

USER REFERENCE

4th DIMENSION[®]

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4th DIMENSION USER REFERENCE

4th DIMENSION by Laurent Ribardière

4th DIMENSION USER REFERENCE

Written by David Brandt

Copiedited by Brenda Keller

Illustrated by Mark Vernon

and Mei-Ying Dell'Aquila

Layout by David Brandt

Designed by Patrick Chédal C&C

Publication assistance from Lasselle-Ramsay, Inc.

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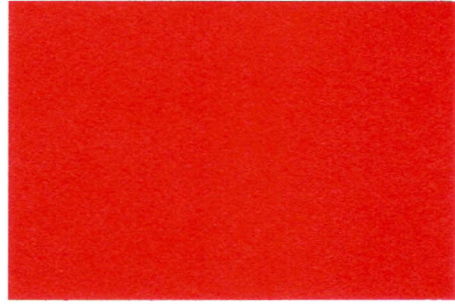
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USER

PREFACE



4th DIMENSION is a powerful relational database for Apple's family of Macintosh computers.

You can use 4th DIMENSION to manage your own data. In the User environment, you can

- add, modify, and update records
- search and sort records
- create reports and labels from information in the database
- import and export data between 4th DIMENSION and other applications

With 4th DIMENSION, you can enhance conventional data management tasks with

- a powerful Layout editor that works like a full-featured drawing program to let you add object-oriented graphics to your layout
- the capacity to store graphics in databases
- a password access system to protect sensitive data
- graphing functions that let you generate a variety of business graphs
- the capability to create custom applications from 4th DIMENSION with custom menus, dialog boxes, and buttons
- a full-featured programming language

4th DIMENSION's flexibility and power make it ideal for a complete range of information management tasks. Novice users can quickly create databases and begin managing their data. Experienced users without programming experience can customize their databases with 4th DIMENSION's development tools. Experienced developers can use 4th DIMENSION's powerful programming language to add sophisticated features and capabilities to their databases.

When you design a custom database with 4th DIMENSION, all the components of the Macintosh user interface are at your disposal. You can add menus, dialog boxes, buttons, and windows to enhance your databases and allow users to be more productive.

About This Manual

This manual serves as a reference to 4th DIMENSION's User environment and provides detailed descriptions of the operations that you can perform in this environment.

The manual that complements the information in this guide is the *4th DIMENSION Design Reference*. It provides a description of 4th DIMENSION's Design environment. Refer to it when you are designing and building a database.

Using This Manual

Use this manual in conjunction with the other manuals in the 4th DIMENSION package.

The *4th DIMENSION Quick Start* and the *4th DIMENSION Tutorials* lead you through lessons where you create and use a 4th DIMENSION database. These lessons give you first-hand experience and help you become familiar with the concepts and features of 4th DIMENSION.

The *4th DIMENSION Design Reference* describes the environment where you create databases.

The *4th DIMENSION Language Reference* describes the language associated with 4th DIMENSION, and it includes an introduction to programming with 4th DIMENSION.

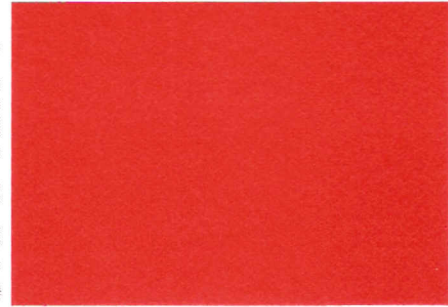
The *4th DIMENSION Utilities Guide* describes the utilities included with 4th DIMENSION, such as 4D Tools.

The *4th DIMENSION Glossary and Master Index* provides the glossary that defines terms and an index for all 4th DIMENSION documents.

To use the *4th DIMENSION User Reference* effectively:

- Go through the *4th DIMENSION Quick Start* and *Tutorials*.
- Create a database, referring to the *4th DIMENSION Design Reference* when you need to review a process or explanation.
- Enter and manipulate data in your database, referring to this manual when you need to review a process.
- Refer to the *4th DIMENSION Glossary* if you encounter an unfamiliar term.

CHAPTER 1



USER ENVIRONMENT BASICS

USER ENVIRONMENT BASICS

This chapter provides an overview of the User environment and discusses several special topics relating to the User environment. The special topics are

- using the User environment menus
- choosing single-user or multi-user mode
- specifying the location of temporary files
- opening a remote data file
- entering and using a password-protected database

The User Environment

The User environment is where you work with your data. It contains a complete set of generic tools to manage information. You can import or export data; enter, modify, or delete records; conduct searches and sorts; and create and print reports, labels, and graphs.

In the User environment, you use layouts to enter and manage data. Each file in your database has an *input layout* and an *output layout*. Any layout can be used as either an input or output layout.

When a layout is used as an input layout, it displays one record at a time. An input layout is used to enter, view, and modify information. When a layout is used as an output layout, it displays several records in the form of a list. An output layout is used to browse through records, select records, and print a selection of records. You can switch from one file to another and change the input and output layouts you work with.

When you manage data, you select the group of records you want to work with. This group of records is called the *current selection*. The current selection can be one, some, or all records in a file. Each file in your database has its own current selection.

The current selection is an important concept in 4th DIMENSION. The most common data management operations are performed on the records in the current selection. These operations include

- sorting records
- viewing and modifying individual records
- updating records using a formula
- printing a report
- generating labels

- graphing data
- exporting records

The User environment includes complete facilities for designing reports and labels and for graphing data. The Quick Report, Label, and Graph editors let you create printed output without using a layout.

User Environment Menus

This section gives a brief description of the User environment menu bar. The User environment menu bar contains the following menus

- File
- Edit
- Use
- Enter
- Select
- Report
- Special

You can add custom menus to the User environment menu bar. Custom menus appear to the right of the Special menu. You use custom menu bars to customize the User environment to simplify complex or time-consuming tasks.

The File Menu

The File menu contains items for performing standard file operations. It contains the following menu items:

- **New Database** displays the create-file dialog box. Use it to create and name a new database. It first closes and saves the database that is currently open.
- **Open Database** displays the open-file dialog box. Use it to open an existing database. It first closes and saves the database that is currently open.
- **Import Data** displays the Import Data dialog box. Use it to import data into the current file. For a discussion of importing and exporting data, see Chapter 12.
- **Export Data** displays the Export Data dialog box. Use it to export the current selection.
- **Choose File/Layout** displays the Choose File/Layout dialog box. Use it to change files or layouts. For a discussion of choosing files and

File	
New Database...	
Open Database...	
Import Data...	
Export Data...	
Choose File/Layout...	⌘F
Page Setup...	
Print...	
Quit	⌘Q

- **Page Setup** displays the Page Setup dialog box for the printer that you have specified in the Chooser.
- **Print** first displays the “Choose print layout” Dialog box. Use it to print reports using a layout. For a discussion of printing reports using layouts, see Chapter 7.
- **Quit** closes and saves the database you are working with and returns to the Finder.

The Edit Menu

The Edit menu contains the standard Macintosh Edit menu items:

- **Undo**
- **Cut**
- **Copy**
- **Paste**
- **Clear**
- **Select All**
- **Show Clipboard**

These menu items perform the standard Macintosh editing operations. Standard Macintosh editing operations are covered in the user’s guide that came with your Macintosh.

You can use these commands when managing data. For more information, see Chapter 3.

The Use Menu

The Use menu contains the names of the three 4th DIMENSION environments. Use it to switch from one environment to another. It contains the following items:

- **Design** switches to the Design environment.
- **User** indicates that you are in the User environment.
- **Runtime** switches to the Runtime environment. The Runtime menu item is dimmed if you have not created custom menus.



Note: The Design menu item is dimmed if you do not have access privileges to this environment. See Chapter 8 of the *4th DIMENSION Design Reference* for information on access privileges.



The Enter Menu

The Enter menu contains items used for entering and modifying data. It contains the following items:

Enter	
New Record	⌘N
Modify Record	⌘M
Apply Formula...	
✓Enter in List	⌘,

- **New Record** displays a blank input layout for data entry. Choose New record to begin entering data.
- **Modify Record** displays a highlighted record using the current input layout. Modify Record is dimmed if no records are highlighted. Modify Record is also dimmed if you are using an input layout.
- **Apply Formula** displays the Formula editor. Choose Apply Formula to make changes to the current selection of records using a formula.
- **Enter in List** toggles the Enter in List mode. When in the Enter in List mode, you can enter and modify data using an output layout. When the Enter in List mode is active, a check mark appears next to the item.

For information on entering, modifying, and updating records, see Chapter 5.

The Select Menu

The Select menu contains items for selecting, searching, and sorting records. It contains the following items:

Select	
Show All	⌘G
Show Subset	⌘H
Search Editor...	
Search by Layout...	⌘L
Search and Modify...	
Search by Formula...	
Sort Selection...	
Sort File...	⌘T

- **Show All** displays all the records in the file you are working with using the output layout. Show All is dimmed if you are using an input layout.
- **Show Subset** is used to select the group of records that is highlighted in the output layout. Show Subset is dimmed if no records are highlighted or if you are using an input layout.
- **Search Editor** displays the Search editor. The Search editor is a general-purpose search editor that you can use to carry out many types of searches.
- **Search by Layout** displays the current input layout as a search-by-example window.
- **Search and Modify** displays the Search and Modify dialog box. Use Search and Modify to search on the indexed fields in the current file. The first record that is located by the search is displayed in the input layout.
- **Search by Formula** displays the Formula editor. Use Search by Formula when you need to write a formula to search records.
- **Sort Selection** displays the Sort editor. Use Sort Selection to sort the current selection.

- **Sort File** displays the Sort editor. Use Sort File to sort all the records in a file permanently.

For a discussion of selecting and searching, see Chapter 4. For a discussion of sorting, see Chapter 6.

The Report Menu

The Report menu contains menu items that display the Quick Report, Label, and Graph editors. You use these editors to create a wide range of printed output.

The Report menu contains the following menu items:

- **Quick** displays the Quick Report editor. Use it to create and print tabular reports.
- **Labels** displays the Label editor. Use it to create and print labels.
- **Graph** displays the Graph editor. Use it to graph data.

The Quick Report, Label, and Graph editors are discussed in Chapters 8, 9, and 10, respectively.

The Special Menu

The Special menu contains three miscellaneous menu items:

- **Edit Input ASCII Map** displays the “Edit an ASCII Map for importing” dialog box. Use it to create and choose an ASCII map for importing data.
- **Edit Output ASCII Map** displays the “Edit an ASCII Map for exporting” dialog box. Use it to create and choose an ASCII map for exporting data.
- **Execute Procedure** displays the “Execute procedure” dialog box. Use it to execute a global procedure from the User environment.

ASCII maps are discussed in Appendix A. The Execute procedure command is discussed in Chapter 11.

Custom Menus

Using the Layout editor in the Design environment, you can associate a menu bar with a layout. Whenever the layout is used as an input layout, the menus on the custom menu bar are appended to the User environment’s menu bar.



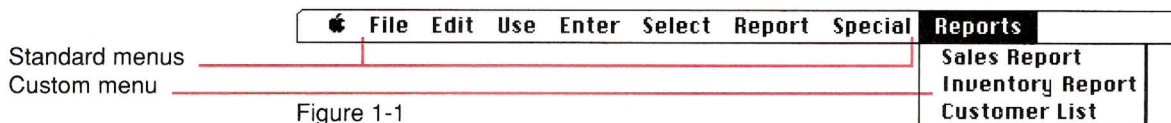


Figure 1-1
User environment menu bar with custom menu

You use the menus and menu items on the custom menu bar for specialized functions. For example, a custom menu might contain menu commands that display custom search dialog boxes, print reports, or import data using a special format. You use custom menu bars as you would use menus and menu items in any application.

See Chapter 7 of the *4th DIMENSION Design Reference* for more information on designing custom menu bars. Chapter 4 of the *4th DIMENSION Design Reference* contains information on associating menu bars with layouts.

Choosing Single-User or Multi-User Mode

Any 4th DIMENSION application will run in multi-user mode. In multi-user mode, several people can access the same data file at the same time. When one user makes a change to the database, that change becomes available to all other users immediately. 4th DIMENSION automatically handles possible conflicts that arise when two users try to modify the same record at the same time.

To run in multi-user mode, you will need a file server, a network, and 4th DIMENSION or 4th DIMENSION Runtime for each Macintosh on the network.



Note: You must use a separate licensed 4th DIMENSION or 4th DIMENSION Runtime for each user of the database. The license agreement prohibits the use of any one copy of 4th DIMENSION or 4th DIMENSION Runtime by more than one user or more than one computer.

To operate a database in multi-user mode:

- Install 4th DIMENSION or 4th DIMENSION Runtime on each Macintosh on the network. The run-time version allows a user to manage information in the Runtime environment but not make any changes to the design of the database.
- Install a file server and a network to physically link the Macintoshes. For optimal performance, use a high-speed network such as EtherNet.
- Copy the data file to the file server.

- Make copies of the structure file and install one copy on each local hard disk (the hard disk connected to each Macintosh) or copy the structure file to the file server.

 **Note:** For optimal performance, install separate copies of the structure file on each local hard disk.

When each user first launches 4th DIMENSION, he or she must instruct 4th DIMENSION to operate in multi-user mode.

To choose multi-user mode, follow these steps:

1. Double-click the application icon or the structure file and hold down the mouse button.

The dialog box shown in Figure 1-2 is displayed.

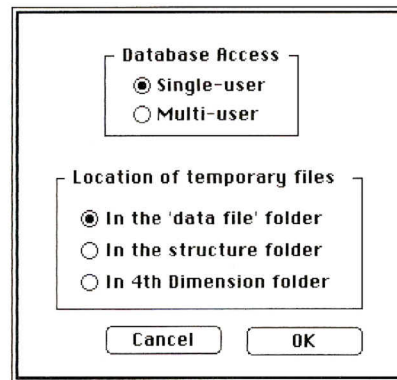


Figure 1-2
Single- or multi-user dialog box

2. Click the Multi-user radio button.

After this option is selected, the copy of 4th DIMENSION or 4th DIMENSION Runtime will remain in multi-user mode until it is changed. You will not need to hold the mouse button down while launching 4th DIMENSION unless you want to switch to single-user mode.

Specifying the Location of Temporary Files

While 4th DIMENSION is running it sometimes creates and uses temporary disk files. These disk files are automatically deleted from your hard disk when you quit 4th DIMENSION and return to the Finder.

The dialog box shown in Figure 1-2 also lets you specify the location of temporary files. If you are using 4th DIMENSION in single-user mode and

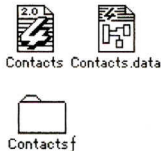
are using one hard disk, the location of the temporary files probably does not matter. If you are using multi-user mode, you will probably want to use the local hard disk for temporary files. 4th DIMENSION can access the local hard disk faster than it can access the file server. Placing the temporary files on the local hard disk improves performance.

If you have installed your data file on the file server and the structure file on the local hard disk, choose either the “4th DIMENSION folder” or “Structure file” options.

The selected option remains in effect until you change it.

Opening a Remote Data File

A 4th DIMENSION database consists of two disk files, a structure file and a data file. The structure file contains all or your specifications for the design of the database. The data file contains your data and any indexes you build. When you create a new database, 4th DIMENSION creates a folder and places the structure and data files in the folder. The folder is given the name you assigned to the database, followed by an “f”. The data file is also given the same name, followed by “.data”. For example, if you named a database Contacts, the folder will be named `Contactsf`, the structure file will be named `Contacts`, and the data file will be named `Contacts.data`.



You can open a database by double-clicking the structure file.

4th DIMENSION will look in the folder that contains the structure file for a data file with the same name. If it finds it, it will open the data file automatically.

4th DIMENSION does not require that the structure and data files have the same names, be in the same folder, or be on the same disk. You can move either the structure or data files to new locations. The new location can be on the same hard disk, on a different hard disk connected to the Macintosh, or a hard disk on a network. If you separate the data file from the structure file, you will need to tell 4th DIMENSION where you have moved it.

If you move the data file, 4th DIMENSION will prompt you for the location of the data file the first time you open the structure file. It will display the “Open data file” dialog box shown in Figure 1-3.

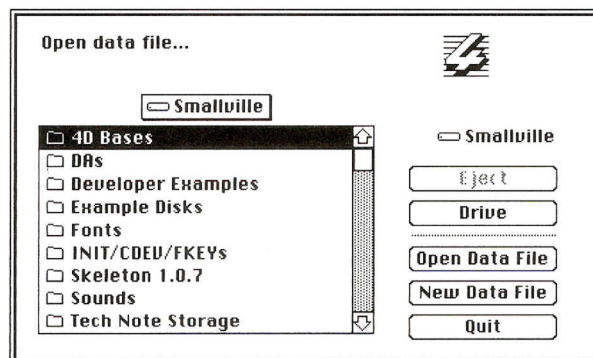


Figure 1-3
“Open data file” dialog box

Select the data file by double-clicking the filename or by selecting the filename and clicking the “Open data file” button.

On subsequent launches of the database, 4th DIMENSION will “remember” where the data file is (technically, 4th DIMENSION stores the pathname of the data file). The Open Data file dialog box will not be displayed unless you move the data file to a new location.

Entering a Password-Protected Database

4th DIMENSION’s Design environment includes a comprehensive Password access system. The access system is used to selectively grant access to parts of a database. Access can be granted to files, layouts, menu items, and procedures. The access system can be used for either the User or Runtime environments.

The Password access system is based on a set of passwords. Each user of the database is given a password. To enter a password-protected database, you must first type your password.

To enter a password-protected database, follow these steps:

1. Open the database by double-clicking the structure file or 4th DIMENSION icon or by clicking either icon and choosing Open from the File menu.

4th DIMENSION displays the “Enter password” dialog box shown in Figure 1-4.



Figure 1-4
“Enter password” dialog box

The “Enter password” dialog box lists all users who have been given passwords.

2. Click your name and type your password. If you do not have a password, click Guest and click the OK button. A guest is granted limited access to the database.

The password system is case-sensitive; be sure to type the password using the correct upper- and lower-case characters.

When you type, a small icon is displayed in place of each character.

If you typed the password correctly, you are given the level of access to the database that was specified when the access system was designed. If you typed the password incorrectly, the Macintosh will beep.

Using a Password-Protected Database

After you have entered a password-protected database, you can use any part of the database to which you have been granted access. Unless you are the designer of the database, you will not have access to the Design environment.

The access system is used to grant access to files, layouts, menus, and procedures. If you try to use a part of the database to which you do not have access, a dialog box similar to the one shown in Figure 1-5 will be displayed.

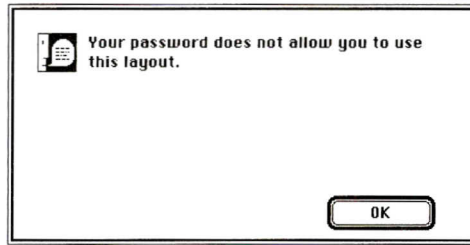


Figure 1-5
"Access denied" alert box

Click OK and use another part of the database.



CHAPTER 2

CHOOSING FILES AND LAYOUTS

CHOOSING FILES AND LAYOUTS

In a 4th DIMENSION database, you store information in files. Each file stores a different type of information. For example, a Contacts database might have one file that stores information about people and another file that stores information about companies. Each record in the [People] file contains information about one person. This file can have fields for First Name, Last Name, Home Address, City, State, Zip code, and Home telephone number. In the [Company] file, each record could contain information about a particular company. The [Company] file might have fields for Company name, Address, City, State, and Zip code.

In the User environment, you use one layout at a time. Each layout belongs to a particular file. You can switch between files whenever you need to work with data in another file. For example, while entering data into the [Company] file, you may need to look up a home telephone number stored in the [People] file.

Each file can have as many as 32,000 layouts attached to it. You can create different layouts to meet specific needs. For example, different report forms can be used for different types of reports, and different layouts can be used for different monitor sizes. In the User environment, you can switch between files and layouts at any time.

A default input and a default output layout is specified in the Design environment for each file in the database. These layouts are used unless you specify different layouts in the User environment. There are two ways of choosing files and layouts:

- Use the Choose File/Layout menu item in the File menu.
- Use the “List of files” window.

These two methods can be used interchangeably. They carry out exactly the same functions. The Choose File/Layout menu item is more convenient for choosing layouts because it displays a thumbnail picture. The “List of files” window is more convenient for switching files or for switching layouts when you don’t need to view a thumbnail.

You can choose a new file or a new layout while you are using either an input or an output layout. Your choices are used immediately.



Note: If you switch to the Design environment, your choices are saved with the database; otherwise they are temporary changes.

Using the Choose File/Layout Dialog Box

To choose a file and layout using the Choose/File Layout dialog box, follow these steps:

1. Choose the Choose File/Layout item from the File menu.

The Choose File/Layout dialog box shown in Figure 2-1 is displayed.

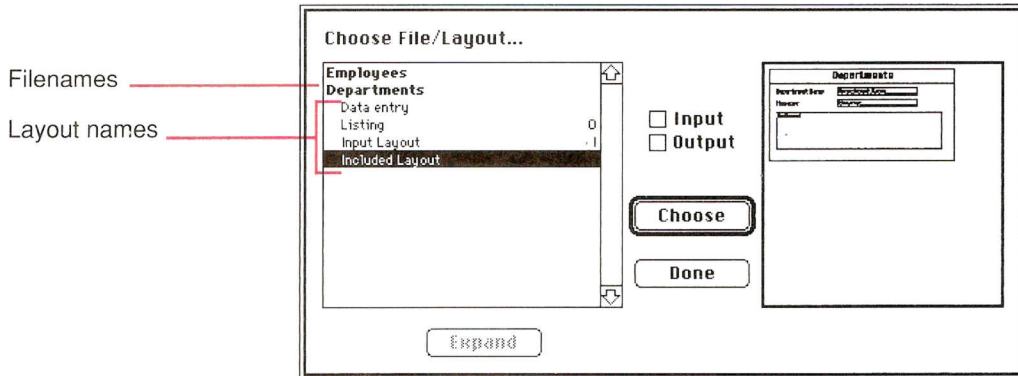


Figure 2-1
Choose File/Layout dialog box

It lists the names of the files in the database.

2. Select a file by double-clicking a filename.

4th DIMENSION displays a list of layouts that belong to that file.

If the selected layouts are satisfactory, click Choose to make your change.

If you also want to change the input or output layouts, proceed to step 3.

The *O* and *I* next to layout names indicate the default output and default input layouts, respectively. The letter *B* next to a layout name indicates that the same layout is used as both the input and output layout.

3. Click a layout name on the expanded list.

4th DIMENSION displays a thumbnail sketch of the selected layout in the area on the right side of the dialog box.

If the selected layout is already a default layout, a check appears in the Input or Output check box.

4. Click the Input or the Output check box to change layouts.

Or click both check boxes to specify the layout as the current layout for both input and output.

5. Click Choose to change the current file and input or output layouts.
Or click Done to return to the layout you were using at the time you chose Choose File/Layout.

Your changes remain in effect until you change them again.

Using the “List of files” Window

To choose a file using the “List of files” window, follow these steps:

1. If the “List of files” window is not visible, hold down the Command key and press the Space bar to bring it to the foreground.

The “List of files” window, shown in Figure 2-2, is displayed.

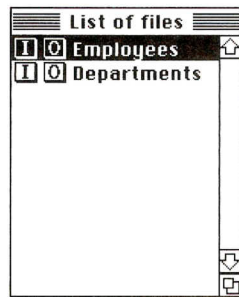


Figure 2-2
The “List of files” window

If necessary, use the scroll bar or the size box to view the names of additional files.

Each filename in the “List of files” window is accompanied by two icons that represent output and input layouts. The left icon (I) represents input layouts; the right icon (O) represents output layouts.

2. Click the name of the file in the “List of files” window.

4th DIMENSION displays the current selection for that file using the output layout.

To change layouts, follow these steps:

1. Click either the input or output icons next to a filename in the “List of files” window and hold down the mouse button.

A pop-up menu appears. It lists the names of all the layouts belonging to the selected file. Figure 2-3 shows a pop-up menu.

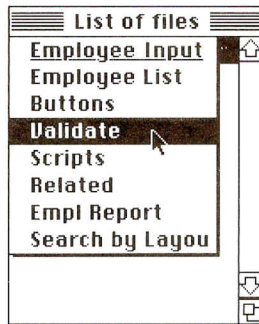


Figure 2-3
Pop-up menu in "List of files" window

An underline in the pop-up menu indicates the current input or output layout.

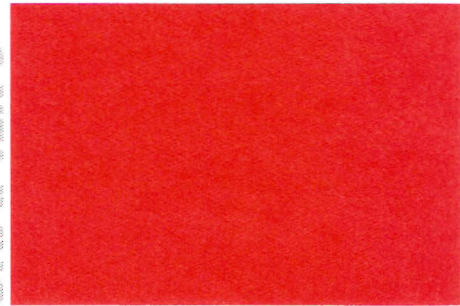
2. Select the name of the layout you want to specify as the current input or output layout.

To hide the "List of files" window, follow this step:

- Press Command–Space bar.

USING INPUT AND OUTPUT LAYOUTS

CHAPTER 3



USING INPUT AND OUTPUT LAYOUTS

Input and output layouts provide a “view” into your database. You use layouts to enter, view, modify, and print information. This chapter covers basic skills in managing information using input and output layouts. These skills are used whenever you work with data—entering new records, modifying existing records, and working with a list of records.

Any layout can be used as either an input or an output layout.

When a layout is used as an output layout, it displays several records in a scrollable list. You use an output layout to

- scroll a list of records
- highlight a subset of records
- double-click a record to display it in the input layout

The Enter in List mode changes the way in which you use an output layout. When in the Enter in List mode, the fields in the layout become enterable. You can also enter or modify records using the output layout. But you cannot highlight or double-click records when in Enter in List mode.

When a layout is used as an input layout, it displays one record at a time. You can enter and modify information, move from one field in the layout to another, and move from one record to another. An input layout usually has buttons that you use to

- save a new record to disk or save modifications to an existing record
- cancel changes to a record
- navigate from one record to another
- delete a record

Using Output Layouts

An output layout lists records. Although any layout can be used as an output layout, most output layouts have these features:

- Each row is a record
- Each column is a field or a variable
- Each column is labeled at the top of the window

A typical output layout is shown in Figure 3-1 on the following page.

Title Bar _____

Number of records in selection _____

Number of records in file _____

Elevator _____

Scroll bars _____

Employees: 57 of 57						
First Name	Last Name	Start Date	Salary	Title	DEPT CODE	
Biff	Davis	1/2/80	43780	Salesperson	SAL	
Shirley	Ransome	1/11/80	36040	Supervisor	MAN	
Lance	Wolfram	1/14/80	27300	Technician	PROD	
Dennis	Hanson	1/14/80	40520	Manager	ADM	
Lydia	Vernon	1/15/80	36870	Supervisor	SAL	
Andy	Venable	1/15/80	43520	Engineer	ART	
Jim	Borrell	1/22/80	36540	Salesperson	SAL	
Bryan	Pfaff	1/22/80	26440	Secretary	ADM	
Nancy	Hetzer	1/23/80	26270	Clerk	SAL	
Kathy	Forbes	1/28/80	18840	Secretary	ART	
Garth	Hammons	2/6/80	50100	Salesperson	SAL	
Mary	Smith	2/7/80	55000	Engineer	TRAN	
Frederic	Bell	2/14/80	60400	Director	MAN	
Alan	Hull	2/20/80	41460	Supervisor	PROD	
Shirley	Nalevanko	2/21/80	41050	Designer	DES	
Marlys	Wilson	2/27/80	36500	Supervisor	ADM	
George	Lyle	2/28/80	47900	Salesperson	SAL	
Smeldorf	Garbando	3/6/80	19610	Clerk	TRAN	

Figure 3-1
An Output layout

An output layout can be used in either of two modes, the “normal” mode and the Enter in List mode. In the normal mode, you can scroll, highlight, and double-click records. In normal mode, fields are not enterable.

In Enter in List mode, the fields on the output layout are enterable. You can add new records or modify existing records.

There are four basic skills used in working with output layouts:

- scrolling
- highlighting
- double-clicking
- entering and modifying

Scrolling

The output layout has standard horizontal and vertical scroll bars. You can scroll records by clicking either arrow, clicking the scroll bar, or by dragging the elevator. If the output layout has more fields than can be displayed in the window, you can scroll horizontally using the scroll bar at the bottom of the window.

Highlighting

You highlight a record by clicking it. You can highlight one record, two or more adjacent records, or two or more records that are not adjacent. After highlighting records, you can perform operations such as selecting or deleting them.

To highlight one record, follow this step:

- Click a record displayed in the output layout.

The record you clicked is highlighted.

To highlight several adjacent records, follow these steps:

1. Click the first record you want to highlight.
2. Hold down the Shift key and click the last record you want to highlight.
All the records between the first and last ones you clicked are highlighted.

To highlight several non-adjacent records, follow these steps:

1. Click the first record you want to highlight.
2. Hold down the Command key and click another record.
3. Continue clicking records while holding down the Command key.

Each record you click is highlighted.

To highlight all records, follow this step:

- Choose Select All from the Edit menu.

All records displayed in the output layout are highlighted.

If you want to highlight all records in the file, choose Show All from the Select menu before choosing Select All from the Edit menu.

Double-clicking

You can view a record in the input layout by double-clicking it in the output layout. When you double-click a record, the output layout is replaced by the input layout. The record you double-clicked is displayed in the input layout ready for modification.

Entering and Modifying

You can add and modify records in an output layout using the Enter in List mode. The output layout is especially useful for modifying a few adjacent records because several records are displayed on the screen simultaneously.

You can only enter or modify fields in the current file. You cannot enter into variables, fields from other files, or included layouts.

When you are in Enter in List mode, you can

- use the Enter key or the New Record menu item to add a new record
- use the Tab or Return key to move from field to field

Tabbing out of a field or clicking on another field will save your changes.

Employees: 78 of 78			
Employ	Name	Department Name	Salary
69	Georgina LINDAY	Accounts Payable	\$28,324
68	Karla KLUTZ	Accounts Payable	\$23,500
47	Anna FREDRICKSON	Accounts Payable	18750
20	Mary SMITH	Accounts Payable	\$26,650
5	Nathan ANDERSON	Accounts Payable	\$39,500
24	Richard CHAVEZ	Accounts Payable	\$31,200
67	Cindy KANE	Accts Receivable	\$23,000
61	Samuel C IRRVING	Accts Receivable	\$37,500
54	Julie HANSON	Accts Receivable	\$23,000
43	Maria C DENNISON	Accts Receivable	\$17,950
22	Kendall Newton	Accts Receivable	\$38,550
3	Sally Smith	Accts Receivable	\$35,567
49	Susan R Fennel	Administration	\$25,330
38	Frederich Burgess	Administration	\$28,000
30	Jonathan Patel	Administration	\$31,100
26	Wanda MATTHEWSON	Administration	\$25,260
1	Tom DAVIS	Administration	\$28,500
74	Fredi Prince	Art Department	\$35,287
56	Hildebrand Hill	Art Department	\$23,678

Figure 3-2

Enter in List mode with a field highlighted



Note: Enter in List is available only for single-user use and only in the User environment.

When using the Enter in List mode, the highlighting and double-clicking functions are disabled.

To enter and modify fields using an output layout, follow this step:

- Choose Enter in List from the Enter menu.

The fields in the output layout become enterable. A check mark appears next to this menu item to indicate that you are in Enter in List mode.

To leave Enter in List mode, choose Enter in List from the Enter menu again.

Using Input Layouts

The input layout is the primary tool for entering and modifying data. Although any layout can be used as an input layout, most input layouts have the following elements:

- one or more *enterable areas*, into which data can be entered
- a button for *accepting* the record
- a button for *canceling* the record
- buttons for *navigating* from one record to another (e.g., First record, Last record, Next record, Previous record) and buttons for navigating from one page to another (e.g., First page, Last page, Next page, Previous page)
- a button for *deleting* the record

You use these elements to manage information. You use enterable areas to enter values into the database. You use the accept button to save a new record or save changes to an existing record. When you accept a record, you request 4th DIMENSION to add the new record (or your changes to an existing record) to the database stored on disk.

You use the Cancel button to discard changes you make to an existing record or discard a new record. If you press the Cancel button while entering a new record, 4th DIMENSION does not add the record to the database. If you press the Cancel button while modifying an existing record, 4th DIMENSION ignores any changes you have made. The record you were modifying is not affected by your changes.

You use navigation buttons to move from one record to another. When you press a navigation button, 4th DIMENSION accepts the record you were adding or modifying before displaying a new record.

You use the Delete button to permanently delete a record from the database.

Layout Templates

The Layout editor in the Design environment has templates that are used to generate input layouts automatically. All templates generate layouts containing one or more enterable areas and a default control panel or a set of buttons. They differ in the way the Accept, Cancel, Navigation, and Delete functions are represented.

There are two types of templates. One type places a control panel to the left of the enterable areas and the second type places a row of buttons at the bottom of the screen. Example layouts based on the two types of standard templates are shown in Figure 3-3.

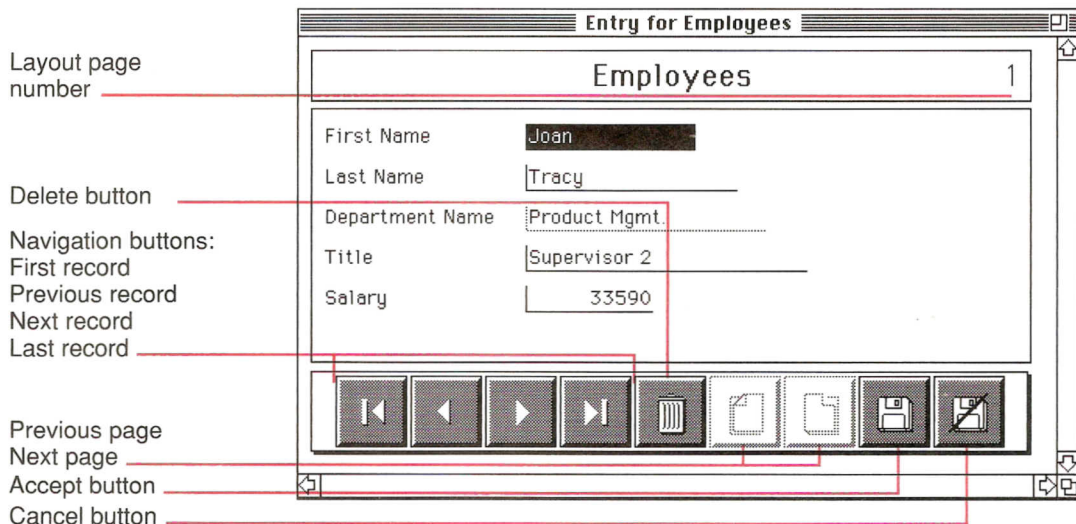
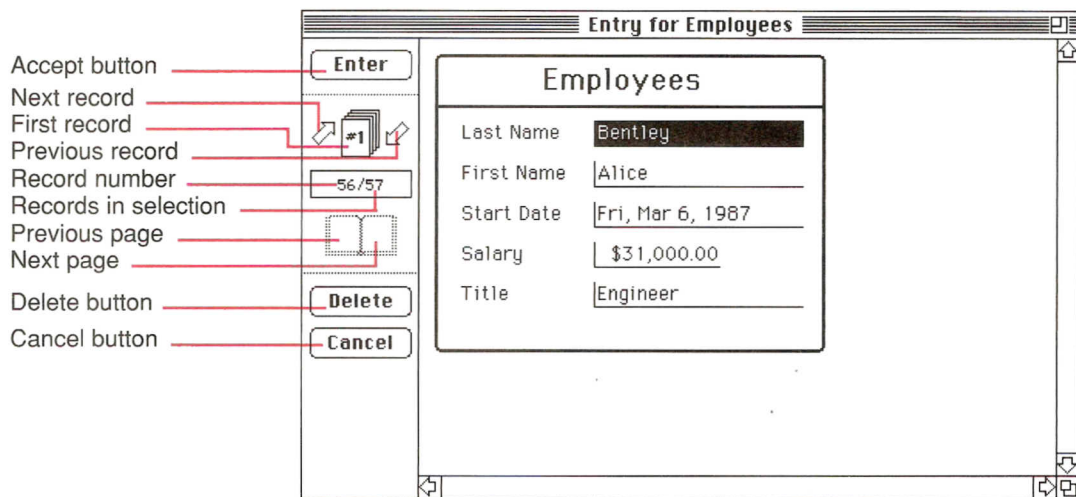


Figure 3-3
Simple input layouts

Enterable Areas and the Data Entry Order

You enter data into enterable areas. An enterable area can be either a field or a variable.

When entering or modifying data, you move from one enterable area to another in a consistent order. This order is called the *data entry order*. Every enterable area into which you can type a value is included in the data entry order. Also, Boolean fields (shown as radio buttons or check boxes), included layouts, and areas that accept pictures are included in the data entry order.

Thermometers, rulers, dials, scrollable areas, and pop-up menus can also be used to enter data. These objects, however, are not included in the data entry order. They are selected by clicking.



Note: The data entry order can be changed in the Layout editor. The data entry order for a particular layout may not necessarily move from left to right or top to bottom. See Chapter 3 of the *4th DIMENSION Design Reference* for information on changing the data entry order.

To move forward in the data entry order, follow this step:

- Press the Tab key or the Return key.



Note: In a Text field, pressing Return ends the paragraph you are writing and moves the insertion point to the next line in the field. Use the Tab key to move forward in the data entry order.

To move backward in the data entry order, follow this step:

- Hold down the Shift key and press Tab.

To select any enterable area, follow this step:

- Click on the area or tab into it using either Tab or Shift-Tab.

Accept Button

When you are satisfied with your entry, you can accept the record. When you accept a record, you tell 4th DIMENSION to add the record to the database.

To accept a record, follow this step:

- Click the Accept button.

Or press the Enter key.

4th DIMENSION adds the record to the database.

In multi-page layouts, the fields on all the pages are part of the same record. In a multi-page layout, pressing the Accept button on any page saves the entire record. Similarly, pressing the Enter key while on any page saves the entire record.



Note: 4th DIMENSION updates the data file stored on your hard disk at regular intervals. You can specify this interval using the Preferences dialog box in the Design environment. See Chapter 1 of the *4th DIMENSION Design Reference* for more information on setting preferences.

Cancel Button

If you decide you don't want to add the record to the database or save modifications to an existing record, you can cancel the entry. When you cancel an entry, the data you entered is not saved. If you were modifying an existing record when you canceled, 4th DIMENSION discards the modifications. No changes are made to the record stored on disk.

To cancel a record, follow this step:

- Click the Cancel button.
- Or press Command-period.

4th DIMENSION discards any data you have entered or modified for that record and displays the output layout.

Navigation Buttons

A layout often contains buttons for moving from one record to another. 4th DIMENSION automatically disables navigation buttons when appropriate. The four navigation buttons are:

- First record
- Last record
- Previous record
- Next record

Clicking any of these buttons accepts the current record and then moves to another record.

Page Navigation Buttons

An input layout can consist of more than one page. Multi-page layouts have navigation buttons for moving between pages. The four page navigation buttons are:

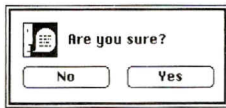
- First page
- Last page
- Previous page
- Next page

Clicking a page navigation button displays another page in the layout but does not accept or cancel the record.



Note: Not all the page navigation functions appear on the standard layout templates. You can add the remaining functions using the Layout editor in the Design environment.

The Delete Button



An input layout can have a Delete button. It is used to delete the record being displayed. Deleting a record cannot be undone; before deleting the record, 4th DIMENSION displays a dialog box in which you can confirm or cancel the deletion.

To delete a record, follow this step:

- Press the Delete button.

Editing Data



While you are entering or modifying data, you can edit the values you enter before accepting the record. Highlight the value you want to edit and use standard Macintosh text editing techniques. You can use the Cut, Copy, and Paste commands in the Edit menu to modify any entry. Select text by dragging.

If you make a typing error, you can press the Delete key to backspace over the incorrect characters. You can also choose Undo from the Edit menu. 4th DIMENSION will undo your last action.

For more information on data entry, see the section "Entering and Modifying Data" in this chapter.

Interrupting Data Entry

When you are using an input or output layout, you can choose any menu item that is not dimmed. For example, you can conduct a search, print a quick report or labels, print a report using a layout, or graph data. If you choose a menu item while you are in the process of entering or modifying a record, 4th DIMENSION displays an alert box asking you whether you want to accept or discard the record being entered, or cancel the menu selection and return to the record being entered.

Figure 3-4 shows the "This record has been modified" alert box.



Figure 3-4

The "This record has been modified" alert box

You can proceed with the menu selection and then add or modify records at a later time.

Entering and Modifying Different Types of Data

Each field in a layout has a field type that dictates the kind of data you can enter. Most fields are generally numeric or alphanumeric; you enter data in these fields simply by typing. Other types of fields accept data only in particular formats.

Alpha, Numeric, Date, and Time fields can have display formats associated with them. When you Tab out of a field with a display format, 4th DIMENSION applies the format to the data you entered. For more information about each data type and the available formats, see Chapter 3 of the *4th DIMENSION Design Reference*.

Scripts and layout procedures can be used to process data as it is entered. When you tab out of a field, a script or part of a layout procedure is executed. Scripts or layout procedures might be used to validate data, update the contents of other files, or compute values of variables. For more information about scripts and procedures, see Chapter 4 of the *4th DIMENSION Design Reference*.

Entering Data in an Alpha Field

An Alpha field can contain alphanumeric characters (letters and numbers), punctuation marks, and special characters (*, %, @, {, and so forth). The maximum length of an Alpha field is set in the Design environment. If you type more characters than the maximum, the extra characters are truncated.

An entry filter can be associated with an Alpha field. An entry filter validates the values that you type on a character-by-character basis. It affects how you can enter and edit data. See the section “Entering data into a field with an Entry Filter” in this section for more information.

Entering Data in a Numeric Field

4th DIMENSION supports three types of numeric fields: Integer, Long Integer, and Real. Integer and Long Integer fields store only whole numbers. If you enter a decimal point and numbers to the right of the decimal, the number will be truncated.

Integer fields accept numbers between $\pm 32,767$. Long integer fields accept numbers between $\pm 2,147,483,647$. A Real field contains double-precision real numbers, between $\pm 1E1022$.

Numeric fields do not store formatting characters such as the dollar sign or the comma (Real number fields store the decimal place). If you enter a formatting character, it is ignored. To format a numeric field, use a format.

Entering Data in a Text Field

A Text field functions like a text processor. It can hold up to 32,000 characters. Typically, text fields are used for entering long blocks of text such as notes or comments. A Text field can have a vertical scroll bar.

A Text field provides basic text editing features: scrolling; word wrap within the field; double-clicking to select words; support of the arrow keys; and standard cut, copy, and paste operations. You can type a Return into a Text field. If you press the Return key, the insertion point moves to the next line.

You cannot use tabs in a Text field. If you press the Tab key while in a Text field, the insertion point moves to the next enterable area in the data entry order.

4th DIMENSION lets you paste text files into a text field. For example, you can copy the contents of a letter written in a word processor into a Text field. You will, however, lose the word processor's formatting.

Entering Data in a Date Field

A Date field accepts any date entered in a standard month/day/year format (MM/DD/YYYY). 4th DIMENSION stores dates between the year 100 AD and the year 32,767. You can enter the year using either two or four digits. If you use two digits, 4th DIMENSION assumes the date is in the 20th century.

The month, day, and year can be separated by any character except a number. Some example date entries are shown in Table 3-1.

Table 3-1
Example date entries

Entry	Result
6:23:84	6/23/1984
6/23/84	6/23/1984
6 23 1984	6/23/1984
6/23/1492	6/23/1492

Entering Data in a Time Field

A time can be entered in 12- or 24-hour format. The time is stored in hours/minutes/seconds format (HH:MM:SS). The entries can be separated by any character except a number. During data entry, 4th DIMENSION will attempt to interpret partial entries. For example, the entry "1 p" is interpreted as 1:00 PM. The "p" tells 4th DIMENSION to add 12 hours to

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the value you enter. The entry “6 a” is interpreted as 6:00:00. If you enter “36 3 7”, 4th DIMENSION interprets the entry as “36 hours 3 minutes 7 seconds.” Table 3-2 shows some example time entries.

Table 3-2
Example time entries

Entry	Result
11 a	11:00:00
3 p	15:00:00
3h 11m	3:11:00
23:43	23:43:00
6:00:05	6:00:05
23 8 6	23:08:06

Entering Data in a Boolean Field

A Boolean field takes on one of two values, TRUE or FALSE. A Boolean field is displayed as either a check box or a pair of radio buttons. Boolean fields are included in the data entry order. When a Boolean field is selected, the Boolean field is outlined by a marquee (a border that surrounds the field).

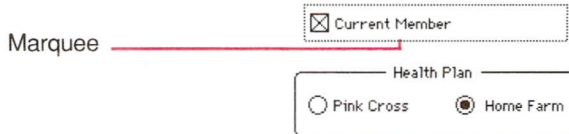


Figure 3-5
Two Boolean fields: check box and radio buttons

4th DIMENSION interprets a checked box as a yes (TRUE) value; an empty box is a no (FALSE) value. If a Boolean field is displayed as a pair of radio buttons, the value of the Boolean field is TRUE if the first radio button is checked. If the second radio button is checked, the value of the field is FALSE.

To enter a value for a Boolean field displayed as a check box, follow this step:

- Click the check box to enter the value of TRUE for the field.
Or press the Space bar to toggle between checked and unchecked.
Or type “Y”.

To enter a value for a Boolean field displayed as a pair of radio buttons, follow this step:

- Click on either radio button.

Or press the Space bar to toggle between the two radio buttons.

Or use the keyboard equivalents.

The first letters of the labels for the radio buttons can be used as keyboard equivalents. For example, if the radio buttons are labeled “Male” and “Female”, you can use the “M” and “F” keys. Also, the “Y” and “N” keys can be used to enter values. Typing “Y” is equivalent to clicking the first radio button; typing “N” is equivalent to clicking the second radio button.

Entering Data in a Picture Field

A Picture field accepts graphics created in Macintosh graphics applications. The size of the graphic is limited only by available memory.

A Picture field can accept bit-mapped or object-oriented graphics in the PICT or PICT2 formats. If you created a graphic in a PostScript-based application, that application may provide an option for copying or saving the image in PICT format. See that product’s manual for more information.

To enter a picture into a Picture field, follow these steps:

1. Copy the picture to the Clipboard.
2. Select the picture field into which you want to paste the graphic.

Select the field either by clicking or by using the Tab key. A selected picture field is inverted.

3. Choose Paste from the Edit menu.

Graphics stored in a Picture field appear in one of three display formats.

- **Truncated:** The boundaries of the Picture field act like a “cookie cutter” on the graphic that you paste into the field. The picture is centered in the field.

4th DIMENSION saves the entire picture, even if only a portion is shown on the input layout.

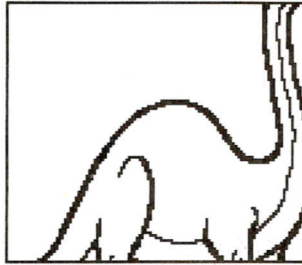


Figure 3-6
Truncated picture field

- **Scaled to Fit:** In this display format, 4th DIMENSION resizes the graphic to fit the dimensions of the picture field. Because 4th DIMENSION may compress or elongate the graphic to fit the dimensions of the Picture field, the picture may appear distorted.

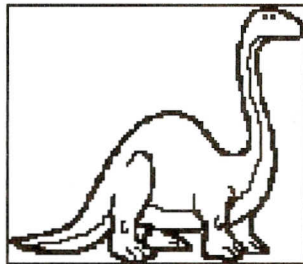


Figure 3-7
Scaled to Fit picture field

- **On Background:** In this display format, the graphic pasted into the layout is transparent—any object behind the pasted graphic is visible through the graphic. When a picture is displayed in this format, you can move the pasted picture around the inside of the picture field by dragging it. 4th DIMENSION remembers the position of the picture after you save the record.

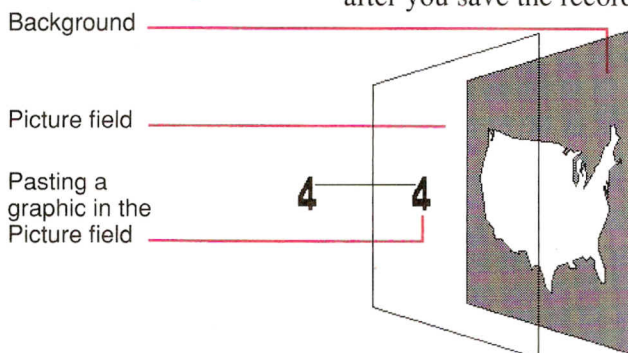


Figure 3-8
On Background picture field

You can change the contrast of the picture with the background.

To change the contrast of a background picture, follow these steps:

1. After you paste the picture into the field, double-click the field.
4th DIMENSION displays the "Choice of mode" palette, shown in Figure 3-9.

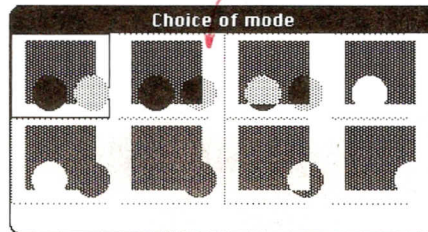


Figure 3-9
"Choice of mode" palette

In choice (1, 5/8)
graphics is framed
for some reason
(may be program error)
2.3 & 4 OK

2. Select one of the contrasts from the palette.
4th DIMENSION applies the new contrast to the picture.

Entering Data in Fields with Attributes

Attributes that are attached to fields affect the way in which 4th DIMENSION processes data. See Chapter 3 of the *4th DIMENSION Design Reference* for information on field attributes. This section discusses how attributes affect data entry.

Entering Data in a Mandatory Field

Mandatory fields contain data that is essential to the database, such as fields that uniquely identify each record in a file. Any field type can be given the Mandatory attribute.

If a field is mandatory, you must enter a value for that field before the record can be accepted. If you don't enter a value into a Mandatory field, 4th DIMENSION will display an alert box when you try to accept the record. After you dismiss the alert box, you can then enter a value into the Mandatory field and accept the record. 4th DIMENSION will not let you accept the record until you have entered a value into the Mandatory field.

Figure 3-10 shows the Mandatory field alert box.

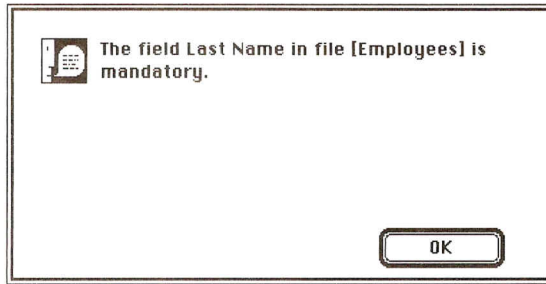


Figure 3-10
Mandatory field alert box

Entering Data in a Unique Field

A field with the Unique attribute accepts only entries that uniquely identify each record in the file. The Unique attribute might be assigned to the key field of a file, such as social security number or invoice number.

When you enter a value into a Unique field and press the Tab key, 4th DIMENSION determines whether the entry is, in fact, unique. If you enter a value that already exists, 4th DIMENSION displays an alert box that informs you that the value has already been entered. You can then enter a new value.

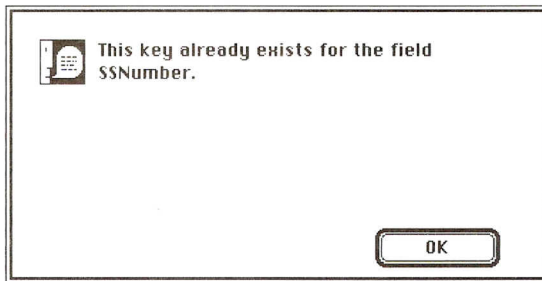


Figure 3-11
The Unique field alert box



Note: You cannot enter more than one record with a null value in a Unique field.

Entering Data in a Field with a Validation Range

A validation range specifies the minimum and maximum values that may be entered in an area. If you enter a value above the maximum value or below the minimum value, 4th DIMENSION will display an alert box when you press the Tab key. The alert box will tell you the minimum or maximum value you have exceeded.

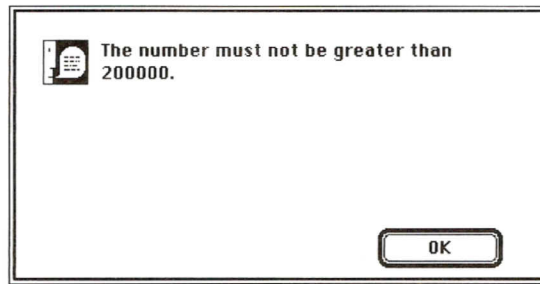


Figure 3-12
The Validation range alert box

Entering Data in a Field with an Entry Filter

An Entry Filter is a data validation tool. It examines each character as it is typed. As you type, 4th DIMENSION compares each character you enter to the set of characters specified by the entry filter. If you type an invalid character, 4th DIMENSION rejects the character; it is not shown on screen. Invalid characters are disregarded and valid characters are displayed normally. This method of data validation differs from other methods, which accept or reject the entire entry.

The Cut, Copy, and Paste functions do not work normally if an Entry Filter is associated with an enterable area. You cannot cut or copy more than one character and you cannot paste into a field with an entry filter.

An entry filter can also specify the maximum number of characters that can be entered in a particular field. When you enter the last character, the insertion point automatically moves to the next enterable area. You do not need to press the Tab key to move to the next field in the data entry order.

Entering Data in a Field with a Choice List

Moving the insertion point into a field with a Choice List displays a list that you can choose a value from. The list is displayed in the Choice List window. An example Choice List window is shown in Figure 3-13.

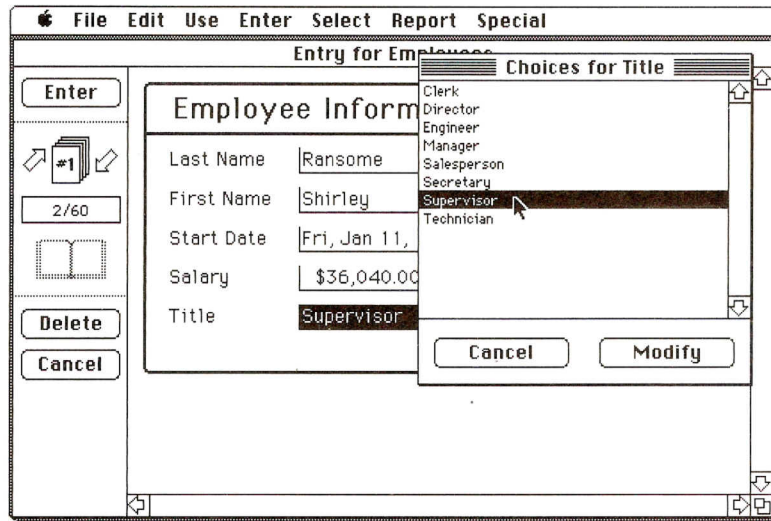


Figure 3-13
Choice List window

A choice list is often used to limit entries to specific values and prevent misspellings. For example, a Title field in a Personnel database can be associated with a list of all the job titles in that company.

Some choice lists contain items that are linked to other lists. If you choose an item that is linked to another list, 4th DIMENSION replaces the list with a new list of items in the Choice List window.

To enter data using a choice list, follow these steps:

1. Display the Choice List window by selecting the field.
2. Click the value you want to enter.

Or if the list is sorted, type an entry. The list will scroll, trying to match the value you type. Press Return to select a highlighted value.

Or use the Up and Down Arrow keys to highlight values on the list. Press Return to select a highlighted value.

Press Tab to cancel the entry.

Entering Data in an Area with a Modifiable Choice List

A Choice List can be designated as modifiable. If so, you can

- add items to the list
- modify items on the list
- delete items
- sort the list alphabetically



Note: Lists cannot be modified while you are using 4th DIMENSION in multi-user mode.

To modify a choice list, follow this step:

- Click Modify.

The “Items in list” dialog box, shown in Figure 3-14, is displayed.

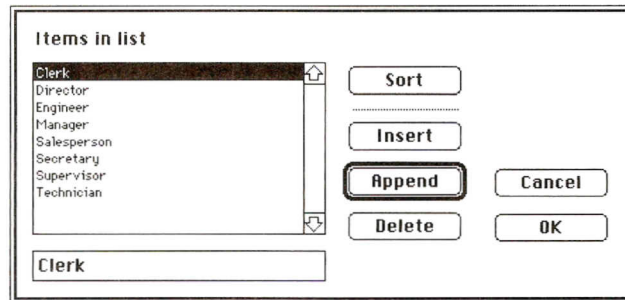


Figure 3-14
The “Items in list” dialog box

The dialog box lists the items on the list. An entry area beneath the list is used to enter or modify items. The buttons on the right side of the dialog box are used to modify the list.

To add items to the end of the list, follow these steps:

1. Click Append.

4th DIMENSION highlights the empty area below the last entry in the list and places the insertion point in the entry area.

2. Type an item.

As you type, the new item appears in the list of menu items.

To insert an item in the list, follow these steps:

1. Click an item on the list.
2. Click Insert.

4th DIMENSION creates an entry area above the item you clicked on and places the insertion point in the entry area.

3. Type an item.

As you type, the new item appears in the list of menu items.

To modify an item, follow this step:

- Click the item you want to modify and then modify the item in the entry area.

To delete an item, follow this step:

- Click the item in the list, then click Delete.

4th DIMENSION deletes the item from the list and removes the space it occupied.

To sort the list, follow this step:

- Click Sort.

4th DIMENSION sorts the list alphabetically. Sorting the list allows you to select an item by typing.

Click OK to save the modified list and close the dialog box.

Click Cancel to discard any changes you made and close the dialog box.

Entering Data in a Field with an Excluded Values or Required Choice List

A list can also be used to exclude values from a field or require that only certain values be entered. Excluded lists contain values that are not acceptable. If you type a value that appears on an excluded list, an alert box will be displayed indicating that the value you typed is not allowed.

Entering Data in an Included Layout

Some of your layouts may contain included layouts—layouts from other files or subfiles that are nested within the current layout. The current layout in this context is sometimes called the parent layout. Included layouts provide a way for you to add data to a subfile or to a related file without switching files or layouts. You can enter data into an included layout in either of two ways.

- **Multi-line:** You can enter multiple records directly into the included layout area on the parent layout. An included layout that supports entry in the multi-line mode is called enterable.

- **Full-page:** You can also enter data using an input layout belonging to the other file or subfile. An included layout that supports this entry method is called double-clickable.

Either of these ways of entering data are specified using the Layout editor in the Design environment.

An included layout can be both enterable and double-clickable. If an included layout is both enterable and double-clickable, you can enter data directly in the included layout or through an input layout belonging to the file or subfile.

If the included layout is enterable, you can enter or modify data directly into the included layout.

To enter data using the included layout, follow these steps:

1. Select the included layout area by clicking it or by Tabbing to it.
2. Press Command-Tab.



Note: A button that creates a new record or subrecord in the included layout can also be used. For more information, see the description of the Add to Included button Action in Chapter 4 of the *4th DIMENSION Design Reference*.

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4th DIMENSION creates a new record or subrecord and selects the first empty field in the included layout.

Figure 3-15
A selected field in an included layout

3. Enter data in the included layout. Use the Tab key to move through the data entry order within the included layout.

The new record in the included layout is saved when you tab out of the included layout or click another enterable area in the parent layout.

If the included layout belongs to a subfile, the new subrecord is not saved until you accept the parent record.

4. If you want to create another record, press Command-Tab within the included layout.
5. Click any field in the parent record to return to the parent layout.

If the included layout has a full-page layout associated with it, you can enter data directly into the input layout of the file or subfile without closing the input layout you are entering.

To enter data using a full-page layout, follow these steps:

1. Double-click anywhere in the included layout area below the last record displayed in the included layout. 4th DIMENSION displays the input layout for the subfile or related file. If the included layout is not double-clickable, double-clicking does nothing.



Note: You can also use a button to display the full-page layout. For more information, see the description of the Open Included button action in Chapter 4 of the *4th DIMENSION Design Reference*.

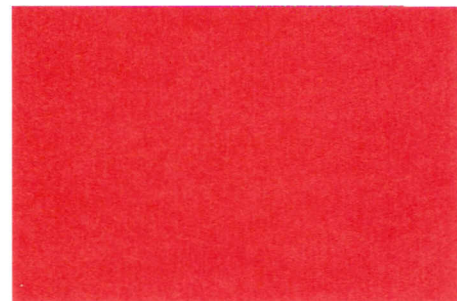
2. Enter data in the full-page layout as you would in any other input layout.
3. Press Enter or click Accept to add the new record to the database and return to the parent layout.

To modify a record using a full-page layout, follow these steps:

1. Double-click the record you want to modify. 4th DIMENSION displays the record using the full-page layout. If the included layout does not have a full-page layout associated with it, double-clicking does nothing.
2. Modify the record.
3. Press Enter or click Accept to save your modifications and return to the parent layout.

SELECTING RECORDS

CHAPTER 4



SELECTING RECORDS

You select records in your database to access information that you want to use. For example, you might search a database of contacts to look up the telephone number of a person you need to call or to select the people to whom you want to send product information.

In 4th DIMENSION, the group of records you have selected is called the *current selection*. The current selection can be any subset of records in a file—from no records up to all the records.

You can change the current selection by

- selecting all records
- selecting a subset of records
- searching the database

The current selection is the group of records on which other operations are carried out. For example, you can

- sort the current selection
- perform a global update
- print the records using a layout
- print the records using a Quick Report
- print labels
- graph data
- modify or delete records
- export records

In other words, creating a current selection is the first step in many other data management operations.

The title bar of the output layout tells you how many records are in the current file and how many records from the file are in the current selection. In multi-user mode, the title bar tells you the number of records in the current selection.

File Edit Use Enter Select Report Special

Employees: 9 of 60

First Name	Last Name	Start Date	Salary	Title	DEPT CODE
Shirley	Ransome	1/11/80	\$36,040	Supervisor	MAN
Lance	Wolfram	1/14/80	\$27,300	Technician	PROD
Dennis	Hanson	1/14/80	\$40,520	Manager	ADM
Lydia	Vernon	1/15/80	\$36,870	Supervisor	SAL
Andy	Venable	1/15/80	\$43,520	Engineer	ART
Jim	Borrell	1/22/80	\$36,540	Salesperson	SAL
Ed	Esber	1/23/80	\$16,270	Clerk	SAL
Frederic	Bell	2/14/80	\$25,200	Director	MAN
Shirley	Nalevanko	2/21/80	\$41,050	Designer	DES

Name of file _____

Number of records in selection _____

Number of records in file _____

Figure 4-1
A current selection of records in a file



The standard control panel in an input layout shows the number of records in the current selection and the number of the record being displayed.

Each file in a multiple-file database has its own current selection. In multiple-file databases, changing the current selection in one file can change the current selections in related files, provided the relations between the files are automatic. For example, in a database consisting of related [Employees] and [Departments] files, a search in the [Employees] file might change the current selection in the [Departments] file. For more information on automatic relations, see Chapter 2 of the *4th DIMENSION Design Reference*.

Selecting All Records

When an output layout is used to display records, you can set the current selection equal to all the records in the current file.

To select all records, follow this step:

- Choose Show All from the Select menu.

Show All is dimmed if you are using an input layout.

All the records in the current file become the current selection.

Select	
Show All	⌘G
Show Subset	⌘H
Search Editor...	⌘S
Search by Layout...	⌘L
Search and Modify...	
Search by Formula...	
Sort Selection...	⌘T
Sort File...	

Selecting a Subset of Records

You can create a new current selection directly in the output layout by highlighting records and defining the highlighted records as the new current selection.

To create a Subset, follow these steps:

1. Highlight one or more records.

Highlighting records is discussed in the section “Using Output Layouts” in Chapter 3.

2. Choose Show Subset from the Select menu.

4th DIMENSION displays the new current selection in the output layout. Figure 4-2 shows the process of creating a Subset.

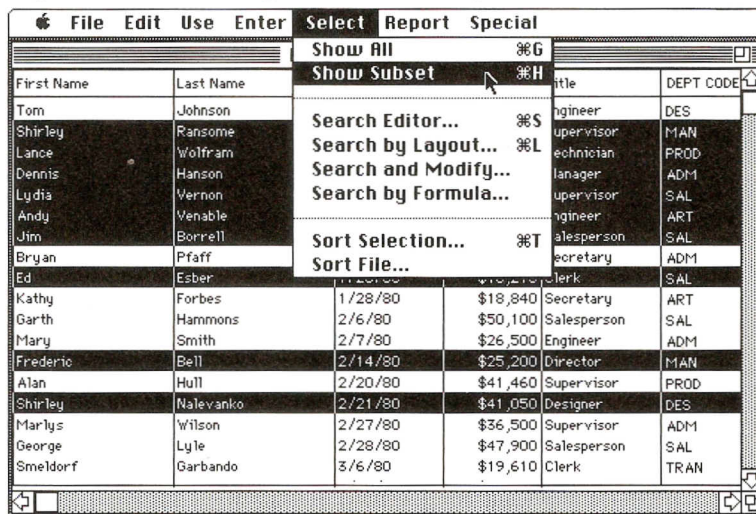


Figure 4-2
Creating a Subset

Searching the Database

Searching is one of the most common database operations. A search is often the most convenient way to select the records you want to work with.

The term searching refers to finding a group of records in the database based on the contents of one or more fields. You perform a search by specifying a *search condition*. A search condition is a set of instructions that tell 4th DIMENSION which records to include in the new current selection.

A search condition always has three elements: field name, comparison operator, and value. The field name is from the current file or a related file. The comparison operator tells 4th DIMENSION how to compare the contents of the field to the value you specify (equal to, greater than, less than, and so forth). The value is the value to which each record is compared.

Suppose you want to see all the records for employees with salaries greater than \$30,000. The search condition you would use is “Salary is greater than 30000.” Salary is the field, “is greater than” is the comparison operator, and “30000” is the value.

When you search a database, 4th DIMENSION compares the contents of the field in the search condition to the value you specify. The new current selection is made up of records that meet the search conditions. The new current selection can be no records, one record, a group of records, or all the records in the file.

You can do a search while you are using either an input or an output layout. If you do a search while you are using an input layout, the first record in the new current selection is shown in the input layout. You can view, modify, or print the record. If the new current selection consists of more than one record, you can move through the records using the navigation buttons (Previous record, Next record, First record, Last record). If you modify a record before pressing a navigation button, 4th DIMENSION will save the modifications to disk.

In multiple-file databases, you can search on fields from other files, provided that an automatic relation between the files has been established. For more information on automatic relations, see Chapter 2 of the *4th DIMENSION Design Reference*.

If you do the search while using an output layout, the new current selection is displayed in the output layout.

Indexed and Sequential Searches

4th DIMENSION can carry out searches very quickly if it has an ordered list of the records to work from. An ordered list is called an *index*. An index is associated with a particular field and is stored on disk as part of the data file.

A search that is done without an index is slower because the program must start at the beginning of the file and examine each record until it finds the records you are looking for. To be sure that it has found all the records you are looking for, it must examine every record in the file sequentially. This process is called a *sequential* search.

If an index is available, the program “knows” where the target records are located. If you are searching for everyone whose last name is Smith, the program will know where in the file the Smiths are located. Thus, it doesn’t need to examine every record in the file.

A good analogy to an index is a card catalog in a library. The card catalog is an alphabetized list of all the books in the library. Each record in the catalog contains information about where the book is physically located. If you are looking for a particular book, it would be very inefficient to conduct a sequential search of the library’s entire holdings. It is much faster to consult the card catalog, obtain the location of the book, and then search the particular shelf on which the book is stored.

When you are designing a database, you should index the fields that you are likely to use often for searching. As you enter or import records, 4th DIMENSION automatically updates all indexes. When you do searches, 4th DIMENSION automatically uses indexes if they are available.

Comparison Operators

When you write a search condition, you tell 4th DIMENSION how to compare the value you specify to the contents of the database. For example, the search condition, “Last Name equals ‘Smith’” uses the “is equal to” comparison operator. It tells 4th DIMENSION to compare the values in the Last Name field to the string “Smith.”

The following comparison operators are available:

- is equal to
- is not equal to
- is greater than
- is greater than or equal to
- is less than
- is less than or equal to
- contains
- does not contain

Handwritten notes:
 10 → AND ← 20
 greater than 10 OR less than 20
 OR
 less than 10 OR greater than 20

4th DIMENSION also has a wildcard character (@) that substitutes for one or more characters in the value being searched for. You use the wildcard character to do a “Begins with” search. For example, to find everyone whose last name begins with “S,” you would use the search condition, “Last name is equal to S@.” That is, you use “S@” as the value to be searched for. Using the wildcard character with the “is equal to” comparison operator is equivalent to a “Begins with” comparison.



The @ symbol is used throughout 4th DIMENSION as the wildcard character, and is not limited to search conditions.

The wildcard character can be used only with Alpha or Text fields.

Simple and Compound Searches

You can search on one or more fields. A search on one field is called a *simple* search. For example, the search “Last name equals ‘Smith’” is a simple search. In this case, 4th DIMENSION examines the contents of one field when searching the database.

A search on two or more fields is called a *compound* search. When you do a compound search you combine separate search conditions using a *conjunction operator*. The conjunction operator tells 4th DIMENSION how to combine the results of the individual searches. There are three conjunction operators:

- **And** finds all the records that meet two conditions simultaneously. For example, the search condition “Find all the employees who work in the engineering department *and* who make over \$50,000” will find the records of only those engineering employees who make over \$50,000.
- **Or** finds all the records that meet either of two conditions. For example, the search condition “Find all the employees who work in the engineering department *or* who make over \$50,000” will find the records of all the people in the engineering department, as well as all the people who make over \$50,000 regardless of the department they work in.
- **Except** is the equivalent of “not.” The search condition, “Find all the engineers who make over \$50,000 *except* those who have worked in the department more than ten years” will exclude the engineers with ten years of seniority.

The conjunction operators let you create compound search conditions, such as “Find the salespeople in New York *and* who have commission rates in excess of 30 per cent *and* who had sales volume less than \$200,000.” 4th DIMENSION will find all the New York salespeople who may be getting high commissions for low volume sales.

Examples of the uses of comparison and conjunction operators are given for each search method.

Using the Search Menu Items

4th DIMENSION provides several powerful methods for searching a database. You can use any of the search methods to create a search condition. Records that meet the search condition become the new current selection.

You can choose any search method when you are using either an input or an output layout.

Select	
Show All	⌘G
Show Subset	⌘H
Search Editor...	⌘S
Search by Layout...	⌘L
Search and Modify...	
Search by Formula...	
Sort Selection...	⌘T
Sort File...	

The Select menu provides four search menu items. Each menu item displays a different search dialog box or a search window. They differ in the types of searches they carry out and the way in which the current selection is displayed.

The four search menu items represent four different search methods:

- **Search Editor** displays the Search editor. It is a general-purpose search dialog box that can be used to perform simple or compound searches. You can specify compound search conditions using the conjunctions. You can also save search conditions to disk and restrict the search to the current selection.
- **Search by Layout** displays the current input layout for use as a search window. You specify a search by typing the values to be searched for in the areas corresponding to the fields to be searched. You can specify compound search conditions by typing values into more than one area.
- **Search and Modify** displays a dialog box that includes only the indexed fields in the current file. You specify a search by typing the value to be searched for into the areas corresponding to the fields to be searched. You can specify compound search conditions by typing values into more than one area. The Search and Modify command always displays the results of the search using the input layout.
- **Search by Formula** displays the Formula editor. You use the Formula editor to construct a search that uses a formula in the search condition. For example, you can use Search by Formula to search on the last three digits of a six-digit part number. A valid formula returns a Boolean expression (TRUE or FALSE).

Search Editor

The Search editor is a general-purpose editor that can be used to create simple or compound search conditions. The Search editor lets you create compound searches linked with the And, Or, or Except conjunctions. For example, you can use the Search editor to perform a search for all

employees who are over 60 years old or who have an income in excess of \$45,000.

The Search editor gives you the choice of searching through the current selection of records, or all the records in the file. The other three search methods always search the entire file.

The Search editor lets you save search conditions to disk. You can open search conditions when you want to repeat the search.

The Search editor remembers your last search conditions. You can edit these conditions or clear them and enter a new search condition.

The Search editor allows you to search on any field in the current file and any fields in related files, provided the relations to the other files are automatic. You can also search on subfields in the current file or subfields in related files.

If your database includes subrecords, you can use subfields in your search conditions. A search on subrecords creates a new current selection of parent records, not subrecords. This group of parent records contain at least one subrecord that meets the search condition. However, the search does not remove the other subrecords from the parent record. All subrecords stay attached to their parent records.

Suppose a database for employees includes a subfile for information about employee children. The fields in the subfile, called subfields, are First Name, Middle Name, and Last Name. To find all the employees with a child named John involves searching the subrecords for John in the First Name subfield. 4th DIMENSION finds all the parent records with at least one subrecord with the name "John" in the first name subfield. The selection is not just the subrecords themselves.

If your database includes related files, you can include fields from related files in your search. A search on a field in a related Many file works like a search of subrecords. The new current selection in the One file consists of all records that are related to at least one record in the Many file that meet the search condition. Searches on related files are always sequential, even if the field being searched on is indexed.

For example, if employees are stored in the One file and children are stored in a related Many file instead of a subfile, a search for employees with children named John would produce the same current selection of employees.

Figure 4-3 shows the Search editor.

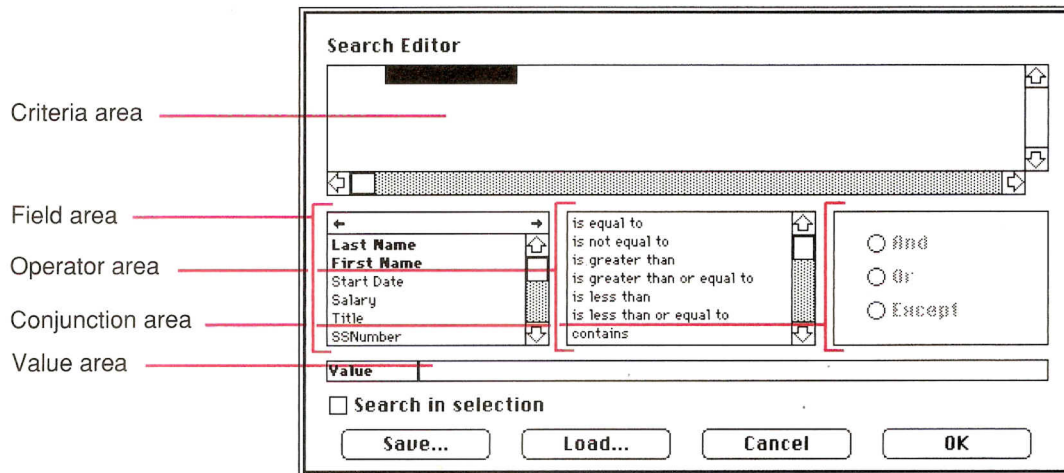


Figure 4-3
The Search editor

The Search editor contains the

- **Criteria area** that displays the search conditions as you create them or after you load them from a disk file.
- **Field area** that displays the names of the fields in the current file or other files. Indexed fields are shown in boldface.
- **Operator area** that displays a list of comparison operators.
- **Conjunction area** that contains three radio buttons that correspond to conjunction operators you can use to join several search conditions into a compound condition.
- **Value area** that is where you enter values to search for.
- **Search in selection** check box that lets you perform a search only on the records in the current selection. If Search in selection is not checked, the entire file will be searched.
- **Search editor buttons** that you use to save your search criterion, load other conditions from disk, cancel the search, or perform the search.

To create a search condition, follow these steps:

1. Choose Search Editor from the Select menu.

4th DIMENSION displays the Search editor, highlighting the portion of the Criteria area where a field name will appear. A blinking marquee around the Field area shows where you can select a field name.

2. Click a field name to use in the search condition. If the field you want to search on is in a related file, click a cycle arrow above the field area to display the fields from other files.



4th DIMENSION displays the field name in the Criteria area and highlights the area where the comparison operator will appear. The blinking marquee moves to the Operator area. Figure 4-4 shows a field name in the Criteria area.

The 'Search Editor' dialog box has a main criteria area at the top containing 'Last Name' followed by a black marquee. Below this is a list of fields: 'Last Name', 'First Name', 'Start Date', 'Salary', 'Title', and 'SSNumber'. To the right of the list is a list of comparison operators: 'is equal to', 'is not equal to', 'is greater than', 'is greater than or equal to', 'is less than', 'is less than or equal to', and 'contains'. Further right are three radio buttons labeled 'And', 'Or', and 'Except'. At the bottom is a 'Value' text box, a 'Search in selection' checkbox, and four buttons: 'Save...', 'Load...', 'Cancel', and 'OK'.

Figure 4-4
Field name in Search editor

3. Click a comparison operator.

4th DIMENSION adds the operator to the Criteria area and advances the highlight to the area where a value will appear. The marquee moves to the Value area.

The 'Search Editor' dialog box is similar to Figure 4-4, but the main criteria area now contains 'Last Name is equal to' followed by a black marquee. The other elements, including the field list, operator list, radio buttons, 'Value' text box, 'Search in selection' checkbox, and buttons, remain the same.

Figure 4-5
Operator in the Criteria area

4. Type the value to search for. In a Text or Alpha field you can use the wildcard character, @, at the end of the value to request a “Begins with” search.

If the field you selected is associated with a Choice List, 4th DIMENSION will display the list and prompt you to select a value. If the field you selected is a Boolean field, 4th DIMENSION will display a pair of radio buttons. If the field you selected is a subfile, a window listing the subfields will be displayed.

5. If you want to create a compound search condition, click one of the conjunction buttons (And, Or, or Except) and repeat steps 2 through 4.

Figure 4-6 displays a compound search condition.

Figure 4-6
A compound search condition

Note: When you build a compound search condition, 4th DIMENSION evaluates the conditions in the order in which they appear in the Search editor, i.e., from top-to-bottom. That is, there is no precedence among the conjunctions. Thus, if you have used more than two simple search conditions in building the compound condition, the order in which you enter search conditions can affect the results of the search.

As you build the search condition, you can modify existing parts of the condition by clicking the area you want to change and selecting or typing a new entry.

You can remove the search condition by choosing Clear from the Edit menu. In a compound search condition, you can remove one line of the condition by choosing Cut from the Edit menu.

6. To save the search condition as a disk file, click Save and enter a filename in the create-file dialog box.

You do not need to save your search condition.

7. Click OK to perform the search.

Click Cancel to quit the Search editor.

Search by Layout

The Search by Layout method is a convenient way to perform most searches. In this search method, you use the current input layout to enter values to search for. You can search only on fields in the current file. Search by Layout performs both indexed and sequential searches.

You can enter a value in a single field or you can specify compound searches by entering a value in more than one field. If you do a compound search, Search by Layout uses the And conjunction operator.

Figure 4-7 shows a simple search using Search by Layout.

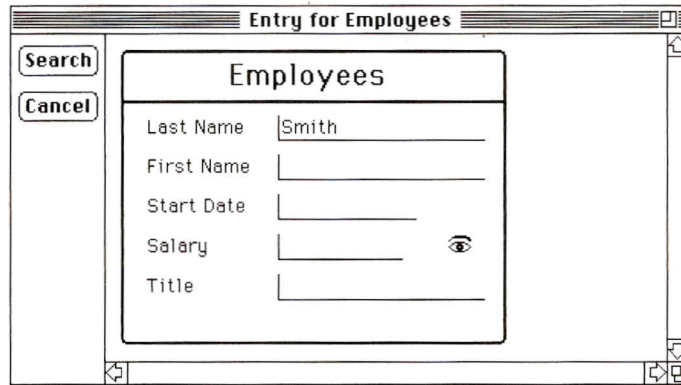


Figure 4-7
Example Search by Layout window

The Search by Layout window shown in Figure 4-7 is only an example. You can control the appearance of the Search by Layout window by designing input layouts in the Layout editor.

The comparison operators shown below can be used in the Search by Layout dialog box. To use the “is equal to” comparison operator, simply enter the value to be searched for in the appropriate field. If another logical operator is needed, precede the value with one of the following signs.

Table 4-1
Comparison operators available in Search by Layout

Comparison operator	Sign	Example
is not equal to	#	#Marketing
is greater than	>	>30000
is greater than or equal to	>=	>=30000
is less than	<	<30000
is less than or equal to	<=	<=30000

You can request a “Begins with” search by placing the wildcard character @ after the value to be searched for. For example, the value “Apple@” requests all records that begin with “Apple” in the specified field.

In Search by Layout, you can create a compound search condition by typing values into more than one field. If you enter a compound search condition, the And conjunction is assumed (e.g., “Last Name is equal to Smith *and* Salary is greater than or equal to \$25,000”). Figure 4-8 shows a compound search using Search by Layout.

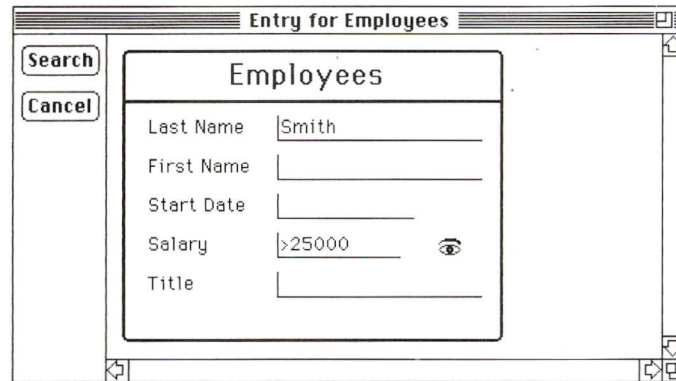


Figure 4-8
Example compound search

To use Search by Layout, follow these steps:

1. Choose Search by Layout from the Select menu.

4th DIMENSION displays the input layout for the current file as a search-by-example window. If the layout uses the standard control panel, the panel is replaced with a Search control panel. If a custom input layout is used, the buttons on the layout replace the standard control panel.

2. Enter a value to search for in a field. For example, to find records for everyone with the last name “Smith,” you would enter “Smith” in the Last Name field.

To use a comparison operator, precede the value by the comparison operator.

3. To do a compound search, enter values in additional fields.

4th DIMENSION uses the And conjunction if you enter values for more than one field. For example, if you enter “Smith” in the Last Name field and “>25000” in the Salary field, you are specifying a search for all persons with the last name Smith *and* also have a salary of more than \$25,000. See Figure 4-8.



4. Click the Search button or press the Enter key to begin the search. (Depending on the input layout used as the template, the Search button may be labeled differently.)

To cancel the search, press the Cancel button or press Command-period.

Search and Modify

The Search and Modify method is intended for quickly finding and modifying records. It, therefore, only supports searches on indexed fields. You can specify compound search conditions, but you cannot specify comparison operators. The “is equal to” operator is used for all searches.

After it has found a record or selection of records, the first record is displayed in the input layout for modification. After you accept the record, you are returned to the output layout.

Because the Search and Modify dialog box only displays the contents of indexed fields in the current file, you cannot use Search and Modify if you need to search on fields from related files, on unindexed fields, or on subfields.

To use Search and Modify, follow these steps:

1. Choose Search and Modify from the Select menu.

4th DIMENSION displays a dialog box containing the names of indexed fields in the current file and corresponding criteria entry areas.

Figure 4-9 shows a typical Search and Modify dialog box.



A screenshot of a dialog box titled 'Employees'. It contains three input fields: 'Last Name' with the value 'Smith', 'First Name' (empty), and 'Department Code' (empty). At the bottom, there are four buttons: 'Previous Page', 'Next Page', 'Cancel', and 'OK'.

Figure 4-9
Search and Modify dialog box

If there are more indexed fields than 4th DIMENSION can display in the Search and Modify dialog box, 4th DIMENSION generates as many pages as it needs. Use the Previous Page and Next Page buttons to display additional pages.

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2. Click the entry area for the first field to search on.
3. Enter a value in the area. For example, if you want to modify records that contain “Smith” in a Last Name field, the dialog box might look like the one shown in Figure 4-9.
4. If desired, select additional entry areas and enter other values to search on. Search and Modify uses the And conjunction if you enter values for more than one field. Figure 4-10 shows a compound search condition.

The figure shows a dialog box titled "Employees". Inside, there are three input fields arranged vertically. The first field is labeled "Last Name" and contains the text "Smith". The second field is labeled "First Name" and is empty. The third field is labeled "Department Code" and contains the text "ENG". Below these fields, there are four buttons: "Previous Page", "Next Page", "Cancel", and "OK".

Figure 4-10
A compound search condition using Search and Modify

For Alpha fields, you can also use the wildcard character, @, to perform a “Begins with” search. For example, entering “Apple@” in the Company area requests a search of all companies whose name begins with Apple.

5. Click OK.
- 4th DIMENSION performs the search, sets the current selection, and displays the first record that meets the search criterion in the input layout.
6. Modify the records using standard Macintosh text editing methods.
 7. Click the navigation icons to move to other records in the current selection. 4th DIMENSION saves each record as you move to another record.

Or click the Accept button or press the Enter key to accept the modified record and return to the output layout.

Click Cancel to end the editing session—you don’t have to modify every record in the current selection.

4th DIMENSION displays the output layout.

Search by Formula

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Use Search by Formula to find records based on the results of a calculation. You use the Formula editor to write the formula. You can use any function in the language or any user-written function in a formula.

Search by Formula is useful for writing search conditions that involve operations such as

- performing operations on alphanumeric strings and making evaluations on them
- searching on the results of date computations
- searching on the results of arithmetic computations

Here are some examples of the uses of Search by Formula.

The following formula is used to search for records in which the last seven characters of the Phone number field is equal to "2524444."

Substring (Phone number;4;7) ="2524444"

The following formula finds people born on the current date regardless of year:

(Day of (Current date) = Day of (Birthdate)) &

(Month of (Current date) = Month of (Birthdate))

The following formula divides annual sales by cost of living and finds records whose calculated value is greater than 1,000:

(Annual Sales / CostOfLiving) > 1000

The formula must be a Boolean expression. That is, it can only return two values, TRUE or FALSE. For example, the formula

Annual Sales / CostOfLiving

is incorrect because it returns a numeric value, not TRUE or FALSE.

You can only write formulas that are one logical line long. That is, you can't press the Return key and write a second line. The editing area, however, will wrap to the next line if the statement is too long.

You can save formulas to disk and load saved formulas into the Formula editor.

See the *4th DIMENSION Language Reference* for more information on using the language.

Figure 4-11 shows a search formula written in the Formula editor.

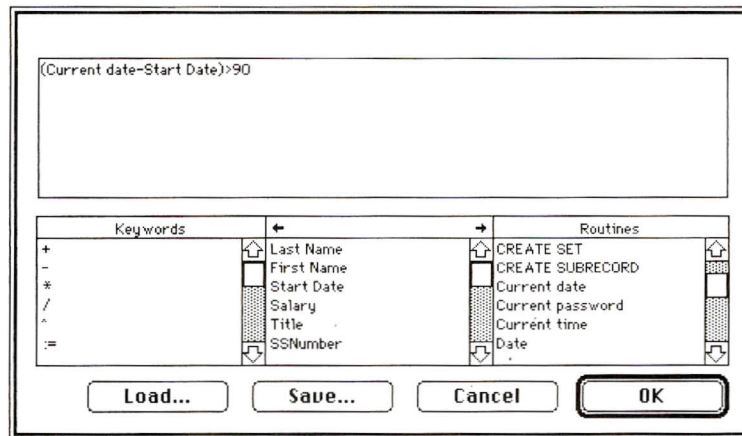


Figure 4-11
The Formula editor

For a detailed description of the Formula editor, see the section “Global Updates” in Chapter 5.

To use Search by Formula, follow these steps:

1. Choose Search by Formula from the Select menu.
2. Use the Formula editor to build a formula.

Or click Load to retrieve an existing formula from disk.

If you click Load, 4th DIMENSION displays an open-file dialog box and asks you to select a file. When you load a file, it replaces any formula that appears in the Apply Formula editor.

The formula must equal either TRUE or FALSE for every record.

3. If you want to save a new formula in a disk file, click Save.

4th DIMENSION displays a create-file dialog box and asks you to name a file to store the new formula.

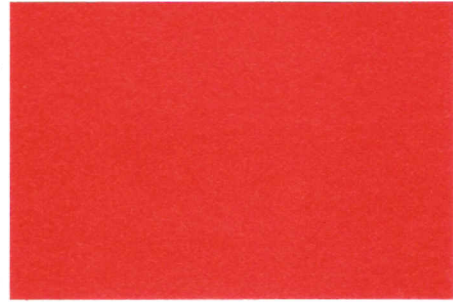
Enter a filename and click Save to save the formula.

4. Click OK to execute the search.

4th DIMENSION closes the Formula editor and evaluates the formula for each record in the file. If the formula is TRUE, the record is added to the current selection.

Click Cancel to cancel the search and return to the input or output layout.





ADDING, MODIFYING, UPDATING, AND DELETING RECORDS

ADDING, MODIFYING, UPDATING, AND DELETING RECORDS

This chapter discusses the major operations you perform when working with data. This includes

- adding records
- modifying records
- updating records
- deleting records

After you create a database in the Design environment, you can switch to the User environment and begin entering data. To add records to the database, you need only to create a file, one or more fields, and one or more layouts. You can then switch to the User environment, begin entering data, and return to the Design environment to add files, fields, layouts, or make any other changes you like.

After adding records to your database, you usually will need to modify the information. If you need to modify one or more records, you can use one of the search methods described in Chapter 4 to display the records. You can then modify the records using either the input or output layout.

Sometimes you need to make exactly the same change to a group of records in a file. This is called a *global update*. In 4th DIMENSION, you can update the contents of a file automatically—without having to make the change to each record by typing the new values.

You may also find that you need to delete one or more records. You can delete a record if you discover the record is outdated or not relevant. If the record is needed but the values stored in the record are no longer correct, you should modify the record rather than deleting it.

You can delete the current record from an input layout or you can delete a subset of records in the current selection using the output layout.

Adding New Records

You can add records using either an input or an output layout. For a description of basic skills you use to work with input and output layouts, see Chapter 3.

To add a new record using an input layout, follow these steps:

1. Choose New Record from the Enter menu.

You can choose New Record while you are using either an input or an output layout.

4th DIMENSION displays a blank input layout and places the insertion point in the first enterable area in the layout.

2. Enter data into the first enterable area.
3. Press Tab.

4th DIMENSION moves the insertion point to the next enterable area.

4. Enter data into this area.
5. Press Tab.

Repeat the process of entering data into each enterable area until all data for that record has been entered.

When you have finished entering data and are satisfied with the values you have entered, you can accept the record.

6. Press the Enter key or click the Enter button on the input layout to accept the record.

By accepting the record, you are requesting 4th DIMENSION to add the record to the database stored on disk.

7. A new blank input layout is displayed. Repeat the data entry process until you want to stop.
8. When you finish entering data, click the Cancel button on the layout or press Command-period when the next blank record is displayed. Either of these actions displays the output layout.

To add a new record using an output layout, follow these steps:

1. Choose Enter in List from the Enter menu.



Note: Enter in List is not available in multi-user mode.

The fields in the current file become enterable. You cannot enter into variables, fields from other files, or included layouts.



2. Choose New Record from the Enter menu or press the Enter key.
An insertion point appears in the first field below the last record displayed in the output layout.
3. Type in the field, and use the Tab key to move through the fields for that record.

Any data validation techniques that are attached to the fields on the layout will be used when you select those fields. For example, a field with a Choice List will display the Choice List when you tab into the field.
4. Press Enter to save the new record and create a new blank record.
Or click a field in another record.

4th DIMENSION accepts the entries in the record you added.
5. Choose Enter in List from the Enter menu to leave the Enter in List mode.

Modifying Records

You modify records when you need to update information or you discover that the information originally entered is incorrect. Before modifying a group of records, select the records to modify as the current selection. You can use a search to select records for modification or select the records after highlighting them in the output layout. For information on selecting records and searching the contents of a database, see Chapter 4.

You can modify records using either the input or output layout. The output layout is convenient for modifying a group of records because several records are displayed at the same time.

To modify records using an input layout, follow these steps:

Enter	
New Record	⌘N
Modify Record	⌘M
Apply Formula...	
Enter in List	⌘,

1. Highlight a record in the output layout and choose Modify record from the Enter menu.
Or double-click the record.
2. Select fields and edit, replace, or delete the values. See Chapter 3 for more information on editing data.
3. After you have made your changes, click Enter to accept the modified record and return to the output layout or click a navigation button (Previous record, First record, Last record) to accept the record and move to the next record in the current selection. Clicking a navigation button moves between records in the current selection.

At any time, you can click Cancel or press Command-period to return to the output layout.

Enter	
New Record	⌘N
Modify Record	⌘M
Apply Formula...	
Enter in List	⌘,

To modify records using an output layout, follow these steps:

1. Choose Enter in List from the Enter menu.

The fields in the output layout become enterable.

A check mark appears next to the Enter in List menu item to indicate that the Enter in List mode is active.

2. Select a field and edit, replace, or delete the value.

When the Enter in List mode is active, double-clicking selects the word or number rather than displaying the record in the input layout.



Note: When you are in Enter in List mode, you can select Modify Record from the Enter menu to modify the record in the input layout.

3. Type the new text and press Tab or Return. This saves your changes to that field and selects the next field.
4. Continue modifying fields as needed.
5. Click a field in another record in the output layout to modify another record.

Or press Enter to accept the modified record and create a new blank record.

4th DIMENSION saves your modifications.

6. Choose Enter in List from the Enter menu to leave the Enter in List mode.

Global Updates

You do a global update when you want to make a specific change to a group of records. You perform a global update to automate changes to a database that would otherwise be tedious and time-consuming. For example, you would perform a global update if you want to

- change all prices in an Inventory file by a certain percentage
- format a numeric or Alpha field

The global update is done by “applying” a formula to the current selection of records. That is, the formula is used to make the change to each record in the current selection.

Here are some example formulas and explanations of the functions they perform. The explanations are written as comments and follow the ` sign.

Salary := Salary * 1.05	` Multiplies Salary field by 1.05
State := Uppercase (State)	` Uses built-in function to uppercase State
Last Name := <i>Uplow</i> (Last Name)	` Uses user-written function to format Last Name

To perform a global update, you use the Formula editor to write a formula that is applied to each record in the current selection.

You use 4th DIMENSION's language to create formulas. See the *4th DIMENSION Language Reference* for detailed information on programming syntax and functions.

The Formula editor provides many shortcuts for writing formulas. You can click field names, operators, and routines to add them to the formula.

Figure 5-1 shows the Formula editor.

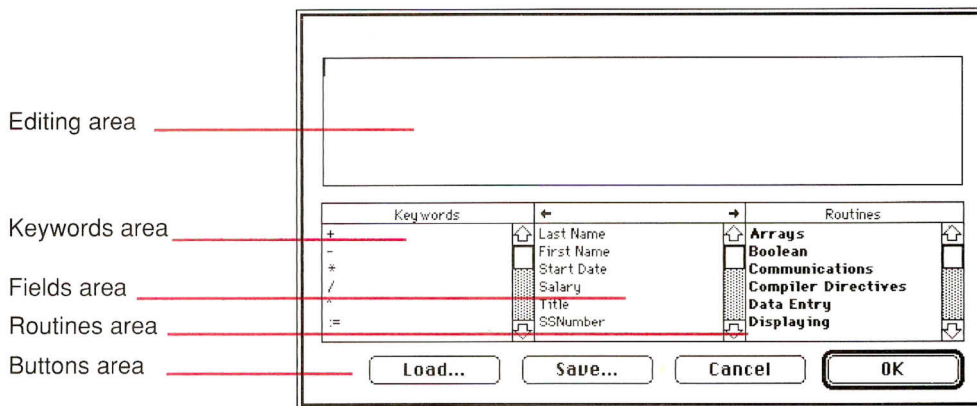


Figure 5-1
The Formula editor

The Formula editor contains the

- **Editing area** that displays the formula as you build and edit it. You create the formula in this area.
- **Keyword area** that contains a list of operators used to build a formula. See the *4th DIMENSION Language Reference* for a detailed discussion of operators.
- **Fields area** that displays the names of the fields and layouts in the current file. The cycle arrows at the top of the Field area allow you to view the contents of other files in the database. Click between the cycle arrows to display a pop-up menu of all filenames.

- **Routines area** that contains a list of pop-up menus. Each pop-up menu lists a group of 4th DIMENSION functions and commands. The Routines area also displays the names of global procedures and external procedures. These procedures appear at the end of the list of pop-up menus.

If you click the header of the Routines area, 4th DIMENSION replaces the list of pop-up menus with an alphabetical listing of all built-in commands and functions. Click the area header again to return to the list of pop-up menus. See the *4th DIMENSION Language Reference* for a detailed discussion of 4th DIMENSION commands.

- **Buttons area** that contains four buttons for saving your formula, loading other formulas from disk, canceling an editing session, and applying the formula.

You build a formula by clicking keywords, field names, and commands. When you click an item it automatically appears in the Editing area, where you can modify it with standard cut, copy, and paste techniques. You can also type directly into the Editing area.

A formula can be only one logical line long. You cannot press Return and type another line.

To perform a global update, follow these steps:

1. Set the current selection to the records to be updated. For more information on setting the current selection, see Chapter 4.
2. Choose Apply Formula from the Enter menu.
3. Use the Formula editor to build the formula.

Or Click Load to retrieve an existing formula from disk.

If you click Load, 4th DIMENSION displays an open-file dialog box and asks you to select a file. When you load a file, it replaces any formula that currently appears in the Apply Formula editor.

After you load a formula, you can modify it in the editing area.

4. If you want to save a new formula in a disk file, click Save.

4th DIMENSION displays a create-file dialog box and asks you to name a file to store the new formula.

5. Click OK to apply the formula to the current selection.

4th DIMENSION closes the editor and applies the formula to the records in the current selection.



Click Cancel to close the editor and return to the output layout without applying the formula.

Deleting Records

You can delete a record if you discover the record is outdated or no longer necessary. If the record is needed but the values stored in the record are incorrect, you should modify the record rather than deleting it.

You can delete records in two ways:

- Delete records individually from the input layout.
- Delete a subset of records from the output layout.



Warning: Deleting records is permanent and cannot be undone. When you delete records, 4th DIMENSION displays a dialog box asking you to confirm the deletion.

Deleting Records Using the Input Layout

Deleting records from the input layout lets you verify the contents of each record before you delete it.

To delete records using the input layout, follow these steps:

1. Use a search method or navigation button to display the record you want to delete.
2. Click Delete to delete the record.

Depending on the design of the input layout, the Delete button may be represented in different ways. In the two types of templates available in the Layout editor, the Delete button is represented by a button labeled “Delete” and a trash can icon, respectively.

4th DIMENSION asks you to confirm the deletion. You cannot undo the deletion after 4th DIMENSION removes the record.

3. Click Yes to complete the deletion. 4th DIMENSION removes the current record from the database and returns to the output layout.

Deleting Records Using the Output Layout

Using the output layout, you can delete a subset of records in one operation. If necessary, use one of the methods to select records that you want to delete.

To delete records using the output layout, follow these steps:

1. Highlight the record or records that you want to delete.

Or if you want to delete all the records in the file, choose Show All from the Select menu and Select All from the Edit menu.

Highlighting records is described in Chapter 3.

2. Choose Clear from the Edit menu.

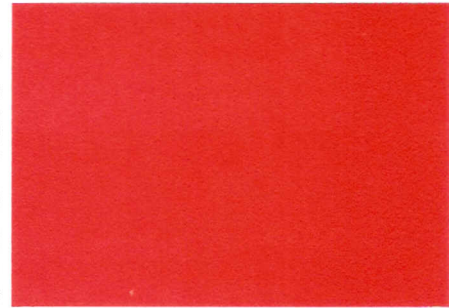
4th DIMENSION displays a dialog box asking you to confirm the deletion. You cannot undo a deletion.

3. Click Yes to complete the deletion. 4th DIMENSION removes the selected record or records from the file.

Or click No to cancel the deletion.

Edit	
Undo	⌘Z
Cut	⌘H
Copy	⌘C
Paste	⌘V
Clear	
Select All	⌘A
Show Clipboard	

CHAPTER 6



SORTING RECORDS

SORTING RECORDS

A sort reorders records according to the values in the database. It is common to sort records

- before printing a report or labels
- to view records on screen in a particular order
- before graphing data

When you enter data, 4th DIMENSION stores the records in the order that they are entered or imported. When you list records in an output layout or print records, they appear in this order. Often, you want to view records in another order. For example, you might want to alphabetize a list of names in a report. For example, a sort on the Last Name field reorders the records alphabetically by Last Name.

A sort can be done while you are using an input or an output layout. If you sort from an input layout, the first record in the new sort order is displayed in the input layout. Otherwise, the sorted records are displayed in the output layout.

4th DIMENSION conducts indexed sorts very quickly. If you are sorting on only one field and that field is indexed, 4th DIMENSION uses the index. Therefore, the sort is very fast.

Sort Levels

You can sort records on up to 30 different fields or formulas. Each field or formula you sort on is referred to as a *sort level*. The first field or formula you sort on is called the *primary* sort field or formula. The other fields or formulas are called the *secondary* sort fields or formulas.

For example, the results of a two-level ascending sort on the last name and first name fields would produce a list such as this:

```

Aardvark, Anthony
Aardvark, Artemis
Aardvark, Arthur
.
.
.
Zygote, Elena
Zymosian, Elmer

```


Ascending and Descending Order

You can specify either an ascending or descending order for each field or formula that you are sorting on. Sorting from A to Z or smallest to largest is known as an ascending sort. Sorting in the reverse order is called a descending sort—largest to smallest, latest to earliest, and Z to A.

If you are sorting on more than one level, you can freely mix ascending and descending sort orders. A multiple-level sort can mix fields and formulas and ascending and descending sort orders.

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You can sort on a field or on a formula. For example, the following formula sorts on the month of a birth date field.

Month of (Birth Date)

Sort Methods

You can perform two types of sorts:

- You can sort the records in the current selection. This is a temporary sort; it does not affect the order in which the records are stored on disk.
- You can permanently sort the contents of a file. You sort the contents of a file permanently if you frequently need to view or print records in a particular order.

There are two sort menu items:

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- **Sort Selection** sorts the records in the current selection. Sorting the current selection changes the order in which records are displayed or printed.

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- **Sort File** permanently sorts the records in a file. Sort the file whenever records are usually viewed or printed in a particular order. A permanent sort can reduce the need to sort the current selection after a search.



Note: The Quick Report editor can also perform sorts. For more information on the Quick Report editor, see Chapter 8.

The Sort Editor

The Sort editor is shown in Figure 6-1.

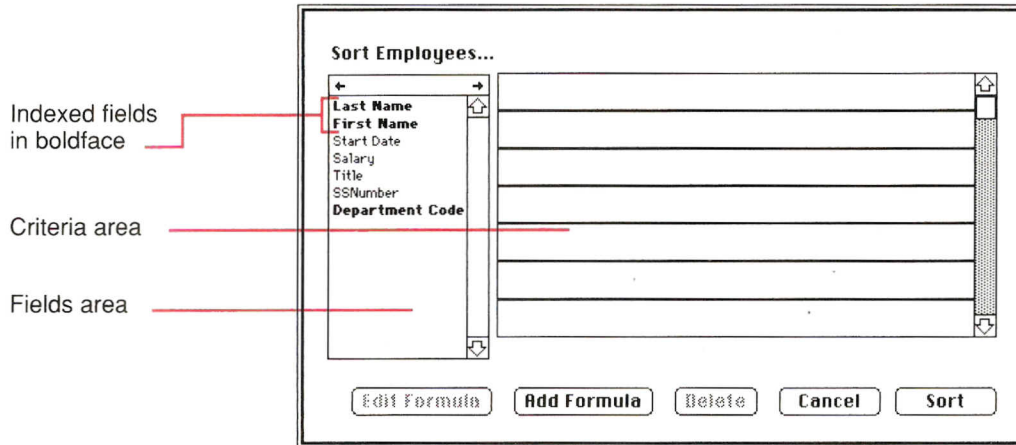


Figure 6-1
The Sort editor

The Sort editor contains the

- **Fields area** that displays the names of the fields in the current file or other files. Cycle arrows are used to display fields in other files. Fields from related files can be used in the sort, provided the relation is automatic. Indexed fields are shown in boldface.
- **Criteria area** that displays the sort fields or formulas and the order of the sort. The field or formula in the first row of the Criteria area is the primary sort field or formula. The arrows on the right of this area are used to specify an ascending or descending sort.
- **Edit Formula** and **Add Formula** buttons that you use to write or edit a formula as one of the sort levels.
- **Delete button** that you use to delete one of the sort levels.
- **Cancel button** that you use to cancel the sort and return to the layout you were using.
- **Sort button** that you use to carry out the sort.

Both the Sort Selection and Sort File methods use the Sort editor.

Using Sort Selection

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Use Sort Selection to sort the current selection of records. This sort is temporary and applies only to the current selection; it does not affect the order in which records are stored in the database. Sort Selection is commonly used immediately after a search.

To sort the current selection, follow these steps:

1. Choose Sort Selection from the Select menu.
2. Click the name of a field you want to sort on.

Or to sort on a formula, click Add Formula.

If you clicked Add Formula, 4th DIMENSION displays the Formula editor.

Create a formula. The formula returns the values you want to sort on. The formula can return values of any data type.

For more information about how to use the Formula editor, see “Global Updates” in Chapter 5.

Click OK when you are finished writing the formula. 4th DIMENSION displays the formula in the Criteria area.

The field name or formula and a sort direction arrow appear in the Criteria area, as shown in Figure 6-2.



Ascending sort
direction arrow

Descending sort
direction arrow

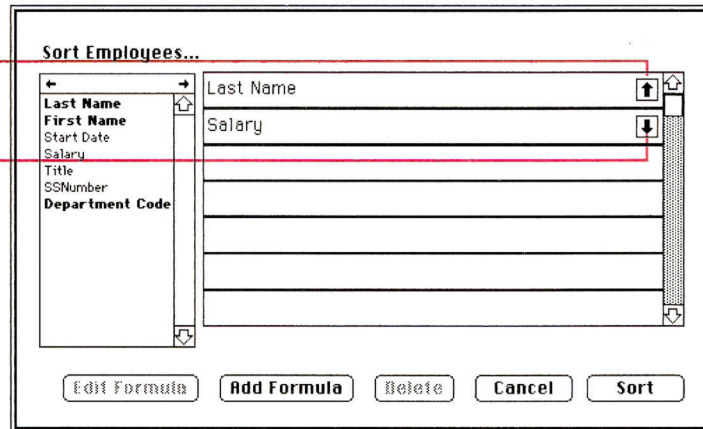


Figure 6-2
Sort editor with a two-level sort



3. Click the sort direction arrow in the Criteria area to switch between ascending and descending sort order. Up is ascending; down is descending.
4. If necessary, repeat steps 2 and 3 to add secondary sort levels to the list.
5. Click Sort.

4th DIMENSION sorts the current selection. If an input layout was being used, the first record in the sorted current selection is displayed.

Using Sort File

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Sort File permanently sorts the contents of the file. In the process, it rebuilds all the indexes belonging to that file. While rebuilding indexes, it displays a progress indicator.



Note: It is wise to back up your database before sorting a file permanently. If there is an interruption during Sort File, the database may be damaged and need to be repaired.

To sort a file, follow these steps:

1. Choose Sort File from the Select menu.

4th DIMENSION displays the Sort editor.

The dialog box is exactly the same as the dialog box that appears when you choose Sort Selection. Indexed fields appear in boldface.

2. Create the sort condition by following the steps just described.
3. Click Sort.

4th DIMENSION sorts the file, rebuilds all indexes for the file, and saves the records in the new sort order.

If your database is very large, rebuilding indexes may be time-consuming.



Note: After using Sort File, new records that you add to the database are not automatically inserted in the sort order. After adding new records, you may want to sort the file again.

Select	
Show All	⌘G
Show Subset	⌘H
Search Editor...	⌘S
Search by Layout...	⌘L
Search and Modify...	
Search by Formula...	
Sort Selection...	⌘T
Sort File...	

CHAPTER 7

REPORTING USING LAYOUTS

REPORTING USING LAYOUTS

One of the major functions of a database is to produce reports. In 4th DIMENSION, you can produce a report using either a layout or using the Quick Report editor. This chapter discusses how you print a report using a layout.

There are several advantages of using a layout for a report: you can use graphic elements on the layout, you can control the placement of report elements precisely, you can use scripts to perform calculations, and you can use headers at each break.

You can use a layout to create reports that

- require a non-columnar format
- display included layouts
- include picture fields
- contain embedded graphics
- contain picture areas
- require special graphic elements, such as hairlines
- require complex procedural processing

Chapter 8 discusses designing and printing reports using the Quick Report editor. The Quick Report editor is excellent for printing tabular reports that use a standard columnar format.

This chapter assumes that you have already created a layout for the report. For further information on designing output layouts, see Chapter 5 of the *4th DIMENSION Design Reference*.

Standard Reports and Reports with Breaks

There are two kinds of reports that can be printed using output layouts, standard reports and reports with breaks. When you create a standard report, you simply print the current selection using a layout. Reports with breaks separate records into groups. To create a report with breaks, you must sort the current selection before printing.

Printing Standard Reports

4th DIMENSION prints the records in the current selection. Set the current selection to the subset of records you want to print. If you want the report to list the records in a particular order, sort the current selection before printing the report.

To print a standard report, follow these steps:

1. Select the records to be included in the report. If desired, sort the records.

Selecting records is discussed in Chapter 4 and sorting records is discussed in Chapter 6.

2. Choose Print from the File menu.

The Choose Print Layout dialog box is displayed, as shown in Figure 7-1.



Layout panel

Thumbnail panel

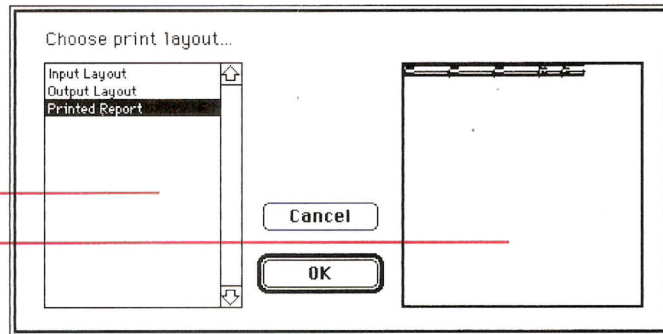


Figure 7-1
The Choose Print Layout dialog box

3. Choose the layout you want to use.

When you click on a layout, a thumbnail sketch of it appears in the area on the right.

4. Click OK.

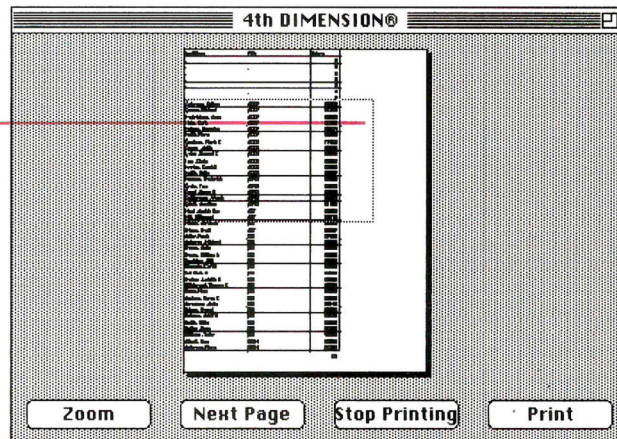
4th DIMENSION displays the Page Setup dialog box for your selected printer. Choose any desired options and click OK.

4th DIMENSION displays the Print Quality dialog box for the printer you selected in the Chooser.

To preview the report on the screen, click the “Preview on screen” check box.

If you clicked “Preview on screen,” the report will be displayed on screen, one page at a time. Figure 7-2 shows a report previewed on screen.

Frame



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'Screen Display'
Page 197*

Figure 7-2
Report previewed on screen

When a page of the report is being previewed, you can

- drag the frame shown within the previewed page
- view a close up of the area inside the frame by clicking Zoom
- view the next page of the report by clicking Next Page
- cancel the printing by clicking Stop Printing
- print the page being previewed by clicking Print

If you did not click “Preview on screen,” the report will be sent to the printer you selected in the Chooser. A dialog box keeps you informed of the progress of the operation.

Printing Reports with Break Levels

Break levels are used to separate records into groups and print summary calculations for each group. The output layout used to print a report with break levels must contain at least one break area. For information on designing output layouts with break levels, see Chapter 5 of the *4th DIMENSION Design Reference*.

If your report includes break levels, you must sort the current selection before printing. When sorting records for a report with break levels, you must sort on at least one more sort level than the number of break levels in your output layout. If your report has one break level, use at least two sort levels. For example, if your report lists employees by departments, the report has one break level (Departments). You can sort on your break field (Department Name) and one more field—Last Name. Employees will be listed alphabetically by last name within each department.

Figure 7-3 shows a report with one break level.

Header area		Consumer Products Employees
	Date : 6/8/89	Time : 5:43 PM
Break Header area		Accounting
Detail area	Name	Title Salary
	Baldwin, Steve	Supervisor \$43,990
	Johnson, John	Clerk \$18,250
Break area		Total Salaries for Accounting \$62,240
		Transportation
	Name	Title Salary
	Bentley, Alice	Engineer \$28,000
	Garbando, Smeldorf	Clerk \$19,610
		Total Salaries for Transportation \$47,610
Total area		Total Salaries for Company \$109,850
Footer area	Salaries by Department	Page : 1

Figure 7-3

A report with one break field (Department)

When you print a report with break levels, you must turn on *break processing*. Break processing causes 4th DIMENSION to break the records into groups and compute summary calculations.

There are two ways to turn on break processing. If the layout uses the Subtotal function, break processing is turned on automatically. Break processing can also be turned on by executing a short global procedure when the report is printed. The global procedure must contain two commands, ACCUMULATE and BREAK LEVEL. For more information on using these commands in a procedure, refer to those commands in the *4th DIMENSION Language Reference*. For information on how to use the Subtotal function in output layouts, see Chapter 5 of the *4th DIMENSION Design Reference*.

You can execute the procedure using the Execute Procedure menu item. See Chapter 11 for more information about executing global procedures.

To print a report with breaks, follow these steps:

1. Select the records to be included in the report.

Selecting records is discussed in Chapter 4.

2. Sort the records by at least one more level than the number of breaks in the report.

Sorting records is discussed in Chapter 6.

3. Execute the procedure that turns on break processing.



Note: This step can be skipped if the output layout turns on break processing automatically.

4. Choose Print from the File menu.

The Choose Print Layout dialog box is displayed.

5. Choose the layout you want to use.

6. Click OK.

4th DIMENSION displays the Page Setup dialog box for your selected printer. Choose any desired options and click OK.

4th DIMENSION displays the Print Quality dialog box for your selected printer.

To preview the report on the screen, click the “Preview on screen” check box.

7. If you clicked “Preview on screen,” the report will be displayed on screen, one page at a time. See the description of the options available for previewing a report in “Printing Standard Reports,” earlier in this chapter.

If you did not click Preview on screen, the report will be sent to the printer you selected in the Chooser. A dialog box keeps you informed of the progress of the operation.



CHAPTER 8

QUICK REPORTS

QUICK REPORTS

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One of the most important tasks in data management is the generation of reports. You can use the Quick Report editor to create a wide variety of columnar reports. Using the Quick Report editor you can

- produce lists of records
- create break areas
- compute summary calculations
- use fonts and styles in the report

The Quick Report editor is one of two tools used to design reports. You can also design reports using the Layout editor in the Design environment. You should use an output layout to design reports that require complex layouts, procedural processing, or graphics. For information about when to use the Layout editor, see Chapter 7.

The Quick Report editor produces reports from the current selection of records. Before you print a report, set the current selection to the records you want to include in your report using one of the methods for selecting records described in Chapter 4.

4th Dimension's Quick Report editor lets you create and print tabular reports. Figure 8-1 illustrates a typical Quick Report.

Name	Last Name	Salary
Accounting	Baldwin	\$43,990
	Johnson	\$18,250
	Subtotal for Accounting	\$62,240
Administration	Hanson	\$40,520
	Pfaff	\$26,440
	Smith	\$26,500
	Terry	\$16,190
	Wilson	\$36,500
	Subtotal for Administration	\$146,150
Art	Forbes	\$18,840
	Martin	\$56,144
	Tompkins	\$19,770
	Venable	\$43,520
	Voltz	\$25,150
	Subtotal for Art	\$163,424
Grand Total:		\$371,814

Figure 8-1
A quick report

When you create a quick report, you can specify

- columns that display fields or formulas, either from the current file or from related files
- a sort order
- break levels
- summary calculations
- text for labels
- formats for numeric data
- font, font size, style, and justification for labels, summary calculations, and data
- page headers and footers

A quick report can be printed

- on the standard printer selected in the Chooser
- on a serial printer
- to disk
- to a graph

These options are discussed in the section “Selecting an Output Device” in this chapter.

Quick Report Basics

This section describes basic operations used in using the Quick Report editor to design a report.

Creating a New Quick Report

To create a Quick Report design, choose Quick from the Report menu.

4th DIMENSION displays the Quick Report editor. If an existing design is displayed, choose New to begin a new Quick Report design.

Loading and Saving a Quick Report Design

You can save a Quick Report design as a file that you can open from the Quick Report editor. The Quick Report design includes all your specifications, but not the data. By saving report designs, you can maintain a library of quick reports that you can use depending on your needs.



Note: If you do not save your design, it is displayed the next time you open the Quick Report editor in that work session.

To save a Quick Report design, follow these steps:

1. Choose Save from the File menu.
4th DIMENSION displays a create-file dialog box.
2. Enter a filename for the Quick Report and click Save. 4th DIMENSION saves the report as a file that you can open with the Quick Report editor.
If you are saving a report previously saved or loaded, it replaces the old report.

When the Quick Report editor is open, you can load a saved design and use it to print a new report. The same Quick Report design can be used repeatedly to print different selections of records.

To load a report design, follow these steps:

1. Choose Open from the File menu.
4th DIMENSION displays an open-file dialog box displaying a list of available Quick Report designs.
2. Select a file from the list and click Open.
4th DIMENSION replaces the current report design with the design you opened.

File	
New	⌘N
Open...	⌘O
Save...	⌘S
Save as...	
Print to...	
Page Setup...	
Print...	⌘P
Close	⌘W

File	
New	⌘N
Open...	⌘O
Save...	⌘S
Save as...	
Print to...	
Page Setup...	
Print...	⌘P
Close	⌘W

The Quick Report Editor

This section describes the main features of the Quick Report editor. Figure 8-2 shows the Quick Report editor.

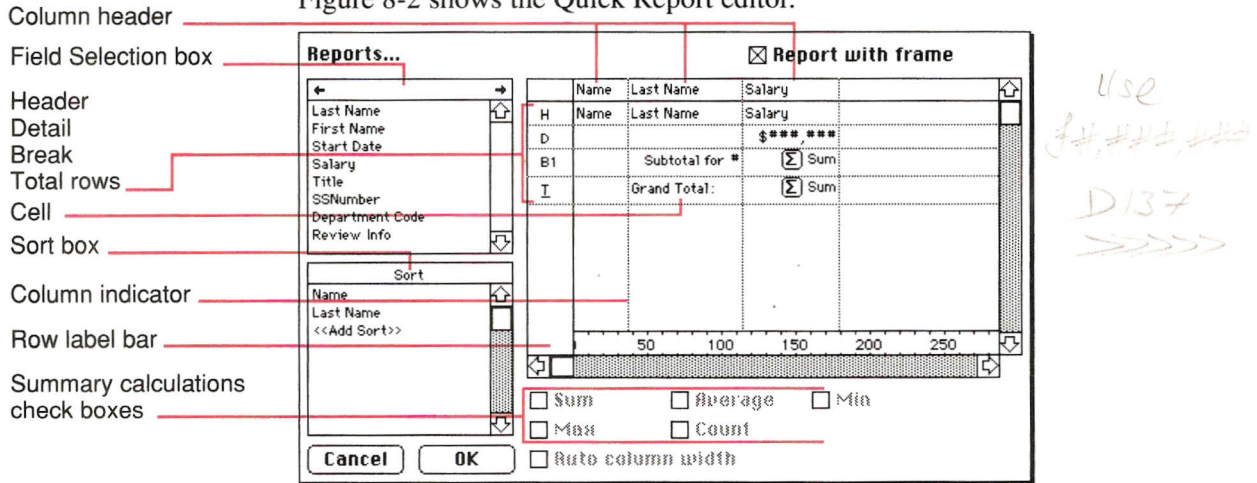


Figure 8-2
The Quick Report editor

The Quick Report editor contains the

- **Field Selection box** that lists fields in the current file. You can view the names of fields in other files by clicking the cycle arrows at the top of this box.
- **Sort box** that displays the sort order assigned to the report. It also contains the <<Add Sort>> marker that you use to set sort levels. If your report will contain summary calculations from groups of records, you must sort the current selection by one or more columns.
- **Quick Report layout** that is used to design the report by dragging fields, adjusting column widths, and adding or deleting breaks.
- **Report with frame** check box that lets you add a rectangular frame to your report.
- **Summary calculations** check boxes that are used to place summary calculations in the Break and Total areas of the report.
- **Column indicators** that indicate the boundaries between columns of the report.
- **Auto column width** check box that is used to request the Quick Report editor to compute a column width based on the maximum length of the contents of the column. This option can be checked for each column individually. This check box does not refer to the entire report.

If “Auto column width” is checked, the Quick Report editor computes column widths at the time the report is printed. If Auto column width is not checked, you can modify column widths by dragging column indicators.

- **Right margin marker** that indicates the right margin of the report. The right margin marker is meaningful only when no columns have “Auto column width” checked. On a 9 inch monitor, you must scroll the Quick Report layout to the right to view the Right margin marker.
- **Column header** displays the names of fields or formulas added to the report.
- **Row label bar** shows the different areas of the report: the Header, Detail, Break, and Total rows.
- **Header row** contains information that appears in the printed report above the records. The Quick Report editor automatically places field names in the Header row, but you can modify its contents.
- **Detail row** prints information from individual records and will be repeated in the printed report for each break.
- **Break and Totals rows** that display summary calculations and any associated labeling. The Break row displays summary calculations for each subgroup in the report and the Totals row displays summary calculations obtained from all records in the current selection.
- **Cells** that are the intersection of a row and a column.
- **Scroll bars** that let you view parts of the Quick Report design that extend beyond the area of the Quick Report layout.

Figure 8-3 on the next page shows a completed Quick Report design and the relationship between the specifications in the design and the printed output.

	Department Name	C2	Title	Salary
H	Department Name	Name	Title	Salary
D				\$ ###,###
B1		Statistics for Department: #	Average Count	(N) Average count
I		Statistics for all Departments	Average Count	(N) Average Count

Department Name	Name	Title	Salary
Accounts Payable	Smith, Mary	Accountant	\$26,650
	Lindsay, Georgina	Manager	\$28,324
	Klutz, Karla	Accountant	\$23,500
	Fredrickson, Anna	Secretary	\$18,750
	Chavez, Richard	Accountant	\$31,200
	Statistics for Department: Accounts Payable	Average Count	\$27,987 5
Accounts Receivable	Smith, Sally	Accountant	\$35,567
	Newton, Kendall	Manager	\$38,550
	Kane, Cindy	Accountant	\$27,000
	Irving, Samuel C.	Secretary	\$17,500
	Statistics for Department: Accounts Receivable	Average Count	\$29,261 4
	Statistics for all Departments	Average Count	\$30,616 77

Figure 8-3
A Quick Report example

Selecting Rows, Columns, and Cells

When designing a quick report, you need to select rows, columns, and cells in the Quick Report layout. A cell is the intersection of a row and a column.

To select a row, follow this step:

- Click on the H, D, B, or T marker on the left of the Quick Report Layout.

Or click in a row to the right of all columns in the Quick Report layout.

To select a column, follow this step:

- Click above the Header row of a column

To select a cell, follow this step:

- Click the cell.

Adding and Modifying Text

You can add or modify text in the Quick Report layout. Text can be used to label parts of the report. For example, if you requested summary calculations, you can also add text to other cells in the Break and Total rows to label the summary calculations.

You can

- edit the text that 4th DIMENSION automatically adds to the Header row of the report
- insert text in empty cells of the Break and Totals rows
- insert the value of a Break field in the Break rows
- specify font, font size, justification, and style for any text that appears in the report

To add text, follow these steps:

1. Click twice on an empty cell in the Quick Report layout.

A text insertion point appears in the cell.

If you are entering a label for a summary calculation, select a cell in the same row as the cell containing the calculation icons. You cannot enter text into the same cell that contains summary calculations.

2. Type the text in the cell.

To edit text, follow these steps:

1. Drag across the text in the cell you want to modify.

4th DIMENSION highlights the selected text.

2. Type the new text in the cell.

Specifying Font, Font Size, Justification, and Style

While designing your quick report, you can specify different fonts, font sizes, justification, and styles. You can apply these specifications to rows, columns, or cells in the quick report. These specifications can be applied to text, data, and summary calculations.

If you assign specifications to the Detail row of the report, you won't see the results until you preview or print the report.

To specify a font, follow this step:

- Select the column, row, or cell where you want to apply the font. Choose a font from the Font menu.

4th DIMENSION applies the font to any text, data, or summary calculations that appear in the selected area.

To specify a font size, style, or justification, follow this step:

- Select the column, row, or cell and choose a font size, style, or justification from the Style menu.

4th DIMENSION applies the font size, style, or justification to any text, data, or summary calculations that appear in the selected area.

Adding Columns to the Report

You create columns by dragging field names from the Field Selection box to the Quick Report layout. Use the cycle arrows in the Field Selection box to display field names from related files in the database. You can add fields from related files to the report, provided the relationship is automatic.

To add a column, follow this step:

- Drag the name of a field to the right of existing columns in the Quick Report layout and release the mouse button.

4th DIMENSION creates a column for the field and places the field name in both the column header and the cell in the Header row. Figure 8-4 shows a column being added to a quick report.

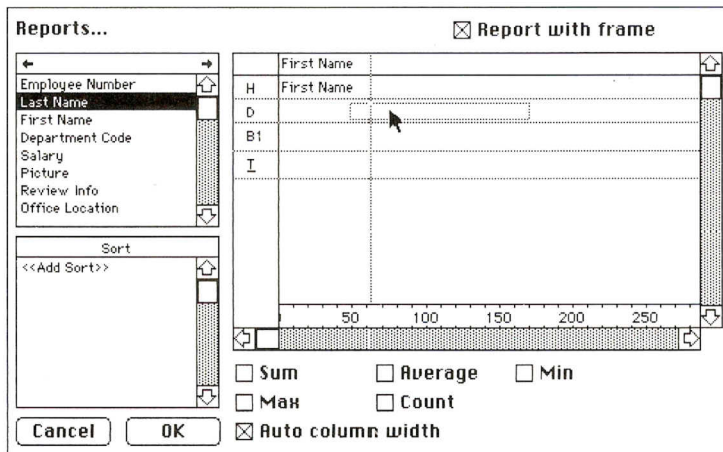


Figure 8-4
Dragging a field to the Quick Report layout

By default, 4th DIMENSION prints the field names as column heads at the top of each page in the quick report.



Note: If you use a subfield in a Quick Report design, the report will list all values of the subfield for each parent record. You cannot sort on a subfield.

Inserting Columns

You can insert a column in a quick report.

To insert a column, follow these steps:

- 1. Select a column.
- 2. Choose Insert Column from the Edit menu.

4th DIMENSION inserts a blank column to the left of the column you selected. You can then assign a field to the empty column by dragging a field name to it or assign a formula to the column. For information on assigning a formula to a column, see the section “Adding Formulas to the Report” later in this chapter.

Edit	
Undo	⌘Z
Cut	⌘H
Copy	⌘C
Paste	⌘V
Clear	
Insert Column	⌘I
Insert Break	⌘B
Delete Column	
Delete Break	
Hide Line	⌘H

Deleting Columns

As you specify fields for your quick report, you may want to remove some columns so that they can be placed elsewhere. You also might want to delete the column from the report.

To delete a column, follow these steps:

- 1. Select the column you want to delete.
- 2. Choose Delete Column from the Edit menu.

4th DIMENSION removes the selected column from the Quick Report layout.

Edit	
Undo	⌘Z
Cut	⌘H
Copy	⌘C
Paste	⌘V
Clear	
Insert Column	⌘I
Insert Break	⌘B
Delete Column	
Delete Break	
Hide Line	⌘H

Replacing Columns

You can also replace a column in the quick report by dragging another field over it. You can also replace a field with a formula.

To replace a column, follow this step:

- Drag a field from the Field Selection box to the column you want to replace.
Or select the column you want to replace and choose Edit a Formula from the Other menu.

See the section “Adding Formulas to the Report” for information on adding a formula to a quick report.

When you print the Quick Report, 4th DIMENSION will print the results of the formula for each record that appears in the Detail row.

Sizing Columns

By default, the Quick Report editor sizes columns automatically. It sizes each column based on the maximum length of data displayed in the column and any labels typed into the column. The Quick Report editor sizes columns at the time the report is printed.

To view the widths of each column, preview the report to the screen. Because the “Auto column width” option will change the width of a column based on the maximum width of data in the records being printed, selecting different records can change the size of columns.

See the section “Printing the Quick Report” in this chapter for more information about previewing the report.

You can resize a column manually after turning off the “Auto column width” option. When a column is set manually, text in the column wraps within the area specified.

To resize a column manually, follow these steps:

1. Select the column you want to resize.
2. Deselect the “Auto column width” option.
3. Move the pointer over the column indicator in the column header to change the pointer into a column width cursor. Figure 8-5 shows the column width cursor.



Figure 8-5
The column width cursor

4. Drag the column indicator to the left or right to size the column.

Adding Formulas to a Quick Report

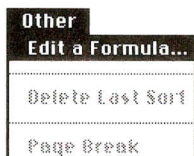
You can add a formula to a column in a quick report. For example, you can add a formula that computes employees’ monthly salaries from an Annual Salary field.

To add a formula, follow these steps:

1. Insert an empty column and choose Edit a Formula from the Other menu.

Or click a column and choose Edit a Formula. The formula will replace previous contents of the column.

4th DIMENSION displays the Formula editor where you can build a formula.



2. Build the formula by clicking fields, keywords, and commands and entering values. For more information on using the Formula editor, see the section “Global Updates” in Chapter 5. *Page 70*

To save the formula as a file that you can recall and use in another column or in another report, click Save and enter a filename in a create-file dialog box.

3. Click OK to assign the formula to the column.

4th DIMENSION adds a new label to the column that identifies it as a formula. You can relabel the column by typing a label into the header cell for that column.

Formulas are labeled C1 through Cn. The labels are the names of variables that contain the column's value. You can use these variables in other formulas.

Sorting Records and Creating Breaks

An important feature of the Quick Report editor is the ability to sort the records in your report. You sort records for two reasons:

- to view records in a particular order
- to create groups of records and Break areas in the report for the purpose of reporting summary calculations for groups. See the section, “Setting Break Levels,” for information on summary calculations.

Specifying a Sort Order

After you specify the columns for your report, you can specify a sort order. You set a sort order by dragging the <<Add Sort>> marker in the Sort box to columns that you want to sort on. For example, if you want to sort salesperson records by the Sales Region field, you drag the <<Add Sort>> marker to the Sales Region column.

You can also sort on a formula. Simply drag the <<Add Sort>> marker to the column that contains the formula. See “Adding Formulas to the Report” earlier in this chapter for more information on adding formulas to quick reports.

To specify the sort order, follow these steps:

1. Drag the <<Add Sort>> marker from the Sort box to the column on the Quick Report layout that contains the field or formula you want to specify as the primary sort level. See Figure 8-6.

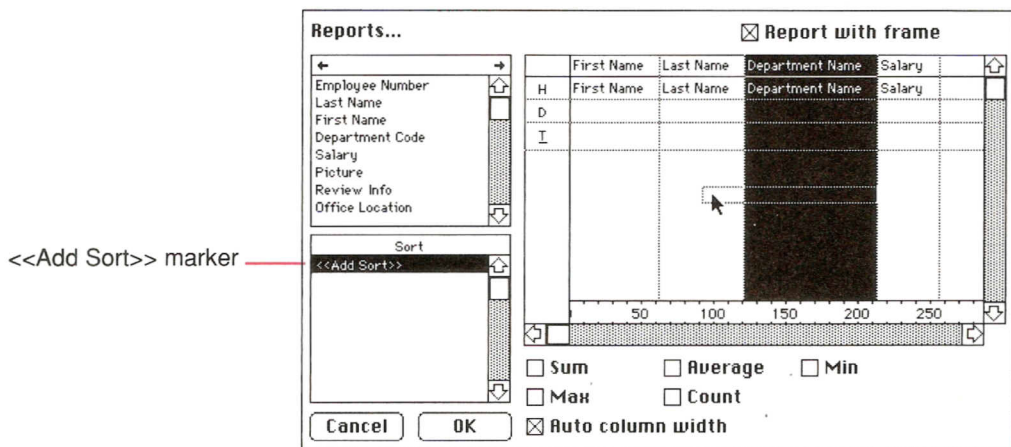


Figure 8-6
Dragging the <<Add Sort>> marker

When you release the mouse button, 4th DIMENSION displays the name of the field in the Sort box.

2. If desired, drag the <<Add Sort>> marker to additional fields or formulas to specify secondary sort levels.

When you specify multiple sort levels, 4th DIMENSION will sort the records on the first field in the Sort field list, then on other fields in the order that they appear in the list. For example, if you specified the Department Name as the primary Sort field and Last Name as the secondary Sort field, your Quick Report design might look like Figure 8-7.

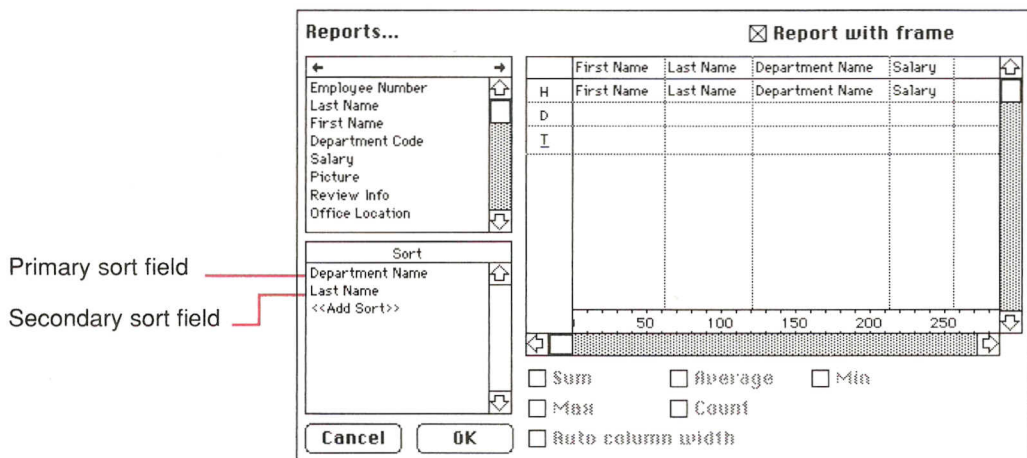


Figure 8-7
A quick report with two sort levels

To change a Sort field, follow this step:

- Drag the name of a Sort field or formula in the Sort box to a new column.

The new column becomes a sort field. Its name appears in the Sort box.

Deleting a Field or Formula from the Sort Order

You can delete the last field or formula from the Sort list. To specify a new sort order, you can delete all the fields from the Sort list and build a new list.

To delete the last sort field, follow this step:

- Choose Delete Last Sort from the Other menu.

4th DIMENSION removes the last field or formula in the Sort field list. It does not delete the column itself from the report. When you print the report, 4th DIMENSION will no longer use that field or formula to sort records.

Setting Break Levels

In a quick report, you set break levels to separate or “break” records into groups according to values in one or more sort fields. At each break level a Break area is printed. You can print summary calculations in the Break area. The summary calculations—sum, average, minimum, maximum, and count—are computed for each group of records.

Break levels are determined by the sort levels and Break rows. For example, if you tell 4th DIMENSION to sort records by Sales Region and create a Break row, 4th DIMENSION inserts a break between each group of records that have the same sales region.

After you add a Break row to the quick report, you can request summary calculations on each break. For example, you can insert a summary calculation in a Break row to display subtotals for sales from each state in a marketing region.

See “Adding Summary Calculations” later in this chapter for more information on adding summary calculations to Break and Total rows.

To insert a Break row, follow these steps:

1. Select the Totals (T) row.
2. Choose Insert Break from the Edit menu.

4th DIMENSION adds a Break row. Figure 8-8 shows a Break row in a Quick Report layout.

Other
Edit a Formula...
Delete Last Sort
Page Break

Edit
Undo ⌘Z
Cut ⌘H
Copy ⌘C
Paste ⌘V
Clear
Insert Column ⌘I
Insert Break ⌘B
Delete Column
Delete Break
Hide Line ⌘H

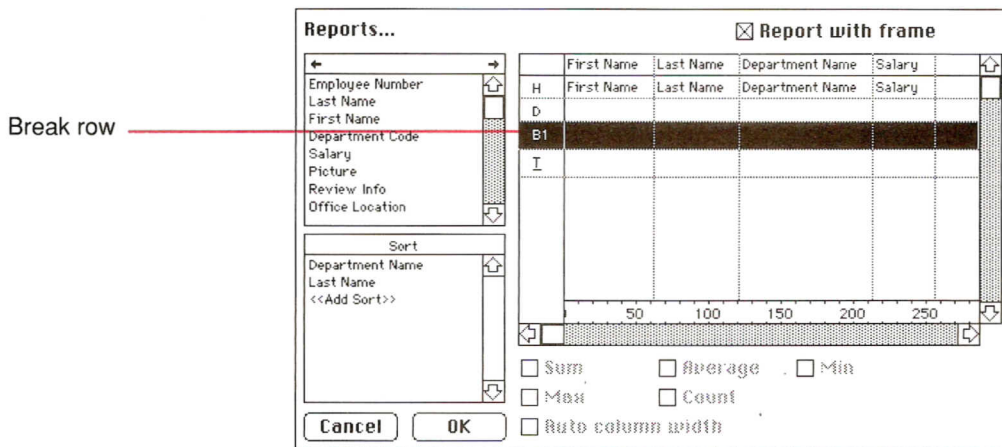


Figure 8-8
A quick report with a Break row

3. If desired, add additional Break rows by selecting an existing Break row and choosing Insert Break from the Edit menu. There should be at least as many sort levels as break levels.

4th DIMENSION adds a sequential number to each new break label in the row label bar, for example, B1, B2, B3, and so forth.

Using the Values of Break Fields in Labels

You can improve the appearance and comprehensibility of your reports by labeling each Break row using the value of the Break field.

To request that the value of a Break field be printed in a label placed in the Break area, use the number sign (#) in the label. For example, the text “Total salaries for department #” will insert the department name (in this case, the value of the Department field) in place of the number sign when the report is printed.

The number sign does not need to be placed in the break field; it will display the value of the Break field in any cell in the Break row.

Figure 8-9 illustrates the use of the number sign in a label in the Break row.

Value of Break field
inserted for number
sign when printed

Reports... ☒ Report with frame

	First Name	Last Name	Department Name	Salary
H	First Name	Last Name	Department Name	Salary
D				
B1			Sum for Department: #	
T				

50 100 150 200 250

☐ Sum ☐ Average ☐ Min
☐ Max ☐ Count
☐ Auto column width

Cancel OK

Figure 8-9
Using the number sign in a Break row label

Adding Summary Calculations

Summary calculations on the contents of fields and formulas can be added to each Break row and to the Totals row.

The check boxes at the bottom of the Quick Report editor identify the summary calculation options available for Quick Reports. The available types of summary calculations are the

- **Sum**, which is the total of the values in the report or break
- **Minimum**, which is the lowest value in the report or break
- **Maximum**, which is the highest value in the report or break
- **Average**, which is the mean of the values in the report or break
- **Count**, which is the number of records in the report or break

When a summary calculation is placed in the Totals row, the calculation is done for all the records in the report. If the summary calculation is placed in a Break row, the calculation is done for the records in each break.

To add a summary calculation, follow these steps:

1. Select a cell—the intersection between row and column—in a Break row or the Totals row where you want to insert the summary calculation.

The Sum, Minimum, Maximum, and Average calculations work only on a numeric field or formula.

2. Click as many summary calculation check boxes as you like.

4th DIMENSION displays a calculation icon in the selected cell for each type of summary calculation you request.

Figure 8-10 shows a summary calculation icon added to the Totals row.

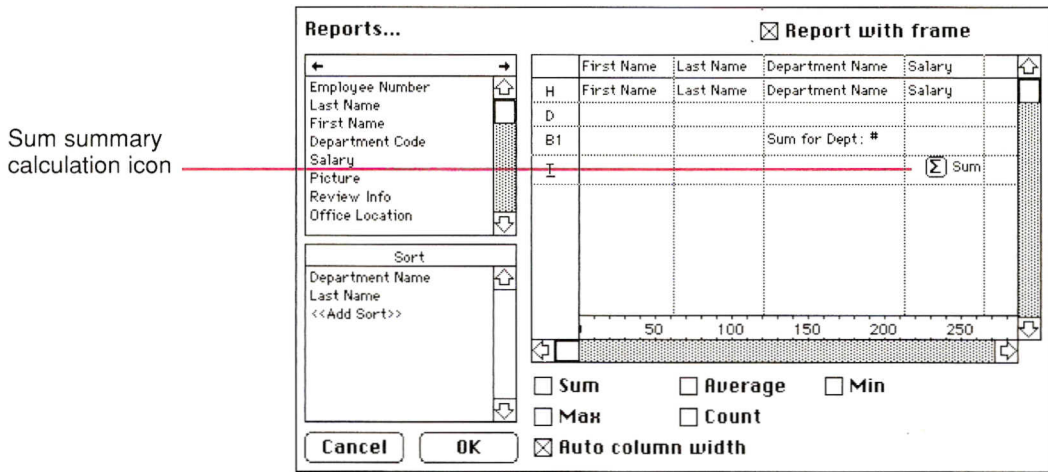


Figure 8-10

A calculation icon in the Totals row

If you add more than one summary calculation to a cell, 4th DIMENSION stacks the calculation icons on top of each other. This is shown in Figure 8-11.

Summary
calculation icons

Figure 8-11
Multiple calculation icons in a cell

If you added summary calculations to a Break row, 4th DIMENSION will perform the calculation on each group of records specified by the Break fields. If you added the summary calculations to the Totals row, 4th DIMENSION performs the calculation on all the records in the report.

Setting Numeric Formats

You can specify formats for columns that contain numeric data. For example, if you are displaying salaries in a column, you can add a format to the Detail cell for the Salary field. The following format places a dollar sign to the left of the number, allows up to 9 places to the left of the decimal and two places to its right:

\$###,###,##0.00

This format can display dollar amounts up to \$999,999,999.99.

You can create formats by using the formatting symbols and rules described in Chapter 4 of the *4th DIMENSION Design Reference*.

You can also use a style as a format.

To set a numeric format, follow these steps:

1. Click twice in the Detail cell for a numeric field.
2. Type a format or the name of a style.

The names of styles are preceded by a vertical bar (|).

Date Formats
use Formula
String L332
D135

~~~~~

D137

D135

21 Dec 1998

If you have also requested summary calculations for that column, the format specified in the Detail cell will automatically be applied to the summary calculations. The Count is always displayed as an integer and ignores formatting symbols, such as the dollar sign.

Figure 8-12 shows a numeric format added to a detail cell in a Quick Report layout.

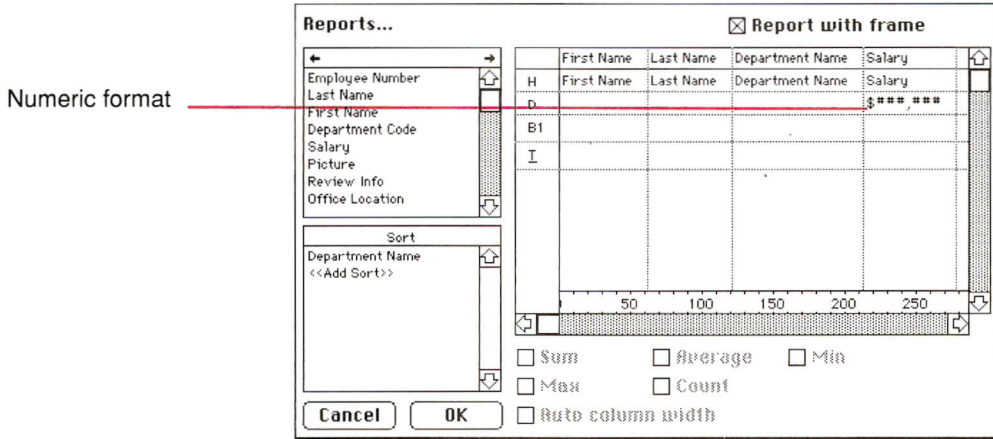


Figure 8-12  
Numeric format in a quick report cell

Different formats can be applied to different columns in the report.

## Hiding Rows

4th DIMENSION lets you hide rows when printing a Quick Report. This feature is useful, for example, when you want the report to include only summary calculations. Hide the Detail row if you want to display only the summary calculations that appear in the Totals and Break rows.

You can also use this feature to hide a Break row or the Totals row.

To hide a row, follow these steps:

1. Select the row you want to hide.
2. Choose Hide Line from the Edit menu.

4th DIMENSION places an icon in the selected row label bar that reminds you that the row won't appear when you print or preview the quick report.



## Adding Page Headers and Footers

Before printing a quick report, you can add page headers and footers. You specify page headers and footers in the Format dialog box. Use this dialog box to

- add page header and footer text
- specify the size of the page header and footer areas
- specify fonts, font sizes, and font styles for page header and footer text
- insert codes that add page numbers, date, and time to your reports

Page headers can only be specified when printing to a normal or Direct ASCII printer. See the section, “Selecting an Output Device” later in this chapter for more information about alternate output devices.

To add page headers and footers, follow these steps:

1. Choose Page Setup from the File menu.

If you have chosen Normal printer in the “Print to” dialog box, the standard Page Setup dialog box is displayed. If you have chosen Direct ASCII, the serial printer driver dialog box is displayed. See Figure 8-17.

2. Select any printing options you want and click OK.

The Quick Report Format dialog box, shown in Figure 8-13, is displayed.

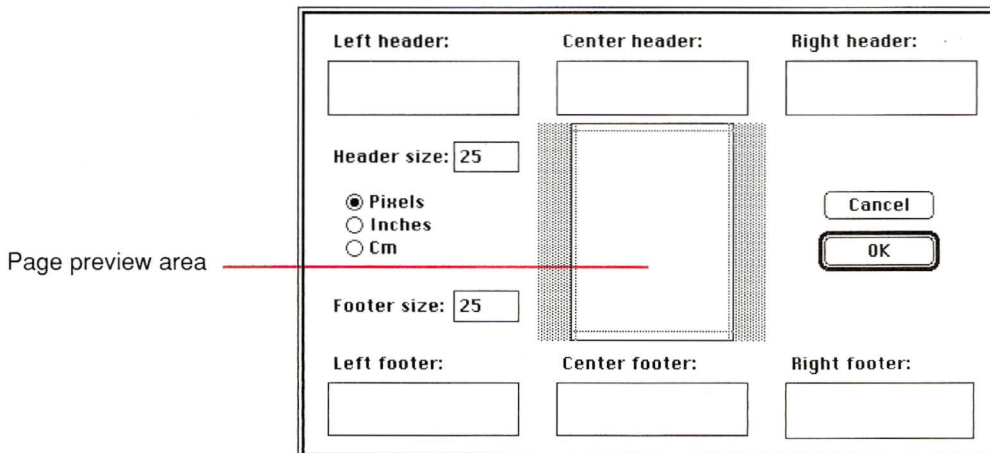


Figure 8-13  
Quick Report Format dialog box

3. Enter header and footer height in the provided entry areas.

As you enter header and footer height, the dotted lines on the page preview area will change to indicate the size of the header and footer as they will appear on the printed report.



4. Select one of the six Header and Footer entry areas and type the header or footer text. Figure 8-14 shows header and footer text entered in the format dialog box.

The dialog box is titled 'Format' and contains several input fields and controls. At the top, there are three text boxes for headers: 'Left header:', 'Center header:', and 'Right header:'. The 'Center header:' box contains the text 'Report title'. Below these are three text boxes for footers: 'Left footer:', 'Center footer:', and 'Right footer:'. The 'Center footer:' box contains the text 'Report footer text'. In the middle of the dialog is a large rectangular area with a dotted border, representing a preview of the page layout. To the left of this preview are two size input fields: 'Header size: 25' and 'Footer size: 25'. Below these are three radio buttons for units: 'Pixels' (selected), 'Inches', and 'Cm'. On the right side of the dialog are two buttons: 'Cancel' and 'OK'.

Figure 8-14  
Example header and footer text

## Specifying Fonts, Font Sizes, Justification, and Styles

You can also specify different fonts, font sizes, justification, and styles for page headers and footers.

To apply these specifications, follow these steps:

1. Select the page header or footer area in the Page Preview area.

Figure 8-15 illustrates a selected page header.

This dialog box is identical to Figure 8-14, but with a mouse cursor pointing at the top border of the central preview area, indicating that the page header is selected for formatting.

Figure 8-15  
Selecting the page header



2. Apply the fonts, font sizes, justification, and styles by choosing the desired items from the Font and Style menus.

## Adding Page Numbers, Time, and Date

Add page numbers, time or date to the quick report by entering the codes shown below in the Page Header or Footer areas.

The following codes are available:

- **#P** adds a sequential page number
- **#H** adds the time of printing
- **#D** adds the date of printing

You can also embed these codes within header or footer text. For example, you can enter the label “Page #P” in a Header or Footer area.

## Accepting the Page Setup

When you are satisfied with your quick report page setup, click OK to accept the setup and return to the Quick Report editor.

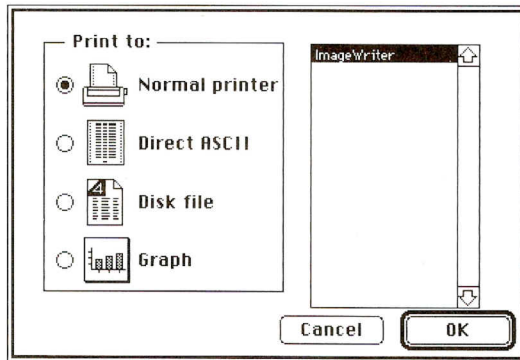
The headers and footers specified will remain in effect until you choose Page Setup again and modify the settings.

## Selecting an Output Device

4th DIMENSION supports four types of output devices for quick reports.

To select a print option, choose “Print to” from the File menu.

4th DIMENSION displays the “Print to” dialog box.



*The option of  
"Printing to Screen"  
not available.  
example Page 87  
Design Reference  
"Screen Display" Page 197*

Figure 8-16  
“Print to” dialog box

The following options are available in the “Print to” dialog box:

- **Normal printer** uses the printer you choose with the Chooser.
- **Direct ASCII** sends your Quick Report to a driver that prints the report on a high-speed serial printer or to another device. If you click Direct ASCII, you also need to click the name of a driver in the list of available drivers. A serial driver for the Apple ImageWriter is included with 4th DIMENSION. For more information on driver software for other printers, contact ACIUS or ACI.

If you selected Direct ASCII and the ImageWriter driver, 4th DIMENSION displays the ImageWriter serial driver dialog box when you choose page setup.

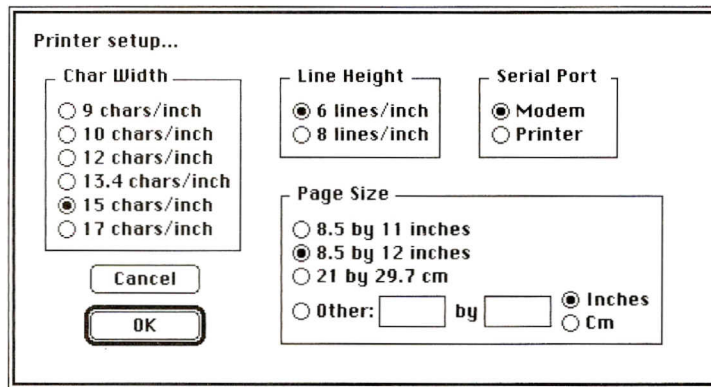


Figure 8-17  
ImageWriter serial driver dialog box

Select the options that are appropriate for your report design and paper and click OK.

- **Disk file** sends your quick report to a disk file that you can open and modify with other applications, including text editors and spreadsheets. This is, in essence, an export of the records in the quick report.
- **Graph** directs the report to the Graph editor. The Graph editor uses the data in the Break row. You can use this option to graph the contents of the report using any of eight graph types. Your graph can be printed through the Graph editor.

When you choose the Graph option in the “Print to” dialog box, your report is graphed rather than presented in tabular form. The Graph editor uses only the summary calculations and labels in the Break row. It uses the leftmost non-numeric column for the x-axis.

To use this feature, your report should

- Include from one to five numeric fields or formulas. These columns will be assigned to the y-axis in the graph.
- Use one type of summary calculation per numeric field.

For example, if you want to graph average salary by department, create a quick report with two columns, Department Name and Salary. Use the Average summary calculation for Salary.

Figure 8-18 shows how such a Quick Report design would look.

Value that will  
be graphed

| Department Name | Salary          |
|-----------------|-----------------|
| H               | Department Name |
| B1              | #               |
| I               | Average         |

Figure 8-18  
A quick report for graphing average salary by department

Figure 8-19 shows the graph produced by the Graph editor.

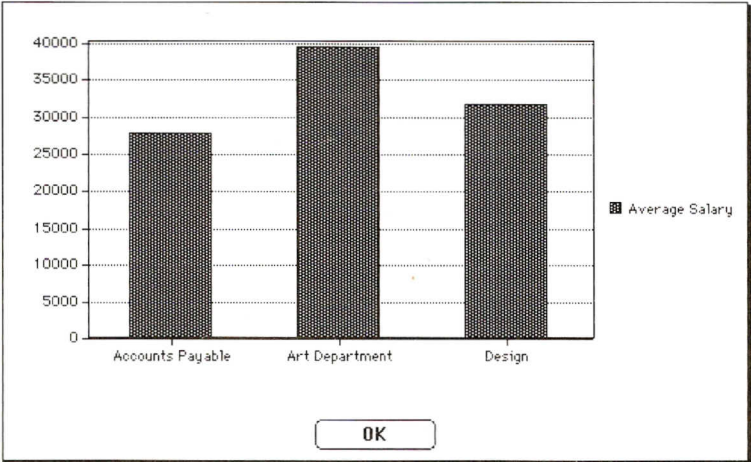


Figure 8-19  
A column graph of average salary by department

## Printing a Quick Report

After you have completed your report design, you can print the quick report. If you are printing to a normal printer, you can preview the report before printing it.

\* To print to a normal printer, follow these steps:

1. Choose Print from the File menu.
2. Click OK and follow the standard 4th DIMENSION procedure for previewing and printing your report. For more information about printing, see the section "Printing Standard Reports" in Chapter 7.

\* To print to a direct ASCII printer, follow these steps:

1. Choose Print from the File menu.

4th DIMENSION displays the serial driver dialog box for the printer you chose in the "Print to" dialog box. If you chose the ImageWriter, the dialog box shown in Figure 8-17 is displayed. If you are using a different serial printer, this dialog box may be different.

2. Choose the settings that are appropriate for your report and click OK.

\* To print to a disk file, follow these steps:

1. Choose Print from the File menu.

4th DIMENSION displays the standard create-file dialog box and asks you to enter a filename.

2. Enter a filename and click OK.

4th DIMENSION displays a dialog box that keeps you informed of the progress of the operation. Click Stop Printing to cancel the operation.

After the report is printed to a file, 4th DIMENSION returns you to the Quick Report editor. Remember to change the output device if you want to resume sending a quick report to a standard printer.

\* To print to a graph, follow this step:

- Choose Print from the File menu.

4th DIMENSION graphs your data as a column graph.

You can use the Graph editor to select another graph type, and to print or preview the graphed data. For more information about the options available in the Graph editor, see the section "Viewing the Graph" in Chapter 10.

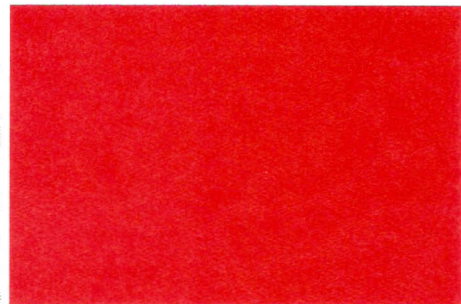
Page 132

| File          |  |    |
|---------------|--|----|
| New           |  | ⌘N |
| Open...       |  | ⌘O |
| -----         |  |    |
| Save...       |  | ⌘S |
| Save as...    |  |    |
| -----         |  |    |
| Print to...   |  |    |
| Page Setup... |  |    |
| Print...      |  | ⌘P |
| -----         |  |    |
| Close         |  | ⌘W |



# ***LABELS***

## CHAPTER 9





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## LABELS

---

4th DIMENSION's Label editor provides a convenient way to print a wide variety of labels. The Label editor lets you create

- mailing labels
- labels for file folders
- labels for file cards

and labels for many other needs.

The Label editor is visually oriented and very easy to use. Using the Label editor, you can

- design the label
- specify the number of labels across and down on each page
- load and save label designs
- specify the output device
- print labels

Labels can also be created using the Layout editor in the Design environment. For more specialized labels, use the Layout editor to create labels. If you use the Layout editor you can

- specify the font, font size, and style of the label
- include separators between fields
- use variables in the labels

For more information on using the Layout editor to create labels, see Chapter 5 of the *4th DIMENSION Design Reference*.

## The Label Editor

---

The Label editor contains facilities for designing the label, determining the size of each label, and the left, right, top, and bottom margins. You can save a label design to disk.

To open the Label editor, follow these steps:

1. Choose Labels from the Report menu.

4th DIMENSION opens the Page Setup dialog box for your selected printer. The Label editor needs to know which printer you will use so that it can format the page accurately.

2. Click the settings that apply to the labels you will be using and click OK.

| Report    |    |
|-----------|----|
| Quick...  | ⌘R |
| Labels... | ⌘J |
| Graph...  | ⌘K |

4th DIMENSION displays the Label editor.

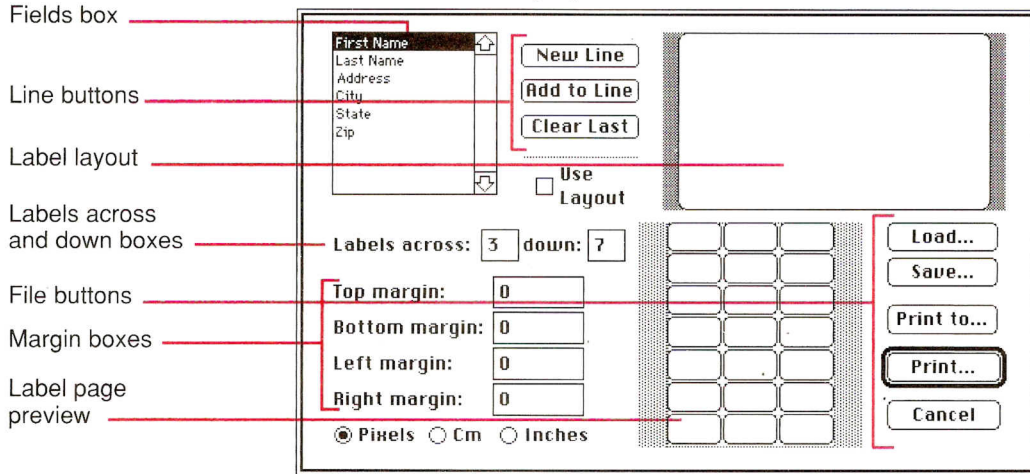


Figure 9-1  
The Label editor

The Label editor contains the

- **Fields box** that lists the names of fields in the current file. If this file is related to other files, the relating fields are shown in boldface. You can display fields from the related file by double-clicking the fields shown in boldface. The fields in the related file are indented.
- **Label layout** that is used to preview your label.
- **Line buttons** to add, delete, and combine lines on the Label layout.
- **Labels across** and **down boxes** are used to control the size of labels by specifying the number of labels that appear on your label paper.
- **Label page preview** that provides a reduced view of how an entire page of labels will look, based on the dimensions you enter in the Label editor. The page preview will also represent the paper size selected in the Page Setup dialog box.
- **Margin boxes** are used to specify the size of the label paper margins. Margin settings also affect the dimensions of the label. You can specify margins in pixels, centimeters, or inches.
- **File buttons** provide options for printing, saving, and loading label design.
- **Use layout check box** that lets you bypass the Label editor and use the output layout to print your labels.

If you use the output layout, 4th DIMENSION executes any layout procedures and scripts associated with the layout. Typically, a script attached to an active object is used to create the label.

See Chapter 5 of the *4th DIMENSION Design Reference* for more information on designing layouts for labels.

## Saving and Loading Label Designs

---

4th DIMENSION lets you save each label design as a file that you can open from the Labels editor. By saving label designs, you can maintain a library of labels that you can use according to your needs.

To save a label design, follow these steps:

1. Click Save.

4th DIMENSION displays a create-file dialog box where you can enter a filename for the label design.

2. Type a filename and click Save.

After you save the label design, you can load it whenever the Label editor is active.

To load a label design, follow this step:

- Click Load.

4th DIMENSION displays an open-file dialog box where you can select the name of a label design file. Choose a filename and click Open.

4th DIMENSION replaces the current label design with the design you selected.

## Creating a Label Design

---

This section describes the process of creating a label.

To create a label, follow these steps:

1. Click the name of the first field you want to display in the label. To select a field from a related file, double-click on any fields that are displayed in boldface to expand the list. Then click on the field from the related file.
2. Click the New Line button.

4th DIMENSION creates a line in the Label layout containing the field name, centering the line in the middle of the label. Figure 9-2 shows one line added to a label.

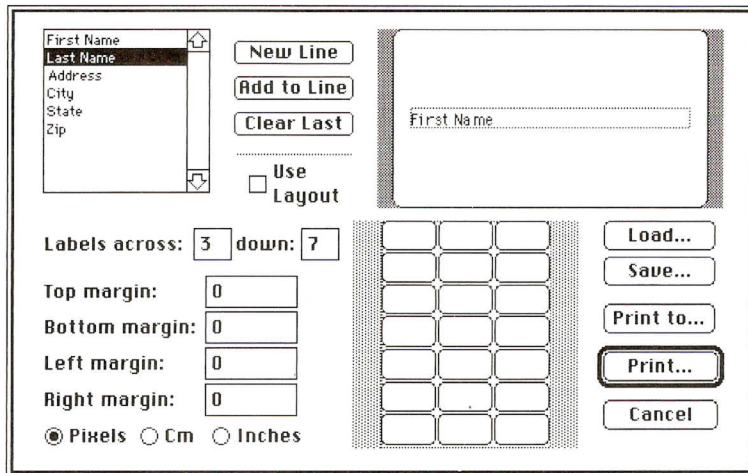


Figure 9-2  
A line added to a label

3. Add fields to the line by clicking field names and clicking Add to Line. A “+” between field names in the Label layout indicates that the fields are joined on a single line. When 4th DIMENSION prints the label, it will insert a space between the fields on the same line.
4. When you are ready to place a field on a new line, click on a field name and click the New Line button.

4th DIMENSION places the field directly below the first line.

As you add fields and lines to the label design, 4th DIMENSION automatically adjusts the position of the lines on the label so that the entire label text is centered. Figure 9-3 shows a sample mailing label.

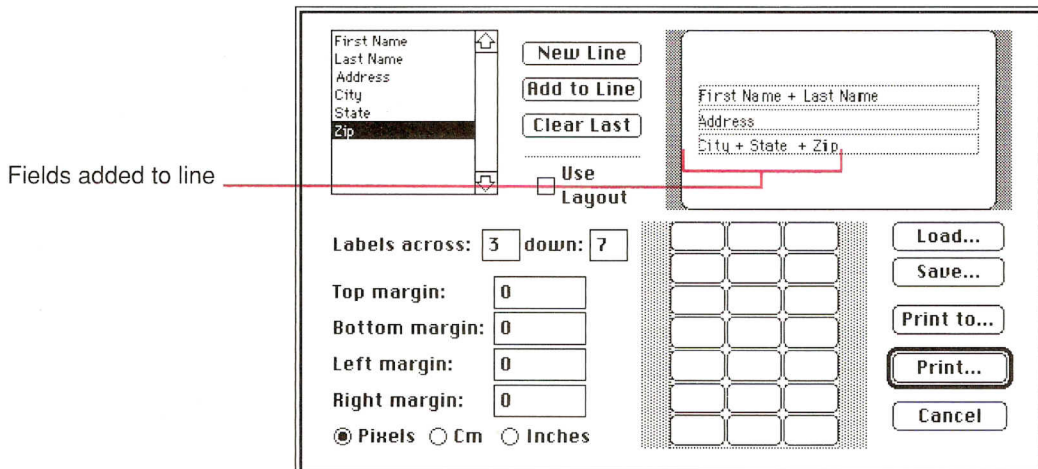


Figure 9-3  
A sample label



4th DIMENSION handles missing data intelligently when printing labels:

- If a field in a line contains no data for a particular record, 4th DIMENSION concatenates the remaining fields in the line without leaving a blank space for the missing data.
- If an entire line contains no data for a particular record, 4th DIMENSION vertically concatenates the remaining lines in the label without leaving a blank line.

To clear the last field, follow this step:

- Click Clear Last.

The last field in the label layout is removed.

To redo a label, use Clear Last to remove all existing fields and start again.

To specify label size, follow these steps:

1. Enter numbers of labels in the Labels across and down boxes to specify the layout of the label paper.

The Label Preview area adjusts to display the appearance of the labels on a printed page.

Page preview area  
adjusts to reflect the  
new Labels across and  
down settings

Figure 9-4  
Specifications in the Labels across and down boxes

2. Click the unit of measurement to use for entering margin sizes.
3. Enter values to reflect the actual margins on your label paper.

The size of the individual labels in the Label page preview will adjust to accommodate the margins. For example, if you increased the size of your margins to two inches, top and bottom, the size of the individual labels

would shrink to maintain the same number of labels that you specified earlier.



**Note:** Depending on the characteristics of your printer, you may need to print test labels and adjust the position of the paper in the printer and your margin settings until you get satisfactory results. You can then save the setup.

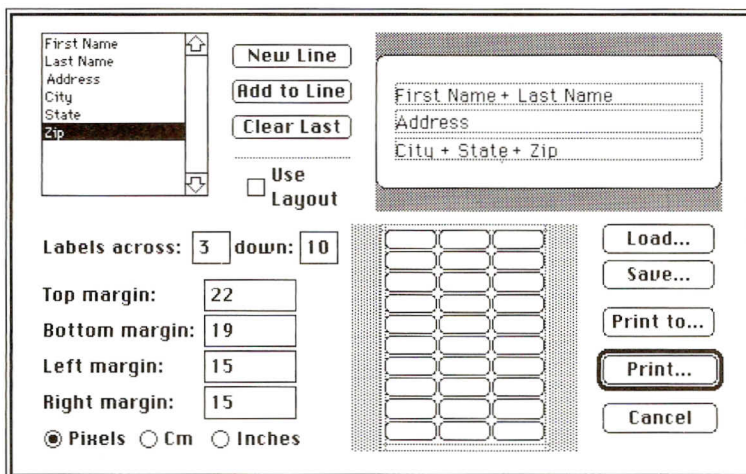


Figure 9-5  
Adjusted margins

## Selecting an Output Device

4th DIMENSION supports two output devices for labels. Select an output device by clicking the “Print to” button.

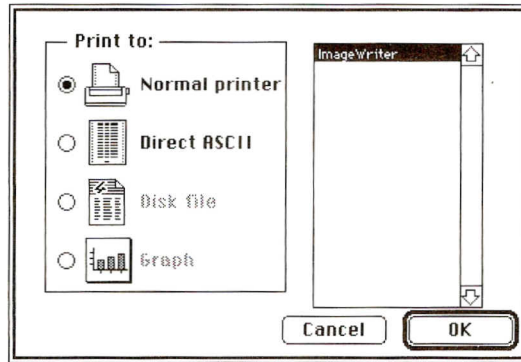
The options available in the “Print to” dialog box are

- **Normal printer**, which uses the printer you chose with the Chooser.
- **Direct ASCII**, which sends your labels to a driver that prints the labels on a high-speed serial printer or to another device. If you click Direct ASCII, you also need to click the name of a driver in the list of available drivers. A serial driver for the Apple ImageWriter is included with 4th DIMENSION. For more information on driver software for other printers, contact ACIUS.

To select an output device, follow these steps:

1. Click the “Print to” button.

4th DIMENSION displays the “Print to” dialog box.



The option of  
"Printing to Screen"  
Not available.  
example Page 87  
Design Reference  
"Screen Display" Page 197

Figure 9-6  
"Print to" dialog box

2. Click the output device you want to use.
3. Click OK to close the dialog box.

If you selected Direct ASCII, select a serial driver. 4th DIMENSION displays the serial printer setup dialog box for the printer you selected.

Select the options that are appropriate for your printer and label design and click OK.

## Printing Labels

After you have completed your label design, you can preview the labels or print them. You may want to first print on regular paper so that you can check the placement of text before you use the more expensive label paper.

Before you print, select a printing option using the "Print to" dialog box. If you are printing to the device selected in the Chooser, click Print and follow the standard procedure for printing and previewing your labels.

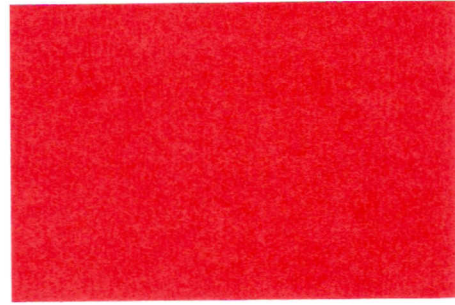
If you selected the Use Layout option, 4th DIMENSION will use the current output layout to print the labels. It assumes that the layout was designed to print labels.

If you print labels designed in the Label editor, 4th DIMENSION uses the Geneva font on the ImageWriter and the Helvetica font on PostScript printers.

After the labels are printed, 4th DIMENSION closes the Label editor and returns you to the layout you were using when you chose Labels from the Report menu.



CHAPTER 10



**GRAPHS**





## GRAPHS

The Graph editor is used to design and print a wide variety of standard business graphs. Using the Graph editor, you can plot your data without having to export the data to a graphics package.

You can print your graphs or copy them to the Clipboard and paste them into another application.

The Graph editor produces

- **Column graphs** which represent values as columns.
- **Proportional column graphs** which represent values as columns, and stacks the columns to represent percentages of a total.
- **Stacked column graphs** which represent values as stacked columns.
- **Line graphs** which represent values as points and connects the points with a line.
- **Area graphs** which shade the area below a line.
- **Scatter graphs** which display values as points on an x-y grid.
- **Pie charts** which display data in a circular chart where each value is represented by a slice of a pie.
- **Picture graphs** which represent each value with a picture. You can specify the picture to be used.

You can modify the graph's scale and change the pattern and color of each element of the graph.

Figure 10-1 shows a typical graph.

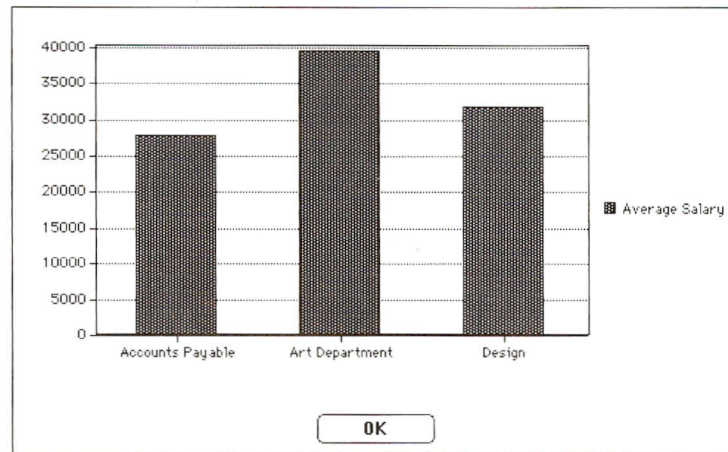


Figure 10-1  
A column graph

The Graph editor produces two-dimensional graphs. The horizontal axis is referred to as the *x-axis* and the vertical axis is referred to as the *y-axis*. A graph is created by assigning a field to the x-axis and one or more numeric fields to the y-axis.

The field assigned to the x-axis can be alphanumeric, numeric, date, or time. 4th DIMENSION automatically groups like x-axis values. For example, in an Employees database you can assign the Department field to the x-axis. 4th DIMENSION would automatically sum all values of each y-axis field for each department. This feature is referred to as “Grouping on the x-axis” and can be disabled when necessary. When “Grouping on the x-axis” is disabled, each record is treated as a separate “group.”

Up to 100 groups can be plotted on the x-axis. There is no limit to the number of records that can be graphed.

In all graph types, the fields assigned to the y-axis must be numeric. Up to five fields can be assigned to the y-axis. For example, if you are graphing data in personnel records, the x-axis field could be Department and the y-axis fields could be Salary, Expenditures, and so forth.

Data for a graph can be directed from a quick report. When you use this option, you use the Quick Report editor to do preliminary data processing prior to graphing data. If you direct a quick report to the Graph editor, the columns in the quick report are treated as fields in the Graph editor. For more information on designing a quick report for the Graph editor, see “Selecting an Output Device” in Chapter 8.

## Creating a Graph

---

The Graph editor graphs the records in the current selection. Before graphing data, select the records you want to graph. Methods of selecting records are discussed in Chapter 4.

To create a graph, follow these steps:

1. Choose Graph from the Report menu.

4th DIMENSION displays the Graph editor, shown in Figure 10-2.

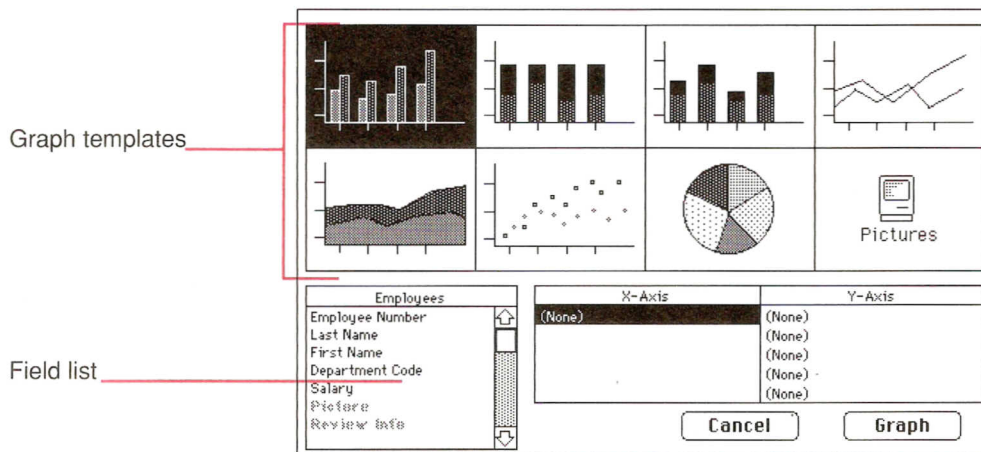


Figure 10-2  
The Graph editor

2. Select a graph type from the eight templates.
3. Assign a field to the x-axis by clicking on a field in the Field list. For pie charts, the x-axis field is used to label slices of the pie.

If you want the graph to display values from low to high (or high to low) on the x-axis, sort the current selection by the x-axis field before displaying the Graph editor, or use the proportional x-axis option. For information on the proportional x-axis option, see the section “Viewing the Graph” later in this chapter.

When you assign a field to the x-axis, the non-numeric fields become dimmed.

4. Assign one or more numeric fields to the y-axis by clicking on a field or fields.

4th DIMENSION displays the field names in the y-axis listing. For all graph types except pie charts, you can assign up to five numeric fields to the y-axis. Figure 10-3 shows the graph editor after fields have been assigned to the x- and y-axes.

Non-numeric fields  
dimmed

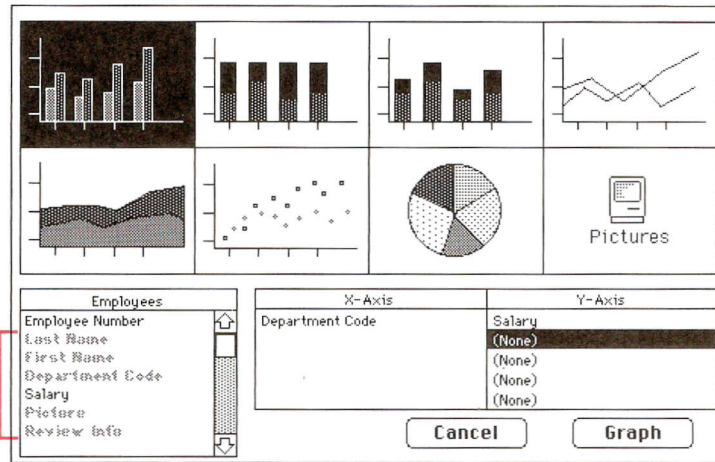


Figure 10-3  
Graph editor with selected fields

## Viewing the Graph

After you have assigned fields to the x-axis and y-axis and selected a graph type, you can view the graph. When a graph is displayed, you can also change graph types, assign colors or patterns to elements of the graph, add pictures, and choose scaling options.

## Displaying the Graph

To display the graph, follow this step:

- Click Graph to display the graph.

4th DIMENSION displays the graph.

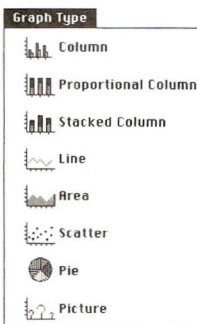
When you display a graph, 4th DIMENSION replaces the current menu bar with the Graph editor menus, Pictures, Graph Type, and Options. Use these menus to change pictures in a Picture graph, change the graph type, or scale the graph.

To change graph types, follow this step:

- Choose another graph type from the Graph Type menu.

4th DIMENSION redraws the graph in the new format.

If you switched to a pie chart from a type of graph that displayed more than one y-axis field, 4th DIMENSION graphs only the first field assigned to the y-axis.





## Changing the Color or Pattern of an Element

Each element in a graph that is represented in the legend can be assigned a pattern and color. The color option is available only on monitors that support gray scale or color. All options are available for column, proportional column, stacked column, area and pie graphs. The Line graph and Scatterplots use foreground color only.

To change the color or pattern of an element in the graph, follow these steps:

■ Average Salary

1. Click on the square in the graph legend that corresponds to the element to be assigned a pattern or color.

The dialog box shown in Figure 10-4 is displayed.

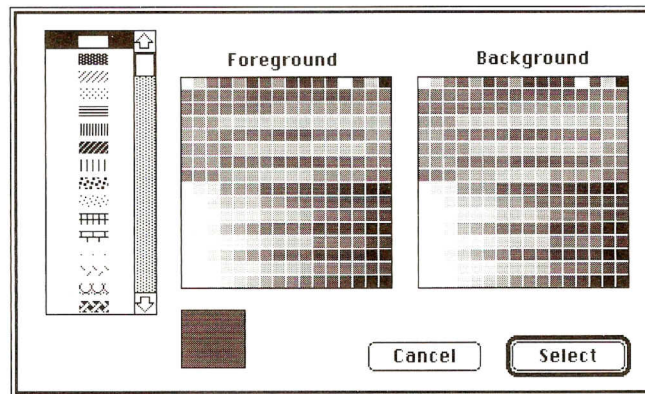


Figure 10-4  
Foreground and background dialog box

2. Select a pattern from the scrollable list of patterns. If you have a color or gray-scale monitor, you can select foreground and background colors or gray scales.

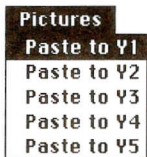
Colors and patterns set for one graph type affect all graph types. These specifications are saved with the database.



**Note:** In multi-user mode, you cannot change these specifications.

## Changing the Picture in a Picture Graph

If you chose Pictures as a graph type, you can substitute a custom picture that you have placed on the Clipboard.



To include a custom picture, follow these steps:

1. With a Picture graph displayed, copy the custom picture to the Clipboard.
2. Choose the y-axis field from the Pictures menu that you want to represent with the picture on the Clipboard.

4th DIMENSION redraws the graph, substituting a proportionally-scaled picture for each x-axis value in the graph. The same picture is used for all values of the x-axis field. The height of the picture represents the value of the y-axis field, not the area of the picture.

Figure 10-5 shows an example picture graph.

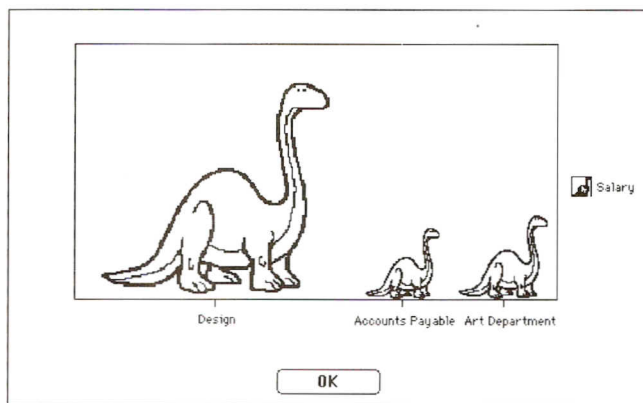


Figure 10-5  
A Picture graph

## Changing the Scaling of a Graph

To specify scaling, follow these steps:

1. Choose Scale from the Options menu.

4th DIMENSION displays the Graph Options dialog box shown in Figure 10-6.

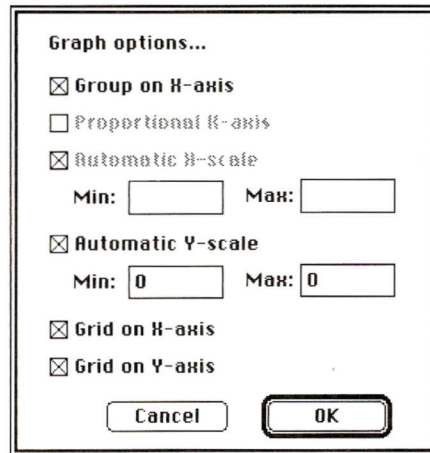


Figure 10-6  
Graph Options dialog box

## 2. Click

- **Group on x-axis** to request that records with the same value on the x-axis field be grouped together to form one category. If “Group on x-axis” is not used, records with the same value on the x-axis will be treated as separate categories in the graph.
- **Proportional x-axis** to draw the x-axis in proportion to the values of the field assigned to the x-axis. This option is available only when the field assigned to the x-axis is numeric, date, or time and the type of graph is either scatter or line.
- **Automatic x-scale** to turn off the automatic scaling of the x-axis, then enter the minimum and maximum values you want to use in the graph. This option is available only when “Proportional x-axis” is checked.
- **Automatic y-scale** to turn off the automatic scaling of the y-axis, then enter the minimum and maximum values you want to use in the graph. This option is always available.
- **Grid on x-axis** to add vertical lines to the graph. The x-axis gridlines appear only when “Proportional x-axis” is checked.
- **Grid on y-axis** to add horizontal lines to the graph. This option is always available.

## 3. Click OK to apply the scaling options to the graph.

Unavailable options are disabled in the Graph Options dialog box.

## Printing a Graph

---

After you are satisfied with your graph design, you can print it. The procedure for printing a graph is the same as the procedure for printing quick reports or labels.

To print a graph, follow these steps:



1. While the graph is displayed, choose Print from the File menu. The standard Print Quality dialog box for your selected printer is displayed.

Click “Preview on screen” if you want to preview the graph before printing.

2. Choose any desired options and click OK.

If you clicked “Preview on screen,” you can print the report when you preview it by clicking the Print button.

## Copying a Graph

---

You can copy a graph to the Clipboard and paste it into a Picture field in 4th DIMENSION or into another application.

To copy a graph, follow this step:

- When the graph is displayed, choose Copy from the Edit menu.

4th DIMENSION places the graph on the Clipboard.

CHAPTER 11

***EXECUTING PROCEDURES***





## EXECUTING PROCEDURES

The Execute Procedure menu item in the Special menu is used to execute a global procedure from the User environment. If you are in the process of writing global procedures, you can test your procedures by switching to the User environment and using the Execute Procedure menu item.

A global procedure can also be executed from the User environment by assigning it to an item on a layout menu bar. When you choose an item on a layout menu bar, the associated procedure is automatically executed. For more information on layout menu bars, see Chapter 4 of the *4th DIMENSION Design Reference*.

### Executing Global Procedures

Use the Execute Procedure menu item to select and execute any global procedure created with 4th DIMENSION's language. The menu item is available only if at least one global procedure has been written.

For more information on writing global procedures, see Chapter 6 of the *4th Dimension Design Reference* and Part I of the *4th DIMENSION Language Reference*.

To execute a global procedure, follow these steps:

1. Choose Execute Procedure from the Special menu.

4th DIMENSION displays the "Execute procedure" dialog box, shown in Figure 11-1.

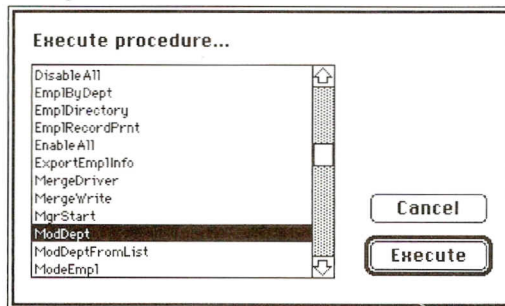
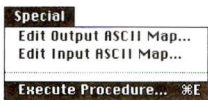


Figure 11-1  
The "Execute procedure" dialog box

2. Select the name of a global procedure in the scrollable list.
3. Click Execute.



**Note:** Double-clicking a procedure name is a shortcut for clicking a procedure name and clicking Execute.

4th DIMENSION executes the procedure. What happens next depends on what the global procedure does. A global procedure can perform calculations, change the current selection, print reports, and even quit the application and return to the Finder.

# ***IMPORTING AND EXPORTING DATA***

Importing from Excel 'Dates' DD/MM/YY replace ' / ' in  
8/6/1998 excel date format (cell) to 'space', & save as TEXT  
I 'Replace' is an Excel 4 command  
II 'Replace' in Excel 1.5 ~~has~~ is a Macro which must be loaded



## IMPORTING AND EXPORTING DATA

---

4th DIMENSION's data importing and exporting facilities provide a fast and reliable way to transfer information to and from your database. If you are upgrading to 4th DIMENSION from another database or a spreadsheet, you can avoid the work of reentering the data from the keyboard by importing your data. You can import data from Macintosh data management applications or any non-Macintosh application whose data has been transferred to the Macintosh.

You can also export data from 4th DIMENSION so that it can be used in other types of programs that process information. For example, you can export data to a specialized graphics or statistics program. You can also transfer the exported data to another type of computer or to a bulletin board system using a telecommunications program.

You can use an ASCII map when importing or exporting data. An ASCII map is a translation table used to interpret characters as they are transferred. An ASCII map is sometimes needed when transferring data between different types of computers but is rarely needed when transferring information from one Macintosh program to another.

This chapter describes the data importing and exporting facilities built into the User environment. These facilities can be used to handle a wide range of standard data importing and exporting tasks. For advanced or unusual tasks, you can transfer data using 4th DIMENSION's language. For more information about commands related to importing and exporting, serial port communications, and the creation and management of documents, see the *4th DIMENSION Language Reference*.

You can import or export data using the settings in the appropriate dialog boxes or using a layout. Importing or exporting using the dialog boxes is faster than using a layout. However, if you use a layout you can use scripts or the layout procedure to process data. When you import or export using a layout, the layout procedure and any scripts attached to fields are executed for every record that is processed.

When importing or exporting data, you specify the file format, the field and record delimiters, and the fields to be imported or exported.



**Note:** You can also use the Quick Report editor to export records. See the print to disk option in the section "Selecting an Output Device" in Chapter 8.

## File Formats

---

The file format describes the way in which fields and records are arranged. Some file formats also include formatting information. 4th DIMENSION supports three standard file transfer formats:

- **SYLK.** SYmbolic LinK format.
- **DIF.** Data Interchange Format.
- **Text.** This format specifies fields within a record separated by the end-of field delimiter and records separated by the end-of-record delimiter. The default field and record delimiters are the tab and the carriage return, respectively.

## Field and Record Delimiters

---

End-of-field delimiters separate fields and end-of-record delimiters separate records. The end-of-field delimiters are placed between fields in a record and the end-of-record delimiter is placed after each record. Field and record delimiters are used only when using the Text format.

By default, 4th DIMENSION uses the Tab character (ASCII code 09) as the field delimiter and the Carriage Return character (ASCII code 13) as the record delimiter. Most Macintosh applications also use these characters. Usually you can use the default delimiters when you import or export data.



**Note:** ASCII codes in 4th DIMENSION are given in decimal (base 10) numbers. Appendix D of the *4th DIMENSION Language Reference* contains a table of ASCII codes.

When importing data using the Text format, 4th DIMENSION uses the delimiters embedded in the file to determine where fields and records end. When exporting data, 4th DIMENSION automatically places these delimiters in the file for you.

Be certain that fields do not contain embedded characters that are also used as field or record delimiters. For example, if the Carriage Return is used as the record delimiter, no field should contain a Carriage Return. When importing data, 4th DIMENSION will interpret any Carriage Return as a record delimiter. Thus, a Carriage Return inside a field will be erroneously interpreted as the end of that record. An improperly placed Carriage Return will disrupt the importing process.

When you export data that includes a Text field, a Carriage Return might be embedded within the field. If this is a possibility, choose another record delimiter or remove the embedded returns prior to exporting the data.

## Using an ASCII Map

An ASCII map is sometimes needed when transferring information to or from other applications. For further information about creating and using ASCII maps, see Appendix A.

You can maintain two types of ASCII maps, input ASCII maps and output ASCII maps. Use an input ASCII map for importing data and an output ASCII map for exporting data.

To use an ASCII map, follow these steps:



1. Choose Edit Input ASCII Map or Edit Output ASCII Map from the Special menu.

4th DIMENSION displays the Edit an ASCII Map dialog box.



2. Load or create your ASCII map.
3. Click Use Map.

Any subsequent import or export operations will use the ASCII map.

4. Choose Import Data or Export Data from the File menu and follow the steps in the next sections for importing and exporting data.

An ASCII map can also be used when the language is used to import or export data or send or receive data using the serial port. For more information about using ASCII maps in connection with the language, see the *4th DIMENSION Language Reference*.

## Importing Data

You can import data from files in SYLK, DIF, or Text formats. If you are importing data that has been exported from another application, see that application's documentation for information on exporting the data in one of these formats. If the other application uses a different format for exporting data, you may need to use the language to manage the importing process or modify the file in advance using a text or word processor.

If you are importing data from another Macintosh application, first export the data using the other application. Note the order in which the fields were exported, the format the program uses to save the data, and, if the Text format was used, the delimiters used by the program. When importing the data, you must match these settings.

If your database has more than one file, use the "List of files" window or the Choose File/Layout menu item to select the file into which you want to



import the data. If you need to import data into more than one file, repeat the importing process for each file.

You do not need to build your entire file structure before you import data. You can, for example, create one file, import the data, return to the Design environment, create another file, import the data into the second file, and so forth.

You have the option of selecting the fields to be imported in the Import dialog box or specifying an input layout that contains the fields to be imported.

To import data, follow these steps:

1. Choose Import Data from the File menu.

The Import Data dialog box shown in Figure 12-1 is displayed.

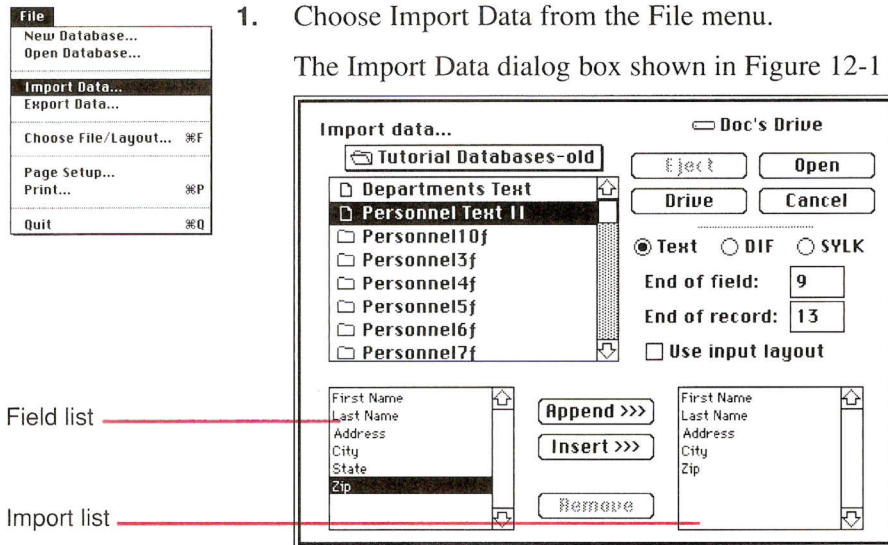


Figure 12-1  
Import Data dialog box

2. Select a file format for the data to be imported (Text, DIF, or SYLK).
3. If necessary, enter new ASCII codes for the end-of-field and end-of-record delimiters. ASCII codes are listed in Appendix D of the *4th DIMENSION Language Reference*.
4. Select the fields in the order in which they appear in the file to be imported. Select the field names displayed in the Field list on the left side of the dialog box and click Append or Insert to add the field to the Import list. Clicking Append places the field after the last field in the list. Clicking Insert places the field before the selected field in the import list. To remove a field from the import list, select the field and click Remove.



**Note:** Double-clicking a field is a shortcut for selecting the field and clicking Append.

Or click the “Use input layout” check box. The fields on the current input layout will be used in the entry order used in that layout.

If you use the input layout, the Import list does not control the fields that will be imported. It can be left blank.

The order of the field names in the import list must match the order of the fields in the file to be imported. You can modify the order of the field names by removing a field or by inserting a field before a selected field.



**Note:** When importing using a layout, use a layout that only contains the fields and enterable objects you want to import into.

5. Select the name of the file to import.
6. Click Open to begin importing the disk file.

4th DIMENSION displays a progress indicator as it imports the data into your database.

## Exporting Data

When you export data, you create a text file that can be opened by or imported into other Macintosh applications. If you are exporting data for use with another application, see that application’s documentation for information on importing data. Choose a file format and delimiters compatible with the other application.

In some cases, you may need to edit the exported text file prior to importing it into the other application. For example, some programs accept the text file format but require that the first record consist of the names of the fields. You can add this record using a text processor.

4th DIMENSION exports the records in the current selection and in the current sort order. For example, if your current selection contains only the records of sales representatives in Arizona, 4th DIMENSION will export only this set of records.

You have the option of selecting the fields to be exported in the Export dialog box or specifying the output layout. If you use the output layout, the fields on the output layout will be exported.



To export data, follow these steps:

1. Set the current selection to include the set of records to export.
2. Choose Export Data from the File menu.

The Export Data dialog box shown in Figure 12-2 is displayed.



Name of the  
file created by  
the export

Field list

Export list

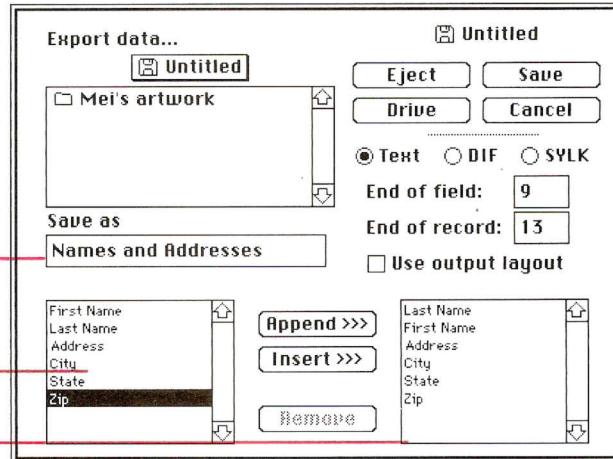


Figure 12-2  
Export Data dialog box

3. Enter a name for the file in the “Save as” area.
4. Select a file format for the data to be exported (Text, DIF, or SYLK).
5. If necessary, enter new ASCII codes for the end-of-field and end-of-record delimiters.
6. Click field names displayed in the Field list on the left side of the dialog box and click Append or Insert to add the field to the Export list. The fields will be exported in the order that they appear in the export list. If you plan to import this file to another Macintosh application, you must specify the same order when you import the data. To remove a field from the Export list, click the field and click Remove.

Or Click the “Use output layout” check box. The fields on the layout will be used in the order specified by the entry order for the current output layout.

If you use this option, the Export list does not control the fields that will be exported. It can be left blank.



# ***APPENDIX***





## ASCII MAPS

---

An ASCII map acts as a translation table for interpreting character codes when data is transferred to or from 4th DIMENSION. The transfer can be a file import or export or a transfer through the Macintosh's serial port.

An ASCII map can be useful when communicating with non-Macintosh systems. The upper 128 characters in Macintosh ASCII are unique to the Macintosh. They represent the symbols seen in the Key Caps desk accessory when you press the Option and Shift-Option keys. You can use an ASCII map to translate some or all of these characters. You can also use an ASCII map to translate some of the control characters (ASCII 00 to ASCII 31) so that they conform to the requirements of the non-Macintosh system.

If you use an ASCII map, the map applies to

- importing and exporting data
- serial port communications
- print-to-disk options in the Quick Report and Label editors
- serial printing using Quick Report and Labels editors

Ordinarily, you do not need to create and use an ASCII map. The ability to edit ASCII maps is a specialized feature that is rarely needed when transferring information between Macintosh applications.

Unless you use an ASCII map, 4th DIMENSION uses standard Macintosh ASCII code when information is transferred between it and another application. A custom map can be used in place of the standard Macintosh ASCII code to handle special or unusual cases that may come up when transferring information to or from 4th DIMENSION.

The Macintosh ASCII codes are listed in Appendix D of the *4th DIMENSION Language Reference*.

### Creating an ASCII Map

---

An ASCII map is a tool that 4th DIMENSION uses to interpret characters as they are transferred from another program or source. The map is used only during the transfer process. The transfer can be done in the User environment using the Import or Export menu items in the File menu or done using the procedural language.

A map can be thought of as a translation table. During the information transfer, the map is placed between 4th DIMENSION and the source or destination file. The translation table is consulted for each character that is processed.

For each character that is passed to the ASCII map, the map specifies the character to be returned. 4th DIMENSION receives a character, looks the character up in the ASCII map, and returns the ASCII character specified by the map.

Normally, no ASCII map needs to be used because no translation needs to be done. That is, each character is interpreted as standard Macintosh ASCII. If you need only to transfer information to or from other Macintosh applications, it is unlikely that you will need to create an ASCII map.

When you create an ASCII map, 4th DIMENSION first displays a default ASCII map. A default ASCII map always returns the same ASCII character it is passed. You can modify the map by changing the characters the map will return. You can change as few or as many entries in the map as you like.

Use the Edit ASCII Map command to create, edit, load, or save ASCII maps. You can create as many ASCII maps as you like.



**Note:** If you create an ASCII map, you should also create a default ASCII map and save it as a disk file. Load the default ASCII map whenever you need to return to standard Macintosh ASCII. The language can also be used to return to the standard ASCII map.

To create an ASCII map, follow these steps:

1. Choose Edit Output ASCII Map or Edit Input ASCII Map from the Special menu.



Use Edit Output ASCII Map for exporting data and Edit Input ASCII Map for importing data.

4th DIMENSION displays either the “Edit an ASCII map for importing” or “Edit an ASCII map for exporting” dialog box.

These dialog boxes are shown in Figures A-1 and A-2, respectively.





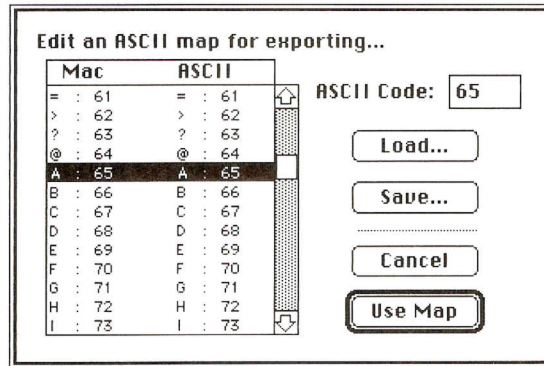


Figure A-1  
"Edit an ASCII map for exporting" dialog box

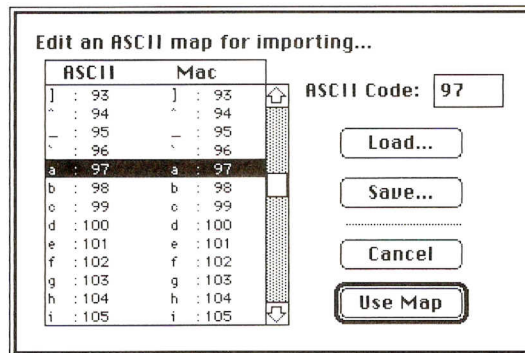


Figure A-2  
"Edit an ASCII map for importing" dialog box

A scrollable area displays two sets of ASCII codes and characters. In Figure A-1, the column labelled "Mac" represents the characters sent from 4th DIMENSION during an export. The column labeled "ASCII" represents the characters received by the other application. Notice that there is a one-to-one correspondence between these columns.

In Figure A-2, the column labeled "ASCII" represents the characters received from the file being imported. The column labeled "Mac" represents the characters being stored in the 4th DIMENSION database.

2. Click the ASCII code in the column on the left that you want to map.

If you are using the "Edit an ASCII map for exporting" dialog box, this column is labelled Mac; otherwise it is labelled ASCII.

4th DIMENSION displays the ASCII code that the map returns in the ASCII Code area.

3. Enter an ASCII code for the character in the ASCII Code area.

The ASCII code you entered appears in the ASCII column in the scrollable area.

During an information transfer, when 4th DIMENSION encounters the ASCII code that you mapped, it will substitute the ASCII code that you entered in the ASCII code area.

For example, if you mapped ASCII code 97 (lowercase A) to ASCII code 65 (uppercase A), the ASCII map will return an ASCII 65 every time it is sent an ASCII 97. The transferred file will contain a lowercase “a” for every uppercase “A” in the file that was transferred.

4. Modify as many additional codes as you require.
5. Click Save to save the ASCII map to a disk file that can be loaded later for use or editing.
6. Click Use Map to apply the map you have edited or loaded.

When you transfer information after clicking Use Map, the ASCII map will be used. ASCII maps are used by the procedural language when importing, exporting, and performing serial port communications.

To load and use an ASCII map for exporting or importing data, follow these steps:



1. Choose Edit Output ASCII Map or Edit Input ASCII Map from the Special menu.

Use Edit Output ASCII Map for exporting data and Edit Input ASCII Map for importing data.

4th DIMENSION displays the either the “Edit an ASCII map for importing” or “Edit an ASCII map for exporting ”dialog box.

2. Press the Load button. A standard open-file dialog box is displayed. Select the ASCII map from the scrollable list of files.

The map specified by the file will be represented in the scrollable area. If needed, modify any entries in the map.

3. Click Use Map to apply the map.



**Note:** The same map loaded for both input and output carries out the translation in reverse. That is, if a map translates “A” to “a” during an import, it will translate “a” to “A” during an export.





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