to separate records of text. For example:



Only the "on" option button will be clipped.

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### A Smart Clip with Extra Text and Punctuation

- Press **F10** when done with the Define Smart Clip screen.
- Type a name for this Smart Clip definition and press **F10**. If you do not supply a name, then the new Smart Clip definition is named "Unnamed". However, the next unnamed Smart Clip definition will overwrite (replace) the previous one.
- The Smart Clip is now defined, named, and ready to use. Press **ESC** to exit the Smart Clip screens. (Or press **F10**, which clips the defined fields from the specified records, if any, and saves them in the Clipboard.)
- If you want to use this Smart Clip now, then follow the next procedure.

### To clip information from a database:

- In a database, select the record(s) whose information you want to clip:
  - To select one record, highlight that entry in the database list or open its record.
  - To select more than one record, mark each desired record by highlighting it in the list and pressing **spacebar**.

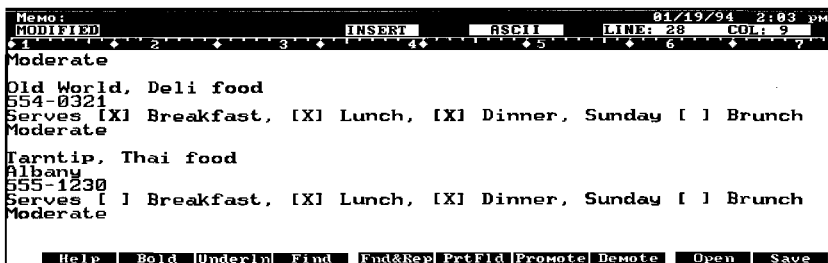


- To select (or de-select) all records in the current list, press **MENU** **E** **A**. (Clipboard Error results if there is not enough Clipboard memory to clip all the records.)
2. Press **F5** (Clip) to display the Smart Clip list.
  3. Highlight the Smart Clip you want and press **F10**.

### Names of the Smart Clip definitions.



4. Open the application and record into which you'd like to copy this information.
5. Tab to the *text field* that should receive this information. A **text field** is any part of a memo, or any field meant for entering text, like an appointment Description or a Note field.
6. Press **Fn** **PASTE**.



### Using Smart Clips with Check Boxes and Option Buttons

- A check box field in a Smart Clip definition appears as the named check box when you paste the Smart Clip for the selected record(s). The check box will be checked or unchecked, depending on its status in a record.

- An option button in a Smart Clip definition appears as just its field name (without the button) when you paste the Smart Clip *if* the option button is turned on in a record. If a button is off, then nothing will be clipped.
- When including option buttons in a Smart Clip definition, you should include *all* of them from the same group, since option buttons are mutually exclusive and only the one that is “on” in a record will be clipped.

#### To edit or rename a Smart Clip:

1. In a database, press (F5) (Clip).
2. Highlight the desired Smart Clip.
3. Press (F3) to rename the highlighted Smart Clip.
4. Press (F4) to edit the highlighted Smart Clip.
  - Press (DEL) to delete the highlighted field.
  - Press (F4) to edit the highlighted field.
  - Press (F2) to add another field.
5. Press (F10) when done. Press (ESC) to exit the Smart Clip screens.

#### To delete a Smart Clip definition:

1. In a database, press (F5).
2. Highlight the Smart Clip you want to delete.
3. Press (F7) (F10) (Delete OK).

To restore a Smart Clip definition you have just deleted (or edited), escape the Smart Clip list, then select (MENU) Edit Undo. Use undo before doing another operation.

**Example: Defining a Smart Clip with Columnar Formatting.** Define a Smart Clip that will format names and phone numbers from selected Phone Book records into columns as shown. This information can then be pasted into a memo in the Memo Editor.

MEMO:		81/19/94 2:19 PM	
MODIFIED	INSERT	ASCII	LINE: 5 COL: 9
Blascow, Stan	(812) 555-0987	(812) 555-6565	
Gilbert, Jean	800-1234	800-1235	
Gruc, Andy	(416) 700-7634	(416) 700-7635	
Harding, John W.	700-0811	700-0812	

### Phone Book Records Clipped into Columns

Define the Smart Clip as shown below. To format columns, give each field a specified width.

Name	Business	Fax
Blascow, Stan	(812) 555-0987	(812) 555-6565
Gilbert, Jean	800-1234	800-1235
Gruc, Andy	(416) 700-7634	(416) 700-7635
Harding, John W.	700-0811	700-0812

### A Smart Clip Definition for Columns

## Sorting Data Lists

By default, your database (including Phone Book) records are sorted in the list in order by the top left field of the record (which is the leftmost column). You can change:

- Which field to use for sorting. The choice of field determines whether the sorting method is alphabetical (Text field), numerical (Number field), or chronological (Date and Time fields).
- Whether to sort in ascending (the usual) or descending order.
- Whether to have second and third sorting fields to break sorting ties (such as for two phone records named Dave Johnson).

### To change the sorting method:

This affects just the current list (or the current subset of a list).

1. Display the list.
2. Press **F7** (Sort).
3. Select the first sorting field. Press **▼** to scroll through the choices and highlight one. (Press **ALT**+**▼** to view the whole list.)
4. To change the order (ascending/descending), tab to the check box and press **spacebar**.
5. If you wish, tab to and specify second and third sorting fields.
6. Press **F10** when done. Or press **ESC** to cancel the information.

**Example: Types of Sorting in the Phone Book.** If the sorting field is a Name field, sorting occurs alphabetically. Ascending means from A to Z, so Aardvark appears before Zebu in the phone list. If the sorting field is a number field, sorting occurs numerically. Ascending means from lower to higher, so 2000 appears before 2026 in the list. (Only numbers in number fields can be sorted numerically.) If the sorting field is a date or time field, sorting occurs chronologically. Ascending means from earlier to later, so 6/1/1993 appears before 6/1/1994.

---

## Rearranging the Columns in Data Lists

You can customize the appearance of a database (including Phone Book) list by altering how many columns are displayed, how wide they are, and which data fields the columns represent.

For instance, you could change the appearance of the phone list from this:

Phone: PHONE2.PDB			All Phone Book Items(6/13)			01/19/94 2:21 PM		
Name	Business	Home						
Blascow, Stan	(812) 555-0987	(812) 555-6543						
Evett, Eric	700-1111	701-0000						
Gilbert, Jean	800-1234	800-4321						
Grouch, Oscar	(800) 123-4567	(800) 123-1234						
Gruc, Andy	(416) 700-7634	(416) 555-7634						
Harding, John W.	700-0811	710-0000						
Johnson, Bill	700-2127	700-1272						
Kaser, Everett	(206) 555-5676	(206) 555-0123						
Megowan, Pat	(212) 555-8761	(212) 555-8866						
Roy, Diana	555-0987	(311) 555-6543						
Wechsler, Susan	800-5457	800-0000						
Winter, Lynn	900-5538	900-0001						
Help			Add			Note		
Find			Clip			Subset		
Sort			Columns			Open		

to this:

Phone: PHONE2.PDB			All Phone Book Items(6/13)			01/19/94 2:28 PM		
Name	Company	Business						
Blascow, Stan	Hyper-Pack	(812) 555-0987						
Evett, Eric	PIM Pro	700-1111						
Gilbert, Jean	Alarm Control	800-1234						
Grouch, Oscar	CTW	(800) 123-4567						
Gruc, Andy	Global Software	(416) 700-7634						
Harding, John W.	Musix	700-0811						
Johnson, Bill	Data Wizard	700-2127						
Kaser, Everett	Features, Inc.	(206) 555-5676						
Megowan, Pat	KitchenSink Co.	(212) 555-8761						
Roy, Diana	Writesimple	555-0987						
Wechsler, Susan	Planning Management	800-5457						
Winter, Lynn	NW Contractors	900-5538						
Help			Add			Note		
Find			Clip			Subset		
Sort			Columns			Open		

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## To rearrange the columns in a list:

This affects just the current list (or the current subset of a list).

1. Display the list.
2. Press **F8** (Columns).
3. Highlight (arrow to) the column you want to alter or move.
4. Use the function keys described below.
5. Press **F10** to save the rearrangement. Or press **ESC** to cancel it.

## Function Keys for Rearranging Columns (Columns)

Key Label	Operation
Add	To add a specified column to the right of the current column.
Delete	Deletes the highlighted column. Leaves a blank column on the right side.
Edit	To change the highlighted column to the one you specify (by field name).
Width-	Narrows the highlighted column.
Width+	Widens the highlighted column.
+Move	Swaps positions with the column on the left.
Move+	Swaps positions with the column on the right.

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### Note



Rearranging the columns affects the appearance of the list only. It does not affect the actual data in the records.

**Example: Deleting and Adding Columns.** Delete the Business column in the Phone Book and then add it back.

#### Keys:



#### Description:

Starts Phone Book.

Displays the function-key labels for arranging columns.

Highlights the Business column.

Deletes the highlighted column.

Column deleted from here.

Name	Arrange Columns
	Home
Blascow, Stan	(812) 555-6543
Evelt, Eric	701-0000
Gilbert, Jean	800-4321
Grouch, Oscar	(800) 123-1234
Gryc, Andy	(416) 555-7634
Harding, John W.	710-0000
Johnson, Bill	700-1272
Kaser, Everett	(206) 555-0123
Megowan, Pat	(212) 555-8866
Roy, Diana	(311) 555-6543
Wechsler, Susan	800-0000
Winter, Lynn	900-0001

Help | Add | Delete | Edit | Width- | Width+ | +Move | Move+ | Cancel | Done

**F2** **▼** **F10**

Selects Business from the list as the new column and adds it to the right of Home.

**F7**

Swaps Business to the left so that Home is on the right side again.

**ESC** **F6**

Restores the original column arrangement (if different from these changes).

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## Using Multiple Files

PIM (Personal Information Management) applications (except World Time) can use more than one file, limited only by available memory. Separate databases occupy separate **files**, as do multiple phone books, multiple appointment books, and so on.

PIM Application	Default Filename	Extension
Appointment Book	.ADB	
Phone Book	.PDB	
Memo Editor	.DOC	
Worldtime	.WDB	
Database	.GDB	
Note Taker	.NDB	

The default directory for these files is C:\\_DAT.

### To open another file in the same application:

- Use **OPEN** or **MENU** File Open. The file must exist already.
- The Database application can open Phone Book (.PDB) files, as well as its own (.GDB) files. (You can use the Database application to modify the structure of the Phone Book, for example.)

### To create another file in the same application:

- Use **MENU** File New to create another file with the same database structure. (In the Database, use **MENU** File Define-New-Database to create a new file for a different database structure.)

### To delete a file:

A database is actually a file. The built-in restaurant file is named RESTR.GDB. *Before deleting a file, you should close it by opening a different file.*

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1. In the Database application, open up a file *other than* the one you want to delete (**MENU** File Open *filename*).
2. Start the Filer (**FILE**) application, highlight the database file you want to delete, and press **DEL** **F10**.

### To rename a file:

1. Start the Filer application (**FILE**).
2. Highlight the filename in the correct directory.
3. Use **MENU** File Rename.

### To merge the current file with another file:

*Merge files of the same application type only.* Merging combines and sorts information from two files. It does not flag or reconcile any duplications or contradictions.

1. Start the application and display its list.
2. Press **MENU** **F** **M** (File Merge).
3. Specify the name of the file to merge into the current file.
4. Press **F10**.

To undo a merge operation, use **MENU** Edit Undo before doing another operation.



### To copy (“extract”) selected records to a new file:

1. Start the application and display its list.
2. Select (press **spacebar**) those items whose records you want to extract.
3. Press **ENTER** **F** **E** (File Extract).
4. Specify the name of the file in which to save the extracted records.
5. Press **F10**.

### To back up a file onto a memory card:

This copies the current file to a memory card in drive A, the plug-in slot.

1. Start the application and display its list.
2. Press **ENTER** **F** **C** (File Copy).
3. Specify a filename on drive A (**A\:***filename*) for the copy.
4. Press **F10**.

---

## Limits While Using the Database Application

- Maximum number of records in a Database file: limited by available RAM disk space. Theoretical maximum: about 5,000.
- Maximum number of fields per database structure: 99 (fewer if long fields).
- Maximum number of pages in a database structure: 4.
- Maximum number of data characters per text field:  $1\frac{1}{2}$  times the visible length, but not less than 10.
- Maximum number of data characters in a Note: 32 KB (about 30 screens).

## More Database Examples

**Example: Defining Similar Database Structures.** Define a database structure for a first-grade class roster, then create similar ones for pupils in different grades. How could you handle the same data using subsets rather than separate databases?

First use **[MENU]** File Define-New-Database to create the first-grade database:

The screenshot shows a window titled "Define New Database(1/4)" with a date of "01/19/94" and time of "2:49 pm". The main area is titled "First Graders" and contains several text input fields: "Name", "Teacher", "Address", "City", "Phone", "Parent1", and "Parent2". There is also a "Room" label with an empty text box. At the bottom, there is a menu bar with options: "Help", "Add", "Size", "Edit", "Delete", "Cancel", and "Done".

Define a Database for First Graders

Define a new database structure for second-graders by copying the first structure (**[MENU]** File New; give the copy a new name). Use **[MENU]** File Modify-Database to **[Edit]** the description at the top from "First Graders" to "Second Graders".

The screenshot shows a window titled "Modify Database(1/4)" with a date of "01/19/94" and time of "2:51 pm". The main area is titled "First Graders" and contains the same text input fields as the previous dialog. A "Field name" box contains "Second Graders". Below this is a "Field Type" section with two columns of radio button options: "Text", "Number", "Date", "Time", "Label", "Group box", "Option button", "Check box", "Category", and "Note". The "Label" option is selected. To the right of the "Field Type" section are three buttons: "Add", "OK", and "Cancel". At the bottom, there is a menu bar with options: "Help", "Add", "Cancel", and "OK".

Modify the Database for Second Graders

Another way to organize these same data would be to include all pupils in one database whose structure includes a field for the grade level. You could then use the Subset function to create and name subsets that select and display just one grade level.





**Smart Clip for Name, Grade, Teacher**

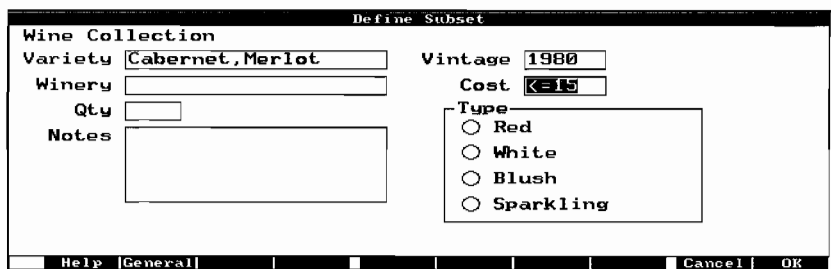
Name the Smart Clip NGT (for name, grade, teacher). Then, whenever you want to use this Smart Clip to copy the information into a memo: open the pupil database, highlight the pupil(s), press **CLIP**, select NGT, open the destination memo in the Memo Editor, place the cursor where you want the information to be copied, and press **(Fn) PASTE**.

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**Example: Defining a Database Subset Using Several Criteria.**

Display a subset of the wine collection database that will display all Cabernets and Merlots from 1980 that cost no more than \$15.





Using **Subset Define**, fill out the Define Subset screen as follows:



The Cost field must be defined as a Number type for the < operator to work.

## Function Keys

### Function Keys for Define-New-Database and Modify-Database

Key Label	Description
Add	Opens a dialog box to define a new database field.
Size	Turns Size mode on. Pressing  ,  ,  , and  now enlarges or diminishes the current field. Shortcut: <b>CTRL</b> +arrow key.
Move	Turns Size mode off. Pressing arrow keys now moves the current field.
Edit	Opens a dialog box to edit the current field.
Delete	Deletes the current field.

### Function Keys for the Data List

Key Label	Description
Add	To add a new Database record.
Note	Displays the full-screen Note for the highlighted item, <i>if the current database has a Note field.</i>
Find	Searches for the specified character string (letters or other characters).
Clip	To copy predefined fields (a Smart Clip) from a database to the Clipboard. Also to define new Smart Clips. Smart Clip definitions are also used in Custom Style printing.
Subset	To display and/or define a specified subset of the data list.
Sort	Specifies how to sort the records for the list.
Columns	Specifies how many columns appear in a list, how wide they are, and which fields they display.
Open	To open a different Database file.

### Function Keys for a Data Record (an Item)

Key Label	Description
Add	Opens a structure to define a new Database record.
Note	Displays the full-screen note, <i>if</i> the database structure has a Note field.
Find	Searches for the specified character string (letters or other characters).
Clip	To copy predefined fields (a Smart Clip) from a database to the Clipboard. Also to define new Smart Clips.
Prev	Displays the previous record.
Next	Displays the next record.

### Function Keys for Defining Subsets and Smart Clips

Key Label	Operation
Define	To define a new subset or Smart Clip.
Rename	To rename the highlighted subset or Smart Clip definition.
Edit	To edit the highlighted subset or Smart Clip definition.
Delete	To delete the highlighted subset or Smart Clip definition.

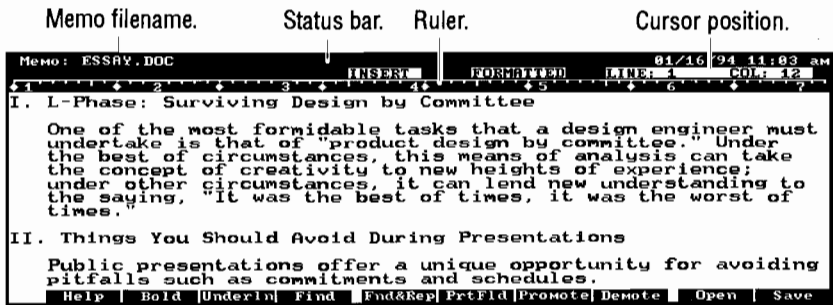
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## Menu Commands

<u>File</u>	<u>Edit</u>	<u>View</u>	<u>Search</u>	<u>Options</u>
New...	Current Item	Subset...	Find...	Smart Clip...
Open...	Add New Item	Sort...	Repeat Last Find	
Copy...	Delete	Arrange Columns...	Prev Item	
Define New Database...	Undo	Full Screen Note...	Next Item	
Modify Database...	Cut			
Merge...	Copy			
Extract...	Paste			
Password...	Select Item			
Print...	Select All/None			
Exit				

## The Memo Editor

Press **(F1)** to start the Memo Editor. Each memo you create is a separate file.



The Memo Editor is a text editor with these formatting features:

- Automatic word wrapping at the ends of lines (no need to press **(ENTER)**).
- Bold, underline, and normal typefaces.
- Different font sizes for the display.
- Settings for tabs, margins, and display spacing.
- Insert mode (inserts text) and Replace mode (writes over text).
- Outline (hierarchical) numbering available.
- Formatted and unformatted (ASCII) file status.

## Creating a Memo

### To start a new memo file:

1. Press **[E]** to start the Memo Editor.
2. If the screen shows no text, you can start typing immediately.
3. If another memo is already displayed, press **[MENU]** **[F]** **[N]** (File New). This command automatically closes any open file first, prompting you to save it, if necessary.
4. Write your memo text.

### Editing a Memo

Keys	Effect
<b>[Fn]</b> INS	Toggles between Insert mode and Replace (type-over) mode for text entry.
<b>[CTRL]</b> + <b>[Fn]</b> INS	Inserts a line.
<b>[CTRL]</b> + <b>[DEL]</b>	Deletes a line.
<b>[CTRL]</b> + <b>[ENTER]</b>	Breaks to a new line, even in Replace mode.

### Moving Around a Memo

Keys	Effect
<b>[Fn]</b> PG UP, <b>[Fn]</b> PG DN	Moves backward or forward in memo by one screenful.
<b>[Fn]</b> HOME, <b>[Fn]</b> END	Moves to beginning or end of line.
<b>[CTRL]</b> + <b>[◀]</b> , <b>[CTRL]</b> + <b>[▶]</b>	Moves backward or forward one word.
<b>[CTRL]</b> + <b>[Fn]</b> HOME, <b>[CTRL]</b> + <b>[Fn]</b> END	Moves to beginning or end of memo.
<b>[TAB]</b>	Moves cursor to next tab stop.

### To “stamp” the current date or time in a memo:

- Press **[Fn]** DATE or **[Fn]** TIME. This inserts the current date or current time at the position of the cursor.

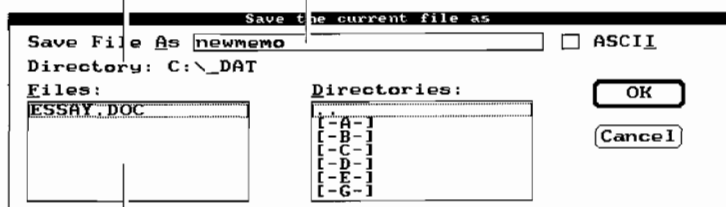


Date and time stamping are different from date and time print fields. Print fields insert codes into the memo that are interpreted only during printing.

### To save the memo file:

- Press **(F10)** when the memo is done or you want to save what you've written so far. If the memo is new and has no name yet, you will see this dialog box:

Current drive and directory. Type filename here.



Lists files in current directory.

#### Memo File: Save As

1. Enter a filename of up to 8 characters. The default file extension is .DOC, but you can change it. To enter a name *without* a file extension, include a final period.
2. If you want to save the file in a different directory or drive than the current one, type the full pathname in the box, such as A:\BUDGET\NEWMEMO.

The list boxes provide shortcuts for changing directories and viewing filenames. For more information about this type of dialog box, see "Specifying Files" on page 2-16.

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## Note



It is essential that you save (**Save**) your memo text after writing or changing it. Until you do save it (or any new version of it), it exists only in a screen buffer and not in a file. Although unsaved text is maintained in the buffer when you turn the HP 100LX off, *it is not saved on the RAM disk*. Should the HP 100LX lose main battery power or need to be reset, it retains only what is stored on the RAM disk, not in the buffer. (If backup battery power fails, then the RAM disk data are also lost.)

---

### To back up a memo onto a memory card:

This copies the current memo file to a memory card in drive A, the plug-in slot.

1. Open the memo file you want to back up.
2. Press **MENU** **F** **A** (File Save-As).
3. Specify a new or existing file on drive A (**A\:** *filename*) for the backup copy.
4. Press **F10**.

## Formatting a Memo

### Changing the Typeface

#### To start boldface, underlined, or bold underlined text in a memo:

1. In the Memo Editor, press **F2** (Bold) or **F3** (Underln) to start the new typeface.
2. Type the text you want in that typeface.
3. Press **F2** to stop boldface or **F3** to stop underlining.

#### To change the typeface of existing text:

1. Select the text to change: highlight it by simultaneously pressing **↑** and an arrow key.
2. Press **F2** for boldface or **F3** for underlining.

Follow these same steps to remove boldface or underlining from existing text.

Note, however, that if the selected text has mixed typefaces, then pressing **F2** or **F3** will change *all* the text to the same typeface.

## Setting Margins and Tabs

### To set the margins:

The space for the *left* margin appears only on the printed page, not in the display. The ruler indicates the column numbers for the left and right margins. This setting applies to the current file only.

1. Press **MENU** **T** **M** (Format Margins).
2. Fill in the fields.
  - Left sets the column in which text begins on the left side of the page.
  - Right sets the last available column for text on the right side of the page.
3. Press **F10** when done. (Or **ESC** to cancel the settings.)

### To set or delete a tab stop:

1. Press **MENU** **T** **T** (Format Tabs).
2. Use the left and right arrow keys to position the vertical bar to the location for a tab stop.
3. Press **spacebar** to add a tab stop or to delete one that is already there.
4. Press **F10** or **ESC** to put away the tab bar.

Tab-setting bar.

Diamonds are tab stops.



## Adjusting the Legibility of the Display

### To change the size of the characters in the display:

- Press **[Fn]**ZOOM (or use **[MENU]** View Character-Size). This cycles through three different display sizes:
  - 40 columns by 16 lines (biggest print).
  - 64 columns by 18 lines (default).
  - 80 columns by 25 lines (smallest print).

### To change the spacing between lines in the display:

1. Press **[MENU]** **[V]** **[Z]** (View Character-Size).
2. Press **[TAB]** to select the Display Line Spacing box.
3. Enter a number, 1 through 9. This sets the number of **pixels** between lines. A pixel is one dot on the screen.
4. Press **[F10]** (or **[ESC]** to cancel).

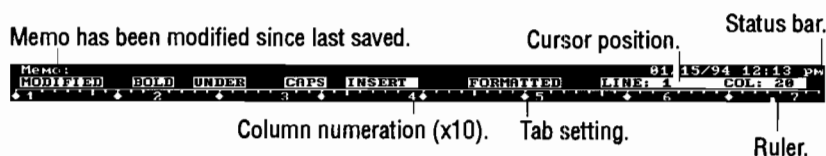
18 This setting does not affect printing.

## Options for Displaying the Memo

### To display or hide the ruler:

The ruler marks column numbers, margins, and tab settings.

- Press **[MENU]** **[V]** **[R]** (View Ruler). This toggles the ruler on and off.



### To display or hide the status bar information:

The status bar tells you whether the current file has been **MODIFIED** since last saved, has **BOLD**face and/or **UNDER**lining on, has capitalization on (**CAPS**), is in **INSERT** or **REPLACE** mode, or has formatting codes (**FORMATTED**) or not (**ASCII**). It also shows the line and column position of the cursor.

- Press **MENU** **V** **S** (View Status). This toggles the status bar on and off.

### To display or hide control characters:

When turned on, this displays carriage-return and tab characters.

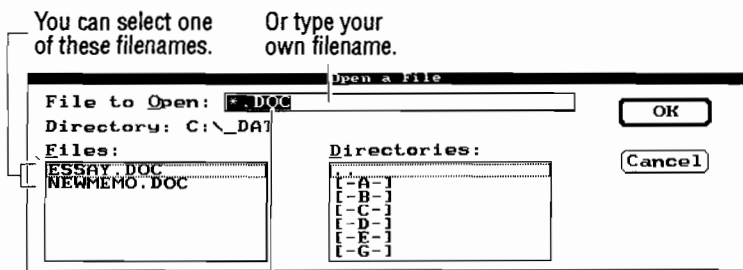
- Press **MENU** **V** **C** (View Ctrl-Characters). This is a toggle setting.

## Editing or Reading a Memo

### To open an existing memo file:

- In the Memo Editor, press **F9** (Open) and specify the filename.
- If you leave off a filename extension, the default (.DOC) is provided. To specify *no* extension, include a period after the filename.

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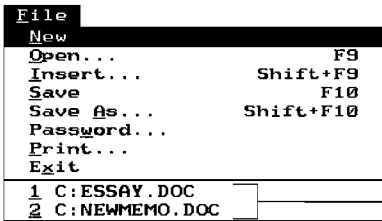


Default filename extension.

You can also open, read, and edit Memo Editor files created on the HP 95LX. HP 95LX Memo Editor files are unformatted, ASCII files (file extension .TXT).

### To re-open one of the last two memos opened:

1. Press **[E]** to start the Memo Editor.
2. Press **[MENU]** **[F]** **[1]** (or **[MENU]** **[F]** **[2]**).



The last two memo files opened.

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### To save editing changes:

- Press **[F10]** (Save).

### To cancel editing changes:

If you are using the Auto-save option, only the changes since the last auto-save can be canceled (not saved).

1. Press **[MENU]** **[Q]** to quit the Memo Editor. A dialog box will ask whether you'd like to save the changes to the current file.
2. Press **[F5]** (No).

---

## Copying or Deleting Information

### Using the Clipboard to Copy, Move, or Delete

The Clipboard is a memory buffer used to copy, move, and delete text.

- The size of the buffer depends on the Memory Config setting in the Setup utility.
- The Clipboard keys are in the lower right-hand corner. You use them in tandem with the green **Fn** (function shift) key.

#### To copy, move, or delete text:

1. Select the text of interest by highlighting it: place the cursor at the beginning of the text region, then simultaneously hold **⇧** and press an arrow key until the text you want is highlighted.
2. Press **Fn**COPY (to copy text) or **Fn**CUT (to delete or to move text).
3. If you want to copy or move the text, move the cursor to the new location to insert the text.
4. Press **Fn**PASTE to copy the selected text into place.

Both COPY and CUT copy the selected text to the Clipboard buffer, which is why you first delete (cut) text before moving (pasting) it.

To restore text that has just been deleted with CUT, press **Fn**PASTE.

### Smart Clip: Copying Multiple Fields from Records

Smart Clip uses the Clipboard to copy information quickly from the current application to another one. For example, you might want to copy a name and phone number from the Phone Book into a memo.

#### To clip information from another application into a memo:

1. Start the application you want to copy from.
2. Select the record(s) whose information you want to clip:
  - To select one record, highlight that entry in the database list or open its record.
  - To select more than one record, mark each desired record by highlighting it in the list and pressing **spacebar**.

- To select (or de-select) all records in the current list, press **MENU**, **E**, **A**.
- 3. Press **F5** to display the Smart Clip list.
- 4. Highlight the Smart Clip you want and press **F10**.
- 5. Start the Memo Editor and open the memo you want to copy to.
- 6. Place the cursor where you want the information to be copied.
- 7. Press **Fn**PASTE.

### Example: Clipping Appointment Information into a Memo.

Suppose you are writing a memo and would like to include information about an appointment. You can use Smart Clip to quickly copy that information into your memo. (Note that in the Appointment Book, you can clip only one record at a time.)

1. Leave the memo and the Memo Editor open.
2. Press **Q** and open the appointment record you want (highlight it in the list, press **ENTER**).
3. Press **F5** (Clip) and select the Smart Clip for "All Fields, No Notes". Press **F10** when done.
4. Press **⏏**, position the cursor where you want to insert the information, and press **Fn**PASTE.

## Deleting, Copying, or Inserting Memos

### To delete a memo file:

Use the Filer application to delete files. For more information on the Filer, see chapter 4.

1. Press **⏏** to start the Filer.
2. Highlight the file to delete. If it is not in the display, you might need to open its directory first: highlight the name of the directory and press **ENTER**.
3. Press **MENU**, **F**, **D**. Press **F10** to confirm.

To rename a file, use the Filer application's File Rename command.

### To copy a memo file:

1. Press **⏏** to open the Memo Editor.
2. Open the memo to copy, if it is not already displayed.
3. Press **MENU**, **F**, **A** (File Save-As).
4. Type the new filename for the copy in the Save File As box.
5. Press **F10** to create the copy (or **ESC** to cancel).



## To insert another file into a memo:

*Insert only other memo (.DOC) or ASCII files into a memo.*

1. Press **[F2]** to open the Memo Editor.
2. Open the memo that will receive the insertion.
3. Press **[MENU]** **[F]** **[I]** (File Insert).
4. Enter the name of the file you want to insert into the current memo.
5. Press **[F10]** to insert the file.

---

## Searching a Memo File

### To find any piece of text in a memo:

1. Open the memo you want to search.
2. Press **[F4]** (Find).
3. Fill in the box with the characters or text to search for.
4. Optional: Check the box (press **[spacebar]**) to discriminate upper from lower case letters.
5. Press **[F10]** or **[F4]** (Next) to search forward from the current position.
  - Or press **[F3]** (Previous) to search *backward*.

To repeat the search, press **[↑]** **[F4]**.

### To find and replace any piece of text:

1. Open the memo you want to search. Start at the beginning (press **[CTRL]+[FN]HOME**).
2. Press **[F5]** (Fnd&Rep).
3. Fill in the characters or text to search for.
4. Press **[TAB]** and fill in the text that should replace the searched-for text.
5. Press **[F4]** (FindNxt). This starts the search from the current position.
  - To replace the found text, press **[F5]** (Replace).
  - To leave the found text unchanged, press **[F4]** (FindNxt).
  - To automatically replace all text that matches, press **[F6]** (Rep All).

Search for the next example and stop.

Find and Replace

Search for

Replace with

Case sensitive

Find Next

Replace

Replace All

Cancel

Replace all examples  
without stopping.

Replace this example  
and find the next.

### To go to (move the cursor to) a specific line in a memo:

1. Open the memo you want to search.
2. Press **[MENU]** **[S]** **[G]** (Search Goto-Line-Number).
3. Type in the line number.
4. Press **[F10]**.

You can find the line number of the cursor's current position in the status line (upper right).

---

## Using Outline-Style Numbering

Outline numbering creates text entries set off by indentation and hierarchical numbering. This can include indented text that is *not* numbered.

The outline feature does this:

- Each time you press **[ENTER]**, another number or letter automatically appears in the proper sequence at the left margin or after an indentation.
- You can change the **level** of numbering using Promote (**[F7]**) and Demote (**[F8]**). Demoting makes an item subordinate to the one above it, while promoting makes an item superior to the one above it.

Up to seven levels of hierarchy.

```
Memo: ANIMAL.DOC                                01/17/94 11:27 AM
I. The Animal Kingdom
  A. Vertebrates
    1. Reptiles
    2. Mammals
      a. Primates
        i) Lemuroidea
        ii) Anthropoidea
          a) Platurrhini
          b) Catarrhini
            1) Cercopithecidae
            2) Pongidae
      b. Carnivores
        i) Creodonta
        ii) Fissipedia
          a) Aelluroidea
          b) Arctoidea
```

← Higher levels.

← Lower levels.

Help | Bold | Underln | Find | End&Rep | PrtFld | Promote | Demote | Open | Save

### Outlined Text with Roman Numerals

Numbered heading.

Unnumbered text.

```
Memo: BASIC.DOC                                01/17/94 11:23 AM
1. Basic Operation
  The basic operations are described below.
  1.1. Register Transfer
  The most basic of all operations is the transfer of
  information from one register to another.
  1.2. Memory Read/Write
  This operation initiates a transfer between the memory
  and the memory buffer.
  1.3. Bit Testing
  There must be a way to test one bit in a register and
  alter the sequence of control.
2. Target Level
```

Help | Bold | Underln | Find | End&Rep | PrtFld | Promote | Demote | Open | Save

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### Outlined Text with Decimal Numeration

## To Start Outline (Hierarchical) Numbering

Choose the numbering type:

This affects the current memo only. It affects the entire memo, including existing text that is above the cursor's position.

1. Press **(MENU)** **(T)** **(O)** (Format Outline).
2. Arrow to highlight Decimal or Roman numeral.
3. If you want to adjust the indentation, press **(TAB)** and enter a number of character spaces (1-5).
4. Press **(F10)**.

### Use Promote or Demote to start numbering:

Promote and Demote affect the numbering of the current line, whether the line has text already or not.

1. Press **F7** to start numbering on the current unnumbered line.
2. If the line has no text yet, enter your text.
3. Press **ENTER** at the end of the entry. Another number (the next one in sequence) appears. To remove a final number without text, press **▲** or **▼**.

### To create a sub-topic (subordinate entry) and increase indentation:

- Press **F8** (Demote). This “demotes” the numbering level of the current line, such as from I. to A. or 1.1 to 1.1.1.

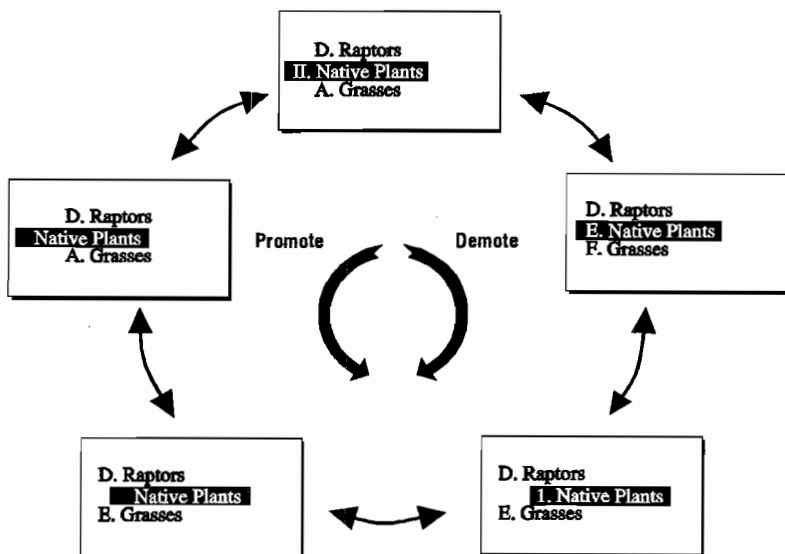
### To create a super-topic (superior entry) and decrease indentation:

- Press **F7** (Promote). This “promotes” the numbering level of the current line, such as from I.B. to II. or from 1.1.2 to 1.2.

### To enter text without numbering:

- Press **F8** until there is no beginning number.

Pressing **F8** again moves the unnumbered text back out to the margin. Once you have entered unnumbered, unindented text like this, the next promotion or demotion *starts a new outline* (level I. or 1.).



A Cycle of Promoting and Demoting

The Promote and Demote functions operate as *cycles*. If you promote more than once, for instance, the Promote function promotes if it can. If it can't, then it removes numbering, then it demotes, and then it promotes again. If the context does not make sense for a function (such as promoting when the text is already left-justified at the highest level), then numbering is removed.

**To stop outline numbering and indentation:**

- Simply press **F8** (or **F7**) until numbering and indentation are gone, leaving the line flush against the left margin.

This affects the current line and future text, but not previous text.

**Editing Existing Outlined Text**

**To remove numbering from a subtopic:**

1. Place the cursor on the line in question, and press **F8** until the numbering disappears.
2. If you want the text flush left, press **F8** again.

### To promote or demote existing text:

Promoting raises the outline level of the current line, while demoting lowers it.

1. Place the cursor on the line to change.
2. Press **F7** (Promote) or **F8** (Demote).

---

## Saving Memo Files

### Saving Memos as ASCII Text Files

Memo Editor files are one of two types:

- **Formatted.** The file contains all the formatting information of the Memo Editor's features: margins, headers, typeface, outlining, and so on.
- **ASCII (Unformatted).** An ASCII file is just characters (letters, numbers, spaces). *It has no formatting*, other than line breaks (made by pressing **ENTER**). The margins are automatically set at 9 and 72.

A new file is ASCII until you enter some formatting information.

If you want to create or edit a file for use in another program (whether an HP 100LX application or not), you should save it as an ASCII (unformatted) file. *Programs other than the Memo Editor cannot read a Memo-Editor-formatted file.* For instance, if you wanted to transfer a memo from the HP 100LX to a PC with WordPerfect, you should transfer it as an ASCII file.

### To save a memo file as an ASCII file:

When you want to save or convert a memo file to ASCII, you can either change the file from formatted to ASCII (keeping the same filename), or create an ASCII copy of the formatted file (using a new filename).

1. Press **☰** to start the Memo Editor.
2. Open the file you want to convert.
3. Press **MENU** **F** **A** (File Save-As).



## Password Protection for Memos

You can set or change a password for a memo as explained on page 2-19. Attaching a password to a memo makes its status “modified” and “formatted” (as indicated in the status bar).

---






### Note



Password protection for a memo takes effect the first time the memo is saved after the password has been set. This is because *the password is associated with the data (the memo text), not the file*, so the password is not saved until the memo text is saved. Likewise, when you copy a file, its password (if any) is copied, too.

---

## 18 Printing a Memo

Printing requires that the correct configuration settings exist in the Setup utility (    ). These settings define the type of printer you are using, the printer's interface type, and its baud rate. (See also chapter 36, “Using a Printer with the HP 100LX.”)

- **Print to Printer:** You can print a memo using a printer connected to the HP 100LX.
- **Print to Printer with Connectivity Pack:** You can print a memo from a PC that has the HP 100LX Connectivity Pack installed. (The Connectivity Pack is a separate product that can transfer files and provide the PC with Memo Editor and other PIM software.) Copy the memo file from the HP 100LX to the PC using the Connectivity Pack, then print the file to the PC's printer.
- **Print to File:** You can print a memo from another computer that does *not* have the HP 100LX Connectivity Pack by printing to a file and transferring it with Datacomm.



## Laying Out a Memo for Printing

### To set the left and right margins:

- Use **[MENU]** **[T]** **[H]** (Format Margins, page 18-5).

### To set headers and footers (for printing):

These can include automatically updated page numbering, time stamping, and date stamping.

1. Press **[MENU]** **[T]** **[H]** (Format Header/Footer). Press **[TAB]** to move between fields.
2. Type in or select the text for the header and/or footer you want.
  - To insert an automatically updated page number, date, or time, press **[F6]** (PrntFld) and select the print field you want to add to the header or footer. Press **[F10]**.
3. Press **[F10]** (or **[ESC]** to cancel).

### To insert a page break (for printing):

1. Press **[F6]** (PrntFld), the Insert Print Field dialog box.
2. Highlight “Page break” and press **[F10]**. The code **▶Page Break◀** appears. The printer will start a new page at this point.

### To add page numbers (for printing):

1. If you want the page numbers to appear in a header or footer on each page, press **[MENU]** **[T]** **[H]** (Format Header/Footer).
2. Press **[F6]** (PrntFld).
3. Select “Page number field” and press **[F10]**. The code **▶PG◀** appears. This is converted to the actual page number during printing.
4. If you need to close the Header/Footer dialog box, press **[F10]**.

### To add date and time fields (for printing):






1. If you want the date or time field to appear in a header or footer on each page, press **[MENU]** **[T]** **[H]** (Format Header/Footer).
2. Press **[F6]** (PrntFld).
3. Select “Date field” or “Time field” and press **[F10]**. The code **▶DATE◀** or **▶TIME◀** appears. This is converted to the date or time at the time of printing.
4. If you need to close the Header/Footer dialog box, press **[F10]**.

Date and time print fields are different from date and time stamping, which insert the current date or time (not a code) into the memo file. Date and time stamps are not just for printing and they are not updated.

## Printing to a Printer

### To print a memo directly:



This prints to a printer connected to the HP 100LX (or to a printer connected to a PC that is running Memo Editor from the HP 100LX Connectivity Pack).

1. Press  to start the Memo Editor.
2. Open the file you want to print.
3. Press    (File Print).
4. Highlight the option button Printer in the Print To box.
5. Press .







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## Printing to a File

This prepares a file for printing at a later time or from another computer program. (If you're using an HP 100LX Connectivity Pack, don't use Print to File; transfer the memo and then use Print to Printer).

This print file contains control codes that the printer (the one specified in the Setup utility) can interpret. To copy this file to another computer, use one of the file-transfer protocols given in the Datacomm application ( ). You can then print out this memo file by copying the binary file to a printer.

### To print a memo to a file:

1. Press  to start the Memo Editor.
2. Open the file you want to prepare for printing.
3. Press    (File Print).
4. Highlight the option button File in the Print To box.
5. Press .
6. Type in a filename for the destination file.
7. Press .

## Setting Up Printing Information

Use **Ⓜ** File Print **S**etup to specify:

- How much printing should appear on a page.
- Starting and/or ending the print-out with special information (initialization and termination strings).

Maximum number of printed lines per page.  
You can change this for shorter or longer sheets.

Print Setup

Page Length (in lines) 60

Top Margin (in lines) 0

Bottom Margin (in lines) 0

Initialization String

Termination String

OK

Cancel

Printer-control sequences to set up or end the printing job.

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Field	Meaning
Page Length	Specifies the lines of printable area on the paper. For paper $8\frac{1}{2} \times 11$ inches: The default page length (60) is appropriate for sheet-fed printers (such as HP Laserjet and HP Deskjet types), as well as for fanfold-paper printers set to skip the paper's perforations. Other fanfold-paper printers require a page-length setting of 66 lines. (See the printer's manual for more information.)
Top Margin	Specifies the number of blank lines to leave above the printed text. Default is zero lines for sheet-fed printers (like HP Laserjet and HP Deskjet) because the page length setting already takes top and bottom margins into account. Many fanfold-paper printers need a top margin setting of three.
Bottom Margin	Specifies the number of blank lines to leave below the printed text. Default is zero lines for sheet-fed printers (like HP Laserjet and HP Deskjet) because

the page length setting already takes top and bottom margins into account. Many fanfold-paper printers need a bottom margin setting of three.

Initialization String	Specifies optional printer-control sequences (up to 128 characters) before the print-out begins. An initialization code might set landscape mode or select a certain font set (such as typeface, type size, character pitch). The exact codes and meanings depend on the printer.
Termination String	Specifies optional printer-control sequences (up to 128 characters) after the print-out ends. A termination code might set a form-feed to occur at the end of the print-out or reset portrait mode (for the next print-out). The exact codes and meanings depend on the printer.

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The default page length (60) and margins (0 each) are appropriate for sheet-fed printers (such as HP Laserjet and HP Deskjet types), as well as for fanfold-paper printers set to skip the paper's perforations. Other fanfold-paper printers should be set to length 66 lines and margins 3 lines. (See the printer's manual for more information.)

### To enter a control code on the HP 100LX:

- Type `\nnn`, where *nnn* is a three-digit control code. For example, the control code for ESC is typed as `\027`.

Refer to your printer's owner's manual for information on which control codes are available and what they do.

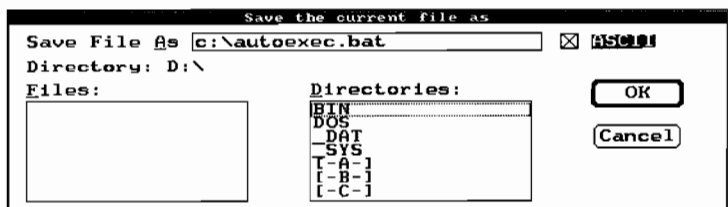
---

## More Memo Editor Examples

**Example: Editing an MS-DOS File.** MS-DOS systems (like this computer) include a start-up file called AUTOEXEC.BAT. This file tells the computer what procedures to follow whenever it is turned on. This file must be in ASCII form, so if you edit it in the Memo Editor, make sure to save it as an ASCII file.

To edit the AUTOEXEC.BAT file on the HP 100LX:

1. In the Memo Editor, open the file D:\AUTOEXEC.BAT.
2. Edit the file. For instance, you might change the prompt command from `prompt $p$g` to `prompt $t` to show the current time.
3. Use **File Save-As** to save this file as C:\AUTOEXEC.BAT. Drive D is write-protected, so you cannot save the edited file on drive D. This is not a problem, since the computer will use an AUTOEXEC.BAT file in drive C first.
4. Make sure the ASCII check box is checked (which it should be, since the original file was ASCII).



**Example: Creating a Distribution List with Smart Clip.** Create a memo distribution list for the Hyena project based on names in the Phone Book. After selecting the names for the distribution list (which you could do by creating a subset of the phone list), use a Smart Clip to choose the format (names and business phone numbers) and copy the list into the beginning of a memo file. (For more information on Smart Clip, see page 17-18.)

1. Define a subset of the Phone Book for all records with "Hyena" in the Category field and name this subset Hyena. *Or*, just select (press **spacebar**) all names associated with the Hyena project and skip the next step.

2. While displaying the Hyena subset, select all its records (**Ⓜ** Edit Select-All). This defines which names will appear in the distribution list.
3. In the Phone Book, select the Smart Clip “Name and Business Phone”. This will define the format of the distribution list. When you press (**F10**), you save the distribution list of the selected names into the Clipboard.
4. In the Memo Editor, paste this Smart Clip into a memo needing this distribution list.



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(If you define your own Smart Clip, you can make the names appear first name first and align the names and numbers into columns.)

**Example: Formatting a Memo.** Set up a memo with the following formats:

1. Extra line spacing (two pixel rows) in the display.
2. Largest character size in the display.
3. Wide margins: left starts at column 15, right starts at column 66.
4. A footer called “Summary Report.”

To implement these formats, first start a new memo (**Ⓜ** File New):

1. **Ⓜ** View Character-Size. Fill in “2” for Display line spacing.
2. **Ⓜ** View Character-Size, 40 columns (or **Ⓜ** ZOOM).
3. **Ⓜ** Format Margins. Fill in “15” for Left, “66” for Right.
4. **Ⓜ** Format Header/Footer. Fill in the Footer field with “Summary Report.”

## Function Keys

Key Label	Description
<b>Bold</b>	Starts/stops boldface; makes selected text bold.
<b>Underlin</b>	Starts/stops underlining; makes selected text underlined.
<b>Find</b>	Searches for the specified text.
<b>Find&amp;Rep</b>	Searches for the specified text and replaces it as specified.
<b>PrntFld</b>	To mark the spot where a page break, page number, current time, or current date should be inserted during printing.
<b>Promote</b>	Raises the hierarchical numbering one level for the current line.
<b>Demote</b>	Lowens the hierarchical numbering one level for the current line. (Use also to eliminate numbering.)
<b>Open</b>	Asks for the name of a memo file to open.
<b>Save</b>	Saves the current memo file.

## Menu Commands

<u>File</u>	<u>Edit</u>	<u>View</u>	<u>Format</u>	<u>Search</u>	<u>Options</u>
New...	Delete	Character	Text...	Goto Line	Setup...
Open...	Cut	Size...	Header/	Number...	
Insert...	Copy	Ctrl Characters	Footer...	Find...	
Save	Paste	Ruler	Tabs...	Find/Replace...	
Save As...	Select All	Status	Margins...	Repeat Last Find	
Password...	Promote		Outline...		
Print...	Demote				
Exit	Insert Print Field				
1					
2					





## The Note Taker

Press **[R...]** **[N]** to start the Note Taker.

The Note Taker is like a note pad. It is a place to write, organize, and keep track of many notes or short memos without having to retrieve and save files. In fact, it is a **database** of notes, with the same features of organization available in the Phone Book and Database applications.

Compared to the Memo Editor, the Note Taker:

- Provides faster access to individual notes.
- Provides an overview of all notes (a sorted list).
- Can search all notes at once. (The Memo Editor can search one memo at a time.)
- Can display a subset of notes. (The Memo Editor cannot create subsets of memo files.)
- Has no formatting features, but does use word wrapping.
- Limits the length of the text.

Since the notes are organized as items in a list rather than as separate files, they are easy to scan, sort, search, and organize.

Size of each note in bytes.      Current item. **[↑]** and **[↓]** move the highlight bar. **[ENTER]** opens the note record.

NoteTaker:NOTES.NDB		All Notes(1/8)	01/15/94 12:21 PM
Title	Size	Note	
+Books to read	86	One Hundred Years of Solitude	Son of
+Drug allergies	25	penicillin sulfa drugs	
+Gift list, NH	33	Pogo stick Dartboard Monopoly	
+Gift list, NJ	36	Portable CD player Hawaiian shirt	
+ID numbers	43	American Express G78 H745 Driver's li	
+Movies to see	46	Queen Salmon Phantom of the Opera Ba	
+Party ideas	130	Buried treasure theme, scavenger hunt.	
+Plantings	41	Magnolia tree Lily of the Valley Kni	

Help | Add | Note | Find | Clip | Subset | Sort | Columns | Open

### The Note List

## To open a note record:

- In the note list, highlight an item and press **ENTER** or **F3** (Note). (**Note** displays the Full Screen Note.)
- Press **F6** (Prev) or **F7** (Next) to see other notes.

The text of the note can fill more than one screen. To see more text in the Note field or Full Screen Note, press **Fn**PGDN or **Fn**PGUP.

---

## Creating a Note

Each note can be up to 32 KB long (about 30 screens).

### To add a new note:

1. In the Note Taker, press **F2** (Add).
2. Fill in the fields. (Use **TAB** to move among fields.)
  - a. **Title**. Identifies the note in the note list.
  - b. The main, unlabeled field is for your text.
  - c. **Category**. Includes a list of any categories used for notes. You can enter a new category or press **▼** to see the list and select an existing category. (See "Using the Category Field," page 16-3.) You can categorize the records in any way you want, and use this information later to view a **subset** of the notes.
3. Press **F10** when done, or press **F2** to add another note. This saves the note automatically. (Or press **ESC** to *not* save the note.)

Automatic word wrap.



Full Screen Note (more text space).

### Adding a Note Record

Notes in the Note Taker are automatically saved when you press **(F10)** (Done). In contrast, memos written in the Memo Editor are saved into files. However, you can save a note as an ASCII file (see below).

### To “stamp” the current time or date in a note:

- Press **(Fn)DATE** or **(Fn)TIME**. This inserts the current date or current time at the position of the cursor.

### To save a note as an ASCII (unformatted text) file:

1. Highlight the note in the note list, or open the note record.
2. Press **(F3)** **(F2)** (Note Save-As).
3. Enter the filename. (There is no default file extension.)
4. Press **(F10)** to save the file. (Or press **(ESC)** to cancel.)

---

## Editing or Deleting Notes

### To edit (change) a note:

1. Display the note list.
2. Highlight the item you want to edit.
3. Press **(ENTER)** or **(F3)** (Note) to open the note's record.
4. Edit the Title, Category, or Note.
  - To clear the Title or Category, highlight it and press **(DEL)**.
  - To restore the previous Title or Category, press **(ESC)**.
5. Press **(F10)** to save your changes. (Or press **(ESC)** to cancel them.)

### To clear (erase) the text of a note:

1. Highlight the note in the list or open its record.
2. Press **(F3)** (Note) to display the Full Screen Note.
3. Press **(F4)** (Clear) to erase the Note field.

### To delete a note:

1. Display the note list.
2. Highlight the note to delete.
  - If you want to delete several notes, select each note by highlighting it and then pressing **(spacebar)**.
3. Press **(DEL)**.

### To restore the last deleted or edited note:

- Press **MENU** **E** **U** (Edit Undo) before doing another operation.

### To erase all notes:

1. Display the note list.
2. Press **MENU** **E** **A** (Edit Select-All).
3. Press **DEL** **F10**.

This deletes all the records from the current Note Taker file.

---

## Searching the Note Taker

### To look up a note (speed-locate):

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1. Display the note list.
2. Start typing the title of the note.
3. Press **ENTER** when done, or arrow to the title you want.

The speed-locate operates as it does in the Database and the Phone Book.

### To find any piece of text in the notes:

1. From the note list or record, press **F4** (Find).
2. Fill in the box with the characters or text to search for. Optional: Select the check boxes (press **spacebar** to change) for the options you want.
3. Press **F10** to search forward from the beginning of the list.
  - Or press **F4** (Next) to search forward from the current (highlighted) position.
  - Or press **F3** (Previous) to search *backward* from the current position

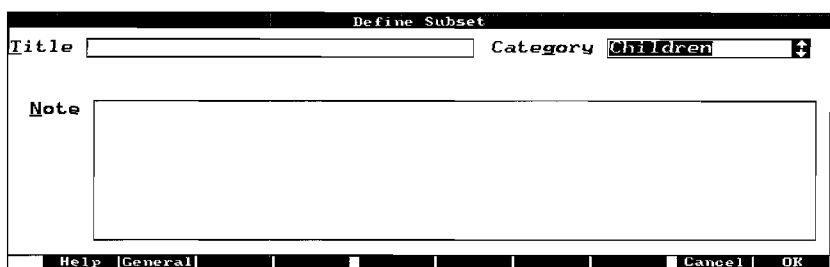
To repeat the search, press **↑** **F4**.

If you want to search through only the titles or categories of the notes (and not the bodies of the notes), you can speed up a search by not checking Include Notes for the search.

---

## Using Subsets of the Note Taker

The **Subset** function displays a specified subset of your note list. You determine the subset by filling out the Title, Category, and/or note fields according to the contents you want to select for. For example, you could display the titles of just those notes in the Category “Children”, or just those notes that mention “computer”. To define and view subsets of the note list, follow the instructions under “Defining Subsets of a Database,” page 17-13.



The screenshot shows a window titled "Define Subset". It contains three input fields: "Title" (empty), "Category" (containing "Children"), and "Note" (empty). The "Category" field has a dropdown arrow. At the bottom, there are buttons for "Help", "General", "Cancel", and "OK".

**Example: A Subset Definition for Notes about Children**

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## Copying or Moving Information

### Using the Clipboard to Copy or Move

You can use the Clipboard functions to copy and move information within the Note Taker, as well as to and from other applications.

#### To copy or move the contents of a field:

1. Open the desired note record and tab to the desired field.
2. Press **(Fn)COPY** (to copy) or **(Fn)CUT** (to move).
  - To copy just part of the text in a field, select the range of text first. (Hold **(⇧)** and press an arrow key to highlight the text.)
3. Open the destination field, if different. (It can even be in a different application).
4. Highlight the destination field or place the cursor where you want the text.
5. Press **(Fn)PASTE**.

### To copy a complete note record:

1. Display the note list and highlight the note you want to copy.
2. Press **[Fn]COPY**.
3. Press **[Fn]PASTE**. The new note is sorted with the other notes.

### Smart Clip: Copying Multiple Fields from Records

Smart Clip uses the Clipboard to copy formatted information quickly from *predefined fields* in the current application to another location. For example, you might want to copy a name and phone number from the Phone Book into a note.

### To clip information into a note:

1. Start the application you want to copy from.
2. Select the record(s) whose information you want to clip:
  - To select one record, highlight that entry in the list or open its record.
  - To select more than one record, mark each desired record by highlighting it in the list and pressing **[spacebar]**.
  - To select (or de-select) all records in the current list, press **[MENU]** **[E]** **[A]**. (Clipboard Error results if there is not enough Clipboard memory to clip all the notes.)
3. Press **[F5]** to display the Smart Clip list.
4. Highlight the Smart Clip you want and press **[F10]**.
5. Press **[&...]** **[N]** and open the note you want to copy to.
6. Place the cursor where you want the information to be copied.
7. Press **[Fn]PASTE**.

**Clip** provides predefined choices of fields to copy, and lets you define others yourself. The predefined Smart Clip from the Note Taker is "All Fields". You can also clip information from a note to another note or to another application.

### Inserting a Text File into a Note

The text file must be an ASCII (unformatted text) file. You can convert a Memo Editor file to ASCII by using **[MENU]** File Save-As and checking the ASCII box.

## To insert an ASCII text file into a note:

1. In the Note Taker, open the note you want to add to.
2. Press **F3** (Note) to display the Full Screen Note.
3. Position the cursor where you would like the text to be inserted.
4. Press **F3** (Insert).
5. Specify the filename. It must be an ASCII text file.
6. Press **F10**.

---

## Limits While Using the Note Taker

- Maximum number of notes (items) in Note Taker (one file): limited by available RAM disk space. Theoretical maximum: about 5,000.
- All the notes are part of one file. However, you can create more than one Note Taker file if you wish.
- Maximum length of a note: 32 KB characters (about 30 screens).

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## Function Keys

### Function Keys for the Note List

Key Label	Description
Add	Opens a template to write a new note.
Note	Displays Full Screen Note for highlighted item.
Find	Searches for the specified character string (letters or other characters).
Clip	To copy predefined fields (a Smart Clip) from the Note Taker to the Clipboard. Also to define new Smart Clips. (See also page 17-18.) Smart Clip definitions are also used in Custom Style printing.
Subset	To display and/or define a specified subset of the note list. See "Defining Subsets of the Database," page 17-13.
Sort	Specifies how to sort the notes for the list. See "Sorting Data Lists," page 17-23.
Columns	Specifies how many columns appear in a list, how wide they are, and which fields they display. See "Rearranging the Columns in Data Lists," page 17-24.
Open	To open a different Note Taker file.

## Function Keys for a Note Record (an Item)

Key Label	Description
Add	Opens a template to write a new note.
Note	Displays the Full Screen Note.
Find	Searches for the specified character string (letters or other characters).
Clip	To copy predefined fields (a Smart Clip) from the Note Taker to the Clipboard. Also to define new Smart Clips. (See also page 17-18.)
Prev	Displays the previous note.
Next	Displays the next note.

## Function Keys for the Full Screen Note

Key Label	Description
Save As	Saves the current note in the specified ASCII text file.
Insert	Copies the specified ASCII text file into the current note at the position of the cursor.
Clear	Erases the Note field.

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## Menu Commands

<u>F</u> ile	<u>E</u> dit	<u>V</u> iew	<u>S</u> earch	<u>O</u> ptions
New...	Current Item	Subset...	Find...	Smart Clip...
Open...	Add New Item	Sort...	Repeat Last Find	
Copy...	Delete	Arrange Columns...	Prev Item	
Merge...	Undo	Full Screen Note...	Next Item	
Extract...	Cut			
Password...	Copy			
Print...	Paste			
Exit	Select Item			
	Select All/None			



## Printing with Personal Information Applications

---

Printing requires that the correct configuration settings exist in the Setup utility (**&...** **S** **MENU** **O** **P**). These settings define the type of printer you are using, the printer's interface type, and its baud rate. (See also chapter 36, "Using a Printer with the HP 100LX.")

Pressing **Fn**PRTSC prints everything on the current screen.

---

### What You Can Print

This chapter explains how to print information from PIM applications: appointments, to-do items, phone records, other database records, city records (from World Time), and notes (from Note Taker). Although you might not realize it, each of these applications saves its information in its own file (or files).

For information on printing memos, see chapter 18 (page 18-18).

You can print PIM items in these styles:

- As a list (a list of appointments, a list of phone records, etc.).
- As the fields (the details) of a record in a customized format based on a Smart Clip.

You can print out a single record, several selected records, or all records in the current application file.

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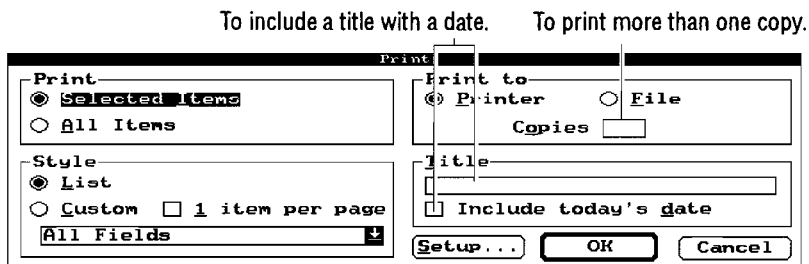
## How You Can Print

- **Print to Printer:** You can print using a printer connected to the HP 100LX.
- **Print to Printer with Connectivity Pack:** You can copy a file to a PC using the HP 100LX Connectivity Pack (a separate product that transfers files and provides the PC with HP 100LX applications). You can then print to a printer connected to the PC.
- **Print to File:** You can create an ASCII file (a “print file”), transfer it to another computer, and print it out without the Connectivity Pack.

## Printing Directly to a Printer

Follow these procedures to print information using a printer connected to the HP 100LX.

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**The Print Dialog Box**

### To print items in a list (List Style):

*Do not use this procedure for Appointment Book items. See the next procedure.*

1. Display the appropriate application and, if necessary, the appropriate file and subset. You can print from the currently displayed subset or list only.
2. Display the list of items (records) that you want to print or print from. Select the desired items, unless you want to print *all* of the items in the current application.
  - For one item, just highlight it.

- For more than one item, press **spacebar** after highlighting each one.
- 3. Press **MENU** **F** **P** (File Print).
- 4. In the Print box, select Selected Items to print one or more records or All Items to print all records in the current list.
- 5. In the Style box, select List.
- 6. In the Print to box, select Printer.
- 7. Press **F10**.

Name	Business	Home
Blascow, Stan	(812) 555-0987	(812) 555-6543
Bvett, Eric	700-1111	701-0000
Gilbert, Jean	800-1234	800-4321
Grouch, Oscar	(800) 123-4567	(800) 123-1234
Gryc, Andy	(416) 700-7634	(416) 555-7634
Harding, John W.	700-0811	710-0000
Johnson, Bill	700-2127	700-1272
Kaser, Everett	(206) 555-5676	(206) 555-0123
Megowan, Pat	(212) 555-8761	(212) 555-8866
Roy, Diana	555-0987	(311) 555-6543
Wechsler, Susan	800-5457	800-0000
Winter, Lynn	900-5538	900-0001

### Phone Book Printed in List Style, All Items

#### To print appointments, events, and to-do items:

You can print one item, or you can print items within a date range. You can pick which items: appointments, events, appointments and events, checked-off to-do items, unchecked-off to-do items, or all to-do items.

1. Display the Appointment Book.
2. If you want to print just one item, then display the appropriate list and highlight the item.
3. Press **MENU** **F** **P** (File Print).
4. In the Print box, select Current Item or These Items.
  - Select Current Item to print the current appointment or to-do item.
  - Select These Items to print all specified items within a date range.

- If you select These Items, then select the type of items. Press  to scroll through the choices. Type in the beginning and ending dates bracketing the items you want to print.
- In the Style box, select List.
- In the Print to box, select Printer.
- Press .

Print Dialog Box—Appointment Book

### Symbols for Printed To-Do Lists

Printed Symbol	Equivalent Symbol	Meaning
#	✓	Completed item (checked off).
!	!	Item due today (and not yet checked off).
>	★	Item new today (its first occurrence).
<	☹	Item past-due (and not yet checked off).
+	+	Item includes Note.

### To print details of items or appointments (Custom Style):

This prints the specified fields for one or more records. It uses the choices and formats from the Smart Clip list (.

- Prepare to print as in the previous two procedures for items or appointments. Only the Style box will be different.
- In the Style box, select (arrow to) Custom.
- To print each record on its own page, tab to and check “1 item per page”.
- Tab to the list box to select the fields to print for each record. The choices are from the current Smart Clip list. Press  to scroll through the list. To print a complete record, select All Fields.
- When done, press .

Appointment date.	Title.	Today's date.
	Appointments as of	
	Saturday January 15, 1994	

Description: Meet with visiting editors  
 Start Date : 1/17/1994  
 Start Time : 11:00am  
 End Time : 12:00pm  
 Location :  
 Alarm  
 Leadtime: 5  
 #Consecutive Days: 1  
 Repeat Status: None  
 Shows in Week View  
 Shows in Month View  
 Note:  
 Include lunch

Description: Help with computer lab  
 Start Date : 1/17/1994  
 Start Time : 2:30pm  
 End Time : 3:00pm  
 Location : Jefferson School  
 Alarm  
 Leadtime: 20  
 #Consecutive Days: 1  
 Repeat Status: Weekly  
 Shows in Week View  
 Shows in Month View  
 Note:

Description: School play  
 Start Date : 1/17/1994  
 Start Time : 6:30pm  
 End Time : 7:30pm  
 Location : Highland View  
 Alarm  
 Leadtime:  
 #Consecutive Days: 1  
 Repeat Status: None  
 Shows in Week View  
 Shows in Month View  
 Note:  
 Help usher

**Appointment Records Printed in Custom Style, All Fields**

**To add Custom field choices:**

The Custom list box has one or more built-in field choices, such as All Fields and Business Phone in the Phone Book application. These are actually Smart Clip definitions. You can add more Custom field choices for printing by creating new Smart Clip definitions for a particular application. Refer to "Smart Clip: Copying Multiple Data Fields from Multiple Records," page 17-18.

## Printing to a File (Creating an ASCII Data File)

Printing to a file creates an ASCII version of the HP 100LX PIM information and saves it in a file. (This applies to the Appointment Book, Phone Book, Database application, Note Taker, and World Time. It does not apply to the Memo Editor.) The ASCII file can then be interpreted by other editing software besides the original application. You can insert this ASCII file into any other file, or transfer it to another computer for printing or editing.

If you have the HP 100LX Connectivity Pack for your PC, then you do not need to use Print to File to create an ASCII file for the PC; the PC can print the original PIM file directly.

### To create an ASCII file (a “print file”):

1. In the Print dialog box (**MENU** File Print), select File in the Print To box.
2. When you are done, press **F10**. You will be prompted for a filename.

### To print the ASCII file on another computer:

1. Copy the ASCII (print) file (not the original application file) to a PC.
2. Use the PC's software or DOS Print to print out this file.

## Setting Up Printing Information (Setup)

Use **MENU** File Print **Setup** (**MENU** **F** **P** **F3**) to specify:

- How much printing should appear on a page.
- Starting and/or ending the print-out with special information (initialization and termination strings).

Field	Meaning
Page Length	Specifies the lines of printable area on the paper. For paper 8 <sup>1</sup> / <sub>2</sub> × 11 inches: The default page length (60) is appropriate for sheet-fed printers (such as HP Laserjet and HP Deskjet types), as well as for fanfold-paper printers set to skip the paper's perforations. Other fanfold-paper printers require

a page-length setting of 66 lines. (See the printer's manual for more information.)

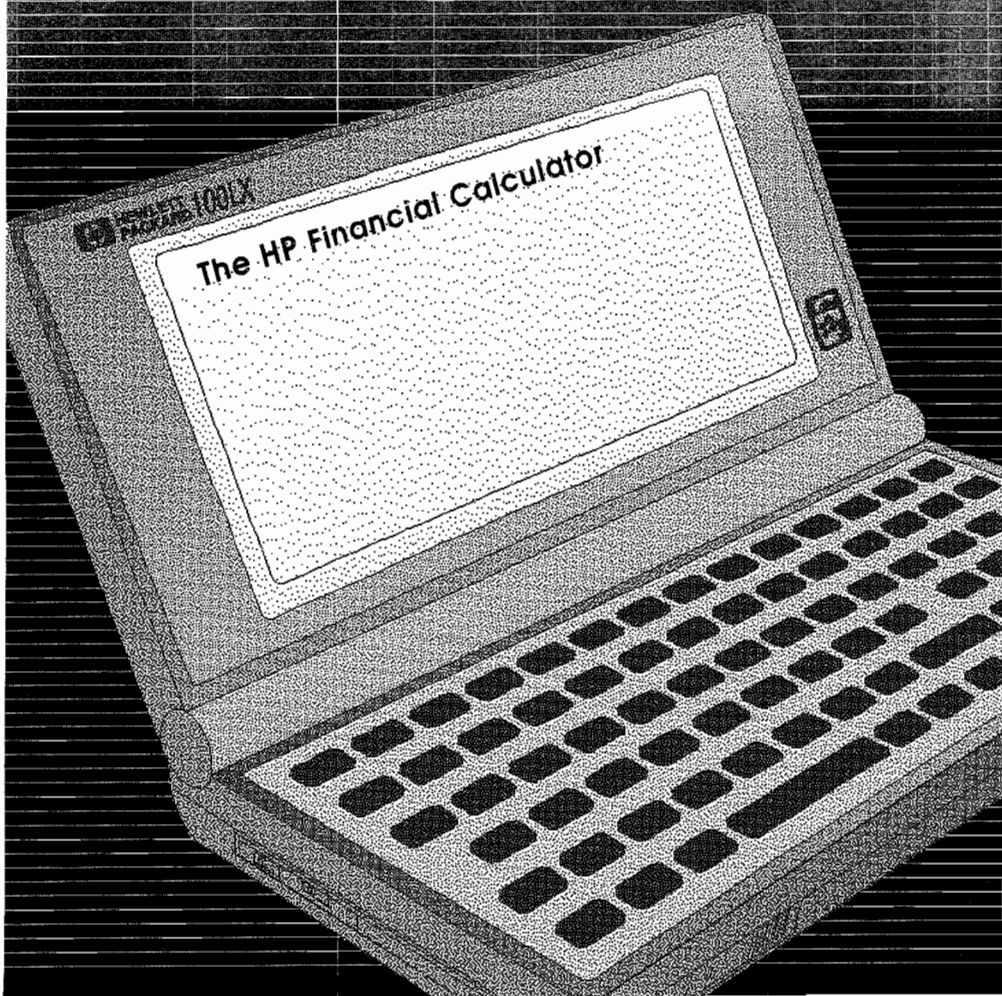
- Top Margin** Specifies the number of blank lines to leave above the printed text. Default is zero lines for sheet-fed printers (like HP Laserjet and HP Deskjet) because the page length setting already takes top and bottom margins into account. Many fanfold-paper printers need a top margin setting of three.
- Bottom Margin** Specifies the number of blank lines to leave below the printed text. Default is zero lines for sheet-fed printers (like HP Laserjet and HP Deskjet) because the page length setting already takes top and bottom margins into account. Many fanfold-paper printers need a bottom margin setting of three.
- Initialization String** Specifies optional printer-control sequences (up to 128 characters) before the print-out begins. An initialization code might set landscape mode or select a certain font set. The exact codes and meanings depend on the printer.
- Termination String** Specifies optional printer-control sequences (up to 128 characters) after the print-out ends. A termination code might set a form-feed to occur at the end of the print-out or reset portrait mode (for the next print-out). The exact codes and meanings depend on the printer.

The default page length (60) and margins (0 each) are appropriate for sheet-fed printers (such as HP Laserjet and HP Deskjet types), as well as for fanfold-paper printers set to skip the paper's perforations. Other fanfold-paper printers should be set to length 66 lines and margins 3 lines. (See the printer's manual for more information.)



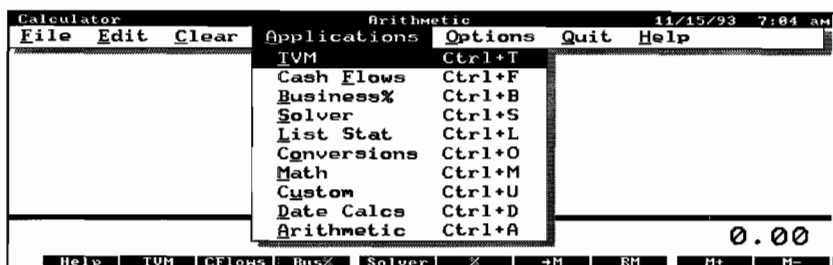


# PART 5





## Calculator Basics



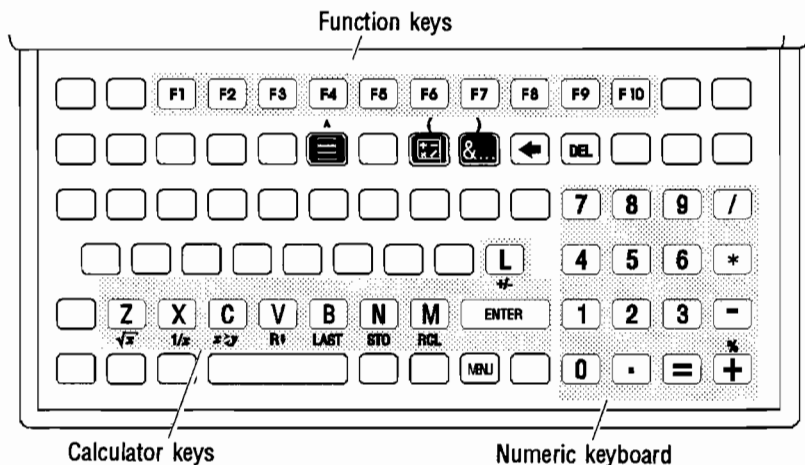
The HP 100LX Financial Calculator has its own set of applications that answer problems dealing with:

- General arithmetic (chapter 22).
- Business percentages, including markup and margin (chapter 23).
- Time value of money (chapter 24).
- Interest rate conversions (chapter 24).
- Uneven cash flows (chapter 25).
- Currency and other unit conversions (chapter 26).
- One- and two-variable statistics (chapter 27).
- Date calculations (chapter 28).
- Solver equations that you enter (chapters 29 and 30).
- Function graphing (chapter 29).
- Customizing the Calculator (chapter 31).

This chapter describes many of the features common to the various Calculator applications: using the keyboard and display, storing and manipulating numbers, clearing data, and using the Clipboard to move data from the Calculator to other HP 100LX applications.

## The Calculator Keyboard

The Calculator uses primarily three areas of the keyboard:

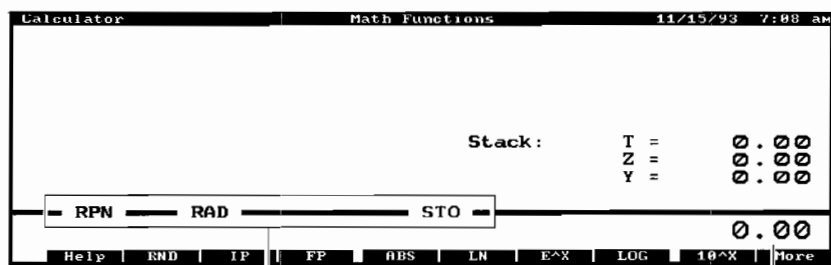


**About the Special Calculator Keys.** Most of the time the alpha keys are not active within the Calculator. The Calculator takes advantage of this by redefining the bottom row of alpha keys ( $\square Z$ ,  $\square X$ ,  $\square C$ , etc.) along with the  $\square L$  key to give you a set of special Calculator keys. The Calculator definitions are printed just below the corresponding keys— $\square Z$  becomes  $\square \sqrt{x}$ ,  $\square X$  becomes  $\square 1/x$ , etc.

Key	Description
$\square \sqrt{x}$	Calculates the square root of the number in the calc line.
$\square 1/x$	Calculates the reciprocal of the number in the calc line.
$\square x \leftrightarrow y$	If the calc line contains a number, exchanges that number with the result of the previous calculation. If the calc line contains two numbers separated by an operator, swaps the order of the numbers (for example, $3 \div 4$ changes to $4 \div 3$ ).

Key	Description
<b>R↓</b>	Rolls down the history stack. (See “Using the History Stack” on page 21-5.)
<b>LAST</b>	Copies the result of the previous calculation into the current calculation. (See “Using the LAST Key” on page 21-6.)
<b>STO</b>	Copies a number from the calc line into the designated register or variable. (See “Using Registers” on page 21-7.)
<b>RCL</b>	Recalls the number from the designated register or variable. (See “Using Registers” on page 21-7.)
<b>+/-</b>	Makes a positive number negative or a negative number positive. For example, pressing <b>+/-</b> with the number 118 in the calc line changes it to -118. Pressing it a second time makes the number positive again.

## About the Calc Line



Annunciators display above the calc line.

Calc line.

**The calc line.** This is where you enter numbers and see results.

**The annunciator area.** The top part of the box surrounding the calc line is the area the Calculator uses to display **annunciators**—symbols that tell you when the Calculator is in a special state or mode.

- The **ALG/RPN annunciator** describes how the HP 100LX expects you to enter calculations—either in algebraic syntax or in Reverse Polish Notation. For more information, see “Using RPN with the Calculator” on page 21-14.
- The **RAD/GRAD annunciator** tells you how angles are interpreted: radians (RAD), grads (GRAD), or degrees (no annunciator). This annunciator displays only in the math screen and the Solver.
- The **STO/RCL annunciator** turns on when you’re storing or recalling the contents of registers.
- The **Popul/Sample annunciator** tells you which model is used to calculate the statistics. This annunciator displays only in the List Stat application.
- The **1-Var/2-Var annunciator** indicates the number of columns available for statistics data entry. This annunciator displays only in the List Stat application.

Chapter 31, “Configuring and Customizing the Calculator,” tells you how to set or change modes of operation.

#### To clear the calc line:

- Press **[DEL]**.

#### To edit the calc line:

- Use **[←]** (backspace). When the cursor is visible—which is when you are in the process of keying in a number—**[←]** deletes the last character you keyed in. When the cursor is not visible, **[←]** erases the rightmost number or operator.

#### To enter a negative number:

- Type the number and press **[+/-]** (the **[L]** key).

#### To view displayed numbers to their full precision:

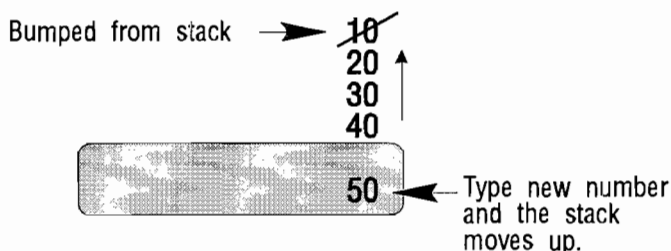
1. Press **[Fn]ZOOM**.
2. Press **[ESC]** to continue.

## Recalling Numbers to the Calc Line

Sometimes, you may want to include the result of a previous calculation in a new calculation. There are several ways to reuse numbers.

### Using the History Stack

The **history stack** is a four-level record of activities within the Calculator. It includes the calc line and three levels “above” the calc line. When you start a new operation on the calc line, the previous contents move up to level 1, bumping level 1 contents to level 2, level 2 to level 3, and level 3 off the stack. Numbers are lost when bumped off the stack.



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The history stack is shared by all Calculator applications and always contains four numbers. If you clear the stack (by pressing **MENU** **C** **S**), the numbers change to 0's. The current state of the stack can be viewed in three of the Calculator applications:

- In the Math application, where the stack is always displayed.
- In the Arithmetic application.
- In the Custom application.

The stack is displayed in Arithmetic and Custom only when you've configured that option—press **MENU** **O** **M** and select Show Stack.

The **R↓** key (the **V** key when the Calculator is active) “rolls” the history stack down one line. For example, pressing **R↓** once with the above stack moves 50.00 to the top of the stack (level 3) and rolls the other numbers down one level, putting 40.00 in the calc line. Pressing **R↓** four times cycles through the entire stack.

The  $\boxed{x\leftrightarrow y}$  key (the  $\boxed{C}$  key when the calculator is active) normally swaps a number in the calc line with the number in stack level 1. For example, if your stack looks like the one in the previous illustration, pressing  $\boxed{x\leftrightarrow y}$  puts 40.00 in the calc line and moves 50.00 to level 1.

The exception to this rule is when you have an incomplete calculation in the calc line. Then,  $\boxed{x\leftrightarrow y}$  swaps the two operands. For example, pressing  $\boxed{x\leftrightarrow y}$  changes 2.00/3.00 in the calc line to 3.00/2.00.

## Using the LAST Key

Pressing  $\boxed{LAST}$  (the  $\boxed{B}$  key when the Calculator is active) copies the number in level 1 of the history stack into a calculation you are in the process of doing.

**Example: Using  $\boxed{LAST}$**  Here is one way to calculate  $\frac{39 + 8}{\sqrt{123 + 17}}$ .

**Keys:**

$\boxed{\frac{1}{x}}$   $\boxed{MENU}$   $\boxed{A}$   $\boxed{M}$

**Description:**

Selects the Math application so you can see the stack.

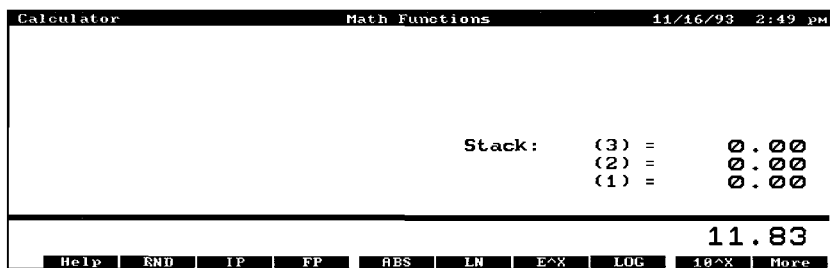
123  $\boxed{+}$  17  $\boxed{=}$

Calculates  $123 + 17$ .

$\boxed{\sqrt{x}}$

Calculates the square root of  $123 + 17$ .

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39  $\boxed{+}$  8  $\boxed{=}$   $\boxed{/}$

Copies 11.83 back to the calc line.

$\boxed{LAST}$

$\boxed{=}$

Displays the final answer of 3.97.



## Using Registers

The Calculator has 10 **registers** (storage locations), numbered 0 through 9, that can be used to store and recall numbers.

### Viewing Registers

The current values in the registers can be viewed in the Arithmetic and Custom applications: Press  $\boxed{\text{MENU}}$   $\boxed{\text{O}}$   $\boxed{\text{M}}$  and select Show Registers.

### Storing and Recalling Numbers

To store or recall a number, press  $\boxed{\text{STO}}$  (the  $\boxed{\text{N}}$  key when the Calculator is active) or  $\boxed{\text{RCL}}$  (the  $\boxed{\text{M}}$  key when the Calculator is active), followed by a number in the range 0 through 9.

$\boxed{\text{STO}}$  copies the number from the calc line to a designated register. If there is more than one number in the calc line,  $\boxed{\text{STO}}$  copies *only the rightmost number*.  $\boxed{\text{RCL}}$  recalls the stored number back to the calc line.

To cancel the store or recall after you've pressed  $\boxed{\text{STO}}$  or  $\boxed{\text{RCL}}$ , press  $\boxed{\text{ESC}}$  or  $\boxed{\leftarrow}$ .

**Example: Using Registers** The following keystrokes solve these two calculations using two registers:

$$\begin{array}{r} 475.6 \\ 39.15 \\ \hline \end{array} \qquad \begin{array}{r} 560.1 + 475.6 \\ 39.15 \\ \hline \end{array}$$

**Keys:****Description:**

Selects the Arithmetic application. (Not necessary if you're already in Arithmetic.)

Displays the registers in Arithmetic. (Not necessary if they're already displayed.)

475.6 1

Stores 475.6 into register 1.

39.15 2

Stores 39.15 (the rightmost number) into register 2.

Completes the first calculation.

560.1 1

Recalls the contents of register 1.

Adds the two numbers.

2

Recalls the contents of register 2.

Completes the second calculation.

Calculator		Arithmetic	11/15/93	7:13 am
		Reg0 (M) =	0.00	
		Reg1 =	475.60	
		Reg2 =	39.15	
		Reg3 =	0.00	
		Reg4 =	0.00	
		Reg5 =	0.00	
		Reg6 =	0.00	
		Reg7 =	0.00	
		Reg8 =	0.00	
		Reg9 =	0.00	
			26.45	
Help   TVM   CFlows   Bus%   Solver   %   +/-   RM   M+   M-				

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and can also be used with variables. For example, pressing (the payment function-key in TVM) stores the rightmost number in the calc line into the variable *PMT*. Pressing copies the contents of *PMT* into the calc line.

**Clearing Registers**

In most cases, it is unnecessary to clear registers, since storing a number *replaces* the previous contents. However, you can clear the registers to zero by pressing .

## Doing Arithmetic inside Registers

The Calculator lets you do arithmetic on numbers that are stored *inside* registers regardless of which Calculator application you are in.

**Example: Register Arithmetic** Store 45.7 in register 3, multiply that number by 2.5, and store the result back in register 3.

### Keys:

### Description:

45.7 (STO) 3

Stores 45.7 into register 3.

2.5 (STO) (\*) 3

Stores 114.25 ( $45.7 \times 2.5$ ) into register 3.

(RCL) 3

Displays the contents of register 3.

The following table shows the options for arithmetic inside registers:

Keys	New Number in Register
(STO) (+)	old number in register + number in calc line
(STO) (-)	old number in register - number in calc line
(STO) (*)	old number in register $\times$ number in calc line
(STO) (/)	old number in register $\div$ number in calc line











21

You can also do arithmetic on numbers stored in variables. For example, 2 (STO) (\*) **PMT** multiplies the current contents of **PMT** by 2 and stores the product in **PMT**.

## Using the M Register

Register 0 (the M register) is a special register that has its own set of “shortcut” memory keys. You can use the (STO) key-combinations and (RCL) with register 0 just like you would with the rest of the registers, or you can use the four function keys ((F7) through (F10)) that are present whenever you’re in the Arithmetic application. These keys do storage operations on register 0 with a minimum of keystrokes.

## M Register Keys in the Arithmetic Application

Keys	Description
 → M (F7)	Stores the value in the calc line into register 0. (Same as  0.)
 R/M (F8)	Recalls the contents of register 0 to the calc line. (Same as  0.)
 M+ (F9)	Adds the value in the calc line to the old value in register 0 and stores the sum in register 0. (Same as   0.)
 M- (F10)	Subtracts the value in the calc line from the old value in register 0 and stores the difference in register 0. (Same as   0.)

**Example: Using the M Register** The following example stores 355.6 in register 0, and then adds 49.2 into the register.

**Keys:**

**Description:**

Selects the Arithmetic application.

355.6 

Stores 355.6 into register 0.

49.2 

Stores 404.8 (355.6 + 49.2) into register 0.



Displays the contents of register 0.

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## Moving Values between the Calc Line and 1-2-3

If you're using the Calculator while you have an open 1-2-3 worksheet, you have the ability to copy values from the calc line to a 1-2-3 cell and from a 1-2-3 cell to the calc line. Any numbers copied into 1-2-3 this way are treated as values by 1-2-3.

### To copy the rightmost number in the calc line to a 1-2-3 cell:

1. Press **(STO)** **(spacebar)** from the Calculator. The open 1-2-3 worksheet is displayed.
2. Move the cell pointer to the cell you want to receive the number.
3. Press **(ENTER)**. The number from the calc line is copied to the highlighted cell, and you're returned to the Calculator.

### To copy a number in a 1-2-3 cell to the calc line:

1. Press **(RCL)** **(spacebar)** from the Calculator. The open 1-2-3 worksheet is displayed.
2. Move the cell pointer to the cell with the value you want to copy.
3. Press **(ENTER)**. The number in the highlighted cell is copied to the calc line.

If in step 2 you selected an empty cell or a cell with a label, 0.00 is returned to the calc line.

---

## The Point-and-Shoot Method of Data Entry













Most of the examples in the Calculator part of this manual demonstrate entering data using the function keys that correspond to the variables on the screen. An alternate method for data entry involves highlighting a variable on the screen using the arrow keys, typing a number, and then pressing **(▲)**, **(▼)**, or **(ENTER)**. Then, once you've entered all the necessary data, you can highlight the variable to solve for and press the spacebar to return the answer.

This "point-and-shoot" method is available throughout the Calculator whenever a list of variables is displayed.

### Example: Using Point-and-Shoot to Calculate a Mortgage
















**Payment** The owner of Bunsen's Burner, a local Cajun food restaurant, has taken out a 30-year (360-month) mortgage on his eatery. The amount is \$200,000 at 10% annual interest. Calculate his monthly payment.


**Keys:****Description:**

- |   |  |
|---|--|
|     | Selects the TVM application.                               |
|      | Clears any prior TVM data.                                 |
|    | Highlights the <i>N</i> variable.                          |
| 360    | Enters the number of payments and highlights <i>I%YR</i> . |
| 10   | Enters the interest rate.                                  |
| 200000   | Enters the amount of the mortgage.                         |
|    | Calculates the monthly payment.                            |

Calculator		Time Value of Money - case 1		11/15/93 7:14 AM	
Number of periods.....	N	=		360.00	
Annual interest.....	I%YR	=		10.00	
Present value.....	PV	=		200,000.00	
Payment.....	PMT	=		-1,755.14	
Future value.....	FV	=		0.00	
Payments per year.....	P/YR	=		12	
Begin/End mode.....	B/E	=		END	
				<b>PMT = -1,755.14</b>	
Help		Amort		Iconv	
B/E		P/YR		N	
I%YR		PV		PMT	
FV					

## Clearing Information from Calculator Memory

- To clear the data associated with the current Calculator application, press   . For example, if you're in the TVM application, pressing    clears all your TVM data.
- To clear the calc line, press   .
- To clear the history stack, press   .
- To clear the storage registers, press   .

Pressing  is another way to clear just the calc line.

---

## Using the Clipboard with the Calculator

The Clipboard lets you capture a number from the calc line and move it to another HP 100LX application (or even back into the Calculator). For example, you could use the Clipboard to capture the result of a percentage calculation and insert it in a memo you're writing.

The Calculator Solver has a special use for the Clipboard, which is described in "Using the Clipboard in the Solver" on page 29-11.

### To copy a number from the calc line into the Clipboard:

- Press **Fn**COPY. The content of the calc line is copied into the Clipboard. (Any previous contents of the Clipboard are erased when you copy something new into it.)

### To insert the contents of the Clipboard into the active HP 100LX application:

1. Position the cursor where you want the text inserted. (Except in the Solver, anything inserted into the Calculator goes into the calc line.)
2. Press **Fn**PASTE.

---

### Note



1-2-3 interprets the contents of the Clipboard as a label. So, if you move a number from the Calculator to 1-2-3 using the Clipboard, it will go into 1-2-3 as a label, not as a value. To move numbers from the Calculator to 1-2-3 that 1-2-3 would interpret as values, see "Moving Values between the Calc Line and 1-2-3" on page 21-10.

---

When you paste the contents of the Clipboard into the calc line, only the last *number* in those contents is pasted; all non-numeric characters are ignored.

---

## Using RPN with the Calculator

If you're an experienced RPN user, you may want to configure the Calculator to operate in RPN mode.

### To Set RPN Mode in the Calculator:

1. Press **MENU** **O** **M** to get the Calculator Modes dialog box.
2. Select RPN in the Operation Mode box.

When the Calculator is in RPN mode, the **RPN** annunciator is displayed at the left side of the calc line.

### What is RPN?

**Reverse Polish Notation** (RPN) is based on an unambiguous, parentheses-free mathematical logic known as "Polish Notation," developed by the Polish logician Jan Łukasiewicz (1878–1956). While conventional algebraic notation places the operators *between* the relevant numbers or variables, Łukasiewicz's notation places them *before* the numbers or variables. For optimal efficiency of the stack, we have modified that notation to specify the operators *after* the numbers. Hence the term *Reverse Polish Notation*, or *RPN*.

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### Where to Learn More About RPN

There are several easy-to-follow books designed to explain RPN to the beginner. Here is one such book:

*ENTER* by Jean-Daniel Dodin

It's available at the time of this writing from:

EduCALC  
27693 Cabot Road  
Laguna Niguel, CA 92677 USA

Telephone: 800 677-7001 (Credit card orders only)



## Arithmetic and Math Functions

---

### Simple Arithmetic

Here are some examples of simple arithmetic in the Calculator using algebraic syntax. Notice how [=] completes the calculation.

**Keys:**

**Description:**



Starts the Calculator.

54.69 [+ ] 28.33

Adds 54.69 to 28.33 and displays 83.02 in the calc line.



[\* ] 6 [- ] 200 [= ]

Multiplies the previous result by 6, subtracts 200 from that result, and displays 298.12 in the calc line.

---

### Chain Calculations

Notice in the example above that you did not need to press [=] to multiply 83.02 by 6—the multiplication was completed when you pressed the operator (in that case, [-]) for the next part of the calculation. Calculations strung together are called **chain calculations**.

### Operator Priority and Pending Operations

Some chain calculations might be interpreted several different ways. For example,  $9 + 12 \div 3$  has two interpretations:

$$9 + \frac{12}{3} = 13 \quad \text{or} \quad \frac{9 + 12}{3} = 7$$

The HP 100LX uses a system of operator priority to evaluate expressions:

Operator	Priority
$\wedge$	First
$*$ and $/$	Second
$+$ and $-$	Third

The HP 100LX calculates an intermediate result when the next operator you enter has a lower or equal priority. When the next operator has higher priority, the HP 100LX retains the previous numbers. For example, in the calculation  $9 + 12 / 3 =$ , division has a higher priority than addition. Thus, the 9 and  $+$  are retained as a pending operation until the division is completed.

**Example.** Calculate  $4 \times 7^3$  plus  $5 \times 7^2$  plus 6.

**Keys:**

$\text{ON}$

**Description:**

Starts the Calculator.

4  $*$  7  $\wedge$

$\wedge$  has a higher priority than  $*$ . ( $\wedge$  is the shifted  $\text{=}$  key.)

3  $+$

Calculates  $4 \times 7^3$ , and the calc line shows 1,372.00+.

5  $*$

$*$  has a higher priority than  $+$ .

7  $\wedge$

$\wedge$  has a higher priority than  $*$ .

2  $+$

Adds  $5 \times 7^2$  to 1,372.

6  $=$

Completes the calculation and displays 1,623.00.

If a calculation requires that operations be done in an order inconsistent with operator priority (for example, addition *before* multiplication), use parentheses. You can have a maximum of eight pending operations.

---

## Using Parentheses in Calculations

Use parentheses when you need to postpone calculating an intermediate result until you've completed lower-priority operations.

**Example.** Suppose you want to calculate:

$$\frac{30}{85 - 12} \times 9$$

If you were to key in 30  $\left(\frac{\quad}{\quad}\right)$  85  $\left(\frac{\quad}{\quad}\right)$ , the Calculator would calculate the intermediate result of 30/85, which is 0.35. However, that's not what you want. To delay the higher-priority division until you've subtracted 12, use parentheses:

**Keys:**

**Description:**

$\left(\frac{\quad}{\quad}\right)$

Starts the Calculator.

30  $\left(\frac{\quad}{\quad}\right)$   $\left(\frac{\quad}{\quad}\right)$  85  $\left(\frac{\quad}{\quad}\right)$

The parenthesis prevents an intermediate calculation.

12  $\left(\frac{\quad}{\quad}\right)$

Calculates 85 - 12 and displays  
30.00/73.00.

$\left(\frac{\quad}{\quad}\right)$  \*

Calculates 30 ÷ 73 and displays 0.41\*9.

$\left(\frac{\quad}{\quad}\right)$  =

Completes the calculation with a result of  
3.70.

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---

## Percent

In most cases,  $\left(\frac{\quad}{\quad}\right)$  (the shifted  $\left(\frac{\quad}{\quad}\right)$  key) divides the number furthest to the right in the calc line by 100. The exception is when a plus or minus sign precedes the number. Then, the  $\left(\frac{\quad}{\quad}\right)$  key uses the rightmost number as a percent, and calculates that percent of the number preceding the plus or minus sign.

**Example: Percentages.** Find 27% of 85.3.

**Keys:****FX**

85.3 \* 27 %

=

**Description:**

Starts the Calculator.

Divides 27 by 100.

Calculates 27% of 85.3 and displays 23.03.

**Example: Calculating Simple Interest.** You borrow \$1,250 from a relative, and agree to repay the loan in a year with 7% simple interest. How much money will you owe?

**Keys:**

1250 + 7 %

=

**Description:**

Interest on the loan (7% of \$1250) is \$87.50.

Displays 1,337.50, the total amount you must repay at the end of 1 year.

---

## Other Keyboard Arithmetic

**Examples.** The other keyboard arithmetic keys are  $\sqrt{x}$  (the **Z** key),  $1/x$  (the **X** key), and  $\wedge$  (the shifted **Y** key). They act on the number furthest to the right in the calc line.

**Keys:****FX**4  $1/x$ 20  $\sqrt{x}$ 1.1  $\wedge$  2 =**Description:**

Starts the Calculator.

Calculates the reciprocal of 4 to be 0.25.

Calculates the square root of 20 to be 4.47.

Calculates  $1.1^2$  to be 1.21.

The  $1/x$  function is useful for calculating the root of a number.

125  $\wedge$  3  $1/x$ 

=

Calculates  $1/3$  and displays 125.0000.33.

Calculates the cube root of 125 to be 5.00.

## Using the Automatic Constant in Calculations

An **automatic constant** is an operator (+, −, \*, /, or ^) and a number or percentage that can be used for repetitive calculations. To initiate an automatic constant, press an operator twice followed by a number or percentage. Once initiated, the constant is displayed to the right of the calc line in brackets, for example [+5%].

**Example.** Calculate  $128 \times 3.2$ ,  $219 \times 3.2$ , and  $316 \times 3.2$ .

**Keys:**



128 3.2

**Description:**

Starts the Calculator.

Stores “\*3.2” as a constant and multiplies 128 by 3.2. The result and constant are displayed: 409.60 [\*3.20].

219

Multiplies 219 by 3.2 and displays 700.80 [\*3.20].

316

Multiplies 316 by 3.2 and displays 1,011.20 [\*3.20].

**Example.** Calculate  $10 + 10\%$ ,  $11 + 10\%$ , and  $25 + 10\%$ .

**Keys:**

10 10

**Description:**

Stores “+10%” as a constant and adds 10% to 10. The result and constant are displayed: 11.00 [+10.00%].

Adds 10% to 11 and displays 12.10 [+10.00%].

25

Adds 10% to 25 and displays 27.50 [+10.00%].

**The K Abbreviation.** If it causes the contents of the calc line to become too long to be viewed in the display, the constant is abbreviated as K, as in [+K%].

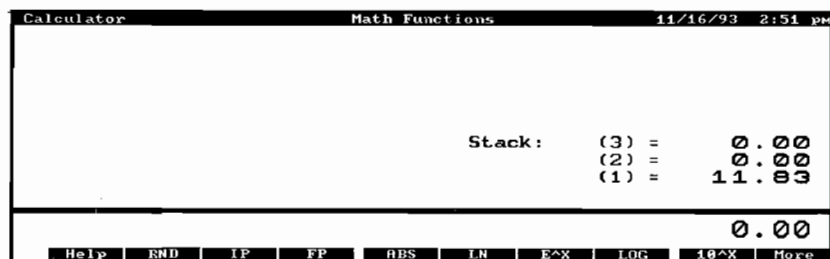
**Clearing the Constant.** Pressing clears the constant and the result from the calc line. Pressing another operator key or clears just the constant and leaves the result.



## Technical Math Functions

Press **2ND** **MENU** **A** **M** to start the Calculator Math application, which gives you function key labels at the bottom of the display for the technical math functions. (As a shortcut from anywhere else in the Calculator, you can press **CTRL**+**M** to get to the Math application.)

There are four sets or **pages** of function keys—pressing **More** (**F10**) shows you the next page, and pressing **↑** **More** shows you the previous page. The Calculator remembers the current page when you leave the math functions screen so that it is displayed again when you return.



Pressing **More** (**F10**) brings up another "page" of math functions.

Unless noted otherwise, the technical math functions operate on the rightmost real number in the calc line.

**Rounding a Number.** **RND** rounds the number in the calculator line to the number of displayed decimal places. (Before rounding, the stored version of the number may have additional non-zero digits that are not displayed.) Any subsequent calculations using that number use the rounded value.

**Example: Rounding a Number.** This example assumes numbers are displayed to two decimal places.

**Keys:**



**Description:**

Selects the Calculator Math application. (You may need to press **MORE** to see the function key used in this example.)



Calculates  $7.2781$ . The result is displayed to two decimal places— $7.28$ —but the entire number is in memory and is used in any further calculations.



Rounds the number to  $7.28$ . ( $7.2781$  is no longer in Calculator memory.)

**Integer Part, Fractional Part, and Absolute Value.** The following table describes these functions.

Key	Function
IP	Integer part of rightmost real number in calc line.
FP	Fractional part of rightmost real number in calc line.
ABS	Absolute value of rightmost real number in calc line.

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**Exponential and Logarithmic Functions.** There are four exponential and logarithmic functions.

Key	Function
LN	Natural (base $e$ ) logarithm of a positive number.
$E^X$	Natural antilogarithm; $e^x$ .
LOG	Common (base 10) logarithm of a positive number.
$10^X$	Common (base 10) antilogarithm; $10^x$ .

**Example: Logarithmic Functions.** Find the natural log of 47.5.

**Keys:**



**Description:**

Selects the Calculator Math application.  
(You may need to press **MORE** to see the function keys used in this example.)

47.5 **LN**

Natural log of 47.5 is 3.86.

**E<sup>x</sup>**

Natural antilogarithm of the previous result is 47.50.

**Changing the Angle Mode.** The trigonometric functions and polar/rectangular coordinate conversions involve angles that can be interpreted either as degrees, radians, or grads, depending on the current angle mode. Annunciators at the top-left part of the calc line indicate the mode—the **RAD** annunciator indicates Radians mode, the **GRAD** annunciator indicates Grads mode, and no annunciator indicates Degrees mode.

To change the angle mode, press **2nd** **MENU** **O** **M** and then select the desired angle mode.

**Trigonometric Functions.** Except for  $\pi$ , trigonometric functions interpret angles in degrees, radians, or grads, depending on the angle mode.

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Key	Function	Key	Function
<b>PI</b>	$\pi$ (3.14159265359)	<b>ASIN</b>	arc sine
<b>SIN</b>	sine	<b>ACOS</b>	arc cosine
<b>COS</b>	cosine	<b>ATAN</b>	arc tangent
<b>TAN</b>	tangent		



**Example: Trigonometric Functions.** This example assumes the angle mode is set to Degrees.

**Keys:**



**Description:**

Selects the Calculator Math application. (You may need to press **More** to see the function keys used in this example.)

15 **SIN**

Sine of  $15^\circ$  is 0.26.

2.73 **ATAN**

Arc tangent of 2.73 is 69.88.

**Angle and Hour Conversions.** The following table describes the four angle- and hour-conversion functions:

Key	Function
<b>→DEG</b>	<i>To degrees</i> ; converts the number from a radian value to its decimal degree equivalent.
<b>→RAD</b>	<i>To radians</i> ; converts the number from a decimal degree value to its radian equivalent.
<b>→HR</b>	<i>To hours</i> ; converts the number from hours(degrees)-minutes-seconds-decimal seconds format (H.MMSSss or D.MMSSss) to decimal hours (or degrees) format.
<b>→HMS</b>	<i>To hours-minutes-seconds</i> ; converts the number from decimal hours (or degrees) to hours(degrees)-minutes-seconds-decimal seconds format (H.MMSSss or D.MMSSss).

**Example: Angle and Hour Conversions.** In this example you may have to press **More** (**F10**) after you start the Math application to get to the **PI** function key.

**Keys:**

**Description:**

**2nd** **MENU** **A**

Selects the Calculator Math application.

**M**

1.79 **\*** **PI**

Calculates  $1.79\pi$  to be 5.62.

**=**

**More**

Converts 5.62 radians to 322.20 degrees.

**→DEG**

90.2015 **→HR**

Converts 90 degrees, 20 minutes, 15 seconds to 90.34 decimal degrees.

**Polar/Rectangular Coordinate Conversions.** These functions interpret the angle as degrees, radians, or grads, depending on the current angle mode.

Key	Function
<b>XCOORD</b>	Stores the $x$ -coordinate or calculates the $x$ - and $y$ -coordinates.
<b>YCOORD</b>	Stores the $y$ -coordinate or calculates the $x$ - and $y$ -coordinates.
<b>RADIUS</b>	Stores the radius or calculates the radius and angle.
<b>ANGLE</b>	Stores the angle or calculates the radius and angle.

**Example: Coordinate Conversions.** Convert the rectangular coordinates (10, -15) to polar coordinates. This example assumes the angle mode is set to Degrees.

**Keys:****Description:**

Selects the Calculator Math application.  
(You may need to press **MORE** to see the function keys used in this example.)

10 **XCOORD**

Stores the  $x$ -coordinate.

15 **(+/-) YCOORD**

Stores the  $y$ -coordinate.

**RADIUS**

Calculates the radius and angle and displays  
**RADIUS = 18.03.**

**Probability Functions.** Combinations, permutations, factorials, and random numbers are included in the probability functions.

Key	Function
<b>X</b>	Stores $x$ for calculating combinations and permutations.
<b>Y</b>	Stores $y$ for calculating combinations and permutations.
<b>CX, Y</b>	Combinations; calculates the number of different <i>sets</i> containing $y$ items that can be taken from a larger group of $x$ items. Different orders of the same $y$ items are not counted separately.
<b>PX, Y</b>	Permutations; calculates the number of different <i>arrangements</i> of $y$ items that can be taken from a larger group of $x$ items. Different orders of the same $y$ items are counted separately.
<b>NI</b>	Calculates the factorial of the rightmost number in the calc line.
<b>SEED</b>	Stores a seed for the random number generator. A <i>seed</i> is a number that initiates the sequence of random numbers. Pressing 0 <b>SEED</b> uses a new seed from the system clock. To specify a particular seed, key in a non-zero number and press <b>SEED</b> . You can repeat a random number sequence by storing the same non-zero seed.
<b>RAN#</b>	Displays a random number between 0 and 1. All random numbers have 12 significant digits.

**Example: Probability Functions.** Calculate combinations and permutations.

**Keys:**



**Description:**

Selects the Calculator Math application.  
(You may need to press **More** to see the function keys used in this example.)

5  **$x$**

Stores  $x$ .

3  **$y$**

Stores  $y$ .

**$C_{x,y}$**

Calculates combinations:  $C_{x,y} = 10.00$ .

**$P_{x,y}$**

Calculates permutations:  $P_{x,y} = 60.00$ .

When you calculate either combinations or permutations, the other of the two is automatically calculated at the same time, and both are displayed near the top of the screen.

## Business Percentage Calculations

To start the Calculator Business% application press

**F2** **MENU** **A** **B**. (Or, as a shortcut from anywhere within the Calculator, press **CTRL**+**B**.) Business% has two screens: one for calculating percent change and percent of total, and one for calculating markup and margin. Press **More** (**F10**) to switch between the two screens:

Calculator		Business Percentages		11/15/93 7:22 am	
Old value.....	OLD	=	110,000.00		
New value.....	NEW	=	115,000.00		
Percent change.....	%CHG	=	12.00		
Total amount.....	TOTAL	=	675,040.00		
Part of total.....	PART	=	234,576.00		
Percent of total.....	%TOTAL	=	34.71		
			%CHG = 12.00		
Help		OLD	NEW	%CHG	TOTAL
					PART %TOTAL More

### Percent Change and Percent of Total

Calculator		Business Percentages		11/15/93 7:23 am	
Cost.....	COST	=	49.00		
Price.....	PRICE	=	78.40		
Mark up.....	MARKUP	=	60.00		
Margin.....	MARGIN	=	37.50		
			PRICE = 78.40		
Help				COST	PRICE
					MARKUP MARGIN More

### Markup and Margin

---

## Calculating Percent Change

The percent change function keys are **OLD** (F3), **NEW** (F4), and **%CHG** (F5). Percent change is expressed as a percentage of the *OLD* number.

**Example: Calculating the Percent Change. Part 1.** Last year, total sales for Paddy McGowan's Fine Irish Potatoes were \$110,000. This year, sales are \$115,000. What is the percent change between last year's sales and this year's?

**Keys:**

**↑** **MENU** **A**  
**B**

**Description:**

Starts the Business% application. (You may have to press **More** to get to the function keys used here.)

110000 **OLD**

Stores the old value.

115000 **NEW**

Stores the new value.

**%CHG**

Calculates the percent change of 4.55.

**Part 2.** What would this year's sales have to be to show a 12% increase from last year? (*OLD* remains 110,000, so you don't have to key it in again.)

**Keys:**

12 **%CHG**  
**NEW**

**Description:**

Stores the percent change.

Calculates the new value of 123,200.

## Calculating Percent of Total

The percent of total function keys are **TOTAL** (F7), **PART** (F8), and **%TOTAL** (F9).

**Example: Calculating the Percent of Total. Part 1.** Total assets for Lynn Winter's Travel Insurance are \$675,840. The firm has \$234,576 cash on hand. What percentage of total assets is cash on hand?

### Keys:



### Description:

Starts the Business% application. (You may have to press **More** to get to the function keys used here.)

675840 **TOTAL**

Stores the amount of total assets.

234576 **PART**

Stores the cash-on-hand part of the assets.

**%TOTAL**

Calculates the percent of total.

Calculator		Business Percentages		11/15/93 7:21 am	
Old value.....	OLD	=	110,000.00		
New value.....	NEW	=	115,000.00		
Percent change.....	%CHG	=	12.00		
Total amount.....	TOTAL	=	675,840.00		
Part of total.....	PART	=	234,576.00		
Percent of total.....	%TOTAL	=	34.71		
			<b>%TOTAL = 34.71</b>		
Help	OLD	NEW	%CHG	TOTAL	PART %TOTAL More

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**Part 2.** Last year, due to missed and rerouted flights, the company incurred special expenses that were 45% of operating expenses. If operating expenses were \$76,249, how much were the special expenses?





**Example: Calculating Margin.** Jean's Jeans Company purchases designer blue jeans for \$25 per pair. The jeans are then sold for \$395. What is the margin?

**Keys:**

**Description:**

Starts the Business% application. (You may have to press to get to the function keys used here.)

25

Stores the cost.

395

Stores the selling price.

Calculates the margin.

Calculator		Business Percentages		11/15/93 7:25 am	
Cost.....		COST =		25.00	
Price.....		PRICE =		395.00	
Mark up.....		MARKUP =		1,480.00	
Margin.....		MARGIN =		93.67	
				<b>MARGIN = 93.67</b>	
Help		COST		PRICE MARKUP MARGIN More	

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**Example: Using Margin and Markup Together.** Faus Firewood Distributors buy cords of cut oak at a cost of \$79.60 per cord. If they routinely use a 25% markup, for what price should they sell a cord of oak? What is the margin?

**Keys:**

**Description:**

Starts the Business% application. (You may have to press to get to the function keys used here.)

79.6

Stores the cost.

25

Stores the markup and calculates the margin of 20.00%.

Calculates the selling price of \$99.50.



## Time Value of Money and Interest Conversions

---

When you press **(F2)** **(MENU)** **(A)** **(T)**, you get the time-value-of-money (TVM) application, which enables you to do compound-interest, amortization, and interest-rate-conversion calculations. (As a shortcut from anywhere within the Calculator, you can press **(CTRL)+(T)** to start TVM.)

You can use TVM to solve virtually any financial problem involving a series of cash flows (money received or money paid) that meets these criteria:

- The dollar amount is the same for each payment.
- The payments occur at regular intervals.
- Payment periods coincide with the compounding periods.

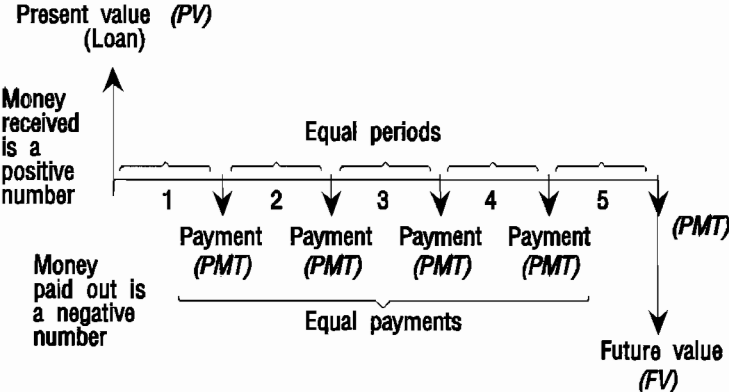
For uneven or irregular cash flow problems, see chapter 25, “Uneven Cash Flow Calculations.”

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### Making Cash Flow Diagrams

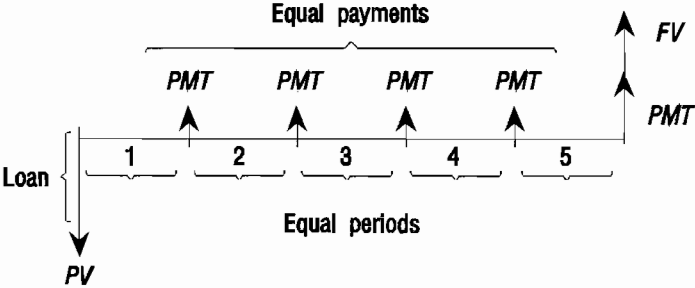
You can represent and understand many types of financial transactions using **cash flow diagrams**. A cash flow diagram is a time line divided into equal segments representing the compounding periods. Arrows represent the cash flows. Money received is a positive value, and money paid out is a negative value. Cash flow diagrams are used in the examples in this manual to help describe the problems.

The cash flow diagram for a transaction depends on the point of view you take in your problem statement. For example, a loan is an initial positive cash flow for the borrower, but it's an initial negative cash flow for the lender. The following cash flow diagram shows a loan from a *borrower's* point of view.



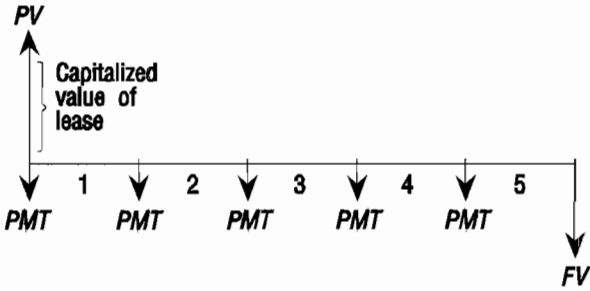
The following cash flow diagram shows a loan from a *lender's* point of view.

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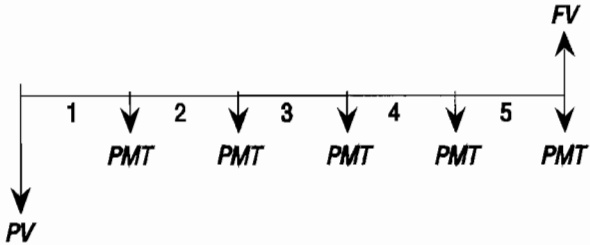


In addition, cash flow diagrams specify *when* payments occur relative to the compounding periods: at the *beginning* of each period or at the *end*. TVM provides both of these payment modes: **Begin mode** and **End mode**.

The following cash flow diagram shows lease payments at the *beginning* of each period.



The following cash flow diagram shows deposits into an account at the *end* of each period.



## The TVM Screen

Pressing **2nd** **MENU** **A** **T** the first time displays the main TVM screen, which contains the TVM variables and their corresponding function keys:

Calculator		Time Value of Money - case 1		11/15/93 7:26 am	
Number of periods.....	N	=		0.00	
Annual interest.....	I%YR	=		0.00	
Present value.....	PV	=		0.00	
Payment.....	PMT	=		0.00	
Future value.....	FV	=		0.00	
Payments per year.....	P/YR	=		12	
Begin/End mode.....	B/E	=		END	
					0.00
Help   Amort   Iconv   B/E   P/YR   N   I%YR   PV   PMT   FV					

Two of the function keys, **Amort** (amortization) and **Iconv** (interest rate conversion), bring up other screens with their own sets of function keys.

After the first time you use TVM, it starts where you last left off. If the amortization or interest conversion screen is displayed and you want to get back to the main TVM screen, press **ESC** until you get to that screen.

## The TVM Function Keys

Function	Description
Amort	Brings up the amortization screen and function keys (see “Calculating Amortization” later in this chapter).
Iconv	Brings up the interest conversion screen and function keys (see “Calculating Interest Rate Conversions” later in this chapter).
B/E	Switches the payment mode between BEGIN (for payments made at the beginning of periods) and END (for payments made at the end of periods).
P/YR	Stores the number of payments or compounding periods per year. The value must be an integer in the range 1 through 999.
N	Stores or calculates the total number of payments (or compounding periods). $N$ can be expressed in any unit of time—for example, days, months, or years. $\boxed{\uparrow}$ $\boxed{N}$ multiplies the number in the calc line by $P/YR$ and stores the result in $N$ . For example, if $P/YR$ is 12, pressing 30 $\boxed{\uparrow}$ $\boxed{N}$ stores 360 in $N$ .
I%YR	Stores or calculates the nominal <i>annual</i> interest rate as a percentage.
PV	Stores or calculates the present value of a series of future cash flows. To a lender or borrower, $PV$ is the amount of the loan; to an investor, $PV$ is the initial investment. $PV$ always occurs at the beginning of the first period.
PMT	Stores or calculates the amount of each periodic payment. The payments are the same amount, and no payments are skipped. Payments can occur at the beginning or end of each period.
FV	Stores or calculates the future value—the amount of the final cash flow, or the compounded value of the series of previous cash flows. $FV$ always occurs at the end of the last period.




## Switching TVM Cases

The Calculator lets you keep two different sets of TVM variables in memory, cases 1 and 2. They are displayed one at a time, with the current case being noted at the top of the TVM screen.

To switch cases, press  or . The displayed case number and values in the variables change.

---

## Clearing the TVM Variables






The Calculator retains the values stored in the TVM variables until they are changed or cleared. To clear the variables for the displayed TVM case—the other case is not affected—press   . This clears  $N$ ,  $I\%YR$ ,  $PV$ ,  $PMT$ , and  $FV$  to 0, sets  $P/YR$  to 12, and sets End mode.

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## Making TVM Calculations

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To make TVM calculations, follow this general procedure:

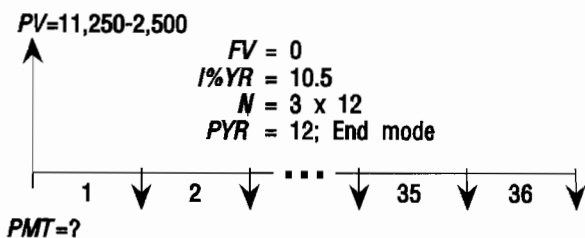
1. Press     to start TVM.
2. If necessary, press  to display the main TVM screen.
3. Check and set these TVM conditions:
  - Number of payments per year.
  - Payments at beginning or end of periods.
4. Store values for the four known TVM variables.
5. Find the unknown value.

The next few pages contain a series of TVM examples. These examples demonstrate entering data using the function keys that correspond to the variables on the screen. The point-and-shoot method for data entry (described on page 21-11) also works.

For more keystroke examples, see “Additional TVM Examples” at the end of this chapter.



**Example: A Car Loan.** Otto Tailfin is financing the purchase of a car with a 3-year loan at 10.5% annual interest, compounded monthly. The purchase price of the car is \$11,250, and his down payment is \$2500. What are his monthly payments? (Assume that payments start at the end of the first period.)



**Keys:**

3

10.5

11250 2500

0

**Description:**

Starts the TVM application.

Clears any prior TVM data.

Enters the total number of monthly payments.

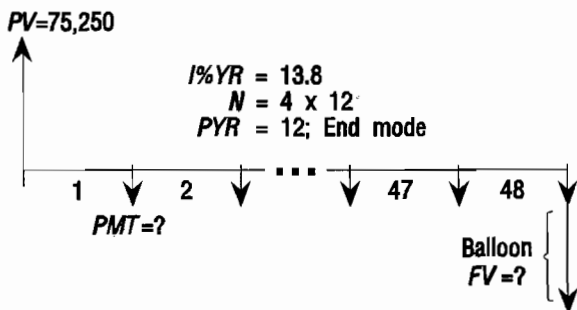
Enters the annual interest rate.

Enters the amount of the loan as the present value.

Enters 0 as the future value because the loan will be completely paid off at the end of 3 years. (This step is really not necessary because  $FV$  was set to 0 when the data was cleared above.)

Calculates a monthly payment of \$284.40.

**Example: A Mortgage with a Balloon Payment.** Russ T. Pipes has taken out a 25-year, \$75,250 house mortgage at 13.8% annual interest. He expects to sell the house in 4 years, repaying the loan in a balloon payment. Find the size of the balloon payment—the value of the mortgage after 4 years of payments.



**Keys:**

**2nd** **MEMO** **A**  
**T**

**MEMO** **C** **D**

25 **↑** **F6**

13.8 **F7**

75250 **F8**

0 **F10**

**F9**

**Description:**

Starts the TVM application.

Clears any prior TVM data.

Enters 300 as the total number of monthly payments.

Enters the annual interest rate.

Enters the amount of the mortgage as the present value.

Enters 0 as the future value.

Calculates the monthly payment.

24

Calculator		Time Value of Money - case 1		11/15/93 7:27 am	
Number of periods.....	N	=		300.00	
Annual interest.....	I%YR	=		13.80	
Present value.....	PV	=	75,250.00		
Payment.....	PMT	=		-894.33	
Future value.....	FV	=		0.00	
Payments per year.....	P/YR	=		12	
Begin/End mode.....	B/E	=		END	
<b>PMT = -894.33</b>					
<div style="display: flex; justify-content: space-between; font-size: small;"> <span>Help</span> <span>Amort</span> <span>Iconv</span> <span>B/E</span> <span>P/YR</span> <span>N</span> <span>I%YR</span> <span>PV</span> <span>PMT</span> <span>FV</span> </div>					

894.33 **+/-** **F9**

Stores the actual dollars-and-cents payment, which is the computed payment rounded to 2 decimal places. (Otherwise, *PMT* would have fractional cents as previously calculated.)

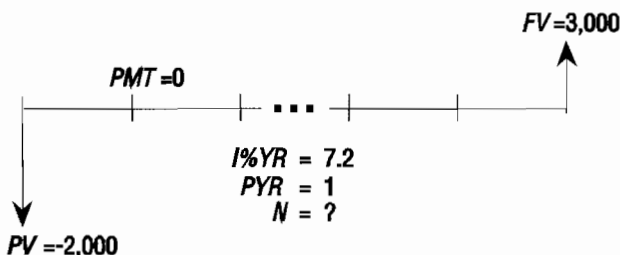
4 **↑** **F6**

Enters the number of payments made in 4 years.

**F10**

Calculates the balloon payment to be \$73,408.81.

**Example: A Savings Account.** Penny Horder deposits \$2000 into a savings account that pays 7.2% annual interest, compounded annually. If she makes no other deposits into the account, how long does it take for the account to contain \$3000?



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**Keys:**

**2nd** **MENU** **A**

**T**

**MENU** **C** **D**

1 **F5**

7.2 **F7**

2000 **+/-** **F8**

3000 **F10**

**F6**

**Description:**

Starts the TVM application.

Clears any prior TVM data.

Sets 1 compounding period per year.

Enters the annual interest rate.

Enters the amount of the deposit.

Enters the future value.

Calculates 5.83 years.

Since the calculated value of  $N$  is between 5 and 6, it will take 6 years of annual compounding to achieve a balance of at least \$3,000. The actual balance at the end of 6 years can be calculated:

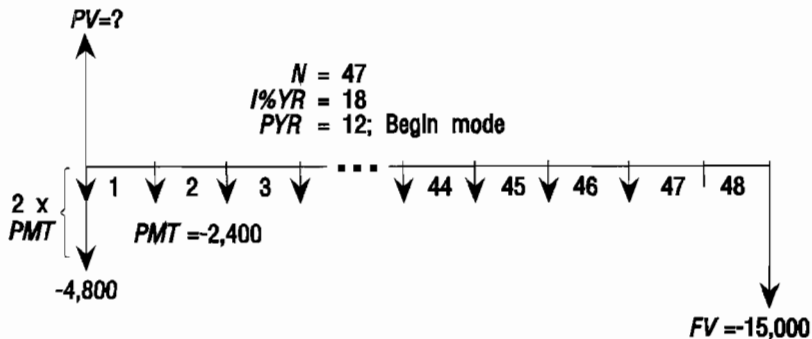
6 **F6**

Enters 6 as  $N$ .

**F10**

Calculates the balance to be \$3,035.28 after 6 years.

**Example: A Lease.** Sandy Lome is leasing farm equipment for 4 years. The monthly payment is \$2400. An additional \$2400 payment at the beginning of the leasing period replaces the final payment. The leasing agreement includes an option to buy the equipment for \$15,000 at the end of the leasing period. Calculate the capitalized value of the lease, assuming that the interest rate Lome pays to borrow funds is 18%, compounded monthly.



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Make the calculation in four steps:

1. Calculate the present value for the 47 monthly payments—the initial investment required to make the monthly payments.
2. Add the advance payment to the result of step 1.
3. Calculate the present value of the buy option—the initial investment required to generate the option price after 48 months.
4. Add the values calculated in steps 2 and 3.

**Step 1.** Calculate the present value of the monthly payments.

**Keys:**

**2nd** **MENU** **A**

**T**

**MENU** **C** **D**

**F4**

47 **F6**

18 **F7**

2400 **+/-** **F9**

**F8**

**Description:**

Starts the TVM application.

Clears any prior TVM data.

Set payments at the beginning of the periods.

Enters the number of payments.

Enters the annual interest rate.

Enters the monthly payment.

Calculates the present (capitalized) value of the 47 monthly payments to be \$81,735.58.

**Step 2.** Add the additional advance payment to *PV* and store the answer.

**+** 2400 **=**

**STO** 1

Adds the advance payment to *PV*.

Stores 84,135.58 in register 1.

**Step 3.** Find the present value of the buy option.

48 **F6**

15000 **+/-** **F10**

0 **F9**

**F8**

Enters the number of periods.

Enters the amount of buy option.

Clears *PMT*.

Calculates the present value of the buy option to be \$7,340.43.

**Step 4.** Add the results of steps 2 and 3.

**+** **RCL** 1 **=**

Calculates \$91,476.00 to be the present (capitalized) value of the lease.

## Calculating Amortization

Amortization calculations determine the amounts applied toward principal and interest in a payment or series of payments. When you're in TVM and press **Amort** (**F2**), you get the amortization function keys:

Key	Description
<b>GO</b>	Calculates the amortization for a group of payments. If you enter a number in the calc line and then press <b>GO</b> , that number is used as the number of payments in the group; if you press <b>GO</b> without entering a number, the current number of payments per year ( <i>P/YR</i> ) is used, which is 12 unless you change it.
<b>↕ GO</b>	Calculates the amortization for a number of groups, specified by the number you type in the calc line.
<b>Adjust</b>	Displays the amortization adjustment screen and function keys.
<b>I/YR'</b>	Stores or calculates a new interest rate or returns the current interest rate to the calc line.
<b>PMT'</b>	Stores or calculates a new payment amount or returns the current payment to the calc line.
<b>BAL</b>	Returns the amount of the remaining balance of the loan to the calc line. (Pressing <b>(STO) BAL</b> stores a new balance.)
<b>INT</b>	Returns the amount of the payments applied toward interest to the calc line.
<b>ACCUM</b>	Returns the amount of accumulated interest since the start of the amortization (period 0) to the calc line.
<b>PRIN</b>	Returns the amount of the payments applied toward principal to the calc line.
<b>1-2-3</b>	Specifies the current 1-2-3 worksheet as the destination for the amortization table. When an amortization table is generated, it is sent to the 1-2-3 worksheet starting at the current cell. This feature works only when a 1-2-3 worksheet is currently loaded.

To make amortization calculations, follow this general procedure:

1. Start TVM by pressing **MENU** **A** **T**.
2. Check that these TVM conditions are set:
  - Number of payments per year.
  - Payments at beginning or end of periods.
3. Store values for three TVM variables:  $I\%YR$ ,  $PV$ , and  $PMT$ . These variables define the payment schedule. (For an adjustable rate mortgage, also store the total number of payments in  $N$ .)
4. Press **Amort** (**F2**) to select the amortization screen.
5. Do one of the following:
  - Simply press **GO** (**F2**) to calculate amortization for the number of periods stored in  $P/YR$  (which is 12 unless you changed it).
  - Enter the number of payments to amortize, then press **GO** (**F2**).
6. For an Adjustable Rate Mortgage (ARM):
  - a. At the point in the schedule where the interest rate changes, adjust it by typing the new rate in the calc line and pressing **I%YR** (**F4**).
  - b. Calculate the adjusted payment by pressing **PMT'** (**F5**).
  - c. Optionally press **Adjust** (**F3**) to select the amortization adjustment screen. (This screen enables you to adjust other amortization variables, if necessary, for your particular problem.)
  - d. Continue using **GO** (**F2**) to calculate the adjusted amortization schedule.
  - e. When you're finished, press **ESC** to return to the amortization screen.

To start the amortization schedule over, press **MENU** **C** **D** to clear the data and begin again.

Amortization calculations use values of  $PV$ ,  $PMT$ , and  $INT$  rounded to the number of decimal places specified by the current display setting. However, the stored values of  $PV$  and  $PMT$  do not change. Amortization uses all 16 digits of  $I\%YR$ .

Pressing **ESC** from the amortization screen returns you to the main TVM screen.

### Example: Amortization Schedule for a Home Mortgage. Part 1.

Rufus Leekin has taken out a 30-year, \$65,000 mortgage at 12.5% annual interest. Calculate his monthly payment, and then calculate the first year's payments that are applied toward principal and interest.

#### Keys:

30

12.5

65000

#### Description:

Starts the TVM application.

Clears any prior TVM data.

Enters the number of payments.

Enters the annual interest rate.

Enters the amount of the mortgage.

Calculates \$693.72 as the monthly payment.

Selects the amortization screen.

Calculates the amortization for the first year (12 payments).

24

Calculator		TVM Amortization - case 1		11/15/93	7:28 am
Group	1	Payments	1 - 12		
Payments per Group:			12		
Amort interest rate.....		I%YR' =		12.50	
Amort payment.....		PMT' =		-693.72	
Remaining balance.....		BAL =		64,788.52	
Interest.....		INT =		-8,113.16	
Accum. interest.....		ACCUM =		-8,113.16	
Principal.....		PRIN =		-211.48	
					-693.72
Help		Go	Adjust	I%YR'	PMT'
				BAL	INT
				ACCUM	PRIN
					1-2-3

**Part 2.** Calculate the loan balance after  $3\frac{1}{2}$  years. (You've already amortized the first 12 months, so if you amortize 30 more months, you will have amortized a total of 42 months, or  $3\frac{1}{2}$  years.)

30

Calculates the amortization for the next 30 payments. After  $3\frac{1}{2}$  years, Rufus has an unpaid balance of \$64,129.05.



**Example: Adjustable Rate Mortgage. Part 1.** Pete Moss took out a \$100,000, 20-year ARM to purchase the building for his garden supply store. His interest rate for the first year is 8.25%. Moss expects the rate for the second year to increase to 8.75%. How would the increase affect his monthly payment for the second year?

Keys:	Description:
<b>2nd</b> <b>MENU</b> <b>A</b> <b>T</b>	Starts the TVM application. (You may need to press <b>ESC</b> to display the main TVM screen.)
<b>MENU</b> <b>C</b> <b>D</b>	Clears any prior TVM data.
20 <b>↑</b> <b>F6</b>	Enters the number of payments.
8.25 <b>F7</b>	Enters the annual interest rate.
100000 <b>F8</b>	Enters the amount of the mortgage.
<b>F9</b>	Calculates the monthly payment of \$852.07.
<b>F2</b>	Selects the amortization screen.
<b>F2</b>	Calculates the amortization for the first year (12 payments). His remaining balance is \$97,948.74.
8.75 <b>F4</b>	Enters the adjusted interest rate ( $1\%R'$ ).
<b>F5</b>	Calculates the adjusted payment ( $PMT'$ ). The number of remaining periods is updated automatically to 228.

Calculator		TVM Amortization - case 1		11/15/93 7:30 am
Group	1	Payments	1 - 12	
Payments per Group:			12	
Amort interest rate.....		$1\%R'$	=	8.75
Amort payment.....		$PMT'$	=	-882.62
Remaining balance.....		BAL	=	97,948.74
Interest.....		INT	=	-8,173.58
Accum. interest.....		ACCUM	=	-8,173.58
Principal.....		PRIN	=	-2,051.26
<b><math>PMT' = -882.62</math></b>				
<span style="font-size: small;">Help   Go   Adjust   <math>1\%R'</math>   <math>PMT'</math>   BAL   INT   ACCUM   PRIN   1-2-3</span>				

Moss's monthly payment would increase from \$852.07 in year 1 to \$882.62 in year 2.

**Part 2.** How much would Moss pay in interest the second year?

**F2**

Calculates amortization for the second year.  
Pete's interest total for the second year is  
\$8,487.46.

**Note**



The previous adjustable rate mortgage example uses the variables in the main amortization screen for the calculations. This same example could be done using the amortization adjust screen. (Press **Adjust** (**F3**) from the main amortization screen to see this screen; press **ESC** to leave it.) The amortization adjust screen is most useful when you have a more complicated adjustment problem that requires adjusting more than just the payment or interest rate.

**Example: Graduated Payment Mortgage.** To purchase a vacation condominium, Biff Beamer took out a 15-year, 12.5% GPM for \$95,000. His monthly payment for the first 2 years is \$875, after which time the payment increases to fully amortize the loan. What will the remaining balance be at the end of the 2 years? How much will Biff's payment have to increase to fully amortize the loan by the end of the original 15-year period?

24

**Keys:**

**2nd** **MENU** **A**  
**T**

**MENU** **C** **D**

15 **↑** **F6**

12.5 **F7**

95000 **F8**

875 **+/-** **F9**

**Description:**

Starts the TVM application. (You may need to press **ESC** to display the main TVM screen.)

Clears any prior TVM data.

Enters the number of payments.

Enters the annual interest rate.

Enters the amount of the mortgage.

Enters the monthly payment during the first 2 years.

F2

Selects the amortization screen.

24 F2

Calculates the amortization for the first 2 years, showing a remaining balance of \$98,106.01.

F5

Calculates the payment required to fully amortize the loan over the remaining number of periods. For the last 13 years of the loan Biff's monthly payment will be \$1,275.15.

---

## Note



The previous example involves **negative amortization**—a case in which payments are less than accrued interest for a time, causing the principal to increase by the difference between paid and accrued interest. In negative amortization the interest amounts shown in the amortization screen reflect the *accrued* interest, not the interest *paid*. As long as the payment is less than the accrued interest for the period, you can calculate the interest paid for a group of payments by multiplying the payment amount by the number of payments in the group.

---

---

## Sending an Amortization Table to 1-2-3 or a Printer

The Calculator enables you to print an amortization table or send it to a 1-2-3 worksheet as the table is created.

### To print an amortization table:

1. From the amortization screen, press **PRINT** **F** **P** **D** to turn printing on. When printing is on, a PRINT annunciator appears in the upper-right corner of the display.
2. Use **GO** and **GO** to generate the parts of the table you want printed. (**GO** is very useful here because it prints the table for the *number of groups* specified in the calc line.) The groups are printed as they are generated.

3. When you're finished printing, press **MENU** **F** **P** **D** again to turn printing off. Leaving the amortization screen also turns off printing.

**To send an amortization table to the current 1-2-3 worksheet:**

- From within TVM press **Amort** (**F2**) then **1-2-3** (**F10**). The current 1-2-3 worksheet is displayed.
- Move the cell pointer to the cell where you want to start receiving input and press **ENTER**. Eight amortization column headings are put into the worksheet and you are returned to the amortization screen. The amortization screen now shows a 1-2-3 annunciator in the upper-right corner of the screen to remind you that output will be sent to 1-2-3.
- Calculate the amortization as described earlier in this chapter. Each time you press **GO** (or **↑** **GO**) the results are sent to the current 1-2-3 worksheet—a row of information is sent for each group of payments calculated.
- When you no longer want the results sent to the current worksheet, press **1-2-3** (**F10**) again. The 1-2-3 annunciator turns off.

When you display the worksheet, you'll be able to see the amortization output. Here is an example of five groups sent to a worksheet:

Group	BAL	PRIN	INT	ACCUM	#PMTS	IXYR	PMT
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Nov-93 07:48 AM

The table sent to the worksheet comprises eight columns of data:

Column	Description
Group	The group number.
BAL	The remaining balance at the end of that group of payments.
PRIN	The principal paid for that group of payments.
INT	The interest paid for that group of payments.
ACCUM	The accumulated interest paid.
#PMTS	The number of payments in that group.
I%YR	The annual interest rate for that group of payments.
PMT	The periodic payment for that group.

## Calculating Interest Rate Conversions

Interest rates are generally stated as *nominal annual interest rates*. A nominal annual interest rate is an annual rate that is compounded *periodically*—for example, 18% per year, compounded monthly (12 times per year). When investments have different compounding periods, *effective interest rates* are used to compare them. The effective rate is the annual rate that would produce the same interest earnings as the nominal rate compounded  $P$  times per year. For example, earning 18% annual rate compounded monthly (nominal rate) is equivalent to earning 19.56% effective annual interest.

The Calculator lets you easily convert interest rates for comparison. When you press **MENU** **A** **T** to start TVM and then press **Iconv** **(F3)**, you get the interest conversion screen with the following function keys:

Function	Description
P/YR	Stores the number of payments per year.
I%YR	Stores or calculates the nominal annual rate.
EFF%	Stores or calculates the effective annual rate.
I%PER	Stores or calculates the periodic interest rate ( $I\%YR \div P/YR$ ).
CONT	Stores or calculates the continuously-compounded rate.
360/365	Stores or calculates the rate based on the 360/365 method. (This is a very specialized method sometimes used in the savings industry. If you don't know about it, don't worry—it's too complicated to explain here.)

Storing any of the interest rate values *automatically* updates the others. Storing  $P/YR$  updates the other values based on the effective rate. Also, pressing  $(RCL)$  before a function key recalls that value to the calc line.

Pressing  $(ESC)$  from the interest conversion screen returns you to the main TVM screen.

**Example: Converting and Comparing Interest Rates.** Rodeo star Buck Doff is considering how to invest his recent winnings. He has two investment options: One promises to pay 13.6% annual interest, compounded daily, and the other promises to pay 14.0%, compounded semi-annually. Which of Doff's options would give him the highest effective rate?

24

**Keys:**

$(\text{2nd})$   $(MENU)$   $(A)$   
 $(T)$

$(F3)$

365  $(F3)$

13.6  $(F4)$




**Description:**


Starts the TVM application. (You may need to press  $(ESC)$  to display the main TVM screen.)

Selects the interest conversion screen.

Enters the number of compounding periods in option 1.

Enters the nominal annual rate for option 1, and returns an effective annual rate of 14.57%.

-  Selects interest conversion screen, case 2.
- 2  Enters the number of compounding periods in option 2.
- 14.0  Enters the nominal annual rate for option 2, and returns an effective annual rate of 14.49%.

Use  to switch back and forth between case 1 and case 2 to compare the effective rates. The effective annual rate for option 1 (14.57%) is higher than that for option 2 (14.49%).

---

## Compounding Periods Different from Payment Periods

TVM in the Calculator assumes that the compounding periods and the payment periods are the same. However, regularly occurring deposits and withdrawals do not necessarily coincide with the investment's compounding periods. To solve a TVM problem where they don't coincide, first convert the interest rate to an equivalent interest rate with compounding periods that match the regular deposits or withdrawals.

**Example: A Savings Account with Compounding Periods Different from Payment Periods.** Starting today, Penny Horder makes monthly deposits of \$25 into an account paying 5% interest compounded daily (365-day basis). At the end of 7 years, how much will Penny receive from the account?

**Keys:**

**2** **MENU** **A**  
**T**

**MENU** **C** **D**

**F3**

365 **F3**

5 **F4**

12 **F3**

**ESC**

**F4**

7 **↑** **F6**

25 **+/-** **F9**

0 **F8**

**F10**

**Description:**

Starts the TVM application. (You may need to press **ESC** to display the main TVM screen.)

Clears any prior TVM data.

Selects the interest conversion screen.

Enters the number of compounding periods.

Enters the nominal annual rate for daily compounding, and returns an effective annual rate of 5.13%.

Enters monthly compounding periods, and calculates the equivalent nominal rate for monthly compounding at 5.01%.

Displays the main TVM screen.

Sets payment mode to beginning of a period.

Enters the total number of periods.

Enters the payment per period.

Enters the present value.

Calculates that Penny's account will have \$2,519.61 after 7 years.

24

Calculator		Time Value of Money - case 1		11/15/93 7:42 AM	
Number of periods.....	N	=		84.00	
Annual interest.....	I%YR	=		5.01	
Present value.....	PV	=		0.00	
Payment.....	PMT	=		-25.00	
Future value.....	FV	=		2,519.61	
Payments per year.....	P/YR	=		12	
Begin/End mode.....	B/E	=		BEGIN	
				<b>FV = 2,519.61</b>	
<div style="display: flex; justify-content: space-between; font-size: small;"> <span>Help</span> <span>Amort</span> <span>Iconv</span> <span>B/E</span> <span>P/YR</span> <span>N</span> <span>I%YR</span> <span>PV</span> <span>PMT</span> <span>FV</span> </div>					

**Example: Canadian Mortgages.** In Canadian mortgages, interest is compounded semi-annually while payments are made monthly. The *Canadian mortgage factor* is calculated by converting the stated nominal interest rate (compounded semi-annually) to the nominal rate



compounded monthly (the payment period). The factor is then used as the TVM variable  $I\%YR$ .

The multinational law firm of Honig, Bradley, and Erickson has opened a Canadian office in Toronto. What is the monthly payment required to fully amortize their 30-year, \$300,000 Canadian mortgage with an interest rate of 12%?

**Keys:**

**2** **MENU** **A**  
**T**

**MENU** **C** **D**  
**F3**

2 **F3**

12 **F4**

12 **F3**

**ESC**

30 **↑** **F6**

300000 **F8**

0 **F10**

**F9**

**Description:**

Starts the TVM application. (You may need to press **ESC** to display the main TVM screen.)

Clears any prior TVM data.

Selects the interest conversion screen.

Enters the number of compounding periods.

Enters the nominal annual interest rate and calculates 12.36% as the effective annual rate.

Enters monthly compounding periods, and calculates 11.71% as the equivalent nominal rate for monthly compounding (the *Canadian mortgage factor*).

Displays the main TVM screen.

Enters the total number of periods.

Enters the present value.

Enters the future value.

Calculates Honig, Bradley, and Erickson's monthly payment to be \$3,019.16.

---

## Additional TVM Examples

### Yield of a Discounted (or Premium) Mortgage

The annual yield of a mortgage bought at a discount or premium can be calculated given the original mortgage amount ( $PV$ ), interest rate ( $I\%YR$ ), periodic payment ( $PMT$ ), balloon payment (if any) ( $FV$ ), and the price paid for the mortgage (new  $PV$ ).




**Example: Yield of a Discounted Mortgage.** Seymour Profit wishes to purchase a \$100,000 mortgage from Skip Towne. Towne originally issued the mortgage at 9% interest for 20 years. Since the mortgage was issued, 42 monthly payments have been made. The loan is to be paid in full (a *balloon payment*) at the end of its fifth year. What is the yield if the purchase price of the mortgage is \$79,000?

1. Calculate  $PMT$  for the fully amortized loan ( $N = 20 \times 12$ ,  $FV = 0$ ,  $PV = -100,000$ , and  $I\%YR = 9$ ).
2. Calculate the balloon payment ( $FV$ ). (Use  $PMT$  from step 1,  $N = 5 \times 12$ ).
3. Store the number of payments remaining until the balloon payment as  $N$  ( $5 \times 12 - 42$ ), and store the proposed purchase price as  $PV$  (\$79,000); calculate  $I\%YR$  (the annual yield).

**Step 1. Calculate  $PMT$ .**


#### Keys:

20  

#### Description:

Starts the TVM application. (You may need to press  to display the main TVM screen.)

Clears any prior TVM data.

Enters the total number of monthly payments for a full 20-year mortgage.

- 9 **F7** Enters the annual interest rate.
- 100000 **+/-** **F8** Enters the amount of the original loan.
- 0 **F10** Enters 0 as *FV*.
- F9** Calculates the monthly payment received from the borrower to be \$899.73.

### Step 2. Calculate the balloon.

- 5 **↑** **F6** Enters the number of payments in 5 years.
- F10** Calculates the balloon due in 5 years to be \$88,707.05.

### Step 3. Calculate the yield.

- RCL** **F6** **-** 42 Enters the number of payments remaining until the balloon payment.
- F6**
- 79000 **+/-** **F8** Enters proposed, discounted purchase price.
- F7** Calculates annual yield for discounted mortgage with balloon to be 20.72%.

## Loans With Fees

The **annual percentage rate**, APR, incorporates fees charged when a mortgage is issued, which effectively raises the interest rate. The actual amount received by the borrower (*PV*) is reduced, while the periodic payments remain the same.

**Example: APR of a Loan with Fees.** Ernest Munnie is charged two points for the issuance of his mortgage. (One point is equal to 1% of the mortgage amount.) If the mortgage amount is \$60,000 for 30 years and the interest rate is 11.5% annually with monthly payments, what APR is Ernie paying?

1. Calculate  $PMT$ , using  $PV = \$60,000$  and  $I\%YR = 11.5\%$ .
2. Adjust  $PV$  to reflect the amount of the loan minus the fees. Then, calculate the APR ( $I\%YR$ ), using the  $PMT$  calculated in step 1 (all other values remain the same).

**Step 1. Calculate  $PMT$ .**

**Keys:**

**Description:**

Starts the TVM application. (You may need to press to display the main TVM screen.)

Clears any prior TVM data.

30

Enters the number of monthly payments.

11.5

Enters the annual interest rate.

60000

Enters the amount of the loan.

0

Enters 0 as  $FV$  since there's no balloon payment.

Calculates \$594.17 as the monthly payment.

**Step 2. Adjust  $PV$  and calculate the APR.**

Enters the actual amount of money received by the borrower.

2

Calculates the APR to be 11.76%.

**Example: Interest-Only Loan with Fees from the Lender's Point of View.** Bill Lender is making a \$1,000,000, 10-year, 10.5% (annual interest) *interest-only* loan with an origination fee of 3 points. What is the yield to Bill? Assume that the interest-only payments are made monthly. ( $PMT$  is  $\$1,000,000 \times 10.5 \div 12$ ,  $FV$  is the entire loan amount, and  $PV$  is the loan amount minus the points.)

**Keys:**

**2nd** **MENU** **A**  
**T**

**Description:**

Starts the TVM application. (You may need to press **ESC** to display the main TVM screen.)

**MENU** **C** **D**

Clears any prior TVM data.

10 **↑** **F6**

Enters the number of monthly payments.

1000000 **\*** 10.5  
**%** **/** 12 **F9**

Calculates and stores the monthly payment of \$8,750.

1000000 **F10**

Enters the entire loan amount as a balloon payment.

**-** 3 **%** **=**  
**+/-** **F8**

Enters amount borrowed (total – points) as \$970,000. ( $PV = -970,000$ .)

**F7**

Calculates APR, the yield to the lender, as 11.00%.

**A Tax-Free Account**

You can use the TVM screen to calculate the future value of a tax-free or tax-deferred account, such as an IRA or Keogh account. Current tax law will determine the extent to which the account is tax-free. The purchasing power of the future value depends on the inflation rate and the duration of the account.

$N$  = the number of payments until retirement.

$I\%YR$  = the annual dividend rate.

$PV$  = the present value of the retirement account.

$PMT$  = the amount of your deposit. (It must be constant for the duration of the account.)

$FV$  = the future value of the retirement account.

**Example: Future Value and Purchasing Power of a Tax-Free Account. Part 1.**

Les Tacksis plans to open an individual retirement account with a dividend rate of 8.175%, and invest \$2,000 at the beginning of each year until he retires in 35 years. Calculate the account balance at retirement.

**Keys:**

**F4** **MENU** **A**  
**T**

**MENU** **C** **D**

1 **F5**

**F4**

35 **F6**

8.175 **F7**

0 **F8**

2000 **+/-** **F9**

**F10**

**Description:**

Starts the TVM application. (You may need to press **ESC** to display the main TVM screen.)

Clears any prior TVM data.

Sets payments per year to 1.

Sets payment mode to BEGIN.

Enters the number of periods.

Enters the dividend rate.

The present value is 0 before the first payment.

Enters the annual deposit.

Calculates \$387,640.45 as the amount in the account at retirement.

**Part 2.** How much has Les paid into the account at retirement?

**RCL** **F9** **\***  
**RCL** **F6** **=**

Calculates  $PMT \times N$  to be \$70,000.00.

**Part 3.** How much interest has the account earned. (The interest earned equals the difference between  $FV$  and the total amount deposited.)

**+** **RCL** **F10**  
**=**

Calculates the interest part of  $FV$  to be \$317,640.45. j

**Part 4.** If his post-retirement tax rate is 15%, what is the after-tax future value of the account? Assume only interest is taxed.

**\*** 15 **%** **=**

Calculates taxes, 15% of total interest.

**+/-** **+** **RCL**  
**F10** **=**

Subtracts taxes from total  $FV$  to calculate after-tax  $FV$  to be \$339,994.39.

**Part 5.** Calculate the purchasing power of this amount in today's dollars, assuming an 8% annual inflation rate.

F10

0 F9

8 F7

F8

Calculates the purchasing power in today's dollars to be \$22,995.36. (A negative number for *PV* in the display indicates money available to flow *from* the investor, so it represents positive purchasing power.)

## A Taxable Retirement Account

The following example calculates the future value of a *taxable* retirement account that receives regular, annual payments. The annual tax on the interest is paid out of the account. (Assume the deposits have been taxed already.)

$N$  = the number of payments until retirement.

$I\%YR$  = the annual interest rate diminished by the tax rate:  
 $interest\ rate \times (1 - tax\ rate)$ .

$PV$  = the current amount in the retirement account.

$PMT$  = the amount of the annual payment.

$FV$  = the future value of the retirement account.

**Example: Future Value and Purchasing Power of a Taxable Retirement Account. Part 1.** Izzy Smart is considering investing his money with E. Norma Spayback Investment Company. They claim that if Izzy invests \$3,000 with them each year for 35 years at a dividend rate of 8.175%, with dividends taxed as ordinary income, he'll be rich at retirement with close to \$500,000. Exactly how much would Izzy have in the account at retirement? Assume a tax rate of 28%, and that payments begin today.

**Keys:**

**2nd** **MENU** **A**  
**T**

**MENU** **C** **D**

1 **F5**

**F4**

35 **F6**

8.175 **-** 28 **%**

**F7**

0 **F8**

3000 **+/-** **F9**

**F10**

**Description:**

Starts the TVM application. (You may need to press **(ESC)** to display the main TVM screen.)

Clears any prior TVM data.

Sets payments per year to 1.

Sets payment mode to BEGIN.

Enters the number of periods.

Enters and stores the dividend rate diminished by the tax rate as 5.89%.

The present value is 0 before the first payment.

Enters the annual deposit.

Calculates \$345,505.61 as the future value of the taxed account.

**Part 2.** What would be the purchasing power of that amount in today's dollars, assuming 8% annual inflation?

0 **F9**

8 **F7**

**F8**

Calculates the purchasing power in today's dollars to be \$23,368.11. (A negative number for *PV* in the display indicates money available to flow *from* the investor, so it represents positive purchasing power.)



## Uneven Cash Flow Calculations

When you press **2nd** **MENU** **A** **F**, you get the Cash Flows application, which enables you to calculate internal rate of return (IRR%), net present value (NPV), net uniform series (NUS), and net future value (NFV). Also, you can plot net present value versus the periodic interest rate.

Cash-flow amounts.

Calculator: CFLOW.CFL		Cash Flow		11/15/93	7:49 am
	Init Flow:		-50,000.00		1
	Flow# 1)	<-	5,000.00		3
	2)		10,000.00		4
	3)		0.00		1
P/YR = 1	4)		15,000.00		3
	5)				
	6)				
	7)				
	8)				
	9)				
		IRR%/YR = 11.30			
Help   Insert   Delete   IRR%/YR   NPV   NUS   NFV   I%YR   P/YR   Plot					

Number of occurrences.

### An Example of Cash-Flow Data

As a shortcut from anywhere else within the Calculator, you can press **CTRL**+**F** to start the Cash Flow application.

---

## The Cash-Flow Function Keys

Function	Description
Insert	Inserts cash flows into the list at the highlight.
Delete	Deletes the highlighted cash flows.
IRR%/YR	Calculates the <i>annualized</i> internal rate of return—the annual interest rate at which the net present value of the cash flows equals 0.
NPV	Calculates net present value—the present value of a series of cash flows plus the initial cost of the investment, computed for a specified periodic interest rate.
NUS	Calculates net uniform series—the dollar amount of regular, equal cash flows having a present value equivalent to the net present value.
NFV	Calculates net future value—the future value of the net present value.
I%/YR	Stores the annual nominal interest rate.
P/YR	Stores the number of periods per year.
Plot	Plots NPV vs. the periodic interest rate.

---

### NPV and IRR%: Discounting Cash Flows

The NPV and IRR% functions are frequently referred to as *discounted cash flow functions*. When a cash flow is discounted, you calculate its present value. When multiple cash flows are discounted, you calculate the present values and add them together.

The net present value (NPV) function finds the present value of a series of cash flows. The annual nominal interest rate must be known to calculate NPV.

The internal rate of return (IRR%) function calculates the annual nominal interest rate that is required to give an NPV of zero.

The utility of these two financial tools becomes clear after working a few examples.

## Making Cash-Flow Calculations

To make cash-flow calculations, follow this general procedure:

1. Organize your cash flows. A cash-flow diagram is useful here (see page 24-1). Put equal, consecutive cash flows into groups.
2. Press **←** **MENU** **A** **F** to start the Cash Flow application.
3. If necessary, clear prior data by pressing **MENU** **C** **D**.
4. Enter the number of compounding periods per year.
5. If you plan to calculate NPV, NUS, or NFV, enter the annual interest rate.
6. Enter the amount of the initial investment.
7. Enter the amount of the next cash flow. (If this amount occurs more than once consecutively, enter in the right-hand column the number of times it occurs.)
8. Repeat the previous step for all cash flows and groups.
9. Press the function key for what you want to calculate: IRR%, NPV, NUS, or NFV.

## Saving Cash-Flow Data in a File

You can save your cash-flow data in files for future use. If you don't specify a file extension when you give a set of cash flows a file name, the HP 100LX appends the extension **.CFL** for you. For easy recognition it's a good idea for all your cash-flow files to have the **.CFL** extension.

### To save changes to the current file:

- When you switch to another application or open another data file, changes to the current file are saved automatically.

### To copy cash flows to another file:

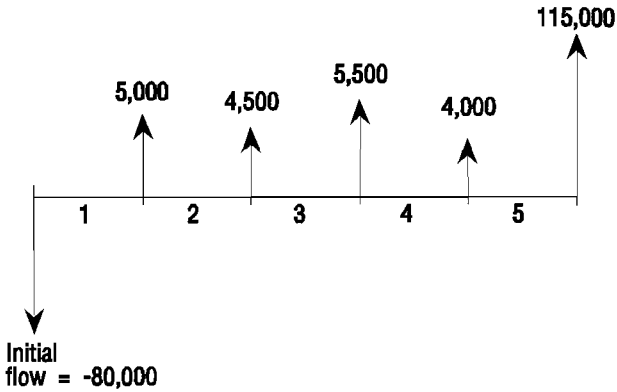
1. Once you've entered the cash flows, press **MENU** **F** **C**.
2. Type a file name and press **ENTER**.

### To open a cash-flow file:

1. From the data edit screen, press **MENU** **F** **O**.
2. Type the file name and press **ENTER**.

## Uneven Cash Flow Examples

**Example: Calculating IRR%, NPV, NUS, and NFV of an Investment. Part 1.** An investor makes an initial investment of \$80,000 and expects returns over the next 5 years as shown below:



Calculate IRR%, NPV, NUS, and NFV, assuming an annual interest rate of 10.5%.

25

**Keys:**

F

1 F9

80000 +/- ENTER

5000 ENTER 4500

ENTER 5500

ENTER 4000

ENTER 115000

ENTER

F4

10.5 F8

F5

F6

F7

**Description:**

Starts the Cash Flow application.

Clears any prior data.

Enters 1 compounding period per year.

Enters the investment as the initial cash flow.

Enters the cash flows over the life of the investment.

Calculates the IRR% per year to be 11.93.

Enters the annual interest rate.

Calculates the NPV to be \$4,774.63.

Calculates the NUS to be \$1,275.66.

Calculates the NFV to be \$7,865.95.

**Part 2.** Assuming the same interest rate, calculate NPV if cash flow number 4 is reduced from \$4,000 to \$1,000.

*Highlight flow# 4*

Use the arrow keys to highlight the \$4,000 cash flow.

1000 ENTER

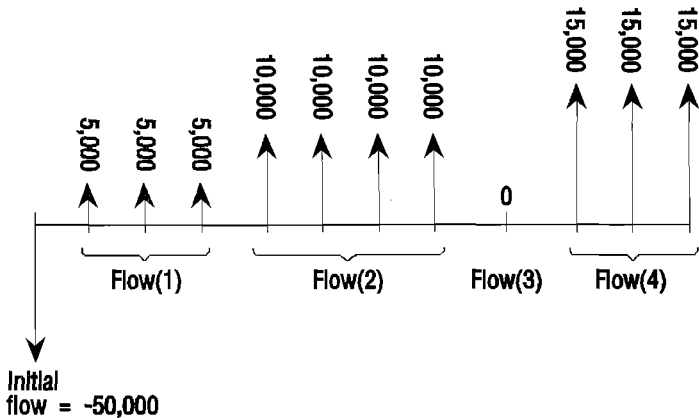
Inserts \$1,000 in its place.

F5

Calculates the NPV to be \$2,762.43.



**Example: An Investment with Grouped Cash Flows.** You are considering an investment that requires a cash outlay of \$50,000 with the following annual returns:



Calculate IRR%. Also, find the NPV at an annual interest rate of 9%.

**Keys:**

**25** **MENU** **A**  
**F**

**Description:**

Starts the Cash Flow application.

**MENU** **C** **D**

Clears any prior data.

1 **F9**

Enters 1 compounding period per year.

50000 **+/-** **ENTER**

Enters the initial investment.

5000 **▶** 3

Enters the groups of cash flows.

**ENTER** 10000 **▶**

4 **ENTER** 0

**ENTER** 15000 **▶**

3 **ENTER**

**F4**

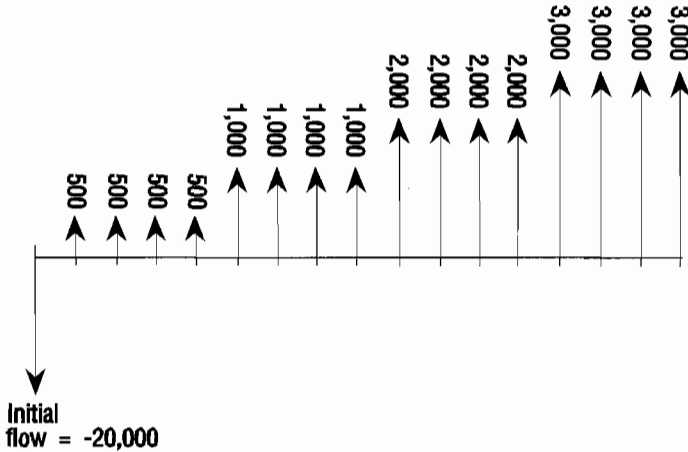
Calculates an IRR% of 11.30.

9 **F8** **F5**

Enters the interest rate and calculates an NPV of \$6,728.63.

**Example: An Investment with Quarterly Returns.** You have been offered an opportunity to invest \$20,000. The investment returns quarterly payments over 4 years as follows:

Year 1	4 payments of \$500
Year 2	4 payments of \$1,000
Year 3	4 payments of \$2,000
Year 4	4 payments of \$3,000



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Calculate the annual rate of return for this investment.

**Keys:**

4

20000

500 4

1000 4

2000 4

3000 4

**Description:**

Starts the Cash Flow application.

Clears any prior data.

Enters 4 periods per year, based on quarterly payments.

Enters the initial investment.

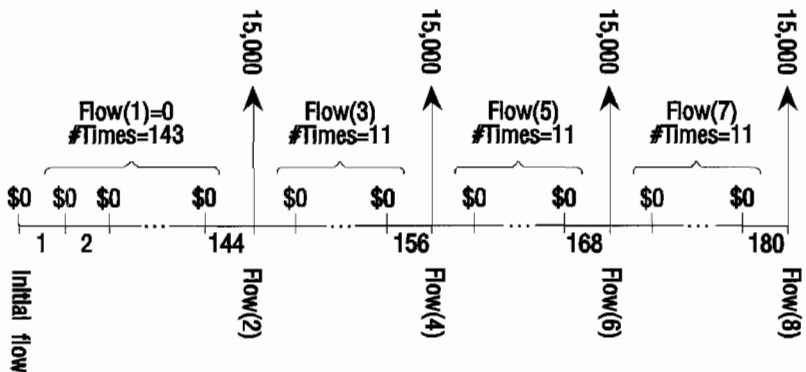
Enters the groups of cash flows.

Calculates the annual return to be 9.72%.

**Example: Deposits Needed for a Future Expenditure.** Your son will be starting college in 12 years, at which time he will need \$15,000 at the beginning of each year for 4 years. How much should you deposit each month into a fund paying 9% annual interest to meet his educational expenses?

To do this calculation, enter the withdrawals into a cash flow list along with zero for all the deposits. Then, store the annual interest rate and calculate NUS. NUS is the periodic deposit equivalent to the withdrawals.

25





**Keys:**

[2nd] [F7] [MENU] [A]

[F]

[MENU] [C] [D]

0 [ENTER]

0 [▶] 12 [\*] 12

[-] 1 [ENTER]

15000 [ENTER]

0 [▶] 11 [ENTER]

15000 [ENTER]

0 [▶] 11 [ENTER]

15000 [ENTER]

0 [▶] 11 [ENTER]

15000 [ENTER]

9 [F8]

[F6]

**Description:**

Starts the Cash Flow application.

Clears any prior data and resets the number of periods per year to 12.

Enters zero as the initial cash flow.

Enters 143 months (after the initial investment) until the first withdrawal.

Enters the freshman year withdrawal.

Enters 11 more months until the next withdrawal.

Enters the sophomore year withdrawal.

Enters 11 more months until the next withdrawal.

Enters the junior year withdrawal.

Enters 11 more months until the next withdrawal.

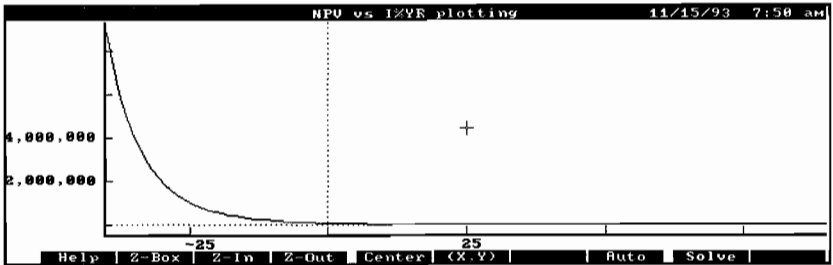
Enters the senior year withdrawal.

Enters the interest rate.

Calculates an NUS of 182.30. Starting this month, you would need to make monthly payments of \$182.30 into this fund for your son's education.

## Plotting

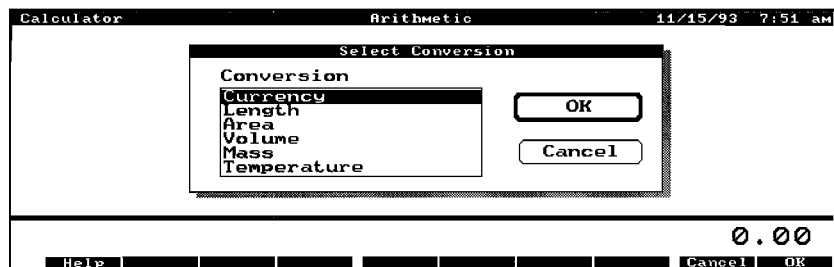
Pressing **Plot** (**F10**) when you're in the Cash Flow application enables you to plot NPV versus I%/YR for the current cash-flow data. Here is a plot using the autoscale feature (**Auto**) for the example on page 25-6.



For a more detailed explanation of the plotting parameters and procedures, see page 29-22.

## Currency and Other Unit Conversions

Press **2** **MENU** **A** **O** to see the Conversions menu. (As a shortcut from any other Calculator application, simply press **CTRL**+**O**.)



From this menu, highlight the units you want to convert and press **ENTER**. While you're in the Conversions application, pressing **MENU** **C** **D** clears all the displayed unit values. Also, whenever you want to select a different type of unit to convert, press **ESC** to see the unit-type menu.

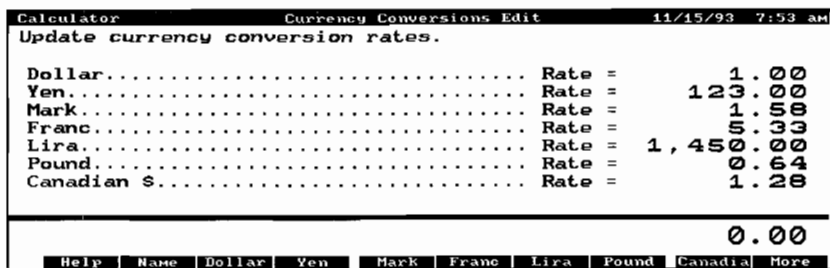
## Converting Currencies

Since exchange rates change frequently, often daily, you have the ability to set exchange rates between currencies whenever you need to. You must do this the first time you use the currency conversion feature.

### To set exchange rates:

1. Press **F7** **MENU** **A** **O** to start the Conversions application.
2. Press **C** **ENTER** to select currency conversions.
3. Press **F2** (Edit) to display the currency conversions editing screen.
4. Use the arrow keys to highlight a currency.
5. Type the exchange rate for that currency. (A rate of 0 removes a currency from consideration when you calculate exchanges.)
6. Press **V** or **ENTER**.
7. Repeat the steps 4 through 6 for all the desired currencies. (Note that **F10** (More) enables you to see all three screens of currencies.)
8. When you're finished assigning rates, press **ESC** to return to the main currency conversion screen.

Here is what a set of exchange rates might look like in the edit screen:



The screenshot shows a terminal window titled 'Calculator Currency Conversions Edit' with a date and time of '11/15/93 7:53 am'. The main text reads 'Update currency conversion rates.' Below this is a list of currencies with their corresponding exchange rates. At the bottom, there is a status bar with a '0.00' value and a menu of options: Help, Name, Dollar, Yen, Mark, Franc, Lira, Pound, Canada, More.

Currency	Rate
Dollar	1.00
Yen	123.00
Mark	1.58
Franc	5.33
Lira	1,450.00
Pound	0.64
Canadian \$	1.28

0.00

Help | Name | Dollar | Yen | Mark | Franc | Lira | Pound | Canada | More

### To calculate exchanges:

1. Press **F7** **MENU** **A** **O** to start the Conversions application.
2. Press **C** to select currency conversions.
3. Make sure you've set exchange rates as described in the previous section.
4. Type the number of units in the calc line and press the function key for the corresponding currency—for example, 20 **F8**

(Pound). All the currencies are shown simultaneously in equivalent amounts—in this case, in amounts equal to 20 Pounds.

A currency value can be returned to the calc line by pressing (RCL) followed by the function key for the currency you want.

## Changing the List of Currencies

You can add up to five currencies to the list of currencies, plus you can change the name of any currency in the original list. Effectively, this means that you can create a list with any 21 currencies you want.

### To change the name of an existing currency:

1. Press (F7) (MENU) (A) (O) to start the Conversions application.
2. Press (C) (ENTER) (F2) to display the currency conversions editing screen.
3. Highlight the currency you want to change and press (F2) (Name).
4. Type the new name and press (ENTER).
5. Repeat steps 3 and 4 for all changes you want to make.
6. When you're finished, press (ESC) to return to the main currency conversion screen.

### To add a new currency to the list:

1. Press (F7) (MENU) (A) (O) to start the Conversions application.
2. Press (C) (ENTER) (F2) to display the currency conversions editing screen.
3. Press (F10), if necessary, to display the screen of currencies containing some empty lines.
4. Highlight a line without a currency and press (F2).
5. Type the name of the new currency and press (ENTER).
6. Type the exchange rate for the new currency and press (ENTER).
7. Repeat steps 4 through 6 for all changes you want to make.
8. When you're finished, press (ESC) to return to the main currency conversion screen.

**Example: Exchanging Currencies. Part 1.** Change “Dollar” in the existing list to “U.S. Dollar”, and add Kenya Shilling to the bottom of the list with a rate of 18.53 Shillings to 1 U.S. Dollar. (Assume U.S. Dollar has a rate of 1.00.)

**Keys:**

**[F7]** **[MENU]** **[A]**

**[O]**

**[C]** **[ENTER]** **[F2]**

**[▼]**

**[F2]** U.S. Dollar

**[ENTER]**

**[F10]** **[F10]** **[▼]**

**[▼]**

**[F2]** Kenya Shilling

**[ENTER]**

18.53 **[ENTER]**

**[ESC]**

**Description:**

Starts the Conversions application.

Displays the currency conversions editing screen. (You may have to press **[F10]** once or twice to get to the screen with Dollar.)

Highlights the Dollar currency.

Changes the name to U.S. Dollar.

Highlights the first blank currency line.

Enters the name of the new currency.

Enters the exchange rate for the Kenya Shilling.

Returns you to the main conversion screen.

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Calculator		Currency Conversions		11/15/93 7:55 AM	
	Peso	=		3.10	
	Rupee	=		28.70	
	Kenya Shilling	=		18.53	
	.....	=			
	.....	=			
	.....	=			
	.....	=			
	.....	=			
				18.53	
Help	Edit	Peso	Rupee	Kenya S	More

**Part 2.** Calculate the exchange of 500 U.S. Dollars into Kenya Shillings.

**Keys:**

F10

**Description:**

Displays the currency conversion screen with U.S. Dollars.

500 F3

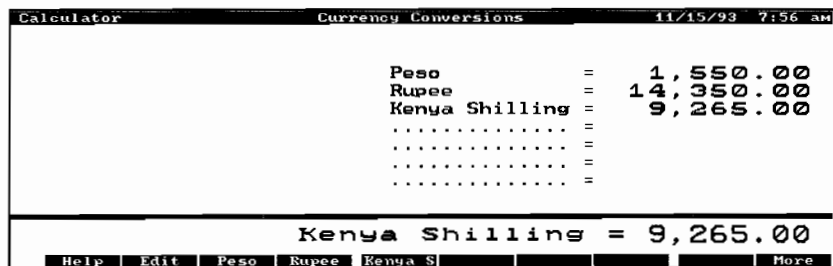
Enters 500 U.S. Dollars. Note that when you enter one value the other values change to equivalent numbers automatically.

F10 F10

Displays the next set of currencies, which shows the number of Kenya Shillings.

F5

Returns the number of Kenya Shillings to the calc line. 500 U.S. Dollars exchanges to 9,265 Kenya Shillings at the current rate.



## Converting Other Units

Besides currency conversions, you have the ability to convert related units within the categories of length, area, volume, mass, and temperature.

### To convert units of length, area, volume, mass, or temperature:

1. Press **ON** **MENU** **A** **O** to start the Conversions application.
2. Select the type of units you want to convert (highlight and press **ENTER**).
3. Type a value and press the function key corresponding to its unit. (If the unit you want isn't currently displayed, remember that **F10** displays another screen of related units for most unit types.)

A unit value can be returned to the calc line by pressing **[RCL]** followed by the function key for the unit you want.

**Example: Length Conversion.** How many meters are there in 1 mile?

**Keys:**

**[2nd]** **[MENU]** **[A]**

**[0]**

**[L]** **[ENTER]**

1 **[F2]**

**[RCL]** **[F7]**

**Description:**

Starts the Conversions application.

Displays the length conversions screen.

Enters 1 mile and displays the conversions.

Returns the number of meters to the calc line. There are 1609.34 meters in 1 mile.

Calculator		Length Conversions		11/15/93 8:09 am	
miles.....	mile	=		1.00	
yards.....	yard	=	1,760.00		
feet.....	foot	=	5,280.00		
inches.....	inch	=	63,360.00		
kilometers.....	km	=	1.61		
meters.....	meter	=	1,609.34		
centimeters.....	cm	=	1,609,934.40		
millimeters.....	mm	=	1,609,344.00		
				meter = 1,609.34	
Help		mile		yard	
foot		inch		km	
meter		cm		mm	
More					



## Statistics

When you press **2nd** **MENU** **A** **L**, you get the List Stat application, which enables you to:

- Calculate statistics for a column of data.
- Fit a curve to a set of data.
- Forecast estimates.
- Graph your data and curve.
- Save your data in a file.

As a shortcut from anywhere else within the Calculator, you can press **CTRL**+**L** to start List Stat.

## Entering and Editing Data

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You can enter data in either one column for one-variable statistics or two columns for paired-variable statistics. When you're in the **data edit screen**, **F4** switches between one and two columns.

Calculator: STAT.STA		Statistics: Edit X		11/15/98 8:01 am	
Item	1)		340.00		
	2)		175.00		
	3)		450.00		
	4)		780.00		
	5)		625.00		
	6)		245.00		
	7) <-				
	8)				
	9)				
Sum:			2,615.00		
				1-Var	
					245.00
Help		Insert		Delete	
2-Var		SwapVar		Sort	
SUM				Stats	

Data Edit Screen with One Column of Data

## Note



The HP 100LX always thinks in terms of data pairs. So, if you enter data with just one column displayed, the HP 100LX automatically creates a second, invisible column of zeros that correspond to the data entered. However, these zeros do not effect any statistical results you calculate while just one column is displayed.

### To enter statistical data:

1. Press **2ND** **MEMO** **A** **L** to start the List Stat application.
2. If the data edit screen is not displayed, press **ESC** one or more times or press **Edit** (**F10**) to see it.
3. If the displayed number of columns (one or two) is not right for your data, press **F4**.
4. Type in your data, pressing **ENTER** after each number. As you enter data, a running total is displayed for each column.

Calculator: STAT.STA	Statistics: Edit X	11/15/93	8:00 am
Item	1)	340.00	11.00
	2)	175.00	16.00
	3)	450.00	7.00
	4)	780.00	5.00
	5)	625.00	5.00
	6)	245.00	19.00
	7) <-		
	8)		
	9)		
Sum:		2,615.00	63.00
			2-Var
			19.00
Help   Insert   Delete   1-Var   SwapVar   Sort   SUM   Frcast   Stats			

### Data Edit Screen with Two Columns of Data

#### To edit a list of data:

If the data edit screen is not displayed, press **ESC** one or more times or press **Edit** (**F10**) to get to your data.

- From the data edit screen, use the arrow keys to highlight the entry that you want to change, type a number, and press **ENTER**.

You can also use these keys in the data edit screen:

## Data Editing Function Keys

Key	Description
<b>Insert</b>	Inserts new data at the highlight, moving the rest of the data down.
<b>Delete</b>	Deletes the highlighted number. (Note that the <i>data pair</i> is deleted, whether both numbers are displayed or not.)
<b>Sort</b>	Numerically sorts the column with the highlight from least to greatest. (Pairs of data are kept together.)
<b>SwapVar</b>	Swaps the position of the two columns of data, even if only one column is displayed. Note: If you've entered only one column of data, <b>SwapVar</b> swaps that column with a column of zeros; pressing <b>SwapVar</b> swaps back the original data.

### To clear data:

- From the data edit screen, press **MENU** **C** **D** to clear the entire data list. (Both columns are cleared, even if only one is visible.)

## Saving Statistical Data in a File

You can save your statistical data in files for future use. If you don't specify a file extension when you give a set of data a file name, the HP 100LX appends the extension .STA for you. For easy recognition it's a good idea for all your statistics files to have the .STA extension.

### To save changes to the current file:

- When you switch to another application or open another data file, changes to the current file are saved automatically.

### To copy data to another file:

1. Once you've entered the data, press **MENU** **F** **C**.
2. Type a file name and press **ENTER**.

### To open a statistical data file:

1. From the data edit screen, press **MENU** **F** **O**.
2. Type the file name and press **ENTER**.

---

## Statistics Calculations

### To calculate statistics for a column of data:

1. Press **↵** **MENU** **A** **L** to start the List Stat application.
2. Enter the data as described on page 27-1.
3. Make sure the highlight is in the column of data you want to use to calculate the statistics.
4. Press **Stats** (**F9**) to see the statistical values for the highlighted column.

Here are the function keys available when you press **Stats**:

#### Stats Function Keys

Key	Description
<b>MEAN</b>	Recalls the mean value to the calc line.
<b>STDEV</b>	Recalls the standard deviation to the calc line.
<b>MIN</b>	Recalls the minimum value to the calc line.
<b>MEDIAN</b>	Recalls the median value to the calc line.
<b>MAX</b>	Recalls the maximum value to the calc line.
<b>W. MEAN</b>	Recalls the weighted mean to the calc line. (This key appears only when two columns of data are visible in the data edit screen.)

### Stats Function Keys (continued)

Key	Description
<b>g. STDEV</b>	Recalls the grouped standard deviation to the calc line. (This key appears only when two columns of data are visible in the data edit screen.)
<b>Sample</b> (F9)	switches between sample and population for the model used to calculate the standard deviation and grouped standard deviation. Use <b>Sample</b> to get unbiased results based on a <i>sample</i> of a population; use <b>Popul</b> to get results based on data for an entire population. The Sample/Popul annunciator (just above the calc line) indicates the current mode.
<b>Popul</b>	
<b>Edit</b>	Returns to the data edit screen.

**Example: Statistics Calculations.** Nimrod Archery Company had the following phone bills during the past 6 months:

Month	Phone Expense	Month	Phone Expense
1. March	\$340	4. June	\$780
2. April	\$175	5. July	\$625
3. May	\$450	6. August	\$245

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To prepare for this example:

1. Press **2nd** **MEMU** **A** **L** to start the List Stat application.
2. Press **MEMU** **C** **D** to clear any prior data.
3. If **F4** shows **1-Var**, press it to display only one column of data. (When you press **1-Var**, the label changes to **2-Var**.)

Now calculate population statistics for the data and return the standard deviation to the calc line.

**Keys:**340 **ENTER** 175**ENTER** 450**ENTER** 780**ENTER** 625**ENTER** 245**ENTER****F9****Description:**

Enters the data.

Calculates and displays the statistics.

At this point if **F9** shows **POPUL**, press it to choose the population statistics model for the standard deviation. (When you press **POPUL**, the **POPUL** annunciator appears above the calc line.)

**F3**

Returns the standard deviation to the calc line.

Calculator: STAT:STA		Statistics: X		11/15/93 8:04 am	
Mean Value.....	MEAN	=	435.83		
Standard Deviation.....	STDEV	=	211.37		
Minimum Value.....	MIN	=	175.00		
Median Value.....	MEDIAN	=	395.00		
Maximum Value.....	MAX	=	780.00		
			1-Var	Popul	
				211.37	
Help	MEAN	STDEV	MIN	MEDIAN	MAX
				Sample	Edit

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**To calculate weighted mean and grouped standard deviation:**

1. Press **F2** **MENU** **A** **L** to start the List Stat application.
2. Enter data into two columns, with the first column (x-column) containing the numeric data and the second column (y-column) containing the weights or frequencies of each number. (See page 27-1 for entering data.)
3. Press **Stats** (**F9**) to see the values for weighted mean and grouped standard deviation. (To recall a value to the calc line, press the function key for the value you want.)

**Example: Weighted Mean.** A small college town has 266 one-bedroom rental apartments. If 54 of them rent for \$400 per

month, 32 for \$410, 88 for \$420, and 92 for \$432, what is the average monthly rent and its population standard deviation?

To prepare for this example:

1. Press  $\left[ \downarrow \right]$   $\left[ \text{MENU} \right]$   $\left[ \text{A} \right]$   $\left[ \text{L} \right]$  to start the List Stat application.
2. Press  $\left[ \text{MENU} \right]$   $\left[ \text{C} \right]$   $\left[ \text{D} \right]$  to clear any prior data.
3. If  $\left[ \text{F4} \right]$  shows  $\left[ \text{2-Var} \right]$ , press it to display two columns of data.

Now calculate the weighted mean and grouped standard deviation.

**Keys:**

**Description:**

400  $\left[ \text{ENTER} \right]$  54  
 $\left[ \text{ENTER} \right]$

Enters the data.

410  $\left[ \text{ENTER} \right]$  32  
 $\left[ \text{ENTER} \right]$

420  $\left[ \text{ENTER} \right]$  88  
 $\left[ \text{ENTER} \right]$

432  $\left[ \text{ENTER} \right]$  92  
 $\left[ \text{ENTER} \right]$

$\left[ \text{F9} \right]$

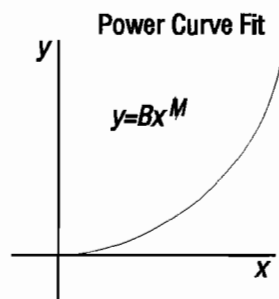
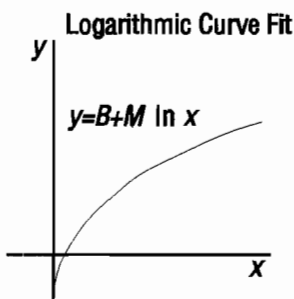
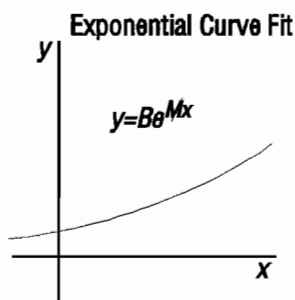
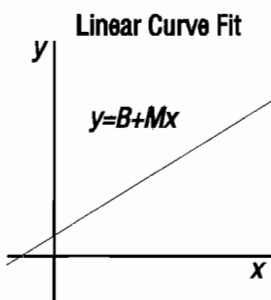
(If  $\left[ \text{F9} \right]$  now shows  $\left[ \text{Popul} \right]$ , press it for population statistics.) Calculates the average price (weighted mean) to be \$415.50 and the standard deviation to be 11.86.

---

## Curve Fitting and Forecasting

The HP 100LX enables you to find a mathematical relationship between two sets of numbers ( $x$ -values and  $y$ -values) using curve fitting. Once the curve is calculated, you can use it to do forecasting (what if?) calculations.

To calculate the curve the HP 100LX uses one of four models for the data:



**27** The default model is linear, and it stays in effect until you select another model.

**To do curve fitting and forecasting:**

1. Press  $\left[ \frac{\square}{\square} \right]$   $\left[ \text{MENU} \right]$   $\left[ \text{A} \right]$   $\left[ \text{L} \right]$  to start the List Stat application.
2. Enter two columns of data (see page 27-1 for entering data). With two columns visible, the left column represents the  $x$ -values and the right column represents the  $y$ -values.
3. Press  $\left[ \text{Forecast} \right]$  ( $\left[ \text{F8} \right]$ ) and check the correlation coefficient to ensure the current model is acceptable.
4. If necessary, change the model by pressing  $\left[ \text{F7} \right]$  and selecting a new model.
5. To do forecasting, type a number and press the function key for the known value— $\left[ \text{XVALUE} \right]$  or  $\left[ \text{YVALUE} \right]$ .

**Example: Curve Fitting and Forecasting.** For the past 6 weeks the manager of Tom's and Jerry's Pet Store has kept records of their sales and the number of minutes of radio advertising that were purchased:



	Minutes of Radio Advertising	Sales
Week 1	2	\$1,400
Week 2	1	\$920
Week 3	3	\$1,100
Week 4	5	\$2,265
Week 5	5	\$2,890
Week 6	4	\$2,200

**Part 1.** Determine whether there is a linear relationship between the amount of radio advertising purchased and the weekly sales.

To prepare for this example:

1. Press  $\left[ \begin{smallmatrix} \times \\ \div \end{smallmatrix} \right]$   $\left[ \text{MENU} \right]$   $\left[ \text{A} \right]$   $\left[ \text{L} \right]$  to start the List Stat application.
2. Press  $\left[ \text{MENU} \right]$   $\left[ \text{C} \right]$   $\left[ \text{D} \right]$  to clear any prior data.
3. If  $\left[ \text{F4} \right]$  shows  $\left[ \begin{smallmatrix} 2 \\ \text{Var} \end{smallmatrix} \right]$ , press it to display two columns of data.

**Keys:**

**Description:**

2  $\left[ \text{ENTER} \right]$  1400  
 $\left[ \text{ENTER} \right]$

Enters the first data pair.

1  $\left[ \text{ENTER} \right]$  920  
 $\left[ \text{ENTER} \right]$

Enters the rest of the data.

3  $\left[ \text{ENTER} \right]$  1100  
 $\left[ \text{ENTER} \right]$

5  $\left[ \text{ENTER} \right]$  2265  
 $\left[ \text{ENTER} \right]$

5  $\left[ \text{ENTER} \right]$  2890  
 $\left[ \text{ENTER} \right]$

4  $\left[ \text{ENTER} \right]$  2200  
 $\left[ \text{ENTER} \right]$

$\left[ \text{F8} \right]$

Calculates the curve and displays the forecast screen.

If the forecast model is not Linear, press  $\left[ \text{F7} \right]$   $\left[ \text{L} \right]$   $\left[ \text{F10} \right]$  to select it.

Calculator: STAT.STA		Forecast		11/15/93 8:06 AM	
X Value.....		XVALUE =		0.00	
Y Value.....		YVALUE =		0.00	
Correlation.....		CORR =		0.90	
Slope.....		SLOPE =		425.88	
Intercept.....		INTRCPT =		376.25	
Forecast model.....		Model =		LINEAR	
				2-Var	
					2,200.00
Help		XVALUE	YVALUE	CORR	SLOPE
		INTRCPT	Model	Sums	Plot
					Edit

The correlation coefficient of 0.90 satisfies the manager that it is a linear relationship.

**Part 2.** Estimate the level of sales if 7 minutes of advertising were purchased.

7 (F2) (F3)

Enters 7 as the  $x$ -value and displays a  $y$ -value of 3,357.38. Tom's and Jerry's can expect around \$3,300 in sales with 7 minutes of radio advertising.

## 27 Viewing Statistical Summations

To see the summation statistics for a set of data, display the data edit screen (press (ESC) one or more times if necessary) and press **Forecast** ((F8)) then **SUMS** ((F8)). Here are the summation values for the data in the previous example:

Calculator: STAT.STA		SUMS		11/15/93 8:07 AM	
Sum X.....		Sum X =		20.00	
Sum Y.....		Sum Y =		10,775.00	
Sum X*Y.....		Sum XY =		41,595.00	
Sum X <sup>2</sup> .....		Sum X <sup>2</sup> =		80.00	
Sum Y <sup>2</sup> .....		Sum Y <sup>2</sup> =		22,338,725.00	
				2-Var	
					3,357.38
Help		SUM X	SUM Y	SUM XY	SUM X <sup>2</sup>   SUM Y <sup>2</sup>
					Forecast

To recall a value to the calc line, press the function key for the summation value you want.

---

## Plotting the Curve Model for Your Data

The easiest way to plot the curve model for your data is to use the autoscale feature:

1. Display the data edit screen (press **ESC**) one or more times if necessary).
2. Make sure both columns of data are visible (press **2-Var** if necessary).
3. Press **Frcast** (**F8**).
4. Press **Plot** (**F9**).
5. Press **Auto** (**F3**) to display the curve.
6. When you're finished viewing the curve, press **ESC**.

In addition, you can take advantage of the HP 100LX function-plotting power and flexibility as described in "Function Plotting" starting on page 29-22.



## Date Calculations

Press **2nd** **MENU** **A** **D** to start the Date Calculations application. (Or, from anywhere else in the Calculator, simply press **CTRL**+**D**.) You can use Date Calculations to:

- Determine the day of the week for any date.
- Find the number of days between two dates.
- Determine the date a given number of days in the future or past.

### Date Calculation Function Keys

Function Key	Description
<b>DATE1</b> <b>DATE2</b>	Stores or calculates a date, using the current Calculator date format—month/day/year (MM.DDYYYY), day.month.year (DD.MMYYYY), or year.month.day (YYYY.MMDD). Also displays the day of the week. If you omit YYYY, the current year is used. (See the next page for more information on date formats.)
<b>DDAYS</b>	Stores or calculates number of days between <i>DATE1</i> and <i>DATE2</i> using the actual calendar. The actual calendar recognizes leap years.
<b>360/YR</b>	Calculates number of days between <i>DATE1</i> and <i>DATE2</i> using the 360-day calendar (based on 30-day months).
<b>365/YR</b>	Calculates number of days between <i>DATE1</i> and <i>DATE2</i> using the 365-day calendar (ignores leap years).
<b>TODAY</b>	Displays the current date, which can then be stored in <i>DATE1</i> or <i>DATE2</i> .

---

## About Calculator Date Formats

The Setup utility enables you to set the current date format for your HP 100LX. The 11 different formats in Setup correspond to three formats that the Calculator uses. See page 3-9 for instructions on changing the current date format.

### Date Formats: Calculator vs. Setup Utility

Calculator	Setup Utility	
DD.MMYYYY	(DD-MMM-YY) (MMM-YY) (DD.MM.YY) (DD.MM)	(DD-MMM) (DD/MM/YY) (DD/MM)
MM.DDYyyy	(MM/DD/YY)	(MM/DD)
YYYY.MMDD	(YY-MM-DD)	(MM-DD)

**Example: Determining the Day of the Week for Any Date.** What day of the week is July 4, 1996? Assume the current date format is month/day/year (MM.DDYyyy).

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#### Keys:



7.041996

**F3**

#### Description:

Starts the Date Calculation application.

Enters July 4, 1996 in the current date format.

July 4, 1996 falls on a Thursday.

**Example: Calculating the Number of Days Between Dates.** Find the number of days between January 2, 1990 and April 13, 1994. Assume the current date format is month/day/year (MM.DDYYYY).

**Keys:**

**F7** **MENU** **A**  
**D**

1.021990 **F3**

4.131994 **F4**

**F5**

**F8**

**Description:**

Starts the Date Calculation application.

Enters the first date (using the current date format) in *DATE1*.

Enters the second date in *DATE2*.

The actual number of days between the dates is 1,562.

Using the 365-day calendar, which ignores leap years, the number of days is 1,561.

**Example: Determining a Future Date.** What day is 90 days after February 9, 1992? Assume the current date format is month/day/year (MM.DDYYYY).

**Keys:**

**F7** **MENU** **A**  
**D**

2.091992 **F3**

90 **F5**

**F4**

**Description:**

Starts the Date Calculation application.

Stores February 9, 1992 in *DATE1*.


Stores 90 in *DDAYS*.



May 9 is 90 days after February 9, 1992.

**Example: Determining a Prior Date.** What day is 180 days prior to December 15, 1995? Assume the current date format is month/day/year (MM.DDYYYY).

**Keys:**


12.151995 

180  



**Description:**




Starts the Date Calculation application.

Stores December 15, 1995 in *DATE1*.

Stores -180 in *DDAYS*. (Note that a negative number signifies days *prior* to a given date.)

June 18, 1995 is 180 days before December 15, 1995.

**To clear the Date Calculation variables:**

- Press   . *DATE1* and *DATE2* are reset to today's date.



## Using the Solver and Function Plotting

### Introduction

The Solver enables you to enter your own equations with variables into the Calculator. You can solve for any of the variables using special function keys, one for each variable, that the Solver creates for you.

You can also plot an equation against any of its variables, solve the equation graphically for any variable, and zoom in and out repeatedly to view minute details or very large structures.

Your equations can be named and saved in the **Solve Catalog** for later use.

### Introductory Example

Suppose you frequently buy carpet and must calculate how much it will cost. The price is quoted to you per square yard. Regardless of how you do the calculation (even if you do it longhand), you use an equation:

$$\begin{array}{ccccccc}
 \begin{array}{l} \text{Price per} \\ \text{square} \\ \text{yard} \end{array} & & \begin{array}{l} \text{Length} \\ \text{(feet)} \end{array} & & \begin{array}{l} \text{Width} \\ \text{(feet)} \end{array} & & \\
 \swarrow & & \downarrow & & \swarrow & & \\
 \text{PPSY} & \times & L & \times & W & = & \text{COST} \\
 & & \downarrow & & & & \\
 & & 9 & & & & \\
 & & \uparrow & & & & \\
 & & \text{Converts square feet to square yards.} & & & & 
 \end{array}$$

**Part 1.** Enter the above Carpet equation into the Solver.

**Keys:**

**Description:**

**[F2]** **[MENU]** **[A]** **[S]** Selects the Solve Catalog. (If you don't see a screen entitled Solve Catalog, press **[ESC]** until you see it.)

**[Fn]** **END** **[◀]** Ensures the highlight is at the end of the catalog and in the name field (the left side of the screen where equation names are displayed).

Carpet **[ENTER]** Enters the equation name into the name field.

**[▶]** Moves the highlight to the equation field.

PPSY **[\*]** **[L]** **[\*]** Automatically displays the solve editor and types the Carpet equation.

W **[/]** **[9]** **[=]**

COST

**[F10]** **[F9]** Verifies the equation, enters it into the equation list, and selects the solve calc screen. (If the Solver detects an error in the equation, the cursor in the solve editor locates the problem. Correct the error and press **[F9]** (**[CALC]**) again.)

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Calculator: SOLVE.EQN		Solve Calc		11/15/93 8:13 am	
Carpet: PPSY*L*W/9=COST					
	PPSY =				0.00
	L =				0.00
	W =				0.00
	COST =				0.00
					0.00
Help	PPSY	L	W	COST	

**Part 2.** Calculate the cost of carpet needed to cover a 9 foot by 12 foot room. The carpet costs \$22.50 per square yard.

**Keys:**

**Description:**

22.5 (F2)

Stores the price per square yard in *PPSY*.

12 (F3)

Stores the length.

9 (F4)

Stores the width.

(F5)

Calculates the cost, \$270.00.

Calculator: SOLVE.EQN		Solve Calc	11/15/93 8:14 AM
Carpet: $PPSY * L * W / 9 = COST$			
	PPSY =	22.50	
	L =	12.00	
	W =	9.00	
	COST =	270.00	
			COST = 270.00
Help	PPSY	L	W COST

**Part 3.** Determine the most expensive carpet you can buy if the maximum amount you can pay to carpet the room is \$300.

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The following steps illustrate the “point-and-shoot” way to enter a value into a variable and to solve for a variable. Point-and-shoot is described in detail on page 21-11.

**Keys:**

**Description:**

(▲) 300 (▲) (▲)

Stores \$300 in *COST* and moves the cursor to the *PPSY* cell.

(▲)

(spacebar)

Calculates the maximum price per square yard you can pay to be \$25.00.

## The Solve Catalog

To display the catalog of Solver equations:

1. Press **F2** **MENU** **A** **S**.
2. If a screen entitled Solve Catalog is not displayed, press **(ESC)** repeatedly until it is.

Until you enter some equations, your Solve Catalog will be empty. Here is an example of what a Solve Catalog might look like:

Optional names.

Equations.

Optional names.	Equations.
Carpet	$PPSY * L * W / 9 = COST$
Volume	$V = L * W * H$
	Rate * Time = Distance
	$s1^2 + s2^2 = h^2$
Ec Order Qty	$EOQ = \sqrt{2 * FIXCST * SALES / (CARRY\% / 100 * PRICE)}$
Salary	hours * rate = pay

Help | Insert | Delete | Find | Edit | 1-2-3 | Calc | Plot

Press Edit (F6) to edit or view the highlighted equation.









## Solve Catalog Function Keys

Key	Description
Insert (F2)	Inserts a blank row above the highlighted row. This row is ready to accept your new name and your new equation.
Delete (F3)	Allows you to delete a highlighted name, a highlighted equation and/or its variables, or a blank row.
Find (F4)	Allows you to search the names or equations (whichever field is highlighted) for a specified group of characters.
Edit (F6)	Allows you to edit a highlighted name or equation. Also allows you to view an entire equation that is longer than 45 characters.
1-2-3 (F8)	Displays the Solve 1-2-3 screen. Allows you to “back-solve” a 1-2-3 worksheet; that is, make a cell containing a formula equal to a desired value by solving for a specified input cell.
Calc (F9)	Verifies the equation or expression, selects the solve calc screen, and displays a function key label for each variable.
Plot (F10)	Displays function plotting. Allows you to graph the highlighted function with respect to a specified independent variable.

## Entering Equations

The Solve Catalog can contain as many equations as you like, limited only by the HP 100LX's memory. Entering equation names is optional.

### To enter an equation and its name:

1. Press     to display the Solve Catalog. (You may need to press  one or more times, also.)
2. Move the highlight bar up or down to the position you want to enter the new equation.
3. Type the equation and press .
4. (Entering a name is optional.) Press  to highlight the name field. Type a name and press .

When you're ready to use the equation, press **Calc** (**F9**), at which point the Solver verifies the equation. If the equation cannot be interpreted, the Solver briefly displays: *Invalid equation* and the cursor is positioned before the first character the Solver could not interpret. Check to be sure you've made no typing mistakes and that you've followed the rules for writing equations in chapter 30.

## Basics on Typing in an Equation

When you're in the Solve Catalog and start typing an equation, you're automatically put into the **solve editor**. Here you have access to numerous function keys—described in the next chapter—that act as typing aids for Solver functions. In addition to these typing aids, the editor offers other useful features described below.

### Adding Spaces in an Equation

To improve readability, you can add spaces throughout an equation, except spaces are not allowed within variable or function names.

### Adding Comments to an Equation

You can add a comment at any point in an equation. Simply start and end the comment with an exclamation point (!).

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### Creating Line Breaks

Press **ENTER** to break an equation at any point to improve clarity. If you don't use **ENTER**, the line will automatically break when you reach the right margin of the screen.

### Maximum Length of an Equation

The maximum length of an equation is about 2000 characters.

### Maximum Number of Variables in an Equation

A single equation can have up to 256 different variables. If your equation has more than nine variables, the Solver creates the **F10** function key **More** to enable you to access all of your variables.

## Editing the Equation List

When you're editing the equation list, all the standard editing keys are available—the arrow keys, **←**, **DEL**, etc.

### To edit an equation name:

1. Display the Solve Catalog.
2. Highlight the name you want to edit.
3. Press **F6** and edit the name. (To cancel an edit, press **ESC**.)
4. Press **ENTER** to put the edited name into the equation list.

### To edit an equation:

1. Display the Solve Catalog.
2. Highlight the equation you want to edit.
3. Press **F6** and edit the equation. (To cancel an edit before making changes, press **ESC**. To cancel an edit after you've made changes, press **ESC**, then press **NO** (**F5**).
4. Press **F10** to replace the previous version with the edited version.

## Calculating with Your Solver Equations

### To perform a calculation:

1. Display the Solve Catalog screen.
2. Highlight the equation you want to calculate.
3. Press **Calc** (**F9**). This selects a new screen dedicated to the current equation where each variable is represented by a function key.
4. Store your known values by typing a value and then pressing the function key for the associated variable. You must store values in all variables but one.
5. Press the function key for the value you want to calculate. If the Solver is able to find a solution to the equation, the answer is displayed in the calc line.

In most cases, this is all you will need to know about how the Solver works. However, there are certain types of equations that are more difficult to solve. If, during the calculation, the display temporarily shows sets of changing numbers, such as:

```
A: 1.500000000000 -  
A: 1.13476129834 +
```

the Solver is searching for a solution. You should read “How the Solver Works” on page 29-18.

## Clearing Data in Solver Variables

Clearing Solver variables sets them equal to 0.

### To clear a set of variables:

1. Display the Solve Catalog.
2. Highlight the desired equation and press **(F9)**.
3. Press **(MENU)** **(C)** **(D)**.

### Caution



Be sure you display the solve calc screen (press **(F9)**), not the Solve Catalog screen to clear the variables for an equation. If you press **(MENU)** **(C)** **(D)** in the Solve Catalog screen, you will erase *all* variables and *all* equations.

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## Viewing Long Equations

The equation list in the Solve Catalog shows only the first 45 characters of an equation.

### To view an entire equation:

1. Display the Solve Catalog.
2. Highlight the desired equation and press **(F6)**.
3. If your equation is too long to view in one screen, press **(▼)** or **(Fn)PGDN** to see additional lines.
4. When you're finished viewing, press **(F10)**.



## Shared Solver Variables

If two or more equations contain the same variable names, that variable is shared among the equations in which it appears. For example, suppose your equation list includes these two equations named CARPETPRICE and TOTALPRICE:

CARPETPRICE: PPSY\*L\*W/9=COST

TOTALPRICE: COST+HOURS\*20.50=CHARGE

*COST* is a shared variable. You can calculate a value for *COST* using the Solver's function keys for CARPETPRICE, and then switch to the function keys for TOTALPRICE. Since the value for *COST* is shared, you do not need to store it again. After entering *HOURS*, you can calculate *CHARGE*.

No sharing occurs between built-in variables and Solver variables. For example, the *COST* user-variable in the Solver is not shared with the *COST* built-in variable in the Business Percentages application.

## Deleting Names, Equations, and Variables

### To delete an empty line in the Solve Catalog:

- Highlight the empty line and press **F3**.

### To delete a single name in the Solve Catalog:

- Highlight the name you want to delete and press **F3**.

### To delete a single equation and/or its variables:

1. Highlight the equation in the Solve Catalog you want to delete.
2. Press **F3**. (To cancel the delete command, press **ESC**.)
3. Use **▲** to select the equation, its variables, or both.
4. Press **F10** to delete, or press **F9** to cancel.

---

**Note**

When deleting an equation, you should first delete its variables (as long as none are *shared variables*) to free up memory.

If you delete the equation's variables but not the equation, the variables are created again with values of zero the next time you use the equation. If the variable is a shared variable, its value is lost to all the equations that share it.

---

**To delete all variables and/or all equations:**

1. Display the Solve Catalog.
  2. Press **REHI** **C** **D**.
  3. Use **▲** to select all equations, all variables, or both.
  4. Press **F10** to delete them, or press **F9** to cancel the delete.
- 

**Note**

When you delete variables, you free up for other uses the memory they used. If you do not delete the equations, the variables are created again with values of zero the next time you use the equation. (The memory used by a single variable is 15 bytes plus a byte for each character in the variable.)

---

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## Finding Equations

**To find an equation in the Solve Catalog:**

1. Display the Solve Catalog.
2. Move the highlight bar to either the name field or the equation field, depending on which list you want to search.
3. Press **F4** and type the text you want to find (maximum of 29 characters).
4. Press **F10** to find the first occurrence of the text, searching from the beginning of the list.

Of course, if your equation list isn't too long, you may want to simply scroll through it by moving the highlight bar instead of using

**Find**.

Instead of pressing **(F10)** in step 4 above, you can press either **Next** or **Prev**:

Key	Description
<b>Next</b> <b>(F4)</b>	Searches for the specified text until a match is found or the search fails. The search begins with the next entry.
<b>Prev</b> <b>(F3)</b>	Searches for the specified text until a match is found or the search fails. The search begins with the previous entry.

## Using the Clipboard in the Solver

The Clipboard and **Find** (**F4**) can be used to simplify writing a complex equation that is similar to one already in your equation list.

### To use an existing equation segment in a new equation:

You want to enter an equation into the Solver's equation list that's similar to an existing equation in that list. Your plan is to put a copy of that existing equation into the solve editor and edit it to create your new equation.

1. Use **Find** (**F4**) to highlight the existing equation in the Solve Catalog. (See the previous procedure, "To find an equation.")
2. Press **(Fn)COPY** to put a copy of the highlighted equation in the Clipboard.
3. Press **(Fn)END** to move the highlight to the end of the equation list.
4. Press **(Fn)PASTE** to add the copy of your found equation to the end of the list.
5. Press **(F6)** and edit the equation to create the equation you want.
6. Press **(F10)** to add your new equation to the equation list, and, if you want to name it, press **(◀)** and type a name for your equation.

---

## Using Multiple Equation Lists

The Calculator Solver application enables you to manage different equation lists using the standard File commands (press **MENU** **F**). Below are a few procedures, but see page 2-16 in chapter 2 for a more thorough treatment of the File commands.

### To save changes to the current file:

- When you switch to another application or open another file, changes to the current file are saved automatically.

### To copy an equation list to a new file:

1. Press **MENU** **F** **C**.
2. Type a file name (8 characters maximum). If you don't type an extension, `.EQN` will be supplied to identify your file as an equation list.
3. Press **ENTER** to copy your equation list.

If you save the equation list using an existing file name, the new file will overwrite the old file.

### To open an existing equation list file:

1. Press **MENU** **F** **O**.
2. Press **TAB**, highlight the name of the file you want, and press **ENTER**.

### To create a new, empty equation list:

1. Save the current equation list.
2. Press **MENU** **F** **N**.

### To merge another equation list into your current equation list:

1. Position the cursor in your present equation list at the position you want the other list inserted.
2. Press **MENU** **F** **M** to display all file names with the extension `.EQN` in the current directory.
3. Press **TAB**, highlight the name of the equation list you want to merge, and press **ENTER**.

## Using the Solver in a 1-2-3 Worksheet.

A worksheet often contains a series of cells, where all but one contain variable *values* (the variable *names* are the cell names), and where that one remaining cell contains the result of a formula calculation. The formula uses the other cell names as its variables, and the contents of those other cells are the values for those variables.

Normally, the values in the variable cells are entered first, then the formula cell calculates the result. The Solve Catalog's 1-2-3 feature (**1-2-3**) allows this calculation order to be reversed. Rather than have the formula-cell's value *calculated last*, it's *entered first*, and a *variable-cell's* value is *calculated last*. This variable cell is called the **solve cell**, and this method of calculating for that cell's value is called **backsolving**.

**Example: Adjusting a Day's Expenses.** Say you want today's expenses on your trip to be no more than \$300. You want this \$300 to cover transportation, meals, entertainment, and lodging. You consider all but entertainment to be fixed. You're using a 1-2-3 worksheet to record your trip expenses, and you've already entered \$30 for transportation, \$60 for meals, and \$150 for lodging. Before you enter the cell B8 formula, your worksheet looks like the figure below.

	A	B	C	D	E
1	EXPENSE REPORT	05-06-94			
2	TRANSPORTATION	\$30.00			
3	MEALS	\$60.00			
4	LODGING	\$150.00			
5	ENTERTAINMENT				
6	TOTALS				
7					
8					
9					
10					
11					
12					
13					

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If you want to press keys as you follow this example, put the numbers shown in the figure in cells B3 through B5 of a new current worksheet, and leave blank the entertainment expense cell, B6. This is the solve cell. Then enter the formula `@SUM(B3..B6)` into cell B8. The row and column titles are not necessary for this example. At this point, the formula cell B8 is no longer blank, but shows a value of \$240.00 (assuming automatic recalculation is in effect).

## Keys:

*highlight cell B8*

300

*highlight cell B6*

## Description:

Displays the Solve Catalog of the Calculator application (press one or more times if necessary to display the Solve Catalog).

Displays the Solve 1-2-3 screen.

Displays your current worksheet in point mode and asks you to highlight the formula cell, the cell that calculates your total day's expenses.

Use the arrow keys to highlight cell B8.

Returns to the calculator's Solve 1-2-3 screen and enters B8 in the Solve 1-2-3 screen as the formula cell.

Enters 300 as the desired total expenses calculated by cell B8.

Displays the worksheet in point mode and asks you to highlight the solve cell, the cell whose value you want to determine.

Use the arrow keys to highlight the entertainment expense cell B6.

Returns to the Solve 1-2-3 screen and enters B6 as the solve cell, the cell whose value is to be calculated so the total (B8) equals \$300. The calculation occurs automatically and gives \$60 as the backsolve result—the allowable entertainment expense.

Displays the worksheet. Note that the solve cell B6 now shows \$60.00.

Returns to the calculator's Solve 1-2-3 screen.

## To calculate a 1-2-3 solve cell value that will produce a specified formula cell value:

This is the general procedure to perform a backsolve similar to that described in the example above.

1. Use 1-2-3 to create worksheet segment that includes a formula cell and the data cells representing all the variables used in the formula cell. Ensure that this worksheet is the current worksheet (the one displayed when **1-2-3** is pressed).
2. Enter values into all but one of the data cells. The remaining data cell is the solve cell.
3. Press **☰** **MENU** **A** **S** (and press **ESC** one or more times, if necessary) to display the Solve Catalog.
4. Press **1-2-3** (**F8**) to display the calculator's Solve 1-2-3 screen.
5. Press **Form** (**F8**) to display the current 1-2-3 worksheet.
6. Move the cursor to highlight the formula cell.
7. Press **ENTER** to define that cell as the formula cell and to return to the calculator's Solve 1-2-3 screen.
8. Type the value of the result you want that formula cell to calculate and press **VALUE** (**F9**).
9. Press **Solve** (**F10**) to display the current 1-2-3 worksheet.
10. Move the cursor to highlight the data cell you choose to be the solve cell—the cell whose value is to be determined.
11. Press **ENTER** to define that cell as the solve cell and to return to the calculator's Solve 1-2-3 screen. The cell's value is calculated, displayed in the Solve 1-2-3 screen, and entered in the worksheet.

## To restore the solve cell to its previous value:

- Press **Undo** (**F5**). The solve cell is restored to the value it had just before the last backsolve took place.

## To set up a solver worksheet:

1. Write down your chosen formula (like  $\text{DISTANCE} = \text{RATE} * \text{TIME}$ ), then convert it to an expression by subtracting the right side from the left (like  $\text{RATE} * \text{TIME} - \text{DISTANCE}$ ).
2. Reserve a set of adjacent 1-2-3 cells, one for each variable in your expression and the last one (the formula cell) for the expression itself.
3. Enter the expression into the formula cell.

4. Press **[F7]** **[MENU]** **[A]** **[S]** (and press **[ESC]** one or more times, if necessary) to display the Solve Catalog.
5. Press **[1-2-3]** (**[F8]**) to display the calculator's Solve 1-2-3 screen.
6. Press **[FORM]** (**[F8]**) to display the current 1-2-3 worksheet.
7. Move the cursor to the formula cell.
8. Press **[ENTER]** to define that cell as the formula cell and to return to the calculator's Solve 1-2-3 screen.
9. Type  $\emptyset$  as the result you want that formula cell to calculate and press **[VALUE]** (**[F9]**). Your solver worksheet is now ready to be used. The next procedure describes how this is done.

### To use a solver worksheet:

This procedure starts with the worksheet set up as described in the above procedure "To set up a solver worksheet:". This worksheet is now the current worksheet. You know the values of all but one of the variables, and you'll use this solver worksheet together with the Calculator's Solve 1-2-3 screen to solve for that unknown.

1. If the Solve 1-2-3 screen is not displayed, display the Solve Catalog, then press **[1-2-3]** (**[F8]**).
2. Press **[SOLV]** to display the solver worksheet.
3. Enter values into all but one of the variable's cells.
4. Move the cursor to the unknown variable's cell.
5. Press **[F7]** **[F10]** **[ENTER]** and see the solution in the calc line labeled **Solve result**. If the expression in the worksheet's formula cell does not evaluate to zero exactly, that cell will contain a very small number.
6. To solve for another variable, repeat these steps.

**Example: Creating and Using a Solver Worksheet.** This example demonstrates how to set up the solver worksheet and how to use it.

The equation used in this example is  $\text{RATE} * \text{TIME} = \text{DISTANCE}$ . The solver worksheet uses expressions, not equations, so forming left - right gives the expression  $(\text{RATE} * \text{TIME}) - \text{DISTANCE}$ . If you want to press keys as you follow this example, create the worksheet shown in the following figure. Cells B3, B4, and B5 contain values only; no formulas. Cell B8 contains the formula  $+B3*B4-B5$ . When the example starts, this worksheet is the current worksheet.



	A	B	C	D
1				
2				
3	RATE	40.00		
4	TIME			
5	DISTANCE	100.00		
6				
7	RATE * TIME - DISTANCE	-100.00		
8				
9				
10				
11				
12				
13				
14				
15	Nov-93 00:46 AM			READY

### Keys:

**123**

*highlight cell B3*

40 **▼** **▼** 100

**▼** **▼** **▼**

**1-2-3** **MENU** **A**

**S**

**1-2-3** **(F8)**

**Form** **(F8)**

**ENTER**

0 **VALUE** **(F9)**

**Solve** **(F10)**

### Description:

Displays the solver worksheet containing the formula  $(RATE * TIME) - DISTANCE$  in cell B8.

Move the cursor to cell B3.

Enters 40 miles per hour into B3 and 100 miles into B5.

Moves the cursor to cell B8.

Displays the Solve Catalog. (You may have to press **(ESC)** one or more times.)


Displays the Calculator's 1-2-3 screen.

Displays the current 1-2-3 worksheet. The cursor highlights cell B8, the formula cell.

Defines B8 as the formula cell and returns to the Calculator's 1-2-3 screen.

Enters the value the formula cell is to calculate.

Displays the worksheet. The formula cell, B8, is highlighted.

 (4 times)

Highlights cell B4, TIME. This is the cell whose value is to be calculated to force cell B8 to equal zero.



Defines B4 (TIME) as the solve cell and returns to the solve 1-2-3 screen. The calculation is performed and the display shows 2.5 hours (the SOLVE result) as the time required to cause RATE \* TIME - DISTANCE (B8) to equal zero. If you return to the worksheet, you'll see that B8 now contains 0.

---

## How the Solver Works

The operation of the Solver is explained in the earlier section, “Calculating with Solver Variables.” This section explains Solver operation in more detail.

The Solver has two ways of finding an answer—**direct** solutions and **iterative** solutions.

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Initially, the Solver tries to find a *direct* solution by rearranging the equation and then solving for the variable. If the Solver finds a direct solution, the HP 100LX displays the answer on the calc line, and no other information is displayed.

If the Solver is unable to find a direct solution, the Solver tries to find an *iterative* solution. (*Iterative* refers to the repetitive numerical procedures used.) This involves searching for the answer by estimating a set of answers, seeing how close they are to a solution, and then making another set of estimates. The HP 100LX displays the current estimates (“guesses”) while the Solver is searching for an answer iteratively. You should keep in mind that *there may be more than one solution to an equation*, and that it may be necessary for you to enter guesses in order to influence which solution the Solver finds.

If the displayed estimates don't appear to be proceeding towards a number you judge to be a reasonable answer, you may want to stop the iterative process, enter your own guesses, and restart the search

(refer to the following sections: “Halting and Restarting an Iterative Search” and “Entering Guesses.”)

Since the process of finding an iterative solution is very complex, there are four possible outcomes that you should be aware of:

- The HP 100LX displays an answer but displays no message. It is very likely that the Solver has found a solution. The HP 100LX may display additional information if you repeat the calculation by pressing the function key for the variable you solved for.
- The HP 100LX displays an answer and automatically displays a message. The Solver has found a possible solution, but you must use judgement in interpreting the results.
- The HP 100LX displays `Try again. Bad guesses.` This indicates that the Solver cannot begin the search with the current guesses. (See the following section “Entering Guesses.”)
- The HP 100LX displays `Solution not found` because the Solver was unable to find a solution. Check to see if your equation and stored values are correct. If the equation is correct, you may be able to find a solution by entering very good guesses.

## Halting and Restarting an Iterative Search

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When the Solver is searching for an iterative solution (in other words, when the Solver is displaying sets of estimates), you can halt the calculation by pressing any key. The HP 100LX displays the best estimate the Solver has found so far, and the message `Interrupted.` You can restart the search from where it left off by pressing the function key for the variable you are solving for. Or, you can restart the search using your own guesses (see “Entering Guesses,” below).

## Entering Guesses

Entering your own guesses serves two purposes. First, it can save time by telling the Solver where to start searching. Second, if more than one solution exists, entering guesses can help the Solver select the answer you want. The closer your guesses are to the answer you want, the better chance the Solver has of finding it.

You can enter guesses at these times:

- Before beginning the calculation, after you've stored a value for every variable except the unknown variable.
- After you've halted the iterative search.
- After the Solver has returned an answer, and you want to begin searching for another answer somewhere else.

You can enter one or two guesses. If you enter one guess, the Solver makes a second guess. If you enter two guesses, the Solver starts searching for a solution in the range between the two guesses. The Solver works most efficiently when the answer is between your two guesses. For example, if you know the answer is between 5 and 12, you should enter 5 and 12 as the starting guesses.

### To enter one guess:

Key in the value and press the function key for the variable twice. For example, 4.5  $\text{A}$   $\text{A}$  enters 4.5 as a guess for a variable named *A* and starts the calculation.

### To enter two guesses:

1. Key in the first guess and press the function key.
2. Key in the second guess and press the function key twice.

### Example: Calculating Profit for a Manufacturing Operation.

The following Solver equation calculates the profit from a piano-manufacturing operation:

$$\text{PROFIT} = \text{PRICE} * \text{QUAN} - \text{VARCOST} * \text{QUAN} - \text{FIXED}$$

where

*PROFIT* = profit for the manufacturing operation.

*PRICE* = the retail price of a piano.

*QUAN* = the number of pianos sold.

*VARCOST* = variable costs (per piano).

*FIXED* = fixed costs.

The Bill Johnson Piano and Dog Whistle Corporation sells pianos for \$6,000. Variable costs are \$4,100; fixed costs per year are \$112,000. How many pianos must Bill Johnson sell this year in order to earn a profit of \$130,000? (In past years, Johnson has had to sell between 100 and 200 pianos to make an acceptable profit. You can use this information as initial guesses.)

**Keys:**




Piano 




PROFIT=

PRICE 

QUAN 

VARCOST 

QUAN  FIXED






6000 

4100 

112000 

130000 

**Description:**

Selects the Solve Catalog. If you don't see the Solve Catalog, press  one of more times.

Ensures the highlight is in the name field.

Enters the equation name into the name field.

Moves the highlight to the equation field.

Types the equation.

Verifies the equation and selects the solve calc screen.

Stores the price.

Stores the variable costs.

Stores the fixed costs.

Stores the profit.

The next two steps enter guesses for *QUAN*. If the Solver must do an iterative search to solve for *QUAN*, it will begin the search using the estimates (100 and 200) that you enter.

**Keys:**

100 

200 



**Description:**

Enters the first guess for *QUAN*.

Enters the second guess for *QUAN*.

Solves for *QUAN* iteratively. The final value is 127.37.

## Function Plotting

The Solver's function plotting lets you draw a graph and determine roots of an equation or mathematical expression. You can autoscale the graph so the curve is sure to appear in the display. You can also zoom in and zoom out to see more detailed or wider views of the graph, and you can display the coordinates of any point on the graph. The general procedures below are followed by an example that demonstrates the power and flexibility of HP 100LX function plotting.

### To draw a graph:

1. Highlight an equation in the Solve Catalog.
2. Press **Plot** (**F10**).
3. Press **MENU** **C** **D** to set the plot conditions to their initial values. (Or, if you know the range of interest, enter values for XMIN and XMAX—use **XMIN** (**F5**) and **XMAX** (**F6**).)
4. Press **F3** (Auto) to draw the graph.

When you first use function plotting, the graph boundaries and the resolution have these values:

XMIN = -5.00  
XMAX = 5.00  
YMIN = -3.00  
YMAX = 3.00  
RES = 112.00

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Step 3 above resets the plot conditions to these initial values. Another approach to steps 3 and 4 is to set XMIN, XMAX, YMIN, and YMAX yourself and press **Draw** (**F4**).

### To zoom in (to view a smaller region of the graph in more detail):

1. Draw the graph.
2. Do one of the following:
  - Press **↑** **Z-Inv** (**F3**) or **Z-Inv** one or more times. Each press of **↑** **Z-Inv** zooms in by a factor of 5 and autoscales the y-axis. Each press of **Z-Inv** zooms in on both axes by a factor of 5.
  - Press **X** **Z-Inv** to zoom in just the x-axis, or press **Y** **Z-Inv** to zoom in just the y-axis.
  - Use an x, y zoom box.

- a. Use the arrow keys to move the cursor to one corner of the area you wish to expand.
  - b. Press  $\boxed{\text{Z-Box}}$  ( $\boxed{\text{F2}}$ ).
  - c. Move the cursor to the diagonally opposite corner.
  - d. Press  $\boxed{\text{Z-Box}}$  again to enlarge the defined area to fill the entire screen.
- Use an x, autoscale-y zoom box.
    - a. Move the cursor horizontally to an x-value that defines one end of the x-range you want to expand.
    - b. Press  $\boxed{\text{Z-Box}}$  ( $\boxed{\text{F2}}$ ).
    - c. Move the cursor horizontally to an x-value that defines the other end of the x-range you want to expand.
    - d. Press  $\boxed{\leftarrow} \boxed{\text{Z-Box}}$  to enlarge the defined x-range to fill the entire screen and autoscale the y-axis.

### To zoom out (to view a larger region of the graph in less detail):

1. Draw the graph.
2. Do one of the following:
  - Press  $\boxed{\leftarrow} \boxed{\text{Z-Out}}$  ( $\boxed{\text{F4}}$ ) or  $\boxed{\text{Z-Out}}$  one or more times. Each press of  $\boxed{\leftarrow} \boxed{\text{Z-Out}}$  zooms out by a factor of 5 and autoscales the y-axis. Each press of  $\boxed{\text{Z-Out}}$  zooms out on both axes by a factor of 5.
  - Press  $\boxed{\text{X}} \boxed{\text{Z-Out}}$  to zoom out just the x-axis, or press  $\boxed{\text{Y}} \boxed{\text{Z-Out}}$  to zoom out just the y-axis.

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### To display the coordinates of any point on the screen:

1. Draw the graph.
2. Press  $\boxed{\text{X,Y}}$  one or more times until **COORD** is displayed in the upper left corner of the display (coordinate mode is active).
3. Use the arrow keys or shifted arrow keys (hold down  $\boxed{\leftarrow}$  and press the arrow keys repeatedly) to select the point you want. Then read on the screen the coordinates of that point.

### To display a function's value for any point on the curve:

1. Draw the graph.
2. Press  $\boxed{\text{X,Y}}$  one or more times until **TRACE** is displayed in the upper left corner of the display (trace mode is active).
3. Use the arrow keys or shifted arrow keys (hold down  $\boxed{\leftarrow}$  and press  $\boxed{\rightarrow}$  or  $\boxed{\leftarrow}$  repeatedly) to display the x-value you want. Then read on the screen the corresponding function value.

## To digitize a point's coordinates (to display the coordinates with full accuracy):

You can separately digitize an x-coordinate or a y-coordinate, or you can digitize a point.

1. Move the cursor to the desired x-value, y-value, or point.
2. Do one of the following (the display will not change):
  - Press **X** **ENTER** to digitize the x-value.
  - Press **Y** **ENTER** to digitize the y-value.
  - Press both **X** **ENTER** and **Y** **ENTER**, in turn, to digitize a point.
3. The coordinate or coordinates will be entered into the calculator's history stack. If you enter the x-coordinate first, the x-value will be in level 1 and the y-value in the calc line. To view these values, use **xy** or press **MENU** **A** **M** to start the Math application.

## To solve for the roots of a function graphically:

1. Draw the graph.
2. Do one of the following:
  - Move the cursor to an XVAR value close to a root (where the curve crosses the x-axis). This locates an initial guess for the root. Often, zooming out helps to find all roots.
  - (Optional for cases where the root is not as easily found.) Press **Z-Box** to mark (x) the first guess, then move the cursor to another XVAR value to define a second guess. These two guesses should be on either side of the expected location of the root.
3. Press **spacebar** to display the value of the root. If a "questionable solution" is found (a gap, pole, etc.), the top line will display a message to that effect followed by the x and y coordinates.
4. Repeat the last two steps to solve for any additional roots.

## To find the coordinates of an extremum (maximum or minimum):

An extremum is a point on a graph where the sign of the curve's first derivative changes (where a graph shows a local maximum or minimum). This procedure shows you how to zoom in repeatedly on the area containing the extremum until your measurement of its coordinates achieves the desired accuracy.

1. Draw the graph.
2. If the extremum is not already visible, zoom out (press **Z-Out**) until it's visible on the graph.



3. Press  $\text{[X,Y]}$  one or more times to select trace mode.
4. Move the cursor to the point of the extremum to display its coordinates.
5. Define a tight “x, autoscale y zoom box” around the extremum by moving the cursor just to the left of the extremum and pressing  $\text{[Z-Box]}$ , and then moving cursor horizontally just to the right of the extremum and pressing  $\text{[Z-Box]}$ . The smaller the x-range containing the extremum, the greater zoom you’ll create.
6. Move the cursor to the point of the extremum.
  - If these coordinates show the accuracy you want, you can move the coordinates of the extremum to the Calculator stack by pressing  $\text{[X] [ENTER] [Y] [ENTER]}$ —see the earlier procedure “To digitize a point’s coordinates (to display the coordinates with full accuracy):”.
  - If you want more accurate coordinates, zoom in again (repeat steps 5 and 6) until they are accurate enough.

## Note



If the number of places used to display the coordinates prevents you from seeing the accuracy you want, you can usually show between 6 and 8 decimal places for each coordinate, depending on the sign of the mantissa and exponent. Press  $\text{[MENU] [O] [N]}$  and set the Number Format to Scientific and the Number of Digits to 6, 7, or 8, and then redraw.

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**Example: Finding the Roots of an Equation.** This example shows how to find graphically the two roots of the equation  $x^2 + 10x = 75$ .

### Keys:

$\text{[Z-Box]}$   $\text{[MENU]}$   $\text{[A]}$

$\text{[S]}$

$\text{[▶]}$   $\text{[Fn] END}$

x  $\text{[^]}$  2  $\text{[+]}$  10

$\text{[*]}$

x  $\text{[=]}$  75

### Description:

Displays the Solve Catalog screen. If it’s not displayed, press  $\text{[ESC]}$  one or more times.

Ensures the highlight is at the end of the equation field.

Enters the equation.

**F10**

Enters and highlights the equation in the Solve Catalog.

**F10**

Displays the function plotting screen.

**MENU** **C** **D**

Initializes the function plotting data. The plot-variable is x.

**F3**

Plots the equation as the expression  $x^2 + 10x - 75$ . Note that the equation is converted to an expression by subtracting the right side from the left.

The minimum and maximum x-values (the left and right boundaries) are those specified by XMIN and XMAX in the function plotting screen. The minimum and maximum y-values (the bottom and top boundaries) are chosen by the Auto function to ensure that the curve is displayed on the screen.

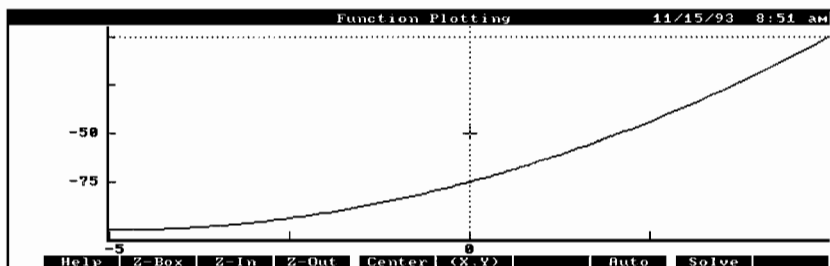
**ESC**

Returns to the function plotting screen. This screen shows that Auto set these values: YMIN = -105 and YMAX = 5.

**Draw** (**F4**)


Redraws the graph.

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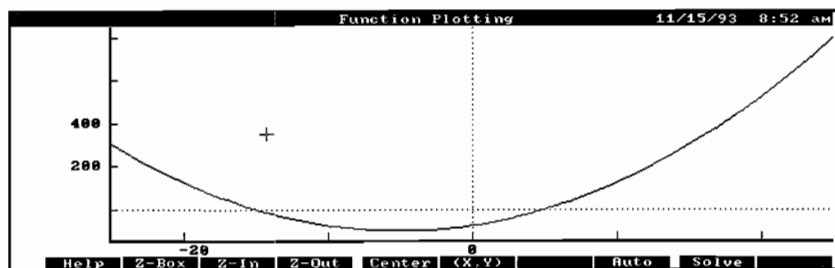


 F4

Zooms out and autoscales the y-axis in one operation. The range covered by the x-axis is increased by 5 times, and the y-axis range is automatically chosen (autoscaled) to ensure that the curve appears on the screen. Both roots are now shown (where the curve crosses the x-axis).

 (8 times)


Moves the cursor to an x-value near the left root. The cursor position now locates an initial guess for this root. (The initial guess is determined only by the x-value of the cursor's position, so there's no need to move the cursor to a y-value close to zero.)



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Solves for the left root and displays its value, -15.

 (11 times)

Moves the cursor to locate an initial guess for the right root.



Solves for the right root and displays its value, 5.

---

## How Function Plotting Works

Function plotting plots values of a function for a number of evenly spaced values of the plot variable (independent variable) measured along the x-axis. When the graph is drawn, these function values or points are connected by straight lines. The number of these plotted points is determined by RES (resolution), the plot boundaries are given by XMIN, XMAX, YMIN, and YMAX, and the plot variable is given by XVAR. These values are shown in the screen that displays plot conditions.

The number of evenly spaced values (points) of the plot variable XVAR is determined by the value of RES. For instance, a RES value of 10 means that the XVAR values between XMIN and XMAX are divided into 10 equal parts. If XMIN is -50 and XMAX is +50, the function would be plotted for x-values of -50, -40, -30, . . . +40, and +50, and each of these plotted points would be connected by straight lines to produce the graph.

## Selecting the Expression to Plot

Every graph is a plot of a function versus an independent variable (the XVAR value). You select a function or an equation to plot (the current equation) from the Solver's equation list. If you plot an equation of the form  $y = f(x)$ , the function  $f(x)$  is plotted. If you plot an equation of the form  $\text{expression} = \text{expression}$  (such as  $x^3 + 10x = 5x^2 + 75$ ), the HP 100LX automatically changes it into a single expression (no equal sign) by *subtracting the right side of the equation from the left side* ( $x^3 + 10x - 5x^2 - 75$ ). The value of this expression is then plotted against XVAR.

This table shows examples of how equations would be converted to expressions by function plotting, and what choices you would have for the independent variable, XVAR.

Expression or Equation in Equation List	What's Plotted as y-value	XVAR Choices
$y = \sin(x)$	$\sin(x)$	y, x
$\sin(x)$	$\sin(x)$	x
$(PPSY*L*W)/9 = \text{COST}$ (from previous example)	$(PPSY*L*W)/9 - \text{COST}$	PPSY, L, W, COST
$(PPSY*L*W)/9$	$(PPSY*L*W)/9$	PPSY, L, W

## Setting the Plot Conditions

Function plotting uses two screens, one that shows plot conditions and one that shows the graph. You set the plot conditions on the first of these two screens, the one you reach from the Solve Catalog by pressing **Plot** (**F10**). The function keys provided by this first function plotting screen are described in the following table.

















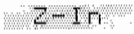



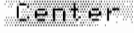

### Function Keys Active in the Function Plotting and Plot Conditions Screen

Key	Description
Auto	Sets the upper and lower boundaries of the graph (YMAX and YMIN) to ensure that the curve will appear in the display, then draws the graph of the current equation. Using <b>Auto</b> ( <b>F3</b> ) is generally the easiest way to begin plotting an equation.
Draw	Draws the graph of the current equation using the values of the variables described below in this table.
XMIN	Defines the left boundary of the graph; the minimum x-axis value or XMIN. To change this value, type the value and press <b>XMIN</b> ( <b>F5</b> ).
XMAX	Defines the right boundary of the graph; the maximum x-axis value or XMAX. To change this value, type the value and press <b>XMAX</b> ( <b>F6</b> ).
YMIN	Defines the lower boundary of the graph; the minimum y-axis value or YMIN. To change this value, type the value and press <b>YMIN</b> ( <b>F7</b> ).
YMAX	Defines the upper boundary of the graph; the maximum y-axis value or YMAX. To change this value, type the value and press <b>YMAX</b> ( <b>F8</b> ).
XVAR	Specifies the independent variable. Pressing <b>XVAR</b> cycles through the equation's variables, specifying each in turn as the independent variable.
RES	Determines the resolution; the number of XVAR values for which the function is plotted. Larger values of RES provides greater accuracy but the graph is drawn more slowly. To change this value, type the value and press <b>RES</b> ( <b>F10</b> ). (RES is ignored when plotting statistics data with a linear model.)







## Interacting with the Graph

Once the graph is drawn, you can use specially defined keys to zoom in, zoom out, define a specific part of the graph to enlarge, find the function's roots, and perform other operations. These special keys and their actions are described over the next few pages in the following table.

**Keys Active in the Function Plotting and Interactive Graphics Screen**

Key	Description
 ,   , 	Moves graphics cursor around the graph by jumps.
 ,   ,   ,   , 	Moves the graphics cursor around the graph by individual dots (pixels).
CTRL+  CTRL+  CTRL+  CTRL+ 	Pans the graph in the direction of the arrow.
	Zooms in by a factor of 5.
	Zooms out by a factor of 5.
 Z-In	Zooms in by a factor of 5 and autoscales the y-axis.
 Z-Out	Zooms out by a factor of 5 and autoscales the y-axis.
	Centers the graph at the graphics cursor position.
 Center	Centers the graph at the graphics cursor position and autoscales the y-axis.

**Keys Active in the Function Plotting / Interactive Graphics  
Screen - continued**

Key	Description
$Z-Box$	<p>Press once to set a mark (x) that remains when the cursor is moved. (This mark defines one corner of a zoom box or the first of two guesses for a root.) Move the cursor and press it again to enlarge to full screen the portion of the graph defined by the cursor position and the mark. If, after setting the mark and moving the cursor, you press  <math>Z-Box</math>, it enlarges to full screen the x-axis portion of the graph defined by the cursor position and the mark and then autoscales the y-axis.</p>
$Solve$ or 	<p>Solves for a root using either one or two guesses chosen as follows:</p> <ul style="list-style-type: none"> <li>■ the first guess is provided by the XVAR value of the cursor's position when  is pressed.</li> <li>■ For two guesses the first is provided by the XVAR value of a mark (x), produced at the cursor's position when <math>Z-Box</math> is pressed. The second guess is provided by the XVAR value of the cursor's position when  is pressed.</li> </ul>
$(X,Y)$	<p>When pressed repeatedly, rotates through three graph display modes:</p> <ul style="list-style-type: none"> <li>■ Standard mode, showing labeled axes only.</li> <li>■ Coordinate mode, where the coordinates of the cursor position are displayed as the cursor moves throughout the interactive graphics screen.</li> <li>■ Trace mode, where the cursor traces the function as you press  and , and the value of the function is displayed for each cursor position (for each XVAR-value).</li> </ul>



**Keys Active in the Function Plotting / Interactive Graphics  
Screen - continued**

Key	Description
<b>ESC</b>	Exits the graph and displays the Function Plotting screen.
<b>X</b> <b>ENTER</b> or <b>ENTER</b>	Enters the x-value of the cursor's position into the calc line. To exit the graph and view the calc line, press <b>ESC</b> .
<b>Y</b> <b>ENTER</b>	Enters the y-value of the cursor's position into the calc line. To exit the graph and view the calc line, press <b>ESC</b> .
<b>X</b> <b>ENTER</b> <b>Y</b> <b>ENTER</b>	Enters both the x-value and the y-value of the cursor's position into the history stack. If you enter the x-coordinate first, the x-value will be in level 1 and the y-value in the calc line. To view these values, use <b>x&amp;y</b> or start the Math application to see the history stack.



## Writing Solver Equations

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### Introduction

Sometimes an equation printed in a book or written out longhand has to be adapted before it can be typed into the equation list. For example, examine the following equation for calculating the annual percent yield on a T-bill, given the purchase price. This price is in terms of full units of \$10,000.

$$\frac{\text{Percent annual yield}}{100} = \frac{\$10,000 - \text{Price}}{\text{Price}} \times \frac{360 \text{ days}}{\text{Days to maturity}}$$

This equation requires several changes before the Solver can understand it. In addition, an enhancement can be added to make the calculation easier; a Solver **function** can be included to calculate *Days to maturity*. The following section discusses how these changes are incorporated into the equation.

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### Rules for Writing Equations

The rules for writing equations use several terms:

- *Variables* are the named items for which you store or calculate values.
- *Constants* are numbers—for example, \$10,000, 360 days.
- *Operators* perform arithmetic—for example, \* and –.
- *Functions* do calculations using mathematical capabilities built into the Solver—for example,  $\text{SQRT}(x)$ ,  $\text{USPV}(i\%, n)$ , and  $\text{DDAYS}(d1, d2, \text{cal})$ .

## Length of Equations

An equation cannot exceed 2279 characters and cannot contain more than 256 different variables. There are no other limits as long as there is sufficient memory to store it.

## Variable Names

Solver variable names can be a maximum of 15 characters long and must be all one word (no spaces allowed). The following characters are not allowed in variable names: +, -, \*, /, ^, (, ), <, >, =, :, ;, !, {, }, [, ], and |. Also, the character currently defined as argument separator (, in US mode and . in European mode) is not allowed in variable names. You cannot use NOT, AND, OR, or XOR as variable names, nor can you use the names of functions that have no arguments as variable names. A variable name cannot begin with a number.

For example, you could rewrite the T-bill equation as:

$$\frac{\%Yield}{100} = \frac{\$10,000 - Price}{Price} \times \frac{360 \text{ days}}{DTM}$$

Note the shortened names using both uppercase and lowercase letters: %Yield, Price, DTM.

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### Note



Variable names are case sensitive. For example, the variable %Yield is not the same as another variable named %YIELD.

The first seven characters of the variable names become function key labels. Therefore, make sure no two variables have the same first seven characters.

## Constants

Constants must be keyed in as numbers without digit separators or other characters. For example:

$$\frac{\%Yield}{100} = \frac{10000 - Price}{Price} \times \frac{360}{DTM}$$

Note the properly written numbers: 10000 and 360.

## Functions

An equation can contain any of the functions shown in the “Solver Functions” table later in this chapter. For example, rather than computing *DTM* yourself, you can use the Solver function *DDAYS* with arguments *SDATE* (settlement date), *MDATE* (maturity date), and 3 (designating the 360-day calendar):

$$\frac{\%Yield}{100} = \frac{10000 - Price}{Price} \times \frac{360}{DDAYS(SDATE, MDATE, 3)}$$

## Operators, Parentheses, and the Order of Calculations

When necessary, use parentheses to control the order of calculations. Without parentheses, the Solver does calculations using the same rules as those used by an algebraic calculator. These rules are:

**Functions First.** For example, when solving for *D* in the equation  $A * \text{SQRT}(B + C) = D$ , the Solver calculates  $\sqrt{(B + C)}$  and then multiplies the answer by *A*.

**Exponentiation before Multiplication and Division.** For example, an equation typed in as  $A * B^3 = C$  is interpreted as  $A \times B^3 = C$ . *B* is raised to the 3rd power and *then* multiplied by *A*. To raise  $A \times B$  to the 3rd power, write the equation:  $(A * B)^3 = C$ .

**Multiplication and division before addition and subtraction.** For example, an equation typed in as  $A + B / C = 12$  is interpreted as:

$$A + \frac{B}{C} = 12$$

To divide the sum  $A + B$  by *C*, type the equation:  $(A + B) / C = 12$ .

The T-bill equation can be written:

$$\%Yield / 100 = (10000 - Price) / Price * 360 / DDAYS(SDATE, MDATE, 3)$$

A good rule is: when in doubt, use parentheses. So, if you were unsure of how the T-bill equation written above would be interpreted, you could type it as:

$$\%Yield / 100 = ((10000 - Price) / Price) * (360 / DDAYS(SDATE, MDATE, 3))$$

The extra parentheses don't change the meaning of the equation, but they may make it easier to understand.

You cannot use parentheses for "implied" multiplication. For example, an equation printed in a book as  $P_{SN} = P_S(1 - F)$  can be typed into the Solver as  $P_{SN}=P_S*(1-F)$ . The \* sign must be inserted between  $P_S$  and the parenthesis.

## Spaces and Line Breaks

You can use spaces to make the equation more readable as long as there are no spaces inside variable names and function names. The following version of the T-bill equation is easier to read:

```
%Yield / 100 = ((10000 - Price) / Price) *  
(360 / DDAYS (SDATE, MDATE, 3))
```

You can also create a line break in an equation using **ENTER**.

## Conditional Expressions and Logical Operators




The Solver IF function, in combination with the logical operators in the table "Operators Used in Conditional Expressions" later in this chapter, allow equations to do certain decision-making operations (see the section "Conditional Expressions (IF Function)") later in this chapter. You cannot use logical operators as variable names. For example, you cannot name a variable AND, but *CANDY* and *LAND* are acceptable variable names.

## Date Formats

The functions CDATE, DATE, and DDAYS (defined in the Solver Functions table in the next section), either return a date or use one or more dates as arguments. The format in which these dates are expressed depends on the date format set in the Setup Utility. The formats shown in the second and third columns give the Calculator date formats shown in the first column.

### Date Formats: Calculator vs. Setup Utility

Calculator	Setup Utility
DD.MMYYYY	(DD- MMM-YY) (DD- MMM) (DD/ MM/ YY) (DD/ MM/ YY) (DD. MM. YY) (DD/ MM) (DD. MM)
MM.DDYYYY	(MM/ DD/ YY) (MM/ DD)
YYYY.MMDD	(YY- MM- DD) (MM- DD)

Note that you won't see the entire date in the display unless you've set the number format to be All or Fixed Point with 6 digits. To change the format press    and fill out the Number Format dialog box.




---

## Solver Functions

The following table lists the Solver functions. Lowercase characters in parentheses stand for numbers, variable names, or numeric expressions that the functions use to do their calculations.

## Solver Functions

Function	Description
ABS( <i>x</i> )	Absolute value.
ACOS( <i>x</i> )	Arc cosine. <sup>1</sup>
ALOG( <i>x</i> )	Common (base 10) antilogarithm; $10^x$
ANGLE( <i>x,y</i> ) <sup>2</sup>	Returns polar coordinate angle $\sphericalangle$ given ( <i>x,y</i> ) rectangular coordinates. <sup>1</sup>
ASIN( <i>x</i> )	Arc sine. <sup>1</sup>
ATAN( <i>x</i> )	Arc tangent. <sup>1</sup>
CALCCELL ( <i>input list</i> , <i>output range</i> , <i>row, col</i> ) <sup>2</sup>	You can specify <i>row, col</i> , just <i>row</i> , or neither. <i>input list</i> is zero or more inputs to the worksheet of the form: [ <i>expr, range, row, col</i> ]. For each input, the expression is evaluated and stored in the appropriate cell in the worksheet. Then the worksheet is recalculated, and the value of the output cell is returned. <sup>3</sup>
CDATE	Current date. <sup>4</sup>
COMB( <i>x,y</i> )	Number of combinations of <i>x</i> items taken <i>y</i> at a time.
COS( <i>x</i> )	Cosine. <sup>1</sup>
CPCOL	Returns the worksheet column number of the current cell pointer. <sup>3</sup>
CPROW	Returns the worksheet row number of the current cell pointer. <sup>3</sup>

- 1 Uses the current angle mode—degrees, radians, or grads. To change the angle mode, press   .
- 2 Use the current argument separator when keying in formulas.
- 3 See the section “Solver Functions that Access 1-2-3 Worksheets” near the end of this chapter.
- 4 Uses the current date format, DD.MMYYYY, MM.DDYyyy, or YYYY.MMDD. See the earlier section “Date Formats.”



### Solver Functions (continued)

Function	Description
CTIME	Current time in HH.MMSS, 24-hour format.
DATE( <i>date</i> , <i>n</i> )	The date <i>n</i> days after (when <i>n</i> is positive) or before (when <i>n</i> is negative) the specified <i>date</i> . <sup>1</sup>
DDAYS( <i>d1</i> , <i>d2</i> , <i>cal</i> )	The number of days between dates <i>d1</i> and <i>d2</i> . <sup>1</sup> <i>cal</i> designates the calendar: <ul style="list-style-type: none"> <li>■ <i>cal</i>=1 for the actual calendar, which recognizes leap years.</li> <li>■ <i>cal</i>=2 for the 365-day calendar, which ignores leap years.</li> <li>■ <i>cal</i>=3 for the 360-day calendar, which uses 12, 30-day months.</li> </ul>
DEG( <i>x</i> )	Converts <i>x</i> in radians to decimal degrees.
EXP( <i>x</i> )	Natural antilogarithm; $e^x$ .
EXPM1( <i>x</i> )	$e^x - 1$ .
FACT( <i>x</i> )	Factorial; <i>x</i> is an integer $\geq 0$ .
FLOW( <i>filename</i> , <i>row</i> )	The specified cash flow from the specified cash-flow file. (The filename must be entered <i>without</i> a DOS path and file extension. The .CFL extension and the current path from the Cash Flows application are assumed.)
FP( <i>x</i> )	Fractional part.
FV( <i>n</i> , <i>i</i> % <i>yr</i> , <i>pv</i> , <i>pmt</i> , <i>p</i> / <i>yr</i> , <i>m</i> )	TVM function for FV. <sup>2</sup>

<sup>1</sup> Uses the current date format, DD.MMYYYY, MM.DDYYYY, or YYYY.MMDD. See the earlier section "Date Formats."

<sup>2</sup> See the section "The TVM Functions" later in this chapter.

### Solver Functions (continued)

Function	Description
G( <i>var</i> )	The GET function returns the contents of <i>x</i> .
HMS( <i>x</i> )	Converts <i>x</i> in decimal hours (degrees) to H.MMSS (D.MMSS) format.
HR( <i>x</i> )	Converts <i>x</i> in H.MMSS (D.MMSS) format to decimal format.
IDIV( <i>x,y</i> )	Integer part of the quotient $x \div y$ .
IF( <i>con,alg1,alg2</i> )	If conditional expression <i>con</i> is true, use algebraic expression <i>alg1</i> ; otherwise, use <i>alg2</i> . (IF is discussed later in this chapter.)
INT( <i>x</i> )	The greatest integer less than or equal to <i>x</i> .
INV( <i>x</i> )	Reciprocal, $1/x$ .
IP( <i>x</i> )	Integer part.
ITEM( <i>filename, row,col</i> )	Returns the value of the designated statistics data (from a .STA file). If you don't specify a column, it defaults to 1. <sup>1</sup>
I%YR( <i>n,pv,pmt, fv,p/yr,m</i> )	TVM function for I%YR. <sup>2</sup>
L( <i>var,alg</i> )	The LET function evaluates the algebraic expression <i>alg</i> , stores the result in <i>x</i> , and also returns that result as the value of the L function.
LENGTH( <i>range</i> )	Returns the number of worksheet rows in the given range. <sup>3</sup>
LN( <i>x</i> )	Natural (base e) log of <i>x</i> .
LNP1( <i>x</i> )	$\ln(1 + x)$ .
LOG( <i>x</i> )	Common (base 10) log of <i>x</i> .

1 *filename* must be entered *without* a DOS path and extension. The current path and standard extension from the application are assumed.

2 See the section "The TVM Functions" later in this chapter.

3 See the section "Solver Functions that Access 1-2-3 Worksheets" near the end of this chapter.

### Solver Functions (continued)

Function	Description
MAX( $x, y$ )	Larger of $x$ and $y$ .
MIN( $x, y$ )	Smaller of $x$ and $y$ .
MOD( $x, y$ )	The remainder of the division $x \div y$ ; MOD( $x, y$ ) = $x - y \times \text{INT}(x \div y)$ .
N( $i\%/yr, pv, pmt, fv, p/yr, m$ )	TVM function for $N$ . <sup>1</sup>
PERM( $x, y$ )	Permutations of $x$ items taken $y$ at a time.
PI	$\pi$ ; 3.141592653589793 (16 digits).
PMT( $n, i\%/yr, pv, fv, p/yr, m$ )	TVM function for $PMT$ . <sup>1</sup>
PV( $n, i\%/yr, pmt, fv, p/yr, m$ )	TVM function for $PV$ . <sup>1</sup>
RAD( $x$ )	Converts $x$ in decimal degrees to radians.
RADIUS( $x, y$ )	Returns polar coordinate radius $R$ given ( $x, y$ ) rectangular coordinates.
RAN# or RAND	Pseudo-random number ( $0 \leq r < 1$ ).
RCLCELL ( $range, row, col$ )	You can specify <i>row</i> and <i>col</i> , just <i>row</i> , or neither. Returns the value of the designated worksheet cell. <sup>2</sup>
RND( $x, y$ )	$x$ rounded to $y$ decimal places (when $0 \leq y \leq 15$ ) or to $ y $ significant digits (when $-16 \leq y \leq -1$ ). When $y=16$ , $x$ is rounded to number of decimal places given by current display setting.
S( $var$ )	$var$ is a variable; S( $var$ ) is used with the IF function to create a set of function keys from more than one equation. (S is discussed later in this chapter.)

<sup>1</sup> See the section "The TVM Functions" later in this chapter.

<sup>2</sup> See the section "Solver Functions that Access 1-2-3 Worksheets" near the end of this chapter.

### Solver Functions (continued)

Function	Description
SGN( $x$ )	Sign of $x$ (+1 if $x > 0$ , 0 if $x = 0$ , -1 if $x < 0$ ).
SIGMA ( $cv, c1, c2, s, alg$ )	Sums values of the algebraic expression ( $alg$ ) for values of the counter variable ( $cv$ ). $cv$ starts with value $c1$ and is incremented in steps of $s$ , to a final value of $c2$ . (SIGMA is covered in more detail on page 30-23.)
SIN( $x$ )	Sine. <sup>1</sup>
SIZEC( $filename$ )	Returns the last flow number in the specified cash-flow file. <sup>2</sup>
SIZES( $filename$ )	Returns the number of statistics rows in the specified statistics-data file. <sup>2</sup>
SPFV( $i\%, n$ )	Future value of a single \$1.00 payment; equivalent to $(1+i\% \div 100)^n$ . $n$ is the number of compounding periods, $i\%$ is the interest rate per compounding period, expressed as a percentage.
SPPV( $i\%, n$ )	Present value of a single \$1.00 payment; equivalent to $1 \div \text{SPFV}(i\%, n)$ . $n$ is the number of compounding periods. $i\%$ is the interest rate per compounding period, expressed as a percentage.
SQ( $x$ )	$x^2$
SQRT( $x$ )	$\sqrt{x}$
STOCELL( $expr$ , $range, row, col$ )	You can specify $row$ , $col$ , just $row$ , or neither. Evaluates the expression and stores the result in the designated worksheet cell. The worksheet is not recalculated.
#T( $filename$ , $flownum, row$ )	Group size of the specified cash flow in the specified cash-flow file. <sup>2</sup>
TAN( $x$ )	Tangent. <sup>1</sup>

<sup>1</sup> Uses the current angle mode—degrees, radians, or grads. To change the angle mode, press   .

<sup>2</sup>  $filename$  must be entered *without* a DOS path and extension. The current path and standard extension from the application are assumed.

### Solver Functions (continued)

Function	Description
TRN( $x, y$ )	$x$ is truncated to $y$ decimal places (when $0 \leq y \leq 15$ ) or to $ y $ significant digits (when $-16 \leq y \leq -1$ ). When $y$ equals 16, $x$ is truncated to the number of decimal places given by the current display setting.
USFV( $i\%, n$ )	Future value of a uniform series of \$1.00 payments; equivalent to $(\text{SPFV}(i\%, n) - 1) \div (i\% \div 100)$ . $n$ is the number of payments. $i\%$ is the periodic interest rate, expressed as a percentage.
USPV( $i\%, n$ )	Present value of a uniform series of \$1.00 payments; equivalent to $\text{USFV}(i\%, n) \div \text{SPFV}(i\%, n)$ . $n$ is the number of payments. $i\%$ is the periodic interest rate, expressed as a percentage.
WIDTH( $range$ )	Returns the number of worksheet columns in the given range. <sup>1</sup>
XCOORD( $R, \sphericalangle$ )	x-coordinate of polar coordinates. (Uses the current angle mode—degrees or radians.)
YCOORD( $R, \sphericalangle$ )	y-coordinate of polar coordinates. (Uses the current angle mode—degrees or radians.)

<sup>1</sup> See the section “Solver Functions that Access 1-2-3 Worksheets” later in this chapter.

**Example: Calculating Purchasing Power After Inflation.** The following equation, written as it might appear in a book, calculates the future value ( $FVAL$ ) of a sum ( $PVAL$ ) after any number of years ( $YEARS$ ), given a constant percentage rate of inflation ( $INFL$ ).

$$FVAL = \frac{PVAL}{\left(1 + \frac{INFL\%}{100}\right)^{YEARS}}$$

Compare the denominator of the equation with the equation for the SPFV function in the preceding table. (The SPFV function calculates the future value of a single \$1 payment.) Notice that if you replace  $i\%$  and  $n$  in the SPFV equation with *INFL%* and *YEARS*, the two are identical. Thus, the Solver equation can be written:

$$FVAL = PVAL / SPFV(INFL\%, YEARS)$$

**Part 1.** Calculate the purchasing power of \$10,000 after 10 years of 7% inflation per year.

**Keys:**



FVAL [=] PVAL

[/] SPFV (INFL%,

YEARS) [F10]

[OK]

[Calc]

10000 [FVAL]

7 [INFL%]

10 [YEARS]

[FVAL]

**Description:**

Displays the Solve Catalog. (You may need to press [ESC] one or more times until the Solve Catalog is displayed.)

Ensures that the highlight is in the equation field, not the name field.

Types the equation into the solve editor.

Verifies the equation and selects the solve calc screen.

Stores the original amount.

Stores the inflation rate.

Stores the number of years.

Calculates the purchasing power in 10 years to be \$5,083.49.

**Part 2.** What would the inflation rate have to be for the purchasing power to be reduced by only \$2000 over the 10-year period?

**Keys:**8000 **FV%****INFL%****Description:**

Stores desired purchasing power.

Calculates the inflation rate of 2.26%. (The Solver searches for an iterative solution and displays intermediate estimates as described in “How the Solver Works” on page 29-18.)

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## Typing Aids for Solver Functions

Solver functions may either be typed in (as in the previous example) or entered with the help of function keys. For example, when you're entering an equation and want to use the function PMT, you can press **F10** **PMT** to display  $PMT(, , , , )$ . The commas (argument separators) and parentheses are displayed as well as the three letters. As you type in the arguments to the function, use **▶** to skip over the commas and parentheses. After entering the function, press **ESC** to display the previous set of function keys.

Here are the function keys in the solve editor that give you typing aids.

### Solve Editor Function Keys

Key	Description
Math	Provides typing aids for RND, IP, FP, ABS, LN, EXP, LOG, ALOG, SQRT, SQ, INV, TRN, LNP1, EXPM1, IDIV, INT, MOD, MIN, MAX, SGN, SIGMA.
Trig	Provides typing aids for PI, SIN, COS, TAN, ASIN, ACOS, ATAN
Conv	Provides typing aids for DEG, RAD, HR, HMS, XCOORD, YCOORD, RADIUS, ANGLE, CTIME, CDATE, DATE, DDAYS.
Prob	Provides typing aids for COMB, PERM, FACT, RAN#.
Fin	Provides typing aids for N, I%YR, PV, PMT, FV, SPFV, SPPV, USFV, USPV.
Other	Provides typing aids for STOCELL, RCLCELL, CALCCELL, LENGTH, WIDTH, CPCOL, CPROW, IF, OR, XOR, AND, NOT, S, L, G.
NUM+	Inserts into the editor the last number or other operand displayed in the calc line. The number is inserted in full precision.

## Conditional Expressions (IF Function)

Equations can include conditional expressions using the IF function. For example, the Solver accepts the equation:  $BONUS=IF(SALES>3000, .02*SALES, .01*SALES)$ . The two commas inside the parentheses stand for "THEN" and "OR ELSE." According to this equation, if *SALES* is greater than 3000, then *BONUS* equals  $.02 \times SALES$ ; otherwise, *BONUS* equals  $.01 \times SALES$ .

In general, the form of the IF function is:

$IF(\text{conditional expression}, \text{algebraic expression}, \text{algebraic expression})$

A conditional expression can also be an algebraic expression. If the algebraic expression evaluates to zero, it is interpreted as false. Otherwise, true. For example, if *A* equals  $-1$  in the algebraic



expression  $A+1$ , the expression is false. If  $A$  equals any other number, the expression is true.

The logical and relational operators that can be used in conditional expressions are described in the table below:

### Operators Used in Conditional Expressions

**Logical Operators:** NOT, AND, OR, XOR

**Relational Operators:** > Greater than  
< Less than  
= Equal to  
>= Greater than or equal to  
<= Less than or equal to  
<> Not equal to

### Order of Logical Operations

Logical operations are done after arithmetic operations (addition, subtraction, etc.). For example, the expression

$$A+1 \text{ OR } B=5$$

is true if  $A <> -1$  and/or  $B=5$ . The expression is false only if  $A=-1$  and  $B <> 5$ .

When there are two or more logical operators, they are done in the order NOT first, then AND, and finally OR or XOR. Thus, the expression

$$A=360 \text{ AND } B=12 \text{ OR } A=365$$

is true if  $A$  equals 360 and  $B$  equals 12, or if  $A$  equals 365.

**Example: An Equation With a Conditional Expression.** Use the *BONUS* Solver equation to calculate the bonus for a salesperson who generated \$5000.00 in sales last month.

Note that the symbol following SALES is the “greater than” symbol >.

$$\text{BONUS}=\text{IF}(\text{SALES}>3000, .02*\text{SALES}, .01*\text{SALES})$$

Enter the equation (press **ESC**, if necessary, to display the Solve Catalog), then press **Calc** (**F9**).

**Keys:**

5000 SALES

BONUS

**Description:**

Stores the sales.

Calculates a \$100 bonus  $(.02 \times SALES)$ .

Here are several additional examples of equations using conditional expressions:

*Equation:*  $B=IF(7<A \text{ AND } A\leq 15, 2*A/6, 3*A+10)+C$

*Meaning:* If  $A$  is greater than 7 and less than or equal to 15, then  $B=(2 \times A \div 6)+C$ . Otherwise,  $B=(3 \times A+10)+C$ .

*Equation:*  $VALUE=FIRST+IF(NOT FIRST=0, 1/FIRST, 0)$

*Meaning:* If  $FIRST$  is unequal to 0, then  $VALUE=FIRST+(1 \div FIRST)$ . If  $FIRST=0$ , then  $VALUE=FIRST$ .

*Equation:*  $T=W*IF(A=0 \text{ XOR } B=0, A+B, A*B)$

*Meaning:*  $T=W \times (A+B)$  if  $A$  or  $B$ , but not both, equals 0. Otherwise,  $T=W \times A \times B$ . In other words,

When  $A=0$  and  $B \neq 0$ ,  $T=W \times B$

When  $A \neq 0$  and  $B=0$ ,  $T=W \times A$

When  $A=0$  and  $B=0$ ,  $T=0$

When  $A \neq 0$  and  $B \neq 0$ ,  $T=W \times A \times B$ .

- 30 Example: Using One IF Function Inside Another.** An IF function can be used as the argument of another IF function. For example, suppose a corporation uses a rating system to determine salary. Employees are rated on a scale 1 through 3, and are given the following annual percent raise based on their rating:

Rating	Percent Salary Increase
1	3%
2	6%
3	10%

The following equation calculates a new salary based on the previous salary and rating:

$NSAL=OSAL*(1+IF(R=1, .03, IF(R=2, .06, .1)))$

where

*NSAL* = the new salary.

*OSAL* = the previous salary.

*R* = the rating; 1, 2, or 3.

If  $R = 1$ , the equation uses  $.03$ .

If  $R = 2$ , the equation uses  $.06$ .

If  $R \neq 1$  or 2, the equation uses  $.1$ .

Calculate the new annual salary for an employee with rating 2 who currently earns \$27,500 annually.

Enter the equation in the Solve Catalog and then press **Calc** (**F9**).

**Keys:**

**Description:**

27500 **OSAL**

Stores the old salary.

2 **R**

Stores the rating.

**NSAL**

Calculates the new salary to be \$29,150.00.

## Creating Function Keys for Multiple Equations (S Function)

30

The S (solving for) function is used with the IF function to group equations and to specify the conditions under which one or the other is used. For example, consider these two equations for calculating gross pay:

*Wage* pay based on an hourly wage:

*Salary* pay based on a fixed salary plus a 5% sales commission:

$WPAY = WAGE * HRS$

$SLPAY = SALRY + .05 * SALES$

where:

where:

*WPAY* = gross wage pay.

*SLPAY* = gross salary pay.

*WAGE* = hourly wage.

*SALRY* = the fixed salary.

*HRS* = hours worked.

*SALES* = sales.

To use the S function, the equations must first be rearranged to place 0 on one side of each equation:

$$WPAY - WAGE * HRS = 0$$

$$SLPAY - SALRY - .05 * SALES = 0$$

To create one set of function keys that can be used for either equation:

$$IF(S(WPAY), WPAY - WAGE * HRS, SLPAY - SALRY - .05 * SALES) = 0$$

IF(S(WPAY) asks: Solving for WPAY?

If the answer is “yes” (true), the expression  $WPAY - WAGE * HRS$  is used.


If the answer is “no” (false), the expression  $SLPAY - SALRY - .05 * SALES$  is used.

The =0 ending to this equation is optional. If it's omitted, =0 is implied.

The S function appears within the IF function in the conditional expression. In this case, the conditional expression is true if you solve for WPAY, and false if you solve for anything else. The algebraic expressions in the IF function are the two equations, rewritten to gather all the terms on one side of the equation, so that each expression is equal to 0.

30

The IF function can be set equal to an expression common to both equations. For example, the equations  $X + Y + (10/A) = Z$  and  $Q + R + (10/A) = T$  can be combined to  $IF(S(X) OR S(Y) OR S(Z), X + Y - Z, Q + R - T) = -10/A$ . Note that the Solver uses the second equation when solving for  $Q$ ,  $R$ ,  $T$ , or  $A$ .

**Example: Using the S function. Part 1.** Enter the combined equation discussed earlier:  $IF(S(WPAY), WPAY - WAGE * HRS, SLPAY - SALRY - .05 * SALES) = 0$  and then press  (F9). The HP 100LX displays:

Calculator: SOLVE.EQN		Solve Calc		11/15/93 8:57 am	
Equation: IF(S(WPAY),WPAY-WAGE*HRS,SLPAY-SALRY-.05*SALES)=0					
	WPAY	=		0.	00
	WAGE	=		0.	00
	HRS	=		0.	00
	SLPAY	=		0.	00
	SALRY	=		0.	00
	SALES	=		0.	00
					0.00
<span>▲</span> Help   WPAY   WAGE   HRS   SLPAY   SALRY   SALES					

Calculate the weekly pay for an employee working 35 hours for \$6.75 per hour.

**Keys:**

**Description:**

6.75 WAGE

35 HRS

WPAY

Stores wages and hours.

Calculates wage pay of \$236.25.

**Part 2.** Calculate the monthly pay for an employee with a base salary of \$1,800 who generated \$5,000 in sales.

**Keys:**

**Description:**

1800 SALRY

5000 SALES

SLPAY

Stores salary and sales.

Calculates salary pay of \$2,050.00.

---

## The TVM Functions

The five Solver TVM functions allow you to write equations that do calculations analogous to the calculations done in the TVM Calculator application:

$$\begin{aligned}N & ( i\%yr, pv, pmt, fv, p/yr, m ) \\I\%YR & ( n, pv, pmt, fv, p/yr, m ) \\PV & ( n, i\%yr, pmt, fv, p/yr, m ) \\PMT & ( n, i\%yr, pv, fv, p/yr, m ) \\FV & ( n, i\%yr, pv, pmt, p/yr, m )\end{aligned}$$

Each function calculates one TVM value, given the values for all the others. For example, the first function calculates  $N$  (the total number of payments or compounding periods), given the annual percentage interest rate, present value, payment amount, future value, number of payments per year, and the Begin/End mode.

The parameters of the functions (the contents of the parentheses) are defined identically (with one exception) to the TVM application's variables, described in the table on page 24-5. The exception is that  $m$  stands for the Begin/End mode ( $\text{E/E}$ ). Use  $m=1$  for Begin mode,  $m=0$  for End mode.

You can give the parameters any legal variable name; for example you can use *LOAN* in place of *pv*. Parameters can also be algebraic expressions. For example, the following equation calculates the monthly payment for a car loan:

$$\text{CARPMT}=\text{PMT}(\text{MONTHS}, \text{I\%YR}, \text{PRICE-DOWN}, \emptyset, 12, \emptyset)$$

MONTHS is the number of monthly periods ( $n$ ).

DOWN is the down payment.

PRICE is the purchase price.

PRICE-DOWN is the present value ( $pv$ ).

The first  $\emptyset$  is the final value ( $fv$ ).

12 is the payments/year ( $p/yr$ ).

The final  $\emptyset$  specifies End mode.

Notice that *PMT* is *not* a variable in the equation—it is the name of the function.

The Solver TVM variables are not shared with the variables in the Calculator's TVM application. For example, the variable  $I\%YR$  in the  $CARPMT$  equation is separate from the TVM variable  $I\%YR$ .

**Example: Homeowner's Monthly Payment Estimator.** Monthly house payments often include payments for taxes and insurance. The following Solver equation calculates the payment, assuming that the assessed value of the house equals its purchase price.

$$PAYMT = PMT(N, I\%YR, PRICE - DOWN, 0, 12, 0) - TAX * PRICE / 12000 - INSUR / 12$$

where

$PAYMT$  = monthly house payment.

$N$  = total number of payments to repay the mortgage.

$I\%YR$  = annual interest rate.

$PRICE$  = purchase price of the house.

$DOWN$  = down payment.

$TAX$  = tax rate per \$1,000 assessed value.

$INSUR$  = cost of insurance per year.

The minus signs before  $TAX$  and  $INSUR$  are necessary in order for the taxes and insurance to increase the payment amount ( $PAYMT$ ), since the value calculated by the  $PMT$  function is a negative number (see "Making Cash Flow Diagrams" near the front of chapter 24).

For example, suppose you put 10% down on a \$65,000 house, and take out a  $10\frac{1}{4}\%$ , 35-year loan. If the tax rate is \$25 per thousand, and insurance is \$600 per year, what are your monthly payments?

Enter the equation in the Solve Catalog and press  $\boxed{C \rightarrow 1 \rightarrow}$  ( $F9$ ).

**Keys:**35  $\boxed{*}$  12 $\boxed{N}$ 10.25  $\boxed{I\%YR}$ 6500  $\boxed{PRICE}$  $\boxed{*}$  10  $\boxed{\%}$  $\boxed{DOWN}$ 25  $\boxed{TAX}$ 600  $\boxed{INSUR}$  $\boxed{PAYMT}$ **Description:**

Stores number of periods, interest rate, and house price.

Calculates and stores the down payment.

Stores the tax rate.

Stores insurance.

Calculates a monthly payment of \$699.55.

**Example: Using the Solver to Calculate APR of a Loan With Fees.**

The following equation uses a TVM Solver function to calculate the APR (*annual percentage rate*) of a loan with fees.

$$APR = I\%YR(N, LOAN - FEES, PMT(N, I\%YR, LOAN, 0, 12, 0), 0, 12, 0)$$

where

$N$  = the total number of payments for the loan.

$LOAN$  = the loan amount.

$FEES$  = the sum of all the fees for the loan.

$I\%YR$  = the annual interest rate.

Notice that  $I\%YR$  appears twice in the equation—as the TVM function, and as a variable. The two occurrences are independent of one another.

Use the APR Solver equation to calculate APR for a \$60,000, 30-year mortgage. The annual interest rate is  $11\frac{1}{2}\%$ , and the borrower is charged two points (2% of the mortgage amount) in fees.

Enter the equation in the Solve Catalog and press  $\boxed{Calc}$  ( $\boxed{F9}$ ).

**30**



<b>Keys:</b>	<b>Description:</b>
30 <input type="text" value="*"/> 12 <input type="text" value="N"/>	Stores number of payments.
60000 <input type="text" value="LOAN"/>	Stores mortgage amount.
<input type="text" value="*"/> 2 <input type="text" value="%"/> <input type="text" value="FEES"/>	Calculates and stores the fees.
11.5 <input type="text" value="I%YR"/>	Stores the annual interest rate.
<input type="text" value="APR"/>	Calculates an APR of 11.76%.

---

## The Summing Function (SIGMA)

The SIGMA function provides the ability to do a variety of summing operations. The function has the form:

$SIGMA(\text{counter variable}, \text{starting value}, \text{ending value}, \text{step size}, \text{algebraic expression})$

The **counter variable** takes on a series of values, beginning with the **starting value**, and incrementing according to the **step size**, until it passes the **ending value**. For each value of the counter, the **algebraic expression** is evaluated, and the value is added to the previous value. The function returns the final summation. The counter variable is not represented by a function key.

The following equation contains a counter  $I$  and two other variables,  $X$  and  $THESUM$ :

$THESUM = SIGMA(I, 1, 6, 1, I * X)$

The counter  $I$  runs from 1 through 6 in steps of 1—that is, 1, 2, 3, 4, 5, 6. For each value of  $I$ ,  $I \times X$  is calculated and added to the sum. If you store 3 in  $X$  and then solve for  $THESUM$ , the Solver calculates  $THESUM = 63$ ; that is,  $3 + 6 + 9 + 12 + 15 + 18$ .

---

## Creating Solver Files on a PC or Another Editor

An equation list may be created using an editor outside of the Solve application. Each name/equation line entry is bounded by curly brackets. The vertical line (press  $\leftarrow$   $\rightarrow$ ) is used to separate the name from the equation. If the line entry consists of a name only, the vertical line follows the name. If the line entry consists of an equation only, no vertical line is used.

Consider the following to be the contents of a word processor or editor file. This file defines four lines of an equation list.

```
{Graph#1|x^3-5*x^2-10*x+z}
  {Note Price|}
  {y=sin(x)}
  {Graph#2|x^4-60*x^3-595*x^2-1770*x-1656}
```

When this file is retrieved or inserted into the equation list, the four added lines will look like this:

```
Graph#1      x^3-5*x^2-10*x+z
Note Price
              y=sin(x)
Graph#2      x^4-60*x^3-595*x^2-1770*x-1656
```

30

---

## Solver Functions that Access 1-2-3 Worksheets

The seven Solver 1-2-3 functions allow communication between the Solver and 1-2-3 worksheets, giving the Solver new powers. The worksheet must be the current worksheet (the one displayed when  $\left[\text{123}\right]$  is pressed) and the worksheet must be in ready mode (READY must be displayed in the upper-right corner of the worksheet screen).

The example following the explanations illustrates the use of CALCCELL.

The parameters used by these functions are:

*expr* = a value, variable name, or mathematical expression whose calculated value is acted upon by the function.

*range* = a 1-2-3 range name or cell address (like B7).

*row*, *col* = the offsets (relative cell addresses) from the upper left corner of the given range. Non-integer values for *row* and *col* are rounded to the nearest integer and negative values are allowed.

Some examples:






(B3, 1, 1) refers to cell B3



(B3, 0, 0) refers to cell A2

(B3, -1, 0) refers to cell A1



(B3, 2, 3) refers to cell D4

An error is reported if the resulting cell reference is not within the bounds of the worksheet. If *col* is not specified, column 1 is assumed. If neither *row* nor *col* are specified, they are both assumed to be 1.



In the Calculator, press      to see the typing-aid function keys for these functions. The names and key numbers for the typing aids are shown by each Solver 1-2-3 function below.

STOCELL (*expr*, *range*, *row*, *col*)  ()

You can specify *row*, *col*, just *row*, or neither. Evaluates the expression and stores the result in the designated worksheet cell. The worksheet is not recalculated.

RCLCELL (*range*, *row*, *col*)  ()

You can specify *row* and *col*, just *row*, or neither. Returns the value of the designated worksheet cell.

CALCELL (*input list*, *output range*, *row*, *col*)  ()

You can specify *row*, *col*, just *row*, or neither. *input list* is zero or more inputs to the worksheet of the form: [*expr*, *range*, *row*, *col*]. For each input, the expression is evaluated and stored in the appropriate cell in the worksheet. Then the worksheet is recalculated, and the value of the output cell is returned.

LENGTH (*range*)  ()

Returns the number of worksheet rows in the given range.

WIDTH (*range*)  ()

Returns the number of worksheet columns in the given range.

CPCOL **CPCOL** (F7)

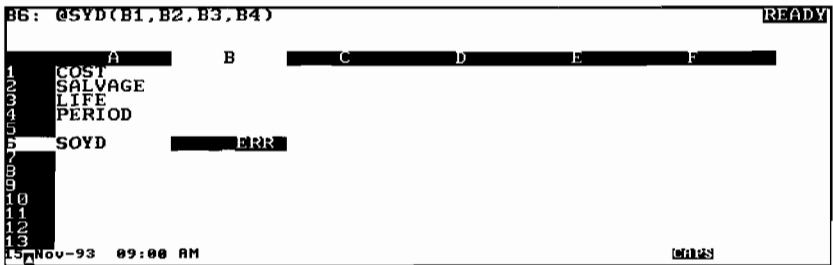
Returns the worksheet column number of the current cell pointer.

CPROW **CPROW** (F8)

Returns the worksheet row number of the current cell pointer.

**Example: Depreciation.** CALCCELL can be used to tap the power of 1-2-3 in a Solver equation. For example, suppose you want to compute depreciation (sum of years digits) in Solver. You can use CALCCELL to access the @SYD function in 1-2-3.

1. Create the 1-2-3 worksheet shown in the figure below. The ERR message in cell B6 when you enter the SOYD function in that cell is normal in this case. The SOYD function is not valid when all its variables equal zero.



30

2. Display the Solve Catalog equation list and enter this equation:

`CALCCELL([COST,B1], [SALVAGE,B2], [LIFE,B3], [PERIOD,B4], B6) = SOYD`

This use of CALCCELL is explained at the end of this example.

3. Press **Calc** (F9) and enter:

10000 into **COST** (F2)

2000 into **SALVAGE** (F3)

5 into **LIFE** (F4)

2 into **PERIOD** (F5)

4. Press **SOYD** (F6) to get the solution:

SOYD = 2133.33.

You now have a depreciation application in Solver. As with any Solver equation, you can solve for any of the variables, not just SOYD. Look at the worksheet and see that whatever results are computed in Solver also appear in 1-2-3.

Here is an explanation of this example's use of `CALCCELL`; that is, what the meanings are of the various elements of `CALCCELL([COST,B1],[SALVAGE,B2],[LIFE,B3],[PERIOD,B4],B6)`.

As stated above, the elements of `CALCCELL` are (*input list, output range, row, col*)

The *input list* is `[COST,B1],[SALVAGE,B2],[LIFE,B3],[PERIOD,B4]`.

The *output range* is `B6`. The output range can be either a range name or a cell address, like `B6`.

The *row, col* entries are not needed, since there is no offset from the cell address. If neither *row* nor *col* are specified, both are assumed to be 1 (no offset).

To explain further the inputs to the worksheet that make up the *input list*, consider one of those inputs, `[COST,B1]`. The elements of one input are [*expr, range, row, col*]. In this case, the expression is a variable name, *COST*. The range is a cell address, `B1`. Since no row nor column is specified, the offsets for both are 1; that is, there are no offsets. Cell `B1` will contain the value for *COST*.

---

## Examples of Solver Equations

The rest of this chapter contains examples as described in the following table.

## Solver Examples

Page	Example	Solver Functions Used
30-28	Simple Annual Interest	DDAYS, IF
30-30	Loan With an Odd (Partial) First Period	PV, FP, IF
30-32	Canadian Mortgages	FV
30-33	Advance Payments (Leasing)	USPV, SPPV
30-34	Price of an Insurance Policy	
30-36	Discounted Notes	DDAYS
30-37	Moving Average	SIGMA, RCLCELL, MAX, MIN
30-39	Chi-Squared ( $\chi^2$ ) Statistics	SIGMA, RCLCELL, LENGTH
30-41	Economic Ordering Quantity	SQRT
30-42	Simulating a Toss of Dice	IP, RAN#
30-42	Distance Between Two Locations	ACOS, SIN, HR, COS
30-43	Number of Days Until a Special Day	DDAYS, CDATE, FP, IF
30-44	Finding Several Solutions to an Equation	

### Simple Annual Interest

The following equation calculates the amount due for a loan with simple annual interest, given the duration of the loan. Both the principal and interest are paid in a lump sum at the end of the loan period. This LOAN,DAYS equation assumes a 365-day calendar basis.

$$\text{DEBT} = \text{LOAN} + \text{LOAN} * \text{I\%} / 100 * \text{DAYS} / 365$$

where

*DEBT* = the total owed at the end of the loan period.

*LOAN* = the original amount (principal) lent.

*I%* = the annual interest rate as a percent.

*DAYS* = the number of days of the loan.

If you know the dates for the course of the loan, rather than the number of days, use this LOAN,DATES equation:

$$\text{DEBT} = \text{LOAN} + \text{LOAN} * \text{I\%} / 100 * \text{DDAYS}(\text{DATE1}, \text{DATE2}, \text{IF}(\text{BASIS}=365, 1, 3)) / \text{BASIS}$$

where

*DATE1* = the date the loan commences.

*DATE2* = the date the loan ends.

*BASIS* = 360 for a 360-day basis.

*BASIS* = 365 for a 365-day basis.

**Example: Simple Interest for a Specified Number of Days.** You lend a friend \$450 for 60 days, charging 7% simple annual interest (calculated on a 365-day basis). What is the total amount he will owe you in 60 days?

Starting from the solve calc screen for the LOAN,DAYS equation:

Keys:	Description:
450 <b>LOAN</b>	Stores loan amount.
7 <b>I%</b>	Stores interest rate.
60 <b>DAYS</b>	Stores term of loan.
<b>DEBT</b>	Calculates \$455.18 due in 60 days.

30

**Example: Simple Interest From the Dates of the Loan.** On March 26, 1992, you borrow \$1,200 from a relative. You promise to repay the loan, with 8% simple interest (to be calculated on a 365-day basis), on June 12, 1993. How much will you owe?

Starting from the solve calc screen for the LOAN,DATES equation:

<b>Keys:</b>	<b>Description:</b>
1200 <code>LOAN</code>	Stores loan amount.
8 <code>I%</code>	Stores interest rate.
3.261992 <code>DATE1</code>	Stores date of loan (assumes current date format is MM.DDYYYY).
6.121993 <code>DATE2</code>	Stores repayment date.
365 <code>BASIS</code>	Stores calendar basis.
<code>DEBT</code>	Calculates \$1,316.52 to be repaid.

### Loans With an Odd (Partial) First Period

The Calculator's TVM application requires all payment periods to be the same length. However, situations exist in which the first payment period does not equal the remaining periods. That period (from the date that interest begins accruing to the date of the first payment) is sometimes called an **odd** or **partial first period**.

The following Solver equation named `ODDPER` does calculations involving an odd first period, using simple interest for the odd period. The equation is valid for 0 to 59 days from inception to first payment, and assumes a 30-day month.

You do not need to specify `Begin` or `End` mode. If the odd period is less than 30 days, `Begin` mode is assumed. If the odd period is between 30 and 59 days, inclusive, `End` mode is assumed.

$$(I\%YR/100/P\_YR*FP(DAYS/30)+1)*PV - PV(N, I\%YR, PMT, FV, P\_YR, IF(DAYS<30, 1, 0))=0$$

where

$I\%YR$  = the nominal annual interest rate, as a percentage.

$P\_YR$  = the number of payment periods per year.

$DAYS$  = the actual number of days until the first payment is made.

$PV$  = the loan amount.

$N$  = the total number of payment periods.

$PMT$  = the periodic payment.

$FV$  = the balloon payment.



**Example: Loan With an Odd First Period.** A 36-month loan for \$4,500 has an annual interest rate of 15%. If the first payment is made in 46 days, what is the monthly payment amount?

<b>Keys:</b>	<b>Description:</b>
15 <b>I%YR</b>	Stores annual interest rate.
12 <b>P_YR</b>	Stores number of payments per year.
46 <b>DAYS</b>	Stores days until first payment.
4500 <b>PV</b>	Stores loan amount.
36 <b>N</b>	Stores 36 payment periods.
0 <b>FV</b>	Stores no balloon payment (no final value).
<b>PMT</b>	Calculates a \$157.03 monthly payment.

**Example: Loan With an Odd First Period Plus Balloon.** A \$10,000 loan has 24 monthly payments of \$400, plus a balloon payment of \$3,000 at the end of the 24th month. If the payments begin in 8 days, what annual interest rate is being charged?

Starting from the solve calc screen for the same ODDPER equation:

<b>Keys:</b>	<b>Description:</b>
12 <b>P_YR</b>	Stores number of payments per year.
8 <b>DAYS</b>	Stores days until first payment.
10000 <b>FV</b>	Stores loan amount.
24 <b>N</b>	Stores 24 payment periods.
400 <b>(+/-) PMT</b>	Stores periodic payment.
3000 <b>(+/-) FV</b>	Stores balloon payment.
<b>I%YR</b>	Iterates to a 19.67% annual interest rate.

## Canadian Mortgages

In Canadian mortgages, interest is compounded semi-annually while payments are made monthly. The following Solver equation named CAN can be used to calculate Canadian mortgages.

Canadian mortgages can also be calculated using the Calculator's TVM application. See page 24-23 for an example.

$$FV(N, ((1+CI\%YR/200)^(1/6)-1)*1200, PV, PMT, 12, 0)=FV$$

where

$N$  = total number of payment periods for the life of the loan.

$CI\%YR$  = annual (Canadian) interest rate as a percent.

$PV$  = the loan amount, or present value.

$PMT$  = periodic payment amount.

$FV$  = remaining balance, or future value.

### Example: Calculating the Payment for a Canadian Mortgage.

What is the monthly payment required to fully amortize a 30-year, \$50,000 Canadian mortgage if the interest rate is 9%?

Starting from the solve calc screen for this example's equation:

#### Keys:

#### Description:

30  $\boxed{*}$  12

$\boxed{N}$

9  $\boxed{CI\%YR}$

50000  $\boxed{PV}$

0  $\boxed{FV}$

Stores known values.

$\boxed{PMT}$

Calculates a \$396.42 payment.

### Example: Calculating the Interest Rate for a Canadian Mortgage.

A Canadian mortgage has monthly payments of \$612.77 with a maturity of 25 years. The principal amount is \$75,500. What is the annual interest rate?

**Keys:****Description:**612.77 75500 25  120 

Stores known values.

Calculates an 8.75% annual interest rate.

## Advance Payments (Leasing)

Occasionally payments are made in advance, such as in leasing. Leasing agreements sometimes call for the extra payments to be made when the transaction is closed. A residual value (salvage value) can also exist at the end of the normal term.

The following equation named ADV calculates the monthly payment and the annual yield when one or more payments are made in advance. It can be modified to accommodate periods other than monthly by changing the number 12 to the appropriate number of payment periods per year.

$$PMT = (-PV - FV * (SPPV(I\%YR/12, N))) / (USPV(I\%YR/12, N - \#ADV) + \#ADV)$$

where

*PMT* = the monthly payment amount.

*PV* = the value of the equipment.

*FV* = the residual value.

*I%YR* = the annual interest rate as a percent.

*N* = the total number of payments.

*#ADV* = the number of advance payments.

**Example: Leasing With Advance Payments.** Equipment worth \$750 is leased to you for 12 months. The equipment is assumed to have no salvage value at the end of the lease. You agree to make three payments at the time of closing. What is the monthly payment if the annual interest rate is 10%?

Starting from the solve calc screen for this example's equation:

Keys:	Description:
750 <code>FV</code>	
12 <code>N</code>	
0 <code>FV</code>	
3 <code>#ADV</code>	
10 <code>I%YR</code>	Stores known values.
<code>PMT</code>	Calculates a \$64.45 monthly payment.

## Price of an Insurance Policy

The price of an insurance policy, other than term life insurance, is rarely apparent at first glance. The price should include not only the premium payments, but also the interest that could have been earned on the cash value or **savings portion** of the policy.

The following equation named POLICY calculates the price per \$1,000 of protection for one policy year and the interest rate earned on the savings portion of the policy.

Reference: Joseph M. Belth, *Life Insurance—A Consumer's Handbook*, Indiana University Press, 1973, p. 234.

$$INS = ((PREM + LVAL) * (1 + I\% / 100) - VAL - DIV) / (.001 * (FACE - VAL))$$

where

*INS* = the price per \$1,000 of protection in one policy year.

*PREM* = the annual premium amount.

*LVAL* = the value of the policy at the end of last year.

*I%* = the rate of return, as a percent.

*VAL* = the value of the policy at the end of the current year.

*DIV* = the dollar value of the dividend for one year.

*FACE* = the face value of the policy for one year.

To calculate the price, assume some value for interest—for example, the interest rate you could earn on a one-year savings certificate after tax. Similarly, to calculate interest, assume a price per \$1,000 of protection per year for alternative insurance; for example, a low-cost term policy of the one-year renewable type.

Even complex policies like minimum-deposit plans can be analyzed with this procedure. Use policy surrender values for cash values and the actual (after-tax) amounts for payments (premiums) and dividends.

**Example: Price of an Insurance Policy. Part 1.** You are evaluating your \$50,000 insurance policy. The premium of \$1,010 is due at the beginning of the year, and a dividend of \$165 is received at the end of the policy year. The cash value of the policy is \$3,302 at the beginning of the year, and it will grow to \$4,104 by the end of the year. You can earn 6% on a savings account. What is the price per \$1,000 protection per year?

Starting from the solve calc screen for the POLICY equation:

**Keys:**

**Description:**

1010 PREM

Stores annual premium.

3302 LWAL

Stores value of policy at end of last year.

6 I%

Stores interest rate you could get elsewhere.

4104 VAL

Stores value of policy at end of this year.

165 DIV

Stores annual dividend.

50000 FACE

Stores face value of policy.

INS

Your protection cost: \$6.57 per \$1,000 face (protection) value.

30

**Part2.** Insurance protection could be purchased for \$3 per \$1,000 face value. Calculate the rate of return on your savings, using the same equation:

3 INS

Stores price of alternate protection.

I%

Calculates a 2.20% rate of return on your savings.

## Discounted Notes

A note is a written agreement to pay the buyer of the note a sum of money plus interest. Notes do not have periodic coupons, since all interest is paid at maturity. A discounted note is a note that is purchased below its face value. In the following two equations, the calendar basis is actual/360. To find the price given the discount rate, use the following NOTE,PRICE equation:

$$\text{PRICE} = \text{RV} - (\text{DISC} * \text{RV} * \text{DDAYS}(\text{SETT}, \text{MAT}, 1) / 360000)$$

To find the yield given the price (or to find the price given the yield), use the NOTE,YIELD equation:

$$\text{YIELD} = (\text{RV} - \text{PRICE}) / \text{PRICE} * 360000 / \text{DDAYS}(\text{SETT}, \text{MAT}, 1)$$

where

*PRICE* = the purchase price per \$100 face value.

*YIELD* = the yield as an annual percentage.

*RV* = the redemption value per \$100.

*DISC* = the discount rate as a percent.

*SETT* = the settlement date (in current date format).

*MAT* = the maturity date (in current date format).

30

**Example: Price and Yield of a Discounted Note.** What are the price and yield of the following U.S. Treasury Bill: settlement date July 16, 1991; maturity date December 17, 1991; discount rate 8.7%? (Assume MM.DDYyyy format.)

Starting from the solve calc screen for the NOTE,PRICE equation:

Keys:	Description:
7.161991 <b>SETT</b>	
12.171991 <b>MAT</b>	
8.7 <b>DISC</b>	
100 <b>RV</b>	Stores known values.
<b>PRICE</b>	Calculates a price of \$96.28.

Starting from the solve calc screen for the NOTE,YIELD equation:

**YIELD**

Calculates a 9.04% yield.

## Moving Average

Moving averages are often used to predict trends in data over time. In moving average calculations, a specified number of values are averaged. Each time a new value is acquired, the oldest is discarded.

The following Solver equation named MOVAVG calculates the moving average of data stored in a 1-2-3 worksheet.

$MAVG = \text{SIGMA}(I, \text{MAX}(1, \text{LAST} - N + 1), \text{LAST}, 1, \text{RCLCELL}(\text{name}, I)) / \text{MIN}(\text{LAST}, N)$

where

$N$  = the number of values averaged in each calculation.

$LAST$  = the entry number of the most recent value to be averaged.

$name$  = the range name of the first data cell.

**Example: Moving Average.** Calculate a three-month moving average for the number of units manufactured during the first half of the year. Manufacturing volumes were:

January	February	March	April	May	June
4400	5360	2900	3670	4040	3200

30

If you want to preserve the current worksheet, save it to a file before you erase it.

**Keys:**

**F2**

**DEL** **W** **E**

**Y**

**DEL** **RNCVOL**

**ENTER**

**Description:**

Starts 1-2-3.

Erases the worksheet and moves to cell A1.

Creates the range name VOL for cell A1.

**ENTER**

Names first cell of data range.

4400 **▼**

5360 **▼**

2900 **▼**

3670 **▼**

4040 **▼**

3200 **▼**

Enters data.

**↵** **MENU** **A**

Displays Solve Catalog and highlights bottom of equation list. If the Solve Catalog screen is not displayed, press **ESC** one or more times.

**S** **F<sub>n</sub>** **END**

Type the equation, substituting *WOL* for *name*, and press **Calc** (**F9**) to display the solve calc screen. Then:

**Keys:**

**Description:**

3 **N**

Stores number of points.

3 **LAST**

Stores entry number of last entry to be averaged.

30

**MAVG**

Calculates an average of 4,220.00 for months 1, 2, and 3.

4 **LAST**

“Moves” *LAST* down one entry.

**MAVG**

Calculates an average of 3,976.67 for months 2, 3, and 4.

5 **LAST**

“Moves” *LAST* down one entry.

**MAVG**

Calculates an average of 3,536.67 for months 3, 4, and 5.

6 **LAST**

Calculates an average of 3,636.67 for months 4, 5, and 6.

**MAVG**



## Chi-Squared Statistics

The Chi-squared statistic is a measure of the goodness of fit between data and an assumed distribution. The statistic can be assumed to be Chi-squared distributed with  $n-1$  degrees of freedom if  $n$  or some of the  $E_i$  values are large. It is used to test whether a set of observed frequencies differs from a set of expected frequencies sufficiently to reject the hypothesis under which the expected frequencies were obtained. In other words, you are testing whether discrepancies between the observed frequencies ( $O_i$ ) and the expected frequencies ( $E_i$ ) are significant, or whether they may reasonably be attributed to chance. The equation is:

$$\chi^2 = \sum_{i=1}^n \frac{(O_i - E_i)^2}{E_i}$$

If there is close agreement between the observed and expected frequencies,  $\chi^2$  is small; if the agreement is poor,  $\chi^2$  is large.

The following Solver equations calculate  $\chi^2$  using data in a 1-2-3 worksheet.

If the expected values vary:

```
CHI2=SIGMA(I,1,LENGTH(name),1,(RCLCELL(name,I)  
-RCLCELL(name,I,2))^2/RCLCELL(name,I,2))
```

If the expected value is a constant:

```
CHI2=SIGMA(I,1,LENGTH(name),1,(RCLCELL(name,I)  
-EXPT)^2/EXPT)
```

where

$$CHI2 = \chi^2$$

*name* = the range name of the data containing the observed values in one column and (for the second equation), the expected values in an adjacent column to the right.

*EXPT* = the expected value, if constant.

**Example:**  $\chi^2$ . To determine whether a suspect die is biased, you toss it 120 times and observe the following results. (Since the expected frequency is the same for each number,  $120/6$ , you'll analyze your data using the second equation.)

Number	1	2	3	4	5	6
Observed Frequency	25	17	15	23	24	16

If you want to preserve the current worksheet, save it to a file before erasing.

**Keys:**

**123**

**W E**

**Y**

25 **▼**

17 **▼**

15 **▼**

23 **▼**

24 **▼**

16 **▼**

**HOME** **MENU**

**R N C**

DATA

**ENTER** **Fn** **END**

**▼**

**ENTER**

**↔** **MENU** **A**

**S** **Fn** **END**

**Description:**

Starts 1-2-3.

Erases the worksheet and moves to cell A1.


Enters data.

Names the range.


Displays Solve Catalog and highlights bottom of equation list. If the Solve Catalog screen is not displayed, press **ESC** one or more times.

30

Type the second equation, substituting **DATA** for *name*, and press **Calc** (**F9**) to display the solve calc screen. Then:

**Keys:**120  6 **EXPT** **CHI2****Description:**

Stores expected value.

Calculates  $\chi^2$  to be 5.00. (If the Solver doesn't display SOLVING, press  **CHI2** again.)

The number of degrees of freedom is  $(n-1) = 5$ . Consult statistical tables to find  $\chi^2$  to a significance level of 0.05 with 5 degrees of freedom. The table shows that  $\chi^2_{0.05,5} = 11.07$ . Since the computed value (5.00) is less than 11.07, you can conclude that, to a 0.05 significance level (95% probability), the die is fair.

## Economic Ordering Quantity

The **economic ordering quantity** is the optimum quantity to order each time an order is placed. It is based on the cost of placing and receiving an order, annual sales, carrying costs (including warehousing costs, interest on funds tied up in inventory, insurance, and obsolescence), and the purchase price of the goods.

The following Solver equation calculates economic order quantity:

$$EOQ = \text{SQRT}(2 * \text{FIXCO} * \text{SALES} / (\text{CARRY}\% / 100 * \text{PRICE}))$$

where

*EOQ* = the economic ordering quantity.

*FIXCO* = the fixed costs of placing and receiving an order.

*SALES* = the annual unit sales.

*CARRY%* = the carrying costs as a percentage of inventory.

*PRICE* = the purchase price per unit of inventory.

**Example: Economic Ordering Quantity.** Your annual sales are 10,000 units. The purchase price per unit is \$4.73. Carrying cost is 20% of inventory value and the cost of placing and receiving an order is \$35. Calculate the economic ordering quantity.

Starting from the solve calc screen for this example's equation:

**Keys:**35 **FIXCO**10000 **SALES**20 **CARRY%**4.73 **PRICE****EQO****Description:**

Stores fixed cost of placing order.

Stores annual unit sales.

Stores carrying cost.

Stores price per unit.

Calculates economic ordering quantity of 860 units.

**Simulating a Toss of Dice**

The Solver random number function **RAN#** can simulate the toss of one or more six-sided dice. The equation:

$$\text{TOSS} = \text{IP}(\text{RAN}\#\*6+1)$$

generates integers in the range 1 through 6. Similarly,

$$\text{TOSS} = \text{IP}(\text{RAN}\#\*6+1) + \text{IP}(\text{RAN}\#\*6+1)$$

simulates the toss of two dice and gives the sum of both.

1. Type the equation for the appropriate number of dice and press **Calc** (**F9**).
2. Press **TOSS** as many times as desired to see the results of the tosses.

**Distance Between Two Locations**

The following Solver equation calculates the approximate statute miles between two places, given their longitudes and latitudes. The longitudes and latitudes are entered in degrees-minutes-seconds format (D.MMSS); South Latitude and East Longitude are negative numbers. The HP 100LX must be in Degrees mode.




$$\begin{aligned} \text{DISTANCE} = & 69.0466 * \text{ACOS}(\text{SIN}(\text{HR}(\text{LT1})) \\ & * \text{SIN}(\text{HR}(\text{LT2})) + \text{COS}(\text{HR}(\text{LT1})) * \\ & \text{COS}(\text{HR}(\text{LT2})) * \text{COS}(\text{HR}(\text{LG1}) - \text{HR}(\text{LG2}))) \end{aligned}$$

where






*LG1*, *LT1* = the longitude and latitude of the first place.

*LG2*, *LT2* = the longitude and latitude of the second place.

**Example: Calculating the Distance Between Two Places.** Find the statute miles between Philadelphia, Pennsylvania (40°35'N, 75°10'W) and Corvallis, Oregon (44°35'N, 123°16'W).

If the RAD or GRAD annunciator is displayed, press    and select Degrees angle mode.

Starting from the solve calc screen for this example's equation:

Keys:	Description:
40.35 	Stores latitude and longitude for Philadelphia.
75.10 	
44.35 	Stores latitude and longitude for Corvallis.
123.16 	
	Calculates the distance to be 2,425.31 statute miles.



## Number of Days Until a Special Day


The following equation named WHEN? calculates the number of days between today's date and some other meaningful date within one year from today—for example, Christmas. For accurate results, the system clock must be set to today's date (see "Setting the Time and Date" in chapter 3).

```
SANTA= DDAYS(CDATE, 12.25+.01*
FP(CDATE*100+IF(CDATE<=12.25+.01, 0, 1E-4)), 1)
```

Note that 12.25 represents Christmas. For other special days, replace 12.25 with the special day, expressed in MM.DD format.

**Example: Number of Days to Christmas.** If today is April 20, 1994, how many days remain until Christmas?

Starting from the solve calc screen for this example's equation:

Keys:	Description:
	Calculates 249 days until 12/25/1994.

## Finding Several Solutions to an Equation

**Example: Solving A Cubic Equation.** The equation  $x^3 - 5x^2 = 10x - z$  can have more than one solution for  $x$ . The Solver can find each solution or root using function plotting. The procedure below shows one way to do this. (Function plotting is covered starting on page 29-22.)

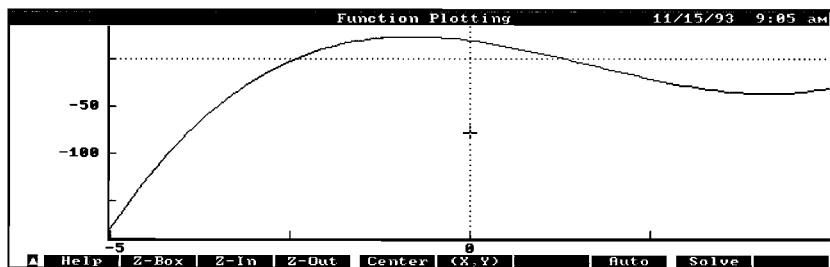
You'll plot this equation for a particular value of  $z$ .

1. Select **MENU** **A** **S** to display the Solve Catalog. If necessary, press **ESC** one or more times.
2. Type  $x^3 - 5x^2 = 10x - z$  into the solve editor and press **F10**.
3. Press **CE** **CE** (**F9**) to enter the expression into the equation list and display function key labels for  $x$  and  $z$ .
4. Type 20 and press **Z** (**F3**) to assign the value 20 to  $z$ .
5. Press **ESC** to display the Solve Catalog
6. Press **Plot** (**F10**) to display the function plotting screen.
7. Press **MENU** **C** **D** to set the function-plotting conditions to initial values.
8. Press **Func** (**F3**) to auto-plot the equation. YMIN and YMAX will be chosen to ensure that the curve is shown on the screen.

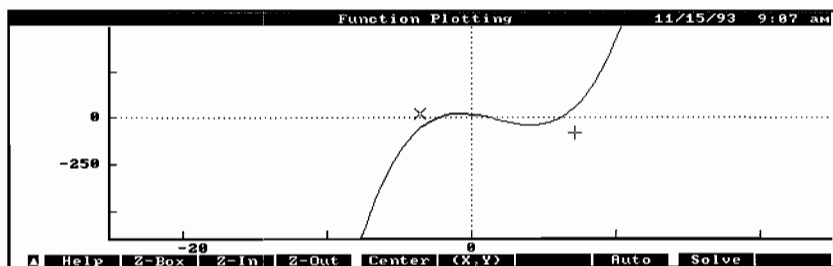
30

Function plotting accepts both equations and expressions, but it converts equations into expressions before plotting by subtracting the right side of the equation from the left side. So the graph you see is actually a plot of  $x^3 - 5x^2 - 10x + 20$  against values of  $x$ .

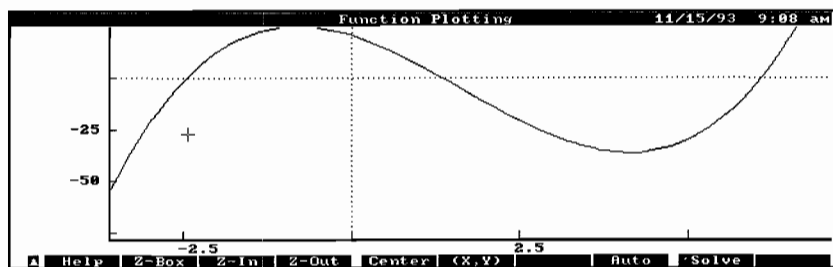
Your screen should look like this:



9. Press **Z-Out** (**F4**) to zoom out five times and to show the curve crossing the x-axis three times (to show the three x-values where the expression equals zero).
10. Start the definition of a zoom box by moving the cursor to the upper-left corner of an imaginary box that includes all three x-axis crossings (all three roots). To move the cursor by jumps, press an arrow key. To move the cursor by individual dots (pixels) on the screen, press and hold **↑** while pressing an arrow key.
11. Press **Z-Box** (**F2**) to fix this upper-left corner.
12. Move the cursor to locate the lower-right corner of the zoom box. Your screen should look something like this:



13. Press **Z-Box** again to enlarge the boxed area to full-screen size.
14. Move the cursor near the left root. Your screen should look something like this:



15. Press **spacebar**. You'll see displayed the root:

$$x = -2.44$$

16. Find the other two roots in a similar way—move the cursor near each root and press **spacebar**. You'll see each of these roots displayed in turn:

$$x = 1.34$$




$$x = 6.10$$

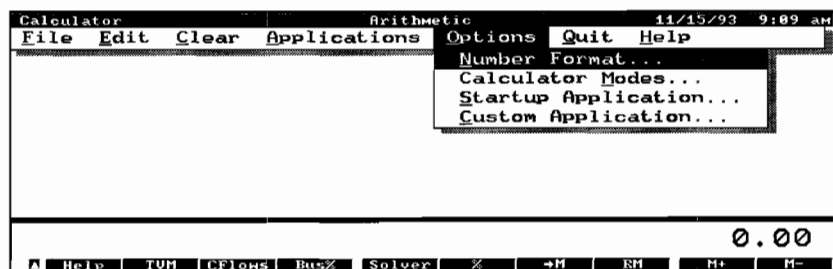
17. Press **ESC** **ESC** to return to the Solve Catalog.



## Configuring and Customizing the Calculator




### Configuration Options

The Calculator contains a standard Options menu that enables you to set various configuration options. Whenever any of these options are changed, the way the Calculator operates is changed accordingly. To see the Calculator Options menu, press   .



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### Changing the Number Format

When you press   , you see four choices for how numbers are displayed in the calc line.

Format	Description
Fixed Point	Sets the displayed number of digits to the right of the decimal point to a fixed number. (That number is set by the Number of Digits option.)
Scientific	Displays numbers in scientific notation. For example, 13,246.5798 is displayed as 1.325e4.
Engineering	Displays numbers in engineering notation. For example, 13,246.5789 is displayed as 13.25e3.
All	Displays numbers to their full precision.

Regardless of the way numbers are displayed, the Calculator stores most numbers to their full precision. (The exceptions are some of the TVM variables, which are rounded to the current Number of Digits setting.)

The Number of Digits field lets you specify the number of digits to be displayed to the right of the decimal point when Fixed Point is the selected Number Format.

## Changing the Calculator Modes

When you press   , you see the choices for affecting Calculator modes of operation.

- Angle Mode** Gives you three choices for the way angles are interpreted: Degrees, Radians, or Grads. If Radians or Grads are selected, a RAD or GRAD annunciator appears at the top-left of the calc line when the angle mode is relevant.
- Operation Mode** Gives you two choices for the syntax for entering calculations: RPN or conventional Algebraic. (If you want to know what RPN is, see page 21-14.)
- Show Stack** If you select this check box, the current stack is always displayed in Arithmetic, Custom, and Math.
- Show Registers** If you select this check box, the storage registers are always displayed in Arithmetic and Custom.







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## Changing the Startup Application

The Startup application is the application that first comes up when quit and then restart the Calculator. It is also the “home” application that you return to when you press  from some other Calculator application when no menu is displayed.

You can select any Calculator application as your startup application, or select Last Screen to start up with the last screen displayed when you quit the Calculator. (Selecting Last Screen prevents  from exiting the current application.)

## To change the Startup application:

1. Press    .
2. Use  to select your new Startup application.
3. Press .

---

## Creating Your Custom Calculator Application







You can create your own Calculator application, called Custom, by picking various functions from throughout the Calculator and assigning them to a set of function keys.

### Applications and Functions That Can Be Assigned to Custom Function Keys

TVM	Time Value of Money.	SIN	Sine.
CFlows	Uneven Cash Flows.	COS	Cosine.
Bus%	Business Percentages.	TAN	Tangent.
Solve	Solver.	ASIN	Arc sine.
Stat	List Stat.	ACOS	Arc cosine.
Currency	Currency Conversions.	ATAN	Arc tangent.
Length	Length Conversions.	IP	Integer part.
Area	Area Conversions.	FP	Fractional part.
Volume	Volume Conversions.	ABS	Absolute value.
Mass	Mass Conversions.	LN	Natural logarithm.
Temp	Temperature Conversions.	E <sup>-X</sup>	Natural antilogarithm.
Math	Technical math functions.	LOG	Common logarithm.
Date	Date Calculations.	10 <sup>X</sup>	Common antilogarithm.
Arith	Arithmetic.	→DEG	To degrees.
RM	Recalls register 0.	→RAD	To radians.
M+	Adds to register 0.	→HMS	To hours-minutes-seconds.
M-	Subtracts from register 0.	N!	Factorial.
→M	Stores in register 0.	Help	Help.
PI	Value for $\pi$ .		

The applications in the previous table are described in detail in their own chapters. The math functions are described in chapter 22.

### To create your Custom application:







1. Press     to display the Define Custom Keys dialog box.
2. Tab to the function key you want to define.
3. Use  to select the function you want to assign to that function key. (Shortcut: Try typing the first letter of the function you want; repeat that letter until your function is displayed.)
4. Repeat steps 2 and 3 for other function keys.
5. When you're finished, press  to save and start your Custom application.

### To start your Custom application from another application:

- Press    .

You can also set Custom as the Startup Application in the Options menu. Then, every time you start the Calculator, Custom will come up as the default application.

### To make Custom your Startup Application:

1. Press    .
2. Use  to highlight Custom (it's near the bottom of the list) and press .





## Printing with the Calculator





This chapter covers the specific printing commands within the Calculator. To execute them you need to have a properly configured printer attached to your HP 100LX. If you need information on connecting and configuring a printer, see chapter 36, “Using a Printer with the HP 100LX.”

### Note



Printing an amortization table is a special case of printing and is covered under “Sending an Amortization Table to 1-2-3 or a Printer” on page 24-17.

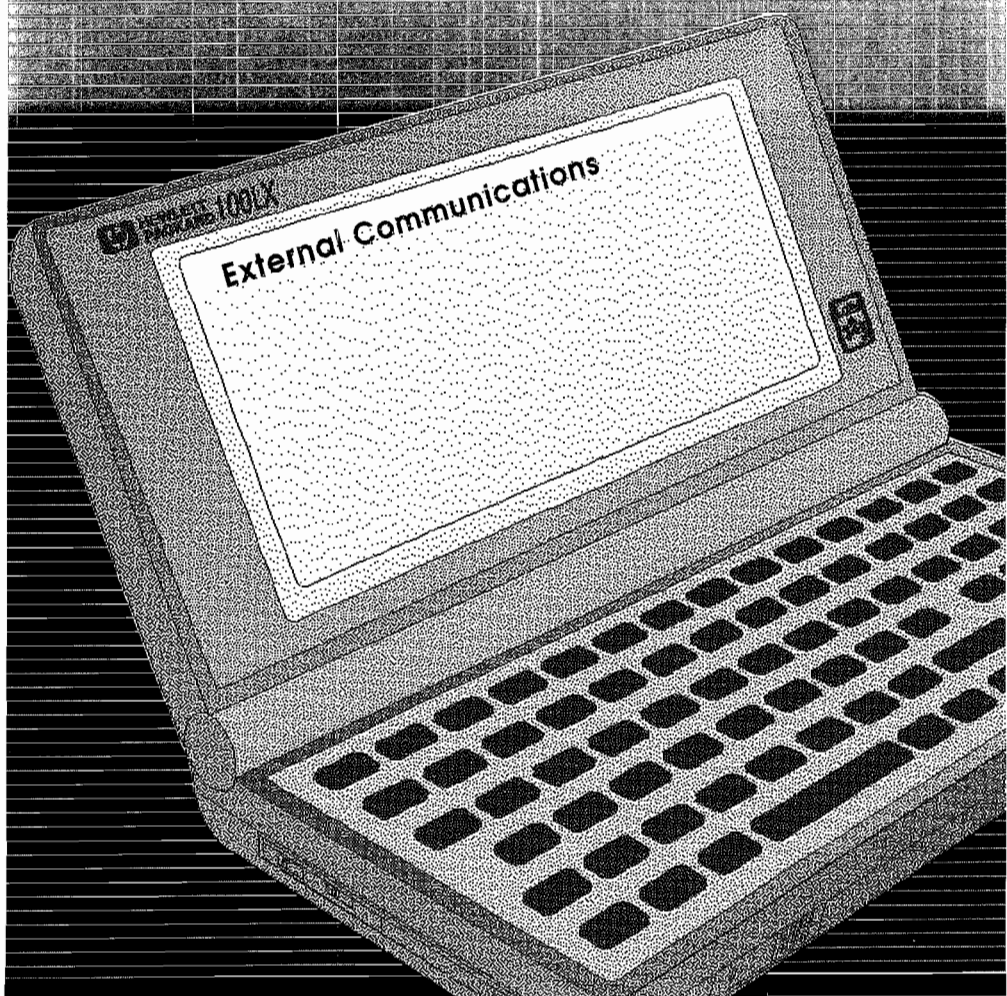
Press     to see the menu of Calculator printing commands.

Command	Description
Data	Prints the data associated with the current Calculator screen. For instance, if you're doing currency exchanges and press     , the displayed currencies with their current values are printed. You can print the data associated with every Calculator application.
Calcline	Prints the contents of the calc line.
Stack	Prints the contents of the history stack.
Registers	Prints the contents of the storage registers.

Once printing is completed using any of these commands, you are returned to the screen from which you started the print operation.



# PART 6

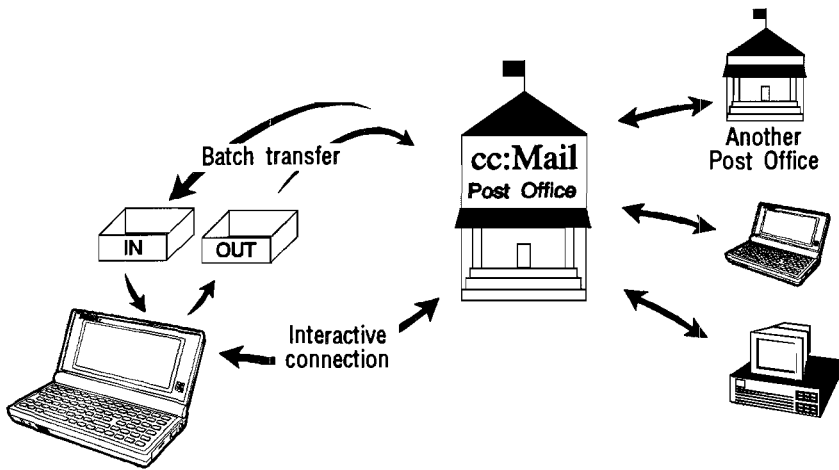









## Getting Started with cc:Mail

---



To start cc:Mail, press  or  .

### About cc:Mail

Using cc:Mail you can exchange messages through an established cc:Mail **Post Office** with any cc:Mail user in the world. If your company or office doesn't have a cc:Mail Post Office you can use, or if you want additional information about the cc:Mail product line, contact cc:Mail at the following address:

cc:Mail, A Division of Lotus  
 2141 Landings Drive  
 Mountain View, CA 94043

800-448-2500  
 FAX: 415/960-0840

Your cc:Mail Post Office is managed by your **Post Office Administrator**. He or she is your local cc:Mail expert, and is the first one to talk to if you have questions about how to use cc:Mail.

Many cc:Mail Post Offices are open 24 hours a day and 7 days a week, allowing you to send and receive message at any time. Ask your Post Office Administrator the hours your Post Office is open.

Using cc:Mail with a modem, you can:

- Write text messages using the built-in editor.
- Include entire MS-DOS files with your message.
- Exchange messages periodically between your HP 100LX and your home Post Office using a **Batch Transfer**. This minimizes long distance telephone expense, since you connect to your Post Office only during message exchange.
- From your HP 100LX, read, write, and manage messages at your Post Office using an **Interactive Connection**, provided your Post Office is equipped with the necessary **cc:Mail Router**—an electronic gateway program that routes messages entering and leaving the Post Office. Ask your Administrator about this Router. An Interactive Connection removes the need to exchange messages periodically between your HP 100LX and your Post Office, since a continuous connection to your Post Office is used.

## What You Need Before You Can Use cc:Mail

Your Post Office Administrator can help you with these items.

- A cc:Mail Post Office maintained by your department or company.
- A modem connected between your HP 100LX and a telephone line. See “Connecting to a Modem” on page 37-2 for modem installation assistance.
- The name of your Post Office.
- The telephone number of your Post Office.
- Your user name, chosen by you and your Administrator. Your Administrator will ensure that your user name is not assigned to any other user registered at your Post Office. To receive a message, it must be addressed to your user name.
- Your cc:Mail password chosen by you and your Administrator. To change your password, first get it approved by your Administrator, then follow the procedure “To change your password” on page 34-20.

- For an Interactive Connection (see **Interactive Connection** on page 33-2) your Post Office's LAN needs the cc:Mail Router program. See your Administrator. Batch Transfer works with all cc:Mail Post Offices.

## Starting cc:Mail the First Time

### Notes



- Before you begin to receive, write, and send messages, you must complete the following procedure.
- Procedures in this chapter use **Batch Transfer**.
- See your Administrator about Interactive Connections.

### To complete the Connect Settings dialog box:

1. From cc:Mail, press **RENU** **C** **S**. The displayed hour glass tells you the HP 100LX is working. The settings dialog box is then displayed. This box, shown in the figure below, contains a number of text boxes and scroll boxes. **To move between boxes, press **TAB****. In a scroll box (**v**), arrow to see the available choices. Read the following steps to help you make your selections for each setting.

Host:	cc:Mail	Modem File:	D:\_DAT\HAYES.
Prefix:	CCMAIL	Modem Volume:	Medium
Post Office:	Silver-HQ	Phone Number:	555-1212
User Name:	?	Dial Mode:	Tone
Password:	?	Dial Timeout:	60 Seconds
Baud:	2400	Idle Timeout:	5 Minutes
Interface:	COM1	Manual Dial:	No
Flow Control:	Hardware	Max Msg Size:	0 Bytes

Buttons: Add Host, Delete, Update, Cancel

Status Bar: Help, Add, Delete, Update, Cancel

Connect Settings Dialog Box

2. In each box, either accept the displayed choice, type a new value, or select a new value as follows:
  - a. **Host:** Accept the displayed choice, `cc:Mail`. For more information, see “Understanding cc:Mail’s Host” on page 34-21.
  - b. **Prefix:** Accept the displayed choice, `CCMAIL`. For more information, see “Understanding cc:Mail’s Prefix” on page 34-21.
  - c. **Post Office:** Replace the displayed choice with the name of your Post Office (ask your Administrator). The first character you type will erase `Silver-HQ` and display your typed character.
  - d. **User Name:** Your Administrator and you choose this name together to ensure that your User Name is not assigned to any other registered user of your Post Office. If (for security) you want to enter your User Name each time you open cc:Mail, leave the ?. You’ll be asked for your User Name each time you connect to your Post Office. Otherwise, type your User Name, the name others will use when addressing messages to you and the name you’ll use when writing messages. For security, a gray square will be displayed in place of each character you type.

---

**Note**

You can type a User Name either as last name first (Kostic, Marc) or first name first (Marc Kostic). cc:Mail recognizes each as the same name.

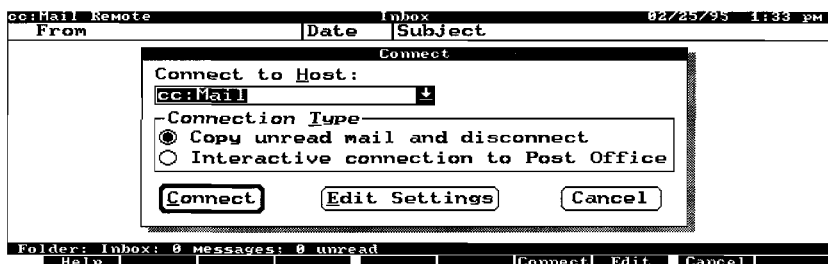
---

**33**

- e. **Password:** Your Administrator and you choose your password together. If (for security) you want to enter your password each time you open cc:Mail, leave the ?. You’ll be asked for your password each time you connect to your Post Office. Otherwise, type your password. For security, a gray square will be displayed in place of each character you type.
- f. **Baud:** Arrow to the highest number recommended by your modem instructions, but *not higher than the baud rate used by your Post Office to send messages*.
- g. **Interface:** Accept `COM1` when using a modem connected to the serial port. You will use `COM2` when using a card modem plugged into the card slot. See 37-3 for more information.

- h. **Flow Control:** Accept the offered choice, **Hardware**, if your modem can accept a hardware link; that is, if your modem can accept information from your HP 100LX at a faster rate than the Post Office's modem can accept information from your modem. When data arrives at this faster rate, your modem stores (buffers) this information temporarily until it is able to transmit it to the Post Office. For short messages, the **Hardware** choice means significantly faster transmission from your HP 100LX. For longer messages, the difference is smaller. If your modem cannot accept a hardware link, arrow to the other choice, **None**.
- i. **Modem File:** Accept the displayed choice if your modem is a Hayes or a Hayes-compatible modem. Otherwise, read the section, "Creating Another Modem File" on page 34-23 and perform the procedure. Then return to the next step, **Modem Volume**.
- j. **Modem Volume:** Arrow to choose modem speaker volume as follows:
  - If you *are* using a Hayes or Hayes-compatible modem, arrow to either **Off**, **Low**, **Medium**, or **High**.
  - If you are *not* using a Hayes or Hayes-compatible modem, press **[Fn]PGUP** to choose **Off**.
- k. **Phone Number:** Type your Post Office's phone number.
- l. **Dial Mode:** Arrow to either **Tone** or **Pulse**. **Tone** allows faster dialing, and some modems no longer support pulse (rotary) dialing.
- m. **Dial Timeout:** Accept **60** seconds or type a different number of seconds during which cc:Mail will try to make a connection before quitting.
- n. **Idle Timeout:** Accept **5** minutes or type a different number of minutes that cc:Mail will maintain an *interactive connection* before disconnecting if there is no activity. If the timeout value set by your Post Office Administrator is smaller than the one you choose, the Post Office's value determines when the connection is broken.





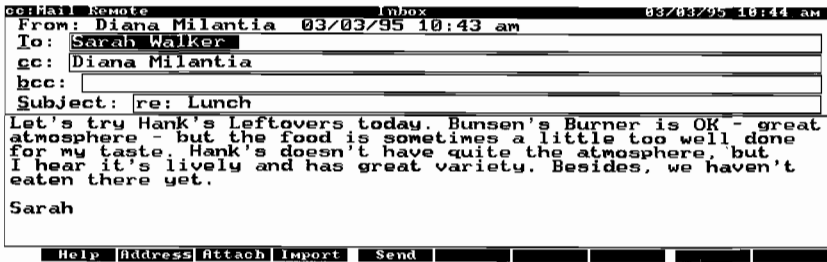
**Connect Dialog Box**

2. The **Connection Type** option box (see the figure above) will show that **Copy unread mail and disconnect** (**Batch Transfer**) is selected, unless you changed the factory setting. If that option is not selected, tab to the **Connection Type** option box and arrow to select **Copy unread mail and disconnect**.
3. Press **ENTER** to execute the command **Connect**.
4. A series of messages will be displayed in the **Connect Status** message box. These will include messages telling you that the connection to your Post Office has been made, and that each of one or several messages waiting for you at your Post Office, if any, have been received. The last **Connection Summary** message box gives the number of messages sent and the number of messages received.
5. Press any key. The **cc:Mail - Inbox** is displayed showing a summary of the one or more messages received. The asterisk (\*) before each message tells you the message has not been read.
6. Arrow to highlight a message you want to read.
7. Press **ENTER** to display the message for reading. (When you return to the **cc:Mail - Inbox** list box, you'll see that the listing for this message remains—only the asterisk is removed to show that you've read the message.)



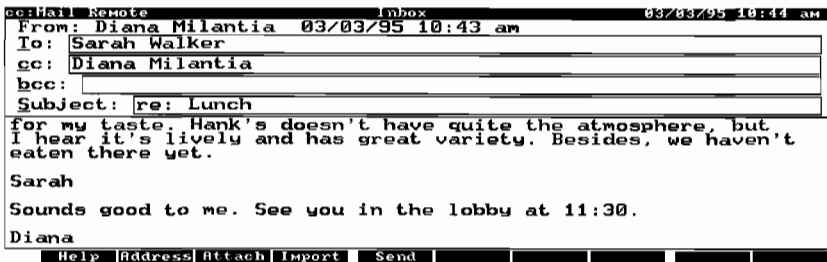


- Changed the From: text to Diana Milantia 03/03/95 10:43 am.
- Changed the To: text to Sarah Walker.
- Added cc: Diana Milantia.
- Changed the Subject: text to re: Lunch.



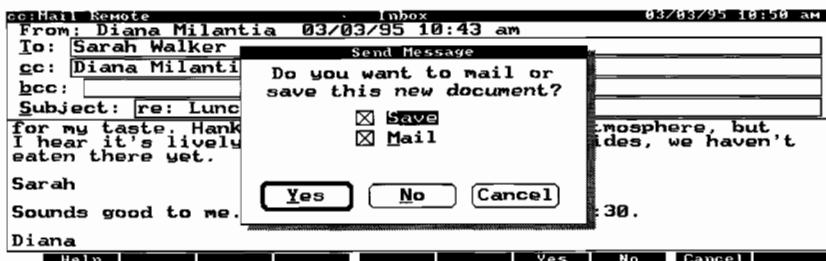
**Sarah's Message Prepared for Diana's Reply**

3. Tab to the message field.
4. Press **▼** several times to move the cursor down as far as it will go. [This step is optional. You can also type your reply above the original message.]
5. Press **ENTER** once or twice to insert a blank line following the message. [This step is optional.]
6. Type your reply. See the next figure.



**Diana's Reply**

7. Press **F5** to display the Send Message dialog box shown in the next figure.



Send Message Dialog Box

8. Press **ENTER** to accept both choices.
9. Press **F10** to display the **Connect** dialog box (see the figure on page 33-7). The settings should be the same as shown in the figure.
10. Press **ENTER**. The last message displayed in the **Connection Summary** message box tells you one message was sent.
11. When prompted, press any key to return to your **Inbox**.

---

## Sending Messages

### Addressing a Message

The simplest way to address a message is to type the addressee's name directly in the **Create Message** form. This name must be known by the **Post Office** before your message will be accepted, so ask the addressee what his or her **cc:Mail** name is. Then use that name in your address.

#### To address a message:

1. From **cc:Mail**, press **F4** to display the **Create Message** form. The cursor is in the **To:** field.
2. Type the person's **cc:Mail** name as described directly above. You can type more than one name in this field. Separate two names by a comma.
3. Tab to the **cc:** and **bcc:** fields, if you want, and enter names in these fields.

4. Continue creating your message by following the next procedure.

## Writing and Sending a Message

### To write and send a message:

1. Address your message. See the preceding procedure, "To address a message."
2. Tab to **Subject:** and type an optional subject. Or type a short (60 characters maximum) message. If you type a message here, skip to step 4.
3. Tab to the first line of the message field and type your message. For its editor, cc:Mail uses the editor in the Note Taker. See chapter 19.
4. Press **F5** to display the Send Message dialog box.
5. Press **ENTER** to accept both **Save** and **Mail**. A copy of your message will be saved in the Saved Message Folder and the original will be sent to your Outbox, waiting to be sent to your Post Office during a Batch Transfer.
6. Press **F10** to display the Connect dialog box. The **Connection Type** option box should have **Copy unread mail and disconnect (Batch Transfer)** selected.
7. Press **ENTER** to start sending your message. The **Connection Summary** box gives you progress reports.
8. When prompted, press any key to return to your Inbox.

---

## Folders for Storing Your Messages

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There are three different HP 100LX folders provided by cc:Mail: in which you can store messages. You can also create additional folders for your own use (similar to creating physical folders for your filing drawer or cabinet). The three cc:Mail folders are described below.

- **Inbox:** This folder holds messages you've received from other cc:Mail users. Once you've read a message, you can leave it in the Inbox, move it to another folder, or delete it.

- **Outbox:** When you send a message, it's temporarily held in the Outbox folder until it's transmitted to your Post Office. Once the message is transmitted, you no longer have a copy unless you specified that a copy be saved in the Saved Message Folder described below.
- **Saved Message:** This folder holds messages that you have chosen to save during the send message procedure.

## Using cc:Mail

---

To start cc:Mail, press  or  .

---

### Getting Started

Before you can receive, read, create, and send messages, you must first complete the procedure “To complete the Connect Settings dialog box” beginning on page 33-3.

---

### Connecting to Your Post Office

There are two types of connections you can make to your Post Office:

- **Batch Transfer** This is an intermittent connection to your Post Office that you control. All cc:Mail Post Offices allow this type of connection. During this connection, two-way message transmission occurs. You receive into your local Inbox any messages waiting for you at your Post Office. You also send from your local Outbox any messages you’ve written. As soon as the two-way transfer is complete, the connection is cut.
- **Interactive Connection** This is a continuous connection to your Post Office that you can make if your Post Office meets certain conditions—ask your Post Office Administrator. While connected, you have direct access to your Post Office Inbox, the Public List of mailing lists, your Private List of mailing lists, and the Post Office’s Directory of names, containing the names of all users you can address directly.

### To make a Batch Transfer connection:

1. In cc:Mail press **MENU** **C** **C** or **F10**.
2. Press **TAB** and arrow to Copy unread mail and disconnect. Unread messages waiting for you at your Post Office will be sent to your HP 100LX's Inbox. Also, messages in your Outbox will be sent to your Post Office, where they will be forwarded to the addressee.
3. Press **ENTER** to initiate the connection. When message transfer is complete, the connection is automatically closed.

### To open an Interactive Connection:

1. In cc:Mail, press **MENU** **C** **C** or **F10**.
2. Press **TAB** and arrow to Interactive Connection to Post Office.
3. Press **ENTER** to initiate the connection. It will take some seconds to complete the connection.

---

#### Note



When an Interactive Connection is active, you can open and use other applications without breaking the cc:Mail connection, provided you do not attempt to make another connection from another application.

---

### To close an Interactive Connection:

1. In cc:Mail, press **MENU** **C** **D** or press **F10**.
2. Press **ENTER**.

---

## Reading Your Mail

### To move your mail from your Post Office to your Inbox:

Any mail addressed to you that the Post Office receives is sent immediately to your mail box located at the Post Office. Depending on the type of connection you have to your Post Office, here is how to move that mail to your Inbox:

- **Batch Transfer:** Complete the procedure “To make a Batch Transfer connection” on page 34-2.
- **Interactive Connection:** You have direct access to your Inbox (mail box) at your Post Office.

### To read a new message when using Batch Transfer:

1. When a Batch Transfer is completed, press **F7**, if necessary, to display your Inbox. Any Inbox message you have not read is marked with an asterisk (\*). The most recent message is listed first and is highlighted. Each entry shows, left to right:
  - The name of the sender.
  - The date sent.
  - The subject.
2. Arrow to a message you want to read.
3. Press **ENTER** to display the message. To scroll your message, press **Fn**PGUP and **Fn**PGDN. You can copy any MS-DOS file(s) attached to your message to any appropriate DOS file you create. See “To copy an attached DOS file from a received message” on page 34-4.
4. To display the next or previous message in the folder, press **F8** (previous) or **F9** (next).

### To read a new message when using an Interactive Connection:

If your Remote Inbox is not displayed after you open an Interactive Connection (see “To open an Interactive Connection” on page 34-2), press **F6**. Then, if necessary, press **F7** (**Inbox**).

- Arrow to the message you want to read and press **ENTER**. It will take some seconds for the message to display, depending on the length of the message and the baud rate.

### To read a message stored in a folder:

1. In cc:Mail, press **MENU** **V** **F** or **F7**.
2. Arrow to the folder whose messages you want to read and press **ENTER**.
3. Arrow to the message in your chosen folder you want to read and press **ENTER**.

## To copy an attached DOS file from a received message:

### Note



To copy an attached DOS file, the message to which the file is attached must be in a local folder (like your local Inbox).

1. Display the local message that contains an attached MS-DOS file. See “To read a new message when using Batch Transfer” on page 34-3 or “To read a new message when using an Interactive Connection”, the second procedure above.
2. If the message is in your Remote Inbox (Interactive Connection), move it to your Local Inbox, then display it.
3. Press **F3**.
4. If the **Attachments** list box shows more than one attachment, arrow to highlight the one you want to extract.
5. Press **ENTER**.
6. Specify a path and file name for the copy of the attached file in one of these ways:
  - If you want to save your file in the directory displayed after **Directories:**, type a file name in the text box, then press **ENTER**.
  - Type both the path and name of the file, then press **ENTER**.
  - Press **ALT+D**, arrow to a directory (select **..** to display a higher-level directory, also press **▼** repeatedly to display additional directories), then press **ENTER**. Next, press **ALT+F**, arrow to the file you want (press **▼** repeatedly to display additional files), then press **ENTER**.
7. Press **F10**.



---

## Addressing a Message

Adding names to your address books is described first, followed by addressing your message.

### Addressing Options

You can:

- Address originals, copies, and blind copies of your message.
- Address your message to names of **users** and to **mailing lists** (distribution lists) of users. While a mailing list can contain the names of many users, the mailing list itself has its own unique **list name**. When you address a message to a mailing list, the names of the individual users (**members**) in that list are automatically added to your message address.

### Types of Address Books or Lists

There are three address books and one directory available for your use. You can use the names in these four lists to address your messages. The table below shows when those lists are available for your use.

The **Remote Directory**, maintained by your Administrator, lists all those you can address directly from your Post Office. In cc:Mail for Windows, it's called the Directory.

---

#### Table



In the following table, the column heads under "When Used" have these meanings:

**Local:** Used when Interactive Connection is off.

**Remote:** Used during an Interactive Connection.

---

### Available Address Books

Type of Address Book	When Used		Where Located	Who Maintains
	Local	Remote		
Local	X	X	HP 100LX	You
Directory		X	Post Office	Administrator
Private		X	Post Office	You
Public		X	Post Office	Administrator

## Adding Names of Users to Your Address Books

### Note



The Private Remote option in the Add/Modify Names dialog box (**MENU** **M** **M**) is not active. This option is provided to take advantage of possible future product developments.

### To add individual names to your Local Address Book:

1. In cc:Mail, press (**MENU** **M** **M**) to display the Add/Modify Names dialog box. See the figure below.



**Add/Modify Names Dialog Box**

2. Press (**ALT**)+(**N**) and type the last name, comma, first name. The first keystroke will clear any name appearing in the User Name text box and also type the letter.
3. If a mail address other than the name is needed, tab to User Address and type the address. Your Post Office Administrator can help you compose a correct address. See "What is a User

Address and a User Name?" following this procedure for more information.

4. Press **ENTER** to copy the name to the `Users` list box and highlight the `User Name` text box.
5. To add another name, type it (last name first) and a mail address, if necessary. Then press **ENTER**. Repeat this step to add additional names.
6. Press **F10**.

## What is a User Address and a User Name?

When you first chose your User Name with the help of your Post Office Administrator, what you actually chose was your `cc:Mail` address. This is the name your Post Office recognizes. When you complete the Add/Modify Names dialog box shown in the above figure, you can always enter in the `User Name` text box names known by your Post Office. If you do that, you can ignore the `Address` text box.

However, you can use the `User Name` text box for an alias (a short familiar name or nickname) that would allow you to address a message more informally and would simplify addressing messages, especially to a person you send messages to frequently. You could type aliases directly in the Create Message address fields more easily than selecting addresses from your Address list. When you enter a name in the `User Name` text box that is not known to your Post Office, you then must enter the person's official `cc:Mail` name in the `User Address` text box in the Add/Modify Names dialog box. When you send your message to your Post Office, the Post Office fails to recognize the User Name, so it looks at the User Address. Since it recognizes that name, it accepts your message.

Another use of the `User Address` text box is to enter a name that includes a `cc:Mail` Post Office name, for a person registered at another Post Office. Say that person's name is Betsey Harrington and her home Post Office name is LBCC. You would type in the `User Address` text box `Betsey Harrington at LBCC`. When your Post Office received a message addressed to her, it would not recognize `Betsey Harrington`, but it would recognize another `cc:Mail` Post Office name. So it would send the message to the LBCC Post Office. That Post Office would recognize `Betsey Harrington` as one of its own, and would accept the message.

## Creating and Editing Mailing Lists

You can add new mailing lists to your Local and Private Address Books as well as edit existing mailing lists.

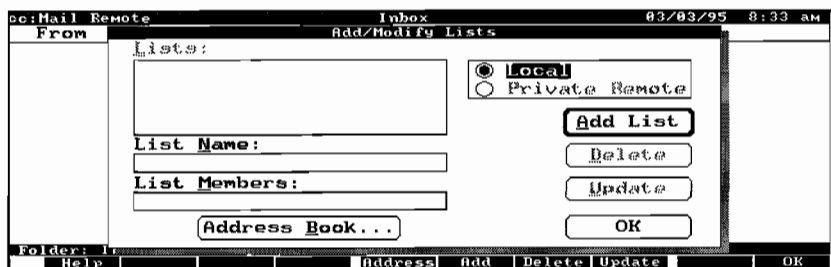
### To create a mailing list:

#### Notes



- The List Members text box you'll see as you complete the first step of the two following procedures can contain 1023 characters.
- To review the names in the current mailing list, select List Members (press **MENU** **M** **L** **ALT**+**M**) and use **Fn** HOME, **◀**, **▶**, and **Fn** END.

1. In cc:Mail, press **MENU** **M** **L** to display the Add/Modify Lists dialog box. See the figure below.



**Add/Modify Lists Dialog Box**

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2. Press **TAB** and arrow as needed to either Local (for your Local Address Book used for Batch Transfers) or Private Remote (for your Remote Address Book used during an Interactive Connection).
3. Press **ALT**+**N**.
4. Type the mailing list's name. Your first character will clear any existing text.
5. Press **ENTER**.
6. Press **TAB** to put your cursor in the List Members text box.
7. Do one of the following:

- Type names directly into the **List Members** text box as follows:
    - a. Type first names first.
    - b. Separate names by commas.
    - c. Go to step 12.
  - Choose names from your address list. Start with step 8.
8. Press **(F5)**.
  9. Arrow to highlight a name you want added to your mailing list. You may add names of mailing lists.
  10. Press **(ENTER)**. **Name Selected** appears in the upper right. Repeat steps 9 and 10 to select other names.
  11. Press **(F10)** to enter the selected name(s) into the **List Members** box.
  12. Press **(F6)** **(ENTER)** **(F10)** to save (update) your list and to display the address book to which your mailing list belongs. You see the name of your new or edited mailing list along with the names of any individuals or mailing lists your address book contains.

### To edit a mailing list:

1. In **cc:Mail**, press **(MENU)** **(M)** **(L)** to display the **Add/Modify Lists** dialog box. See the figure above.
2. Press **(TAB)** and arrow as needed to **Local**.
3. Press **(ALT)+(L)** and arrow to the list. The contents of **List Name** and **List Members** change accordingly.
4. Press **(ALT)+(M)** to put your cursor in the **List Members** text box.
5. Do one of the following:
  - To change the names in the **List Members** text box, do the following:
    - a. Press **(▶)**.
    - b. Make your changes.
    - c. Go to step 11.
  - To add names to an existing list, press **(▶)**, then continue with step 6.
6. There are two ways to add names to an existing mailing list:
  - Type names directly into the **List Members** text box as follows:
    - a. First name first.
    - b. Separate names by commas.
    - c. Go to step 11.

- Choose names from your address list. Start with step 7.
- 7. Press **F5**.
- 8. Arrow to highlight a name you want added to your mailing list. You may add names of mailing lists.
- 9. Press **ENTER**. Name Selected appears in the upper right. Repeat steps 8 and 9 to select other names.
- 10. Press **F10** to enter the selected name(s) into the List Members box.
- 11. Press **F6** **ENTER** **F10** to save (update) your list and to display the address book to which your mailing list belongs. You see the name of your new or edited mailing list along with the names of any individuals or mailing lists your address book contains.

### To delete an individual's name from your Local Address Book:

1. In cc:Mail, press **MENU** **M** **M**.
2. Arrow to the name you want to delete in the Users list box.
3. Press **F7** **ENTER** to delete the name. If this name was also included in a mailing list, the mailing list will still contain the name.

### To delete an individual's name from a mailing list:

1. In cc:Mail, press **MENU** **M** **L**.
2. Arrow to the name of the mailing list you want to modify.
3. Press **ALT**+**M** and arrow to the first character of the individual's name you want to delete.
4. Press **DEL** repeatedly and carefully to delete only the characters of the name.
5. Press **ENTER** to update your mailing list.
6. Press **F10**.

### To delete an ENTIRE mailing list:

1. In cc:Mail, press **MENU** **M** **L**.
2. Arrow to the name of the mailing list you want to delete.
3. Press **F7**.
4. Read the warning message, then either press **F9** to cancel the delete operation or press **ENTER** to delete the entire mailing list.
5. Press **F10**.

## Addressing Your Message

You can address your message with:

- Names you type that will be understood by your Post Office as valid addresses (names that exist in one of the address books or in the Directory exactly as you type it in your address).
- Names of individuals you've added to your Local Address Book.
- Names of mailing lists you've added to your Local Address Book.
- Names of mailing lists you've added to your Private Address Book.
- Names that appear in the Public Address Book.
- Names of mailing lists that appear in the Public Address Book.
- Names that appear in the Remote Directory (your Post Office's Directory)

### What is Quick Access?

When you want to select a name in a list, like your Post Office's Directory, you can begin typing that name. As each letter is typed, the highlight moves to the first name starting with that letter or those letters.

### To address your message to individuals and mailing lists:

1. In cc:Mail, press **SEND** **M** **C** or press **F4**.
2. If necessary, tab to put the cursor in the text box you want (To:, cc:, or bcc:).
3. Do one of the following:
  - Type a name in the form that will be understood by your Post Office (a name that exists exactly as you type it in the Post Office's Directory or in one of the three Address Books—Local, Private, or Public).
  - Select an address as follows:
    - a. Press **F2**.
    - b. Press **ALT**+**(letter)**, where "letter" is "L", "D", "P", or "u", to select the list or directory you want.
    - c. Press **ALT**+**N**.
    - d. Arrow or use Quick Access (see above) to highlight the name (person or mailing list) you want and press **ENTER**. To add additional names from this list, repeat this step.
    - e. Press **F10**.

4. To add more addressees to the current text box (To:, cc:, or bcc:), start at step 3.
5. When you've completed adding names to the current text box, press **(TAB)** as needed to reach the cc:, bcc:, or Subject: text box, or to reach the message field.
6. Continue addressing, if you want, by starting at step 2.
7. When finished, continue with the next section to create the body of your message.

---

## Creating the Body of a Message

### Creating a New Message

1. In cc:Mail, press **(MENU)** **(M)** **(C)** or **(F4)**.
2. Address your message. See "Addressing Your Message" on page 34-11.
3. Tab to Subject: and type a subject.
4. Press **(TAB)** and type the body of your message.
5. You can now **import** an MS-DOS file (*text only*) to be a part of your message (see the next procedure) or **attach** one or more MS-DOS files of any type to your message (see "To attach MS-DOS files to your message," the second procedure below).
6. Your message is now ready to save and send. See "Sending and Saving Messages" on page 34-16.

#### 34 To insert (import) text files to your message:

1. Place the cursor at the point in your message text where you want the imported text file inserted.
2. Press **(F4)**.
3. Import your choice of text file in one of these ways:
  - Type both the path and name of the file, then press **(F10)**.
  - Press **(ALT)+ (D)**, arrow to a directory (select **.** to display a higher-level directory, also press **(V)** repeatedly to display additional directories), then press **(ENTER)**. Next, press **(ALT)+ (F)**, arrow to the file you want (press **(V)** repeatedly to display additional files).
  - Press **(F10)**. You may have to press **(Fn)PGUP** a few times to see the beginning of your message.



4. To import another file, start at step 1.
5. To attach any MS-DOS file to this message, see the next procedure.
6. Your message is now ready to save and send. See “Sending and Saving Messages” on page 34-16.

### To attach MS-DOS files to your message:

#### Note

You cannot attach a file to a message during an interactive connection.



1. When you have finished writing the text of your message, press **F3** to display the Attachments dialog box.
2. Press **ENTER**.
3. Select a file to attach to your message in one of these ways:
  - Type both the path and name of the file (your first keystroke will clear any text), then press **F10**.
  - Press **ALT+D**, arrow to a directory (select **..** to display a higher-level directory, also press **▼** repeatedly to display additional directories), then press **ENTER**. Next, press **ALT+F**, arrow to the file you want (press **▼** repeatedly to display additional files).
  - Press **F10**.
4. To attach another file, start at step 2.
5. Press **F10**.
6. Your message is now ready to save and send. See “Sending and Saving Messages” on page 34-16

### To detach an MS-DOS file from a message before sending:

#### Note

You cannot detach a DOS file from a message during an interactive connection.



If you attach a DOS file to a message, then decide you do not want to send that file with the message, follow this procedure to detach it.

1. Press **F3**.
2. Arrow to the name of the file you want to detach.
3. Press **F4**.

4. Press **(ENTER)** to detach the file.
5. To detach another file, start at step 2.
6. Press **(F10)**.

## Replying to a Message

You can prepare your reply to a message you've just read in three ways:

- Add text to the original, displayed message and send the resulting combined message to the author as your reply. See the next procedure.
- Add text to the original or leave the original message unchanged, then forward it to a new address. See the second procedure below.
- Prepare a separate message and send that as your reply. The original message is not included. See the procedure "Creating a New Message" on page 34-12.

### To return the original message with your comments:

1. Display the original message (highlight the message in your Inbox and press **(ENTER)**).
2. Press **(F6)**.
3. Tab and press **(spacebar)** (if necessary) to select both choices, Retain the original Addressees and Retain the original text and attachments.
4. Press **(F10)**. The sender is now the addressee (**To:**) and you are listed in the **cc:** text box. The original subject and text remain.
5. Tab to the body of the message and arrow to the first blank line below the message text (or arrow to the line where you want to insert your reply).
6. If you want, press **(ENTER)** to insert a blank line.
7. Type your reply.
8. Press **(F5)**.
9. Use **(TAB)** and **(spacebar)** to make save and mail choices.
10. Press **(ENTER)**.
11. Press **(F10)** to display the **Connect** dialog box. Use **(TAB)** and arrow keys to select your choice of connection.
12. Press **(ENTER)** to send your message.

## To forward a message with or without your comments:

1. Display the message you want to forward.
2. Press **F7**.
3. Press **ENTER** to retain message history, or press **F8** to delete history. The message is displayed again in a special format.
4. If necessary, tab to put the cursor in the text box you want (To:, cc:, or bcc:).
5. Do one of the following:
  - Type a name in the form that will be understood by your Post Office.
  - Press **F2**, then arrow to the list or directory you want. Next, arrow or use Quick Access (see “What is Quick Access” on page 34-11) to highlight the name (person or mailing list) you want and press **ENTER**. Finally, press **F10** to add the addressee to your message.
6. To add more addressees to the current text box (To:, cc:, or bcc:), start at step 5.
7. When you’ve completed adding names to the current text box, press **TAB**.
8. Continue addressing, if you want, by starting at step 4.
9. If you want to add a comment, tab to the first line of the message, arrow to the first blank line at the end of the message. Press **ENTER** to insert a blank line, then type your comment. (You can type your comments anywhere else in the message body if you want.)
10. Press **F5**.
11. Use **TAB** and **spacebar** to make save and mail choices.
12. Press **ENTER**.
13. Press **ENTER**.
14. If necessary, arrow to select another host.
15. Press **TAB** and arrow to select the type of connection.
16. Press **ENTER** to send your message.

---

## Sending and Saving Messages

### To save and send a message you've just completed:

1. After completing your message, press **F5**.
2. Use **TAB** and **spacebar** to make save and mail choices.
3. Press **ENTER**.
4. Press **ENTER**.
5. If necessary, arrow to select another host.
6. Press **TAB** and arrow to select the type of connection.
7. Press **ENTER** to send your message.

### To save a message in an MS-DOS file:

1. In cc:Mail, either:
  - Press **MENU** **V** **I** or **F7** (**Inbox**) to display the list of Inbox messages.
  - Press **MENU** **V** **F** or **F7** (**Folders**), arrow to the folder you want, then press **ENTER** to display the list of folder messages.
2. Arrow to the message you want to save in a DOS file.
3. Press **MENU** **F** **A**.
4. Select or create a file where your message will be saved in one of these ways:
  - Type both the path and name of the file, then press **ENTER**.
  - Use **TAB**, arrow keys, and **ALT**+**F** to select a directory path and highlight a file name, then press **ENTER**.

---

## Managing Messages

### To view selected messages during an Interactive Connection:

When you first use your HP 100LX during an Interactive Connection and view the contents of the Inbox or another folder using one of the **MENU** View choices, all the messages in that folder are displayed. This procedure allows you to restrict the messages you view in the Inbox to meet certain criteria.

1. In cc:Mail, press **MENU** **C** **R**, then do one of the following:
  - To restrict a message list to only unread messages, arrow to select **Unread Messages**.
  - To restrict a message list to only messages with a particular subject, arrow to **Messages Re:**, then press **TAB** and type the subject. The subject you type is case insensitive.
  - To restrict a message list to those from a particular person, arrow to **Messages From:**, then press **TAB** and type the person's name.
  - To restrict a message list to those written during a certain date range, arrow to **Message Date:**, press **TAB** and type the first date in the current format (see the upper-right corner of your display), then press **TAB** and type the last date in the range. To receive only messages sent on a single date, make both dates the same.
  - To cancel all message list restrictions, arrow to **All Messages**.
2. Press **F10**.

### To create another folder:

#### Note

Before you can perform this procedure, you need at least one message in at least one folder.



1. Display a folder containing at least one message as follows:
  - To display the Inbox, press **MENU** **V** **I** or **F7** (**Inbox**).
  - To display any other folder, press **MENU** **V** **F** or **F7** (**Folders**), then arrow to the name of a folder and press **ENTER**.
2. With any folder message highlighted, press **F2**.
3. Press **ALT+N** and type a name for your new folder.
4. Press **F10**. Then press **ESC** to see the name of your new folder in the folders list.

## To move or copy a message:

### Note



When NOT using an Interactive Connection:

- You *cannot* move or copy a message *to* the Inbox.
- You *cannot* copy a message *from* the Inbox, you can only move it.

### Note



When USING an Interactive Connection:

- You *cannot* move or copy a message *to* the Inbox.
- You can copy a message from the Inbox, *but only* to a folder within the HP 100LX.

1. Display a folder containing the message you want to copy or move as follows:
  - To display the Inbox, press **MENU** **V** **I** or **F7** (**Inbox**).
  - To display any other folder, press **MENU** **V** **F** or **F7** (**Folders**), then arrow to the name of the folder you want and press **ENTER**.
2. Arrow to highlight the message you want to copy or move.
3. Read the notes above. Then press either **F2** (**Copy**) or **F3** (**Move**).
4. Do one of the following:
  - Arrow to highlight the name of the folder you want your message copied or moved to.
  - Tab to **New Folder** and type a name for your new folder.
5. Press **F10**. If you created a new folder, you can press **ESC** to see its name listed.

## To delete a message:

You can delete a message from any folder.

1. Display a folder containing the message you want to delete as follows:
  - To display the Inbox, press **MENU** **V** **I** or **F7** (**Inbox**).
  - To display any other folder, press **MENU** **V** **F** or **F7** (**Folders**), then arrow to the name of the folder you want and press **ENTER**.

2. Arrow to highlight a single message you want to delete, or tag (highlight and press **[spacebar]**) several messages you want to delete.
3. Press **[DEL]**. You'll be asked to confirm your choice.

### To print a list of all the messages in a folder:

You can print the names of all the messages in a folder.

1. Make sure your printer is connected properly to your HP 100LX and is turned on. See chapter 36, "Using a Printer with the HP 100LX."
2. Select as follows the folder whose message list you want to print:
  - To display the Inbox, press **[MENU]** **[V]** **[I]** or **[F7]** (**Inbox**).
  - To display any other folder, press **[MENU]** **[V]** **[F]** or **[F7]** (**Folders**), then arrow to the name of the folder you want and press **[ENTER]**.
3. Press **[MENU]** **[F]** **[P]**.
4. Arrow to highlight Print list of messages in this folder.
5. Press **[F10]**.

### To print the text of selected messages in a folder:

1. Make sure your printer is connected properly to your HP 100LX and is turned on. See chapter 36, "Using a Printer with the HP 100LX."
2. Select as follows the folder containing the messages whose text you want to print:
  - To display the Inbox, press **[MENU]** **[V]** **[I]** or **[F7]** (**Inbox**).
  - To display any other folder, press **[MENU]** **[V]** **[F]** or **[F7]** (**Folders**), then arrow to the name of the folder you want and press **[ENTER]**.
3. Arrow to select a single message or use **[▲]**, **[▼]**, and **[spacebar]** to select two or more messages whose text you want to print.
4. Press **[MENU]** **[F]** **[P]**.
5. Arrow to highlight Print text of selected messages.
6. Press **[F10]**.

---

## Changing the Directory that Contains Your Mail Messages

When your HP 100LX was shipped, the directory C:\\_DAT\MAIL was selected as the directory to hold all your folder messages, including those in your Inbox and Outbox. The following procedure tells you how to change that directory.

Once you change that directory, you cannot access the messages stored in C:\\_DAT\MAIL from the cc:Mail application. But you could access those messages by changing the directory back to C:\\_DAT\MAIL.

### To change the directory that contains your mail messages:

1. In cc:Mail, press **REND** **F** **L**.
2. Press **ENTER** to confirm your decision.
3. In the text box, type the path and directory where your new mail messages will be located.
4. Press **F10**.

---

## Changing Your Communication Settings

### To change your password:

1. In cc:Mail, press **REND** **C** **P**.
2. If the host you're using is not selected in the Select Host list box, arrow to the host you're using.
3. Tab to the Enter Old Password text box and type your old password. The characters will display as gray blocks.
4. Tab to the Reenter Old Password text box and again type your old password.
5. Press **F10**. You'll be told that your old password was accepted.
6. Press **F10** again to display another Change Password dialog box.
7. Type your new password, press **TAB**, then reenter your new password.
8. Press **F10** to see New password accepted.
9. Press **F10**.



## Understanding cc:Mail's Host

The group of settings identified by your host name initializes cc:Mail for your use. The host name appears after Host#: in the display produced when you press **MENU** **C** **S** and, if necessary, select the host name you want. The default Host is "cc:Mail."

If you have several groups of settings, each group is identified by a different host name. You might want several different hosts if you use cc:Mail in different locations, requiring different Post Offices, passwords, phone numbers, etc.

Each host name and the settings each name represents are saved in the ASCII file C:\\_DAT\CCMAIL.INI. You can view the contents of that file from the Filer (highlight the file name, then press **F8**).






## Understanding cc:Mail's Prefix

The name of your local Outbox is given by cc:Mail's Prefix. Your current Prefix is displayed when you press **MENU** **C** **S** and, if necessary, select the host name you want. Your default Prefix (the name of your default Outbox) is "CCMAIL."










Your Outbox contains the messages to be transmitted to your local Post Office during a Batch Transfer. If you worked for some weeks in a location served by Post Office A and at other times worked in Post Office B's area, you would want two different Outboxes (two different Prefixes); call them A and B. When not using an Interactive Connection, you would want to send your messages to Outbox (Prefix) A when in Post Office's A area, and to Outbox B when in Post Office B's area. To avoid updating your Connect Settings each time you moved between A and B, you could define two different Hosts, one containing Prefix A, the other Prefix B. Before making a Batch Transfer connection, you would specify Host A or B depending on your location (A or B). Then when the connection was made, messages addressed to the nearby Post Office would be sent.

### To modify your Host (your current set of Connect Settings):






1. Press **MENU** **C** **S**.
2. If you have only one host, skip to step 5.
3. Arrow to the name of the Host whose setting you want to change.
4. Press **F10**.

- To change any setting (except **Host**), whose name appears in a text box (a box with no  symbol), arrow to that box and type the new contents. The first character you type will erase the present contents and type that character. **NOTE:** When entering a new file name for your **Modem File**, type the entire path and name, like `D:\_DAT\HAYES.MDM`.
- To change any setting in a scroll box (containing the  symbol), press  and  to display the setting you want.
- To save your new settings under the **present Host name**, press .

### To create a new Host (a new set of Connect Settings):

- Press   .
- If you have only one host, skip to step 5.
- Arrow to the name of the Host whose settings are closest to those of your new Host.
- Press .
- Type the new Host name in the highlighted **Host** text box. The first character you type will erase the present contents and type that character.
- To change any other setting whose name appears in a text box (a box with no  symbol), tab to that box and type the new contents. **NOTE:** When entering a new file name for your **Modem File**, type the entire path and name, like `D:\_DAT\HAYES.MDM`.
- To change any setting in a scroll box (containing the  symbol), press  and  to display the setting you want.
- To save your new settings under your **new Host name**, press .

### To delete a host:

- Press  .
- Arrow to the name of the Host you want to delete.
- Press .
- Press .
- Press .

## Creating Another Modem File

If your modem does not work satisfactorily using the supplied modem file, “D:\\_DAT\HAYES.MDM,” follow the procedure below to create and specify a new modem file.









### Note



Except for the backslash (\) and circumflex (^), the commands you enter in the modem file are sent to the modem without change. The two exceptions modify the interpretation of the characters that follow. For information about these exceptions, see “Specifying a Modem Command Line” on the next page.

### To create a new modem file:

This procedure shows you how to modify the supplied modem file and to specify that modified file in your Create Settings dialog box. Use your modem instructions as a source of information.

1. In the Memo Editor (press ) , press  .
2. Type `d:\_dat\hayes.mdm` and press  to display the contents of the modem file specified in the supplied set of Connect Settings (in the Host, “cc:Mail”).
3. Use the Memo Editor’s text editing tools (see Chapter 18) to change the text following the first line `MODELS=` to the name of your modem.
4. Continue editing this file as necessary to show the commands required by your modem.
5. Press   .
6. Type a file name as specified below for your new modem file.
  - The directory and path should be `C:\_DAT` (not `D:\_DAT`).
  - The file name should have the extension `.MDM`.
  - These two requirements mean that the contents of the `Save File As` text box will be `C:\_DAT\filename.MDM` where you supply a name to replace “filename.”
7. Press  to save your new modem file.
8. Enter your new modem file into one of the following:
  - Your current Host—see the procedure: “To modify your Host (your current set of Connect Settings)” on page 34-21.
  - A new Host—see the procedure “To create a new Host (a new set of Connect Settings)” on page 34-22.

## Specifying a Modem Command Line

Except for backslash (\) and circumflex (^), the commands you enter in a modem command line are sent to the modem without change. The two exceptions are described as follows:

- **Backslash:** The \ character is used to specify an 8-bit value. The three characters immediately following \ must be characters between 0 and 7, and together they are treated as a 3-digit octal integer. For example, \015 is treated as octal 15, decimal 13, hex 0D, and is equivalent to the carriage return character.

There are two exceptions to the 4-character backslash sequence:

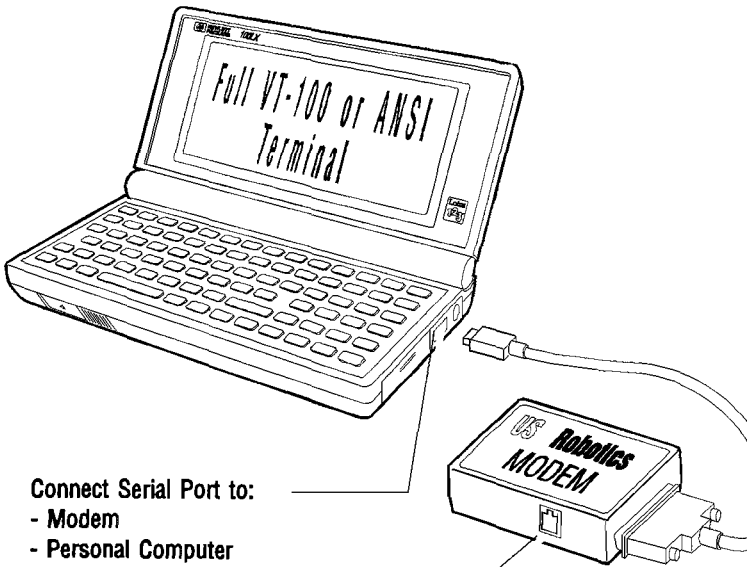
- The actual backslash character is represented by \\.
  - The actual circumflex character is represented by \^.
- **Circumflex:** The ^ character is used to specify commonly used values, such as ^M, which becomes the carriage return character. Bit 6 of the character's value is cleared.

### Examples of \ and ^ in a Modem Command Line

Command	What's Sent	Comment
ATZ	ATZ	No special characters used.
AT\132	ATZ	132 is octal for Z.
AT\\Q3	AT\Q3	\\ is used for \.
AT\^B1	AT^B1	\^ is used for ^.
AT^M	AT	^M = carriage return.
AT\\N0\\Q3	AT\N0\Q3	\\ is used twice here.
AT\134N0\134Q3	AT\N0\Q3	\134 is used instead of \\.

## Datacomm

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Connect Serial Port to:

- Modem
- Personal Computer
- Printer

Dial in to:

- CompuServe, MCI, Dow Jones, GENie (using built-in settings)
- Other remote networks or computers
- Local services

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To start Datacomm, press **CTRL**+ or  **C**.

### Hangup

The hangup command is executed *automatically* when you quit Datacomm.



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## Introduction to Datacomm

Datacomm turns your HP 100LX into a computer terminal. You can:

- Communicate with international information services (CompuServe™, MCI, Dow Jones News Retrieval, and GENIE) using built-in configuration files, each containing many of the Datacomm settings needed to connect to that service.
- Emulate a VT100, an ANSI terminal, or a teletype (“dumb” or “glass tty”) terminal.
- Use built-in file-transfer protocols: Kermit, XMODEM, YMODEM, ZMODEM; also transfer text-only files.
- Use other abilities of a full-featured terminal, such as saving information you receive, automating logon to another system such as your company’s electronic mail system, and translating characters from a different character set used by a sending computer.

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### Note



The first four function keys available in Datacomm’s opening screen, PF1, PF2, PF3, and PF4, are provided for compatibility with Digital Equipment Corporation’s terminal.

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## Preparing Your Hardware

### To connect to the remote system using a modem:

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See Chapter 37, “Using a Modem with the HP 100LX,” for instructions to connect modems to your HP 100LX.

### To connect directly to the remote system:

- Connect the HP 100LX to an IBM-compatible computer using an HP serial cable. Use HP cable part number F1015A plus an HP cable adapter kit, part number F1023A. Connect the other end of the cable to the HP 100LX’s Com1 port. Additional information is provided with the cable and adapter products.

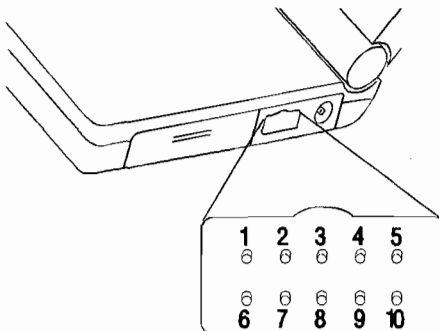
**Note**

Hooking up cables, adapters, and peripheral devices can be a tricky procedure because the required adapters can vary with different peripherals. If you need help with this process, contact a local electronics dealer or the manufacturer of the equipment you're trying to connect.

The following table and figure show the pin assignments and pin locations for the HP 100LX Com1 serial port. This information is important if you need to get help connecting to a remote system or other device.

**Pin Assignments for the HP 100LX Com1 Port**

Pin No.	Used for
1	Data carrier detect
2	Receive data
3	Transmit data
4	Data terminal ready
5	Signal ground
6	Data set ready
7	Request to send
8	Clear to send
9	Ring indicator
10	Shield



**Pin Numbers for the HP 100LX's Com1 Port**

---

## Communicating with an Information Service

### To connect to CompuServe, MCI, Dow Jones News Retrieval, and GENie:

1. Press **&...** **C** to start Datacomm.
2. Press **MENU** **C** **S** **F7**.
3. Tab to the list of files and arrow to the configuration file for the service you want. See the following table.
4. Press **F10**.
5. Press **F5** and type the service's access phone number.
6. Press **F10** **F10**.
7. Press **F10**.

When the connection is made, the information service will ask you for additional information, such as your ID and password.

**Information Service Configuration Files**

Information Service	Path and File Name
CompuServe	C:\_DAT\COMPUSRV.DCF
MCI	C:\_DAT\MCI.DCF
Dow Jones News Retrieval	C:\_DAT\DOWJONES.DCF
GENie	C:\_DAT\GENIE.DCF

### To connect to another information service:

1. In Datacomm, change your configuration settings to those required by the information service. See the section "Choosing and Saving New Configuration Settings" on page 35-7. If you want to save your new configuration settings, see the procedure "To save your configuration settings" on page 35-12.
2. Press **F10** to initiate communication.
3. Press **F10** to end communication.



# Using the HP 100LX as a VT100 or ANSI Terminal

VT100 and ANSI terminal emulation is provided by Datacomm. In addition, two other terminal types are provided, as described in this table:

**The Four Built-in Terminal Types**

Type	Description
VT100	Emulates a VT-100 terminal, <b>except for</b> double-high, double-width characters, smooth scroll features, and 132 columns. VT100 accepts up to 80 columns on one line.
ANSI	Emulates an ANSI terminal.
TTY	Emulates a “dumb” terminal (sometimes called “glass tty” or just “tty”). Control codes for other than CR (carriage return), BS (backspace), BEL (beep), HTAB (hard tab), and LF (line feed) are ignored.
MAP	Emulates a “dumb” terminal, but control codes for other than CR (carriage return), BS (backspace), BEL (beep), HTAB (hard tab), and LF (line feed) are mapped to displayable characters. For example, control code 1 is displayed as ^A, control code 2 as ^B, and so on.

## To emulate a terminal:

1. Press **&...** **C** to start Datacomm.
2. Press **MENU** **C** **S** **F4**.
3. Press **▼** several times to see the four terminal emulation choices in the upper left corner.
4. Arrow to your choice.
5. Press **F10** **F10**.

## To change backspace definition for VT-100 and ANSI emulation:

When you transmit a backspace character, you have two options for the action it produces:

- The cursor moves back one space and *erases* the character at that space.
- The cursor moves back one space and *does not* erase the character at that space. This is the default action.

To select one of these two options:

1. In Datacomm, press **Ⓜ** **C** **S** **F4** **TAB**.
2. To *erase* the character, highlight (arrow to) **Delete**.
3. To *not erase* the character, highlight **Backspace**.
4. Press **F10** **F10**.

---

## Choosing and Saving Configuration Settings

### Choosing Existing Configuration Settings

To choose an existing configuration file:

1. In Datacomm, press **Ⓜ** **C** **S** **F7**.
2. If your file is saved in a directory other than C:\\_DAT, tab to the **Directory** list box and arrow to highlight the correct directory.
3. Tab to the **File name** list box and highlight the correct file name.
4. Press **F10** **F10**.

To choose the default configuration settings:

- In Datacomm, press **Ⓜ** **C** **S** **F6**. All configuration settings are returned to their default settings. See the following table.

### The Default Configuration Settings

Display	Setting	Choice/ Description
<b>Settings dialog box</b>	Baud	2400
	Interface	Com1
	Parity	None
	Data Bits	8
	Stop Bits	1
<b>Advanced Settings dialog box</b>	Emulation	VT100
	Backspace Key	Backspace
	Local Echo	Disabled
	Wrap Long Lines	Disabled
	Scroll	0 lines
	Flow	None
	Enq-Ack	Disabled
<b>Download directory</b>	C:\_DAT	
<b>Logon file</b>	C:\_DAT\*.LCF	
<b>Remap file</b>	C:\_DAT\*.CTF	
<b>Phone dialog box</b>	Type	Tone
	Timeout	30 seconds
	Automatic Redial	Disabled

## Choosing and Saving New Configuration Settings

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The following four procedures explain how to make and save these choices. Each of the first three procedures and its following table cover the choices available in one of the three configuration-setting dialog boxes.

## To choose configuration settings in the Settings dialog box:

1. In Datacomm, press **Ⓜ** **C** **S** to display the choices covered in the following table. Tab to cycle between the boxes or press **ALT** together with the underlined letter to reach a particular box. To display all choices in a box containing a **Ⓜ** symbol, press **Ⓜ** and **Ⓜ** several times. Pressing **ALT**+**Ⓜ** will display several—but not necessarily all—choices.
2. If you have made all your choices (you aren't going to open the Advanced, Phone, Open, or Save As box), press **F10** to complete your choices.
3. If you want to make more choices, follow one or more of the appropriate procedures in this section.

**Choices Available in the Settings Dialog Box**

Setting	Choices/Description
Baud rate	300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
Interface	Com1, Com2, Alternate, Infrared
Parity	None, Odd, Even, Mark, Space
Data bits	7, 8
Stop bits	1, 2
Open	Displays the Open Configuration File dialog box.
Save as	Displays the Save Configuration File dialog box.
Advanced	Displays the Advanced Settings dialog box.
Phone	Displays Phone Settings dialog box.
Defaults	Return settings to their default values. See the previous table.

## The Four Interface Choices

For information about these interface choices, see “The Four HP 100LX Communication Ports” on page 3-20.

**To choose configuration settings in the Phone Settings dialog box:**

1. In the Datacomm Settings screen (press **MENU** **C** **S**), press **F5** to display the choices covered in the following table.
2. Specify your choices using **TAB**, arrow keys, **spacebar**, and typing.
3. Press **F10**.

**Choices Available in the Phone Settings Dialog Box**

Setting	Choices/Description
Number	Phone number to be dialed
Type	Tone, Pulse
Timeout	Phone call ends in specified number of seconds if no answer.
Automatic Redial	Check to enable.

**To choose configuration settings in the Advanced Settings dialog box:**

1. In the Datacomm Settings screen (press **MENU** **C** **S**), press **F4** to display the choices covered in the following table.
2. Specify your choices using **TAB**, arrow keys, **spacebar**, and typing.
3. To display the Download Directory dialog box (**Download...**), press **F6**.
4. To display the Logon File dialog box (**Logon...**), press **F7**.
5. To display the Remap File dialog box (**Remap...**), press **F8**.
6. Press **F10** to make your choices effective.

### Choices Available in the Advanced Settings Dialog Box

Setting	Choices/Description
Emulation	VT100, ANSI, TTY, MAP. See the table "The Four Built-in Terminal Types" on page 35-5.
Backspace key	Backspace, Delete. See "To change backspace definition for VT-100 and ANSI emulation" on page 35-6.
Local Echo	When enabled, characters you transmit will display on your screen.
Wrap long lines	When enabled, long lines are wrapped that otherwise would disappear off the right edge of the HP 100LX's screen.
Scroll	Defines the size of the scroll buffer that allows you to view up to 99 previously displayed lines. See "To scroll up to 99 lines" on page 35-14.
Modem Init	Accepts a command line. For Hayes and Hayes-compatible modems, the command line starts with AT or at and ends with a carriage return. Many commands can be issued to your modem by making choices in the Settings, Advanced Settings, and Phone dialog boxes. Use the Modem Init text box to enter other commands. See "Specifying a Modem Command Line" directly below.
Flow control:	
RTS-CTS	Request to send, clear to send.
XON-XOFF	Transmission on, transmission off.
None	No flow control

**Choices Available in the Advanced Settings Dialog Box  
(continued)**

Setting	Choices/Description
Enq-Ack Download	Enquire-Acknowledge. Displays the Download Directory dialog box. See “To specify a directory to contain downloaded files” on page 35-12.
Logon	Displays the Logon File dialog box. See “To specify an existing script file for a logon procedure” on page 35-12.
Remap	Displays a Remap File dialog box. See “To specify an existing Character Translation Facility remap file” on page 35-12.

**To specify a directory to contain downloaded files:**

**Kermit**



**Do not transfer multiple files using the Kermit protocol unless you move them to the default directory, C:\\_DAT.** If you move multiple files to another directory, the first file moved will be placed in that other directory, and the remaining files will be transferred to the default directory, C:\\_DAT.

1. In Datacomm, press **MENU** **C** **S** **F4** **F6**.
2. To specify a directory other than the default choice, C:\\_DAT, use **▲**, **▼**, and **ENTER**, as necessary, to highlight a directory. The directory's name and path will be displayed following Directory#.
3. Press **F10** **F10** **F10** to return to Datacomm's opening display.

### To specify an existing script file for a logon procedure:

For information about script files, see “Automating Datacomm Procedures” on page 35-16 and “To write and save a script file” on page 35-18.

1. In Datacomm, press **(MENU)** **(C)** **(S)** **(F4)** **(F7)**.
2. Specify your .LCF file. If necessary, tab to the **Directories** list box and arrow to the correct directory, then tab to the **Files** list box and arrow to the .LCF file you want.
3. Press **(F10)** **(F10)** **(F10)** to return to Datacomm’s opening display.

### To specify an existing Character Translation Facility remap file:

For more information about Character Translation Facility (CTF) files, see “Character Translation between Code Pages” on page 35-24 and “To create a CTF file” on page 35-24.

1. In Datacomm, press **(MENU)** **(C)** **(S)** **(F4)** **(F8)**.
2. Specify your .LCF file. If necessary, tab to the **Directories** list box and arrow to the correct directory, then tab to the **Files** list box and arrow to the .CTF file you want.
3. Press **(F10)** **(F10)** **(F10)** to return to Datacomm’s opening display.

### To save your configuration settings:

1. In Datacomm, press **(MENU)** **(C)** **(S)** **(F8)**.
2. Type a file name with no extension. The first character you type will erase .DCF and display that character. The extension .DCF will be added to your file name automatically. Your file will be in the C:\\_DAT directory unless you specify a different directory.
3. Press **(F10)** **(F10)** **(F10)** to save your settings in your new file and to return to Datacomm’s opening display.



---

## Customizing Your Display

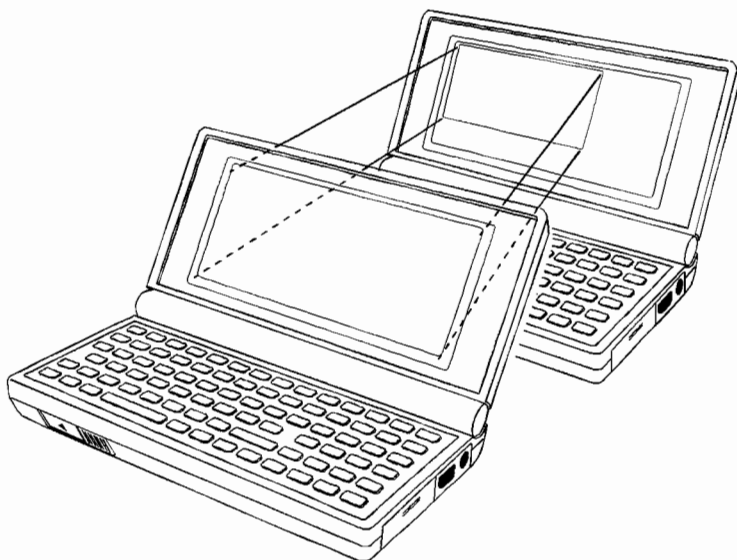
### To change between 64x18 and 80x25 displays:

Datacomm's opening screen shows 64 characters by 18 lines. Since the top and bottom lines are used by the HP 100LX, 16 lines are available for communication text.

- To show 80 characters by 25 lines when 64x18 are displayed, press **Fn**ZOOM.
- To show 64x18 when 80x25 are displayed, press **Fn**ZOOM.

### To move the 64x18 window around the 80x25 screen:

The table following the figure shows the actions of the window-moving key combinations.



**The action of ZOOM**

## Window Moving Keys

Press	Action
ALT + ▲	Move up one line.
ALT + ▼	Move down one line.
ALT + ►	Move right one character.
ALT + ◄	Move left one character.
CTRL + ►	Move right one screen.
CTRL + ◄	Move left one screen.
ALT + <b>Fn</b> PGUP	Scroll up one screen.
ALT + <b>Fn</b> PGDN	Scroll down one screen.
ALT + <b>Fn</b> HOME	Return to the current cursor position.

### To scroll up to 99 lines:

In addition to scrolling the HP 100LX's 64x18 window up and down the standard 80x25 screen (covered in the table above), you can scroll text down to see up to 99 previously displayed lines:

1. In Datacomm, press **MENU** **C** **S** **F4** **ALT** + **S**.
2. Type a number from 0 to 99 to set the size of the scroll-back buffer.
3. Press **F10** **F10** to return to Datacomm's opening display.

---

## Beginning and Ending a Communication Session

35

### To begin data communication:

1. Prepare your hardware (see "Preparing Your Hardware" on page 35-2).
2. Do one of the following:
  - Select an information service covered by the procedure "To communicate with CompuServe, MCI, Dow Jones News Retrieval, or GENie" on page 35-4.
  - Establish configuration and terminal settings needed to communicate to another service. See "Choosing and Saving New Configuration Settings" on page 35-7.
3. Press **F10** to initiate communication.

### To end data communication:

1. If necessary, log off the remote system. When using a Kermit protocol, press **C** **K**, arrow to Issue remote logout, and press **F10**.
2. To close the data communication session:
  - If you're connected via modem or IR, press **F10**.
  - If you have a direct connection, just disconnect the cable.
3. To close the Datacomm application, press **MENU** **Q**. The last configuration settings you used will be active when you return.

---

## Capturing Data in a File

You can capture (save) received information. As you capture, you can filter out ASCII control codes or you can map those codes to displayable characters. This procedure describes how to capture and optionally filter received information.

### To filter and capture data in a file:

1. In Datacomm, press **F5**.
2. Type a file name with no extension. The first character you type will erase **.CAP** and display that character. The extension **.CAP** will be added to your file name automatically. Your file will be in the **C:\\_DAT** directory (unless you specify another directory).
3. Tab to the **Control code** option box and arrow to highlight a filtering option: **Omit**, **Map to letters**, or **Capture as is**. See the table below.
4. Press **F10**.

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## Pausing or Stopping Data Capture

Once you have started data capture, you can:

1. Complete file capture without interruption.
2. Pause file capture to prevent unwanted information from being included in the captured information. After the unwanted information has been stripped out, you can resume file capture.
3. Stop file capture. This will terminate file capture and close the capture file.

### To pause and resume data capture:

- Press **F6** to temporarily stop data capture.
- Press **F6** to begin capturing data again.

### To stop data capture and close the capture file:

- Press **F5**.

#### Capture File Filtering Options

Option	Description
Omit	ASCII control codes are filtered out, not captured.
Map	Control codes are mapped to displayable characters in the capture file. For example, control code 1 is written as ^A, 2 as ^B, 3 as ^C, and so on.
Capture	No filtering. All characters received are written to the capture file if character translation is enabled (see "Character Translation between Code Pages" on page 35-24).

---

## Automating Datacomm Procedures

A **script file** enables you to automate a logon procedure. When you include a script file name as part of your configuration, the script is executed when a remote connection is made.

35

Here is a sample script file that would log Laurie Harrington on to her electronic mail system:

```
Hello |
{Enter your login name:}
L. Harrington |
{Enter your password:}
Cougar |
```

Once you know the remote system's procedure and requirements for logging on, you can create a script file using the Memo application. Here are the special script characters you can use when creating a script file:

## Special Characters for Script Files

Character	Description
{ ... }	The left and right curly braces are used to enclose a string of characters that comes from the remote system. A string in curly braces instructs the HP 100LX to wait until an exact match of that string is received and then continue with the script. If a matching string is not received within 30 seconds, the script quits execution.
^	Indicates that the uppercase character following it is a control character. For example, ^A represents control-A. (If you want to represent the character ^, use ^^ . If you want to represent control-^, use #1E.)
#	Interprets the two characters following it as the hex number to represent the corresponding 8-bit character. For example, #1E represents control-^ . (If you want to represent the character #, use ##.)
	Represents a carriage return.
~	Causes a 1-second pause.
@e	Turns echo pacing on. (Echo pacing requires the remote system to “echo” back each sent character before another one is sent.)
@n	Turns echo pacing off.
@b	Sends a break signal for 1 second.
@@	Sends a single @ character.
@f[path]	Sends the file identified by the DOS path <i>as is</i> —no characters are translated, including control characters. You must include the square brackets around the path, which includes the file name.









35

### Note











If you are communicating by modem, the first entries you put in the script should be a series of pauses to allow time for the remote system to answer the phone.

### To write and save a script file:

1. Press . If the Memo Editor screen is not blank, press    and respond to the Save changes? question to clear the screen.
2. Type the script file for logging onto the particular system using the script language in the table above. In some cases, the point where a script file can be effective is after the initial response from the information service is received. For example, an effective script file for logging onto CompuServe starts with a carriage return ( | ) that acknowledges the initial response, which can be CONNECT 2400.
3. Press   and type a file name with the extension .LCF. The file will be placed in the C:\\_DAT directory unless you specify another directory.
4. Press  .

### To use a script file while a Datacomm connection is active:

1. Complete your logon.
2. At the point in the connection process where you want your script file to take effect, press    , arrow to the script file you want, and press .
3. To cancel script file execution, press -BREAK (+.

---

## Transferring Files

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With an established connection to another computer, you can transfer files between your HP 100LX and that computer using XMODEM, YMODEM, ZMODEM, or Kermit protocols. You can also transfer files as straight ASCII text.

### Kermit



**Do not transfer multiple files using the Kermit protocol unless you move them to the default directory, C:\\_DAT.** If you move multiple files to another directory, the first file moved will be placed in that other directory, and the remaining files will be transferred to the default directory, C:\\_DAT.

---

---

**Note**

If you are connected to a PC equipped with the Connectivity Pack, part number HP F1021A, or if you want to transfer files with another cc:Mail user, use the file-transfer method designed for that purpose, located in either the Filer or the cc:Mail applications. See the Filer section “To copy or move files and directories using a split screen” on page 4-17, or the cc:Mail section “To attach MS-DOS files to your message” on page 34-13 for information.

---

**To prepare for file transfer:**

This procedure should be performed before transferring files by any of the five methods described in this Transferring Files section, XMODEM, YMODEM, ZMODEM, Kermit, or directly, as ASCII text.

---

**Note**

When X-, Y-, and ZMODEM transfer protocols are selected, Datacomm will automatically select 8 bits, no parity, and turn software flow control off. These automatically selected settings may cause problems on some communication networks. Previous values for these configuration settings are restored when the transfer is completed. Also, 57600 and 115,200 baud are not recommended for X-, Y-, and ZMODEM transfers.

---

1. Set the HP 100LX configuration settings as required by the remote system. See “Choosing and Saving New Configuration Settings” on page 35-7. Make sure you select a terminal emulation, choose other settings, and type entries that are compatible with the remote system. Inspect these dialog boxes:
  - Settings dialog box
  - Advanced dialog box
  - Phone Settings dialog box
2. Make a cable or modem connection to the remote system. See “Preparing Your Hardware” on page 35-2.

3. Ensure that the remote system, for a phone connection, has its modem set to auto-answer mode. To set a Hayes-compatible modem for auto-answer, and (for instance) to wait three rings before answering, enter the command `ATS0=3` (0 is zero). See the modem's manual.
4. In the HP 100LX's Datacomm, press **(F10)** to issue a connect command.

---

**To SEND a file TO a remote system using an XMODEM, YMODEM, ZMODEM, or Kermit protocol:****Note**

XMODEM does not allow multiple-file transfers. YMODEM, ZMODEM, and Kermit do allow transferring more than one file at a time using wildcards.

---

1. Complete the above procedure, "To prepare for file transfer."
2. From Datacomm's opening screen, press **(F10)** to connect to the remote system. The HP 100LX will inform you of a successful connection.
3. The remote system should specify the file transfer protocol, execute receive mode, and specify the path and file name of the file you're about to send.
4. Press **(MENU)** **(F)** **(P)** and arrow to the file transfer protocol the receiving system expects.
5. Press **(F10)**.
6. Press **(MENU)** **(F)** **(S)** and specify the file to send. Either tab and arrow to a directory and file name or type the path and file name in the File name text box.
7. Press **(F10)** to send a copy of the file.

---

**To RECEIVE a file FROM a remote system using an XMODEM, YMODEM, ZMODEM, or Kermit protocol:**

1. Complete the page 35-19 procedure, "To prepare for file transfer."
2. From Datacomm's opening screen, press **(F10)** to connect to the remote system. The HP 100LX will inform you of a successful connection.
3. The remote system should specify the file transfer protocol.
4. Press **(MENU)** **(F)** **(P)** and arrow to the file transfer protocol the remote system is using.



5. Press **F10**.
6. Press **MENU** **F** **R** and specify the file to receive. Either tab and arrow to a directory and file name or type the path and file name in the `File name` text box.
7. The remote system should execute send mode and specify the path and file name of the file you're about to receive. Transmission of a copy of the file begins immediately.

### To SEND a file TO a remote system using the Kermit protocol:

1. Complete the page 35-19 procedure, "To prepare for file transfer."
2. On the remote system, Kermit should be in Server mode.
3. In the HP 100LX's Datacomm, press **MENU** **F** **P** and arrow to `KERMIT`.
4. Press **F10**.
5. Press **MENU** **F** **S** and specify the file to send. Either tab and arrow to a directory and file name or type the path and file name in the `File name` text box. To send multiple files, use wildcards and press **ALT**+**S** to enable `Send All`.
6. Press **F10**.
7. When you're finished sending file copies, press **MENU** **C** **K** and arrow to `Finish with remote server`.
8. Press **F10**.
9. To end the Datacomm session, see "To end data communication" on page 35-15.

### To put the HP 100LX in server mode when using the Kermit protocol:

- In Datacomm, press **MENU** **D** **K** **F10**.

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### To GET a file FROM a remote system using the Kermit protocol:

1. Complete the page 35-19 procedure, "To prepare for file transfer."
2. On the remote system, Kermit should be in Server mode.
3. In the HP 100LX's Datacomm, press **MENU** **F** **K** and specify the file to get or, using wildcards, the several files to get.
4. Press **F10**.
5. When you're finished getting file copies, press **MENU** **C** **K** and arrow to `Finish with remote server`.
6. Press **F10**.
7. To end the Datacomm session, see "To end data communication" on page 35-15.

## To send a file from the HP 100LX as ASCII text without a protocol:

See the table below for explanations of the throttling and pacing commands available to you when sending ASCII text from the HP 100LX.

1. Complete the page 35-19 procedure, "To prepare for file transfer."
2. In the remote system, you might want to specify a capture file to contain the ASCII characters you'll be sending.
3. In the HP 100LX's Datacomm, press **MENU** **F** **P** and highlight **TEXT**.
4. Press **F10**.
5. Press **MENU** **F** **S** **ALT**+**T** to display the Text Settings dialog box.
6. To change throttling, type the number of milliseconds delay you want between transmitted characters. See the table below.
7. To change pacing, tab to **PACING:**, then arrow to your pacing choice. If you choose **String** or **Timed**, tab to the associated text box and type the string or the number of milliseconds. See the table below.
8. Type the path and name of the file to send, or tab to the file and directory lists, then arrow to highlight your path and file.
9. Press **F10** to send your file.
10. To end the Datacomm session, see "To end data communication" on page 35-15.






## Throttling and Pacing

Command	Description
Throttling	Sets the time delay between transmitted characters in milliseconds (0-1000). Throttling is used to slow transmission so that the HP 100LX does not overrun a "slow" remote system. The default value is 0 (no delay between characters). The Throttling setting is unaffected by the Pacing setting.
Pacing	Sets the pace of the transmission by causing the HP 100LX to wait for a pacing sequence from the remote system every time a new line character is sent. The Pacing settings to choose from are: <ul style="list-style-type: none"><li>■ <i>None</i>. No pacing—the HP 100LX transmits lines as fast as possible.</li><li>■ <i>CR</i> (Carriage Return). The HP 100LX waits for a carriage return from the remote system before sending the next line.</li><li>■ <i>String</i>. The HP 100LX waits for the specified string from the remote system before sending the next line.</li><li>■ <i>Timed</i>. The HP 100LX waits the specified number of milliseconds (0-1000) before sending the next line.</li></ul>

Throttling and Pacing work together in that characters are transferred at the throttling rate until a new line character is sent, at which point the next line of characters is not sent until the Pacing conditions are met. The Throttling and Pacing settings do not affect any Flow handshaking that's enabled (either XON-XOFF or Enq-Ack).

---

## Character Translation between Code Pages

If a remote system sending you information doesn't use the code page selected in the Setup application's International dialog box () (   ), you may need to translate some of the characters you receive. For instance, if the sending system transmitted character 150 on code page 860 (Ú) to your HP 100LX that was using code page 850, you probably would want to translate it into character 233 on code page 850 (Ů). A Character Translation Facility (CTF) file enables you to translate characters in similar situations into meaningful characters the HP 100LX can display and print.

You can create CTF files to translate files you receive from information services such as CompuServe.

---

### Note







CTF files do not translate characters when you use XMODEM, YMODEM, ZMODEM, or Kermit protocols or when you receive files as ASCII text.

---

### To enable character translation:

- To enable character translation, you need to create a CTF file and specify that file in your configuration settings. See "To create a CTF file" below and "To specify an existing Character Translation Facility remap file" on page 35-12.

### To create a CTF file:

1. Identify the characters causing the problem and determine their decimal or hexadecimal character numbers on both the HP 100LX and the remote system. (Appendix B contains the HP 100LX character sets.) Since the character sets on both the HP 100LX and the remote system may not share the same character, the receiving system may have to choose a character that is a close but not an exact match.
2. Press  to start Memo Editor.
3. See the sample CTF file shown below. Use this file as a guide as you write a new one, and follow the formatting rules and the table of CTF file commands that follow the sample CTF file.
4. Press   .

5. Type a name for your CTF file. Keep the C:\\_DAT path and .CTF extension.
6. Press **F10**.
7. Press **MENU** **Q**.

To use this CTF file, you must add it to your configuration file. See the procedure "To specify an existing Character Translation Facility remap file" on page 35-12.

### Sample CTF File.

```
# This is a partial codepage 850 to 860 translation.
# Values from codes 128 to 143 that need translation
# will be performed
# Codes received will display exact character matches
RADIX 10
RCONV 132 198
RCONV 134 181
RCONV 137 210
RCONV 139 214
RCONV 140 226
RCONV 142 199
RCONV 143 182
# Codes transmitted are nearest equivalent characters
TCONV 132 160
TCONV 134 131
TCONV 137 136
TCONV 139 161
TCONV 140 161
# End of example Character Translation File
```

### Formatting Rules Used in the Above Sample File

- You must start the file with the RADIX command.
- Each command must be on a line by itself. (Blank lines are ignored, so you can add them between commands to enhance readability.)
- At least one space is necessary between the command and each input. (Multiple blank spaces are ignored, so they can be used for additional readability.)
- Lines with just numbers assume the previous command.
- Lines starting with # are ignored and treated as comment lines.

## Descriptions of CTF File Commands

Command	Description
#	Indicates a comment line, which is ignored in the file.
RADIX	Indicates whether the numbers used as input for the rest of the commands are interpreted as decimal codes or hexadecimal codes. You must use either <code>RADIX 10</code> (decimal) or <code>RADIX 16</code> (hexadecimal). (The examples in this table assume <code>RADIX 10</code> .)
RCONV	<p>Specifies that a character received by the HP 100LX is to be converted to another character. It takes two inputs: the first number is the character code that should be translated, and the second is the code to be substituted.</p> <p>For example, using code page 850, <code>RCONV 36 156</code> causes character code 36 (\$) to be translated to 156 (£) when it's received.</p>
TCONV	<p>Specifies that an HP 100LX character is to be translated before it is transferred. It takes two inputs: the first number is the character code to be translated, and the second is the code to be substituted.</p> <p>For example, <code>TCONV 124 132</code> causes the HP 100LX "P" character (code 124 in code page 850) to be translated so that the receiving system gets code 132.</p>
RTCONV	<p>Combines related <code>RCONV</code> and <code>TCONV</code> commands by specifying both the receive and transmit conversions in a single command. It takes three inputs: the first number is the character code to translate when it's received by the HP 100LX; the second is the code to substitute for that character; and the third is the HP 100LX character to translate into the first number for transmission.</p> <p>For example, <code>RCONV 131 140</code> and <code>TCONV 140 131</code> can be combined into <code>RTCONV 131 140 140</code>. This command causes character code 131 to be translated into code 140 whenever it's received by an HP 100LX; and whenever the HP 100LX code 140 is to be transmitted, it is first converted back to code 131 for the remote system.</p> <p><b>Continued on next page.</b></p>

**Descriptions of CTF File Commands  
(continued)**

Command	Description
MTCONV	<p>Specifies that a keystroke is to be translated into multiple characters. It takes from 2 to 11 inputs, one key code to be translated and up to 10 codes of the characters into which the first key code is to be translated. Such a translation is used in special circumstances, such as mapping a single keystroke in the "erase field" sequence expected by an IBM protocol.</p> <p>Each of as many as 20 HP 100LX keystrokes may each be translated into as many as 10 characters.</p>

Before the settings in a CTF file become active, the file must be made part of the current configuration (see "To specify an existing Character Translation Facility remap file" on page 35-12). After the CTF file is added to current configuration file, the CTF file stays with the configuration file when that file is saved.



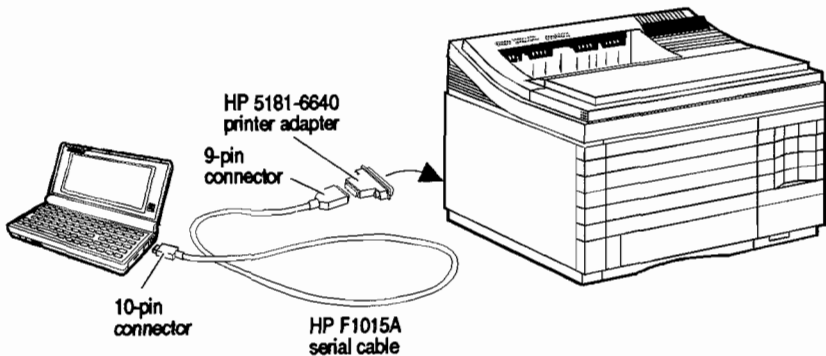


## Using a Printer with the HP 100LX

The HP 100LX has a built-in serial connector that enables you to connect and use a serial printer.

### Equipment You Need

- Your HP 100LX and a serial printer.
- One of the following serial cables:
  - The HP F1015A cable for IBM and IBM-compatible computers. This cable is also available as part of the HP F1023A Connector/Adapter Kit.
  - The HP F1016A cable for the Apple Macintosh.
- A serial printer adapter. (Available as part of the HP F1023A Connector/Adapter Kit—the printer adapter is the *white* adapter in the set. A serial-printer adapter may also come with your serial printer.)



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## Procedures for Using a Printer

If you are using a Kodak DICONIX 150 Plus printer, follow the procedure directly below. If you're using another printer, skip to the last procedure on page 36-3.

### To use a DICONIX 150 Plus Printer:

#### Caution



Use only the AC adapter that comes with the Kodak DICONIX Printer. The use of any other AC adapter can cause damage to the printer. Refer to the printer manual for more information.

---

#### 1. On the HP 100LX:

- a. Press **&...** **S** **MENU** **O** **P**.
- b. Arrow to 9600.
- c. Press **TAB** and arrow to Com1.
- d. Press **TAB** and arrow to Epson FX-80.
- e. Press **TAB** **TAB** **ENTER** **TAB**.
- f. Arrow to [-C-] and press **ENTER**.
- g. Arrow to \_DAT and press **ENTER**.
- h. Press **ALT**+**N** and type DICONIX.
- i. Press **F10** to save your configuration in C:\\_DAT\DICONIX.PCF.

#### 2. Turn the DICONIX printer off.

#### 3. On the printer, set the following switches:

- a. Set the main switches (panel A) as follows. (Note that switch 4 is moved up to support skip perforation mode.)

Switch #	1	2	3	4	5	6	7	8	9
Position	Down	Down	Down	Up	Down	Down	Down	Down	Down

- b. Set the switches of serial panel B as follows. (Note that switches 4 and 8 are moved up to select data length of 8 bits and XON/XOFF software handshaking.)

Switch #	1	2	3	4	5	6	7	8
Position	Down	Down	Down	Up	Down	Down	Down	Up

- c. Set the switches of serial panel C as follows. (Note that all switches are up to ignore hardware handshake lines.)

Switch #	1	2	3
Position	Up	Up	Up

- Turn the printer ON to activate these settings.
- Load paper into the printer.
- Connect the cable to the HP 100LX.
- Connect the DICONIX cable adapter to the HP serial cable. (For a DICONIX printer, you *should not* use the white HP printer adapter.)
- Connect DICONIX adapter to the printer.
- Print a text file from the HP 100LX to test the connection. (HP 100LX applications have their own print commands.)

### To use a printer compatible with Epson FX-80, HP LaserJet, or IBM ProPrinter:

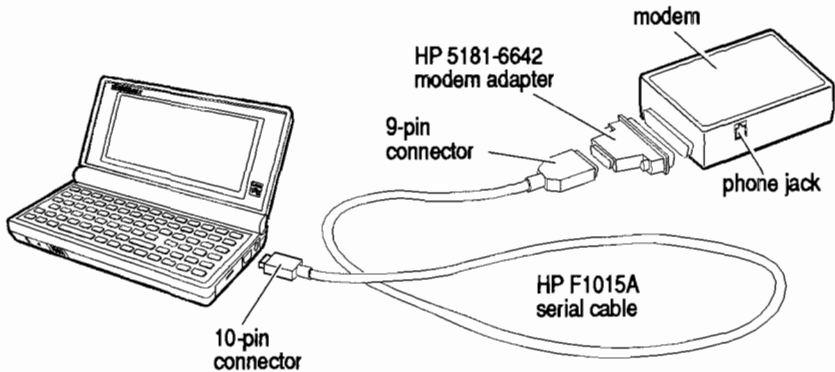
- Press **[&...]** **[S]** **[MENU]** **[O]** **[P]**.
- Press **[ALT]**+**[P]** and arrow to your choice of printer.
- Press **[F10]**.
- Connect the serial cable to the HP 100LX's serial port.
- Attach the HP 5181-6640 white printer adapter to the 9-pin connector of the cable and connect the adapter's other side to your printer.
- Your printer should now be able to print.



## Using a Modem with the HP 100LX

### Equipment You Need

- Your HP 100LX.
- A modem, either serial or card.
- For a serial modem only:
  - The HP F1015A cable (see the figure below) . This cable is available separately or as part of the HP F1021A Connectivity Pack.
  - A serial modem adapter. (Available as part of the HP F1023A Connector/Adapter Kit—the printer adapter is the *white* adapter in the set. A serial-modem adapter has a small telephone icon on it; also, the 9-pin modem adapter is *black* and the 25-pin modem adapter is *gray*.)



---

## Connecting to a Serial Modem

### To connect to a serial modem:

- Refer to your modem instructions to make the communications settings (baud rate, etc) on your modem agree with the communications settings in your HP 100LX application.
- Connect the modem adapter to your modem.
- Connect a phone line to your modem.
- Connect power to your modem.
- Connect the 9-pin end of the HP 1015A cable to the modem adapter.
- Connect the 10-pin end of the HP 1015A cable to the serial connector on your HP 100LX.

### To connect to WorldPort Modems:

The instructions that follow describe how to connect to any of three U.S. Robotics modems that can be powered either by battery or line voltage:

- WorldPort Palmtop Fax/Data (WorldPort 2400 Plus)
  - WorldPort 1200
  - WorldPort 2400 (serial number 50000 and up)
1. Connect the modem adapter to your modem.
  2. Connect a phone line to your modem.
  3. Connect power to your modem, unless you're using battery power.
  4. Connect the 9-pin end of the HP 1015A cable to the modem adapter.
  5. Connect the 10-pin end of the HP 1015A cable to the serial connector on your HP 100LX.

For more information or technical support on U.S. Robotics products, call 1-800-982-5151.

---

## Connecting to a Card Modem

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### Caution



Attempts to use an incompatible modem card may result in data loss. Before attempting to use a specific modem card, call 1-800-443-1254 for a current list of compatible modems.

---

### Batteries



- Use your AC adapter to power your HP 100LX whenever a card modem is plugged into your HP 100LX.
- Remove a modem card when not in use.

PCMCIA modem cards often have relatively high power requirements, so using battery power could cause early battery failure.










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An important difference between a serial modem and a card modem used with the HP 100LX is the way the ports to which they connect receive their port definitions. A serial modem plugs into a port that is hard-wired as Com1. A card modem plugs into a port that normally serves as drive A. For this plug-in slot to serve as Com2, a special TSR (Terminate and Stay Resident) program, CIC100, configures the slot and the just-inserted card modem as Com2.

The CIC100 program is included in a new HP 100LX, but it is not installed by default as a TSR program. You must install CIC100 as a TSR program before you can use a card modem. The following procedure tells you how to perform this installation.

### To prepare your HP 100LX for a card modem:

This procedure assumes neither an AUTOEXEC.BAT nor a CONFIG.SYS program is in C:\.

1. In the Filer, copy `D:\autoexec.bat` and `D:\config.sys` to `C:\`. See "To copy or move files and directories using a split screen" on page 4-17.
2. In the Memo Editor () , press   .
3. Type `*.*`, then press .
4. Arrow to `[-C-]` and press .
5. Press  + .
6. Arrow to `AUTOEXEC.BAT` and press .

7. Erase `Rem` from the line `Rem d:\bin\cic100 /gen 1.`
8. Press **(F10)** to save your edited file on `C:\`.
9. Press **(&...)** **(MENU)** **(A)** **(T)** **(ENTER)** to close all built-in applications including the System Manager.
10. Press **(CTRL)+(ALT)+(DEL)** to reboot the HP 100LX and to start CIC100 as a TSR.

## Using a Card Modem in the Plug-In Slot

When CIC100 is running and you insert a modem card into the plug-in slot, CIC100 will sense that a modem card has been inserted and will configure both card and slot as Com2. When the card modem is removed, CIC100 will sense that change also, and will redefine the slot for memory cards.

---

### Note



When HP 100LX power returns after power turns off during a communication session (after the display becomes blank), and if your communication program is running from the DOS prompt, you need to reconfigure the card modem by restarting the communication program.

This is why you need to restart your communications program in this situation: When HP 100LX power turns off, a card modem will lose power and therefore lose the configuration it received from any communications program running from the DOS prompt. Also, the plug-in port will revert to its earlier state: it expects a memory card. When power returns, the TSR program will redefine the card modem and the plug-in port as Com2, and the communication program will be at the same place it was at when power turned off. However, the card modem will remain without its configuration until you restart the communication program. It's as though you had switched off your Hayes modem while communicating with CompuServe, then switched it on again.

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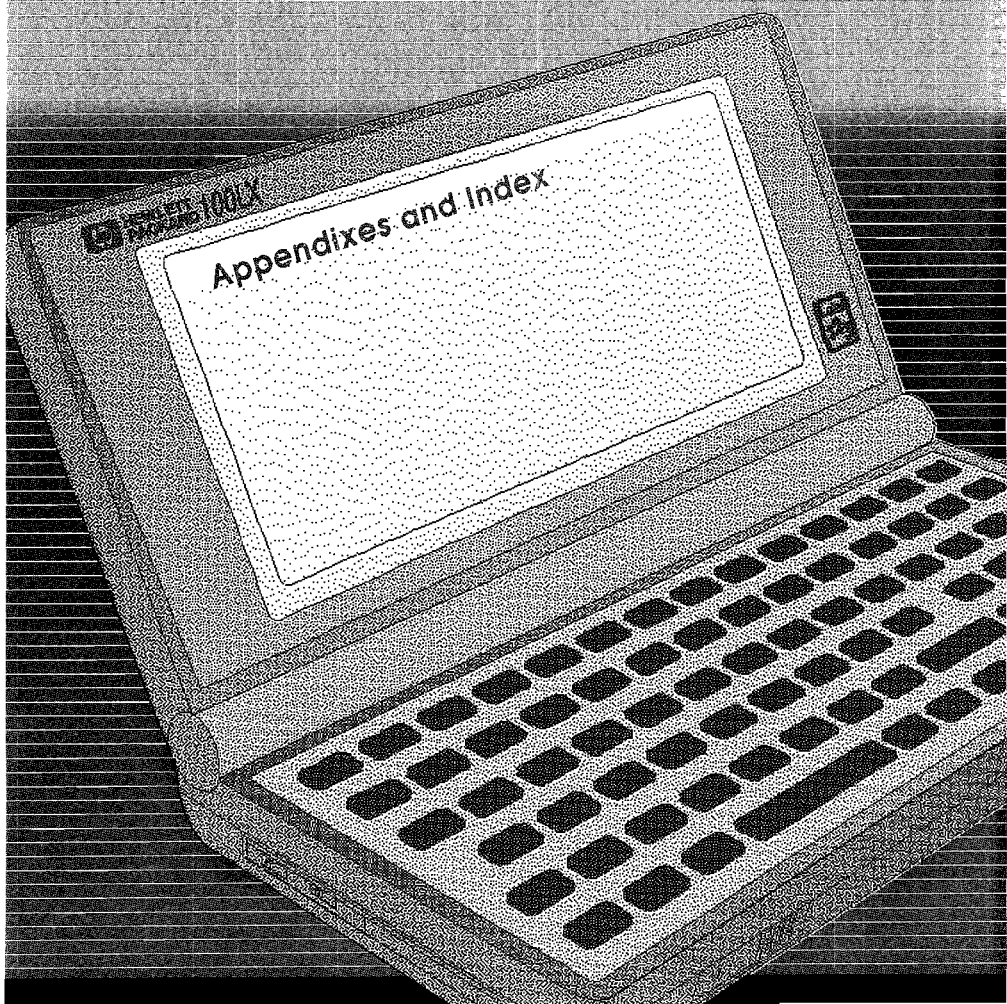
## Modem Example

### Example: Logging onto CompuServe

1. Connect your modem to the HP 100LX. See the previous procedures.
2. Press **&...** **C** to start the Datacomm application.
3. Press **MENU** **C** **S** **F7** **TAB** **F10** to select the COMPUSRV.DCF configuration file.
4. Press **F5** and type your area's CompuServe network access number for 2400 baud.
5. Press **F10** **F10** **F10**.
6. When the connection is made, CompuServe will ask you for your Host Name, your User ID, and your password. After entering this information, you'll have access to any of the CompuServe information services.



# PART 7





## Support, Batteries, and Service

---

### Customer Support

**In the United States.** If you have questions that this *User's Guide* doesn't answer (see the contents and index first), you can contact Hewlett-Packard's Mobile Computing Customer Support department at the address or phone number on the inside back cover of this manual.

**Outside the United States.** Your authorized Hewlett-Packard dealer is committed to provide full after-sale support. Authorized dealers are able to provide local, personal, and uniquely-responsive support, and they are backed by the full resources of Hewlett-Packard.

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### When to Replace Batteries

- When you see a low-battery message in the display, *replace the indicated batteries as soon as possible*. The message will refer to main batteries, the backup battery, or possibly a RAM card battery.
- Even if a low-battery message doesn't appear, replace the HP 100LX backup battery a year after you install it. When you install a fresh battery, set an appointment using the Appointment Book for 1 year from that date to remind you to replace it.

---

#### Caution



If the main batteries run completely down, the unit will draw power from the backup battery. In this condition the backup battery, depending on its charge, may last only a few days. Therefore, it's important to replace low batteries as soon as possible to avoid data loss.

## Battery Types

**HP 100LX Main Batteries.** Any brand of 1.5-volt, size AA Alkaline batteries. *Be sure that both batteries are of the same brand and type,* and always replace both batteries at the same time.

You can also use Nickel-Cadmium rechargeable batteries—see the next section, “Using Rechargeable Batteries,” for information.

**HP 100LX Backup Battery.** 3-volt CR2032 coin cell. If fresh main batteries are maintained, the backup battery should last a year before you replace it.

## About Battery Life

The battery life you get with your HP 100LX depends on several factors:

- The type and quality of batteries you use.
- How you use your HP 100LX. (Things like IR and serial communications, modems, and flash-disk memory cards all require higher current and therefore drain your batteries faster.)
- Whether you use the ac adapter.

For typical use without the ac adapter, fresh Alkaline batteries should last from 2 to 8 weeks. Rechargeable batteries used without the ac adapter will get less life than Alkalines—exactly how much less depends on the quality of the Nickel-Cadmium rechargeable batteries you use.

The best way to extend battery life is to use the ac adapter whenever possible. For more battery-saving tips see page 1-8.

---

## Using Rechargeable Batteries

You can reduce the cost and eliminate the waste of disposable batteries by using rechargeable batteries in your HP 100LX. Also, if you use the HP F1011A adapter, you can recharge them while they're inside the HP 100LX.

---

### Warning










**The HP 100LX recharging system was designed to operate only with Nickel-Cadmium rechargeable batteries. Because of potential hazards, we recommend that you do not use Nickel-Metal Hydride or other types of rechargeable batteries.**

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### To install rechargeable batteries:

Follow the instructions in the next section, "Changing Batteries."

### To charge rechargeable batteries inside the HP 100LX:


1. Connect the HP F1011A adapter to the HP 100LX and a power outlet.
  2. Press   to start the Setup utility.
  3. Press    to select the Battery Type dialog box.
  4. Use  to select the Nickel-Cadmium battery type.
  5. Tab to the recharging field and press  to select it.
- 

### Caution



Charging should be enabled only for Nickel-Cadmium rechargeable batteries. If you select it when Alkaline batteries are installed, permanent damage to your HP 100LX could result.

---

6. Press  when done. Now the batteries will be charged whenever the adapter is plugged in.

If you take out your rechargeable batteries, battery charging is automatically disabled. *It's good practice to go into Setup and verify your battery type and charging setting whenever you change batteries.*

Most Nickel-Cadmium rechargeable batteries will recharge in about 8 to 12 hours. Here are the charging rates for the HP adapter:

A

## HP F1011A Adapter Continuous Charge Rates

Time	Rate of Charging
The first 6 hours	100 mA
After 6 hours	45 mA

---

## Changing Batteries

### Caution



Do not remove the main batteries if the backup battery is dead—complete HP 100LX memory loss will result. Replace the backup battery first in this case.

---

### Warning



**Do not mutilate, puncture, or dispose of batteries in fire. The batteries can burst or explode, releasing hazardous chemicals. Replace batteries with only the types recommended in this manual. Discard used batteries according to the manufacturer's instructions.**

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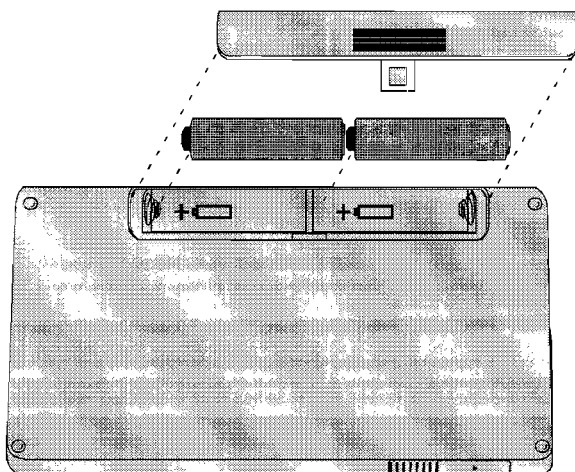
### To change the HP 100LX main batteries:

If you're installing rechargeable batteries, see the previous section, "Using Rechargeable Batteries," first.

1. Close all open applications before changing batteries.
2. **Important:** Turn the HP 100LX off and close the case.



3. Remove the battery cover and old batteries.



4. Install two fresh AA batteries, orienting them as shown by the symbols in the battery compartment.
5. Replace the cover and turn your HP 100LX on. If the HP 100LX won't turn on after you replace the batteries, go back over the procedure and check the orientation of the batteries as shown in step 3—you may have put the batteries in backwards.
6. If you replaced rechargeable batteries (either with Alkalines or another set of Nickel-Cadmium rechargeables) be sure to go into Setup and set or verify your battery type and charging setting.

#### To change the HP 100LX backup battery:

#### Caution

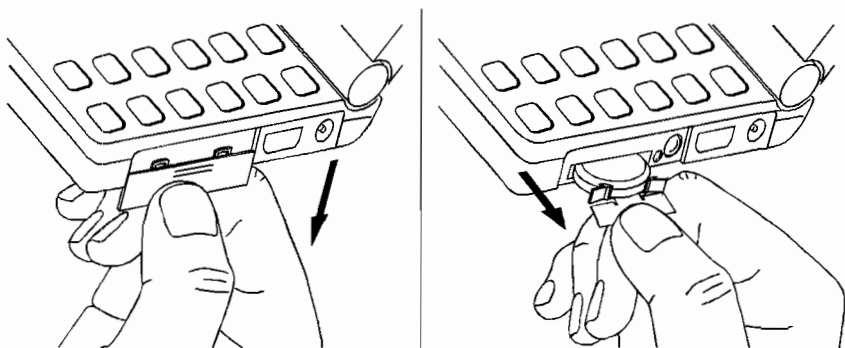


Do not remove both the main batteries and the backup battery at the same time—complete HP 100LX memory loss will result.

A

1. **Important:** Turn the HP 100LX off.

2. Remove the backup-battery cover and pull out the battery tray.



3. Remove the old battery from the tray and insert a fresh, 3-volt CR2032 coin cell. Be sure the “+” on the battery is facing down in the tray.
4. Insert the battery tray back into the HP 100LX and replace the cover.
5. Turn the HP 100LX on. If the battery-low message is still present in the display, go back over the procedure and check the battery orientation as shown in step 3—you may have put the battery in the tray upside down.

---

## AC Adapter Information

Because of special HP 100LX power requirements, you need to use the HP F1011A adapter, or one like it. This adapter is a regulated AC to DC converter with these specifications:

**A**

## DC Power Supply Output Specifications

Polarity:	Negative (center contact on adapter is ground, outer contact is positive)
Minimum voltage:	+9.6 V
Nominal voltage:	+12 V
Maximum voltage:	+14.4 V
Maximum current:	750 mA

Using this adapter whenever possible significantly extends battery life because the HP 100LX doesn't use battery power while the adapter is plugged in.

Also, the adapter can be used to recharge Nickel-Cadmium rechargeable batteries. See page A-3 for information, including the charge rate for the adapter.

---

## Environmental Limits for the HP 100LX and Plug-In Cards

To maintain product reliability, avoid getting the equipment wet and observe the following temperature and humidity limits for the HP 100LX and Hewlett-Packard plug-in cards:

- Operating temperature: 0° to 50°C (32° to 122°F).
- Storage temperature with data retention: 0° to 60°C (32° to 140°F).
- Operating and storage humidity: 90% relative humidity at 40°C (104°F) maximum.

You will likely lose data below 0°C (32°F), but you can have storage temperatures down to -20°C (-4°F) without damaging the hardware.

**A**

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## Testing HP 100LX Operation

If you suspect that your HP 100LX is not working properly, you should first install fresh batteries as described earlier in this appendix. Then, if the problem still exists, try resetting the machine as described in “Resetting Your HP 100LX” in chapter 1. If both of these procedures fail to alleviate the problem, you should run a series of diagnostic tests called the **self test**.

---

### Caution



Before you run the self test, close all applications, saving any changes you've made. The self test causes a system reset to occur, so files or changes to files not already saved will be lost when you run it.

---

To run the self test:

1. Press **OFF** to turn the unit off.
  2. Hold down the **(ESC)** key, press and release **(ON)**, and then release **(ESC)**. This displays the self-test screen.
- 

### Note



The self-test screen contains several messages and test options that are useful only to factory or service personnel. If you accidentally start one of these test options, press **(←)** to terminate the test.

---

3. Start the series of tests by pressing the spacebar followed by **(ENTER)**. *Do not press any keys during the tests.* Your HP 100LX will cycle through all the tests listed in the display except the Keyboard test.
  - Except for the Serial Port test and possibly the Plug-in test, **OK** will appear next to each test as it is passed. The Plug-in test will display **No card** if one is not present, and the Serial Port test will display **No loop**.
  - If the term **Bad** appears next to any of the tests, repeat steps 1 through 3 above to see if the message is duplicated. If the **Bad** message is duplicated, your unit probably requires service. See “If Your HP 100LX Requires Service” later in this appendix for instructions.
4. When the tests are finished, exit the self-test screen by pressing **(ESC)**.

---

## Limited One-Year Warranty

### What Is Covered

*The HP 100LX (except for the batteries, or damage caused by the batteries) and HP 100LX accessories are warranted by Hewlett-Packard against defects in materials and workmanship for one year from the date of original purchase. If you sell your unit or give it as a gift, the warranty is automatically transferred to the new owner and remains in effect for the original one-year period. During the warranty period, we will repair or, at our option, replace at no charge a product that proves to be defective, provided you return the product, shipping prepaid, to a Hewlett-Packard service center. (Replacement may be made with a newer model of equal or better functionality.)*

This warranty gives you specific legal rights, and you may also have other rights that vary from state to state, province to province, or country to country.

### What Is Not Covered

*Batteries, and damage caused by the batteries, are not covered by the Hewlett-Packard warranty. Check with the battery manufacturer about battery and battery leakage warranties.*

This warranty does not apply if the product has been damaged by accident or misuse or as the result of service or modification by other than an authorized Hewlett-Packard service center.

No other express warranty is given. The repair or replacement of a product is your exclusive remedy. **ANY OTHER IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS IS LIMITED TO THE ONE-YEAR DURATION OF THIS WRITTEN WARRANTY.** Some states, provinces, or countries do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. **IN NO EVENT SHALL HEWLETT-PACKARD COMPANY BE LIABLE FOR CONSEQUENTIAL DAMAGES.** Some states, provinces, or countries do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

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Products are sold on the basis of specifications applicable at the time of manufacture. Hewlett-Packard shall have no obligation to modify or update products, once sold.

### **Consumer Transactions in Australia and the United Kingdom**

The above disclaimers and limitations shall not apply to consumer transactions in Australia and the United Kingdom and shall not affect the statutory rights of consumers.

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## **If Your HP 100LX Requires Service**

Hewlett-Packard maintains service centers in many countries. These centers will, at HP's option, repair a unit or replace it with the same model or one of equal or better functionality, whether it is under warranty or not. There is a service charge for service after the warranty period.

---

### **Note**



If the contents of your HP 100LX's memory are important, you should back up the memory on a plug-in memory card, another HP 100LX, or a PC before sending the unit in for repair.

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**In the United States.** Call the Customer Support telephone number listed on the inside of the back cover. *Do not ship the unit for service without first contacting a Hewlett-Packard office.*

**In Europe.** Contact your Hewlett-Packard dealer or sales office for the location of the nearest service center. *Do not ship the unit for service without first contacting a Hewlett-Packard office.*

**In Other Countries.** Contact your Hewlett-Packard dealer or sales office for the location of other service centers.

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## Service Charge

Contact your local Hewlett-Packard Service Center for information about the out-of-warranty repair charge for your area.

Products damaged by accident or misuse are not covered by the fixed charges. These charges are individually determined based on time and material.

## Shipping Instructions

If HP or your authorized dealer determine that your HP 100LX requires service, follow these instructions before shipping the unit:

- Contact your local service center for instructions (in the U.S. call the Customer Support phone number on the inside of the back cover).
- Include your return address and a description of the problem.
- Include proof of purchase date if the warranty has not expired.
- Include a purchase order, check, or credit card number plus expiration date (VISA or MasterCard) to cover the standard repair charge.
- Ship your unit postage *prepaid* in adequate protective packaging to prevent damage. Shipping damage is not covered by the warranty, so we recommend that you insure the shipment.

## Warranty on Service

Service is warranted against defects in materials and workmanship for 90 days from the date of service.

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## HP Marketing Headquarters Outside the U.S.

Should you need to contact Hewlett-Packard, check your local telephone directory for the HP Sales and Service Office near you. If you cannot locate an HP office, contact one of the Worldwide HP Marketing Headquarters listed here.

### ASIA

Far East Sales Region Hdqtrs  
Hewlett-Packard Asia Ltd.  
22nd Floor  
West Tower, Bond Centre  
GPO Box 863  
Hong Kong

### LATIN AMERICA

Hewlett-Packard Latin Am. Hdqtrs  
Monte Pelvoux 111  
Lomas de Chapultepec  
11000 Mexico D.F.

### EUROPE

European Operations Hdqtrs  
Hewlett-Packard S.A.  
150, route du Nant-d'Avril  
P.O. Box CH 1217 Meyrin 2  
Geneva, Switzerland

### OTHER AREAS

Intercon Operations Hdqtrs  
Hewlett-Packard Company  
3495 Deer Creek Road  
P.O. Box 10495  
Palo Alto, CA 94303-0896  
USA



## HP 100LX Character Set

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This appendix contains tables defining your HP 100LX character set as well as instructions for generating special characters.

The English version of the HP 100LX supports code pages 850 and 437.

- The built-in applications, except 1-2-3, and System-Manager-compliant applications (see chapter 5 for a description) use code page 850.
- 1-2-3 uses LICS, the Lotus International Character Set. Most LICS characters are included in code page 850; the few that are not included will not display on the HP 100LX. For more information about LICS, including a table of LICS characters, see appendix C.
- Any DOS applications you load and run will by default use code page 437. If an application requires code page 850, you can select it using the Setup Utility (see page 3-14).

---

### Character Set Tables

The following two pages contain the 437 and 850 code-page tables.

## 437 English

0	32	64 @	96 '	128 Ç	160 á	192 L	224 α
1 ☺	33	65 A	97 a	129 ü	161 í	193 ⊥	225 β
2 ☉	34 "	66 B	98 b	130 é	162 ó	194 T	226 Γ
3 ♥	35 #	67 C	99 c	131 â	163 ú	195	227 Π
4 ♦	36 \$	68 D	100 d	132 ä	164 ñ	196 -	228 Σ
5 ♣	37 %	69 E	101 e	133 à	165 Ñ	197 +	229 σ
6 ♠	38 &	70 F	102 f	134 á	166 ¢	198	230 μ
7 •	39 '	71 G	103 g	135 ç	167 ¢	199	231 γ
8 ■	40 (	72 H	104 h	136 ê	168 ¢	200 ll	232 Φ
9 ○	41 )	73 I	105 i	137 ë	169 □	201 ¶	233 Θ
10 □	42 *	74 J	106 j	138 è	170 □	202 ±	234 Ω
11 ♂	43 +	75 K	107 k	139 ï	171 1/2	203 ∞	235 δ
12 ♀	44 ,	76 L	108 l	140 †	172 1/4	204	236 ∞
13 ♪	45 -	77 M	109 m	141 ì	173	205 =	237 Ø
14 ♫	46 .	78 N	110 n	142 Å	174 <	206 †	238 €
15 ✱	47 /	79 O	111 o	143 Ä	175 >	207 ±	239 ∩
16 ▶	48 0	80 P	112 p	144 É	176 ▒	208 ±	240 ≡
17 ◀	49 1	81 Q	113 q	145 æ	177 ▒	209 ±	241 ±
18 ↕	50 2	82 R	114 r	146 Æ	178 ▒	210 ±	242 ≥
19	51 3	83 S	115 s	147 ð	179	211 ll	243 ≤
20 ¶	52 4	84 T	116 t	148 ð	180	212 ll	244 Γ
21 §	53 5	85 U	117 u	149 ð	181	213 F	245 J
22 ■	54 6	86 V	118 v	150 ù	182	214 ¶	246 +
23 ↕	55 7	87 W	119 w	151 ù	183	215 †	247 ≈
24 ↑	56 8	88 X	120 x	152 ÿ	184 ¶	216 †	248 °
25 ↓	57 9	89 Y	121 y	153 Ö	185	217 J	249 .
26 →	58 :	90 Z	122 z	154 Ü	186	218 ¶	250 •
27 ←	59 ;	91 [	123 {	155 ø	187 ¶	219 ■	251 √
28 ⊥	60 <	92 \	124	156 £	188 J	220 ■	252 n
29 ↔	61 =	93 ]	125 }	157 ¥	189 J	221 ■	253 ²
30 ▲	62 >	94 ^	126 ~	158 Pt	190 J	222 ■	254 ■
31 ▼	63 ?	95 _	127 □	159 f	191	223 ■	255

B

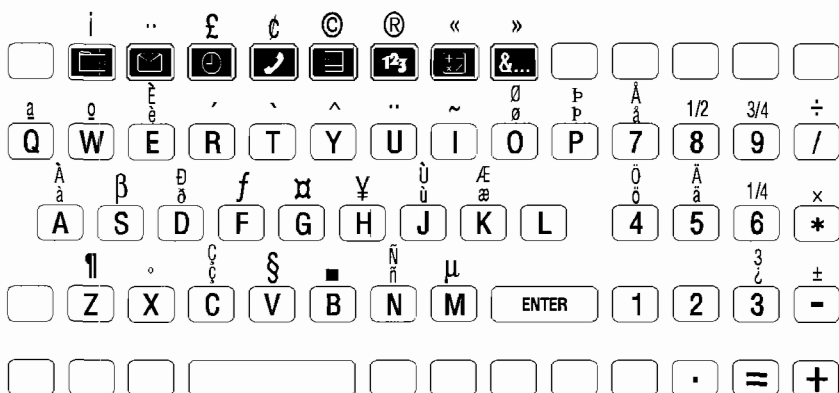
## 850 Multilingual (Latin I)

0	32	64 @	96 `	128 Ç	160 á	192 L	224 Ó
1 ☺	33 l	65 A	97 a	129 ù	161 í	193 Ł	225 b
2 ☼	34 ¨	66 B	98 b	130 é	162 ó	194 T	226 Ô
3 ♥	35 #	67 C	99 c	131 â	163 ú	195 †	227 Ò
4 ♦	36 \$	68 D	100 d	132 ã	164 ñ	196 -	228 õ
5 ♣	37 %	69 E	101 e	133 à	165 Ñ	197 +	229 Õ
6 ♠	38 &	70 F	102 f	134 á	166 ¢	198 ã	230 m
7 •	39 ´	71 G	103 g	135 ç	167 ¢	199 Ã	231 ð
8 ◼	40 (	72 H	104 h	136 ê	168 ĵ	200 L	232 Þ
9 ◊	41 )	73 I	105 i	137 ë	169 ©	201 P	233 Ú
10 ◻	42 *	74 J	106 j	138 è	170 ¬	202 ∞	234 Û
11 ♂	43 +	75 K	107 k	139 ĩ	171 1/2	203 ∞	235 Ü
12 ♀	44 ,	76 L	108 l	140 ï	172 1/4	204 †	236 ý
13 ♪	45 -	77 M	109 m	141 ï	173	205 =	237 Ý
14 🎵	46 .	78 N	110 n	142 Æ	174 «	206 †	238 -
15 *	47 /	79 O	111 o	143 Å	175 »	207 ☒	239 ´
16 ▶	48 0	80 P	112 p	144 É	176 ☒	208 δ	240 -
17 ◀	49 1	81 Q	113 q	145 æ	177 ◼	209 Ð	241 ±
18 ↕	50 2	82 R	114 r	146 Æ	178 ◼	210 Ê	242 =
19	51 3	83 S	115 s	147 ð	179	211 Ë	243 3/4
20 ¶	52 4	84 T	116 t	148 ð	180 †	212 È	244 ¶
21 §	53 5	85 U	117 u	149 ð	181 Á	213 I	245 §
22 ▣	54 6	86 V	118 v	150 ù	182 Â	214 Í	246 ÷
23 ⚡	55 7	87 W	119 w	151 ù	183 À	215 Î	247 -
24 ↑	56 8	88 X	120 x	152 ý	184 ©	216 Ī	248 °
25 ↓	57 9	89 Y	121 y	153 Ò	185 †	217 J	249 -
26 →	58 :	90 Z	122 z	154 Û	186	218 Γ	250 •
27 ←	59 ;	91 [	123 {	155 ø	187 ¶	219 ◼	251 1
28 L	60 <	92 \	124	156 £	188 ¶	220 ◼	252 3
29 ↔	61 =	93 ]	125 }	157 Ø	189 ¢	221 †	253 2
30 ▲	62 >	94 ^	126 ~	158 ×	190 ¥	222 Ì	254 ◼
31 ▼	63 ?	95 _	127 ◻	159 f	191 ¬	223 ◼	255

## Generating Special Characters

There are two primary ways to generate special characters:

- By holding down **ALT**, then holding down **MENU**, and then typing a character code. For example, in the code-page 850 table on the previous page you can see that the character code for the ® symbol is 169. So, to generate ® on your HP 100LX, you would press and hold down **ALT**, press and hold down **MENU**, and then type 169.
- By pressing **Fn** and then another key. For example, pressing **Fn** **Q** generates £. Many, but not all special characters in the HP 100LX character set can be generated this way. Here is the keyboard with those available for code-page 850:



Note that a few keys have shifted **Fn** definitions in addition to regular **Fn** definitions. For example, pressing **Fn** **5** generates ä, while pressing **Fn** **5** generates Å.

**Generating Accented Characters.** The keys **R**, **T**, **Y**, **U**, and **I** represent accent marks when used with the **Fn** key. When you press one of these keys, it prepares the HP 100LX to generate an accented form of the next key you press. For example, pressing **Fn** **Y** followed by **O** generates ô.

## Lotus International Character Set (LICS)

---

1-2-3 uses the Lotus International Character Set to display, store, and print characters. You can use LICS codes to enter text characters that are not on your keyboard.

There are 256 LICS codes (decimal codes 0 through 255) that are divided into three groups:

- Codes 0 through 31 represent control characters and not LICS characters. Although these control characters are used internally by 1-2-3, general use of these characters in the worksheet is not supported.
- Codes 32 through 127 represent the ASCII characters 32 through 127. They are shown in the first table in this appendix, "Standard ASCII Characters."
- Codes 128 through 255 represent various international characters and special symbols, such as £ (British pound) and  $\pi$  (pi). These are listed in the second table in this appendix, "International Characters and Special Symbols."

---

### Displaying and Printing LICS Characters

If your HP 100LX cannot display a LICS character, or if your printer cannot print a LICS character, the HP 100LX uses a **fallback presentation** for that character. The fallback presentation represents the LICS character as closely as possible using characters that are available on your monitor or printer. For example, if you use the © symbol and your printer cannot print it, the HP 100LX might display (c) or c as the fallback presentation (depending on the capabilities of your printer).

---

## Entering LICS Characters

There are four ways to include a LICS character in a text entry. The method you use depends on the specific LICS character you want to enter.

- You can enter any LICS character using the 1-2-3 @CHAR function and the LICS code for the character, as described in the following section “Using @CHAR.”
- You can enter many LICS characters using compose sequences, as described later in this appendix in “Using Compose Sequences.” The tables in this appendix list the compose sequences for the characters that have them.
- You can enter the LICS characters that represent standard ASCII characters (codes 32 through 127) by pressing the appropriate character key on your keyboard.

### Using @CHAR

@CHAR(*x*) returns the character that the LICS code *x* produces. You can enter any LICS character in the worksheet using the @CHAR function and the LICS code for the character. For example, the LICS code for © is 169 (taken from the “International Characters and Special Symbols” table). To enter © in a worksheet, type @CHAR(169) and press **ENTER**.

If you want to combine a LICS character with other text, however, you must use the @CHAR function in a string formula. For more information on the @CHAR function, see @CHAR in chapter 10.

### Using Compose Sequences

A compose sequence is a series of keystrokes you use in combination with the COMPOSE key (**ALT-F1**) in most HP 100LX applications) to enter a LICS character. The tables in this appendix list the compose sequences for the characters that have them. You enter one of these characters by pressing COMPOSE (**ALT-F1**) and then typing the sequence of keystrokes listed for that character. For example, to enter the character £ (British pound) in a cell, look up the compose sequence for £ in the “International Characters and Special Symbols” table. You will find the compose sequence is L=.

Press COMPOSE (**ALT**-**F1**), type L=, and press **ENTER** to complete the entry.

You can use this technique to combine LICS characters with other text in a label.

---

## Printing Characters That Are Not in LICS

If your printer has full backspacing capability, you can use the merge character, COMPOSE (**ALT**-**F1**)  $\text{m}\text{g}$ , to print characters that are not in LICS. Essentially, a merge character tells 1-2-3 to overstrike one character on another. After printing the first character you specify, 1-2-3 prints a backspace (or the equivalent), and then prints the next character you specify. For example, to create a z with an acute accent, you would type z, press COMPOSE (**ALT**-**F1**), and type  $\text{m}\text{g}$  ' —mg is the merge character and ' (apostrophe) is the character you want 1-2-3 to overstrike on the z.

You can also use the merge character to underline a character. For example, suppose you want to enter the word LOTUS in a 1-2-3 cell and underline each letter:

1. Move the cell pointer to the cell where you want to enter the label.
2. Type L, press COMPOSE (**ALT**-**F1**), and type  $\text{m}\text{g}$  \_.
3. Type O, press COMPOSE (**ALT**-**F1**), and type  $\text{m}\text{g}$  \_.
4. Type T, press COMPOSE (**ALT**-**F1**), and type  $\text{m}\text{g}$  \_.
5. Type U, press COMPOSE (**ALT**-**F1**), and type  $\text{m}\text{g}$  \_.
6. Type S, press COMPOSE (**ALT**-**F1**), and type  $\text{m}\text{g}$  \_.
7. Press **ENTER** to complete the label.

---

### Note



Although you can overstrike any printable character with any other, the result may not always look the way you expected.

# LICS Tables

## Standard ASCII Characters

The following table defines LICS codes 32 through 127, which represent standard ASCII characters. It also lists all possible compose sequences. (For information on compose sequences, see “Entering LICS Characters” earlier in this appendix.)

LICS Code	Character	Compose Sequence	LICS Code	Character	Compose Sequence
32	space		56	8	
33	!		57	9	
34	”		58	:	
35	#	++	59	;	
36	\$		60	<	
37	%		61	=	
38	&		62	>	
39	,		63	?	
40	(		64	@	aa or AA
41	)		65	A	
42	*		66	B	
43	+		67	C	
44	,		68	D	
45	-		69	E	
46	.		70	F	
47	/		71	G	
48	0		72	H	
49	1		73	I	
50	2		74	J	
51	3		75	K	
52	4		76	L	
53	5		77	M	
54	6		78	N	
55	7		79	O	

C



LICS Code	Character	Compose Sequence	LICS Code	Character	Compose Sequence
80	P		104	h	
81	Q		105	i	
82	R		106	j	
83	S		107	k	
84	T		108	l	
85	U		109	m	
86	V		110	n	
87	W		111	o	
88	X		112	p	
89	Y		113	q	
90	Z		114	r	
91	[		115	s	
92	\		116	t	
93	]		117	u	
94	^		118	v	
95	_		119	w	
96	'		120	x	
97	a		121	y	
98	b		122	z	
99	c		123	{	(-
100	d		124		~/
101	e		125	}	)-
102	f		126	~	—
103	g		127	delete	

## International Characters and Special Symbols

The following table defines LICS codes 128 through 255, which represent international characters and special symbols. It also lists all possible compose sequences. (For information on compose sequences, see “Entering LICS Characters” earlier in this appendix.)

### Note



Certain characters in the table are either uppercase or lowercase—(UC) or (LC) are added to denote case where appropriate. Also, unknown characters are shown as ■.

C

LICS Code	Character	Compose Sequence	LICS Code	Character	Compose Sequence
128	` (UC)	' spacebar	166	Peseta	PT pt or Pt
129	^ (UC)	^ spacebar	167	§	SO so So or s0
130	^ (UC)	^ spacebar	168	☒	XO xo Xo or x0
131	" (UC)	" spacebar	169	©	CO co Co or c0
132	~ (UC)	~ spacebar	170	₳	a_ or A_
133	■		171	≪	< <
134	■		172	Δ	dd or DD
135	■		173	π	PI pi or Pi
136	■		174	≥	>=
137	■		175	÷	:-
138	■		176	°	^0
139	■		177	±	+ -
140	■		178	²	^2
141	■		179	³	^3
142	■		180	"	"v
143	■		181	μ	/u
144	` (LC)	spacebar ' (LC)	182	¶	!P or !p
145	^ (LC)	spacebar ^ (LC)	183	·	^.
146	^ (LC)	spacebar ^ (LC)	184	™	TM Tm or tm
147	" (LC)	spacebar " (LC)	185	¹	^1
148	~ (LC)	spacebar ~ (LC)	186	⊖	o_ or O_
149	₁	i spacebar	187	⋇	> >
150	₋ (ordinal)	_ spacebar	188	¼	14
151	▲	ba	189	½	12
152	▼	ea	190	≤	=<
153	■		191	¿	? ?
154	hard space	spacebar spacebar	192	À (UC)	A'
155	←	mg	193	Á (UC)	A'
156	■		194	Â (UC)	A^
157	■		195	Ã (UC)	A~
158	■		196	Ä (UC)	A"
159	■		197	Å (UC)	A*
160	Guilder	ff	198	Æ (UC)	AE
161	¡	!!	199	Ç (UC)	C,
162	¢	c  C  c/ or C/			
163	£	l= L= l- or L-			
164	“	”^			
165	Yen	Y= y= Y- or y-			

C

LICS Code	Character	Compose Sequence	LICS Code	Character	Compose Sequence
200	È (UC)	E'	228	ä (LC)	a''
201	É (UC)	E'	229	â (LC)	a*
202	Ê (UC)	E^	230	æ (LC)	ae
203	Ë (UC)	E''	231	ç (LC)	c,
204	Ì (UC)	I'	232	è (LC)	e'
205	Í (UC)	I'	233	é (LC)	e'
206	Î (UC)	I^	234	ê (LC)	e^
207	Ï (UC)	I''	235	ë (LC)	e''
208	Ð (UC)	D-	236	ì (LC)	i'
209	Ñ (UC)	N^	237	í (LC)	i'
210	Ò (UC)	O'	238	î (LC)	i^
211	Ó (UC)	O'	239	ï (LC)	i''
212	Ô (UC)	O^	240	đ (LC)	d-
213	Õ (UC)	O^	241	ñ (LC)	n^
214	Ö (UC)	O''	242	ò (LC)	o'
215	OE ligature (UC)	OE	243	ó (LC)	o'
216	Ø (UC)	O/	244	ô (LC)	o^
217	Ù (UC)	U'	245	õ (LC)	o^
218	Ú (UC)	U'	246	ö (LC)	o''
219	Û (UC)	U^	247	oe ligature (LC)	oe
220	Ü (UC)	U''	248	ø (LC)	o/
221	Ý (UC)	Y''	249	ù (LC)	u'
222	Ë (UC)	P-	250	ú (LC)	u'
223	β (LC)	ss	251	û (LC)	u^
224	à (LC)	a'	252	ü (LC)	u''
225	á (LC)	a'	253	ÿ (LC)	y''
226	â (LC)	a^	254	Ɔ (LC)	p-
227	ã (LC)	a^	255	■	



## The Subset Selection Language

---

### Viewing Subsets

Using your own criteria, you can define and display a subset of a database (Phone Book, Notetaker, World Time, or Database) record list. The `Subset` function (or View Subset command) brings up a list of predefined subsets. From here, the function `Define` displays the Define Subset screen to define a new subset. This screen has a `General` function for more advanced subset definitions using the Subset Selection Language (SSL).

### Using the Define Subset Screen

The `Subset` function `Define` displays a Define Subset template containing the same fields as those for a record (phone, note, city, or other data record). You can define a subset by entering selection criteria into specific fields.

If the subset definition has selection criteria in more than one field, then a record must meet *all* the criteria in order to qualify for the subset. (The criteria are ANDed.)

## Field Selection Criteria Define Subset Screen

Definition in Field	Values That Qualify
empty	Any value in this field.
<i>value</i>	If this field contains the given value.
* <i>value</i>	If <i>any</i> field contains the given value.
<i>value, value</i>	If this field contains <i>either</i> of the given values.
<i>value&amp;value</i>	If this field contains <i>both</i> of the given values.
- <i>value</i>	If this field <i>does not</i> contain the given value.
= <i>value</i>	If this field <i>exactly</i> matches the given value, with no extra characters. For example, =red will <i>not</i> match red and green or red;green.
< <i>value</i>	If this field has one of these unequal relations with the given value.
<= <i>value</i>	
> <i>value</i>	
>= <i>value</i>	
<> <i>value</i>	

The following subset definition will find and display all Phone Book records that contain either (or both) of the area codes 213 and 310:

Define Subset

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

Phone: Business  Home: \_\_\_\_\_

Alternate: \_\_\_\_\_ Fax: \_\_\_\_\_

Title: \_\_\_\_\_ Category: \_\_\_\_\_

Company: \_\_\_\_\_

Address1: \_\_\_\_\_

Address2: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Note: \_\_\_\_\_

Help | General | Cancel | OK

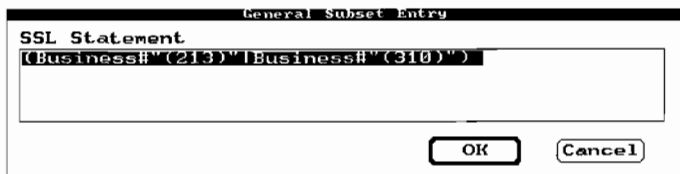
**A Define Subset Screen**

Compare this specification with the SSL statement shown in the next figure. They have the same meaning.

**D**

## Using a More General Subset Definition

The **General** function (**F2** in the Define Subset screen) lets you use the Subset Specification Language (SSL) to create subset criteria as command statements that are too complex for the Define Subset screen (such as comparing values in different fields).



An SSL Statement

### To see the SSL statement for a subset specification:

1. Press **F6** **F2** (Subset Define) and fill out the template, or press **F6** **F4** (Subset Edit) for an existing subset definition.
2. Press **F2** (General) if available.

---

## SSL Syntax

SSL statements use relational operators and Boolean operators to select records for the subset. Spaces around operators are optional.

### Relational Operators

Relational operators test the relationship between two arguments. The test usually compares a field (by its field name) with some value, but it can also compare two fields. The test is case-insensitive. If the test result is true, then the record being tested passes the filter.

D

## Arguments for Relational Tests

Argument	Description
<i>Fieldname</i>	The field name must match the field name given in the record's template. If the field name has any non-alphanumeric characters, the name must be enclosed in { }. You can test any field with a relational operator <i>except</i> those with check boxes and option buttons.
<i>Value</i>	There are three types of values: strings (enclosed in ""), numbers, and others (enclosed in { }). Other-type values are times, dates, and application-defined data types.

If a field and a value are compared, they must be of the same type (string, number, date, etc.).

## Relational Operators

Operator	Meaning	Example
=	Does field match exactly another field or value?	City="Boston" Home=Business
<>	Does field <i>not</i> match exactly another field or value?	Score<>0
<, <=	Is field less than or equal to the value?	Date<{10/12/92} Income<=25000
>, >=	Is field greater than or equal to the value?	{Start Time}>{12:00a} Latitude>=0
->	Is the field a member of the given set of strings? The set is either the given values or a range of values. A range is two values separated by .. Includes boundary values.	State->"MI", "OH" Zip->"97000".."97999"
#	Does the field contain the given value?	Phone#"(503)" Note#"Cougar"
!field#	Does the field <i>not</i> contain the given value?	!City#"Detroit"

D



**Testing Check Boxes and Option Buttons.** Although check boxes and option buttons are not operators, their states (on/off) can be tested to yield a Boolean result (true/false). For example, Enabled tests whether the Enabled check box (for an alarm) is checked.

## Boolean Operators

Boolean operators act on relational operations to negate, extract, or combine results when filtering records to create a subset. If a test result is true, then the record being tested passes the filter. Boolean operators have lower precedence than relational operators.

### Boolean Operators (in order of precedence)

Operator	Example	Selects Record If:
! (NOT)	!Phone# " (503) " !Enabled	Phone field does <i>not</i> contain (503). The alarm is <i>not</i> enabled.
& (AND)	State="VA" & City<> "Richmond"	State is VA but City is <i>not</i> Richmond.
(OR)	State="HI"   State="AK"	State is either HI or AK.

### To apply an operation on a string to any field:

- Use \*"*string*" to select records containing the specified string.

For example, to select (for a subset) all phone records with the dialing prefix 750 in any field, enter the SSL statement \*"750".

## Comparison of SSL and Define Subset Screen

Define Subset screens are translated internally to SSL statements for interpretation of the subset criteria. The following table compares the two methods of subset definition: using the Define Subset screen and using the **General** function (SSL statement) to define some subset criteria in the Category field. (SSL statements may include parentheses to clarify order of operation.)

D

### Examples Comparing Define Subset and SSL in Definitions for the Category Field

Define Subset	SSL Statement	Selects Record If:
red,green	Category#"red"   Category#"green"	Category field contains <b>red</b> or <b>green</b> or both.
-red	! Category#"red"	Category field does <i>not</i> contain <b>red</b> .
-red,green	! Category#"red"   Category#"green"	Category field contains <b>green</b> or does <i>not</i> contain <b>red</b> .
red & green	Category#"red" & Category#"green"	Category field contains both <b>red</b> and <b>green</b> .
=red,green	Category="red"   Category#"green"	Category field matches exactly <b>red</b> or contains <b>green</b> .
*red,*green	*"red"   *"green"	Any field contains <b>red</b> or <b>green</b> or both.

---

## More Examples

An SSL statement to define a Phone Book subset for all Massachusetts phone numbers and all phone numbers without area codes:

```
Phone#"(508)" | Phone#"(617)" | !Phone#"(
```

An SSL statement to define a Phone Book subset for all West Coast business clients:

```
State->"CA", "OR", "WA", "BC" & Category#"Business" &  
Category#"Client"
```

An SSL statement to define a Phone Book subset for all suppliers in major western Oregon cities:

```
Category="supplier" & State#"OR"  
& City->"Portland", "Salem", "Eugene", "Medford"
```

**D**

# E

## South and East European Language Support

---

### How to Access Character Sets and Keyboard Layouts

The KEYBEZ program enables you to select a South East European language and load its corresponding character set, keyboard layout, and national settings. Here are the available languages:

Language	Code Page	Keyboard
Byelorussian (BL)	866	Cyrillic
Croatian (CR)	852	Slavic
Czech (CZ)	852	Slavic
Greek (GK)	437G	Greek
Hungarian (HU)	852	Hungarian
Polish (PL)	852	Polish
Romanian (RO)	852	Slavic
Russian (RU)	866	Cyrillic
Slovak (SL)	852	Slavic
Slovene (SV)	852	Slavic
Turkish (TK)	437T	Turkish
Ukrainian (UR)	866	Cyrillic

The various code pages and keyboard layouts are found at the end of this appendix.

**Note:** 1-2-3 supports only CP 850. If another code page is loaded, you may have trouble displaying or printing certain characters within 1-2-3.

E

## Running KEYBEZ

Modify your AUTOEXEC.BAT file to include the KEYBEZ command (with language option) on the line immediately preceding the 100 line.

**SYNTAX:** KEYBEZ [BL|CR|CZ|GK|HU|PL|RO|RU|SL|SV|TK|UR]

### Example: Implementing Russian Language Support

1. Use the Memo Editor to open your AUTOEXEC.BAT file (located in the root directory of C:\ or D:\)
2. Add the line `KEYBEZ RU` *just before the 100 line*.
3. Save your new version of the AUTOEXEC.BAT file in the root directory C:\.
4. Ensure that your CONFIG.SYS file is in the root directory C:\. Copy it from D:\ if necessary.
5. Close all open applications in preparation to reboot.
6. Reboot by pressing **CTRL**+**ALT**+**DEL**.

When you see the Business Card screen, the Cyrillic Code Page (CP 866) and keyboard are ready to use. Press **CTRL** to toggle the keyboard back and forth between English and Cyrillic. For positions of the Cyrillic characters, see the Cyrillic overlay on page E-4.








**Accessing the Characters.** You access characters in one of two ways, depending on which keyboard layout is implemented.

- For the Cyrillic and Greek keyboards, the characters on the overlay *become* the primary keys, replacing the English key definitions. For example, when the Greek keyboard is implemented and you press **U**, you generate a  $\theta$ .

However, you can switch back and forth between Cyrillic or Greek and English by pressing the **CTRL** key—press it once and you have the Cyrillic or Greek keys, press it again and you're back to English.

Note that while in Cyrillic mode, you may access numbers and punctuation symbols by using the **Fn** followed by the number or **Fn** **↑** followed by the desired punctuation. For example, to access the ',' character while in Cyrillic mode, press **Fn** **↑** **4**.

- For the other keyboards (Hungarian, Polish, Slavic, and Turkish), the special characters are an extension of the English keyboard and are accessed using the **Fn** key. For example, to generate Ö when the Hungarian keyboard is implemented, you press **Fn** **K**.

Some of the keys shown on the overlays for these keyboards show two characters above the primary key (see pages E-6 to E-9). In these cases the left character is the  key definition and the right character is the  key definition. For example, above  on the Slavic keyboard are the characters ] and Î. To generate ] you press  , and to generate Î you press  .

---

## Printing Considerations

In order to print the character sets implemented by KEYBEZ, you must have a printer that supports the character set you want to print.

For example, before you can print a file containing CP 866 (Cyrillic) characters, you must first configure your printer to support this character set. See the documentation for your particular printer.

---

## Keyboard Overlays & Code Page Tables

The following pages illustrate the keyboard overlays and code pages KEYBEZ implements. A set of all six overlays (HP Part No. B2539A) is available. Contact your Hewlett-Packard sales office or dealer, or Hewlett-Packard's South East European Sales headquarters (address below), for information on where to purchase this set of overlays.

Hewlett-Packard Ges.m.b.H.  
Lieblgasse 1  
A-1222 Vienna/Austria  
Telephone: +43 1 2500-0  
FAX: +43 1 2500-444

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### Note



If calling from the United States, dial  
1 011 43 1 2500-0. For FAX's from the U.S. dial  
1 011 43 1 2500-444.

**E**

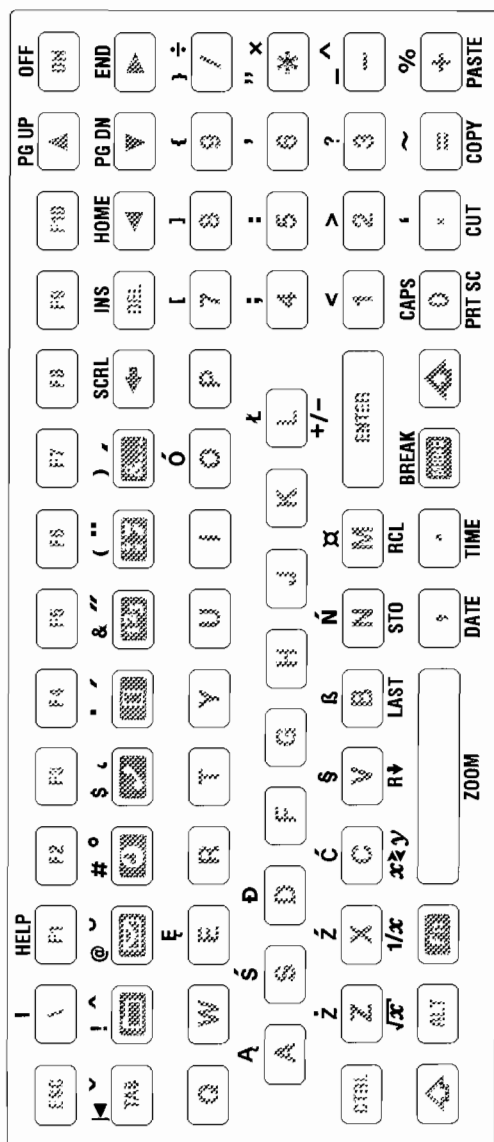






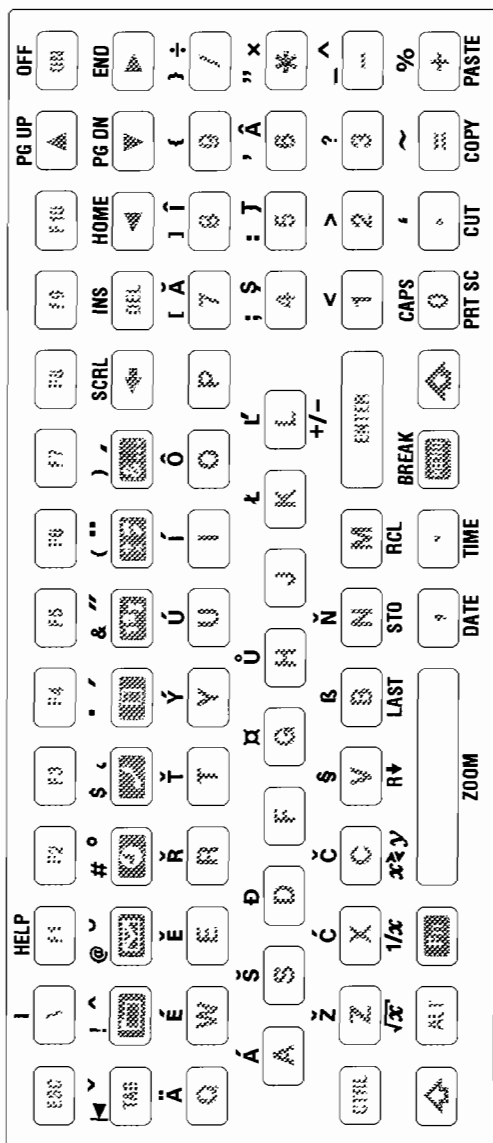


# Polish Overlay

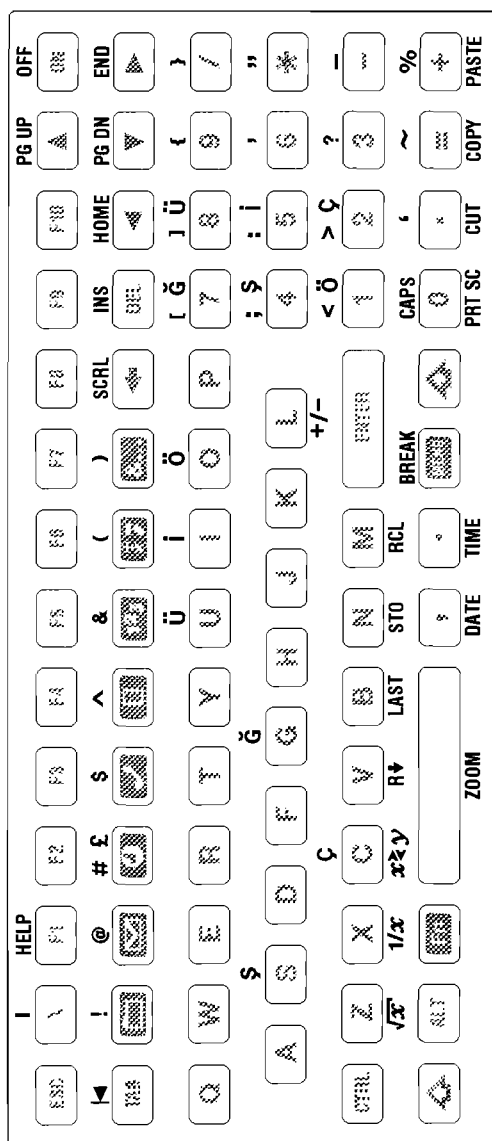


E

# Slavic Overlay



# Turkish Overlay



## CP 437G (PC Latin/Greek)

A 128	P 144	ι 160	⋮ 176	⊥ 192	⊥ 208	ω 224	≡ 240
B 129	Σ 145	κ 161	⊞ 177	⊥ 193	⊥ 209	ά 225	± 241
Γ 130	Τ 146	λ 162	⊞ 178	⊥ 194	⊥ 210	έ 226	≥ 242
Δ 131	Υ 147	μ 163	 179	⊥ 195	⊥ 211	ή 227	≤ 243
E 132	Φ 148	ν 164	⊥ 180	— 196	⊥ 212	ϊ 228	∫ 244
Z 133	X 149	ξ 165	⊥ 181	⊥ 197	⊥ 213	ί 229	J 245
H 134	Ψ 150	ο 166	⊥ 182	⊥ 198	⊥ 214	ό 230	÷ 246
Θ 135	Ω 151	π 167	⊥ 183	⊥ 199	⊥ 215	ύ 231	≈ 247
I 136	α 152	ρ 168	⊥ 184	⊥ 200	⊥ 216	ü 232	° 248
K 137	β 153	σ 169	⊥ 185	⊥ 201	⊥ 217	ώ 233	• 249
Λ 138	γ 154	ς 170	⊥ 186	⊥ 202	⊥ 218	Ω 234	· 250
M 139	δ 155	τ 171	⊥ 187	⊥ 203	■ 219	δ 235	√ 251
N 140	ε 156	υ 172	⊥ 188	⊥ 204	■ 220	∞ 236	ⁿ 252
Ξ 141	ζ 157	φ 173	⊥ 189	⊥ 205	■ 221	φ 237	² 253
O 142	η 158	χ 174	⊥ 190	⊥ 206	■ 222	ε 238	■ 254
Π 143	θ 159	ψ 175	⊥ 191	⊥ 207	■ 223	∩ 239	255

E

## CP 437T (PC Turkish)

Ç	É	á	⋮	ℒ	⋮	α	≡
128	144	160	176	192	208	224	240
Ü	æ	í	⊞	⊥	⊥	β	±
129	145	161	177	193	209	225	241
é	Æ	ó	⊞	⊥	⊥	Γ	≥
130	146	162	178	194	210	226	242
â	ô	ú		⊥	⊥	π	≤
131	147	163	179	195	211	227	243
ä	ö	ñ	⊥	—	⊥	Σ	∫
132	148	164	180	196	212	228	244
à	ò	Ñ	⊥	+	⊥	σ	J
133	149	165	181	197	213	229	245
å	û	Ğ	⊥	⊥	⊥	μ	÷
134	150	166	182	198	214	230	246
ç	ù	ğ	⊥	⊥	⊥	τ	≈
135	151	167	183	199	215	231	247
ê	î	¿	⊥	⊥	⊥	Φ	°
136	152	168	184	200	216	232	248
ë	Ö	⌈	⊥	⊥	⊥	Θ	·
137	153	169	185	201	217	233	249
è	Ü	⌋	⊥	⊥	⊥	Ω	·
138	154	170	186	202	218	234	250
ï	ç	½	⊥	⊥	■	δ	√
139	155	171	187	203	219	235	251
î	£	¼	⊥	⊥	■	∞	ⁿ
140	156	172	188	204	220	236	252
ı	¥	ı	⊥	⊥	■	φ	²
141	157	173	189	205	221	237	253
Ä	Ş	«	⊥	⊥	■	ε	▪
142	158	174	190	206	222	238	254
Å	ş	»	⌋	⊥	■	∩	
143	159	175	191	207	223	239	255

E

## CP 852 (PC Latin-2)

Ç	É	á	⋮	Ł	đ	Ó	-
128	144	160	176	192	208	224	240
Ü	Í	í	⊞	⊥	Đ	ß	˘
129	145	161	177	193	209	225	241
é	Í	ó	⊞	⊥	Ď	Ô	˙
130	146	162	178	194	210	226	242
â	ô	ú		┌	Ě	Ň	˘
131	147	163	179	195	211	227	243
ä	ö	Ą	┌	—	d'	ń	˘
132	148	164	180	196	212	228	244
ů	Í	ą	Á	┌	Ň	ň	§
133	149	165	181	197	213	229	245
ć	Í	ž	Â	Ǻ	Í	Š	÷
134	150	166	182	198	214	230	246
ç	Ś	ž	Ě	ǻ	Î	š	˙
135	151	167	183	199	215	231	247
†	ś	Ę	Ş	Ł	ě	Ř	°
136	152	168	184	200	216	232	248
ë	Ö	ę	≡	≡	┘	Ú	˝
137	153	169	185	201	217	233	249
Õ	Ü			≡	┘	ř	˙
138	154	170	186	202	218	234	250
ő	Ť	z	≡	≡	■	Ů	ů
139	155	171	187	203	219	235	251
î	ť	Č	≡	≡	■	ý	Ř
140	156	172	188	204	220	236	252
Ž	ł	ş	Ž	≡	┘	Ý	ř
141	157	173	189	205	221	237	253
Ä	×	«	ž	≡	Ů	ţ	■
142	158	174	190	206	222	238	254
Ć	č	»	┘	□	■	˘	
143	159	175	191	207	223	239	255

## CP 866 (PC Cyrillic)

А 128	Р 144	а 160	⋮ 176	⌒ 192	⌒ 208	ρ 224	Ë 240
Б 129	С 145	б 161	⊞ 177	⌒ 193	⌒ 209	с 225	ë 241
В 130	Т 146	в 162	⊞ 178	⌒ 194	⌒ 210	т 226	€ 242
Г 131	У 147	г 163	⌒ 179	⌒ 195	⌒ 211	у 227	€ 243
Д 132	Ф 148	д 164	⌒ 180	— 196	⌒ 212	ф 228	ï 244
Е 133	Х 149	е 165	⌒ 181	⌒ 197	⌒ 213	х 229	ï 245
Ж 134	Ц 150	ж 166	⌒ 182	⌒ 198	⌒ 214	ц 230	ÿ 246
З 135	Ч 151	з 167	⌒ 183	⌒ 199	⌒ 215	ч 231	ÿ 247
И 136	Ш 152	и 168	⌒ 184	⌒ 200	⌒ 216	ш 232	° 248
Й 137	Щ 153	й 169	⌒ 185	⌒ 201	⌒ 217	щ 233	• 249
К 138	Ъ 154	к 170	⌒ 186	⌒ 202	⌒ 218	ъ 234	· 250
Л 139	Ы 155	л 171	⌒ 187	⌒ 203	■ 219	ы 235	√ 251
М 140	Ь 156	м 172	⌒ 188	⌒ 204	■ 220	ь 236	№ 252
Н 141	Э 157	н 173	⌒ 189	⌒ 205	■ 221	э 237	⊠ 253
О 142	Ю 158	о 174	⌒ 190	⌒ 206	■ 222	ю 238	■ 254
П 143	Я 159	п 175	⌒ 191	⌒ 207	■ 223	я 239	255





## Regulatory Information

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### U.S.A.

The HP 100LX generates and uses radio frequency energy and may interfere with radio and television reception. The HP 100LX complies with the limits for a Class B computing device as specified in Part 15 of FCC Rules, which provide reasonable protection against such interference in a residential installation. In the unlikely event that there is interference to radio or television reception (which can be determined by turning the unit off and on), try the following:

- Reorienting or relocating the receiving antenna.
- Relocating the HP 100LX with respect to the receiver.

For more information, consult your dealer, an experienced radio/television technician, or the following booklet, prepared by the Federal Communications Commission: *How to Identify and Resolve Radio-TV Interference Problems*. This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402, Stock Number 004-000-00345-4. At the first printing of this manual, the telephone number was (202) 783-3238.

The HP F1015A Serial Interface Cable must be used to connect the HP 100LX to printers, computers, and other peripheral devices to ensure compliance with the Class B emission limits for residential use.

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# Europe

## Declaration of Conformity (according to ISO/IEC Guide 22 and EN 45014)

**Manufacturer:** Hewlett-Packard Company

**Address:** Hewlett-Packard Co.                      Hewlett-Packard Co.  
Corvallis Division                                      Singapore (PTE) Ltd.  
1000 NE Circle Blvd.                                      1150 Depot Road  
Corvallis, OR 97330                                      Singapore 0410

declares that the following product

**Product name:** Palmtop Personal Computer

**Model Number:** HP 100LX

**Options:** All

conforms to the following product specifications

**Safety:** IEC 950:1986+A1,A2 / EN 60950 (1988)+A1,A2

**EMC:** CISPR 22:1985 / EN 55022 (1988): Class B (1)

IEC 801-2:1991 / prEN 55024-2 (1992): 3kV CD, 8kV AD  
IEC 801-3:1984 / prEN 55024-3 (1991): 3V/m

### Supplementary Information:

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC.

(1) The product was tested in a typical configuration with Hewlett-Packard personal computer peripherals.

Quality Department  
Hewlett-Packard Company  
Corvallis Division

F

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**HEWLETT  
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For HP internal use only:  
F1020-90002 (English)  
Printed in U.S.A. 6/93

Part Number F1020-90001 Edition 3

