

SmartWare Database

COPYRIGHT INFORMATION

Copyright, SmartWare Corporation, 1997. All Rights Reserved Worldwide. The ANGOSS software and most support materials (see below) are confidential and the property of SmartWare Corporation. They may only be used under license. Any unlicensed use, reproduction, disclosure, decompilation, or transfer is strictly prohibited. Use of ANGOSS software is governed by the License Agreement.

ANGOSS is a trademark of SmartWare Corporation. SmartWare is a trademark of Informix Software, Inc. All brand and product names in this publication are registered trademarks or trademarks of their respective owners/holders.

Acrobat(R) Reader copyright (C) 1987-1996 Adobe Systems Incorporated. All rights reserved. Adobe and Acrobat are trademarks of Adobe Systems Incorporated

The programs "bmptoppm, giftoppm, pxtoppm, tiftoppm, ppmtobmp, ppmtogif, ppmtopcx, and ppmtotif" are derived from the PBMPlus package, written by Jef Poskanzer. The PBMPlus package has the following copyright:

Copyright (C) 1988, 1989, 1991 by Jef Poskanzer. Permission to use, copy, modify, and distribute this software and its documentation for any purpose and without fee is hereby granted, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation. This software is provided "as is" without express or implied warranty.

The programs "tiftoppm and ppmtotif" contains the "libtiff" package, which was written by Sam Leffler. The libtiff package has the following copyright:

Copyright (c) 1988, 1989, 1990, 1991, 1992 Sam Leffler

Copyright (c) 1991, 1992 Silicon Graphics, Inc.

Permission to use, copy, modify, distribute, and sell this software and its documentation for any purpose is hereby granted without fee, provided that (i) the above copyright notices and this permission notice appear in all copies of the software and related documentation, and (ii) the names of Sam Leffler and Silicon Graphics may not be used in any advertising or publicity relating to the software without the specific, prior written permission of Sam Leffler and Silicon Graphics. THE SOFTWARE IS PROVIDED "AS-IS" AND WITHOUT WARRANTY OF ANY KIND, EXPRESS, IMPLIED OR OTHERWISE, INCLUDING WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL SAM LEFFLER OR SILICON GRAPHICS BE LIABLE FOR ANY SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES OF ANY KIND, OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER OR NOT ADVISED OF THE POSSIBILITY OF DAMAGE, AND ON ANY THEORY OF LIABILITY, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.

The program "tiftoppm and ppmtotif" are derived from software written by Patrick J. Naughton, which has the following copyright:

Copyright (c) 1990 by Sun Microsystems, Inc.

Author: Patrick J. Naughton naughton@wind.sun.com Permission to use, copy, modify, and distribute this software and its documentation for any purpose and without fee is hereby granted, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation. This file is provided AS IS with no warranties of any kind. The author shall have no liability with respect to the infringement of copyrights, trade secrets or any patents by this file or any part thereof. In no event will the author be liable for any lost revenue or profits or other special, indirect and consequential damages.

The programs "bmptoppm and ppmtobmp are based on software written by David W. Sanderson, which contains the following copyright:

Copyright (C) 1992 by David W. Sanderson. Permission to use, copy, modify, and distribute this software and its documentation for any purpose and without fee is hereby granted, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation. This software is provided "as is" without express or implied warranty.

The programs "pxtoppm and ppmtopcx" is based on a program written by Michael Davidson, which contains the following copyright:

Copyright (c) 1990 by Michael Davidson Permission to use, copy, modify, and distribute this software and its documentation for any purpose and without fee is hereby granted, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation. This file is provided AS IS with no warranties of any kind. The author shall have no liability with respect to the infringement of copyrights, trade secrets or any patents by this file or any part thereof. In no event will the author be liable for any lost revenue or profits or other special, indirect and consequential damages.

Portions of this software are (c) Copyright 1984 FairCom Columbia MO, All Rights reserved.

Table of Contents

Table of Contents	i
--------------------------------	----------

Chapter 1: Introduction to ANGOSS Database..... 1 - 1

What is a Database?.....	1 - 1
Using ANGOSS Documentation	1 - 3
Special Notes.....	1 - 3
Practice Sessions	1 - 3

Chapter 2: Getting Started 2 - 1

Running ANGOSS	2 - 1
Key Strokes Under Unix.....	2 - 2
Key Help	2 - 2
Using the Tutorial	2 - 3
Using Example Files.....	2 - 3
ANGOSS Help.....	2 - 4
The Display Screen.....	2 - 5
The Data Window	2 - 5
The Control Area.....	2 - 6
The Status Line.....	2 - 6
The Autohelp Line	2 - 7
Using the Mouse.....	2 - 8

Table of Contents

- Operating Modes 2 - 8
 - Command/View Mode 2 - 8
 - Enter/Update Mode 2 - 9
- Definition Menus 2 - 10
- Definition Windows..... 2 - 11
- Important Database Concepts 2 - 12
 - Database Terms Defined..... 2 - 12
 - Fields 2 - 12
 - Records..... 2 - 12
 - Views..... 2 - 13
 - Viewing Multiple Files 2 - 15
 - Analyzing File Relationships 2 - 17
 - Linking Data-Files 2 - 17
 - Tables..... 2 - 18
 - Overview - Creating a Database 2 - 19
 - Field References 2 - 20
 - Operating System Access 2 - 21
 - File Extensions 2 - 21
 - Automatic File Backup..... 2 - 22
 - Exiting 2 - 23

Chapter 3: Creating a Database 3 - 1

- Creating a Database 3 - 1
 - Establishing A View 3 - 2

The View Definition Window	3 - 3
Creating a Data-File.....	3 - 3
Field Definition Menu.....	3 - 6
Example Fields.....	3 - 16
Other Definition Elements.....	3 - 17
Calculation for a Field.....	3 - 18
Menus	3 - 19
Field Rules.....	3 - 23
Field Entry Order	3 - 23
Creating a Box.....	3 - 24
Creating a Note.....	3 - 24
Moving View Elements	3 - 25
Moving an Area of the View.....	3 - 25
Moving An Item on the View	3 - 25
Deleting View Elements.....	3 - 26
Deleting an Area of the View.....	3 - 26
Deleting An Item of the View	3 - 27
Modifying a View.....	3 - 27
Creating Views for an Existing Data-File	3 - 30
File Create Similar	3 - 30
The View	3 - 31
Replicating Structures.....	3 - 32
Creating the View.....	3 - 32
Replicating a Data-File.....	3 - 33
Replicating a Field	3 - 33
Viewing Multiple Data-Files	3 - 33
Attaching a Data-File	3 - 35
Attaching Fields	3 - 35

Linking Multiple Files	3 - 36
Link Definition.....	3 - 37
Creating a Table.....	3 - 41
Practice	3 - 44
Chapter 4: Entering and Viewing Data	4 - 1
Accessing a Database	4 - 1
Entering and Updating Data	4 - 3
Data Enter	4 - 3
The Escape Key	4 - 4
Moving the Cursor	4 - 4
Entering Data	4 - 7
Entering Numbers and Text	4 - 7
Data Entry in Multi-File Views.....	4 - 13
Exiting Enter/Update Mode	4 - 17
Saving and Unloading Files	4 - 17
Viewing Data	4 - 17
Physical and Logical Record Numbers	4 - 18
Moving from Record to Record	4 - 19
Moving through a Database.....	4 - 20
Browsing Data	4 - 21
Cursor Movement.....	4 - 22
Finding Data Records	4 - 23
Selection Options	4 - 23

Search Type Options	4 - 23
Deleting Records	4 - 25
Practice	4 - 26
Chapter 5: Managing a Database.....	5 - 1
Organizing Data.....	5 - 1
Keys	5 - 2
Defining a Key	5 - 3
Key Order.....	5 - 4
Indexes.....	5 - 6
Sorting Records	5 - 8
Sort Definition.....	5 - 8
Executing the Sort	5 - 9
Removing a Sort Definition	5 - 11
Querying Records	5 - 11
Query Definition.....	5 - 14
The Query Editor.....	5 - 14
Types of Expressions	5 - 15
Selecting Records.....	5 - 22
Obtaining Summary Statistics	5 - 27
Performing Actions	5 - 28
Executing the Query.....	5 - 29
Removing a Query Definition.....	5 - 30
Using Database Utilities	5 - 30
Appending Data.....	5 - 31
Changing Record Count	5 - 32

Table of Contents

- Repairing Damaged Files 5 - 32
- Purging Deleted Records 5 - 33
- Information About Files 5 - 33
- Using Database Windows..... 5 - 35
 - Splitting a Window 5 - 35
 - Zooming a Window 5 - 36
 - Closing a Window 5 - 36
 - Painting a Window 5 - 36
 - Toggling Border Display 5 - 37
 - Linking Views 5 - 37
 - Unlinking Views..... 5 - 39
 - Practice 5 - 39

Chapter 6: Printing Database Information 6 - 1

- Before You Print..... 6 - 1
- Predefined Formats 6 - 1
 - Printing the Current-Record 6 - 1
 - Print Current-Record List..... 6 - 2
 - Print Current-Record Page 6 - 3
 - Print Current-Record View 6 - 4
 - Printing the View 6 - 5
 - Printing to Screen 6 - 5
 - Print View List 6 - 5

Print View Report.....	6 - 6
Custom Reports	6 - 7
Table Report	6 - 7
Form Report	6 - 7
Combination Reports.....	6 - 8
Printing Mail Labels	6 - 8
One-up Labels	6 - 8
Three-up	6 - 13
Laser Printers.....	6 - 14
Other Uses for Labels.....	6 - 15
Using Fonts	6 - 15
Adjusting Positioning.....	6 - 16
Printing on Preprinted Forms	6 - 16
Defining the Report.....	6 - 17
Defining the Form	6 - 17
Previewing the Report.....	6 - 18
Editing Report Definitions.....	6 - 18
Adjusting Positioning.....	6 - 18
Moving Elements	6 - 18
Removing Elements	6 - 19
Updating Elements	6 - 19
Designing Your Own Forms.....	6 - 20
Using Graphics	6 - 20
Report Tables.....	6 - 22
A Simple Report Table.....	6 - 23
Establishing Breakpoints.....	6 - 25
Multiple Breakpoints.....	6 - 27
Result Lines	6 - 28
Multiple Result Lines	6 - 29
Grand Totals	6 - 31
Titles.....	6 - 32

- Combination Reports 6 - 34
 - Using Forms and Tables together..... 6 - 35
- Fonts in Reports 6 - 38
 - Editing Fonts 6 - 38
 - Removing Fonts 6 - 38

Chapter 7: Relating and Summarizing Data..... 7 - 1

- Relating Views..... 7 - 1
 - Creating the Relation..... 7 - 7
 - Executing the Relation 7 - 9
 - Removing a Relation 7 - 10
- Data Transactions 7 - 10
 - Creating the Transaction 7 - 11
 - Executing the Transaction..... 7 - 14
 - Removing a Transact File 7 - 14
- Cross-Tabulating Data 7 - 14
 - Creating a Cross-Tab Definition 7 - 16
 - Executing a Cross-Tab Definition..... 7 - 19
 - Types of Match Equations..... 7 - 20
 - Removing a Cross-Tab Definition 7 - 27
- The FILELOOKUP Function 7 - 27
- ANGOSS Statistical Database Functions 7 - 28

Chapter 8: ANGOSS Integration 8 - 1

- Integration with Other ANGOSS Modules..... 8 - 1
 - Using Data Send 8 - 2

Sending Database Records	8 - 3
Sending Summarized Data	8 - 5
Using File Import.....	8 - 6
Using File Export.....	8 - 9
Integration with Other Software	8 - 10
Import and Export.....	8 - 10
ODBC	8 - 11
Defining an ODBC Data Source	8 - 11
How to Link SmartWare to Other ODBC Programs.....	8 - 13
How to Establish an SQL Interface to a SmartWare Data file.	8 - 15

Chapter 9: ANGOSS Database Command Reference..... 9 - 1

Using Database Commands	9 - 1
Classifying Commands by Function.....	9 - 2
Data Commands.....	9 - 6
Data Browse.....	9 - 7
Data Browse All, Fields, and Off.....	9 - 8
Data Cross-Tab	9 - 9
Cross-Tab Options.....	9 - 9
Cross-Tabulation Overview	9 - 9
Data Cross-Tab Create	9 - 10
Data Cross-Tab Execute.....	9 - 16
Data Cross-Tab Modify.....	9 - 16
Data Cross-Tab Remove	9 - 16
Data Delete	9 - 16

Table of Contents

Data Enter	9 - 17
Data Find	9 - 19
Data Find Comparison Options.....	9 - 19
Data Find Search Type Options	9 - 19
Performing a Binary Search	9 - 20
Data Goto.....	9 - 21
Goto Options	9 - 21
Data Goto Page.....	9 - 21
Data Goto Record.....	9 - 21
Data Goto Table	9 - 22
Data Goto View.....	9 - 22
Data Goto Window.....	9 - 22
Data Query.....	9 - 22
Querying Options	9 - 22
Data Query Create.....	9 - 23
The Query Editor.....	9 - 23
Data Query Execute	9 - 29
Data Query Modify	9 - 30
Data Query Now.....	9 - 30
Data Query Remove	9 - 31
Data Relate.....	9 - 31
Data Relate Options	9 - 32
Data Relate Create.....	9 - 32
Data Relate Execute	9 - 42
Data Relate Modify	9 - 43
Data Relate Remove.....	9 - 43
Data Send.....	9 - 43
Send Options	9 - 43
Data Send All	9 - 44
Data Send Crosstab	9 - 47
Data Transact.....	9 - 48

Data Transact Options	9 - 49
Data Transact Create	9 - 49
Data Transact Execute.....	9 - 54
Data Transact Modify.....	9 - 54
Data Transact Remove	9 - 54
Data Utilities	9 - 55
Data Utilities Options.....	9 - 55
Data Utilities Append.....	9 - 55
Data Utilities Change-Count	9 - 57
Data Utilities File-Fix.....	9 - 57
Data Utilities Purge	9 - 57
Utilities Information.....	9 - 58
Data Utilities Recalc-All	9 - 64

File Commands 9 - 65

File Load.....	9 - 65
File Create.....	9 - 66
File Modify	9 - 67
The View Definition Window	9 - 67
View Definition Keyword: Attach.....	9 - 68
Attach Data-File	9 - 68
Attach Field	9 - 69
View Definition Keyword: Create.....	9 - 70
Create Box.....	9 - 70
Create Calculation.....	9 - 70
Create Data-File	9 - 73
Create Field	9 - 74
Field Definition Menu	9 - 74
Extended Field Options.....	9 - 76

Table of Contents

Create Menu	9 - 83
Create Note.....	9 - 86
Create Rule.....	9 - 86
Create Table	9 - 88
View Definition Keyword: Delete.....	9 - 90
Delete Block.....	9 - 90
Delete Item	9 - 90
View Definition Keyword: Edit.....	9 - 91
Edit Field	9 - 91
Edit Links	9 - 92
View Definition Keyword: Input-Order	9 - 93
View Definition Keyword: Move.....	9 - 94
Move Block.....	9 - 94
Move Item	9 - 94
View Definition Keyword: Paint.....	9 - 95
View Definition Keyword: Replicate	9 - 95
Replicate Data-File.....	9 - 95
File Save	9 - 96
File Unload	9 - 97
File Activate.....	9 - 97
File Display-Active.....	9 - 97
File Import	9 - 98
File Import Ascii and Smart	9 - 98
File Import Dbase.....	9 - 99
File Import Fixed.....	9 - 99
File Import 310-Smart.....	9 - 100
File Export	9 - 100

File Export Ascii	9 - 101
File Export Dif	9 - 101
File Export M-Sylk.....	9 - 101
File Export Smart	9 - 101
File Export Text	9 - 102
File Export 3-Dbase	9 - 102
File Password.....	9 - 102
File Password Data-File	9 - 102
File Password View.....	9 - 103

Order Commands 9 - 105

Order Key	9 - 105
Order Key Options	9 - 105
Order Key Add.....	9 - 106
Order Key Delete	9 - 107
Order Key Rebuild	9 - 107
Order Sort	9 - 108
Order Sort Options	9 - 108
Order Sort Create	9 - 108
Order Sort Execute	9 - 110
Order Sort Modify.....	9 - 110
Order Sort Now	9 - 111
Order Sort Remove.....	9 - 111
Order Manual.....	9 - 111
Order Change.....	9 - 112
Order Change Options.....	9 - 112
Order Change Key.....	9 - 112
Order Change Index	9 - 113
Order Change Physical.....	9 - 113

- Print Commands 9 - 115**
 - Print Current-Record 9 - 115
 - Print Current-Record List..... 9 - 115
 - Print Current-Record Page 9 - 117
 - Print Current-Record View 9 - 118
 - Print View 9 - 119
 - Print View List 9 - 119
 - Print View Report..... 9 - 120
 - Print Report..... 9 - 121
 - Table Report 9 - 121
 - Form Report 9 - 122
 - Combination Reports..... 9 - 122
 - Print Report Options 9 - 122
 - Print Report Create 9 - 123
- Report Definition Menu..... 9 - 123
 - Form Definition 9 - 124
 - Calculation 9 - 124
 - Field..... 9 - 126
 - Label 9 - 127
 - Page-Number..... 9 - 129
 - Text..... 9 - 129
 - Dupe 9 - 130
 - Move..... 9 - 130
 - Remove..... 9 - 130
 - Update 9 - 131
 - Set-Font 9 - 131
 - Table Definition..... 9 - 133
 - Columns 9 - 133
 - Breakpoints..... 9 - 136

Multiple Breakpoints	9 - 143
Grand-Totals	9 - 145
Titles	9 - 149
Set-Font	9 - 151
Page Definition	9 - 152
Print Report Execute	9 - 158
Print to Disk	9 - 158
Print to Printer	9 - 159
Print to Screen or Text-Screen	9 - 159
Print Report Modify	9 - 159
Print Report Remove	9 - 160

Tools Commands..... 9 - 161

Tools Preferences	9 - 161
Tools Preferences Database	9 - 161

Window Commands 9 - 165

Window Split	9 - 165
Window Split Horizontal	9 - 166
Window Split Vertical	9 - 166
Window Close	9 - 166
Window Zoom	9 - 166
Window Border	9 - 167
Window Paint	9 - 167
Window Paint Options	9 - 167

Table of Contents

Window Link 9 - 168
Window Unlink 9 - 169

Help, Remember and Quit Commands..... 9 - 171

Help Commands 9 - 171
 Help About-Help 9 - 171
 Help Contents 9 - 171
 Help Index 9 - 172
 Help On-Error 9 - 172
 Help Tutorial..... 9 - 172
Remember Commands..... 9 - 173
Quit Commands 9 - 173

Index..... Index - 1

Chapter 1: Introduction to ANGOSS Database

Congratulations on your purchase of ANGOSS Database. By choosing ANGOSS, you have acquired one of the most powerful database management systems available.

This manual describes the features and capabilities of ANGOSS Database. Topics covered include:

- creating elements of a new database
- editing existing databases
- organizing and managing data
- printing customized reports
- integrating ANGOSS Database with other ANGOSS modules and other programs

What is a Database?

A database is a collection of data organized around a specific need or purpose and arranged for easy retrieval. There are three basic categories of database operations:

1. Creating the structure of the database.
2. Entering data into the database.
3. Manipulating the data in the database in order to provide on-screen information or printed output that is meaningful.

A database management system directs and controls all data that enters or leaves a user database. ANGOSS Database is a full-featured database management system that combines speed, power, and flexibility into one versatile package.

ANGOSS Database can be used in virtually any business, educational, or private environment where there is a need to record, manipulate, store, and retrieve large amounts of data quickly and easily. It can be used either as a stand-alone data management system or as an integrated data management module within the ANGOSS system.

Chapter 1: Introduction to ANGOSS Database

Examples of database management systems are apparent everywhere. Personnel record management and inventory records are just a few examples of how these systems can be used in the workplace.

A simple database could be designed to store and manipulate the following customer record information using ANGOSS Database:

Name	Acct #	Phone	City	State	Zip
Dave Byers	108	913-876-3521	Shawnee	KS	66203
Jan Sloke	276	608-324-5264	Madison	WI	53715
Tim Connor	342	609-667-5421	Camden	NJ	08131
Mike Green	287	212-856-8312	New York	NY	10007
Ben Nye	043	215-425-5723	Scranton	PA	18509
Don Parks	425	812-314-8873	Evansville	IN	47712
Mike Green	172	503-621-4628	Eugene	OR	97405
Ted Brown	341	608-324-5264	Madison	WI	53703
Tal Brody	214	212-426-5721	New York	NY	10002
John Tyler	176	212-573-5846	New York	NY	10004

After the database structure is established, the data listed above could be entered into it. You could then use ANGOSS Database to select those customers who live in New York or those customers whose phone numbers are within a particular area code. Once selected, this subset of information can be printed or processed in ways that you specify.

Using ANGOSS Documentation

This manual explains how to create, edit, and manage data-files; print information; and perform more advanced database operations. The integration of ANGOSS Database with other ANGOSS modules is also discussed. Practice exercises at the end of selected chapters are provided to encourage you to try the procedures discussed. **Chapter 9: ANGOSS Database Command Reference**, contains a comprehensive discussion of all the commands available in ANGOSS Database. Refer to **Chapter 9** for in-depth information about the scope and sequence of commands.

Special Notes

Throughout this manual you will see standard formatting conventions, such as italicized comment blocks and paragraphs labeled NOTE: or IMPORTANT:.

NOTE: paragraphs contain information that **you should read** before proceeding.

IMPORTANT: paragraphs contain information that **you MUST read** before proceeding. Failure to read and follow the instructions provided in IMPORTANT: paragraphs may cause unexpected results.

COMMENT: Comments are designed to give you additional information about the topic being discussed.

In addition to these formatting conventions, you will see boldface type, numbered lists, and bulleted lists throughout the manuals. Please refer to **ANGOSS Software System** for more information about these formatting conventions and how they can help you understand the information being presented.

Practice Sessions

At the end of some chapters in this manual, you will find Practice Sessions. These sessions are designed to reinforce the information you have just read and take you through the proper procedures, step by step. Please take time to perform the practice instructions before continuing to the next chapter.

Chapter 1: Introduction to ANGOSS Database

Chapter 2: Getting Started

This chapter contains information about some of the terminology and operating conventions you should be familiar with to begin using ANGOSS Database. Topics covered include

- how to enter and run ANGOSS Database
- Keystrokes under Unix
- how to use on-line tutorials
- ANGOSS Database screen layout
- how to move the cursor
- basic concepts of ANGOSS Database organization

Before beginning this chapter, make certain you have ANGOSS installed. If you have not yet installed ANGOSS, refer to *ANGOSS Software System* for explicit instructions on the correct installation procedure.

Running ANGOSS

To enter ANGOSS from the operating system, type **angoss** at the prompt. You will then see the Main Menu with a list of keywords, including the module options, Help, Tools, Remember, and Quit. Keywords are selected by typing the first letter of the keyword or by using the **Spacebar** or **Backspace** to position the highlighter over the keyword and pressing **Enter**.

Select the keyword **Database** from the Main Menu.

NOTE: You can also enter ANGOSS Database directly from your operating system by typing **angoss d** where "d" stands for Database. This allows you to bypass the Main Menu.

After you select "Database," ANGOSS Database is loaded.

Key Strokes Under Unix

Throughout the documentation and software, keystroke names are the same for DOS and Unix. Because of differences between the two operating systems, the method for producing the key strokes often varies.

In Unix ANGOSS, you may generate these key strokes by using predefined key combinations. For instance, to generate **Alt L** press the **Esc** key followed by the “**L**” key.

ANGOSS supports a large number of terminals. Each terminal has different capabilities which usually affect the manner in which keystrokes are invoked. A few general rules apply across all terminals:

1. The **Esc** key is used as a modifier for the next key stroke.
2. The **Ctrl C** key is used as the **Esc** key.
3. To obtain help on keystrokes, press **Esc Esc **.
4. To perform an **Alt** key, press **Esc** and the letter.
5. Function keys should work the same way as in DOS, if your terminal has them. To obtain function keys that are not on your keyboard press **Esc** and a number located between one and zero inclusively. (**Esc 0 = F10**).
6. Most **Ctrl** keys have been left the same. Though in some cases they have been remapped.
7. You can modify what a keystroke does with the **ETIC** utility. Therefore, your terminal can be customized which will cause special keys to work differently.

The Keystroke conversion table, found in *Appendix C* of the *Install Manual*, shows: the ANGOSS keystroke in column 1; the default keystroke sequence that must be used in column 2; and the actual keystroke required on a properly configured ansi terminal (if it varies from the default) in column 3.

Key Help

There is an on-line keyboard help feature. If you press **Esc Esc ** you will be prompted for a key. Type in the base name of the key that you want to examine. For example, if you wanted to find out how to produce an **Alt F5**, **Ctrl F5** or **Shift F5**, type “**F5**”. To find out how to get any variation of “**A**”, type “**A**”. A small chart will then be displayed showing the keystrokes. This chart shows all customized keystrokes for your terminal.

For more information on Unix keystrokes, refer to the *Install Manual*.

Using the Tutorial

The ANGOSS Database Tutorial introduces you to the general operating concepts of ANGOSS Database. The tutorial is designed to provide you with a short demonstration of some of the features of ANGOSS Database. If you are unfamiliar with database management programs, you should review the tutorial for an introduction to ANGOSS Database.

IMPORTANT: The ANGOSS tutorials only work on certain screen configurations. In Dos, you must be using a 25x80 character based (non WYSIWYG) screen driver. Under Unix, you must use an ansi terminal type.

If you have installed the ANGOSS Database Tutorial and the Example Files, you can use the following procedure to gain access to the tutorial.

IMPORTANT: Because ANGOSS Tutorials run within the module they describe, it is important that you unload all active files with the **File Unload All** command before entering a tutorial.

To run the ANGOSS Database Tutorial:

1. Make certain you have entered ANGOSS Database. A module menu beginning with the keyword **Data** should appear in the Control Area of your screen.
2. Select the keyword **Help**.
3. Select the option **Tutorial**.

Using Example Files

When you install ANGOSS Database you have the option of installing Example Files to help you complete some of the practice exercises. If they were not installed, and you are working in a single-user environment, you can install them through the Changes and Additions option of the Install program. If they were not installed, and you are in a network environment, contact your system administrator. You must have write and delete privileges to use the tutorials and example files on a network.

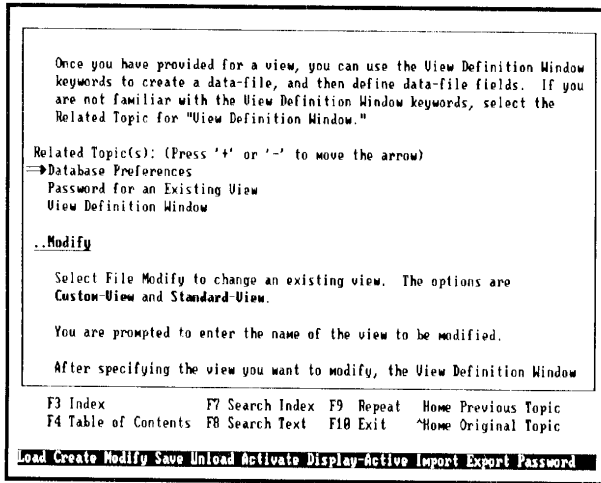
Because you build on the Example Files as you complete each exercise, you need to have your own copies of them. Do not modify the original files. Do not try to share your Example Files with someone else.

ANGOSS Help

One of the most useful features ANGOSS offers you is the ability to receive on-line help from anywhere within the program. Help is always available to you simply by pressing **F1**.

When you press **F1** at any keyword or option, the help screen appears over your current file. Help includes information about the current topic as well as related topics. Figure 2-1 shows a list of related topics in the help text.

Figure 2-1. Related Topics



Use **up arrow** and **down arrow**, and **PgUp** and **PgDn** to scroll up and down through the help information. Use **+** and **-** to move the pointer through the related topics list. When the arrow is pointing to the related topic you want, select it by pressing **Enter**.

In addition, help is displayed when you select the Help keyword. A table of contents and an index are provided to help you find the information you need. An explanation of each error message is available through the On-Error option. Information on using help is available through the **About-Help** option.

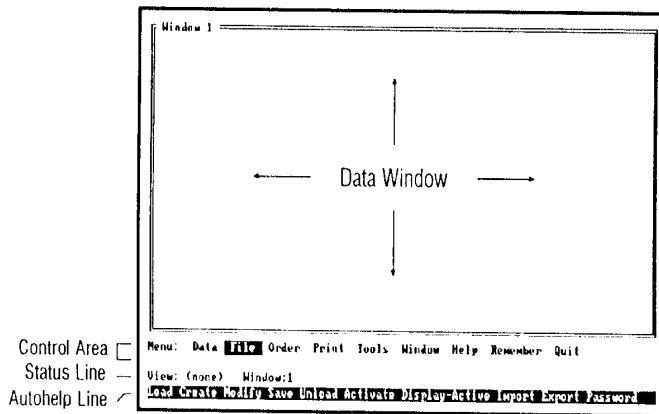
To remove the help information from your screen, press **F10**.

The Display Screen

The ANGOSS Database display screen is divided into four distinct areas:

- the Data Window
- the Control Area
- the Status Line
- the Autohelp Line

Figure 2-2. The Display Screen



The Data Window

The Data Window occupies the largest area of the screen display and is surrounded by a window border. This is where you create, display, and modify the components of the databases. When you first enter ANGOSS Database, no files are loaded, so the window is blank.

A window identifier is located at the upper left corner of the window. When you first enter ANGOSS Database, the current window is always identified as Window 1.

ANGOSS Database allows you to "split" the data window area into two or more smaller windows. Different files, or different parts of the same file, can then be displayed on the screen at the

same time by loading them into separate windows. As many as 25 windows with borders or 35 windows with the borders turned off can be created in ANGOSS Database on standard 25 row x 80 column screens. You will learn more about splitting windows in *Chapter 5: Managing a Database*.

The Control Area

The Control Area is located just beneath the Data Window. When you enter the Database, the Control Area displays a keyword menu from which you can build commands. As you create your database and enter data, the information displayed in the Control Area may include menus, prompts, data entry information, or error messages, depending on your activities.

Quick Keys

The Control Area can also display lists of ANGOSS Database Quick Keys. Quick Keys allow you to select the most frequently used commands without having to use the keyword menus. A Quick Key can be a function key, or it can be some key combination involving **Alt** or **Ctrl**.

To display the Quick Key lists in the Control Area, press **F2** repeatedly until you have cycled through the entire series of lists. For example, **L Load** means you can hold down **Alt** and press **L** to execute the File Load command. If a letter in the Quick Key list is preceded by a caret (^), it means you can hold down **Ctrl** and then press the letter to execute the command. See the *Quick Reference Guide* for a complete list of ANGOSS Database Quick Keys.

The Status Line

Directly beneath the Control Area is the Status Line, which contains information relating to the current status of your file.

The "View" designation is followed by "(none)" if no view is currently loaded. Once you have loaded a view, the name replaces (none). A view name can contain up to eight characters, but no blank spaces. The name of the loaded view shown in Figure 2-3 is "invtry.vw."

Figure 2-3

part num	Quantity	Manufacturer	Standing	Phone
T1112111	50000	ABC Plumbing Fixtures	83737373	(827)262-6262
A0000001	10000	ACME Widgets	23232322	(848)474-8488
R2264353	500	Bateman Plastics	89534345	(431)432-4432
EEF2EE	800	Cardinal Manufacturing	99909009	(413)987-8768
Q5552321	75	Evanston Glass	11211120	(615)333-2323
E4454097	370	Gantry Products, Inc.	22029289	(615)323-4323
19897557	2000	Gopert Chemicals	88898998	(714)632-6178
U2343321	300	Hartley Steel	87837728	(312)334-3213
U1121223	732	Hibing Electronics	77673241	(212)654-7567
T4321432	4000	Underhill Plastics	90394289	(236)426-4287
G2020202	2500	Waterworks	99994949	(987)927-9492
L6667777	35000	Yates Manufacturing	64646466	(654)614-3646

Menu: **Data** File Order Print Tools Window Help Remember Quit

View: invtry.vw Key:Manufacturer Window:1 Rec:10 (10) **DEL**
 Browse Cross-Tabs Delete Enter Find Goto Query Relate Send Transact Utilities

The "**Key:**" or "**Index:**" designation identifies the current key field or index you have used to order records. If records are not currently ordered by a key field or index, this designation will not appear on the screen.

The "**Window:**" designation specifies the number of the current window.

"**Rec:**" displays both the current logical record number and the physical record number (in parentheses) on the screen. Each record is assigned a physical number when it is entered. It reflects the order in which records were entered. If you create a sort or an index, a logical record number appears based on the current position of the record in the sort or index. More information about record numbers is provided in *Chapter 4*.

"**Del**" is an abbreviation for deleted that appears at the far right on the Status Line if the record has been deleted (that is, if it does not have active status).

The Autohelp Line

The Autohelp Line is located at the bottom of the display screen, directly beneath the Status Line. Autohelp displays a single line of help information related to your current activity.

Autohelp is activated or deactivated by selecting the On or Off option for the **Autohelp:** setting in the Global Preferences Definition Menu of the Tools Preferences Global command. Some screen

illustrations in this manual show the Autohelp Line and others do not, depending upon whether Autohelp is pertinent to the activity being discussed. When you enter the module, the Autohelp Line displays a list of options for the menu keyword that is highlighted.

Using the Mouse

A Microsoft compatible mouse can be used with ANGOSS in this module. For complete details on mouse usage, refer to the section called “Using the Mouse” in the *Software System* Manual. When specific Database usage occurs, the mouse is discussed in this manual within the appropriate section. However, commands and options are generally discussed in terms of the keyboard.

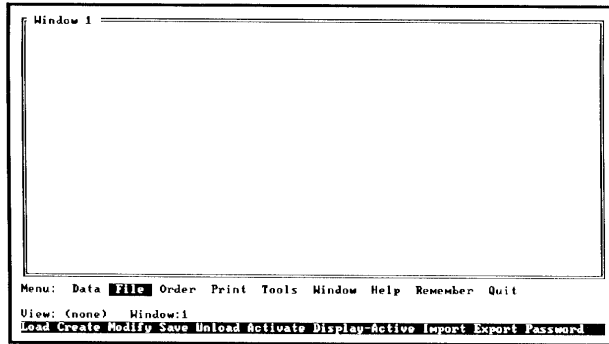
Operating Modes

ANGOSS Database has two operating modes, Command/View Mode and Enter/Update Mode. Command/View Mode is used to execute ANGOSS Database commands. Enter/Update Mode is used to enter and modify the data in your database. If you have a view loaded into the Display Window, you can toggle between these two modes by pressing **Esc**.

Command/View Mode

When you first enter ANGOSS Database, the program is in Command/View Mode. The module menu is displayed.

By selecting keywords and options from the menu and answering prompts, you build Database commands. Your combined response to the options and prompts presented becomes a part of the complete command format. See *ANGOSS Software System* for more information about building commands.

Figure 2-4. Command Mode

Enter/Update Mode

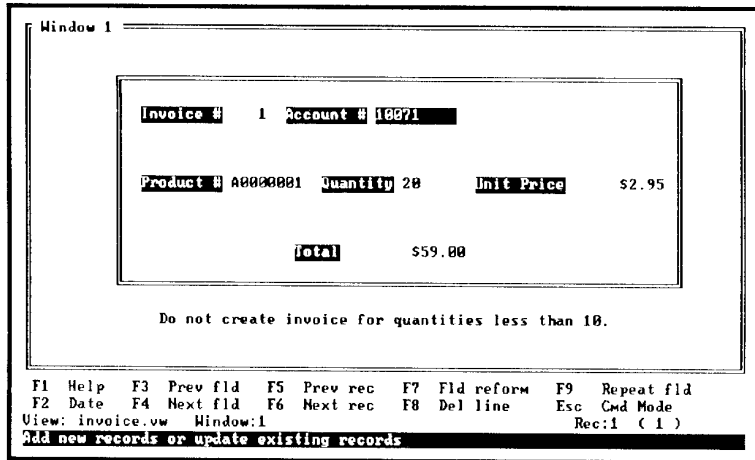
In Enter/Update Mode, you can enter data or revise the data previously entered into a record. To enter a new data record, use the Data Enter command. The cursor is moved to the end of the file and you are asked to enter data into a new record.

To revise previously entered data, press **Esc** when the record you wish to update is displayed. You can use the command Data Goto Record Record-Number to make a particular record the current record. More information about entering and updating records is provided in *Chapter 4*.

Once the Database is in Enter/Update mode, the module menu is replaced by a list of keys that are available when you are entering data. Figure 2-5 shows what the screen looks like in Enter/Update mode.

A cursor appears in the Data Window Area in Enter/Update Mode. The cursor indicates your exact position within the view as you enter or edit the data.

Figure 2-5. Enter/Update Mode



When you are finished entering or updating records in the current view, you can return ANGOSS to Command/View Mode by pressing **Esc**.

Definition Menus

Some Database commands provide listings, called "definition menus," that consist of prompts and option lists. Responses to these prompts and option lists are called "settings." The keys used to select and define menu settings are the same for all definition menus. Refer to the *Tools Preferences Global* section of *ANGOSS Software System* for specific instructions.

Remember from *ANGOSS Software System* that you select the Tools Preferences commands to establish global, hardware, and module-specific settings. Before proceeding to **Chapter 3**, make certain that you have selected appropriate settings for display, output, and hardware compatibility. This is accomplished with the Tools Preferences Hardware command.

Database settings are selected on the Tools Preferences Database Definition Menu. This menu controls a number of items that affect how ANGOSS Database performs when it is accessed. In addition,

these settings control data attributes, such as numeric precision, alignment, and format for screen display. Some specific settings include:

- automatic loading of a view or macro file when ANGOSS Database is accessed
- automatic execution of a project file when you enter ANGOSS Database
- establishment of a data path for ANGOSS Database
- specification of an encryption driver to use on new files
- number of key buffers per data-file
- default numeric formats

See the discussion of the Tools Preferences Database command in *Chapter 9* for more information about these settings.

Definition Windows

A number of other Database commands provide access to a Definition Window. Each Definition Window has its own keyword menu. By making selections from these keywords you can use the Definition Window to define how a certain process will take place. Following is a brief description of several Database Definition Windows.

View Definition. The structure of a database is established or modified in the View Definition Window. Use the View Definition window to create, edit, move, delete, or reorganize the elements of views and data-files.

Report Definition. When you print information from your database, use the Report Definition Menu to control the structure and appearance of your reports. Custom report definitions can be developed to meet many needs with this definition menu.

Other Definition Windows. Definition Windows are also used to establish the criteria for Queries, Cross-Tabs, Transactions, and Relates. More information on these definitions will be presented later in this manual.

Important Database Concepts

Before you begin working in ANGOSS Database, there are several terms and concepts with which you should be familiar. The sections that follow contain brief discussions of these terms and concepts.

In addition, there is a section giving an overview of the basic steps in creating a new database. Step-by-step information for creating views, data-files, and tables will be presented in the next chapter. Before creating a database, it is important to understand how all the pieces of the ANGOSS Database relate to each other.

Database Terms Defined

A **database** is a collection of data organized around a specific need or purpose. In ANGOSS, data is stored in **data-files**. A data-file is a disk file containing data organized into rows and columns. For example, a customer data-file might organize data like this:

Acct#	Name	Address	City	ST	Zip
100	Dave Beyers	123 A St	Shawnee	KS	66203
101	Mike Green	456 B St	New York	NY	10007
102	Bob Beyers	123 A St	Shawnee	KS	66203

Fields

All entries under a column heading are the same type of data. In other words, all entries under **Acct#** are account numbers, all entries under **Name** are customer names, and so forth. The columns represent **fields** in the data-file, and the column headings represent field names, which identify the fields.

Records

Each row of data shown in the example represents a **record** in the data-file. A record consists of fields that describe a particular entity (in this case, a customer).

Views

A view is a screen on which you can see and manipulate data. You can place your fields in any position or format that allows you to enter and display your data in ways you find meaningful. Data stored in data-files can be accessed only through views.

Types of Views

Any view that you create and design is called a **custom view**. Your design can be simple or elaborate. Figures 2-6 and 2-7 show examples of custom views.

Figure 2-6. A simple Custom View

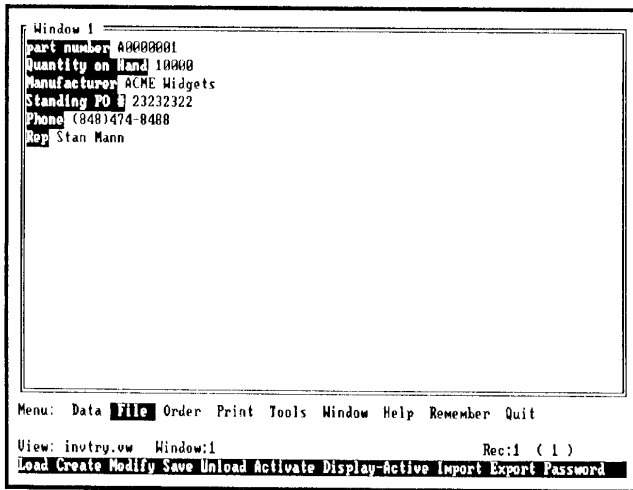
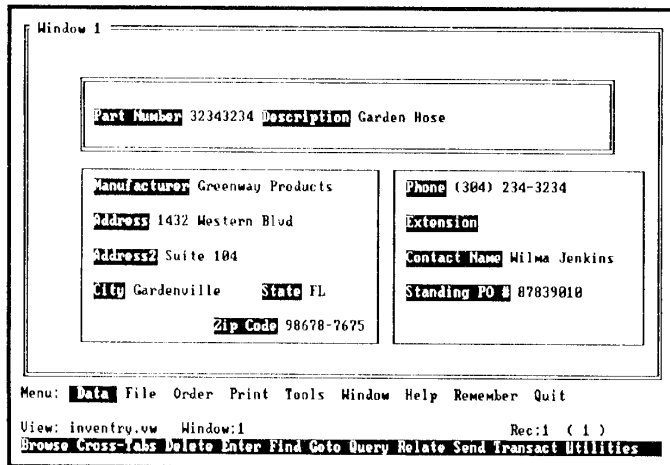


Figure 2-7. A more elaborate Custom View



When you create a data-file with your custom view, ANGOSS also automatically creates a **standard view**, showing all fields in standard columnar format. Figure 2-8 shows an example of a standard view.

Figure 2-8. A Standard View

part num	Quantity	Manufacture	Standing	Phone
Q0000001	10000	ACME Widgets	23232322	(848)474-8488
T1112111	50000	ABC Plumbing Fixtures	83737373	(827)262-6262
G2020202	2500	Waterworks	99994949	(987)927-9492
T4321432	4000	Underhill Plastics	90394209	(236)426-4287
L6667777	35000	Yates Manufacturing	64646466	(654)614-3646
U2343321	300	Hartley Steel	87837728	(312)334-3213
I9897557	2000	Gopert Chemicals	88898998	(714)632-6178
R2264353	500	Bateman Plastics	89534345	(431)432-4432
U1121223	732	Hibing Electronics	77673241	(212)654-7567
T3332336	800	Cardinal Manufacturing	99909009	(413)987-8768
Q5552321	75	Evanston Glass	11211120	(615)333-2323
E4454097	370	Gantry Products, Inc.	22029209	(615)323-4323

Menu: Data **file** Order Print Tools Window Help Remember Quit

View: inotry.vws Window:1 Rec:1 (1)

Load Create Modify Save Unload Activate Display-Active Import Export Password

You will find more information on the differences between custom views and standard views in the next chapter. Standard views are identified by the same name as the corresponding data-file, but have a different extension. See the section in this chapter titled *ANGOSS Database File Extensions* for a list of extensions for the various file types used in ANGOSS Database.

Viewing Multiple Files

Because ANGOSS Database is a relational database system, you also have the option of creating views that display only selected fields in a data-file, or that combine fields from multiple data-files.

There are a number of reasons you might choose to break up a large data-file by placing some of the fields into two or more smaller data-files. In some cases, smaller data-files will process more quickly than one very large file. Better security can also be maintained by breaking a large data-file into several smaller data-files. By controlling who has access to each data-file you can also control what data they see.

Figure 2-9

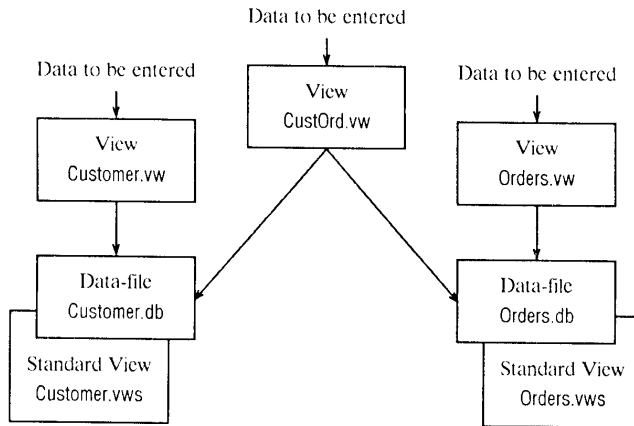


Figure 2-9 shows two data-files, titled "customer" and "orders". Each has a custom view attached to it. In this example, the names of the views correspond to the names of the data-file. Notice, however, that the extensions are different. Each data-file also has a standard view that was automatically created with the data-file.

The "customer" data-file contains information such as the name, address, customer number, and contact name for each business customer. The "orders" data-file contains information such as order number, purchase order number, and ship date for all orders received by a company. Data is entered into each data-file through its view.

It would be a waste of space to have customer address information in both the "customer" and "orders" data-files and views. However, there may be times you would like to be able to look at information in both data-files at the same time.

To accomplish this, a third view titled "custord" is created. Both data-files are attached to it. You can select any of the fields in either data-file to appear in this view. Creating this type of view, attached to multiple data-files, gives you great flexibility. You can relate your data in many different ways without wasting storage space.

Analyzing File Relationships

When you design your database, take time to plan the data-files that will be needed. In particular, consider the relative associations that the records of any two data-files may have to each other. There are four types of association.

One-to-one. A "one-to-one" association means that for each record in the first data-file, there is only one corresponding record in the second. For example, if you store employee names, addresses, and other employee data (using employee numbers to uniquely identify each employee) in one data-file, and, for confidentiality, store salary amounts by employee number in a second data-file, there will be only one salary record in the second file that corresponds to each employee record in the first file. Salary records have limited use unless they can be associated with employee records; thus, the employee records identify the salary records.

One-to-many. A "one-to-many" association means that for each single record in the first data-file, there could be multiple corresponding records in the second data-file. A customer information file and a file consisting of customer transactions could be considered to have a one-to-many association, i.e., for each customer, there could be many transactions.

Many-to-one. A "many-to-one" association means that there could be multiple records in one file that correspond to a single record in a second file. For example, there could be several records in a transaction file that belong to a single customer in a customer information file.

Many-to-many. A "many-to-many" association means that multiple records in one file correspond to multiple records in a second file. For example, numerous part-number records in an inventory file could apply to any number of records in a sales transaction file. This type of association is more complex than the other three types and may require an intermediary view to break down the associations into one-to-many or many-to-one types.

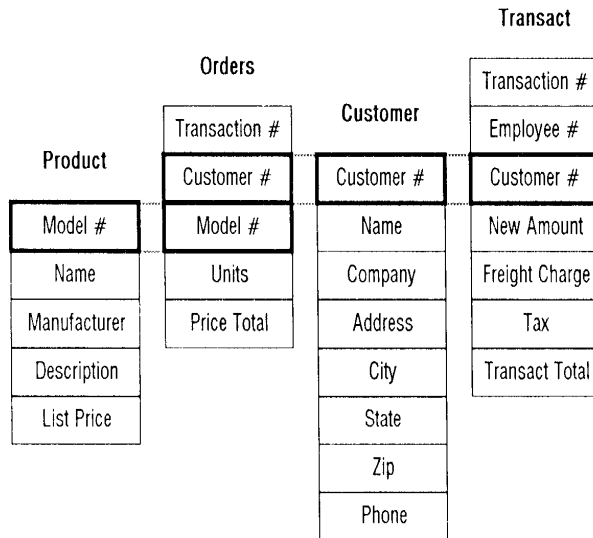
Keep the types of associations in mind as you are designing and building your database. Knowing how your files are to be related will help you determine how to link them so that their records are correctly matched.

Linking Data-Files

When you create or attach multiple data-files within a custom view, you must link those data-files so that data in fields of corresponding records can be displayed simultaneously. This data thus appears as a single record, or **view record**.

Data-files are always linked in pairs. Select fields that both data-files have in common as link fields. Figure 2-10 shows an example of how a number of files might be linked.

Figure 2-10. Linked fields



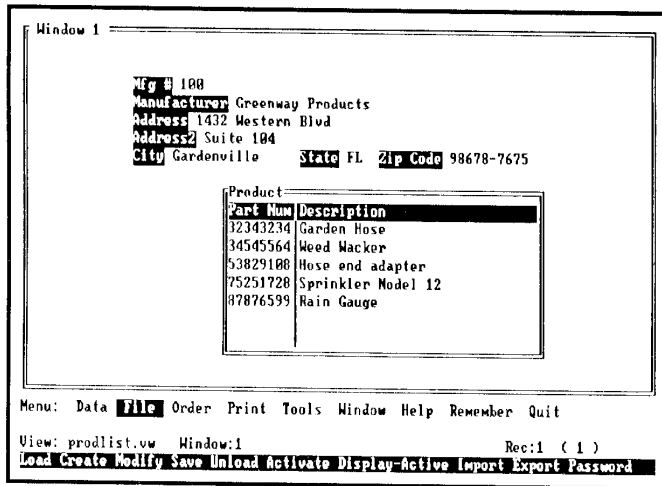
Tables

A **table** is an area of a custom view in which multiple records from another data-file are shown in standard columnar format. Tables are used in a "one-to-many" relationship.

For example, suppose you have two data-files like those described in Figure 2-9. The first data-file contains customer information; the second contains information pertaining to orders that customers have placed. Both files have a field containing the customer's account number.

You could create a view displaying the customer information at the top of the screen, and then create a view table showing the customer's order records. The customer's account number is used to link the files.

Figure 2-11. A View with a Table



Overview - Creating a Database

The following discussion is an overview of the steps that go into creating a database. Step-by-step information is provided in the next chapter.

Because a view is the only way you can enter or manipulate the data in your data-file, views and data-files must be created together. After choosing the File Create command, you will be prompted to name your new view. The View Definition Window will appear. You must then create your data-file by selecting the Create Data-File command from the menu. Then name your new data-file.

IMPORTANT: Each view stores internally the names of the data-files attached to it. Therefore, the renaming of files is not recommended.

Once your view and data-file are named, the View Definition Window reappears and you can place your fields anywhere on the screen. Position your cursor where you want the field to appear, and execute Create Field Data-File. A definition screen then appears, giving you the option of assigning data entry or display restrictions to each field.

After you have finished defining your fields, your data-file is ready to accept data. **Chapter 3** discusses each of these steps in more detail. However, it is important that you understand the order of the creation process.

IMPORTANT: To create a view that relates data in existing data-files, (such as the view "custord.vw" in Figure 2-10) you follow many of the same steps. However, since you are not creating a new data-file, you do not execute Create Data-File after naming your view. Instead execute Attach Data-File to attach one or more existing data-files to the view.

Field References

A field is identified by its name. When referring to a field, enclose the name in brackets, e.g., [address]. Refer to a field from another view by using the format [view.fieldname]. For example, [Inventory.Part#] references the field [Part#] in a view named Inventory.

Frequently in ANGOSS Database, you are asked to enter a "field list." To respond, you can either type the field references, or you can select from a prompter list of available fields.

The following examples illustrate the various ways you can specify fields in a field list:

Specification Format	Fields Selected
[Name;Address;Phone]	Fields [Name], [Address], and [Phone]
[Name Zip]	Every field between [Name] and [Zip]
[Name;Date Total]	The field [Name] and the fields [Date] through [Total]

IMPORTANT: It is preferable to use field names rather than field numbers when listing fields. Any addition or removal of fields, or a change of input order, might cause all field numbers to change. This could require time-consuming editing of all field numbers in your list. If you use names, no changes are needed.

Operating System Access

When you are working in ANGOSS Database, you can temporarily suspend the Database program and gain access to the operating system to execute system commands by pressing **Ctrl O**. When you have completed your system operations, you can return to ANGOSS Database by typing **EXIT** at the prompt.

You can also select the Tools OS option to execute one operating system command and return immediately to ANGOSS Database.

File Extensions

ANGOSS Database uses several file extensions to identify different kinds of files. The following table lists file types and their corresponding extensions. You will learn more about these file types in subsequent chapters.

File Type	Extension
Data-files	db
Index files	idx
Physical index files	pix
Key files	key
Input-Screen files	is3
Macro files	mac
Project files (text version)	pf3
Project files (runtime version)	rf3
Query definition files	dfq
Report definition files	dfr
Sort definition files	dfs

File Type	Extension
Transact definition files	dft
Cross-Tab definition files	dfw
Relate definition files	dfx
Custom view files	vw
Standard view files	vws

Automatic File Backup

ANGOSS Database provides an option for automatic file backup on the Tools Preferences Global menu (see Tools Preferences for details). If you choose **Yes** for this setting, the program automatically retains backup copies for files of all types except data-files, index files, key files, input-screen files, and runtime project files.

Backup files do not appear in prompter displays.

The extensions of the files that are automatically backed up are as follows:

File Type	Extension
Macro files	mbk
Project files (text version)	bp3
Query definition files	bfq
Report definition files	bfr
Sort definition files	bfs
Transact definition files	bft
Cross-Tab definition files	bfw
Relate definition files	bfx

File Type	Extension
Custom view files	bvw
Standard view files	bvs

Exiting

To exit ANGOSS Database, select Quit from the Database module menu, or press **F10**. You can then exit the ANGOSS Software System or proceed to another ANGOSS module.

If you press **F10** accidentally, before you are ready to exit ANGOSS Database, press **Esc** to return to your previous location in ANGOSS Database.

Chapter 2: Getting Started

Chapter 3: Creating a Database

This chapter explains the basic tasks required to create and modify a database. Remember from *Chapter 2* that creating a database involves the creation of a view, which allows you to see and manipulate data, as well as a data-file to store the data. Fields must also be created and positioned on the view. These steps must be accomplished in the following order:

1. Create a View
2. Create a Data-File
3. Create Fields

More information on each of these steps is available in this chapter. Watch for the three steps as you read through the following discussions. Other topics include modifying the elements of a database and customizing your data entry screen with features such as boxes and menus.

At the end of this chapter are practice exercises designed to help you understand the information presented here. After you read this chapter, perform the practice exercises. If you are unable to perform some of the exercises, please reread this chapter and try again.

Creating a Database

As discussed previously, the structure of a database can be simple or complex. Let's begin by designing a simple database.

Assume the following information is a list of people donating to a local charity. The information includes a donor number; the name, address, and phone number of each donor; and the amount of his donation. Having this information on paper gives you a record of each donation, but you are limited in the other ways you can use this data.

#121

Robin Murphy

#340

Mike Wright

Chapter 3: Creating a Database

494 Lee Street
Lenexa, KS 66219
(913)486-9311
\$25.00

5468 King Street
Kansas City, MO 64108
(816)243-4044
\$35.00

#247
Wendy Carte
40 Richards Lane
Raymore, MO 64083
(816)331-0090
\$50.00

#97
Kirby Peters
10 Hanson Avenue
Kansas City, MO 64801
(816)756-7799
\$45.00

By placing the information in a database, you could manage the data to keep track of many different types of information about the donations. For example, you could determine how many donors come from a certain zip code area, or how many donations a particular donor has made in the last year.

The following section presents the steps necessary to create a simple database for an application such as the donor database. A view and a data-file must be created; data is entered into the view and stored in the data-file. Fields must also be defined for each type of data you will be storing.

Establishing A View

When creating a database, you must first establish a view by giving it a name and responding to several prompts that establish the basic structure of the view. To begin, select the File Create command. You are prompted to enter a name of up to eight characters for the view.

Then specify whether this new view is to be created from scratch with the New option, or with the Similar option, which uses an existing view as a template. In this example, New is the proper option.

You must then decide whether you wish to restrict access by assigning a password. Password protected views are "encrypted." An encrypted view is stored in a format that becomes readable only with proper entry of your specified password. If you select the Password option, you will be prompted to enter

up to 16 letters for your password. Passwords are case sensitive. The Database then prompts you to type the password a second time to verify proper spelling.

The View Definition Window

Once you have named your view and decided whether to password protect it, you gain access to the View Definition Window. The View Definition Window is the area on your screen in which you design your custom view by positioning fields. The View Definition Window includes the Control Area, which contains a keyword menu and a prompt line, and the Data Window Area, where your view will actually be designed.

You can use the following keys to control keyword selection and exit from the View Definition Window:

Key	Action
Spacebar	Moves the highlighter one keyword to the right
Backspace	Moves the highlighter one keyword to the left
Enter	Executes the displayed command format
Esc	Abandons the View Definition Window without saving the current definition
F10	Completes the current definition and then saves it, returning to Command/View Mode.
Alt X	Displays the last command executed and permits you to edit it.

Creating a Data-File

The first thing you must do in the View Definition Window is create a data-file in which to store data entered into this view. You will be asked to name the data-file and respond to several prompts about its structure. Select the View Definition keywords Create Data-File. At the prompt, enter a name of

up to eight characters. You can name your data-file anything you wish, but it may be more efficient to give it the same name as the view you are also currently creating.

After naming the data-file, you are asked whether the data-file is to be Fixed-Length or Variable-Length. In a Fixed-Length file, all records have the same length. Each field is allocated a specific length, regardless of how much data is entered into it. In a Variable-Length file, the lengths of records depend on the amount of data entered into them. Each field is allocated only as much storage space as needed to save the data entered. Generally, a fixed-length data-file requires more space while providing faster data access times. A variable-length data-file requires longer access time while increasing storage efficiency. A fixed-length data-file is usually the preferred option if the storage space is available.

Next, decide whether you wish to password protect the data-file. If you choose to password protect the data-file, you have the option of adding additional protection by encrypting the file as well. You are prompted to enter the password and then type it a second time for verification. The data-file is then password protected. The next paragraph provides more information about password protecting various database files.

Password Protection

You can specify separate passwords for a data-file and any views associated with it, including the standard view. A password can be attached to a data-file or a custom-view during the creation process as previously described. The File Password command can be used to assign a password to an existing view or data-file. An existing view must be loaded before the File Password command is executed. A password can also be assigned to the standard view by loading it and executing the File Password View command.

IMPORTANT: Be extremely cautious about password assignments. If passwords are lost or forgotten, you will not be able to recover the data to which they give access.

Creating a Field

After creating a data-file, you can begin creating fields for your database. When you place a field in the View Window, you usually also want to create the field in your data-file. There are some types of fields which you would choose not to automatically create in your data-file. This process, and the various types of fields, are discussed later in this chapter.

To create a field, first move the cursor to the position on the view (within the View Definition Window) where you want the new field to appear.

COMMENT: Some thought should be given to where fields are placed on a view. If data will be entered from a preprinted form, fields should be positioned to match the form.

You can place fields anywhere on the view by moving the cursor appropriately in the Data Window. The View Definition keywords allow you to create or modify the components of a view, such as data-files and fields.

To move the cursor, use the standard cursor keys:

Key	Action
right arrow	Moves the cursor one character to the right
left arrow	Moves the cursor one character to the left.
Ctrl right arrow	Moves the cursor one screen width to the right
Ctrl left arrow	Moves the cursor one screen width to the left
Tab	Moves the cursor eight spaces right
Shift Tab	Moves the cursor eight spaces left
Home	Moves the cursor to the top of the screen
End	Moves the cursor to the bottom of the screen
Ctrl Home	Moves the cursor to the top line of the view
Ctrl End	Moves the cursor to the bottom line of the view
PgUp	Moves the cursor up one screen height
PgDn	Moves the cursor down one screen height

While you are creating or modifying a view, the Status Line displays information about the field residing at the current cursor position.

(Orientation). If the field is a data-file field, the name of the data-file, including the **.db** extension, is shown in parentheses. If the field is a view field, the word (**view**) is displayed. If the field is a project variable, the word (**project**) is shown.

Field-type. `Field-type`: shows the type of data that can be entered, followed by the width of the field. For alpha fields, the width shown represents the actual width of the field; for numeric fields, the width represents the display width.

Menu. If the field has a menu attached, the word `Menu`: followed by a letter representing the menu type is displayed. `B` indicates bar menu; `P` indicates popup menu; `D` indicates data-file menu.

Calc. If the field has a calculation attached, the word `Calc`: followed by a letter representing the calculation type is displayed. `W` indicates Wait; `I` indicates Immediate; `M` indicates Manual.

Rule. If the field has a rule attached, the word `Rule` is displayed.

Once the cursor is positioned where you want your field to appear in the view, select the keywords Create Field. You are prompted to type in a name for the field. A field name can contain spaces but no period. Then you must specify whether this field is a Data-File field, a View field, or a Project-Processing variable.

Select Data-File if you want the data entered into the field to be stored in the data-file you are creating. This will probably be your most common selection.

Select View if you do not want information in the field to be stored on disk. For example, you may want the value produced in a calculated [Total] field, which is the product of the fields [Price] and [Quantity], to appear only on the screen, and not be stored in a data-file. This would allow you to conserve storage space.

Select Project-Processing if you want to create the field as a Project variable. In this case, information entered into the field is stored in a project variable, not in the data-file. For more information about Project Processing, refer to *Project Processing*.

After you specify Data-File, View, or Project-Processing for the field, the Field Definition Menu appears.

Field Definition Menu

On the Field Definition Menu the name of the field is displayed at the top of the screen. With the pointer arrow located on the first line, the following prompts appear initially on the Field Definition Menu:

Field type: Inverted **Alpha** Numeric Counter Date Time

Field width: 8

Field title placement: None Above-Field **Left-of-Field**

Extended Field Options? **No** Yes

Field Type

On the first line, you can select a type for the field you are creating. Table 3-3 describes the field types you can specify:

Table 3-3

Field Type	Description
Alpha(numeric)	Can contain all keyboard characters
Counter	Contains an automatically assigned sequential number for each record
Date	Contains a date which can be displayed in a number of different formats
Inverted (name)	Can contain alphanumeric information, sorted by the last word in the field. For example, if "John Smith" is in the field, "Smith" is used to sort.
Numeric	an contain a number. A display width of up to 255 characters can be specified. However, only 15 significant digits are used for numeric purposes.
Time	Displays time in an AM/PM or 24-hour format

Field Width

On the second line, specify a width for the field. The maximum width for most fields is 31,000 characters. However, an inverted field has a maximum width of 100 characters. Press **F6** while the prompter is on the field width option, and the Database displays at the bottom of the screen the number of characters available for the field length.

Numeric fields. You can specify a display width of up to 255 characters for a numeric field. However, you can only enter as many digits as the display width you specify. For example, if you set a display width of 12, you can only type in 12 characters. The display width should

include character positions for decimal points, currency symbols, and other format characters. If there is not room to display the number in the format you specify, asterisks will be displayed in the field. The number is stored in the data-file, but cannot be displayed. Numeric fields cannot wrap to a second line, so you must make sure there is room on the view for the size field you specify.

Alpha fields. For alpha or inverted fields, however, the display width and storage width can be set independently.

When an alpha field is created, the value entered for the `Field Width` setting usually determines both the storage width and the display width. This may not be the case, however, for very long fields. Long fields are automatically wrapped to multiple lines extending only to the rightmost position in the current window. The last line of a multi-line field is "padded" with extra display characters to make all lines in the field equal in length. This will make the display width of the field longer than the storage width. Because of this, the Database may tell you the field is full, even if it looks like there is more room on the line.

If you edit the alpha or inverted field you can also change the display width, storage width or both. More information on changing these widths is available in the section titled *Editing Fields*, later in this chapter.

NOTE: A difference in the display and storage width of an alpha field can cause scrolling of data in the field. If you type the maximum number of characters into a field, you will receive an error message. You can go back and delete some of your entry to make more room, or let the Database truncate.

Field Title Placement

On the third line, you can select a placement position for the field name. The field can appear without a name (`None`), with the name above the data (`Above-Field`), or with the name to the left of the data (`Left-of-Field`). The default is `Left-of-field`.

At this point, you can end the field definition by pressing **F10**, or you can further define the field by selecting from the extended field options.

Extended Options

The extended field options allow you to add characteristics to the field to make data entry easier or more efficient. If you move the pointer to the fourth line and select **Yes**, you access the Extended Field Options, as follows:

View Field Name

View field name: (field name)

On this line, you can change the name of the field that is displayed on the view by entering a new name in place of the original field name. Changing the name here changes the display reference for the field, but not the reference stored in the data-file. For example, you may wish to name a field [Acct_#] in the data-file, but you want "Account Number" to appear on the view. The name change has no effect on the standard view.

IMPORTANT: If you later modify a view and change the name of a field, any existing calculations or rules that refer to that field by its previous name are no longer valid. You will get an error message alerting you that these invalid calculations will be dropped from the appropriate standard view. If you change a field name, be sure to edit any relevant calculation or rules.

Field Attributes

Field attributes: **Read/Write** **Read-Only** **Mandatory-Entry** **Project-Write**

On this line, you can select an access/entry attribute for your new field. The initial default is **Read/Write**, granting standard read/write permission to your field. If you select **Read-Only**, the Database prohibits all data entry to the field. If you select **Mandatory-Entry**, you require users to enter data into the field in order to move on to the next record or to exit Enter/Update mode. If you select **Project-Write** the field is Read Only to users, however a project processing program will be able to write information into the field.

NOTE: The **Project-Write** option was added in v2.50.

Automatic Advance on Full Field

Automatic advance on full field? **No** Yes

On this line, you can choose whether or not you want the "automatic advance" option during data entry. If you select **Yes**, whenever a field is filled to its capacity with data, the Database automatically moves the cursor to the next field. If you do not change the initial default selection, **No**, the cursor remains in the last character position of the completed field until moved by pressing **Enter** or **F10**.

Title and Data Colors

Title foreground, background color: 0,0

Data foreground, background color: 0,0

With the pointer on these lines, you can change the respective foreground (characters) and background colors used in the display of the field name or the data on the view. Press **F6** to display a list of numbered colors at the bottom of the screen.

IMPORTANT: If you accept the default colors here, you can later change these colors with the Window Paint commands. If you assign colors at this prompt, these items cannot be changed with Window Paint. They can only be changed by executing File Modify and changing these settings.

Field Display Format

Field display format:

On this line, you can enter a display format for your new field. This setting allows you to control how the data stored in the field is to be displayed.

A list of available format characters is displayed when you press **F6**.

The order in which you must enter field display format items is: Precision, Alignment, Type, and Options. Do not separate the specifications from each other with spaces or commas. You are not required to select an item from each type; just make sure that you enter items in the proper order.

Precision. The Precision specification can be a number between 0 and 15 that indicates the number of places displayed right of the decimal in a number. If you enter no precision, the display precision specified at the `Default numeric format:` setting in Tools Preferences Database is used.

Alignment. The Alignment specification can be one of the following:

L	Left Justification
R	Right Justification
M	Middle (Centered) Justification

These align the text data within the supplied width of the field. If no alignment is specified, the default of left justified is used.

Alignment is the only display format option that applies to alphanumeric fields.

Type. The Type specification can be one of the following:

\$	Dollars
%	Percent
E	E-Notation
H	Histogram
,	Commas (valid only when precision is specified)
Dn	Date 1, 2, or 3, Where n=1, 2, or 3
Tn	Time, Where n=1 for 12-hr format or n=2 for 24-hr format
dd	Numeric Day: 2 Characters for one-digit days, e.g., 04
d	Numeric Day: 1 character for one-digit days, e.g., 4
day	Text day of the week(e.g., Thursday)
mm	Numeric Month: 2 characters for one-digit month
m	Numeric Month:1 character for one-digit month
mon	Text Month (3 char.)
month	Text Month: all characters
yy	Numeric Year: 2 digits
yyyy	Numeric Year (4 digit)
D	Custom date specification followed by format for custom date (e.g., Dmm/yy)

NOTE: Custom date formats must begin with an uppercase D, i.e., Dmm/dd/yy.

If you wish to use a character in your format that is itself a format character, it must be preceded by a backslash (\) in order to be treated as a literal character. For example, suppose you have the format `DToday is month d, yyyy`. Assume that the date is 3/6/89. The result would be "ToMonday is March 6, 1989." The format interprets the "day" part of today to be a request for the day name. A backslash must be placed in front of letters d and y in Today for this format to display properly. The format should be `DTo\d\y is month d, yyyy`.

Options. The Options specification can be one of the following:

F	Fill with *
Z	Single blank space for zero
P	Parentheses around negative number
B	Negative number with cr, positive number with db
C	Negative number with cr

The P, B, and C Options specifications are applied only if you also enter an appropriate Type specification (i.e., \$, %, or E). All other data characters are treated as literals (i.e., characters like /, -, or "spaces").

Consider the following display format examples:

- An entry of 32694 into a numeric field with display format specifications `Dd/m/yy` would appear as 6/7/89.
- An entry of 100 into a field with a display width of 11 and display format specifications `2M$F` would appear as `**$100.00**`.
- An entry of 5 into a field with display format specification `H` would appear as `+++++`.
- An entry of .1 into a field with display format specification `%` would appear as 10%.
- An entry of -100.2 into a field with display format specification `OP` would appear as (100).

Field Input Mask

Field input mask:

On this line, you can enter an input mask (maximum of 100 characters) for the field. Input masks allow you to place data entry qualifications and restrictions on fields.

NOTE: Input masks are permitted on date fields, but they require special consideration. If you define an input mask for a date field, be sure the mask is compatible with the display format. For example, if the input mask is **AAA ##,####**, the display format should be **Dmon dd, yyyy**. If the mask and the display format do not match, the mask is in effect during Enter Mode but is ignored during Update Mode. If you do not define a mask for a date field, either alphabetic or numeric dates can be entered. The dates must be entered according to the Date Style setting on the Global Preferences Menu.

A list of input mask characters and mask definition symbols is displayed when you press **F6**.

Character or Symbol	Meaning
*	Repeat symbol: Designates a repeat count (i.e., *5A equals AAAAA)
A	Mask character: Alphabetic character only
X	Mask character: Any character (includes space and punctuation)
N	Mask character: Alphanumeric character
@	Literal symbol: The character that follows is a literal character, not a mask character or symbol
L	Case modifier: Force to lower case
U	Case modifier: Force to upper case
[]	List markers: Specify a list
!	List symbol: Signifies "NOT" in a list
-	List symbol: Separates lower and upper values of a range in a list
{ }	Option Markers: Specify an option

A mask character specifies the input that is allowed for a single character position in an input stream. The basic template for any individual mask character is nMc, where n is an optional repeat count, M is the mask character and c is an optional case modifier.

Repeat Count. A repeat count is an asterisk (*) followed by a number. It can precede A, N, X, #, or a list. The number indicates a series of character positions, all having the same mask specification. The following example illustrates how the repeat count might be entered.

*10A*5#

The mask specifies 10 alphabetic characters, followed by 5 numeric characters.

Mask Character. A mask character can be A, N, X, #, a literal character, or a list. A backslash must precede any literal character that would otherwise be interpreted as a mask character, symbol, or marker, such as A,X,#,[,], etc.

Lists. A list is a bracketed ([]) set of characters, any of which is acceptable for the single character position designated by the list. A range of characters can also be specified inside a list (i.e., [a-m]).

For example, an entry of A[3-6] on the input mask line means that the first character must be alphabetic and the second character must be any numeric digit from 3 through 6.

The ASCII value for each character is used to determine if it fits in a range. Because of this, a list can also include a range of symbols, such as [\$-~]. This example means that all characters with ASCII values falling between those of \$ and ~ are allowable.

NOTE: To make a symbol such as - or ! a valid literal character in the list, precede the symbol with a backslash.

A list can contain characters in various formats. The following table shows examples for lists.

Example	Valid Entries
[abcD]	a,b,c, or D
[\$@\-]	\$, @ or - (hyphen must be preceded by \ because it is a mask symbol in a list)
[a-t]	lowercase a through t
[-~]	space through tilde

Example	Valid Entries
[a-t!i!m!p]	lowercase a through t excepting i, m, and p
a-t!q-s]	a through t excepting q through s

Case Modifiers. Case modifiers are U to force upper case, and L to force lower case. They are optional. A case modifier must **follow** another mask specification character, such as A, N, X, or a list. For example, AU specifies one alpha character and forces it to upper case; UA will not give the same result.

Options. An option is a group of input characters specifying that if any character in the option is filled, all characters must be filled. An option marker ({ }) indicates a set of characters that, when begun, must be completed.

The following example of a phone number illustrates how these options might be used.

```
{(###)}###-####
```

The area code is optional, but if any character is entered in the first three positions, all three positions must be filled. You could use arrow keys to bypass the area code and begin entering data in the phone number.

Nesting or Repeating options also allows the creation of variable-length fields as illustrated in the following examples.

```
{au{au{au{au}}}}
```

or

```
*5 {au}
```

Each letter entered will be converted to uppercase. You can enter from one to five letters.

Some commonly used input masks are as follows:

Use	Field Type	Input Mask
Telephone number	Alphanumeric	{(###)}###-####

Use	Field Type	Input Mask
Social Security number	Alphanumeric	###-##-####
Zip Code (5 or 9 char)	Alphanumeric	{#####-#####}

Data Entry Message

Data entry message:

On this line, you can enter a data entry message (maximum of 100 characters) for your new field. Data entry messages are displayed as user prompts and/or reminders during data entry.

Default Equation for Field

Default equation for field:

On this line, you can enter a default equation (maximum of 255 characters) for your new field. The Database calculates this formula and inserts the result in the field whenever the cursor is moved to the field and finds it blank.

A field input mask does not affect data placed in a field by a default calculation.

When you are finished with the Field Definition Menu, press **F10** to exit the menu and record your selections.

Example Fields

For the donor database being used as an example in this discussion, the following data-file fields would be defined:

- An alpha field with the title [Donor #] and a width of 5.
- An inverted field with the title [Name] and a width of 25.
- An alpha field with the title [Address] and a width of 25
- An alpha field with the title [City] and a width of 15.
- An alpha field with the title [State] and a width of 2. This field also has an input mask of AUAU. This means two alphabetic characters will be forced to uppercase when displayed on the screen.
- An alpha field with the title [Zip] and a width of 10.

- An alpha field with the title [Phone #] and a width of 13. This field also has an input mask of (###)###-####. This means the parentheses for the area code and the dash will appear when the cursor moves to this field, and only numbers will be accepted as input.
- A numeric field with the title [Amount of Donation] and a width of 8. This field also has a display format of 2r\$. This means the number entered will have a precision of 2, be right justified, and be preceded by a dollar sign.

Figure 3-1 shows what a record in the new database might look like when design is completed and data entered.

Figure 3-1

The screenshot shows a window titled "Window 1" containing a record for a donor. The fields and their values are as follows:

Field Name	Value
Donor #	212
Name	Timothy Curtis
Address	321 Carlton Avenue
City	Jonesboro
State	AL
Zip	98564-8766
Phone #	(416)354-2342
Amount of Donation	\$150.00

Below the record, there is a menu bar with the following options: Menu: Data **File** Order Print Tools Window Help Remember Quit. The status bar at the bottom indicates: View: donor1.wv Window:1 Rec:1 (1) and a list of actions: Load Create Modify Save Unload Activate Display-Active Import Export Password.

Other Definition Elements

In addition to the items established within the Field Definition Menu, a number of other specifications can be created or modified with View Definition keywords.

Calculation for a Field

For any field, except a counter field, you can create a calculation that may reference other fields.

To create a calculation for a field, select the View Definition keywords Create Calculation. Then use the prompter to specify the field to contain the calculation.

Next, select Immediate, Wait, or Manual. If you select Immediate, the Database calculates the value of the field as soon as the cursor is placed at the field. If you select Wait, the Database performs the calculation and waits with the cursor in the calculated field until **Enter** is pressed. If you select Manual, the Database enters the calculated value into the field when the user presses **Alt F5**. The user can then accept or change this value.

When you edit an existing calculation (using the Edit Calculation command), an additional option, Same, is displayed with Immediate, Wait, and Manual. Selecting Same instructs ANGOSS to retain the current calculation type.

Once you've selected Immediate, Wait, Manual, or Same, the Formula Editor appears on the screen. Use the Formula Editor to enter a formula calculating the contents of your calculated field. You can press **F6** to see a list of available fields. This enables you to select fields from this prompter rather than typing them into your formula.

You can define calculations referencing fields from views outside the current view, as long as the external views are active.

Simple formulas can be established to add, subtract, multiply, and divide the data in your fields. For example, you might enter the formula [Price]+[Tax] in the field named [Total]. This would specify [Total] as a calculated field in which the sum of values in the [Price] and [Tax] fields is displayed. For information on more advanced formulas, refer to *ANGOSS Formula Reference*.

Specifying Fields in Database Formulas

In your formula, you can reference one or more fields by:

- Name (e.g., [Purchases_YTD])
- Number (e.g., [12])
- List (e.g., [Name;Address;City;State], meaning fields [Name], [Address], [City], and [State])
- Range (e.g., [Name|City], meaning fields [Name] through [City])
- External Reference (e.g., [Invoice.Name], meaning the field [Name] in the data-file Invoice, whether or not the view it appears on is the current view.

IMPORTANT: Fields can be referenced by number. Field numbers refer to the position of the field in the defined input order on the current view. However, it is preferable to use field names rather than field numbers when listing fields. Any change to the input order of the fields might cause field numbers to change. This could require time consuming editing of all field numbers in your list. If you use names, no changes are needed.

Menus

To increase the efficiency and integrity of data entry, you can use the Create Menu command to create bar option menus or pop-up menus containing choices that you have predefined. You can also create menus offering records from another data-file as menu choices.

To create a menu:

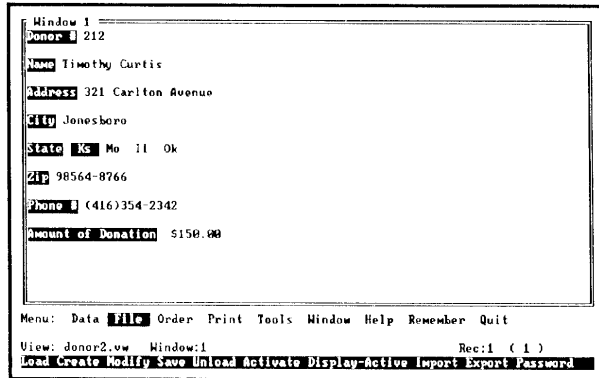
1. Select Create Menu.
2. When the prompter list of fields appears, specify the field to which the menu is to be attached.
3. Select the type of menu to be created: Bar, Popup, or Data-File.
4. Define the menu, as described in the discussion of the menu type.
5. Press **F10** to complete the definition.

Bar Menu Type

A bar option menu lists data entry choices for that field. When the cursor moves to the field during data entry, the user selects one of the bar options from the menu in lieu of typing in data. The option selected is entered into the field.

Figure 3-2 shows a custom view with a bar option menu at the field titled "state."

Figure 3-2. Bar option menu on [State]



Defining the Bar Menu. After you select Bar, define the menu by typing the choices, separated by spaces, in the bar menu area. Press **F4** if you want to resize the area.

NOTE: When you create a bar option menu, you must restrict the cumulative length of menu choices and spaces so they do not overlap another field. Up to 500 characters can be placed in a bar menu.

Popup Menu Type

A popup menu displays a larger list of options when the cursor is placed at the field position. Each option in the popup menu can be only as long as the field width. When the user selects an option, that item is entered into the field, the popup menu is removed from the screen, and the cursor moves to the next field. Up to 64 items can be placed in a popup menu.

Figure 3-3. Popup menu on [Amount of Donation]

Window 1
 Donor 212
 Name Timothy Curtis
 Address 321 Carlton Avenue
 City Jonesboro
 State AL
 Zip 9856
 Phone #
 Amount of Donation \$150.00

field [Amount of Donation]	
25	50
75	100
150	250
500	1000
5000	

F1 Help F3 Prev fld F5 Prev rec F7 Fld reform F9 Repeat fld
 F2 Date F4 Next fld F6 Next rec F8 Del line Esc Cmd Mode
 View: donor3.vw Window:1 Rec:1 (1)
 Add new records or update existing records

NOTE: A bar option menu created for a custom view will appear in popup menu format on the standard view.

Defining the Popup Menu. After you select Popup, define the menu by typing the choices, separated by semicolons, in the Popup Menu Editor.

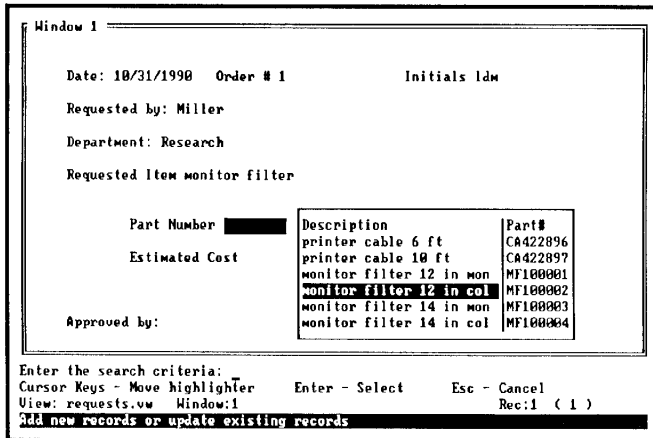
Data-File Menu Type

A Data-File menu is a type of popup menu that lists data from a data-file as items to be selected. The fields of data are displayed in Browse Mode format.

For example, you might define a data-file menu showing data from two fields: [Part#] and [Description], as shown in Figure 3-4. The menu is attached to the [Part Number] field on the view.

During data entry, the operator can use the combination of information provided by the fields to determine which item to select.

Figure 3-4



For example, the operator might use the information in either [Description] or [Part#] to make a selection. The value designated to be returned to [Part Number] from this menu is the value from the [Part#] field. Alternatively, you could define the menu to display the [Description] field without displaying the [Part#] field; the return field need not appear on the menu.

In contrast to the bar and popup menus, the data-file menu does not appear automatically during data entry. The operator can type data directly in the field, or can invoke the data-file menu by pressing **Alt F5**. To inform the operator that the menu is available, you may wish to define a data entry message (e.g., "Press Alt-F5 to invoke menu") for the field. Refer to the discussion of the Data Entry Message feature in the *Field Definition Menu* section of this chapter.

Attaching the Data-File. The data-file to be used by the menu must be attached to the current view, and the data-file's standard view must be available. The menu data-file cannot be the main data-file. If the data-file is attached to the view only for use by the menu, set Process Key Links on the Link Definition Menu to **no**; it is not necessary to define linking fields.

Defining the Data-File Menu. After you select the Data-File option, you are prompted to specify the name of the data-file containing the fields to be used.

You are then prompted to select the field (or fields) from which data is to be displayed on the menu.

After you select the display fields, you are prompted to specify the field from which data is to be returned. The return field need not be one of the display fields.

After you select the return field, define the location and size of the menu. The default size, represented by a box in the center of the screen, is based upon the fields selected to be displayed. Use the cursor movement keys to move or to resize the menu. **F3** toggles between moving and resizing modes.

Same Menu Type

An additional option, Same, is listed when you select Edit Menu instead of Create Menu. Select Same when you want to change the contents of the menu without inadvertently changing the menu type.

Field Rules

The Create Rule command can be used to specify a formula condition for a field called a "field rule." When data entered into the field conforms to the condition you set up, an action is produced. For example, if a data entry operator is entering data from a survey that has been conducted, you might want the cursor to jump to the part of the survey directed at married persons if a "Y" is entered in the [Married?] field.

Up to 2000 rules can be specified per field. Three different types of actions can be produced when the data entered in the field conforms to the rule you establish:

- An error message appears if an equation fails.
- Field color changes in a specified way.
- The cursor jumps to a specified field.

NOTE: If an error message appears the data entry operator can press **F10** or **Enter** and reenter information into the field. If a key is pressed to exit the field (e.g., **F3**), data that generated the error message is not retained.

Field Entry Order

You can specify the order in which fields will accept data by selecting the View Definition keyword Input-Order. The initial default order for entering data is the order in which fields were created or attached to the view.

When you execute Input-Order, the cursor moves to the first field in the view, and a menu of movement keys is displayed at the bottom of the screen. Press **F3** to move the cursor to the previous field, or **F4** to move the cursor to the next field.

COMMENT: The input order of your file should usually go from left to right and top to bottom for ease of data entry.

When the cursor reaches the field whose input order you want to change, remove the old number with **Del** or **F8** and enter the new position number. The input order of other fields will be adjusted automatically when you move the cursor off of that field. For example, if you assign a new input order of 1 to a field whose input order was 3, previous fields 1 and 2 are changed to 2 and 3 in the new input order.

Press **F6** to increment the current field by one in the new input order. Press **Alt R** to reorder the fields according to their position on the screen (top left to bottom right). Press **Alt O** to return to the original input order; the order before you selected the Input-Order command. When you are satisfied with the displayed input order, press **F10**. Press **Esc** to abort and retain the existing input order.

Creating a Box

View Definition keywords Create Box allow you to create boxes and lines to improve the display appearance of your view. For example, you might wish to emphasize the importance of a field or a message by enclosing it in a box.

Position the cursor where you want one of the corners of the box or one end of the line to be. Then select Create Box. A prompt appears asking whether you want a single or double line. Next you can specify an optional foreground color for the box or line. If you press **Enter** without entering a number, the default colors are selected.

Finally, move the cursor vertically and horizontally to outline the box or line that you desire. If you want to change the beginning point of your box or line, move the cursor to the new position and press **F2** to drop a new anchor. When the box or line is the size you want, press **Enter**. If you set an optional color, you cannot use Window Paint commands to change it. You must change it by executing File Modify and editing the box.

Creating a Note

The Create Note command allows you to specify permanent text messages to appear at a location of your choice on the view. Use them to display instructions, headings, remarks, or other information. Position the cursor in the area where you want the note to appear, and execute the Create Note command. You are first prompted to enter an optional color note text, or press **Enter** to accept default colors. If you set an optional color, you cannot use Window Paint commands to change it. You must change it by executing File Modify and editing the note. Then type in the text of your note.

NOTE: ANGOSS Database allows a maximum of 3200 notes, boxes, and lines per view.

Moving View Elements

You can move either a block area or a specific item from one location on the view to another. This allows you to easily reorganize the appearance of your screen. If you move a block, place the cursor on one corner of the block you wish to move before executing the Move Block command. If you wish to move a specific item, place the cursor on that item before executing the Move Item command.

Moving an Area of the View

To relocate a block area on the current view, execute the View Definition keywords Move Block. You are then prompted to move the cursor vertically and horizontally until the area to be moved is highlighted. You can reset the anchor position of your block any time by pressing **F2**. When the block is highlighted press **Enter**. The cursor keys are then used to relocate the block to its new location. Press **Enter** to complete the move.

IMPORTANT: If you mark a block to move, any item that is touched by the block will be moved. Use care in positioning the block to make sure you are not accidentally moving items.

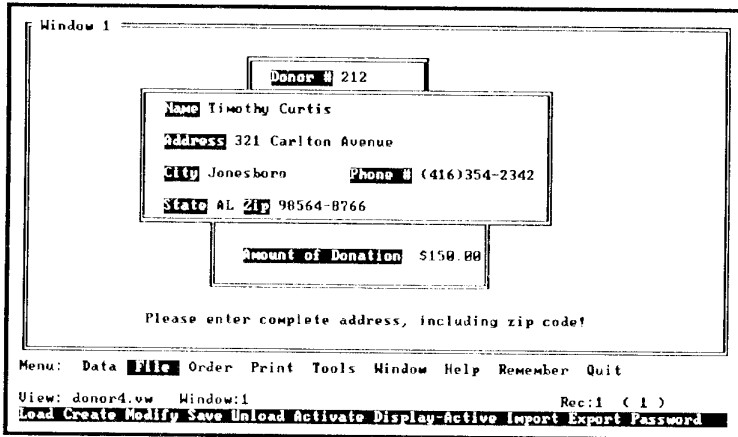
If you execute Move Block from within a table area, you will move the entire table area on the screen. The column order is preserved.

Moving An Item on the View

To move a specified item on the current view, execute the View Definition keywords Move Item. You then have a choice to move a box, a field, a note, or a table. If you want to move a box, line, text note, or field within a table, you must position your cursor on some part of that item before you execute Move Item. For some items, such as fields, a prompter list appears after you execute the Move Item command. The list shows the names of existing fields, data-files, etc., and asks you to pick the one you wish to move.

Figure 3-5 shows how the donor database might be given a more pleasing appearance by moving some elements and adding a few boxes.

Figure 3-5



Deleting View Elements

You can also delete a block area or a specific item, such as a field or table, from the current view.

Deleting an Area of the View

To delete all items within an area of the view, move the cursor to one corner of the area you wish to delete, and execute the View Definition keywords Delete Block. Then move the cursor horizontally and vertically to outline the area to be deleted. You can change the anchor position at any time by pressing **F2**. Press **Enter** to record this area. If the area includes more than one item, a verification prompt appears.

If one of the items in a block is a data-file field, you are asked if you want to delete the field from the data-file as well as from the current view. If you wish to remove this field from this view, but to still be in the data-file and available to other views attached to the data-file, choose "N". If you want the field deleted completely from the view and the data-file, select "Y".

IMPORTANT: If you mark a block to delete, any item that is touched by the block will be deleted. Use care in positioning the block to make sure you are not accidentally deleting items.

Deleting An Item of the View

To delete a specified item in the current view, execute the View Definition keywords Delete Item. You then have a choice to delete a box, calculation, data-file, field, menu, note, field rule, or table. If you want to delete a box, line, or a text note, you must position your cursor on some part of that item before you execute Delete Item. For some items, such as fields, a prompter list appears after you execute the Delete Item command. The list shows the names of existing fields, data-files, etc., and asks you to pick the one you wish to delete.

If the item you are deleting is a data-file field, you must specify if the field is to be deleted from the data-file. If you want to remove the field from the view only, select "View". Select "Data-File" to remove the field from the view and the data-file.

NOTE: Deleting a data-file detaches it from the view, but does not erase the file.

Modifying a View

After you have finished designing your view and have exited the View Definition Window, you can still make changes to your view using the File Modify commands. In the donor database example, it is decided the date each donation is made should also be recorded. This can be easily accomplished by modifying the database to add a date field.

After executing File Modify, you will be asked to type in the name of the view you want to change, or select it from the prompter that appears. The View Definition Window then appears, containing the selected view.

NOTE: If you wish to modify the view during the creation process, the Edit options described below are accessible within File Create. You do not have to exit File Create and select File Modify to execute the Edit options.

Table 3-8 shows the View Definition keywords used to edit items of a view. Each of these sets of keywords works much the same as their corresponding keyword in the creation process. For example,

Edit Field works the same as Create Field, only instead of creating a new field, you are asked which existing field you wish to edit.

Element to Edit	Corresponding View Definition Keywords
Field	Edit Field
Calculation in calculated field	Edit Calculation
Field menu	Edit Menu
Field rule	Edit Rule
Table	Edit Table
Box or Line	Edit Box
Note	Edit Note

When editing boxes, lines, or notes, the cursor must be positioned on that item before executing the appropriate Edit command. If you execute any of the other Edit commands, a prompter list of existing fields or tables appears. You must pick the field or table to edit, or the field whose menu or rule you wish to edit.

Once you have identified the element you wish to edit, most items behave much as they did in the Create mode. For example, if you execute Edit Rule, and select the field whose rule you wish to edit, the Rule Definition Menu is displayed. If you have defined multiple rules for this field, they will all be displayed. Make any necessary changes and then press **F10**.

Editing Fields

There are a few differences between creating fields and editing fields. When you select the field you wish to edit from the prompter list, a line appears with the cursor through the data region of that field. You can move the cursor horizontally to change the size of the field. This allows you to see how the new field size fits with the other fields on the screen.

The first line in the control area now displays a line containing the following information.

Lines: Cols:

As you adjust the size of the field, the column number reflects the size of the field. After sizing the field, press **Enter** and the Field Definition Menu will be displayed to allow editing to those settings.

There are some differences between the ways numeric and alpha fields can be edited.

Numeric fields. Any adjustments to the size of the field on the screen will be reflected in the `Field width` setting on the Field Definition Menu. Numeric fields can be only a single line and cannot wrap. Be sure to leave enough room in the field for any decimal points or other format characters.

Alpha fields. For alpha or inverted fields, the display width and storage width can be set independently. Any size changes you make on the screen will only affect the display width. When the Field Definition Menu appears, the field width setting will not have changed. If you wish to also change the storage width of the field, you must change the field width setting.

Alpha fields are also allowed to wrap to multiple lines. When you edit an alpha field, you can move the cursor vertically as well as horizontally when sizing the screen. When you create a multi-line field, it will only wrap to the edge of the current window. When you are editing, you can extend a multi-line field beyond the edge of the current window.

If the display width is larger than the storage width, you can enter only as many characters into the field as you have storage space. It will appear that you have more room to enter data on the screen, but you will not be able to continue.

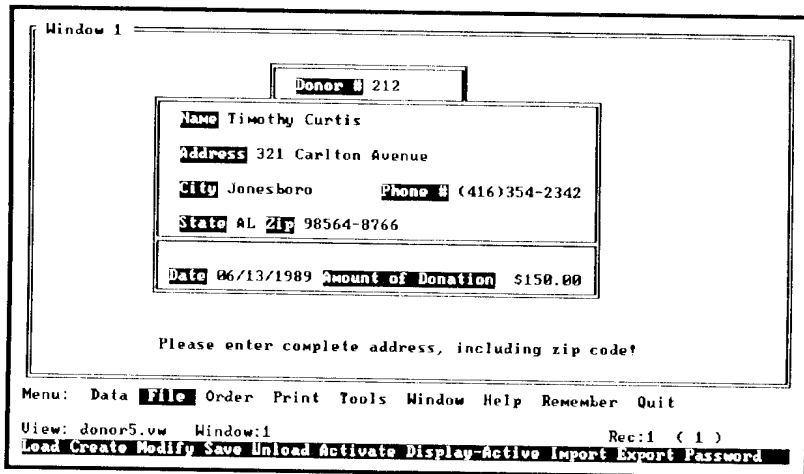
If the display width is smaller than the storage width, you can continue typing after the displayed field is full, until you reach the limit set in the storage width. Once the display limit is reached, the text will scroll within the field. If you try to exceed the storage limit of the field, the following error message will be generated.

Text exceeds maximum field width. Truncate text? (y/n)

You have the option of going back and deleting some of your entry to make room for more text, or allowing the Database to truncate the entry at the current position. If you continue to enter text after receiving this message, the text will be lost when you press **Enter**.

Figure 3-6 shows the donor database with the new date field.

Figure 3-6



Creating Views for an Existing Data-File

Views can also be created for existing data-files. This allows you to view information in the data-file in a number of different ways. There are several methods that can be used to create a view for an existing data-file, depending on how the view will be used.

File Create Similar

Let's return to the donor database for an example of how a view created with the File Create Similar command might be useful. Assume a worker at the local charity wanted to gather some demographic information about all donations, such as where the donations were coming from. She might need to see the amount of a donation, and the zip code area the donor lived in. To gather this demographic information, it is not necessary for her to see the names, addresses, and phone numbers of the donors.

A view could be created that would be attached to the donor data-file, but displaying only the fields [Donor #], [Zip code], and [Amount of Donation]. This would provide the security of limiting

access to donor names and addresses. It also makes the worker's job easier by removing unnecessary information from the view.

The View

The File Create Similar command creates a view with the identical structure of the view you specify as a template. It is also attached to the same data-file as the template view.

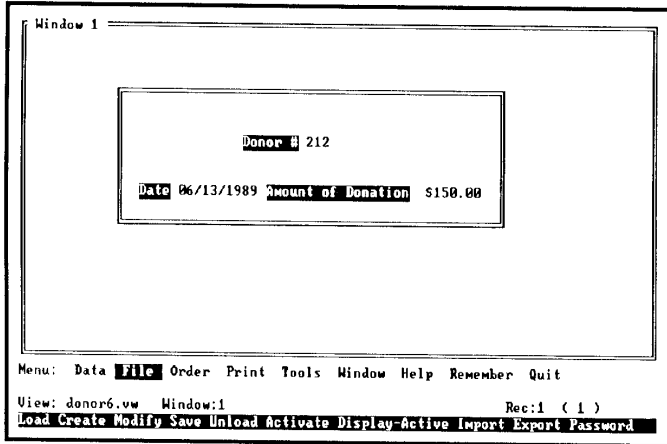
In the donor database example, you would want to make an exact copy of the donor view. You could then remove any unneeded fields from the new view. The new view will also be attached to the donor data-file, so the information in certain fields of that data-file can be seen through it.

Begin creating the second view by executing the File Create command. Then give the new view you are creating a name. Select the Similar option. You are then asked whether you want a custom-view or a standard-view to serve as a template. After selecting one of these options, a prompter list of existing views will appear. Select the view you wish to copy and decide if you wish to attach a password to the new view.

A copy of the template view then appears in the View Definition window. You can delete fields, move items, and create boxes or notes. Any changes you make to the view will only be reflected on the new view, not the template view. However, if you delete items, change the storage widths of alpha fields, or make other changes that affect the data-file, they will have an impact on both views. Remember, both views are attached to the same data-file.

When the new view is finished, press **F10** to complete the creation process. You can now view data in the fields you selected from the donor data-file. Figure 3-7 shows what the new view might look like.

Figure 3-7



Replicating Structures

There may also be occasions that you would like to create a view and a data-file with the exact structure of another view and data-file, but you do not want them connected to the old data-file. This can be done by replicating the structure of the data-file and creating a view for it.

The local charity can again provide a use for this type of file. Assume the charity is conducting a special fund-raising drive. You want to keep all records about donations to this special fund separate from the other donor database. However, you will be keeping the exact same information on these donors that you do on all other donors. After the special drive is over, you will want to combine these donors into the main donor database.

Creating the View

Replicating a data-file makes an exact copy of the structure of the data-file you use as a template, but then detaches the original data-file so that you have a separate place to store data from the new view.

Begin the process by executing the File Create command. Name the new view. Select the Similar option and decide if you want to password protect the new view. The View Definition Window then appears.

Replicating a Data-File

Select the View Definition keywords Replicate Data-File. A prompter list of data-files attached to the new view then appears. Select the data-file you wish to replicate and then enter a name for the (new) replicated data-file. You then choose whether the replicated file will be fixed or variable-length, or password protected.

The program then creates an empty data-file with a record structure matching the original. Replicating only copies the structure of the data-file, not any data in the data-file. The original data-file is then automatically detached from the view, leaving only the new data-file attached.

Now you have an exact copy of the donor database in which to enter information about donations to the special fund. At the end of the special drive, the Data Utilities Append command can be used to add the information in the special fund database to the donor database. Data Utilities Append is discussed in *Chapter 9*.

Replicating a Field

You can also use the Replicate keyword to replicate a field in a view. This can be a great time saver. If you have a field that has a complicated definition, instead of going through the Field Definition Menu to set it up more than once, the field can be replicated. This makes an exact copy of the field structure.

First, position your cursor at the location for the new field. Then execute the View Definition keywords Replicate Field. Prompts follow to specify the field to replicate and to enter a name for the new field.

NOTE: You do not have to use the Replicate Data-File command prior to using the Replicate Field command. Replicating a data-file and replicating a field are independent.

Viewing Multiple Data-Files

ANGOSS Database allows you to create relational views, which are views that show fields from several data-files together in one view record. This gives you the flexibility and security of dividing your data between a number of data-files. However, you also have the convenience of creating views that allow input or viewing of data in several data-files as if they were in one data-file.

For increased security and flexibility, you might want to set up the donor database as two separate data-files, one containing the donor number, names, addresses, and phone numbers of each donor, and the other containing the donor number, date, and amount of each donation. Each data-file could be created separately using the steps discussed previously under *Creating a Database*. Each data file would have its own custom view. Then an additional view could be created that would allow you to enter information into, or view data from, both files simultaneously.

Begin creating the new view that will combine fields from both data-files by executing File Create. Name the new view and select the New option. Then decide if you wish to attach a password to this view. The View Definition Window then appears.

You will not be creating a data-file for this view as in previous examples. Since the data-files containing the fields you wish to display already exist, they must be attached to the new view.

Figure 3-8

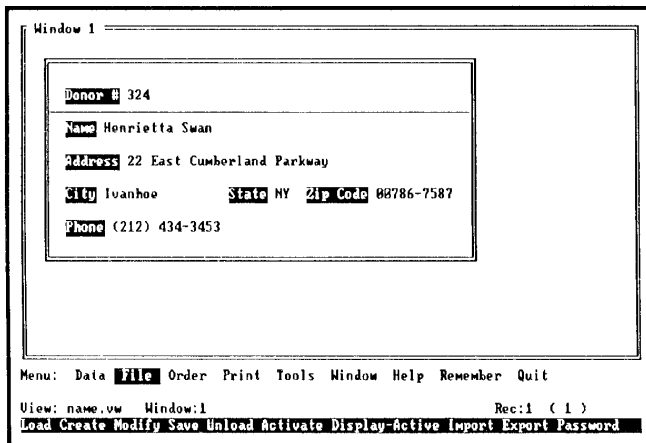
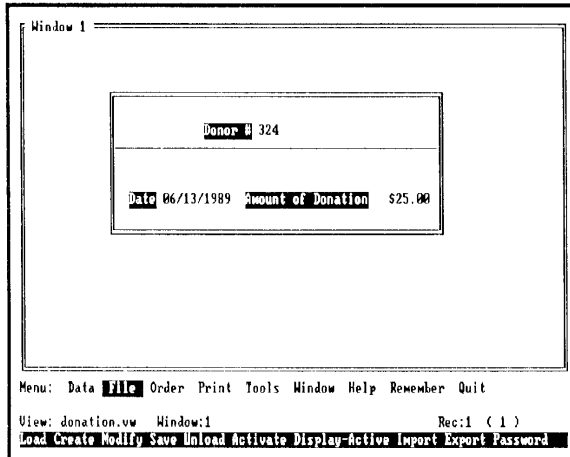


Figure 3-9



Attaching a Data-File

Select the View Definition keywords Attach Data-File. A prompter listing all currently existing data-files is then displayed. Move the pointer to the data-file you wish to attach to your view and press **Enter**. The view and data-file are now attached.

For the new view in the example, Attach Data-File would be executed twice, to attach both the Name.db data-file and the Donation.db data-file.

Once the data-files have been attached, you must decide which fields from each data-file you want to appear on the view.

Attaching Fields

Use the View Definition keywords Attach Field to attach fields from attached data-files to the current view. A prompter appears showing fields in each data-file. When more than one data-file is attached, you can use **F3** and **F4** to see prompter lists for each attached data-file. You can see the previous view by pressing **F3** and see the next view by pressing **F4**.

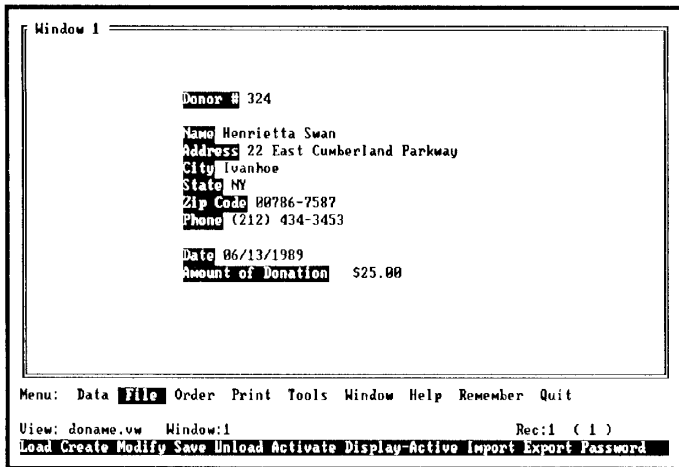
You can move the pointer and press **F6** to select a field, or type the name of the field directly. That field will then be placed at the current cursor position on the view. Attach Fields must be executed

for each field you wish to attach to the view. You can then move the fields on the view and add any boxes or notes you desire.

NOTE: Fields can only be attached from data-files that were created with, or attached to, the view.

For our example, we will attach all fields in both data-files to the new view. Figure 3-10 shows what the new view might look like.

Figure 3-10



Linking Multiple Files

If you attach more than one data-file to a view, you must "link" fields in the various data-files before you can exit the View Definition Window. This is done by establishing a link definition with the View Definition keywords Edit Links.

A display link uses specified "link fields" to tie two or more data-files together so their corresponding records can be viewed simultaneously. The linked fields must contain data items common to both linked data-files. They must also be the same data field type and width.

Advanced users may want to edit the data-file names to change the order that files are processed, change which file is the driver, or substitute a one data-file with another identical data-file.

The substitution process will 'detach' one data-file and 'attach' another. All fields remain intact. You may not substitute a file that you have modified during the current session and the data-file being substituted must be of an identical layout.

Advanced application developers can calculate the location and file name. See the reference section for more details.

NOTE: The ability to substitute a data file and calculate a path are new as of v2.52.

Figure 3-11

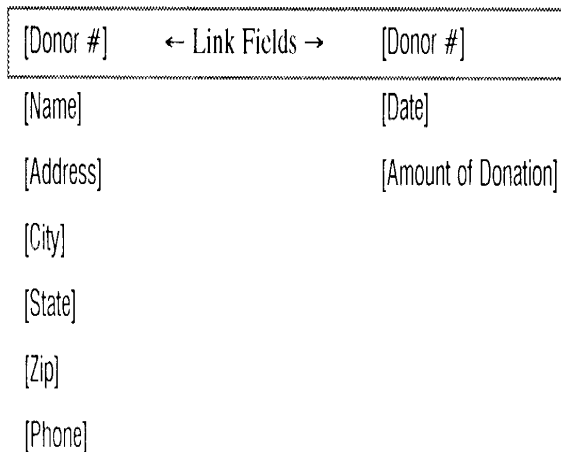


Figure 3-11 shows the fields in the Name.db and Donation.db data-files and identifies the link field they have in common. Since the data in the field [Donor #] is the same for both data-files, it can be used as a link. For every record with a specific donor number in Donation.db, there is a corresponding record in Name.db that has the same donor number.

Link Definition

The View Link Definition Menu asks you to specify a "main"(driver) data-file and a "driven" data-file. Careful consideration must be given to what information you want in your new view and how it is related. This will determine which should be the "main"(driver) and "driven" data-files and fields.

Remember in *Chapter 2* we talked about analyzing the relationships between data-files. As a rule of thumb, the "driver" is the first file; "driven" refers to the second file.

Type	Driver and Driven Definitions
One-to-One	One" is the driver. The other "One" is driven
One-to-Many	One" is the driver. The "Many" side is driven
Many-to-One	The "Many" side is the driver. "One" is driven
Many-to-Many	Break this association down into two one-to-many or many-to-one associations, related through an intermediary view. Define the simpler links in the intermediary view

Link Field

You must also specify the `Field in driven data-file to link to:` and `Driver fields on view to link from:`. Press **F6** to see the available fields from the appropriate data-file. This is where you select the fields that contain data both data-files have in common.

NOTE: The linked field should be attached to the view from the "main" data-file. If it was attached from the driven data file, you will get an error message stating both link fields must be from different data-files. The driver link field must appear on the view.

When you establish a link, you are defining a key; therefore, you can choose a major and several minor keys to help define the search the link will conduct. Keys will be discussed further in *Chapter 4*.

Other Definition Selections

There are two other selections on the View Link Definition Menu. The first determines what will happen to linked data if a record in the main data-file is deleted. Deleting records and this selection will be discussed further in *Chapter 4*.

The second selection asks whether you wish to process links. The only time you would say **No** to this is if there is a problem with the Link Definition and you need to exit the Link without abandoning the choices you have already made. For example, if the width of the link fields you select is not identical,

you will receive an error message when you press **F10** to complete the definition. You must edit one or both fields to make the width the same. If you press **Esc** to exit the definition, you will lose any selections you have already made. If you set `Process Key Links?` to **No**, you can press **F10**, leave the definition, edit the fields, and return to the definition to pick up where you left off.

Example Definition

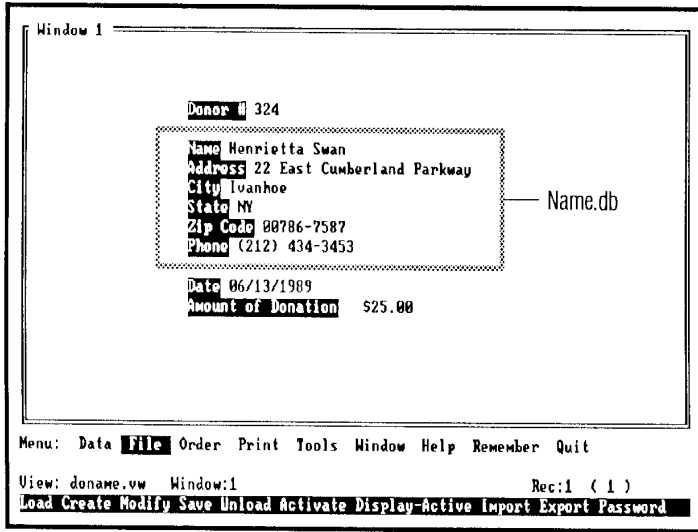
In the Link Definition for the example view, `Donation.db` is the "main" data-file, and `Name.db` the driven data-file. This means that when you look at the records in the new view `ANGOSS Database` will take a record from the "main" data-file and then search the driven data-file for a match in the link field. In this case, for each donation in `Donation.db`, a search will be conducted in `Name.db` for a record that has the same data (number) in the `[Donor #]` field. If it finds a match, these two records will be used to display data in the view. Obviously, only data in those fields you attached to the view will be displayed.

NOTE: If you wish to link more than two data-files, you must specify a pair of linked fields for each additional linked data-file.

Viewing Data

Figure 3-12 shows a view record from the newly created view. Data from `Name.db` is highlighted; the remaining data is from `Donation.db`. The field `[Donor #]` is a field both data-files have in common.

Figure 3-12



Entering Data

You can also enter data into this view. As you enter information into the view record, the data will be stored in the appropriate data-file. The name, address, and phone number will be stored in Name.db and the date and amount of donation is stored in Donation.db. The Donor number is stored in both data-files.

NOTE: If you create a field and more than one data-file is attached to the view, a prompter list will appear, asking you to specify in which data-file you want to place the field.

For simplicity, the steps given for creating a view for multiple data-files assume that you are using existing data-files and the Attach Data-File and Attach Field commands. It is possible, however, to create the view, data-files, and fields all in one session. Use the Create Data-File and Create Field commands instead.

Creating a Table

The view just created allowed you to see information about one particular donation. What if you want to see all the donations made by a particular donor? The most convenient way to display this information is in a table.

As mentioned in the previous chapter, a table is an area of a view that displays multiple records in columnar format. The defined area cannot be less than 4 lines or more than 19 lines. Up to 126 tables can be inserted into a view. A table can reference fields from one data-file only.

When you display a view having a table, you can scroll through the table area to see additional records. Use Data Goto Table to make the table available; then use the cursor movement keys to scroll. Return to normal view display by selecting Data Goto View.

The fields that are displayed in a table are from a data-file attached to the current view. One field in the table's data-file must correspond to a field in the view in order to link the records. The linking field need not be one of the fields displayed in the table.

Table Relationships

Tables are normally used with files having a "one-to-many" relationship. That is, one record in the first file may be related to many records in the second file.

For the donor database example, we will again be using Name.db and Donation.db data-files. This time, instead of creating a new view, we are modifying the custom view created with the Name.db to add a table that will display information from the Donation.db.

The field [Donor #] will again be the link field. Every time a record in Name.db with a particular donor number is displayed, a search is conducted of Donation.db and all donation records that have the same donor number will be displayed in the table.

Name.db is the "one" side, and Donation.db is the "many" side of this "one to many" relationship. The fields from the "one" side of the relationship will appear on the view. Fields from the "many" side will be displayed in the table. One of the fields on the "one" side must be the field that will be linked to the "many" (or table) data-file. In this case that field is [Donor #].

Begin by executing the command File Modify. Specify Custom-View and select the view to which you wish to add a table. This should be the view that comprises the "one" side of the relationship. Then execute the View Definition keywords Attach Data-File to attach the data-file that comprises the "many" side of the relationship. Move the cursor to the position in the view that is to be the upper-left corner of the table area. From the View Definition Menu, execute Create Table and specify a table name. Move the cursor down to the line that is to be the bottom of the table area and press **Enter**. The Table Definition Menu appears.

Table Definition Menu

The Table Definition Menu allows you to define the format for your table. If you elect to use Table Titles, field names will be used as headings at the top of each column. If the field name is wider than the field itself, the display of the title will be truncated. If you choose not to use Table Titles, no headings will be shown.

If you choose to use Table Column Separators, a vertical line will be displayed between the columns. If you choose not to use the separators, the columns are displayed without separating lines.

In addition, the Table Definition Menu allows you to define colors for the table itself and for the table cursor. The background colors are the colors of the table area and cursor. The foreground colors are the colors to be used for displayed characters.

When you have completed your Table Definition Menu selections, press **F10**. A rectangle, empty except for the table cursor, is displayed on the screen. Any commands you execute while in "table creation mode" affect the table, not the view itself. As long as you are in the table creation mode the **F10 Exit Table** will appear at the bottom right-hand corner of the display.

The following commands cannot be used in "table creation mode:"

- Create Box and Edit Box
- Create Note and Edit Note
- Create Table

Attaching Fields

Specify fields for the table by selecting Attach Field. A prompter list of available fields is displayed for your convenience. As you attach each field, the table area expands.

If multiple data-files are attached to the view, use **F3** and **F4** to find the data-file containing the fields you want in the table. Remember, all fields in a table must be from the same data-file.

Press **F10** to complete the table definition and return to the view.

Table Functions

Fields in a table can be used in calculated fields outside the table area, if you wish, by using the Table SDb functions. For example, if you had a table listing all donations a donor had made during the year, you could find his total donation using TABLESUM. Create a field called [Total] on the view (outside the table) and attach a calculation to it. You would want to find the sum of amounts in the table field [Amount of Donation]. The formula entered in [Total] would be TABLESUM([Amount of Donation]). Refer to *ANGOSS Formula Reference* for more information on using Table SDb functions.

Link Definition

Before leaving the View Definition Window, you must specify the linking fields by executing the Edit Links command. Set `Process Key Links?` to **Yes**. The driven field is from the "many" or table file. The driver field is from the "one" or main data-file and must be present on the view.

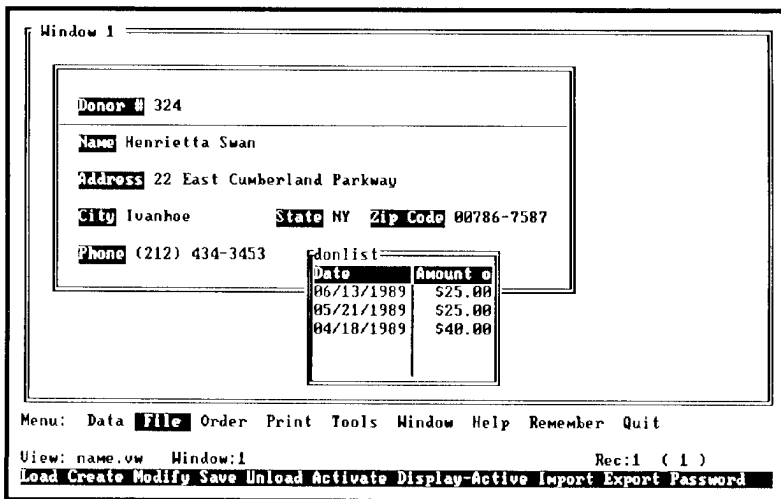
When you have finished defining the view, press **F10**.

Example Definition

In our example, the fields [Date] and [Amount of Donation] are attached to the table. In the Link Definition, Name.db is the "main" data-file and Donation.db is the driven data-file. [Donor #] is the field selected from both the driven data-file and the Driver field on the view.

Figure 3-13 shows what a view record including a table might look like.

Figure 3-13. View containing a table



NOTE: For simplicity, the steps given for creating a table assume that you are using existing data-files and the Attach Data-File and Attach Field commands. It is possible, however, to create the view, data-files, fields, and the table all in one session. Use the Create Data-File and Create Field commands instead.

Practice

In this session, you will be able to practice creating views, data-files, fields, tables, boxes, rules and notes. You will create two views with their corresponding data-files, and then link them with a table.

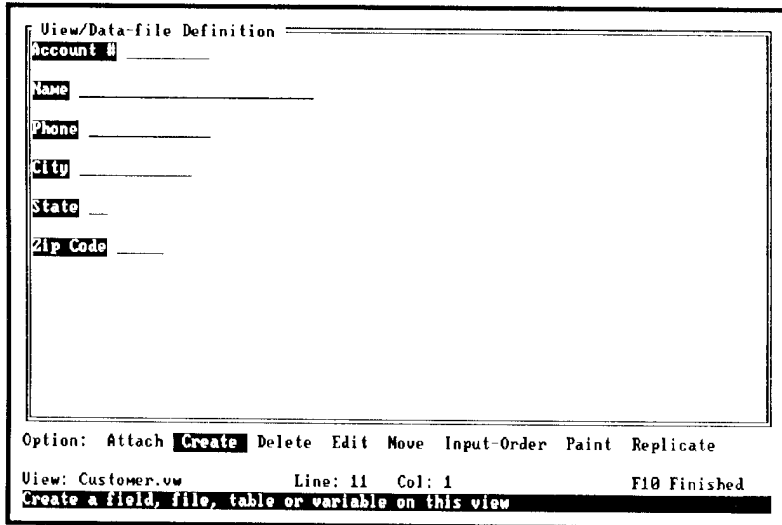
1. Begin by creating a custom view named "Customer".
 - Execute **File Create**.
 - Enter the name **Customer** when prompted for the name of your new view.
 - Select the **New** option to create this view from scratch.
 - Select the **No-password** option to decline password protection for this view.
2. The View Definition Window now appears. Next, you must create the data-file in which the data entered into this view will be stored.
 - Execute the View Definition keywords **Create Data-file**.
 - Enter the name **Customer** when prompted for the name of your new data-file.
 - Select the **Fixed-length** option to designate fixed-length format for the records in this data-file.
 - Select the **No-password** option to decline password protection for this view.
3. Now that you have established a view and a data-file, it is time to define and place your fields.
 - Position the cursor at the top left corner of the View Definition Window and execute the View Definition keywords **Create Field**. Enter the name **Account #** at the prompt for the field name. Select the Data-File option. On the Field Definition Menu, make this field an alpha field with a width of nine (9). Press **F10** to complete field definition.
 - Move the cursor down two lines and execute Create Field. Enter the name **Name** at the prompt for the field name. Select the Data-File option. On the Field Definition Menu, make this an inverted field with a width of 25. Say Yes to Extended Field Options. Give this field a Special field attribute of Mandatory Entry. Press **F10** to complete field definition.
 - Move the cursor down two lines and execute Create Field. Enter the name **Phone** at the prompt for the field name. Select the Data-File option. On the Field Definition Menu, make this an alpha field with a width of 13. Say Yes to Extended Field Options. Give this field an input mask of **(###)###-####**. Also set up a data entry

message to be displayed whenever the cursor enters this field. Enter the message **Be sure to enter area code**. Press **F10** to complete field definition.

- Move the cursor down two lines and execute Create Field. Enter the name **City** at the prompt for the field name. Select the Data-File option. On the Field Definition Menu, make this an alpha field with a width of 12. Press **F10** to complete field definition.
- Move the cursor down two lines and execute Create Field. Enter the name **State** at the prompt for the field name. Select the Data-File option. On the Field Definition Menu, make this an alpha field with a width of 2. Say Yes to Extended Field Options. Set the Automatic advance on full field to Yes. Set an input mask for this field of AUAU. This will allow two alpha characters to be entered and forced to uppercase. Press **F10** to complete field definition.
- Move the cursor down two lines before executing Create Field. Enter the name **Zip** at the prompt for the field name. Select the Data-File option. On the Field Definition Menu, make this an alpha field with a width of 5. Say Yes to Extended Field Options. At the prompt `View field Name:` enter **Zip Code**. The field name Zip Code will be displayed on the screen, while the name Zip will be stored in the data-file. Press **F10** to complete the definition.

Your View Definition Window should now look like figure 3-14.

Figure 3-14



4. Now use some of the View Definition keywords to change the appearance of your view and add some additional restrictions to your fields.
 - Position your cursor on the letter A in [Account #]. Execute the View Definition keywords Move Block. Move the cursor down to the letter Z in [Zip]. Then move the cursor to the right until the box encloses all fields. Press **Enter**. Now use the cursor keys to move the block until the cursor is at line 5 column 15. Press **Enter** again. Your View should now look like Figure 3-15.

Figure 3-15

View/Data-file Definition

Account # _____

Name _____

Phone _____

City _____

State _____

Zip Code _____

Option: Attach Create Delete Edit **Move** Input-Order Paint Replicate

View: Customer.vw Line: 5 Col: 15 F10 Finished

Move an item or group of items on the view

- Now change the order in which data is entered into the fields. Execute the View Definition keyword Input-Order. Change the number following [Account #] from one (1) to a two (2) by deleting the (1) and then typing in a (2). Use the cursor keys to move off of the [Account #] field. Notice the number two (2) after [Name] automatically changes to a one (1). Press **F10** to finish changing Input-Order.
5. Complete definition of the Customer view by pressing **F10**. Then unload the view and data-file by executing the command File Unload All.
 6. Now create a second custom view named "Invoice".
 - Execute **File Create**.
 - Enter the name **Invoice** when prompted for the name of your new view.
 - Select the **New** option to create this view from scratch.
 - Select the **No-password** option to decline password protection for this view.
 7. The View Definition Window now appears. Next, you must create the data-file in which the data entered into this view will be stored.

- Execute the View Definition keywords **Create Data-File**.
 - Enter the name **Invoice** when prompted for the name of your new data-file.
 - Select the **Fixed-length** option to designate fixed-length format for records in this data-file.
 - Select the **No-password** option to decline password protection for this view.
8. Now that you have established a view and a data-file, it is time to define and place your fields.
- Position the cursor at line 5 column 13 and execute Create Field. Enter the name **Invoice #** at the prompt for a field name. Select the Data-File option. On the Field Definition Menu, make this field a counter field with a width of 4. Press **F10** to complete the definition.
 - Move the cursor to line 5 column 29 and execute Create Field. Enter the name **Account #** at the prompt for field name. Select the Data-File option. On the Field Definition Menu, make this field an alpha field with a width of 9. Say Yes to Extended Field Options. Give this field the Special field attribute of Mandatory Entry. Press **F10** to complete the definition.
 - Move the cursor to line 9 column 13 and execute Create Field. Enter the name **Product #** at the prompt for field name. Select the Data-File option. On the Field Definition Menu, make this an alpha field with a width of 8. Say Yes to Extended Field Options. Give this field an input mask of A*7#. This means the first character must be alpha and the remaining seven characters must be numbers. Press **F10** to complete the definition.
 - Move the cursor to line 9 column 33 and execute Create Field. Enter the name **Quantity** at the prompt for field name. Select the Data-File option. On the Field Definition Menu, make this a numeric field with a width of 7. Press **F10** to complete field definition. On this same field, use the View Definition keywords Create Rule to specify that entry of any number less than 10 into [Quantity] causes the cursor to jump back to the [Account #]. When you execute Create Rule, a prompter appears listing all available fields. Select [Quantity] to create a rule for that field. On the Rule Definition Menu, select the rule type Jump. At the Rule Equation selection, enter <10. With the pointer at the Enter the name of the field to jump to: selection, press **F6** to see a list of available fields. Move the pointer to [Account #], and press **Enter**. Press **F10** to complete Rule definition.
 - Move the cursor to line 13 column 30 and execute Create Field. Enter the name **Total** at the prompt for field name. Select the Data-File option. On the Field Definition Menu, make this a numeric field with a width of 13. Say **Yes** to Extended Options.

Assign a display format of 2r\$ to this field also. Press **F10** to complete field definition. Set a calculation for this field using the View Definition keywords Create Calculation. A prompter list of available fields appears. Select [Total] from the list. Give the calculation Wait status. When the Formula Editor appears, press **F6** to see a list of available fields. Move the pointer to [Quantity] and press **Enter**. Type an asterisk (*). Press **F6** again and select [Unit Price]. You now have a calculation which multiplies the amount in [Quantity] by the amount in [Unit Price] and places the result in [Total]. Press **F10** to complete the calculation definition.

9. Now enhance the appearance of the view by putting a double line box around all the fields. Move the cursor to line 3 column 10 and execute the View Definition keywords Create Box Double. Type in the number of the color of your choice, and then press **Enter**. Move the cursor down to line 15 column
10. Then move the cursor to the right until the box completely surrounds the fields. Press **Enter**.
11. Move the cursor to line 17 column 15. Use the View Definition keywords Create Note to add a message to the view. Type in the number of the color of your choice and press **Enter**. Type in the following message: **Do not create invoice for quantities less than 10**. Press **F10** to complete definition.
12. Press **F10** again to complete defining this view. Figure 3-16 shows what your view should look like.

Figure 3-16

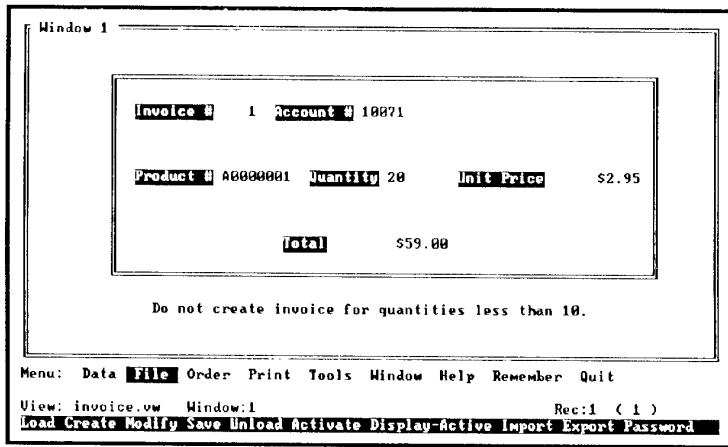


Figure 3-16

13. Unload the view using the command File Unload All.

The next section will involve creating a Table on one of the views to display data from the other data-file.

14. Select the keywords File Modify Custom-View to edit a view and add a table. Select the view named Customer from the prompter list of available views.
15. Select the View Definition keyword Attach Data-File and select the Invoice data-file to be attached to the Customer view.
16. Move the cursor to line 9 column 40. Select the View Definition keywords Create Table. Name the Table **custinv**. Move the cursor to line 18 column 40 and press **Enter**. The View Table Options Menu will appear. Since no changes need to be made to the default settings, press **F10** and a rectangle marking the table will appear on the screen.
17. Use the View Definition keywords Attach Field to see a list of available fields. Select [Invoice #]. You will see the field title appear in the Table. Continue selecting Attach Field to select [Quantity], [Unit Price] and [Total]. Press **F10** to exit the Table definition.
18. Next select the View Definition keywords Edit Links to establish a link between the two data-files. The View Link Definition Menu will appear. Make Customer the Main data-file and Invoice the Driven data-file. Set the Delete Status to No, Process Links to Yes. The

system has already made these choices for you in this case, but these settings could be edited if necessary. Move the pointer to `Field` in driven data-file to link to: . Press **F6** to see a list of fields in the Invoice data-file. Since [Account #] is the field both data-files have in common, select it. Move the pointer to `Driver` fields on view to link from: . Again press **F6** and select [Account #]. Press **F10** to exit the Link definition.

Your view should look like the one in Figure 3-17.

Figure 3-17

View/Data-file Definition

Account # _____

Name _____

Phone _____

City _____

State _____

Zip Code _____

Invo	Quantit	Unit Price	Total
custino			

Option: Attach Create Delete **Edit** Move Input-Order Paint Replicate

View: customer.vw Line: 9 Col: 40 F10 Finished

Edit an existing item on the view or the link structures

19. Select the View Definition keywords `Edit Field` to change the width of [City]. Select [City] from the prompter list of available fields. Move the cursor 5 places to the right to increase the width of the field to 17. Press **Enter** and the Field Definition will be displayed. Since this is an alpha field, you must also change the setting for Field Width to 17 on the menu. Press **F10** to complete definition.
20. Press **F10** again to complete the modification of this view.

The field you chose to be the link field in step 17 must be a key field. To accomplish this,

Chapter 3: Creating a Database

the Key Definition menu appears when you leave the definition. Press **F10** to accept the default settings.

21. Execute File Unload All to end this exercise.

Chapter 4: Entering and Viewing Data

The previous chapter explained how to create the structure of a database. This chapter explains how to enter and view the data in your database. Topics covered include:

- how to access your files for data entry
- how to enter new records and update existing records
- how to enter various types of data
- how to remove your files from memory
- how to display records in normal view mode
- how to display records in "browse" mode
- how to find individual records
- how to delete records

Accessing a Database

If you have just created a view and its associated data-files, you can leave the View Definition Window and return to Command Mode. The newly created files remain in memory and the view is displayed in the Data Window. The new view is ready to accept data through Enter/Update Mode.

IMPORTANT: A view and its data-files must be in memory before any data can be entered.

Loading a View

If the view that you want to use is not in memory, execute the File Load command, indicate whether you want to load the custom view or the standard view, and specify the view name. The view and its associated data-files will be loaded into memory and the view will be displayed in the Data Window.

Loading a View Exclusively

When using ANGOSS Database with a network driver, you can load a view exclusively. This prevents other users from loading the view while you hold it exclusively. (If you are in single user mode

on a network, you cannot load a view unless the view can be loaded exclusively. You cannot share files with other users while in single user mode.)

To load a view exclusively, in ANGOSS:

1. From Command Mode, press **Alt X**, which displays the last executed command in the Control Area.
2. Select **F8** to clear the last command from the Control Area.
3. Type the File Load exclusive command, using one of the following formats:
File Load Custom-View "viewname" exclusive
File Load Standard-View "viewname" exclusive

If someone else is currently using any of the data-files attached to the view, an error message is generated and you are not allowed to load the view.

Loading a file exclusive improves performance by making all key buffers exclusively available to you on that file for operations such as browse, find, and update.

Activating a View

The File Activate command also loads a view and associated data-files into memory. If the current window is empty when the command is executed, the view will be displayed. If another view is already present in the current window, the files will be accessible but not displayed.

When you have more than one view loaded in memory, you can change the view displayed in the current window by executing the Data Goto View command and specifying the view to be displayed. The Quick Key for Data Goto is **F4**.

Displaying Active Views

To display a list of views and files that are currently in memory, execute File Display-Active. A screen called "Index of Open Data Files" appears showing:

- the names of all views in memory
- the names of all data-files associated with the active views
- the current record order of single file views, and the current record order of the main data-file of multi-file views

Figure 4-1. Index of Open Data Files

View	File	Order	Records
c:\smarti\files\invoice.vw	Invoice	Physical	8
c:\smarti\files\customer.vw	Customer	acctidx	3
	Invoice		8

Enter any key to continue

View: customer.vw Index: acctidx Window:1 Rec:1 (2)

Display a summary of all currently active views

To remove the Index of Open Data Files from the screen and return to the Data Window, press any key.

Entering and Updating Data

With the view displayed in the window in Command Mode, you can begin entering data in either of two ways: with the Data Enter command or with the **Esc** key (mouse users can click the right mouse button).

Data Enter

You can select the command Data Enter, which puts ANGOSS in Enter/Update Mode with the cursor positioned in the first field on the view. If records already exist, Data Enter positions the cursor at the end of the file, in the field following the last record entered. In effect, the cursor has moved to a new "blank" record that is ready to accept input. Because the command automatically positions the cursor for a new record, you will normally use Data Enter for entering new records.

The Escape Key

You can also press **Esc** from Command Mode (or click the right mouse button). **Esc** puts ANGOSS in Enter/Update Mode but positions the cursor in the first field of the record currently displayed. Thus, **Esc** is normally used for revising the data in an existing record, once the record has been located. You can, however, press **Esc**, move the cursor through the remaining records until a "blank" record is displayed, and then begin entering new records, if you prefer.

As a rule though, you will probably use Data Enter to enter new records, and **Esc** to update existing records.

Moving the Cursor

When ANGOSS is in Enter/Update Mode, a number of keys are available to help you move the cursor within a field, from one field to another, and from one record to another.

Moving Within a Field

The keys in the following table can be used to move the cursor through data within a field. Note that mouse users can simply click the right mouse button on the desired location.

Key	Action
left arrow	Moves left one character
right arrow	Moves right one character
Tab	Moves 5 characters to the right
Shift Tab	Moves 5 characters to the left
Ctrl right arrow	Moves to the rightmost edge of data
Ctrl left arrow	Moves to the first character in the field

Moving from Field to Field

The keys shown can be used to move the cursor from one field to another during an Enter/Update session in either a custom view or a standard view. Note that mouse users can simply click the right mouse button on the desired field.

Key	Action
Enter	Moves to next field
up arrow	Moves up to previous field within a record
down arrow	Moves down to next field within a record
F3	Moves to previous field within a record
F4	Moves to next field within a record
Ctrl Home	Moves to first field in a record
Ctrl End	Moves to last field in a record

Moving from Record to Record

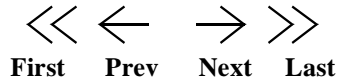
The keys shown can be used to move from one record to another in Enter/Update Mode.

Key	Action
F5	Moves to previous record
F6	Moves to next record
Enter	Moves to the next record if the cursor is in the last field of a record.

Chapter 4: Entering and Viewing Data

If you are entering data in a standard view, which is displayed in columnar format, you may want to use **up arrow** and **down arrow** to move from one record to another.

If the mouse is active, the top right-hand corner of the window border area displays four movement control buttons:



A single click on one of these buttons produces the following action:

First - Go to the first record or page up in browse mode

Prev - Go to the previous record

Next - Go to the next record

Last - Go to the last record or page down in browse mode

Note: Like Scroll Bars, this feature is only active when the window border is turned on.

Using Editing Keys

The following keys can be used to help you enter or edit data in your records. Several of these keys can assist you in correcting typographical errors.

Key	Action
Ins	Toggles Insert Mode ON or OFF. Insert ON causes data to be moved to the right as new characters are entered. Insert OFF causes new characters to overwrite existing characters in the field.
Del	Deletes the character at the current cursor position. Other characters shift to the left

Key	Action
F7	Reformats a multi-line field so that a word is not broken at the end of a line
F8	Deletes all characters on the current line of a field
Alt T	Accesses the Field Text Editor and calculator
Ctrl F8	Deletes the current record while in a table.

Entering Data

To enter new data into a field, move the cursor to the field and enter data that is appropriate to the field type. If you make a mistake, you can use the editing keys (such as **Backspace**) to make the correction. To remove all of the characters from a field so that you can begin again, press **F8**.

When you have finished entering the data, select **F10** (or **Enter** on a single-line field). The cursor advances to the next field.

COMMENT: If the field definition specifies automatic advance, the cursor will move to the next field automatically when the current field is full. If the view consists of more than one screen, the next page will be displayed as soon as you enter data into or move the cursor past the last field on the screen. If the cursor is in the last field of a record when you select **F10** or **Enter**, ANGOSS displays the next record.

NOTE: In ANGOSS, keys are maintained dynamically. That is, when you add a new record or change the data in a key field while the view is in key order, ANGOSS repositions the new or revised record before displaying the next record. Thus, the next (or previous) record before the data was entered or changed may differ from the next (or previous) record after the entry is made.

Entering Numbers and Text

The two basic types of data that you can enter are numeric characters and alphanumeric characters. Numeric characters are numbers and a few symbols such as the decimal point and the minus sign. Alphanumeric characters are all keyboard characters, e.g., letters, numbers, brackets, and punctuation symbols.

The type of data that you can enter is controlled by whether the field was designed to be numeric or alphanumeric. You can enter numeric data in an alphanumeric field, but if you try to enter a letter (for example) in a numeric field, the character will not be accepted.

In addition, input may be further controlled through the use of an input mask. An input mask, which is part of a field definition, is used to restrict input to specific characters or groups of characters. An input mask can also be used to pre-enter characters in a field (e.g., parentheses and a hyphen in a telephone number field).

Numeric Fields

You can enter a numeric value consisting of as many numbers as will fit within the width of the field. ANGOSS will display the value represented to 15 significant digits. If necessary, ANGOSS will display the value you entered in scientific notation.

The following examples assume that the field has a defined width of 15 characters and has been formatted to display two decimal places.

Value Entered	Value Displayed
100	100.00
123456789012345	1.23E+14

Alphanumeric Fields

You can enter as many characters in an alphanumeric field as the highlighted data entry area of the field will allow. The amount of data that is stored, however, is controlled by a setting in the field's definition, which is independent of the width of the field on the screen. If the displayed width is larger than the storage width, some of the characters that you enter may be lost.

Alphanumeric fields accept any keyboard character.

Examples:

ABC Company

MC-70700975

11905 West 166th Terrace

William "Bill" Jones

IMPORTANT: In the last example, double quotation marks (") were used. Many file formats use these marks to indicate alphanumeric text. Although the Database accepts quotation marks as valid field input characters, their use could cause problems if you import or export data.

Multi-line Fields

Alphanumeric fields can be defined to allow you to enter multiple lines of characters. In most cases, whole words will wrap to the next line automatically. Press **F7** to force the lines to end between words if necessary. Press **Enter** to force the cursor to move to the next line. Press **F10** to complete the entry in a multi-line field.

Figure 4-2. View with Multi-line Field, [Notes]

```

Window 1
Donor 212
Name Timothy Curtis
Address 321 Carlton Avenue
City Jonesboro
State AL
Zip 98564-8766
Phone (416)354-2342
Amount of Donation $150.00
Notes Has been donating 3 years. Is
      particularly interested in
      ecological issues.

F1 Help F3 Prev fld F5 Prev rec F7 Fld reform F9 Repeat fld
F2 Date F4 Next fld F6 Next rec F8 Del line Esc Cwd Mode
View: donor1.vw Window:1 Rec:1 ( 1 )
Add new records or update existing records
  
```

Field Text Editor

Select **Alt T** to access the Field Text Editor, which is similar to the Tools Text Editor. The Field Text Editor provides a full screen in which you can enter data. When you select **F10**, the data is inserted into the field and the cursor advances to the next field.

You can use the Field Text Editor with either numeric or alphanumeric fields, but the feature is particularly useful when you want to enter a numeric value that you need to calculate first. Move the cursor to the appropriate field and select **Alt T**.

When the Field Text Editor appears, enter the formula that calculates the needed result, e.g., $144 * 5$. Select **F5** to calculate the result, which is displayed in the Control Area. Select **F8** to delete the formula, and then select **Ctrl C** to write the calculated result on the first line of the Field Text Editor. When you select **F10**, the result is entered in the field and the cursor advances to the next field.

Entering Dates

Dates can be entered in an alphanumeric format, such as September 19, 1990, or in a numeric format, such as 09/19/1990. In either case, the month-day-year order that you should use is determined by the Date Style setting in the Global Preferences menu. The date will be displayed in the field according to the Date2 format in the same menu, unless the field was specifically designed to use another format.

Example:

August 14, 1843

August 10, 1990

08/10/1990

08-10-1990

08-10-90

08-14-1843

To enter the current system date into a field, select **F2**.

NOTE: An input mask, which controls the characters that you can enter, can be defined for a date field. The input mask and the format used to display the date should be compatible. If a conflict exists between the mask and the display format, ANGOSS uses the mask when data is initially entered into the field, but ignores the mask if the data is edited, thereby permitting free-form input of revised data.

Entering Time

Time can be entered in either 12-hour or 24-hour notation. For 12-hour style, the overall format is **hh:mm:ss** for AM and **hh:mm:ssP** for PM. (AM is assumed if you omit the P.) For 24-hour style, the overall format is **hh:mm:ss**. If seconds or minutes are not needed, they can be omitted.

Examples:

3p

3a or 3

4:15p

4:15 or 4:15a

17:00 or 17

17:00:45

A time entry will be displayed according to the Time format in the Global Preferences menu, unless the field was specifically designed to use a different format.

To enter the current system time into a field, select **Alt F2**.

Repeating Entries

Sometimes you will find that the data you are entering in a field is exactly the same information you entered in the same field of the record previously accessed. For example, if you are entering the details of sales transactions, several consecutive records may contain the same invoice number. Rather than retyping the same number again and again, you can repeat the entry by selecting **F9**.

NOTE: Repeated data is taken from the last accessed record, which may not be the physically previous record.

Counter Fields

A counter field is a field containing a numeric value assigned automatically by the Database program. You do not enter anything in a counter field.

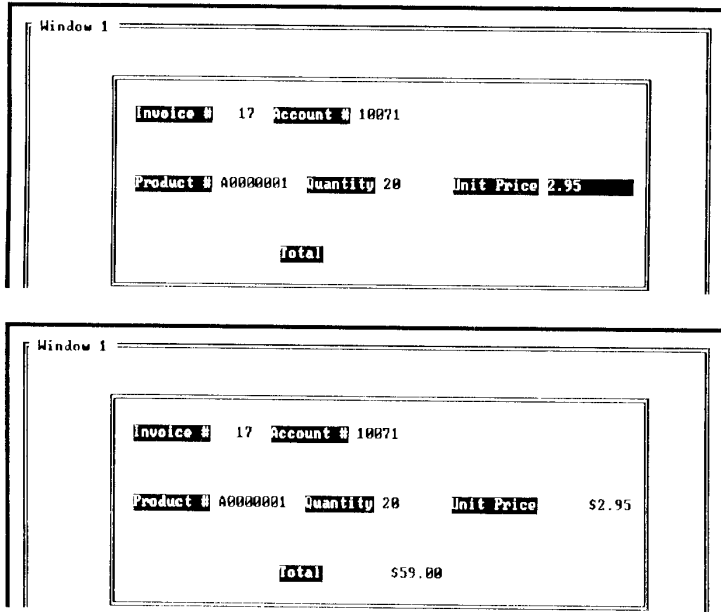
A counter can be reset through the Data Utilities Change-Count command.

Calculated Fields

Another type of field that you do not have to enter data into is a calculated field. For example, a field called [Total] might calculate its input from values that you enter in the fields [Quantity] and [Unit Price].

Depending upon how the field is defined, the calculation may occur "immediately" as the cursor crosses the calculated field to the next field, or after you invoke calculation by selecting **Alt F5**. If the cursor moves to a calculated field, you have the option of accepting the result or entering an overriding amount.

Figure 4-3. [Total] Field Before and After Calculation



Menu Fields

A menu field provides a list (or menu) of valid entries from which to select. There are three types of menu: the bar menu, the popup menu, and the data-file menu.

Bar Menu. The selection items on a bar option menu are visible on the view. When you move the cursor to a bar menu field, the cursor becomes a highlighter.

To select an item from a bar menu, use **Spacebar** and **Backspace** to position the highlighter over your choice. When you press **Enter**, your selection is inserted in the field. Alternatively, you can type the first letter of the item you want to select. (For this method to be effective, each item should begin with a different letter.) Mouse users can simply single click on the item.

If the record is not a new record, the highlighter is positioned on the current selection.

Popup Menu. The selection items from a popup menu are not visible on the view, but are presented on a prompter that appears when you move the cursor to the field.

To select an item from a popup menu, use **Spacebar**, **Backspace**, or the cursor movement keys to position the pointer next to your choice. When you press **Enter**, the popup menu is dismissed and your selection is inserted in the field on the view. Mouse users can simply double click on the item.

If the record is not a new record, the pointer is positioned next to the current selection.

Data-File Menu. A data-file menu is a type of popup menu that presents records from another data-file as choices. The data-file was attached to the view as part of the menu definition process.

The data-file menu does not appear automatically when you move the cursor to the field on the view. Therefore, you can type an entry directly in the field, if you prefer.

To invoke the data-file menu, select **Alt F5**. When the menu appears, the fields are displayed in Browse Mode format. To choose an item from the menu, use the cursor movement keys or mouse to highlight a field on the row you want to select and press **Enter**.

COMMENT: Select **Alt R** to change the order to physical order.

Alternatively, if the field highlighted on the menu is a key field, you can begin typing (in the Control Area) the entry you want to find. After you type a character, the order of the menu changes to key order. The characters you type are used in a **case sensitive** key search. The highlighter then moves to the row most nearly matching the search characters.

When you press **Enter**, the menu is dismissed and the data returned, as a result of your selection, is inserted in the field on the view.

NOTE: The data returned is controlled by the menu definition and may differ from the data you select. For example, the menu might list data from one field, [Description], but return data from another field, [Part #].

To exit the menu without making a selection, press **Esc** (or click the right mouse button). The cursor remains on the current field until you press a cursor movement key.

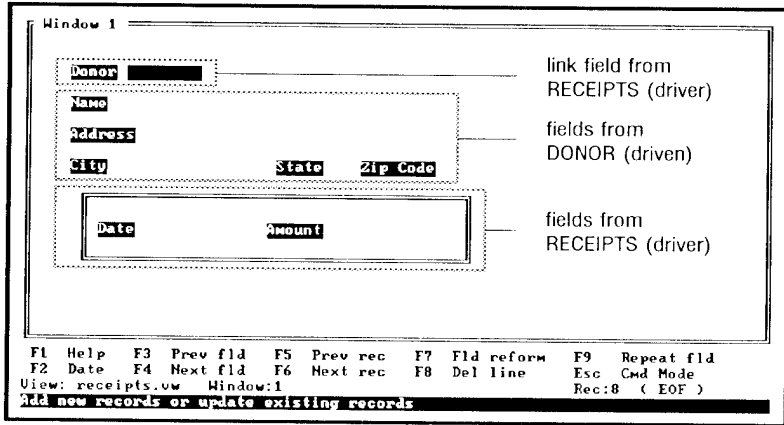
NOTE: Both active and inactive records are shown in the menu.

Data Entry in Multi-File Views

One of the best features of a relational database is that even though you may have a number of separate files containing records, you can use a view to pull the records together as if they all came from the same file. This ability to link files is available not only for viewing records but for entering and revising records as well.

When the view linking two data-files was created, a link field from each data-file was selected. Link fields are fields containing information that two data-files have in common. One of the data-files is designated the "driver" data-file; the other is the "driven" data-file.

Figure 4-4



When you enter data into a link field on the view (i.e., [donor#] in **receipts**), the driven data-file is searched for a matching entry. If a match is found in [donor#] in **donor**, the fields from **donor** (i.e., [name], [address], [city], [state], and [zip]) are displayed in the view. If no match is found, nothing is displayed.

Figure 4-5. Data for Donor 102

```

Window 1
Donor 102
Name Muffy Van Cleef
Address 8 Bridgeport Road
City Shawnee      State KS Zip Code 66216

Date      Amount

F1 Help  F3 Prev fld  F5 Prev rec  F7 Fld reform  F9 Repeat fld
F2 Date  F4 Next fld  F6 Next rec  F8 Del line   Esc Cmd Mode
View: receipts.vw Window:1      Rec:8 ( 8 )
Add new records or update existing records
    
```

If you change the data entered in the link field ([donor#]), different data from the **donor** data-file may be displayed in the view.

Figure 4-6. Data for Donor 103

```

Window 1
Donor 103
Name Punky Tremaine
Address 10 Bridgeport Road
City Shawnee      State KS Zip Code 66216

Date      Amount

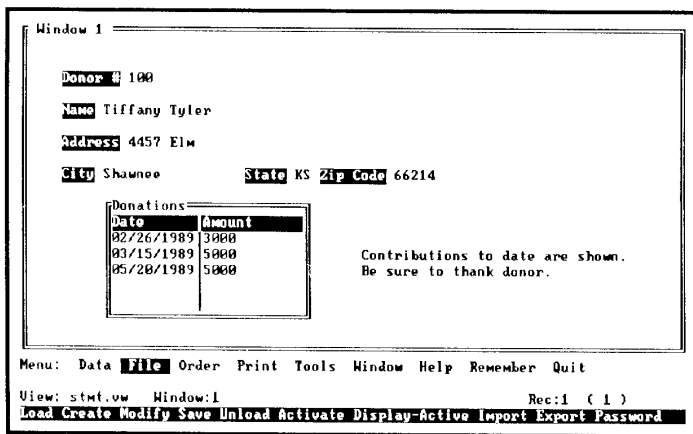
F1 Help  F3 Prev fld  F5 Prev rec  F7 Fld reform  F9 Repeat fld
F2 Date  F4 Next fld  F6 Next rec  F8 Del line   Esc Cmd Mode
View: receipts.vw Window:1      Rec:9 ( 9 )
Add new records or update existing records
    
```

If you change the data entered in the link field ([donor#]) and no match is found (in [donor#]), the view will display [name], [address], [city], [state], and [zip] as blank fields.

Entering Table Records

Some multi-file views contain tables, which are rectangular areas used for displaying multiple records. Enter data into fields in a table in the same way that you would enter data outside the table area. Press **Enter** to move to the next field. Select **F10** to leave the table area.

Figure 4-7. View with Table Showing Donations



If you need to move the cursor within a table for editing purposes, use **up arrow** and **down arrow** to scroll from one line to another. Use **F3** and **F4** to move from one column to another. Mouse users can select the movement buttons at the top right of the table.

NOTE: If the cursor is in the first column of any line within a table when you select **F3**, the cursor will be moved to the previous field **outside** the table. Likewise, if you select **F4** while in the last column of any line, the cursor will advance to the next field outside the table.

If you want to blank a field in a table, select **F8**. If you want to delete the current table record (i.e., line), select **Ctrl F8**. A deleted table record will not be displayed in the table area.

Keep in mind that, for data from the driven data-file to be displayed, the data in the two link fields must match. If you enter a new record in a table (that already contains records), and you then

change the data entered in the link field, the old table records will not be displayed: they are associated with the old link data. The new table record is saved in the driven data-file with the new link data.

Exiting Enter/Update Mode

To complete a session of entering data, press **Esc**, or the right mouse button, to return to Command Mode. **Esc** toggles between Command Mode and Enter/Update Mode.

In ANGOSS Database, a record is saved as soon as you move to the next record. Therefore, to avoid losing part of the data entered in a record, it is important to move off of the last record entered or changed before you press **Esc**. If you do press **Esc** while the cursor is in a record that contains new or revised data, you will be asked if you want to save the current changes to the record. If you answer no, the data will not be saved; if you answer yes, ANGOSS will save the current changes.

NOTE: If you escape while the cursor is still in a field that has just received new or changed data, the new data in the field is abandoned and any previous data is restored; ANGOSS remains in Enter/Update Mode. If you escape again, you may be asked about saving the current changes.

To exit Enter/Update Mode immediately (automatically saving changes), select **Ctrl Enter**.

Saving and Unloading Files

Although new and revised records are saved while you are still in Enter/Update Mode, some internal file information may not be completely updated at that time, particularly if you are in a single user environment. Both File Save and File Unload update and save all the necessary information. File Save leaves the view in memory;

File Unload removes the view from memory. In a single user environment, it is advisable to execute File Save when you leave Enter/Update Mode to manipulate your data from Command Mode, or to execute File Unload if you leave Enter/Update Mode and do not plan to use the files for awhile.

If you enter a lot of records during a data entry session, it is also a good idea to escape periodically and execute File Save. This could prevent the loss of important file information in the event of power failure.

Viewing Data

At some point after data has been entered into the database, you will want to view the records in one form or another. You may want to browse through records or locate one specific record.

To look at records in Command Mode (where there is no danger of changing data accidentally), you must first load or activate the view.

Physical and Logical Record Numbers

Each record in a database is assigned a physical record number, and may also be associated with various logical record numbers. "Physical record number" represents the order in which a record was entered into a database and normally does not change. "Logical record number" represents a record's apparent location in relation to other records in the database.

To illustrate, suppose that you typed the following list of items in the order shown.

nails

wrench

hammer

The physical order is (1) nails, (2) wrench, (3) hammer.

Now suppose that you mentally alphabetize the list. Without actually changing the physical order, the apparent relative (alphabetized) order of the items is hammer, nails, wrench. That is, logical record number 1 is "hammer," logical record number 2 is "nails," and logical record number 3 is "wrench."

The following table lists the items with their logical and physical record numbers.

Item	Logical Record Number	Physical Record Number
hammer	1	(3)
nails	2	(1)
wrench	3	(2)

You can learn more about rearranging records into different logical orders in *Chapter 5: Managing a Database*. For now, keep in mind that the logical and physical record numbers for the current record are displayed on the Status Line. This can help you keep track of where you are as you move from one record to another in your view.

Moving from Record to Record

To move from one record to another in a custom view in Command Mode, use the following keys.

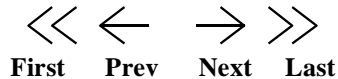
Key	Custom View Action
F5	Moves the cursor to the previous record in the view
F6	Moves the cursor to the next record in the view
Ctrl Home	Moves the cursor to the first record in the view
Ctrl End	Moves the cursor to the last record in the view

To move from one record to another in the standard view, use the following keys.

Key	Standard View Action
up arrow	Moves the cursor up one line in the view. You can also use F5
down arrow	Moves the cursor down one line in the view. You can also use F6
right arrow	Moves the cursor one column to the right
left arrow	Moves the cursor one column to the left
Ctrl Home	Moves the cursor to the first record in the view
Ctrl End	Moves the cursor to the last record in the view

Key	Standard View Action
Home	Moves the cursor to the record at the top of the screen
End	Moves the cursor to the record at the bottom of the screen
PgUp	Moves the cursor up one screen
PgDn	Moves the cursor down one screen

As in update mode, if the mouse is active, the top right-hand corner of the window border area displays four movement control buttons:



A single click on one of these buttons produces the following action:

First - Go to the first record or page up in browse mode

Prev - Go to the previous record

Next - Go to the next record

Last - Go to the last record or page down in browse mode

Note: Like Scroll Bars, this feature is only active when the window border is turned on.

Moving through a Database

Besides moving through records with the cursor movement keys, you may also need to move to specific areas by means of the Data Goto command.

The Quick Key for Data Goto is **F4**.

Going to a Page. Some views may consist of multiple pages. If ANGOSS is in Enter/Update Mode, the view scrolls automatically to the next page. In Command Mode, execute Data Goto Page and choose to go either to the next page or the previous page. Mouse users can also change pages with the scroll bars.

Going to a Record. If you want to go to a particular record number, select Data Goto Record-Number and enter the number of the record you want to move to. If the view is in index order, the number you enter should be the logical record number. If the view is not in index order, the number is assumed to be the physical record number.

You can also go to the next record or the previous record.

Going to a Table. In Enter/Update Mode, the cursor moves to a table area and scrolls automatically as you enter new data. In Command Mode, you must use Data Goto Table if you want to see additional table records that are present but not displayed in the table. Specify the name of the table to go to. Use the cursor movement keys to scroll through the table area. Exit the table by executing Data Goto View.

Going to a View. If you have more than one view active, use Data Goto View to put another view in the current window. This command also lets you leave a table and return to normal view display. You are prompted for the name of the view.

Data Goto View makes another view the current view but does not deactivate any files.

Going to a Window. If you have split the screen into multiple windows, execute Data Goto Window and specify the number of the window you want to go to. The number is on the upper left border of the window. Mouse users can simply click on the desired window.

Browsing Data

Regardless of the design and layout you have chosen for a custom view, you can choose to look at records in a columnar format (similar to the standard view format) called "Browse Mode." Figure 4-8 shows records displayed in Browse Mode.

To display records in Browse Mode, execute Data Browse. If you want to see all fields, select the All option. To see only certain fields, select the Fields option. A prompter list of fields appears, allowing you to choose the fields you want to see.

In normal Browse Mode, the fields are displayed in columns as wide as the defined field width. In compressed Browse Mode, the display of fields wider than 14 characters is truncated. Selecting **Alt F4** toggles between normal and compressed Browse Modes.

Figure 4-8

part num	Quantity	Manufacturer	Standing	Phone
A2000001	10000	ACME Widgets	23232322	(848)474-8488
T1112111	50000	ABC Plumbing Fixtures	83737373	(827)262-6262
G2020202	2500	Waterworks	99994949	(987)927-9492
T4321432	4000	Underhill Plastics	90394209	(236)426-4287
L6667777	35000	Yates Manufacturing	64646466	(654)614-3646
H2343321	300	Hartley Steel	87837728	(312)334-3213
I9897557	2000	Gopert Chemicals	88898998	(714)632-6178
R2264353	500	Bateman Plastics	89534345	(431)432-4432
H1121223	732	Hibing Electronics	77673241	(212)654-7567
T3332336	800	Cardinal Manufacturing	99909009	(413)987-8768
Q5552321	75	Evanston Glass	11211120	(615)333-2323
E4454097	370	Gantry Products, Inc.	22029209	(615)323-4323

Menu: **Data** File Order Print Tools Window Help Remember Quit

View: invtry.vw Window:1 Rec:1 (1)

Browse Cross-Tabs Delete Enter Find Goto Query Relate Send Transact Utilities

Cursor Movement

In Browse Mode, the highlighter indicates the current record. Use **up arrow** and **down arrow** to move to the previous or next record. Use **Home** or **End** to move to the first or last record on the screen. Use **Ctrl Home** or **Ctrl End** to move to the first or last record in the view. **PgUp** and **PgDn** move the display one screen height at a time. **right arrow** and **left arrow** move one field at a time. **Ctrl right arrow** and **Ctrl left arrow** move one screen width at a time. Mouse users can click on fields, use the scroll bar, or click on the control buttons at the top left of the screen.

To exit Browse Mode and return to normal custom view display, execute Data Browse Off.

Finding Data Records

Suppose that you want to see a particular record in an invoice file. You know that the invoice number is A10067.

Now suppose you don't remember the invoice number, but you do know that one of the items listed was for a quantity over 200.

Or, suppose that you are looking for another invoice that lists a screw driver. You don't remember what kind of screw driver.

The Data Find command searches one or more fields (of the same field type) for a data item you specify. You control the selection criteria and the type of search performed.

Selection Options

When you execute Data Find, first choose the field or fields that are to be searched. The following selection options are then presented.

Equal. Select the Equal option when you want to find data that exactly matches the data item you specify. Use Equal to find either numeric or alphanumeric data. You would use the Equal option to locate the record with the specific invoice number A10067 in the field [Invoice#].

Greater-Than. Select the Greater-Than option to search for either numeric or alphanumeric data that is greater than the specified search item. You would use the Greater-Than option to locate the record or records having a value greater than 200 in the field [Quantity].

Less-Than. Select the Less-Than option to search for numeric or alphanumeric data that is less than the specified search item.

Partial. Select the Partial option when you know only part of the data you want to find. You enter, as the search item, the sequence of characters that you know. For example, you would use the Partial option to search the [Description] field for the words **screw driver**. The search might yield "Phillips head screw driver" or "Standard screw driver" or any other record containing the characters "screw driver."

NOTE: Partial is valid only for alpha or inverted data.

Search Type Options

After you choose a Selection option and specify the search data, the following Search Type options appear.

Select	When you want to
B for Backward	search from the current record backwards toward the beginning of the view
F for Forward	search from the current record forward toward the end of the view
G for Global	search the entire view, from beginning to end, without regard to the location of the current record
I for Ignore Case	search without regard to upper and lower case
W for Whole Words Only	search for occurrences as complete words only, not as word fragments. For example, using this option to locate the characters "John" would find "John Smith" but not "Mark Johnson."

If the data is found, the record is displayed, and a prompt in the Control Area notifies you which field contains the entry. The prompt also asks if you want to continue the search. If you choose to continue, the next occurrence is displayed or the prompt notifies you that there are no more occurrences.

To interrupt a search in progress, press **Ctrl Z**. To continue the search, select **Alt R**.

Optimizing the Search

You may be able to make the search more efficient by using options that optimize the search procedure. The most efficient search will be performed if:

- you search a key field in the main data-file, and
- you are ordered to that key, and
- you use the Global option, and
- you do not use the Ignore Case and Whole Word options.

If, under these conditions, you use the Equal option and an exact match is not found, the Database displays the record containing data most similar to the search data.

Deleting Records

Suppose that you have an employee database that you use to compute the payroll each week. The employee data-file contains information about each employee, such as name, Social Security number, and the number of exemptions claimed. If an employee leaves your firm, you still need to keep information about the employee for tax reporting purposes, but you want to discontinue issuing paychecks. In other words, you need to keep but deactivate the former employee's record.

The Data Delete command deactivates a record without actually removing the record from the data-file. More precisely, Data Delete is a toggle command that switches the status of a record (the current record) between active and inactive.

When the current record is inactive, the letters `Del` are shown on the far right edge of the Status Line.

NOTE: Records can also be deleted or activated by query. Refer to the *Performing Actions* and *Deleting Duplicate Records* sections in *Chapter 5* of this manual.

Data Delete has two options: Record and Table-Record. In general, the Record option affects a view record; the Table-Record option affects a single line from a table area.

Deleting from One Data-File

If you want to deactivate (delete) or activate a record from a view attached to a single data-file, put the record in the current window and select Data Delete Record.

Deleting from Linked Data-Files

When deleting or activating a record from a view attached to multiple data-files, you may need to know whether the deletion of records from the driven data-file is tied to the main data-file. The `Delete status tied to main data-file` option is set to either **yes** or **no** in the Edit Links menu.

Delete Status Option Set to Yes. If the delete status is tied to the main data-file, Data Delete Record affects records in both data-files. If the cursor is either in a view that has a table or within a table on a view when the command is executed, all entries in the table on the view disappear or reappear. Data Delete Table-Record (valid only within a table) causes one entry to disappear from the table; the main data-file is not affected, but the record in the table's data-file is marked deleted.

Delete Status Option Set to No. If the delete status of the driven data-file is not tied to the main data-file, only the main data-file is affected by Data Delete Record, regardless of whether the cursor is inside or outside of a table. Data Delete Table-Record causes one entry to

disappear from the table; the main data-file is not affected, but the record in the table's data file is marked deleted.

NOTE: Data Delete Record toggles between deleting and activating a record. Data Delete Table-Record does not reactivate a record.

To actually remove deactivated records, unload the view and execute Data Utilities Purge.

Practice

In this session, you will enter data and then display that data in Browse Mode. You will also edit and delete the records you have entered.

1. Begin by executing File Load Custom-view and selecting the Invoice view to be loaded. Then execute File Activate Custom-view and select the Customer view to activate it.
2. Display a list of active views and data-files by executing File Display-Active. After looking at the list, press any key to return the Invoice view to the screen.
3. Select Data Enter to begin entering the following records into this view.

NOTE: The [Invoice #] field will automatically be filled by a counter number, and the [Total] field will automatically be filled by the result of the attached calculation. After you have seen the result in the [Total] field, press **Enter** to move to the next record.

Account #	Product #	Quantity	Unit Price
10071	A0000001	20	2.95
10056	T1112111	85	6.56
10056	G2020202	15	7.95
10067	T4321432	50	5.95
10071	L6667777	75	4.95
10071	Q9879879	12	29.95
10067	R9006521	150	9.99

4. When you have finished entering records, press **Esc** to return to Command Mode. You can look at the records you have entered by selecting **F5** to go to a previous record, and **F6** to go to the next record. Take a minute to move back and forth through the records.
5. You can change the information you have entered into a field. Execute Data Goto Record Record-Number and type **6** to go to record number 6. Press **Esc** to go to entry mode. Use the cursor keys to move to [Quantity]. Change the 12 entered in the field to 20. Move your cursor to [Total] and watch it recalculate to the new total.
6. Press **Esc** while the cursor is still on [Total]. You will receive the prompt: `Save current changes to record? (y/n)`. Select **Y** to save the changes.
7. Execute Data Browse All to display the records you just created in Browse mode. Use the cursor keys to move through all the records.
8. Execute Data Browse Fields to view only certain fields in Browse mode. A prompter list of available fields is displayed. Use **F6** to highlight [Invoice #] and [Total]. Press **Enter**. Again, use the cursor keys to move through all the records.
9. Place the cursor on record 2. Execute Data Delete Record. This record is now inactive. Notice the small box with the letters DEL in the lower right corner of the screen.
NOTE: The record is not physically removed from the data-file until the Data Utilities Purge command is used.
10. Execute Data Delete Record again to reactivate the second record.
11. Execute Data Browse All again to return all fields to the screen.

Figure 4-9

Invo	Account #	Product	Quantit	Unit Price	Total
1	10071	A0000001	20	\$2.95	\$59.00
2	10056	T1112111	100	\$0.85	\$85.00
3	10056	G2020202	15	\$7.95	\$119.25
4	10067	T4321432	50	\$5.95	\$297.50
5	10071	L6667777	75	\$4.95	\$371.25
6	10071	09879879	20	\$29.95	\$599.00
7	10067	R9006521	150	\$9.99	\$1498.50

Menu: **Data** File Order Print Tools Window Help Remember Quit

View: invoice.vw Window:1 Rec:1 (1)

Browse Cross-tabs Delete Enter Find Goto Query Relate Send Transact Utilities

12. Then Unload the view by executing File Unload View and selecting Invoice from the prompter list of active views.
13. Execute Data Goto View and select the Customer view from the prompter list to bring Customer onto the screen.
14. Select Data Enter to enter the following records into the Customer view.

IMPORTANT: After you have entered the Zip Code number in the last view field for each record, the cursor will move to the first field in the table. Since you are not entering any records in the table at this time, press **F10** to move to the next record.

Name	Account #	Phone	City	St	Zip Code
Joan Mason	10071	(913)492-6780	Lenexa	KS	66201
Mike Evans	10056	(913)765-0978	Olathe	KS	66598
Walt Hudson	10067	(913)569-2343	Shawnee	KS	66545

NOTE: Notice that as soon as a number is entered into the [Account #] field, the link is processed and the information in the Invoice view that corresponds to that account number is displayed in the table.

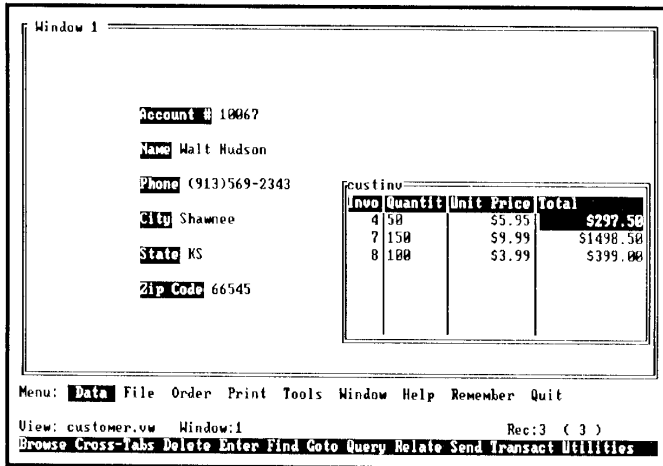
15. When you have finished entering records, press **Esc** to leave Enter\Update Mode. You may receive a prompt asking if you wish to save changes to the current record. Answer **Yes**.
16. Record number 3 will be displayed on the screen. Execute Data Goto Table, and select Custinv from the prompter list. The cursor will now appear in the table. Press **Esc** to enter Update Mode. Press **Enter** to move the cursor through the existing fields in the table. When you press **Enter** on the last field of the table record, it will move to the next table record and the counter field [Invoice #] will automatically be incremented. Enter the following data in the next two fields.

Quantity	Unit Price
100	3.99

NOTE: The total field will be automatically filled with the result of the attached calculation when your cursor moves into it.

17. With the cursor on the last field of the last record, press **Esc** to leave Update Mode. Answer **Yes** to the prompt to save the current changes to the record. Your screen should look like Figure 4-10.
18. Execute File Unload All to complete this practice exercise.

Figure 4-10



Chapter 5: Managing a Database

Chapter 3 discussed how to create a database structure, and *Chapter 4* discussed how to enter data into a database. This chapter, *Managing a Database*, focuses on manipulating the presentation of data in a database. Topics include:

- how to arrange records in "key order"
- how to sort records
- how to use queries
- how to use ANGOSS Database utility commands to append records, purge records, and repair damaged files
- how to use multiple windows

Organizing Data

There are two basic types of record order: physical and logical.

Physical order is usually the order in which records were entered into the data-file. Unless records are purged from a data-file, physical order does not change. Records arranged in physical order may be cumbersome to use, however. For example, a directory of telephone numbers listed in the order of installation would have limited usefulness.

More likely, you need the records reordered in a meaningful way, e.g., an alphabetical list of names accompanied by corresponding telephone numbers. When records are made available in an order other than physical order, they are said to be in logical order.

Keep in mind that when we refer to reordering records, we are talking about changing the way in which records are displayed or accessed through the view, not their actual physical sequence in the data-file. The view acts like a filter, showing the records in the order you want to see and screening out any records that are not applicable.

In ANGOSS Database, there are two ways to rearrange records: by key and by sort index. A third method of "ordering" records is the query, which is used primarily for selection purposes.

Keys

A key is a field or group of fields used to control the order of display and availability of **all** the records of a view, based upon field contents. When a key consists of a group of fields, one field is declared the major key field, and the other fields are minor (secondary) key fields.

Minor key fields may be necessary to refine the ordering of the records. For example, suppose you have a database like the one in Figure 5-1.

Figure 5-1

[lastname]	[firstname]	[born]	[died]
Jefferson	Thomas	1743	1826
Johnson	Lyndon	1908	1973
Jackson	Andrew	1829	1837
Johnson	Andrew	1808	1875

You could designate [lastname] to be the key field, but how would the two Johnson entries be handled? The solution would be to define [lastname] as the major key field and [firstname] as a minor key field.

When a key is created, a list of records in the appropriate key order is stored in a key file.

COMMENT: Key files are assigned the extension .key.

Keys are maintained dynamically. That is, when you add a new record, or change the data in a key field of an existing record, ANGOSS **automatically** updates the list of information in the key file. (For this reason, you may want to use a key to order records that will be added to or revised frequently.)

The key file update occurs as soon as the cursor leaves the record. A revised record is moved to a new position; a new record is inserted at the appropriate location in the list. The positioning occurs before the "next" or "previous" record is displayed.

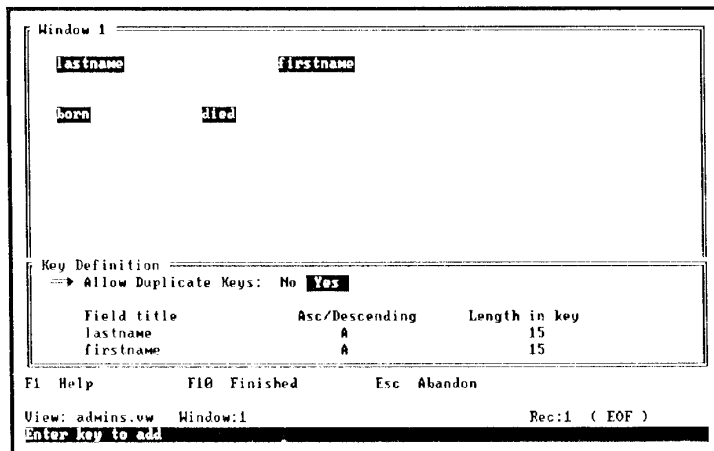
Defining a Key

To define a key, put the view in the current window and execute Order Key Add. A prompter list of available fields appears. A field already defined as a key is indicated by the letter **k**. The first field selected becomes the major key field for the key; subsequent fields become minor key fields.

To define a key for the presidential database mentioned earlier, you would position the pointer next to the [lastname] field; then, press **F6** to select it without exiting the prompter. Move the pointer to the [firstname] field and press **F6**. You would then press **F10** to complete the selection.

The Key Definition Menu appears. If you want to allow duplicate entries in key fields, select the **Yes** setting. Select the **No** setting to disallow duplicates. Since the presidential database (in its entirety) probably consists of one record for each president, you would not want to allow duplicate entries.

Figure 5-2. Key Definition Menu



COMMENT: If duplicate entries already exist in a field you are defining as a key field and you disallow duplicates, the key will not be added.

On the other hand, if the database consisted of records listing treaties or laws passed during each administration, you probably would want to allow multiple entries.

Under the "Allow Duplicate Keys" setting, the selected fields are listed. The default sort order is "A" for ascending; you can change the order to "D" for descending, if you wish.

If the field is an alphanumeric field, you can choose to limit the number of characters from each field to sort by. The default value is the entire width of the field. Use care when specifying a value smaller than the width of the field. The key may process faster but may not be as accurate.

After you press **F10** to complete the key definition, the view returns with the records displayed in key order.

You can define up to 15 keys for a view, but since a large key file takes up a lot of room, you may want to delete keys that are no longer needed. Each key can consist of 16 fields: a major key field and up to 15 minor key fields.

Key Order

When you view records that are in key order, ANGOSS uses the key file as a map to determine where the records should appear.

Once a key file has been established, you can view records in key order by executing Order Change Key. You are prompted to select the key. When a view displays records in key order, the Status Line shows the name of the key being used.

For our donor view, we would probably use [Donor #] as a key, because this field uniquely identifies each donor and therefore can be used as a link to the donation data-file. See Figures 5-3 and 5-4. We might also have another key consisting of [State] as the major key field and [City] as a minor key field; this key would allow us to track all donors by state and city at any given time.

Figure 5-3. Records in key order by [Donor #]

Donor	Name	Address	City	St	Zip Code
100	Tiffany Tyler	4457 Elm	Shawnee	KS	66214
102	Muffy Jan Cleef	8 Bridgeport Road	Shawnee	KS	66216
103	Punky Tremaine	10 Bridgeport Road	Shawnee	KS	66216
105	Carroll Z. Wellborn	2200 Larkspur	Shawnee	KS	66216
119	Georgia Owens	27 North Bryers	Albany	CA	94576
212	Timothy Curtis	321 Carlton Avenue	Jonesboro	AL	98564-8766
319	Georgie Collier	55 Eastlynne	Shawnee	KS	66214
324	Henrietta Swan	22 East Cumberland P	Ivanhoe	NY	00786-7587
497	Carl Jamison	907 Hummel Drive	Carthage	NY	07868-5543
615	Margot Michaels	8 Belvedere	Hillsboro	KS	63327

Menu: Data File **Order** Print Tools Window Help Remember Quit

View: name.vws Key:Donor # Window:1 Rec:6 (6)

Key Change Manual Sort

Figure 5-4. Records in key order by [State], [City]

Donor	Name	Address	City	St	Zip Code
212	Timothy Curtis	321 Carlton Avenue	Jonesboro	AL	98564-8766
119	Georgia Owens	27 North Bryers	Albany	CA	94576
615	Margot Michaels	8 Belvedere	Hillsboro	KS	63327
319	Georgie Collier	55 Eastlynne	Shawnee	KS	66214
100	Tiffany Tyler	4457 Elm	Shawnee	KS	66214
105	Carroll Z. Wellborn	2200 Larkspur	Shawnee	KS	66216
103	Punky Tremaine	10 Bridgeport Road	Shawnee	KS	66216
102	Muffy Jan Cleef	8 Bridgeport Road	Shawnee	KS	66216
497	Carl Jamison	907 Hummel Drive	Carthage	NY	07868-5543
324	Henrietta Swan	22 East Cumberland P	Ivanhoe	NY	00786-7587

Menu: Data File **Order** Print Tools Window Help Remember Quit

View: name.vws Key:State Window:1 Rec:4 (4)

Key Change Manual Sort

Because of the way key file information is stored, only physical record numbers are displayed on the Status Line. Nevertheless, key order is considered to be a logical order rather than a physical order.

Removing a Key

When you no longer need a key, you can remove it by executing Order Key Delete and selecting the key to be deleted. Press **F6** to mark multiple keys for deletion.

Indexes

An index is another method of controlling the display and availability of records. Sort indexes are similar to key files. A key file contains a list of records in the appropriate order; a sort index contains a list of the physical record numbers (not the records themselves).

Because physical record numbers can be interpreted more quickly than the varying contents of key fields, indexes often allow faster processing than keys.

Indexes are **not** maintained dynamically. An index is a "snapshot" of the records that were available at the time the index was created. If new records are entered, you will have to create a new index to include the most current version of your records. If existing records are modified, you may need to create a new index to include the revised data or the revised order.

COMMENT: Indexes are assigned the extension `.idx`.

Using the charity database again as an example, you might create an index of current donation records at the end of each month. The index named `april.idx` could easily be used for financial reports and other informational purposes without concern for new donations received in May. Figure 5-5 shows the April records that can be used again and again in the April index, regardless of new records shown in Figure 5-6.

Figure 5-5. Records as seen through index April

Donor #	Date	Amount
100	04/01/1989	\$65.00
100	04/01/1989	\$35.00
102	04/15/1989	\$70.00
103	04/14/1989	\$100.00
105	04/18/1989	\$40.00
119	04/14/1989	\$35.00
324	04/13/1989	\$25.00
324	04/21/1989	\$25.00
497	04/02/1989	\$20.00
615	04/11/1989	\$40.00

Menu: Data File **Order** Print Tools Window Help Remember Quit

View: donation.ows Index:april Window:1 Rec:1 (10)

Key Change Manual Sort

Figure 5-6. View showing additional records from May.

Donor #	Date	Amount
324	04/13/1989	\$25.00
119	04/14/1989	\$35.00
324	04/21/1989	\$25.00
497	04/02/1989	\$20.00
615	04/11/1989	\$40.00
100	04/01/1989	\$35.00
105	04/18/1989	\$40.00
103	04/14/1989	\$100.00
102	04/15/1989	\$70.00
100	04/01/1989	\$65.00
105	05/01/1989	\$25.00
119	05/02/1989	\$100.00
103	05/03/1989	\$100.00
102	05/02/1989	\$100.00

Menu: Data **File** Order Print Tools Window Help Remember Quit

View: donation.ows Window:1 Rec:11 (11)

Load Create Modify Save Unload Activate Display-Active Import Export Password

There are two types of indexes. One type is a sort index; records are arranged alphabetically or numerically. The other type is from a selection process called "querying." When you query a database, records are chosen by specific selection criteria.

Sorting Records

Suppose that you need to see donations grouped according to the home state of the donors, and perhaps further sorted by city. Or, suppose you want to see donation records arranged by the donation amounts. You might need donor address records arranged by zip code, for mailing purposes. Perhaps you want to arrange the records in reverse order by date.

COMMENT: ANGOSS Database provides two means of sorting records: by key and by sort index.

You can use the Order Sort commands to define the sort criteria and generate a sorted index for each situation. Unlike keys, there are no limitations imposed by the Database program on the number of indexes that you can define for a view.

You can also do a quick sort without saving the sorting criteria in a definition file.

Sort Definition

With the view to be sorted in the current window, select Order Sort Create. You are prompted to name the sort definition file being created.

A prompter list displays available fields from which you can select the primary sort field and any secondary sort fields. The first field that you select becomes the primary sort field. Use the cursor movement keys to move the pointer; press **F6** to highlight a field. Press **F7** to unhighlight a field. If you prefer to type the field names, press **F2** to switch from Prompter mode to Editor mode. Press **F10** to complete the selection of fields.

Figure 5-7 shows fields highlighted to define a sort of donor records by state and then by city. Notice the order in which the fields are listed in the Control Area.

Figure 5-7. prompter list of fields, and control area showing list of fields.

Donor #	Name	Address	City	St	Zip Code
497	Carl Jamison	907 Hummel Drive	Carthage	NY	07868-5543
119	Georgia Owens	27 North Bryers	Albany	CA	94576
324	Henrietta Swan	22 East Cumberland P	Ivanhoe	NY	00786-7587
212	Timothy Curtis	321 Carlton Avenue	Jonesboro	AL	98564-8766
319	Georgie Collier	55 Eastlynne	Shawnee	KS	66214
100	Tiffany Tyler	4457 Elm	Shawnee	KS	66214
105	Carroll Z. Wellborn	2200 Larkspur	Shawnee	KS	66216
103	Punky Tremaine	10 Bridgeport Road	Shawnee	KS	66216
102	Muffy Van Cloef	8 Bridgeport Road	Shawnee	KS	66216
615	Margot Michaels	8 Belvedere	Hillsboro	KS	63327

name.vws

k Donor # k Name Address City => State

Zip Code Phone

[State;City;_

F2 Mode F6 Select fld F7 Remove fld Prompter

View: name.vws Window:1 Rec:11 (11)

Enter fields by which to sort

The Sort Definition Menu appears listing the fields you have selected. You can specify either **A** for ascending or **D** for descending for any field. If a selected field is an alpha field, you can choose the number of character positions that will be used to arrange the records. The default setting is the maximum number of characters allowable in the field.

Press **F10** to finish the definition.

Executing the Sort

To put the records in index order, select Order Sort Execute. The following menu appears:

Dictionary Smart

The Dictionary option orders uppercase and lowercase characters together. The Smart option orders uppercase characters before lowercase characters.

You are prompted to enter the name of the sort definition file.

You are then prompted to specify a name for the index to be created. You can enter a new name, or you can point to an existing index, as long as the view is not currently ordered by that index. When you press **Enter**, the view rearranges the display of the records according to the sort information.

Figure 5-8. shows the donor records in index order by state, city.

Donor	Name	Address	City	St	Zip Code
212	Timothy Curtis	321 Carlton Avenue	Jonesboro	AL	99564-8766
119	Georgia Owens	27 North Bryers	Albany	CA	94576
615	Margot Michaels	8 Bolvedere	Hillsboro	KS	63327
182	Muffy Van Cleef	8 Bridgeport Road	Shawnee	KS	66216
319	Georgie Collier	55 Eastlynne	Shawnee	KS	66214
100	Tiffany Tyler	4457 Elm	Shawnee	KS	66214
185	Carroll Z. Mollborn	2200 Larkspur	Shawnee	KS	66216
183	Punky Tremaine	18 Bridgeport Road	Shawnee	KS	66216
497	Carl Jamison	947 Hummel Drive	Carthage	NY	07868-5543
324	Henrietta Swan	22 East Cumberland P	Ivanhoe	NY	00706-7507

Menu: Data File **Order** Print Tools Window Help Remember Quit

View: name,uns Index:states Window:1 Rec:1 (4)

Key Change Manual Sort

Notice that Figure 5-8, illustrating a sorted index, is very similar to Figure 5-4, showing a view in key order. The main difference is that the key will be updated automatically with new or revised entries; the index will not be updated automatically.

Once you have created a sort index, you can reaccess it at any time by executing Order Change Index. Remember, you are accessing a frozen picture of the records. If you have made additions to the records, the index is outdated and you will need to generate a new version of the index. You can reuse both the definition file and the index file.

Any time a view is in index order, the word "Index:" followed by the name of the index file is shown on the Status Line.

Quick Sorts

Order Sort Now allows you to create the definition and the index with one command. Select the Dictionary option to sort uppercase and lowercase characters together, or select the Smart option to order uppercase characters before lowercase characters.

After you select the fields, select either Ascending or Descending. Order Sort Now does not allow mixed ascending/descending sort methods or partial sorting criteria. When you press **Enter**, the records are displayed in index order.

Removing a Sort Definition

When you no longer need a sort definition file, you can delete it by executing Order Sort Remove.

Querying Records

A third type of "ordering" is by query, which focuses on selecting certain records rather than accessing them in a particular sequence.

Querying, which is one of the most useful features of a database program, has three main purposes. The first purpose is to select records based upon criteria that you supply and then instruct ANGOSS to display the records in an index or in a new data-file.

For example, suppose you want to view donors from New York. You would define a query selecting records that have "NY" in the [State] field. Figure 5-9 shows an example of the resulting index.

On the other hand, you might want to know the sum of all donations over \$100. This is the second purpose for creating a query: to generate statistical summary information using the File SDb functions. No index or data-file is created. You would define a query using the FILESUM function. Figure 5-10 shows the resulting Query Summary.

Figure 5-9

Window 1

Donor	Name	Address	City	St	Zip Code
497	Carl Jawison	907 Hummel Drive	Carthage	NY	07860-5543
324	Henrietta Swan	22 East Cumberland P	Ivanhoe	NY	00786-7587

Menu: **Data** File Order Print Tools Window Help Remember Quit

View: name.vms Index:fig5_9 Window:1 Rec:1 (1)

Browse Cross-tabs Delete Enter Find Goto Query Relate Send Transact Utilities

Figure 5-10

The screenshot shows a window titled "Window 1" containing a table of donor records. A "Query Summary" box is overlaid on the table, displaying search results. Below the table, there are control keys and a status bar.

Donor #	Date	Amount
324	04/13/1989	\$25.00
119	04/14/1989	\$35.00
324	04/21/1989	\$25.00
497	04/02/1989	\$20.00
615	04/11/1989	\$40.00
100	04/01/1989	\$35.00
105	04/18/1989	\$40.00
103	04/14/1989	\$100.00
102	04/15/1989	\$17.00
100	04/01/1989	\$6.00
105	05/01/1989	\$2.00
119	05/02/1989	\$10.00
103	05/03/1989	\$12.00
102	05/02/1989	\$100.00
105	05/01/1989	\$250.00

Query Summary
 15 records searched
 3 matches found
 Sum of [Amount of Donation]: 5545.00

Esc Continue Alt-P Print Alt-W Write disk file

View: donation.vws Window:1 Rec:15 (15)
 Enter name of query definition file to execute

The third purpose for creating a query is to perform an action upon existing data. You can replace the contents of fields, or you can toggle the active status of records.

For example, suppose you want to correct erroneous zip code data entered in several records. You would define a query replacing the zip code 66200 with 66201. As when generating statistics, no index or data-file is created. ANGOSS revises your existing data, as shown in Figures 5-11 and 5-12.

Figure 5-11. Data before Query Replace

Donor	Name	Address	City	St	Zip Code
180	Tiffany Tyler	4457 Elm	Shawnee	KS	66214
182	Muffy Van Cleef	8 Bridgeport Road	Shawnee	KS	66216
183	Punky Tremaine	18 Bridgeport Road	Shawnee	KS	66216
185	Carroll Z. Hobborn	2200 Larkspur	Shawnee	KS	66216
188	Linda Mason	1700 Goddard	Shawnee	KS	66200
111	Tooty Paulson	1714 Goddard	Shawnee	KS	66200
119	Georgia Owens	27 North Bryers	Albany	CA	94576
212	Timothy Curtis	321 Carlton Avenue	Jonesboro	AL	98564-8766
387	Reggie Adams	1718 Goddard	Shawnee	KS	66200
319	George Collier	55 Eastlynne	Shawnee	KS	66214
324	Henrietta Swan	22 East Cumberland P	Ivanhoe	NY	08786-7587
497	Carl Jamison	987 Hummel Drive	Carthage	NY	07868-5543
615	Margot Michaels	8 Belvedere	Hillsboro	KS	63327

Menu: **Data** File Order Print Tools Window Help Remember Quit

View: name.vws Key: Donor # Window:1 Rec:11 (11)

Browse Cross-Tabs Delete Enter Find Goto Query Relate Send Transact Utilities

Figure 5-12. Data after Query Replace

Donor	Name	Address	City	St	Zip Code
180	Tiffany Tyler	4457 Elm	Shawnee	KS	66214
182	Muffy Van Cleef	8 Bridgeport Road	Shawnee	KS	66216
183	Punky Tremaine	18 Bridgeport Road	Shawnee	KS	66216
185	Carroll Z. Hobborn	2200 Larkspur	Shawnee	KS	66216
188	Linda Mason	1700 Goddard	Shawnee	KS	66201
111	Tooty Paulson	1714 Goddard	Shawnee	KS	66201
119	Georgia Owens	27 North Bryers	Albany	CA	94576
212	Timothy Curtis	321 Carlton Avenue	Jonesboro	AL	98564-8766
387	Reggie Adams	1718 G	Shawnee	KS	66201
319	George Collier	55 Eas	Shawnee	KS	66214
324	Henrietta Swan	22 Eas	Ivanhoe	NY	08786-7587
497	Carl Jamison	987 Hu	Carthage	NY	07868-5543
615	Margot Michaels	8 Belu	Hillsboro	KS	63327

Query Summary
 13 records searched
 3 matches found
 3 replacements made

Esc Continue Alt-P Print Alt-W Write disk file

View: name.vws Key: Donor # Window:1 Rec:6 (6)

Enter name of query definition file to execute

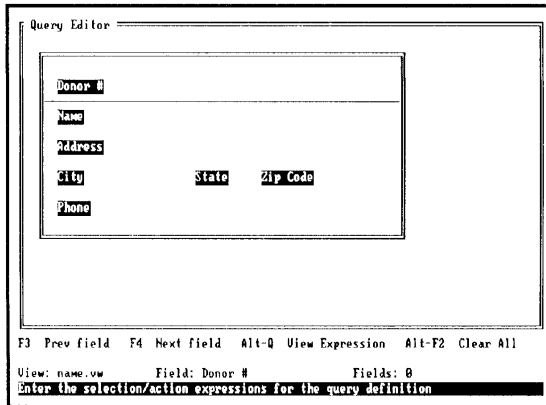
Query Definition

To define a query, be sure the view to be queried is in the current window, then execute Data Query Create. You are prompted to give the query definition file a name. You are then asked to select either the New option (to create a definition from scratch) or the Similar option (to create a definition similar to an existing query). When you press **Enter**, the Query Editor appears.

The Query Editor

The Query Editor is similar to the view in Enter/Update Mode. Use **F4** and **F3** or **down arrow** and **up arrow** to move forward and backward through the fields.

Figure 5-13. Query Editor



You can enter expressions in either of two areas in the Query Editor. You can type the expression directly in the field area. Or, you can press **Alt Q** to display a rectangular area called the View Expression window.

The View Expression window, which is like a small version of the Text Editor, is most useful for entering complex formulas as selection criteria and replacement data. Since the View Expression window is not automatically associated with any one field, you must specify by field reference the fields being used in the formula and identify text strings by enclosing them in quotation marks. In other words, use only full formula expressions in the View Expression window.

To select from a list of available fields, press **F6**.

When you complete the View Expression definition, press **F10** to remove the window. When the View Expression window is not empty, the word `View` is shown on the Status Line.

Press **F10** to exit from the Query Editor, regardless of where you entered the expressions.

Types of Expressions

Query expressions can contain literal or constant data, field references, calculations, functions, logical and relational operators, and some special words and symbols to help you define your queries. For example, `[]` can always be used to refer to the current field.

Logical operators (AND and OR) are used to connect logical expressions. Relational operators are used to compare two values. Table 5-1 lists the relational operators and their meanings. For additional information on functions and operators, refer to *ANGOSS Formula Reference*.

Operator	Meaning
=	equals
==	equals without regard to upper or lower case
!	contains
!!	does not contain
>	is greater than
>=	is greater than or equal to
<	is less than
<>	does not equal

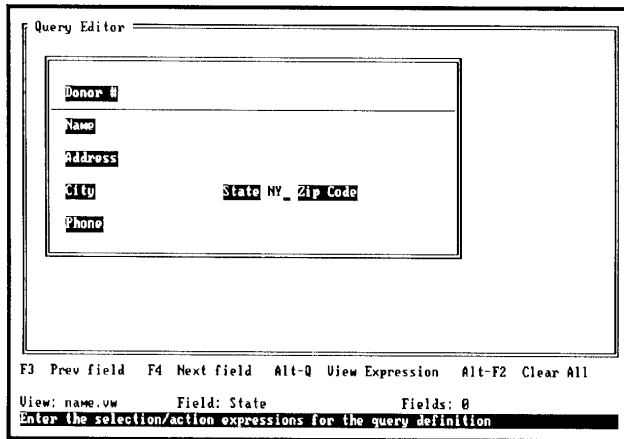
IMPORTANT: Always put a space between the `<` symbol and a negative number, i.e., `< -32`. Omitting the space, as in `<-32`, instructs ANGOSS to replace the current values with the number 32.

In most cases, the easiest way to enter selection or replacement criteria is to move the cursor to a field to be used in the query and type the expression. ANGOSS allows you to enter either "query by example" (QBE) expressions or full formula expressions.

Query by Example

QBE lets you define selection or replacement criteria simply by entering into a field in the Query Editor an example of the data to be selected or replaced. Figure 5-14 shows a query definition that will select all records having "NY" in the field [State].

Figure 5-14



In a QBE expression, the field reference is implied by the location of the expression. Thus, a QBE expression is always entered directly into a field. In addition, the relational operator is assumed to be =, unless you specify otherwise.

NOTE: It is not always necessary to use quotation marks with text strings in QBE expressions. Quotation marks are required only when the characters might be interpreted as a ANGOSS function or part of a formula. To ensure that ANGOSS is able to distinguish between text and project variable names, always use full formula expressions with project variables (e.g., [] = **varname**).

Now suppose that you want to select all records having "NY" in the [State] field and "Albany" in the [City] field. When you use multiple fields in a QBE definition, there is an implied AND between the expressions. Figure 5-15 shows an example.

Figure 5-15

Query Editor

Donor #
Name
Address
City Albany State NY Zip Code
Phone

F3 Prev field F4 Next field Alt-Q View Expression Alt-F2 Clear All
 NY
 View: name.vw Field: State Fields: 2
 Enter the selection/action expressions for the query definition

You could also define a query to select all records with "NY" in the [State] field, and either "Albany" or "Syracuse" in the [City] field, as shown in Figure 5-16.

Figure 5-16

Query Editor

Donor #
Name
Address
City Albany or Syracuse State NY Zip Code
Phone

F3 Prev field F4 Next field Alt-Q View Expression Alt-F2 Clear All
 Albany or Syracuse
 View: name.vw Field: City Fields: 2
 Enter the selection/action expressions for the query definition

Figure 5-16 also provides, in the [City] field, an example of a compound expression. If you use the implied = or if you use either == or ! in a compound expression, the symbol is the implied operator for the remainder of the expression, or until another operator is used.

QBE expressions allow the use of some additional features, such as High and Low, a range operator, and QBE pattern symbols.

High and Low. High and Low are simple, stand-alone words that can be used in QBE expressions. High selects (returns TRUE for) the record in which the field contains the highest value. Likewise, Low selects the record in which the field contains the lowest value. You can also use the format **High n** or **Low n**, where **n** is the number of highest or lowest values to select. For example, High 10 would select the records having the ten largest values in the field.

COMMENT: High and Low include "tying" records.

Range Operator. The range operator .. is a special relational operator available only in QBE expressions. Used before a value (..10), the range operator means "less than or equal to" the value. Used after a value (10..), the range operator means "greater than or equal to" the value.

The expression **5..10** means "greater than or equal to 5, and less than or equal to 10."

Patterns. QBE patterns are wildcard strings. The asterisk (*) is used to match any sequence of characters; the question mark (?) is used to match one character. * and ? can occur in any number and in any sequence.

In wildcard date strings, * matches any individual day, month, or year. In wildcard time strings, * matches any hour, minute, or second specifications. ? cannot be used with date or time strings.

Legal wildcard date entries are:

dayname	to match a particular day of the week
month mon	to match a particular month
y yyyy	to match a particular year
d/mon	to match date and month

mon/y mm/y	to match month and year
mon/d/y d/mon/y m/d/y d/m/y y/m/d	to match month, date, and year according to selected date format.

The syntax to use for wildcard time strings is the same as for constant time entries except that * can be used in place of the hour, minute, or second.

Examples:

hh

hh:mm

hha

hh:mma

hhp

hh:mmp

hh:mm:ss

hh:mm:ssa

hh:mm:ssp

where **hh**, **mm**, or **ss** are represented as numbers or as *.

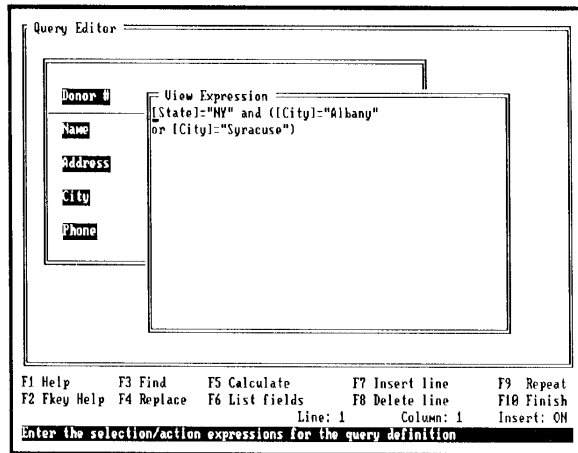
The following table lists some pattern usage examples.

Example	Meaning
*g?	matches any sequence of characters with g as the next to last character
PN??	matches any 4-character sequences beginning with PN.
y	matches any sequence beginning with r and containing a y
7/*	in a date entry, matches any date within July of any year
"*:30"	in a time entry, matches any time at the half hour

NOTE: Because multiplication of date and time expressions is permitted, quotation marks must surround a wildcard date or time string if the first character is *.

Full Formula Expressions

QBE expressions are easy to use and can handle many of your query definition needs. You can, however, enter full ANGOSS formula expressions as shown in Figure 5-17.

Figure 5-17. Full Formula Expression

There are two types of full formula expressions: those containing relational operators and those containing Boolean functions.

Recall that when you enter a QBE expression, the operator is sometimes optional and you only have to enter part of a formula. When you enter a full expression using a relational operator, you must provide values on both sides of the operator.

Examples:

`[State]="NY"`

`[Amount]<=1000`

A Boolean function performs an evaluation and returns either "true" or "false." ISNA, ISERR, ISNUMBER, ISSTRING, NOT, DELETED, ISBLANK, ISDATE, ISVAR, and ISARRAY are Boolean functions. The syntax consists of the function and its arguments; no relational operator is used.

Example:

`isblank([Amount])`

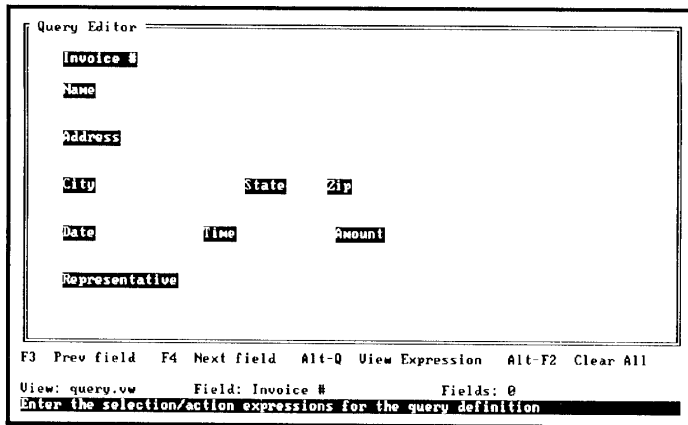
Full formula expressions can be entered in the View Expression window or in any field area of the Query Editor.

Selecting Records

The first purpose for executing a query is to select records. This section lists various types of selection criteria and shows an example of a full formula expression and the corresponding QBE expression for each type.

Figure 5-18 shows the Query Editor containing a view from which all the examples are taken.

Figure 5-18



Full expressions, shown in the left column of the examples, could be entered either in the View Expression window or in a Query Editor field. The corresponding QBE examples, in the right column, are shown with the fields in the Query Editor represented as Fieldname: and the expression (which is the part you type) represented as **expression**.

NOTE: QBE style expressions cannot be entered in the View Expression window.

Selection with a Data Item

You may want to select records containing a particular item of data.

Full Expression	QBE Expression
[Amount] = 100	Amount: 100
[Date] = days("05/02/89")	Date: 5/2/89
[Time] = timevalue("2:00p")	Time: 2:00p
[Name] = "Jones"	Name: Jones
[Name] ! "Jo"	Name: ! Jo <i>or</i> *Jo*

Selection of High or Low Values

You may want to select records based upon the highest or lowest values in a particular field.

Full Expression	QBE Expression
[Amount] = filemax([Amount])	Amount: high
[Amount] = filemin([Amount])	Amount: low

Selection by Inequality

Rather than specifying selection criteria that is "equal to" data, you may want to select records greater than or less than a particular value, or any record that does not equal or does not contain a particular value.

Full Expression	QBE Expression
[Amount] > 1000	Amount: >1000
[Amount] >=1000	Amount: >=1000 <i>or</i> 1000..
[Name] <= "G"	Name: <=G <i>or</i> ..G
[Representative] <> "Mason"	Representative: <> Mason
[Name] !! "Jo"	Name: !!Jo
[Amount] < -32	Amount: < -32

Selection from a Range of Data

You may want to select records that fall within or outside a particular range.

Full Expression	QBE Expression
[Amount] >= 200 AND [Amount] <= 800	Amount: 200..800
[Amount] <= 200 OR [Amount] >= 800	Amount: ..200 OR 800..

Selection Based on a List

Sometimes you may want to define several possible items, any one of which would be a valid selection.

Full Expression	QBE Expression
[Name] = "Bly" OR [Name] = "Fry"	Name: Bly or Fry

Selection Based on Multiple Conditions

There may be some instances where you need to select records based upon multiple conditions. Perhaps you need records having specific data in one field, but only if appropriate data is present in another field.

Full Expression	QBE Expression
[Name] = "Jones" AND [Amount] > 800	Name: Jones Amount: > 800

Perhaps you want to select records based upon the data in any one of several fields. You may need to use parentheses to ensure that the correct combination of data is used to select records.

Full Expression	QBE Expression
[Amount] = 50 OR [Name] = "Fry"	50 OR [Name] ="Fry"
[Amount] = 75 OR ([Amount] = 50 AND [Name] = "Patterson")	75 OR (50 AND [Name] = "Patterson")

Notice in the QBE examples that some parts of the expressions are entered using full expression format.

Selection by Non-Data Conditions

Sometimes you may want to select records based upon conditions that have nothing to do with the data in the fields. You may want to select by record number, by delete/active status, or by whether a field is blank.

Full Expression	QBE Expression
record = 10	Name: record = 10
[Representative] = blank	Representative: blank
deleted	deleted
not(deleted)	not(deleted)

Notice that some of these selection items pertain to the record itself and not to a particular field. In those instances, the full expression needs no field reference, and the QBE expression can be entered in any field area.

Querying Table Records

If your view contains a table, you may want to select records based upon data in the table.

When you base a query upon table data, ANGOSS scans the records in the table, searching for data matching the selection conditions you have specified; if a match is found, all of the table records associated with a particular view record are returned, not just the table records that contain matching data.

To define a table query, invoke the Query Editor. You can enter either a QBE expression or a full formula expression.

QBE Expression. To enter a QBE expression, position the highlighter in the table field on which the selection condition is to be based. Type the expression in the field.

In the following example, ANGOSS is instructed to search the table records for values greater than 100 in a table field entitled [Quantity].

Invoice Quantity Unit Price Total
>100

Full Formula Expression. To enter a full formula expression selecting records from a table, enter an expression using the TABLELOOKUP function in conjunction with the NOT and ISERR functions. The first argument for TABLELOOKUP (in this example) is any field in the table; the second argument is the selection equation.

Example:

not(iserr(tablelookup([Quantity],[Quantity]>100)))

NOTE: Enter the expression in the View Expression window or in a field outside the table.

Obtaining Summary Statistics

The File SDb functions, such as FILESUM, FILEAVERAGE, etc., are used in the query definition to obtain summary statistics information. Refer to *ANGOSS Formula Reference* for a complete list of File SDb functions.

The request for summary statistics suppresses the generation of an index or a data-file.

Summaries with QBE Expressions. The field containing the expression is the implied source for the summary statistic action; function arguments are not used. Use a comma to separate the selection criteria from the File function.

Examples:

State: **KS**

Amount: **filesum**

Amount: **> 50, filesum**

The first example shown would yield the sum of the values in the [Amount] field for records having "KS" in the [State] field. The second example provides the sum of values greater than 50 in the [Amount] field.

Summaries with Full Expressions. Full formula expressions cannot be used to perform summary statistic calculations. Use QBE expressions instead.

Performing Actions

The third purpose for generating a query is to change the data in selected records, or to change the delete status of records. Of course, these changes can be made individually, but defining a query allows you to change many records at once.

Query expressions that cause ANGOSS to act upon existing records are called "action" expressions. The presence of an action suppresses the generation of output files; this type of expression is the same as the Neither option of earlier versions of ANGOSS.

NOTE: You cannot use query actions on table records. Instead, use the standard view associated with the table to define a query containing action expressions.

Actions with QBE Expressions. Separate the selection criteria from the action with a comma. The field containing the expression is the implied destination for the replacement action. If you omit selection criteria, the replacement is performed upon every record. You can use the symbol <- instead of the word **Replace**.

Example:

Zip: **66200**, <- **66201**

The example shown replaces the entries of 66200 with 66201 in the [Zip] field.

Other replace actions are <-**Activate**, and <-**Delete**, which change the "delete status" of records. Unlike the interactive Data Delete command, these actions are not toggles; that is, the Activate action activates records and the Delete action deactivates records, regardless of a record's current delete status.

IMPORTANT: On multi-file views, the Edit Links setting `Delete status tied to main data-file` affects the operation of <-Activate and <-Delete, but there is no corresponding feature for the replacement option. <-**value** replaces data only in the field on the view.

Actions with Full Formula Expressions. The options are Replace [Field], Replace Activate and Replace Delete. (Notice that the word "replace" must be used.) Use quotation marks to identify text selection or replacement data. Do **not** use a comma to separate the selection criteria from the action expression.

If you omit selection criteria, the replacement is performed upon every record.

Example:

[Zip] = "66200" replace [Zip] = "66201"

The example shown replaces entries of 66200 with 66201 in the [Zip] field. In this particular example, [Zip] is an alphanumeric field and the entries are considered to be text strings. You would not use quotation marks for a numeric field.

Deleting Duplicate Records

You can use the FETCHFIELD function with a Delete action to delete duplicate records. The FETCHFIELD function compares the data in the specified field of the current record to the data from the same field in the **previous** record. If the data matches, the action expression deletes the **current** record.

For example, to delete duplicate entries in an [Invoice] field:

1. Put the view in key order. For the deletion to be effective, the key must be precise enough to arrange duplicate records together.
2. Define a query that has the FETCHFIELD function and a Replace Delete expression in a key field. When a more precise comparison is required, use FETCHFIELD in minor key fields as well. You can use either full expressions or QBE expressions.

Full Expression	QBE Expression
[Invoice] = fetchfield([Invoice]) replace delete	Invoice: fetchfield([]), <- delete

3. Execute the query definition.

Executing the Query

After you define the query selection criteria and any actions to be performed, select Data Query Execute. You are prompted to specify the definition file to be used. If the definition contains no action expressions or summary requests, you can select either Index or Data-File for the output. If you select Index, you are asked to supply a filename. If you select Data-File, you are asked to supply a name for the new view and to select the fields to be included.

If the definition does contain an action expression or summary request, the Index and Data-File options are not offered; the action or summarization is performed immediately.

When the query has been processed but before Command Mode returns, a small rectangle called the Query Summary is displayed on the screen. The Query Summary lists the number of records

searched and the number of matching records found. If an index or a data-file has been generated, the filename is also shown. If summary statistics were requested in the definition, the statistics are shown in the Query Summary.

To print the Query Summary, press **Alt P**. To write the Query Summary to a disk file, press **Alt W**. Press **Esc** to return to Command Mode.

Query Order

An index or data-file ordered by the execution of a query is not necessarily a sorted file. Rather, the index or data-file that is created is a subset of the view (or view order). If an index is created, the index can be sorted using the Sort commands. If a data-file is created, you can add a key field and order the file by key, or you can sort using the Sort commands.

You can also query an index or data-file created by a query.

Once an index is created, you can reaccess it at any time by executing Order Change Index. (You can access either the index created by the query, or a sorted index created by the Sort command.) To access a data-file, load the view.

Quick Queries

Data Query Now allows you to define a quick query without requesting a unique name for the definition file. The definition and index are created with one command. The definition file is always qnow.dfq. The index created is always qnow.idx or a numbered variation of qnow.idx.

Another quick way to select records and place them in an index is to execute Order Manual. The records are displayed in columnar format, and you can press **F7** to highlight individual selections. If you use one of a view's existing indexes when you execute Order Manual, all of the records are highlighted, and you can press **F7** to omit specific records. Otherwise, use **F7** to add records to the index.

Removing a Query Definition

To delete a query definition, execute Data Query Remove. You are prompted to specify the filename of the definition to delete.

Using Database Utilities

The Data Utilities commands perform various database maintenance operations.

Appending Data

Data Utilities Append allows you to append or attach data from one view to the end of the current view. This allows you to quickly and easily combine the data from two files into one. There are numerous reasons you might wish to append files. For security reasons you may not want data entry operators entering data directly into a main database. You have the option of creating separate data-files into which the operators enter their data. At a later time, this data can be appended to the main file.

When Append is executed, the destination view must be the current file, and the source view must be active. The two files do not have to have identical structures; Append restructures the data it takes from the source view to match the structure of the current data-file.

After executing Data Utilities Append, you are asked to select the source view from a prompter list of active views. The Restructure Definition Menu then appears. Figure 5-19 shows the Restructure Definition Menu.

Figure 5-19. Append Restructure Definition Menu

Restructure Definition		
Source field		Dest. field
(Donor		(Donor #
(Date		(Date
((Amount of Donation

100	04/01/1989	\$35.00
105	04/18/1989	\$40.00
103	04/14/1989	\$100.00
102	04/15/1989	\$170.00
100	04/01/1989	\$65.00
105	05/01/1989	\$25.00
119	05/02/1989	\$100.00
103	05/03/1989	\$125.00
102	05/02/1989	\$100.00
105	05/01/1989	\$250.00
324	04/13/1989	\$25.00
119	04/14/1989	\$35.00
324	04/21/1989	\$25.00

F1 Help F7 Insert a field PgUp Prev group Up arrow Prev line
 F10 Finished F8 Delete field PgDn Next group Down arrow Next line
 Source c:\40\recs\519.uvs Destination c:\40\recs\donation.uvs
 Enter name of source view

The Restructure Definition Menu allows you to modify the way in which the source view is appended. It relates the source fields to the destination fields in a columnar format. The source field names appear in the left column and the destination names appear at the right.

When the Database creates the Restructure Definition Menu, it compares field names in the source and the destination views. If it finds matching names, it assumes a corresponding transfer and

enters the matching fields in adjacent columns. If it cannot find a matching source name, a blank line appears in the source column opposite the unmatched destination field.

To add or change a predefined field transfer, use the pointer to identify the source field you want to specify.

If you want to insert a source field name, press **F7** to display a prompter showing available fields in the source file. Then use the pointer in the prompter to identify a field name, pressing **Enter** or **F6** to select the name for the source field column.

If you want to delete a source field name and remove the defined transfer, press **F8** while the pointer is next to the source field you want deleted.

Once you are satisfied with the append definition, press **F10** to begin the transfer of data. Data from each of the defined source fields is then placed in its corresponding destination field. This creates a new record for every record in the source file. The new records are added to the end of the current data-file.

NOTE: If the source file has been ordered in key or index order, records are appended in that order. If duplicate key values are not allowed, duplicate key records are skipped.

Changing Record Count

Data Utilities Change-Count allows you to set a new count for the next record entered into a counter field, or to renumber all current values in the counter fields of one of the data-files attached to the current view. After selecting Data Utilities Change-Count, enter the number for the new count. Then choose between Next and Renumber options.

The Renumber option of the Change-Count command includes any deleted records it finds as it numbers. The renumbering begins with the count you enter on the first physical record.

The Next option of the Change-Count command sets the value of the counter field for the next record entered into the data-file. The change only affects records entered after the command is executed. This allows you to have the same number in a counter field multiple times in the same file.

Repairing Damaged Files

If your standard-views or data-files become lost or damaged, a view displays garbled data or faulty formatting, or a view cannot be loaded or activated, the Data Utilities File-Fix may be able to reconstruct them. Data Utilities File-Fix cannot be used on active views or active data-files.

Data Utilities File-Fix Data-File rebuilds the keys defined for the specified data-file. If the data-file is in variable length format, the associated "PIX" file is also rebuilt. All variable length format data-files have an associated PIX file which maintains essential information about the physical size and location of all records in the data-file. Each PIX file is given the same name as its associated data-file and the extension .pix.

NOTE: Executing File-fix on variable length files may alter the physical sequence of records in the file.

The Data Utilities File-Fix View command rebuilds the standard view attached to a given data-file.

NOTE: File-Fix View rebuilds a standard view based on data. This means calculations, rules, etc., will not be present in the rebuilt view.

Purging Deleted Records

The Data Utilities Purge command removes all inactive records from a data-file, freeing the available disk space previously occupied by those records. Records can be made inactive by using the Data Delete command. In order to execute the Purge, the data-file cannot be active. Purge rewrites the entire data-file, so you are encouraged to make a backup of the file before executing the command. Purged records cannot be retrieved.

When a record in a variable length data-file is updated, "dead space" may accumulate in the file, resulting from changes in the amount of space required to store the record's contents. Purging the file helps to reclaim this unusable space. Purge also rebuilds the .pix file.

Information About Files

Data Utilities Information displays a View Information window for the current view, its data-files, and each field. This window, arranged in a report format, can be a handy reference tool for obtaining information about the structure of the view.

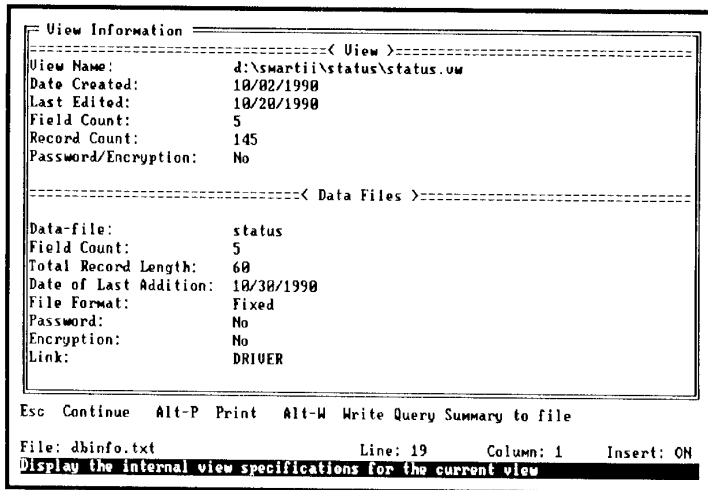
- View information includes view name, date created, date last edited, the number of fields on the view, the number of records, and whether password and encryption is used.
- Data-file information includes data-file name, the number of data-file fields, total record length, date of last data entry activity, file format, password and encryption status, and link field information.

- Information is also provided on keys for driver and driven data-files.
- If tables are present on the view, table names and associated data-files are listed.
- Field information, provided for each field, includes field name and number, whether the field is a major key field, the name of the field's data-file, whether the field is used in a table on the view, the field type and width. Also included is the location of the title, the entry status, the auto advance setting, display format, input mask, data entry message, and default equation. Information about menus, calculations, and rules is also provided where appropriate.

Figure 5-20 shows a sample View Information window.

Use cursor keys to scroll through the window. You can send the information to a printer by pressing **Alt P**, or you can save the information to disk by pressing **Alt W**.

Figure 5-20. View Information window



Using Database Windows

Window commands allow you to manipulate the windows to make it easier to look at several files or different parts of the same file at the same time.

Splitting a Window

Window Split allows you to split the Data Window Area into two or more windows. This allows you to load a number of views into different windows in order to move between them or compare them quickly and easily.

Window Split acts directly on the current window to split it into two separate windows. Each time you use Window Split, the new window is automatically numbered in sequence. You can split a window horizontally or vertically, by moving the cursor to the desired split location and then pressing **Enter**. If window borders are specified, the current window appears within a double-line border.

Figure 5-21. Window split vertically

Window 1			Window 2	
Donor #	Date	Amount	Donor #	Name
324	04/13/1989	\$25.00	497	Carl Jamison
119	04/14/1989	\$35.00	119	Georgia Owens
324	04/21/1989	\$25.00	324	Honrietta Swan
497	04/02/1989	\$20.00	212	Timothy Curtis
615	04/11/1989	\$40.00	319	Georgie Collier
100	04/01/1989	\$35.00	100	Tiffany Tyler
105	04/18/1989	\$40.00	105	Carroll Z. Wellborn
103	04/14/1989	\$100.00	103	Punky Tremaine
102	04/15/1989	\$170.00	102	Muffy Van Cleef
100	04/01/1989	\$65.00	615	Margot Michaels
105	05/01/1989	\$25.00	108	Linda Mason
119	05/02/1989	\$100.00	307	Reggie Adams
103	05/03/1989	\$125.00	111	Tooty Paulson
102	05/02/1989	\$100.00		
105	05/01/1989	\$250.00		
324	04/13/1989	\$25.00		
119	04/14/1989	\$35.00		
324	04/21/1989	\$25.00		

Menu: **Data** File Order Print Tools Window Help Remember Quit

View: name.vms Window:2 Rec:1 (1)

Browse Cross-Tabs Delete Enter Find Goto Query Relate Send Transact Utilities

If there is a view active in the current window when you split it, the view will appear in both windows. You can then move to the new window by using Data Goto Window and specifying the

window by number, or the Quick Key **Alt F7**. Mouse users can simply click on the window. Once there you can execute File Load or Data Goto View to bring a different view into the new window.

Zooming a Window

Window Zoom is a toggle command that expands the current window of a multiple window display to fill the Data Window Area or returns it to its normal size after it has been expanded. The Quick key for zooming a window is **F7**.

Closing a Window

Window Close removes the current window from the screen. Window Close also "unplits" the screen. As the window closes, the remaining windows expand to fill the vacated area. The number of the current window is in the Status Line at the bottom of the screen.

If you close a window that contains a loaded view, that view remains active. To access the view and its associated data-files, you can use the Data Goto View command. To remove the view from memory, use the File Unload command.

NOTE: Under some special circumstances, the Database is unable to close a particular window. Closing another window first may correct the problem.

Painting a Window

Window Paint allows you to change the colors displayed in selected areas of the current window. Colors for the window border, the data, graphics (boxes/lines), titles (background and/or foreground color), the cursor on a standard screen, or the window background can all be changed. These color changes using Window Paint are for the current session only. If you change colors using Window Paint, unload the view, and then reload the view, the colors revert to those specified in the last File Create or File Modify procedure. To change colors permanently, use appropriate File Modify commands.

When you select one of the Paint options, a list of numbered colors appears at the bottom of your screen, accompanied by a prompt to enter a color. If you want to change the color of Titles, you are asked to enter a background color and a foreground color.

toggling Border Display

The Window Border command is a toggle that displays or removes the window border in the current window. When you first enter ANGOSS Database, the window border is on. When the window border is off, additional rows and columns can be displayed in the current window. Note that scroll bars and mouse control buttons are not available when the border is off.

Linking Views

Window Link allows you to simultaneously display corresponding records from different views. This can be a fast and efficient way to find and view corresponding records in two or more views.

The following conditions must be met before a window link can be established:

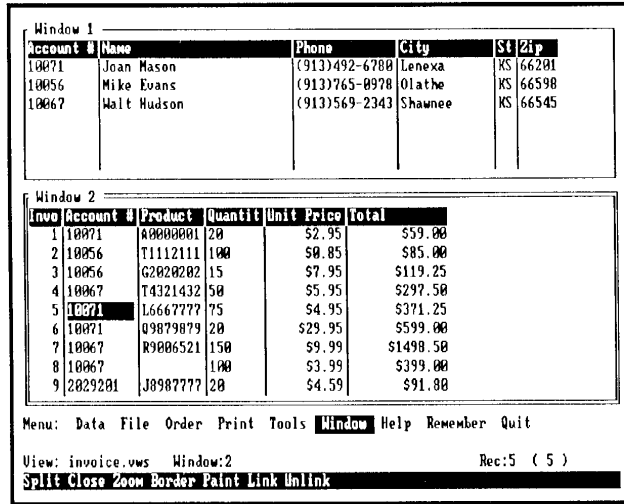
- The two views must have a "common" field for the link.
- The link field in the second view must be a key field.

In order to link two views, you must define a pair of linked fields. Linked fields have a common data type, and they contain individual data items common to both views.

With the link established, each time you access a new record for the current window, the Database attempts to find a corresponding record in the second view by matching data items in the linked fields. If no match is found, the Database issues an audible beep (unless Beep is turned off in the Tools Preferences Global Definition Menu).

Figure 5-22 shows two linked windows. Notice that the record the cursor is sitting on in Window 2 has the same Account # as the first record in Window 1. If the cursor were moved to another record, a record with the corresponding Account # in the view in Window 1 would be placed on the first line.

Figure 5-22. Linked windows



NOTE: You cannot link to a view that is in index order. An index created by a query may not have all the records available, making a link impractical.

Links are associated directly with the view. Because of this, links are maintained even if a view is placed in the "background". This would occur if File Load or Data Goto View is used to bring another view into the same window.

Cascading links are possible. You can have one view linked to a second, the second linked to a third, and so on.

NOTE: Linking is generally disabled during some batch processing operations such as transactions and relates.

Window Link can also be used to link two windows that contain the same view. Linking a view to itself is useful to view two different pages of the same view record at the same time.

Unlinking Views

Selecting the Window Unlink command eliminates all links for the current window. If you have several windows that are "driver" views for links, you must make each one current before executing Window Unlink.

Practice

In this session, you will display your records in key order; you will create a query definition and generate an index of selected records; you will then sort the selected records by account number.

You will also split, zoom, and move between several windows and link the display of records in two different windows.

1. First, execute File Load Custom-View and select the Invoice view to be loaded.
2. Rearrange the order in which the records can be displayed by defining a key field. Start by executing Order Key Add. A prompter list of available fields is shown. Move the prompter to [Product #] and press **Enter**. The Key Definition menu appears. Press **F10** to accept the default definition. The records will then be ordered according to the key you defined.
3. Execute Data Browse All so that you can see how the records are arranged. Figure 5-23 shows what your screen should look like.

Figure 5-23

Invo	Account #	Product	Quantit	Unit Price	Total
0	10067		100	53.99	5399.00
1	10071	A0000001	20	52.95	\$59.00
3	10056	C2020202	15	\$7.95	\$119.25
5	10071	L6667777	75	\$4.95	\$371.25
6	10071	Q9879879	20	\$29.95	\$599.00
7	10067	R9006521	150	\$9.99	\$1498.50
2	10056	T1112111	100	\$0.85	\$85.00
4	10067	T4321432	50	\$5.95	\$297.50

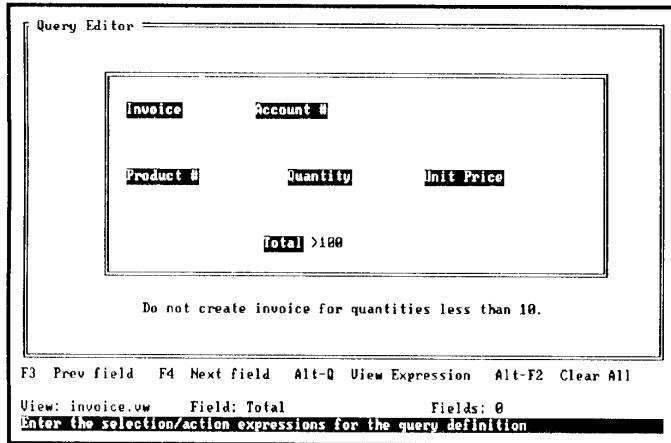
Menu: **Data** File Order Print Tools Window Help Remember Quit

View: invoice.vw Key: Product # Window: 1 Rec: 8 (8)

Browse Cross-Tabs Delete Enter Find Goto Query Relate Send Transact Utilities

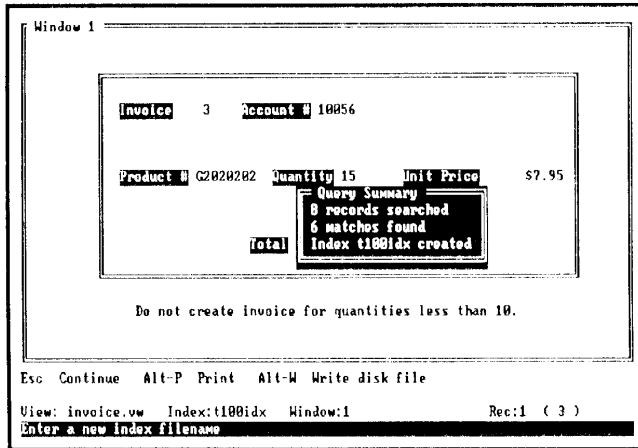
4. Return to normal view mode by executing Data Browse Off.
5. Now, process all the records in this view to find those whose sale total is over \$100.00. Execute Data Query Create. Name the query definition **tot100**. Select the New option. You will see a screen called the Query Editor, which looks a lot like Enter/Update Mode.
6. Move the cursor to the [Total] field and type the QBE (Query by Example) expression **>100**, just as though you were entering data in Enter/Update Mode. The expression instructs ANGOSS to select only those records having an amount greater than \$100.00 in this (the [Total]) field. Your definition should look like Figure 5-24.

Figure 5-24



7. Press **F10** to complete query definition.
8. Select Data Query Execute to execute the query you have just defined. Select the **tot100** definition from the list of query definitions. Select the Index option to have the results of the query placed in an index and name the index **T100idx**. The query is then executed, and the Query Summary box is displayed. Figure 5-25 shows what the screen should now look like. Press **Esc** to remove the Query Summary from the screen.

Figure 5-25



9. Your view is now in index order. You can get a better idea of what this means by executing Data Browse All and looking at the selected records.
10. Now rearrange these queried records to ascending order by account number. Also establish a minor sort field so that when account numbers are the same, those records will be sorted by entries in the [Total] field. Begin by executing Order Sort Create. Name the sort definition **Acct**. A prompter list of available fields appears. Move the prompter to [Account #] and press **F6**. Then move the prompter to [Total] and press **F6** again. Because [Account #] was selected first, [Account #] will be the major sort field and [Total] will be the minor sort field. Press **F10** to complete the selections.
11. The Sort Definition menu then appears. Press **F10** to accept the default definition.
12. To sort the records using the definition you have just created, execute Order Sort Execute Dictionary and select the "Acct" definition file. You must then specify a name for the index that will be created from the sort. Name the file **acctidx**. The sort is then executed and your screen should look similar to the one in Figure 5 -26.

Figure 5-26

Invo	Account #	Product	Quantit	Unit Price	Total
3	10056	G2020202	15	57.95	\$119.25
4	10067	T4321432	50	55.95	\$297.50
8	10067		100	\$3.99	\$399.00
7	10067	R9006521	150	59.99	\$1498.50
5	10071	L6667777	75	54.95	\$371.25
6	10071	Q9879879	20	\$29.95	\$599.00

Menu: Data File **Order** Print Tools Window Help Remember Quit

View: invoice.vw Index: acctidx Window:1 Rec:1 (3)

Key Change Manual Sort

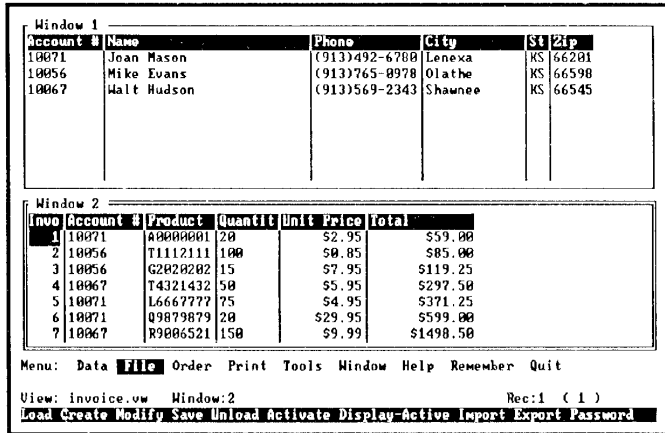
Notice that you created an index of an index. The sort was performed upon the records selected by query.

- Return the records to sequential order by executing Order Change Physical. Notice that all the records are displayed.

Now let's try using some of the Window commands to split the screen and link files through windows.

- Begin by executing Window Split Horizontal. Use the cursor keys to move the dividing line approximately halfway down the left edge of the screen. Press **Enter**. There are now two windows displayed on the screen.
- Execute File Load Standard-View and select the view Customer from the prompter list. The Customer view is now displayed in Window 1.
- Move to Window 2 by pressing **Alt F7**. Notice the double border is now surrounding Window 2. Figure 5-27 shows how your screen should look.

Figure 5-27



17. Press **F7** to zoom Window 2 to the full screen size. Press **F7** again to return to the split screen.

Now you must link the display of data in the two views by creating a window link. In this case, we will be placing the cursor on records in the Invoice view, and want the corresponding records in the Customer view to be displayed. Therefore, Invoice is the driver view, and the driven view will be Customer. [Account #] will again be the link field.

IMPORTANT: Establishing a Window Link does not automatically create a key field like Edit Link does. We must make sure [Account #] is a key field in the Customer view.

18. Press **Alt F7** to go to Window 1. Execute Order Key Add. Select [Account #] from the prompter list. The Key Definition Menu will appear. Press **F10** to accept the default definition. The records are now displayed in key order by account number.
19. Press **Alt F7** again to return to Window 2. Execute Window Link. A prompter list of fields then appears. Select [Account #]. Select Customer.vws as the view to link to. A list of fields in Customer then appears. Again select [Account #].
20. The display of records in the two windows is now linked. Move the cursor up and down through the records in Invoice and watch the changes in Customer. For example, when the

cursor is on a record containing the account number 10071, the record with the corresponding account number in the Customer view is at the top of the list.

21. Unlink the views by executing Windows Unlink.
22. Execute File Unload All to unload both views.
23. Press **Alt W** to close the split window.

Chapter 6: Printing Database Information

Just as important as designing your database and entering data into it is being able to output the data in a meaningful form. This chapter discusses procedures for printing Database files.

Before You Print

There are several steps you should take before printing a file. First, execute Tools Preferences Hardware and review your printer settings. Make sure that the `Printer:` setting reflects the printer and mode you will be using. Also review all other printer related items to make sure they are set properly for the current print job. For more information on each of these settings, see *Printing in ANGOSS* in *ANGOSS Software System*.

ANGOSS Database allows you to output your data to the screen, to a disk, or to a printer in a number of different formats. Two predefined formats are available, as well as custom report formats that can be designed to meet your needs.

The Print Current-Record option prints a copy of the current data-file record in list, page, or view format. Print View prints a copy of every record in the current view's data-files in list or report format. Custom report formats can be created with the Print Report commands.

Predefined Formats

The Print Current-Record and Print View commands print data in predefined formats. They are simple to use and do not require the creation of a definition file. In most cases, you only have to specify which fields you want to include in the printing.

Printing the Current-Record

Print Current-Record prints information about the record that is currently displayed. Page size, and paper handling information for all non-report database printing is controlled by the `Paper`

Profile settings on the Hardware Preferences menu. For information about settings this paper profile, read *Printing in ANGOSS* in *ANGOSS System Manual*.

Print Current-Record List

The List option prints each field of the current record on a new line. It also includes the logical number of the record and indicates whether or not the record is active. Figure 6-1 shows an example of output from the List option of Print Current-Record.

Figure 6-1. Print Current Record List

```
Record#:1 Act:Y  
Name: John Tyler  
Account: #: 176  
Phone: 212-573-5846  
City: New York  
Zip: 10004
```

Printing Records with View Tables

If you execute Print Current-Record List on a record with a view table in it, all records from the table will print out with the record in list format. Figure 6-2 shows an example of output from a record with a view table.

Figure 6-2. Print Current-Record List with a View Table

```
Record#:7 Act:Y
Donor #: 121
Name: Robin Murphy
Address: 494 Lee Street
City: Lenexa
State: KS
Zip: 66219

    Date: 02/15/1989
    Amount of Donation: $100.00

    Date: 04/21/1989
    Amount of Donation: $75.00

    Date: 04/17/1989
    Amount of Donation: $100.00
```

Print Current-Record Page

The Page option of Print Current-Record prints the current page of the record in the current screen format.

All. The All option prints the entire page/screen, including field titles, text, and graphic characters. All does not print the command list or help lines. Figure 6-3 shows an example of output from Page All.

Figure 6-3. Print Current-Record Page All

```
Account # 176
Name John Tyler
Phone 212-573-5846
City New York
Zip 10004
```

Data. Print Current-Record Page Data prints the data as it is displayed on the screen, but only the data in the fields is printed. No text, graphics, or field titles are printed. This option can be useful for printed forms if the screen design matches the design of the form. Figure 6-4 shows an example of output from Page Data.

Figure 6-4. Print Current-Record Page Data

```
          176
    John Tyler
      212-573-5846
New York          NY
      10004
```

NOTE: If you select Print Current-Record Page with a standard view loaded, the output will consist of all the records that are currently on the screen in tabular format.

Printing Records with View Tables

If you print a record containing a view table with the Page option, you will get all the data exactly as it appears on the screen. If you select Page All, you will get any boxes, text, or field titles on your screen. If you select Page Data, you will only get the data.

Print Current-Record View

Print Current-Record View prints all pages of a multi-page view in the format in which it appears on the view. The option All prints data, field titles, text, and graphics, while the Data option prints data only.

NOTE: If you execute Print Current-Record View with a standard view loaded, you will get all pages of the record the cursor is on, in list format.

You can use the following project file to print the entire file in Print-Current-Record View format.

```

data goto record first
while record <= records
  print current-record
  data goto record next
end while

```

Printing Records with View Tables

The View option will work the same on a record that contains a view table. You will be able to print all pages of the view, just as they appear on the screen.

Printing the View

Print View allows you to print all the records in data-files attached to the current view. This information can be printed in a simple list format or in a tabular report format.

NOTE: If you place your records in key order, that is the order they will be printed in. Likewise, if you place your records in index order, only those records in the index will be printed.

Printing to Screen

The Print View commands give you the option of outputting your data to the screen as well as to a printer. The records will scroll across the screen in the format you have specified. You can control the scrolling speed by pressing a number. The higher the number, the faster the scroll rate. (0 = 10, which is the fastest speed.) The Screen option is an excellent way to "preview" your data before selecting the Printer option to send it to a printer.

Print View List

Print View List prints each record of the current view in the current logical order of records. A prompter appears asking you to select those fields you wish to include in the list. You can move the pointer arrow using the cursor keys. To select a field to print, position the pointer arrow next to it, and press **F6**. After you have specified all the fields you wish to print, press **Enter**.

Following is an example of list format:

```
Record #:    1 Act: Y
Name: George Jones
Company: Sticon, Inc.
Address: 256 Kimball Road
City: Kansas City
State: MO
Phone: (816)-736-4824

Record #:    2 Act: Y
Name: Jo Garrett
Company: Genero, Inc.
Address: 30 Oak Road
City: Kansas City
State: MO
Phone: (816)-354-5684
```

Any table records on the view are indented five spaces when the list is printed. This allows you to easily identify view table records.

Print View Report

Print View Report prints each record of the current data-file in a predefined, columnar report format. You are again asked to select, from the prompter, the fields you wish to print. Report format automatically prints column headings with the data from each of the selected fields beneath the proper heading. Following is an example of Report format:

Name	Company	Phone
-----	-----	-----
George Jones	Sticom, Inc.	(816)-736-4824
Jo Garrett	Genero, Inc.	(816)-354-5684
John Tikin	Botkin Mfg. Co.	(816)-645-3851

Table records appear as additional columns with each record in the table area(s) occupying a line of output. All table records that correspond to a particular view record are printed before the next view record is printed.

Custom Reports

Setting up a custom print report involves the creation of a definition file. This is more complicated than using one of the predefined formats, but the results can make the effort worthwhile. By creating a report definition, you can specify multiple formats to be printed in the same report; the printing of fonts; and the insertion of additional text, calculations, breakpoints, and summary information.

The Database provides three main types of custom reports: a table report, a form report and a combination report, which includes both a form and table on the same page. Many additional report options provide even more flexibility over the content and format of your report.

IMPORTANT: Report definitions are not tied to a particular view. As long as the field titles and overall record structure are consistent, a report definition can be used on any number of views. A view you intend to print with this definition must be loaded when you create the definition and when you execute it.

Table Report

In a table report, each record occupies a line, and each field is printed in a column. The following is a sample table report format:

Name	Address	City	State	Zip
John Doe	300 Main St.	Kansas City	MO	64114
Bill Ford	1243 Oak St.	Kansas City	MO	64114
Jim Masium	2343 W. 112	Kansas City	MO	64114

Form Report

In a form report, fields can be placed anywhere on the page. This format can be used for mailing labels and preprinted forms. The following is an example of form report format:

John Doe (816) 482-4921 134-35-7483
 Director, Product Services Rm. 137

Combination Reports

You can also create a combination report that includes both table and form formats. The following invoice is a common example of this type of report.

John Doe
ACME Service
419 West Main Street
Kansas City, MO 64114

Quantity	Description	Unit Price	Total
10	Office Chairs	95.00	950.00
10	Desks	159.00	1590.00
10	File Cabinets	69.00	690.00
Grand Total			3239.00

The name and address section of the invoice is a form report, and the itemized list of purchases is a table report.

NOTE: Print Report skips deleted records, printing only those records that are active.

Printing Mail Labels

A common use of a Form report is printing mail labels. Following are the steps necessary to set up both one-up and three-up labels.

NOTE: Printing labels is often a trial and error process. This discussion presents the steps that must be taken to set up label formats. Getting the exact positioning of printed information on a label may take several modifications to the Report Definition.

One-up Labels

First, load a data-file which contains name and address information using File Load. Then execute Print Report Create and name the view definition. Select the New option to create the definition from scratch.

Page Definition

The first step is to define the printed page. Select the Page option from the Report Definition menu. The Page Definition Screen appears. You must specify the paper profile you are using to print the report.

Paper Profile

A Paper Profile is made up of the page size and paper path you want to use to print a file. The paper path tells ANGOSS where the printer will find the paper for this job, and how it will move it through the printer. For example, you can specify the use of a tractor feed, or manual feed; choose between several paper trays; or specify the use of an envelope or single sheet feeder. Page size tells ANGOSS whether you will be printing an 8-1/2 by 11 inch page, an envelope or a custom page size.

This paper profile will control printing of Database reports. The following steps explain how to select a paper profile.

STEP 1: With the cursor on Paper Profile:, press F6.

A two-column, pop-up box is displayed listing available paper paths and sizes. Figure 6-5 illustrates this box.

Figure 6-5. Paper Profile

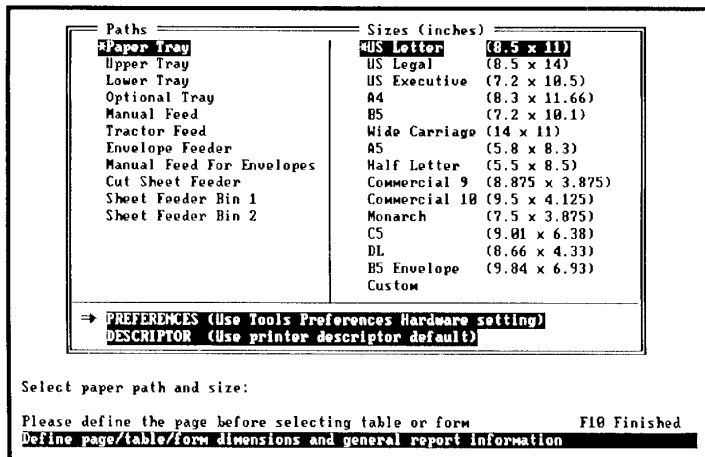


Table 6-1 explains some of the selections in this box.

Paper Paths

Item	Definition
Paper Tray	If your laser printer has only one tray, select this path
Upper Tray	Paper will be taken from the upper tray of a laser printer
Lower Tray	Paper will be taken from the lower tray of a laser printer
Optional Tray	If you have purchased a special attachment to allow you to add a second tray to your printer, select this path to use that optional second tray
Manual Feed	Paper will be manually fed into the printer
Tractor Feed	A tractor feed device will be used to move paper through the dot matrix printer
Envelope Feeder Attachment	An attachment will be used to feed envelopes into the printer
Manual Feed for Envelopes	Envelopes will be manually fed into the printer
Cut Sheet Feeder Attachment	If your dot matrix or bubble jet printer has only one sheet feeder attached, select this option
Sheet Feeder Bin	Paper will be coming from Sheet Feeder Bin 1 to a dot matrix or bubble jet printer
Sheet Feeder Bin 2	Paper will be coming from Sheet Feeder Bin 2 to a dot matrix or bubble jet printer

Paths that are appropriate for the current printer are highlighted. As you move the arrow down the list of paths, the appropriate paper sizes for that path are highlighted.

Notice that one path and one paper size are marked by an asterisk. This indicates that these are the default path and paper size as listed in the current descriptor file.

ANGOSS gets information about appropriate selections and the default path and page size from the currently selected printer descriptor file. If you wish to change the default settings, or if you know your printer supports a particular path or size that is not highlighted, you may want to edit the appropriate descriptor file. Read *Editing Descriptor Files* in *ANGOSS Software System* for more information.

STEP 2: Use up arrow, or down arrow to move the pointer through the path selections. When the arrow points to the appropriate path, press Enter or right arrow.

If you wish to select the default path and paper size, move the arrow to the word **DESCRIPTOR** at the bottom of the box. If you wish to select the same settings you specified on the Hardware Preferences menu, move the arrow to **PREFERENCES** at the bottom of the screen. If you point to either of these words, the path and page size they represent are highlighted as a reminder.

If you set all paper profiles throughout ANGOSS to the **PREFERENCES** selection, you can change all the profiles by making changes in one place, the Hardware Preferences menu.

If you do not wish to select **DESCRIPTOR** or **PREFERENCES**, select a highlighted path. The arrow then moves to the Page Size column.

STEP 3: Select one of the highlighted sizes and press Enter.

If you select **Custom** in the Size column, a prompt is displayed on the command line. Enter the width and length of the custom paper size in inches.

You are returned to the Page Definition screen and your selections appear, separated by a comma, at the `Paper Profile:` prompt. If you select a size or path that is not supported by the current printer, a warning message will be generated when you try to print. You can abandon printing job, or continue. If you continue the print job, the printer driver will try to use the same page size, with a different path. If it is still not valid, the "default" profile specified in the current printer descriptor file will be used.

Orientation

Select **Portrait** to print the document across the width or horizontal side of the page. Select **Landscape** to print the document "sideways," across the length of the page. Landscape printing can only be accomplished if your printer supports it.

For the purpose of this example, assume we are using continuous feed paper in a dot-matrix printer. Laser printers require different settings and will be discussed later.

NOTE: The printer you will be using to print the report should be the current printer selected in Tools Preferences Hardware. Different types of printers have different hardcoded margins. If you create the definition with one printer and then switch to another when you print it, some of your data may be truncated. You can overcome this problem by adjusting the position of forms and tables on the page.

Continuous-Feed

When printing one-up labels on continuous feed paper, each label is treated as a mini-page. Therefore, the page size part of the paper profile setting on the Page Definition Menu must reflect the size of the label. To accomplish this, specify a custom page size and enter the size of the label. For example, if you are printing on one-inch by three-inch labels, the page size would be 1 x 3 inches.

The default settings for Page Number, Start Page Number, and Lines per Inch are fine for this report, so no changes need to be made.

Move the pointer to the prompt `Is there a Form on the Page:`. Use the cursor keys or the space bar to move the highlighter to **Yes**. Several prompts now appear asking you to specify the location of the form on the page. The form can be placed anywhere within the dimensions of the page. For this example, the settings might be: `Upper Left Corner: Line 2 Column 2`, and `Lower Right Corner: Line 5 Column 23`.

No further settings need to be changed, so press **F10** to complete page definition.

Form Definition

Now select the Form option of the Report Definition Menu to further define the Form for the label. The Form Definition Window appears. Select the Label option. Move the cursor horizontally and vertically to define the size of the label. You will only be able to move the cursor within the page that you have already defined. When the box on the screen is the size you want your label to be, press **Enter**. The label will then appear on the screen as a highlighted box.

Next, decide which fields from the view will be printed in this label. Press **F6** to display a list of available fields. Move the pointer to the field you wish to print on that particular line of the label, and press **Enter**. If you wish to select more than one field for a line, use **F6** to highlight the fields and then press **Enter**.

Press **Enter** again to move the cursor to the next line of the label and continue selecting fields for all lines. For the example, you might select the following fields.

[Name]

[Address]

[City;State;Zip]

Press **F10** to complete the label definition. The Label Options menu appears. Here you can set the justification, overflow status, and processing conditions for the label. For the example, the default settings are fine. Press **F10**. Press **F10** again to return to the Report Definition Menu. One final time, press **F10** to complete the report definition.

Printing Labels

To print the labels, first load the view you wish to print and then select Print Report Execute. Select the name of the definition you have just completed. Select the Printer option and then the Detail option. Since you want to print one copy of each record in the view, from first page to last, press **Enter** in response to the next three prompts. The labels should then print.

Three-up

Printing labels three-up follows the same basic procedure as previously discussed. Again, select Print Report Create and name the definition. When the Report Definition Menu appears, select the Page option.

COMMENT: You can use the Screen option of the Print Report Execute command to preview the printout of the labels.

When printing three-up on continuous feed paper, one row of labels is treated as a mini-page. Therefore, if printing one-by three- inch labels, the page size part of the paper path should be a custom page size one label deep and three labels wide.

There will be a Form on the page. Again you must adjust the position of the Form within the page size you have just defined. Then press **F10**.

Select the Form Option of the Report Definition Menu. Again define one label, just as described previously under *One-up Labels*. After you have specified the fields to be printed, press **F10** to return to the Form Definition Menu.

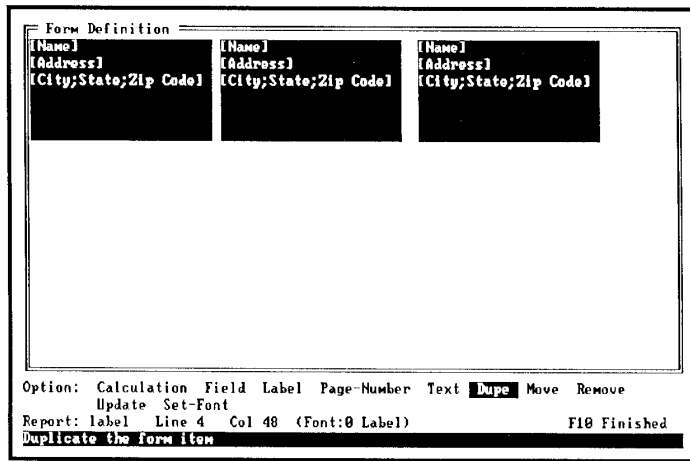
Duping Labels

You must define three labels in this definition in order to print three-up. To save time, you can duplicate the labels instead of creating them. With the cursor on the label you have already defined, select the Dupe option. Use the cursor keys to move the box to the position of the second label on the row, and

press **Enter**. Then select the Update option. Press **F10**. The Label Options Menu will appear. Change the setting for: Obtain next record before processing? to **Yes**.

NOTE: In order to print three-up, ANGOSS Database must obtain all three records before printing them and proceeding to the next page. Since each row of three-up labels is treated as a mini-page, the setting for the first label should be set to **No**, and the second and third labels set to **Yes**.

Figure 6-6. Three-Up Labels



Press **F10** to complete the Update. Repeat the Dupe process, duplicating the second label to the position of the third label. There is no need to Update the third label, since it is identical to the second label. Figure 6-6 shows how the definition will appear.

Press **F10** twice to complete the Report definition.

Laser Printers

Printing labels on a laser printer calls for the labels to be set up differently. Since the label stock goes through the printer one page at a time, the paper profile should reflect the size of a whole sheet of stock. In the Form definition, a label must be defined for each label on a sheet. For example, if your label sheet has 15 labels on it, you would need to have fifteen labels defined in the Form definition. Each label position will correspond to the position of a label on the sheet.

As before, you would define the first label, Dupe it to the second position, and then Update to change the prompt: `Obtain next record before processing?` to **Yes**. Then Dupe the second label for every other position on the page.

NOTE: For a laser printer page, only for the first label is the "`Obtain next record . . . ?`" prompt set to No; all other labels on the page are set to Yes.

Other Uses for Labels

Labels can be used for items other than mail labels. In any situation where you are specifying more than one field on a line, setting them up as a label instead of individual fields ensures more consistent spacing between fields on the same line. The label is then treated as one unit as opposed to each individual field.

For example, if you specified the fields `[City]`, `[State]`, and `[Zip]` to print on one line, each field occupies a specific position. If the length of the city fluctuates, the spacing of the line can look odd. If you specify all three fields as one line in a label, the spacing is dynamic. The `[State]` and `[Zip]` fields will adjust their positions to the length of the data in the `[City]` field.

Using Fonts

You can specify a font for your labels on the Form Definition Menu. The option `Set-Font` allows you to set the default font or change the font of any existing text. The default font is the font used for all subsequently created text on the Form.

When printing labels with a font, it is most efficient to set the font during the creation process. Use `Set-Font Default` to set the default font before creating the first label. Select the font you want to use for your label from the Font Prompter by moving the arrow to it and pressing **Enter**. If the font you want does not appear on the Font Prompter, you can press **F6** to define a new font in the Font Selector. More information about defining fonts is provided later in this chapter.

If you do not set the default font, you can also create the first label and then use `Set-Font Change` to change the font to the correct one. Select the font you want to change to from the Font Prompter list by moving the pointer to it and pressing **Enter**. If the font you want does not appear, press **F6** to define a new font in the Font Selector. More information about defining fonts is provided later in this chapter. If you wait until after you have created or duped all the labels, and then wish to change the font, you must place the cursor on each label and execute `Set-Font Change`. If you have many labels, this could be time consuming.

Font Prompter

After executing Set-Font Default or Set-Font Change, a font prompter will appear showing all defined fonts. You can select one of those fonts by moving the arrow to it and pressing **Enter**, or by typing the number of the font. If you want to use a font that is not displayed on the prompter, you can press **F6** to define a new font. The Font Selector Menu appears.

NOTE: Initially, only the 12 point standard font is listed on the font prompter.

Font Selector

The Font Selector Menu lists a font and its possible characteristics such as italics, underscore, and condensed. To see available settings for font family, character set, size, or color, position the pointer next to the option on the Font Selector Menu and press **F6**. Point to the setting you want and press **Enter**. If no list appears, no additional settings are available.

Other option settings, such as Width, Slant, Weight, Modifications, and Baseline Shift, are listed on the menu. Highlighted items are the current settings. Items shown in parentheses are not supported by the current printer. You can select options that are not supported by the printer, but the printed output will not match your specifications until you use a printer that can handle the options.

Specifying colors for fonts allows you to see at a glance where various fonts are being used. If your printer supports colors, the font foreground color will be printed.

Adjusting Positioning

Particularly with laser printers, you may need to make several adjustments to the position of the labels to get the result you desire.

To modify an existing Report Definition, execute Print Report Modify, and select the report definition you wish to edit. Once the Report Definition Menu appears, all options operate just as they did in the creation process. For a complete discussion of capabilities of each prompt, see the Print Commands in *Chapter 9: ANGOSS Database Command Reference*.

Printing on Preprinted Forms

There are times when it is necessary to format your data to match the layout of a preprinted form. A preprinted form may include a company logo and address, as well as boxes and rules to divide sections of the form. The placement of each field is important to make sure that the form is understandable and pleasing in its appearance.

Defining the Report

Select Print Report Create and name the new definition you are creating. Choose the New option. The first step is to define the page. Select the Page option on the Report Definition Menu.

Make certain that the paper profile reflects the page size and paper path you will be printing on. Specify that there will be a form on this page. Establish the position of the form within the page you have designated. Press **F10**.

Defining the Form

Select the Form option from the Report Definition menu. The position of fields on the Form will be determined by the layout of your preprinted form. Each field must be placed on the screen exactly where you want it to print on the preprinted form. The line and column indicators at the bottom of the screen can help you position each field.

Placing Fields

Move the cursor to the proper position, and select the Field option from the Form Definition Menu. A prompter list of available fields will appear. Move the arrow to the field you wish to select, and press **Enter**. A line appears on the screen, showing you the default field size. You can accept the default by pressing **Enter**, or use the cursor keys to change the area you want the field to occupy. The Display Options screen then appears. Here you can change the overflow status and justification of this field. Overflow status determines whether or not an error message will be generated when the data in the field overflows the field size. Justification affects the position of the data within the field (i.e., left, right, center). After making any desired changes, press **F10**.

Continue positioning and selecting all other fields you wish to print.

Adding Text

You can also use the Text option to add other text to the report. Select the Text option and then use the cursor keys to define the area you wish the text to occupy. Press **Enter**. A highlighted box is displayed. Enter the text you wish to print on each page of the report into this box. When you are finished, press **F10**. The Text Option screen then appears, and you can set the justification of the text within the area you designated. Press **F10** again to complete adding text.

Using Fonts

You can specify a font for any element on a Form. The option Set-Font allows you to set the default font or change the font of any existing text. The default font is used for all subsequently created items on the Report.

If you wish all elements on your form to be the same font, it is most efficient to execute Set-Font before placing any elements on the screen. By setting the default font to the font you desire, all elements placed on the screen will automatically be printed in that font. If you have defined all the elements of the Form, and then wish to change the font, position the cursor off of any form item and select Set-Font Change. Because you are not on an item, you can mark any number of items you wish to change the font on.

You can also position the cursor on each individual item and execute Set-Font Change.

NOTE: Font 0 determines the character sized assumed throughout the report definition.

Previewing the Report

When you have completed defining the Report, press **F10** twice to complete the process. You can preview the data and the format you will be printing by executing the Screen option of Print Report Execute. The data will appear on the screen in the format you defined in the report. This is a good opportunity to catch any errors and make changes before sending the data to a printer. The Text-Screen option causes the report data to scroll on the screen.

NOTE: Physical attributes, such as font size, will not appear when using Text-Screen option. If this is a requirement, use the Screen option instead.

Editing Report Definitions

It is easy to make adjustments to the paper profile, the position of the Form on the page, or to any of the elements in the Form. Execute Print Report Modify. Select the report you wish to modify.

Adjusting Positioning

To make adjustments to the paper profile, or the position of the Form on the page, select the Page option from the Report Definition Menu. Make any necessary changes, and press **F10** to exit.

NOTE: If you want to print page numbers at the bottom of your form, be sure to allow three lines to accommodate them.

Moving Elements

You can move any item, or block of items on the form. Position the cursor on the item you wish to move. Select the Move option from the Form Definition menu. A line will appear through the item. To

move that item, use the cursor keys to move the line to the new position. Press **Enter**, and the item will appear at the new location.

If you want to move a block of items, position the cursor at one corner of the area you wish to move. Select the Move option. A line will appear through the first item. Press **F2** to drop anchor, and use the cursor keys to create a box that surrounds the area you wish to move. Press **Enter** when the box is the proper size. Then use the cursor keys to move the box to its new location and press **Enter** again.

Removing Elements

You can also remove any item from the Form. Position the cursor on the item you wish to remove and select the Remove option. The item disappears from the screen. If you wish to remove multiple items from the screen, place the cursor near, but not on, any of the items before executing the Remove option. ANGOSS then enters a marking mode, and you can use the cursor keys to define a box that touches or contains all the items you wish to delete.

NOTE: Whatever the cursor is on when the Remove option is selected is automatically removed. Be sure your cursor is in the proper position before selecting the option.

Updating Elements

You can also edit many of the elements you have placed in the form with the Update option of the Form Definition Menu.

Calculations. If you select the Update option when the cursor is on a calculation, the equation for that calculation appears so that you can edit it. If your formula is less than 255 characters, it will appear at the bottom of the screen. If it is more, the Formula Editor will appear, so you can do your editing there. Even if your formula appears at the bottom of the screen, you can press **F5** to enter the Formula Editor. Press **F10** when you are finished editing. The Calculation Options menu appears, and you are able to edit the settings for Overflow status, Justification, and Display formatting.

Fields. If you select the Update option when the cursor is on a field, the Display Options menu appears and you can edit the Overflow status and Justification settings.

Labels. If you select the Update option when the cursor is on a label, you can edit the contents of the label. This includes deleting or adding fields and inserting or deleting blank lines in the label. Press **F10** when you are finished editing. The Label Option menu appears, and you can edit the Justification, Overflow status, and record processing settings.

Page Number. If you select the Update option when the cursor is on a page number, the Page Number Options menu appears and you can edit the Control String, Justification, and Overflow Status settings.

Text. If you select the Update option when the cursor is on a text block, you can edit the contents of the text block. Press **F10** and the Text Options menu appears, allowing you to edit the Justification setting.

Designing Your Own Forms

If you don't have a preprinted form to print on, you can create your own form by adding graphics such as boxes, rules, and special characters to your report.

Using Graphics

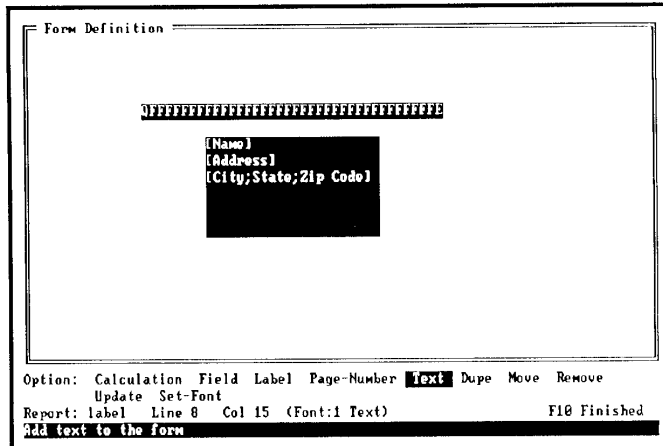
You can place graphics on the form just as you would any other text. This is done by using a graphic font, such as l-graphic (line graphics), b-graphic (bar graphics), symbol, or one of the dingbat fonts.

Following is the procedure for placing a box around a label on the Form Definition Window. First, make the l-graphics font the default font. Select the Set-Font Default option of the Form Definition menu. If the l-graphics font is not one of the choices on the prompter that appears, press **F6** to define a new font. When the Font Selector appears, press **F6** to see a list of available fonts. Select the l-graphics font and press **F10** to complete the font definition. The l-graphics font is now the default font.

NOTE: If the printer you have selected in Tools Preferences Hardware cannot support graphics fonts, they will not be available for you to select.

Position the cursor where you would want the upper left corner of a box to be. Select the Text option. Use the cursor keys to make the line the length you want the top of the box. Press **Enter**.

Appendix B of *ANGOSS Software System* will show you which characters to type to get the graphic you want. Look under the l-graphic column until you find the character you want to print. Follow that line across to the column titled Smart. For example, look for a double-lined upper left corner. You can then look across to the Smart column and see that the character with the same value in the Smart character set is a capital Q. In order to get the graphic character to print out, type the Q on the screen. Figure 6-7 shows how the top line would look on the screen.

Figure 6-7. Drawing a Box with Line Graphics

When this is printed, the Q will be replaced with a double-lined upper left corner, the F with double-line horizontal bars, and E with a double-lined upper right corner. After you have typed in the line, press **F10**. The Text Options menu then appears. Press **F10** to accept the default setting.

You can save time in the next step by using the Dupe option. Place the cursor on the Q, and select the Dupe option. A line will appear through the entire text line you have created. Use the cursor keys to move the line to the position where you want the bottom of your box. Press **Enter**.

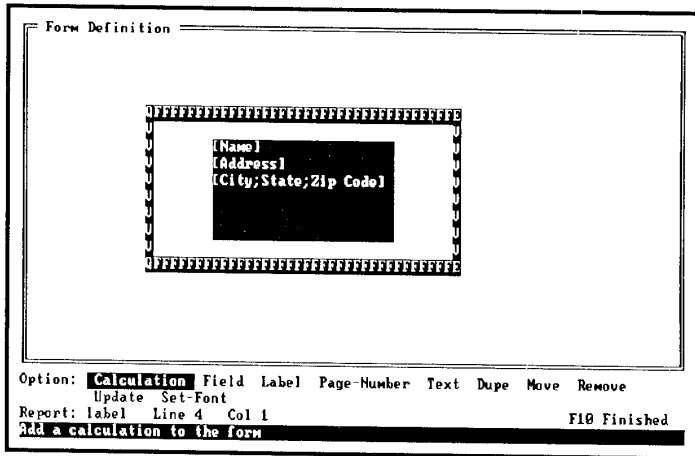
Now select the Update option. Use the cursor keys to change the Q to a Z and the E to a C. This will give you lower corners instead of upper corners. Press **F10**. The Text Options screen then appears. No changes are needed here, so press **F10**.

Now create the sides of the box. Position the cursor one line below the Q in the upper line of the box. Select the Text option. Use the cursor keys to move the line back under the Q and press **F2** to drop anchor. Press **down arrow** until you reach the bottom of the box. Press **Enter**.

The capital V will give you the vertical double-line. Type a V and then press **Enter**. Continue typing V and pressing **Enter** until the line is completed. Press **F10**. The Text Options screen appears. Press **F10** to accept the default setting.

Move the cursor to the first V and select the Dupe option. Use the cursor keys to move the line to the other side of the box. Press **Enter**. Your box should resemble the one in Figure 6-8.

Figure 6-8. Drawing a Box with Line Graphics



When you print this form, the letters will be replaced by a double-line box.

This is just a simple example of the way graphics can be used to customize your report. Any of the characters listed in *Appendix B* of the *ANGOSS Software System* under the l-graphic, b-graphic, dingbat1, dingbat2, and symbol fonts can be used to create graphics in your report, if your printer supports them. Take some time to experiment with these fonts.

NOTE: If your printer has internal fonts or cartridge fonts that can produce line graphics or symbols, you may wish to use them. Since these fonts are characters and not graphics, they will print much faster.

Be sure to return the default font to a non-graphics font before you add any text, fields, or calculations to your form. If you don't, your data will also print out in the graphics font.

Report Tables

Defining a report table allows you to print data in a columnar format. By defining a report table instead of using the Print View Report command, you have much more control over the format and positioning of your columns. You can also add calculations, text, titles, breakpoints, and summary information to your report table.

A Simple Report Table

A simple report table will print information you specify about every active record in the current view. To create a simple report table, begin by executing Print Report Create and naming the definition. Then select the new option to create a definition from scratch. The Report Definition Menu then appears.

Page Definition

First you must define the print page. Select the Page option from the Report Definition Menu. Make sure that the paper profile and orientation settings are appropriate. Move the arrow down to the setting: *Is there a Table on the Page:*, and change the setting to **Yes**. A number of other settings appear, allowing you to adjust the position of the table on the printed page and the spacing of the table. For this example, the default settings are fine, so press **F10** to complete the page definition.

Printing views with view tables. If you establish a report definition for a view that contains a view table, an additional prompt will appear on the Page Definition menu. At the bottom of the screen you will see:

Process records from View Table (leave blank for view Records):

You will also see a box at the bottom of the screen, which lists all the view tables on the current view.

IMPORTANT: If you want all records from the view table to print in the report table, you must type the name of the table after the prompt. If you leave the area blank, only the first table record of each view record will be processed.

Table Definition

Next, select the Table option of the Report Definition menu. The Table Definition screen appears. Select the Columns option. You can now specify which fields will appear in the report table and where the columns will be positioned.

Select the Field option. A prompter list of available fields is displayed. Move the arrow to the first field you wish to print and press **Enter**. The Field Options menu will appear. Here you can adjust the column width, establish headings for the column and determine the justification of both the heading and the data printed in the column. Many of the defaults on this menu are determined by the format established when the field was created. You can accept the defaults or change them. Press **F10** to complete the definition of the first column.

NOTE: To print a multi-line field, containing indentations or other spacing, it is very important to specify the proper length for the field. In order for the field to print in the report **exactly** like it does on the screen, the width in the report must match the display width of the field. Let's assume you have a 300 character field in the data file, that is displayed on the screen in six lines of fifty characters.

When that field is placed into the table, you need to make the field 50 characters wide. If you make the field 49 characters wide, any leading spaces on each line of the field will be stripped out and you will lose your formatting. If you make the field 55 characters wide, the lines will wrap differently, and your formatting will also be disturbed.

Move the cursor to where you would like the next column to print. Then repeat the process to select another field. Continue moving the cursor and selecting fields until all the fields you wish to print are defined. You can define up to four lines of text and fields. To move up and down between lines, use **up arrow** and **down arrow**.

Column Widths. On the Table definition screen, alpha fields will be represented by XXXXX, numeric fields will show a nine (9) in each position with its selected format (i.e. \$99,999.99cr), and date fields will display the current date. Any fields filled with asterisks (*) indicate that the column width set in the table definition is not wide enough to display the data for that field. This commonly happens with Dates, depending on the display format you select. To correct the problem, place the cursor on that field and select the Update option. Then edit the column width.

Moving Columns. If you would like to move any column, position the cursor on that column and select the Move option. Move the cursor to where you want the column to be, and press **Enter**. Moving a column may cause other columns to be adjusted on the table

Previewing the Report Table

After you have finished defining all your columns, press **F10** three times to complete the report definition.

You can preview your report by executing the Screen option of the Print Report Execute command. Figure 6-9 shows how part of this report would look.

Figure 6-9. Print a Report to the Screen.

Donor #	Date	Amount of Donation
121	03/29/1989	\$100.00
247	03/30/1989	\$150.00
340	03/30/1989	\$ 75.00
121	03/31/1989	\$100.00
340	03/31/1989	\$ 50.00
300	03/31/1989	\$ 50.00

Establishing Breakpoints

In Figure 6-9 you will notice that several donors have made more than one donation on this report. It would be nice to group all donations from each donor together on the page. This can be done by establishing a "breakpoint." A breakpoint divides a table into similar subgroups of records, according to the data in a "break field."

For this example, since we want to group the records according to donor number, the field [Donor #] will be the "break field."

Selecting a Break Field

Breakpoints can be set when you are creating or modifying a report. Select the Table option from the Report Definition menu. You will see the fields you have defined for the Table. Select the Breakpoints option. Then select the Add option. Use the cursor keys to move the highlighter to the field which will be the break field. In the case of this example, the highlighter would be placed on the [Donor #] field. Press **Enter**. Or, you can press **F6** to display a list of available fields, and select [Donor #] from that list.

The Totals Options screen then appears. At this point, we only want to separate our breakpoint subgroups with blank lines. Set each line under `Output Lines:` to **Omit** by using the cursor keys to move the arrow down, and then the space bar to move the highlighter. Move the prompt arrow to the `Result Line Label:` prompt. Press **F3** to blank the text. Leave all other prompts at their default settings. Press **F10**.

A number of summarization options for the breakpoint you are defining now appear at the bottom of the screen. For this example, none of these options are needed, so press **F10** to complete the definition. Press **F10** three more times to complete the report definition.

IMPORTANT: Before executing this definition, the view must be ordered according to the field that is a break field. You can order the fields by a key or a sort, according to the break field.

When you execute this definition, you will get a report that looks like Figure 6-10.

Figure 6-10. A Report with a Breakpoint

Chapter 6: Printing Database Information

Donor #	Date	Amount of Donation
121	02/27/1989	\$ 25.00
	03/06/1989	\$100.00
	04/12/1989	\$ 50.00
	04/28/1989	\$ 60.00
200	03/31/1989	\$100.00
	04/05/1989	\$ 50.00
247	02/15/1989	\$ 30.00
	02/28/1989	\$ 50.00
	03/17/1989	\$ 50.00

Multiple Breakpoints

You can establish more than one breakpoint for each report. This allows you to break the information into even smaller subgroups.

For example, look at how breakpoints are used to group the data in Figure 6-11.

Figure 6-11. A Report with Multiple Breakpoints

Donor #	Fund	Date	Amount of Donation
121	Education	02/27/1989	\$ 25.00
		03/06/1989	\$100.00
	Research	04/12/1989	\$ 50.00
		04/28/1989	\$ 60.00
200	Research	03/31/1989	\$100.00
		04/05/1989	\$ 50.00
247	Education	02/15/1989	\$ 30.00
	Research	02/28/1989	\$ 50.00
		03/17/1989	\$ 50.00

In the first breakpoint, the [Donor #] field is selected as a break field. This groups all the donations together according to their donor number. The second breakpoint sets the [Fund] field as a break field. This divides the records within the donor number group according to which fund the contribution will go to.

IMPORTANT: Before executing a report definition containing breakpoints, the view must first be ordered or sorted according to a key field that is the same field as the break field. If more than one break field is specified, the order in which the break fields were selected must correspond to the order of major and minor fields in the key.

Adding Breakpoints

Additional breakpoints can be added during report creation or modification. Select the Table option and then the Breakpoints option. Then select the Add option. You then see the phrase Break 2 :

at the top of the screen. Press **Enter** to signify that you want to add a break at the current break position. Move the cursor to the break field for the second breakpoint. Press **Enter** again.

The Totals Options menu then appears. Since we don't want any output associated with this break field, set all five lines under `Output Lines:` to **Omit**. Move the arrow to the `Result Line Label:`. Press **F3** to blank the text. Set `Lines to Skip After Break:` to **1**. Press **F10**. No summary options are required, so press **F10** again. Press **F10** three more times to complete the report definition.

Result Lines

Now that the report table has grouped all the records according to the break field, you can generate summarization information about each breakpoint. For example, you can determine the total donation for each donor. This is done by adding result lines to the breakpoint.

Result lines can be added when you are creating or modifying the report definition. Select the `Table` option from the definition menu. Then select the `Breakpoints` option. To add a result line to the breakpoint we have already specified, select the `Update` option. Move the cursor to the break field and press **Enter**. You can use **F3** and **F4** to move through breakpoints.

The Totals Options menu appears. Under the `Output Lines` prompt, make the following settings:

Line 1: Underscore

Line 2: Results

Line 3: Double

Line 4: Omit

Line 5: Omit

These settings mean that at each breakpoint an underscore will be printed, followed by the result of a calculation, and finally a double line.

At the `Result Line Label:` **Total** is the default setting. You can accept the default, or type in your own title. The rest of the default settings can remain the same for this example. Press **F10**.

A list of breakpoint summary options appears at the bottom of the screen. In this case we want to know the sum of all donations for each donor, so we will use the sum option to get a result.

First, use the cursor keys to move the highlighter to the field whose data will be summed, in this case, the `[Amount of Donation]` field. Then press **S** to select the Sum option. The word Sum will appear beneath the field. Press **F10** to complete the definition.

When executed, this definition will generate a report that resembles Figure 6-12.

Figure 6-12. Breakpoint Result Lines

Donor #	Date	Amount of Donation
121	02/27/1989	\$ 25.00
	03/06/1989	\$100.00
	04/12/1989	\$ 50.00
	04/28/1989	\$ 60.00
	Total	----- \$235.00 =====
200	03/31/1989	\$100.00
	04/05/1989	\$ 50.00
	Total	----- \$150.00 =====

NOTE: Result line labels can be specified by a formula. To do this, you must enter an equal sign as the first character in the setting. The equal sign is then followed by a valid ANGOSS text expression or formula.

Multiple Result Lines

More than one result line can be specified for each breakpoint. This way, you can specify a number of different summarization options to be performed on each subgroup of the report. Figure 6-13 shows how the additional result line **Average Donation** can be added to the **Total** result we have already defined.

Figure 6-13. Multiple Breakpoint Result Lines

Donor #	Date	Amount of Donation
121	02/27/1989	\$ 25.00
	03/06/1989	\$100.00
	04/12/1989	\$ 50.00
	04/20/1989	\$ 60.00
	Total	\$235.00
	Average Donation	\$ 58.75

200	03/31/1989	\$100.00
	04/05/1989	\$ 50.00
	Total	\$150.00
	Average Donation	\$ 75.00

Adding Result Lines

Additional result lines can be added by selecting a break field that has already been defined as a break field. A break field can only be defined as a breakpoint once, so if you select it again, you are given the opportunity to assign additional result lines.

Select the Table and Breakpoints options. Then select the Add option. Use **F3** and **F4** to move to the breakpoint to which you wish to add a result line. Press **Enter**. Move the cursor to the break field you have previously defined and press **Enter**. Notice the message at the top of the screen now shows not only a break number, but also a line number. This shows you are defining additional result lines for this break, and not a new break.

On the Totals Options screen, you can choose to have this result surrounded by underscores, double lines, or blank lines. Remember that this result will print out following the previously defined result, so you may want to go back and edit those output lines to improve the appearance.

Move the arrow to **Result Line Label:** and type in the title you want for this result. In the case of this example, you might type **Average Donation**. Then you can decide how many blank lines you want printed between this break and the next. Press **F10**.

The summary options again appear at the bottom of the screen. First, move the cursor to the field that will be summarized. In this case the [Amount of Donation] field. Since we want the average of

the donations for our example, choose the Average option. Press **F10** four times to complete the report definition.

Grand Totals

You can also specify a grand total to be calculated and printed for one or more fields. You can specify any of the summary options available under breakpoints to be used to generate a Grand Total. The difference is that it will be calculated on all records in the report, not on a breakpoint subgroup. Figure 6-14 shows how a grand total line could be added to our example report. In this case, it shows the amount of money donated by all donors in the report.

Figure 6-14

200	03/31/1989	\$100.00
	04/05/1989	\$ 50.00

	Total	\$150.00
	Average Donation	\$ 75.00
		=====
247	02/15/1989	\$ 30.00
	02/28/1989	\$ 50.00
	03/17/1989	\$ 50.00

	Total	\$130.00
	Average Donation	\$ 43.34
		=====
		=====
	Grand Total	\$2,734.00
		=====

Adding a Grand Total

You can add a Grand Total line when creating or modifying a Print Report. Select the Table option from the Report Definition Menu. Then select the Grand-Totals option. Select the Add option.

The Grand Totals Options menu appears. Here you have many of the same options you have on the Breakpoint options menu. You can specify how many lines to skip between the report body and the grand total line. Up to five output lines can also be specified for the grand total. The grand totals will be

printed in the order they are entered. You can surround the grand total with double lines, single line, blank lines, or any combination of these items. The result line label presents Grand Total as a default label you can accept it or change it.

When you have specified all necessary settings on the Options menu, press **F10**. The list of summary options now appears at the bottom of the screen. Use the cursor keys to move the highlighter to the field you want to total. Press the appropriate letter for the summary operation you want conducted on the report. In the case of the example, select Sum. Then press **F10** to complete the Grand Total definition.

Titles

Titles are headings, footings, and other miscellaneous information that can be printed on table reports.

Headings and Footings

Headings are printed at the top of the page and Footings are printed at the bottom of the table area.

If you select the Titles option from the Table Definition Menu, the Title Definition screen appears. Here you can type in text for your headings or footings and specify their justification. You can also specify how many blank lines will be printed after headings and before footings. Lines can also be specified to enclose the report.

Control Codes. Control Codes identical to those used in the Word Processor can be used in headings and footings. The following table shows the available codes.

%L	Left Justification
%C	Center Justification
%R	Right Justification
%P	Is replaced by the current page number
%D	Is replaced by the date the report was printed
%T	Is replaced by the time the report was printed

%F	Is replaced by the name of view that is loaded when execution occurs
%[#BU]	Specifies a font for the text immediately following the control code.(# must be a valid font number.) The font number must be surrounded by brackets and can be followed by B or U to boldface or underscore text

Headings and Footings can also include calculations entered by typing an equal sign (=) at the start of the line. Titles are calculated just before they are printed using current field values. (If you need a single equal sign at the beginning of the line or after a PCC, precede the character with a "%".)

Printing only totals

So far, we have only shown examples of detailed printing of reports. There are times when you don't need that much information. For example, perhaps you don't want to see each donation a donor made, just the total amount donated. This can be done by selecting the Totals-Only option of the Print Command. When you select the command Print Report Execute and select the name of the report definition you wish to execute, you then specify whether to send the output to the screen, to disk, or to a printer. The next set of options are Detail or Totals-Only. The Detail option prints all the information you have selected for the report. Totals-Only prints information in the format displayed in Figure 6-15.

Figure 6-15. Printing Totals Only

Donor #	Date	Amount of Donation
121		
	Total	\$235.00
200		
	Total	\$150.00
247		
	Total	\$130.00

Specifying Fonts on a Table Report

You can use the Set-Font option to specify fonts on a table report. You can set the Default font or change the fonts for Column-Headings, Heading-Titles, and Footing-Titles.

Within any of the four options, you can select an available font from the Font prompter list of fonts, or you can use the Font Selector to specify a new set of font characteristics.

Combination Reports

There are a number of times when it is necessary to print both a form and a table in the same report. Combination reports allow you to create a printed report that resembles your view, if you have created a view with a view table in it. You can define a form to represent the view fields, and a table to represent fields in the view table.

One of the most common uses for this type of report is printing invoices. Figure 6-16 shows a sample invoice that could be created with a combination report. The name and address area is defined as a form, and the list of purchases is defined as a table.

Figure 6-16. A Combination Report

212321			
John Doe			
ACME Service			
419 West Main Street			
Kansas City, MO 64114			
Quantity	Description	Unit Price	Total
10	Office Chairs	95.00	959.00
10	Desks	159.00	1590.00
10	File Cabinets	69.00	690.00
Grand Total			3239.00

Using Forms and Tables together

Execute Print Report Create and name the new definition file. Select the New option to create a definition from scratch. The Report Definition screen appears.

Page Definition

Select the Page option from the Report Definition menu. The page definition screen appears. Specify that you want a form and a table on the page by setting responses to the following prompts to **Yes**.

Is there a Form on the Page:

Is there a Table on the Page:

Positioning. Under both the Form and Table prompts additional settings appear asking you to specify the position of the upper left and lower right corners of each element. You have great flexibility as to where you position the form and table on the page.

NOTE: The table can overlap the form dimensions in anyway except to completely obscure it. The default positioning will overlap the form and table completely, so you will need to make changes. If the table obscures the form you will get an error message when you exit the Page Definition screen.

Overflow. There are several additional settings that appear only when you are specifying a combination report. They are:

On Combination Reports:

Start the Table Overflow at the Top of Page: **Yes** No

Reprint the Form on Page Overflow: Yes **No**

Start the Table Overflow at the Top of Page: should be set to **Yes** if you want any overflowed portion of the table to start at the top of a new page. Set to **No**, this specification causes the overflowed portion to start at the first defined line of the table on a new page.

Reprint the Form on Page Overflow: allows you to specify whether to reprint the form if a page overflow occurs.

NOTE: If you have both of these options set to **Yes**, and your form is positioned above the table on the page, both the form and the table will try to reprint at the top of the overflow page. In this situation, the form or the table should overflow, but not both.

View Tables. If you are creating a report for a view that contains a view table, the following prompt will also appear on the Page Definition Screen.

Process records from View Table (leave blank for view Records):

You will also see a box at the bottom of the screen, which lists all the view tables on the current view.

IMPORTANT: If you want all records from the view table to print in the report table, you must type the name of the table after the prompt. If you leave the area blank, only the first table record of each view record will be processed.

If you are trying to recreate the appearance of a view table in your report, you must type in the name of the table at this prompt.

NOTE: Although a view can have multiple view tables, only one view table can be used in a report table.

After adjusting all your settings, press **F10** to complete Page Definition.

Form Definition. Select the Form option from the Report Definition menu. When the Form Definition screen appears this time, a shaded box will represent the area you have specified for the Table to print on this report.

Since we are creating an invoice for this example, we will use the Label option to position the name and address for each invoice. Select the Label option, and use the cursor keys to define the area where you want the label to print. Press **Enter**. Next, decide which fields from the view will be printed in this label. Press **F6** to display a list of available fields. Move the pointer to the field you wish to print on that particular line of the label, and press **Enter**. If you wish to select more than one field for a line, use **F6** to highlight the fields and then press **Enter**.

Press **Enter** again to move the cursor to the next line of the label and continue selecting fields for all lines. For the example, you might select the following fields.

[Name]

[Address]

[City;State;Zip]

Press **F10**. The Label options menu appears. The default settings are fine for this example, so press **F10**.

At this point you could add any desired text, fields, calculations, or font changes to the form section of this report. To complete form definition, press **F10**.

NOTE: To print a multi-line field, containing indentations or other spacing, it is very important to specify the proper length for the field. In order for the field to print in the report **exactly** like it does on the screen, the width in the report must match the display width of the field. Let's assume you have a 300 character field in the data file, that is displayed on the screen in six lines of fifty characters. When that field is placed into the form, you need to make the field 50 characters wide. If you make the field 49 characters wide, any leading spaces on the first line of the field will be stripped out and you will lose your formatting. If you make the field 55 characters wide, the lines will wrap differently, and your formatting will also be disturbed.

Table Definition

Select the Table option from the Report Definition menu. The Table Definition menu appears, and you can set up your table just as previously described. Select the Columns option and then the Field option to select the fields you want printed in the table. If you want the report table to print information from a view table, be sure to select view table fields for the report table.

Press **F10** when you are finished specifying fields for the table. Now you must establish a breakpoint so the proper table items will print with the right form on each invoice page. The break field must be a unique field that both the form and the report table have in common.

Select the Breakpoints option and then the Add option. Put the highlighter on the desired break field and press **Enter**. The Totals Option menu then appears. You can specify a result line if you wish.

When you reach the prompt `Lines to Skip After Break:` change this setting to **New-Page**. This instructs the Database to go to the next invoice page and print the next form before printing anymore table entries. If this prompt is not set to **New-Page** your tables and forms will not be properly matched.

Press **F10**. The list of summarization options appears at the bottom of the screen. If you wish to have a summary performed on any of your fields, move the highlighter to that field. Then press the letter that corresponds to the summary you want to perform. Press **F10**. Continue pressing **F10** until you are back to the ANGOSS Database menu.

IMPORTANT: Before printing or previewing this report definition, you must order the view according to the field you used as a break field. If that field is not yet a key field, execute Order Key Add to make it one before changing the order.

Fonts in Reports

We have already discussed the use of Set-Font to change the default or current font of many report items. There are two additional commands that assist you in managing fonts. Both Edit-Fonts and Remove-Fonts are found on the Report Definition menu.

Editing Fonts

The Edit-Font option allows you to change font characteristics for one of the available fonts. If you change the characteristics assigned to a particular font number, the new characteristics apply for all instances in the report where that font is specified.

When you select a font number to edit, the Font Selector appears showing the current characteristics of that font. You can make changes by pressing **F6** at each prompt to determine available options. If no options appear, the printer you have selected in Tools Preferences Hardware cannot support any options for that particular font.

Removing Fonts

The Remove-Font option allows you to remove unwanted font definitions. After selecting the option the Font prompter appears listing currently available fonts, along with a prompt to enter the font number or numbers to remove. You can type the font number(s) or you can use the cursor keys to point to a font number and press **F6** to mark that font. Only unused fonts can be deleted, and these are marked with an asterisk. If you want to mark all fonts not used in the current report, press **F8**. This highlights each of those fonts. To remove all fonts marked for removal, press **F10**.

IMPORTANT: The size of the font you have defined as Font #0 determines the character spacing the Database expects for the whole report. If you use larger or proportionally-spaced fonts your data may be truncated or may overwrite other data on the report. You may be able to overcome this problem by adjusting the horizontal and vertical spacing of your report. To make a compressed report, all fonts that you use must be specified as compressed, including Font #0.

Chapter 6: Printing Database Information

Chapter 7: Relating and Summarizing Data

This chapter explains how to use some of the additional features provided by ANGOSS Database. You will see how to:

- use the Data Relate commands to create a new view and data-file by comparing and combining information from two separate views
- use the Data Transact commands to transfer, add, or subtract data from one view to another
- use the Data Cross-Tab commands to summarize data in a view and store the summarized data in a data-file or an ANGOSS format disk-file
- use the FILELOOKUP function

Relating Views

The Data Relate commands allow you to create a new standard view and data-file from two existing views. The content of the new file is determined by a relationship you define between the original two files.

Using the Data Relate Create command, you create a definition file. When you use the Data Relate Execute command, the Database references your relate definition to create a composite data-file and a standard view for that data-file.

Relating two views requires a special link that you establish by specifying "link fields." These are fields in each of the two views that have the same field type. The link fields from the view you specify as "view #2" must be key fields. These link fields are automatically included in the new view.

When the Database creates your new standard view and data-file, the record structure is created from the fields in one or both of your two original views. You indicate the fields to be included in your new data-file when you define the relation.

Chapter 7: Relating and Summarizing Data

With Data Relate, you compare and combine the data in the two views according to one of four relation types:

- Intersect
- Not-Intersect
- Subtract
- Union

The following examples illustrate these four types of relations and how they are typically used.

Suppose you work for a credit card company and you have two views for customers. One view consists of people who make over \$30,000 per year. The other view consists of people who have charged over \$10,000 per year on credit cards. The two views look like this:

View 1: spenders

Rec.	[name]	[charges]
1	Jim Brady	12,450.70
2	Mark Brown	10,001.01
3	Mary Thomas	21,225.05
4	Frank Baker	36,023.13
5	J.D. Kemp	12,140.10

View 2: over30

Rec.	[name]	[income]
1	Jack Midas	81,500.00
2	Mark Brown	98,310.00
3	Ima Richie	254,967.00
4	Mary Thomas	54,229.00

Union

If you wish to combine all the records in these two views into one view, you can perform a Union relation. The [name] fields in both views would be the link fields. The new database fields would be [income] from the over30 view and [charges] from the spenders view. The resulting view would look like this:

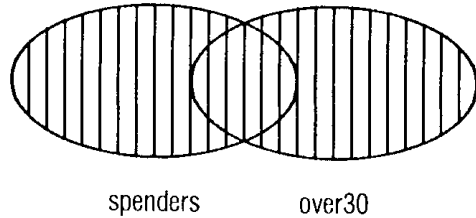
View Name: alloy

Rec.	[name]	[charges]	[income]
1	Jim Brady	12,450.70	
2	Mark Brown	10,001.01	98,310.00
3	Mary Thomas	21,225.05	54,229.00
4	Frank Baker	36,023.13	
5	J.D. Kemp	12,140.10	
6	Jack Midas	81,500.00	
7	Ima Richie	254,967.00	

This example and the following diagram illustrate that the Union relate type creates in the new view a new record for each of the following occurrences:

- a record that contains new database field data from records in the two source views in which the link field data items match (e.g., Rec. 3 in the new view)
- a record that contains new database field data from a record in the second source view in which the link field data item does not match any link field data item in the first source view (e.g., Rec. 6 in the new view)
- a record that contains new database field data from a record in the first source view in which the link field data item does not match any link field data item in the second source view (e.g., Rec. 5 in the new view)

Figure 7-1. Union



Intersect

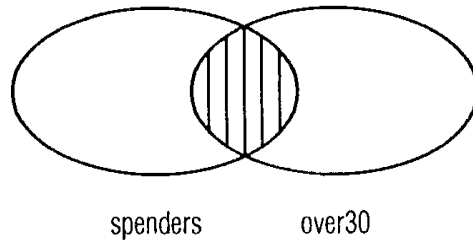
Now you decide to issue a special platinum card to those people who make over \$30,000 and charge more than \$10,000 per year. One way to do this is to query the view created from the Union relation (`[charges] > 10000` and `[income] > 30000`). However, you can obtain the same information in a single step by relating the views with the Intersect relation type. The resulting view is as follows:

View Name: platinum

Rec.	[name]	[charges]	[income]
1	Mark Brown	10,001.01	98,310.00
2	Mary Thomas	21,225.05	54,229.00

This example and the following diagram illustrate that the Intersect relate type creates in the new view a new record for the following occurrence.

- A record that contains new database field data from records in the two source views in which the link field data items match (Rec. 1 and 2 in the new view).

Figure 7-2. Intersect**Not-Intersect**

Next you decide to issue a bronze card that is not as exclusive as the platinum card. Your customers who make over \$30,000 or spend over \$10,000 will be issued this card. Of course, you do not want to offer a bronze card to anyone who has a platinum card. You must find the names in the spenders view and the over30 view that are not in both views. The Not-Intersect relation produces the information you need.

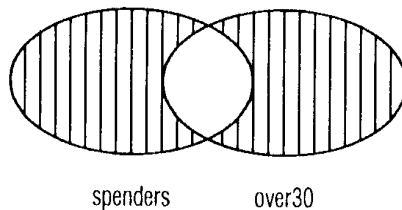
View Name: bronze

Rec.	[name]	[charges]	[income]
1	Jim Brady	12,450.70	
2	Frank Baker	36,023.13	
3	J.D. Kemp	12,140.10	
4	Jack Midas		81,500.00
5	Ima Richie		254,967.00

This example and the following diagram illustrate that the Not-Intersect relate type creates in the new view a new record for each of the following occurrences:

- a record that contains new database field data from a record in the second source view in which the link field data item does not match any link field data item in the first source view (e.g., Rec. 4 in the new view)
- a record that contains new database field data items from a record in the first source view in which the link field data item does not match any link field data item in the second source view (e.g., Rec. 3 in the new view)

Figure 7-3. Not-Intersect



Subtract

Finally, you decide to send a special mailing to those who make under \$30,000 and charge substantial amounts. The Subtract relation can find these people. The resulting view contains names in the spenders view that are not also in the over30 view.

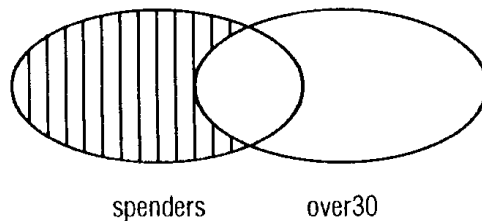
View Name: lead

Rec.	[name]	[charges]	[income]
1	Jim Brady	12,450.70	
2	Frank Baker	36,023.13	
3	J.D. Kemp	12,140.10	

This example and the following diagram illustrate that the Subtract relate type creates in the new view a new record for each of the following occurrences.

- A record that contains new database field data from a record in the first source view in which the link field data item does not match any link field data item in the second source view (Rec. 1, 2, and 3 in the new view).

Figure 7-4. Subtract



Creating the Relation

To create the union relation in the example cited previously, start by selecting Data Relate Create. You are asked to enter a name for the new relate definition file.

The Relate Definition Menu appears. After you create the relate definition using the Relate Definition Menu, you can reference the relate definition to execute the relation any time using Data Relate Execute. When the relate definition is no longer needed, you can delete it by using Data Relate Remove. If you want to modify a relate definition, use Data Relate Modify.

NOTE: The views used in a relate definition must be active when the relation is created, modified, or executed.

The Relate Definition Menu allows you to create or modify a relate definition. The Relate Definition Menu contains seven prompting messages. A pointer appears in the menu next to the first line:

View 1:

Link Field(s):

View 2:

Link Field(s):

Relate Type: **Intersect** Not-Intersect Subtract Union

New Database:

New Database Fields:

The Related Views. On the first and third lines, respectively, enter the names of the first and the second views for this relation. You can press **F6** to display a menu with the names of all currently active views. For our example relation, you would enter **spenders** for the first view and **over 30** for the second view.

The Link Fields. On the second and fourth lines, respectively, enter the link fields of view #1 and view #2. Remember that each link field of view #2 must be a key field. You can press **F6** to display a menu with the names of all currently active fields in the corresponding view. For our example relation, you would enter **[name]** as the link field of both views.

Relate Type. On the fifth line of the Relate Definition Menu, select a relate type from *Intersect*, *Not-Intersect*, *Subtract*, and *Union*. For our example relation, you would select **Union**.

The New Database Name. On the sixth line of the Relate Definition Menu, you enter a name for the new (composite) view. For our example relation, you would enter **alloy**.

The New Database Fields. With the pointer on the seventh line of the Relate Definition Menu, you can select the fields for your new view. (This cannot occur before you specify the link fields for each view.) Data in these fields from one or both of the original views is included in the new view according to the conditions specified by the relate type. The link fields of view #2 are automatically included in the new view. Data for the link fields comes from either or both views.

NOTE: If the link fields are selected as new database fields, they will appear multiple times in the newly-created data-file.

Use **F3** and **F4** to change the menu of fields listed in the prompter from the fields of one view to the fields of the other view.

For our example, the seventh line would appear as follows:

New Database Fields: **[spenders.charges;over30.income]**

Note that the field specification must include the view name and the field name, separated by a period. This is because two fields in different views can have the same name.

After you press **F10** to save a relation, a second window appears underneath the relate definition. This new window contains a columnar list of the fields to be included in your new view. Duplicate field names are marked with an asterisk (*). Figure 7-5 shows an example of the summary window.

Figure 7-5. Relate Definition summary window

```

Relate definition (Credit)
View 1 : spenders
Link field(s) : (Name)
View 2 : over30
Link field(s) : (Name)
Relate type : Intersect Not-Intersect Subtract Union
New Database : alloy
=> New Database Fields : [spenders.Charges;over30.Income]

```

Selected Fields (* = Duplicate name)	
Source View.field	New Name
[over30.Name]	
[spenders.Charges]	
[over30.Income]	

```

F1 Help F2 Edit text F3 Blank text F10 Finished
View: over30.uw Window:1 Rec:1 ( 1 )
Enter name of relate definition file to create

```

The summary window allows you to enter a new name for any field that is to be in the new view. Duplicate field names are not allowed in the new view, so you must change names appropriately to eliminate any duplications. To return to the original definition, press **Esc**, and the summary window is temporarily removed. After you review and (if necessary) change the new view's field names, press **F10** to complete the relate definition and return to Command/View Mode.

Executing the Relation

Use Data Relate Execute to create a new view from the fields in two original views, using the relate definition you stored in a predefined definition file as a guide.

If you select Execute, a prompter appears that shows relate definition files stored in the current disk directory. Enter a relate definition filename by using the pointer in the prompter to identify the file you desire, or type the name of an unlisted definition file including drive and path specifications as necessary. Then press **Enter** to select the filename.

When you specify the definition file, the Database begins the relation process. After creating the new view's structure, it transfers the data supplied by the data-files in the two original views. Then it displays the new data-file in standard view format.

Removing a Relation

Use Data Relate Remove to delete a relate definition file from disk.

When you select Remove, a prompter appears showing relate definition files stored in the current disk directory. The relate definition file you specify is deleted.

Data Transactions

The Data Transact commands allows you to transfer data between views based on a formula you specify. Define the formula and other aspects of the transaction using Data Transact Create (or Data Transact Modify). Use Data Transact Execute to process the transaction.

Consider the following example. You have two views, one entitled inventory and one entitled invoice. Invoice.vw contains a table listing detail sale transactions. (To keep the example simple, assume that the view and its table were defined using normal view-table linking procedures. Only the table records are shown.)

The inventory view contains the following records:

Rec.	[part_no]	[quant_on_hand]	[part_name]	[unit_cost]
1	E467	685	hammer	1.59
2	G635	365	saw	8.67
3	S863	178	plunger	2.36
4	P521	492	axe	6.26

The table of sales entries in the invoice view contains two fields. Notice the four sales records entered.

View Name: invoice

Table: Detail Items

Rec.	[part#]	[quantity sold]
------	---------	-----------------

1	G635	36
2	P521	32
3	S863	17
4	E467	8

For each sales item recorded, you want to reduce the amount in the inventory [quant_on_hand] field by the amount entered in the invoice [quantity sold] field, based upon part number.

After the Data Transact Execute command has processed, the inventory view would look like the following example. Notice the new values in [quant_on_hand].

View Name: inventory

Rec.	[part_no]	[quant_on_hand]	[part_name]	[unit_cost]
1	E467	677	hammer	1.59
2	G635	329	saw	8.67
3	S863	161	plunger	2.36
4	P521	460	axe	6.26

Creating the Transaction

To define the transaction, begin by selecting Data Transact Create. You are asked to enter a name for the new transact definition file. The Transact Definition Menu appears.

NOTE: All views involved in the Transact definition must be active when the Transact is created, modified, or executed.

The Transaction Definition Menu

The Transact Definition Menu is divided into three parts. The first part is for identifying the driver view, for specifying whether each matched driver view record is to be deleted, and whether an audit file is desired.

Driver View:

Delete Driver View record on Match: **No** Yes

Audit: **None** Printer File

Audit File Name:

Driver View. The driver view initiates the transaction. In our example, the driver view is invoice.vw (even though the driving entries are entered into a table).

Delete Driver View record on match. This option, when set to **Yes**, automatically deactivates a record when Data Transact Execute is used. Only active records are included in transactions. This prevents the same sales records from being deducted from inventory again and again. If you use the **No** setting, the sales records remain active.

Audit. The Audit option allows you to produce a text file (extension **.aud**) or a printout of an audit trail report. The report shows the date and time that the transaction updates were processed. Each transaction record is listed individually, along with the number of the matching record. In addition, the report shows the before and after transaction values in the destination field (e.g., [quant_on_hand]).

Link Definition

The second part is termed the "link definition." It specifies the link field in the driver view, the name of the driven view, and the name of the link field in the driven view.

Driver Link Field:

Driven View name:

Driven Link Field:

"Link" fields contain information that, when identical in records in both the driver and driven views, triggers the transaction. Link fields must have the same field type (e.g., alpha, numeric, etc.).

Driver Link Field. The Driver Link Field is the field from the driver view (e.g., invoice.vw) that will be used during the transaction process to locate a matching record in the driven view. The driver link field from the example is [part#].

Driven View Name. The driven view receives the transactions. In the example, the driven view is the inventory view.

Driven Link Field. The Driven Link Field is the field in the driven view that identifies the record that will receive the transaction. The link field of the driven view must be a key field. In the example, [part_no] is the driven link field.

Action Definition

The third section of the menu is for defining the action.

Destination View.Field:

Source View.Field/Formula:

Destination. The Destination is the field that will be affected by the transaction.

Source. The Source contains the definition of the action to be performed. Enter either a field from which data is to be transferred (the "source field") or a formula defining the action.

COMMENT: Press **F5** to access the Formula Editor if you need more room for a complex formula.

Our example uses the following formula.

```
[inventory.quant_on_hand]-[invoice.quantity sold]
```

More than one link can be specified (multiple links). More than one action can be specified for each link definition (multiple actions).

For your convenience, when you enter information into the link definition area on the menu, the Database displays additional link and action definition lines. When you enter information into the action definition area, the Database displays an additional action definition line.

The completed definition screen from our example would appear as follows:

Driver View: **invoice**

Delete Driver View record on Match: No **Yes**

Audit: None Printer **File**

Audit File Name: chkinv

Driver Link Field:[**part#**]

Driven View name:**inventory**

Driven Link Field:[**part_no**]

Destination (View.Field):[**inventory.quant_on_hand**]

Source (View.Field/Formula): [**inventory.quant_on_hand**]-[**invoice.quantity sold**]

NOTE: The Destination and Source specifications require the view name to be included with the field name.

Executing the Transaction

After you press **F10** to accept a displayed Transact definition, you can execute the transaction by selecting Data Transact Execute. You are asked to specify the appropriate transact definition file for the Execute command to reference, and when you do so the transaction proceeds.

To execute a transaction, the source and destination views must be active, and the driven view must have a key defined. If you request an audit file, you must first erase (Tools File Erase) any existing audit file having the same name.

Removing a Transact File

You can delete a transact definition file by selecting Data Transact Remove and specifying the file you wish to delete.

Consult the discussion about Data Transact in *Chapter 9* for a full description of the Transact definition procedure.

Cross-Tabulating Data

The Data Cross-Tab command allows you to obtain summarized statistical information from the records in a database. For example, assume that you have a view called Sales, containing the entries shown in Table 7-1.

Table 7-1

[Month]	[Employee]	[Category]	[Amount]
Apr	Bill	Periodicals	50
Apr	Marty	Periodicals	100
Apr	Rita	Fiction	400
Apr	Lois	Nonfiction	600
May	Bill	Periodicals	50
May	Rita	Nonfiction	800
May	Lois	Fiction	500
Jun	Rita	Periodicals	100
Jun	Lois	Fiction	400
Jun	Bill	Nonfiction	600
Jun	Marty	Periodicals	300

Suppose that you want to know total fiction and nonfiction sales amounts for April and May. To compute these amounts on paper, you might first list the two categories, Fiction and Nonfiction, as follows:

Fiction

Nonfiction

Next, you would add headings for the two months:

	April	May
Fiction		
Nonfiction		

Finally, you would calculate the total amount of sales per category for each of the two months, and enter the result on the appropriate line, under the appropriate month's heading, as follows:

	April	May
Fiction	400	500
Nonfiction	600	800

The end result is a matrix of rows and columns built upon the information you wanted. Notice that an implied AND operator connects each row entry to each column entry. For example, the number 400 represents the sum of the entries having **Fiction** in the [Category] field AND **Apr** in the [Month] field.

There are three points to note about the method used to create the matrix in the example:

1. You created a **row** for each of the book categories to be evaluated.
2. You created a **column** for each of the months to be evaluated.
3. You inserted the results of the **calculations** into the body of the matrix.

In the Data Cross-Tab environment, Item 1 is accomplished with "row match equations." In other words, you construct formulas describing the conditions for generating rows in the matrix.

Item 2 is accomplished with "column match equations." You construct formulas describing the conditions for generating columns in the matrix.

Item 3 is accomplished with "summary definitions." You describe the calculations for the entries that are to populate the body of the matrix.

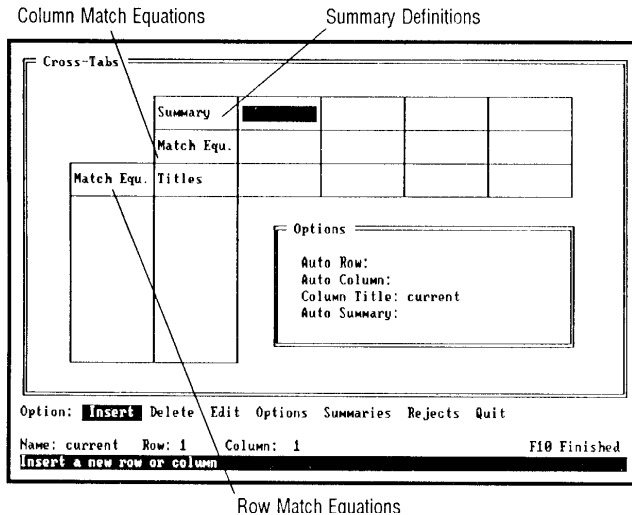
Creating a Cross-Tab Definition

This section explains how to use ANGOSS to create the cross-tabulation matrix described in the example.

First, select the Data Cross-Tab Create command. Specify a name ("sales," for example) for the file that is to store the cross-tab definition. This file can be edited later with Data Cross-Tab Modify.

The Cross-Tabs window appears, as shown in Figure 7-6.

Figure 7-6



Notice that there are two Match Equ. headings. Row match equations (Item 1) are entered beneath the Match Equ. heading, on the left side of the window. Column match equations (Item 2) are entered next to the other Match Equ. heading, below the Summary heading.

Summary definitions (Item 3) are entered next to the Summary heading.

Entering Row Match Equations

Our example requires the following row match equations:

[Category]="Fiction"

[Category]="Nonfiction"

To enter the equations:

1. Position the highlighter below the row Match Equ. heading and press **Esc** to access Enter Mode, where you can begin typing the equation. Alternatively, you can use Command Mode to enter the equations; position the highlighter below the row Match Equ. heading, and select the Edit keyword from the menu.
2. Press **F6** to see a list of fields in the view. Select [Category]. The field name is inserted in the Control Area, where the remainder of the equation is to be entered.

3. Type ="**Fiction**" and press **F10** to finish. The completed equation **[Category]="Fiction"** is inserted under the row `Match Equ.` heading.
4. Press **right arrow** to position the highlighter under `Title`. If you are using Enter Mode, simply type the word **Fiction**. If you are using Command Mode, select Edit, and then type **Fiction**. Notice that quotation marks are not needed for titles. Press **F10** to complete the title.
5. Position the highlighter on the line below the first row `Match Equ.` entry. If you are using Enter Mode, you can begin typing the equation. If you are using Command Mode, select the Edit keyword.
6. Press **F6** to see a list of fields in the view. Select `[Category]` again. The field name is inserted in the Control Area.
7. Type ="**Nonfiction**" and press **F10** to finish. The completed equation **[Category]="Nonfiction"** is inserted below the first row `Match Equ.` entry.
8. Press **right arrow** to position the highlighter under `Title`. If you are using Enter Mode, type **Nonfiction**. If you are using Command Mode, select Edit, and then type **Nonfiction**. Press **F10** to complete the title.

This completes the steps for entering row match equations.

Entering Column Match Equations

Our example requires the following column match equations:

[Month]="Apr"

[Month]="May"

To enter column match equations:

1. Position the highlighter to the right of the column `Match Equ.` heading, which is below the `Summary` heading. If you are using Enter Mode, you can begin entering the equation. If you are using Command Mode, select Edit.
2. Press **F6** to view a list of fields in the view. Select `[Month]`. The field name is inserted in the Control area, where the remainder of the equation is to be entered.
3. Type ="**Apr**" to complete the equation. Press **F10** to finish. The completed equation **[Month]="Apr"** is added to the definition.

4. Press **down arrow** to position the highlighter next to `Title`. If you are using Enter Mode, type the word **April**. If you are using Command Mode, select Edit, and then type **April**. Press **F10** to finish.
5. In the rectangle to the right of the first column match equation, enter the second column match equation:
`[Month]="May"`
6. In the rectangle to the right of the first column title, enter the second column title: **May**

This completes the steps for entering column match equations.

Entering Summary Definitions

A summary definition describes the calculation to be performed upon the selected data. Keywords (such as Sum, Count, Avg) that can be used to define a summary calculation are presented on a Summary Option menu.

Our example definition requires two entries consisting of the expression **Sum[Amount]**.

To define summary definitions for the example:

1. Position the highlighter next to the `Summary` heading. If you are using Enter Mode, press **F2**. If you are using Command Mode, select the Summaries keyword from the menu.
2. When the Summary Option menu appears, select Sum and press **Enter**.
3. From the prompter list of fields, select [Amount] and press **Enter**. The expression **Sum[Amount]** is inserted as the first Summary Definition.
4. Enter the same definition above the second column match equation.

This completes the steps for entering summary definitions. Press **F10** to save the entire cross-tab definition and exit the Cross-Tabs window.

Executing a Cross-Tab Definition

To execute a cross-tab definition, select Data Cross-Tab Execute and specify the name of the definition file. You can elect to create either a data-file or an ANGOSS text file for the resulting output. In either case, you are prompted to specify a name for the output file.

NOTE: If you choose the text file option, include the file extension when you specify the name.

Press **F10** to begin execution.

The output resulting from the example definition, when written to a text file, resembles the following:

```
"sales" "April" "May"  
"Fiction" 400 500  
"Nonfiction" 600 800
```

Notice the word "sales" on the first line. When you first create a cross-tab definition file, ANGOSS automatically uses the name of the file as the title for the first column of output. You can edit this title by selecting the Title keyword from the Options menu.

Types of Match Equations

Match equations can be divided into three basic types:

- match all specified data
- match unique data
- match other data

Matching All Specified Data

The cross-tab definition in the example contains "match all specified data" equations, which specify the conditions for generating the rows and columns in the matrix. Many varieties of definitions containing this type of match equation are possible.

Row and column match equations are required only for specifying selection conditions. If you do not want to limit the selection, either row or column match equations (or both) can be omitted. Continuing with the view shown in Table 7-1, suppose that you want to know total sales by category, regardless of employee or month. You might create a definition having only row match equations and a summary, as follows:

Row Match Equations	Titles
[Category]="Periodicals"	Periodicals
[Category]="Fiction"	Fiction

[Category]="Nonfiction"	Nonfiction
-------------------------	------------

Summary	Title
Sum[Amount]	Totals

The resulting text output resembles the following:

```
"" "Totals"
"Periodicals" 650
"Fiction" 1300
"Nonfiction" 2000
```

You might create a similar definition using only column match equations and a summary. For this type of definition, be sure to provide a title for the row of output to be generated, even though no row match equation is defined.

Likewise, you might create a definition having only summary definitions and no match equations at all. For example, suppose that you want to know total and average sales amounts, regardless of employee or month. Specify the following summary definitions and titles:

Summaries	Column Titles
Sum[Amount]	Total
Avg[Amount]	Average

No match equations are entered, but be sure to specify a title, such as Sales, for the row of output to be generated.

The resulting text output is as follows:

"sales" "Total" "Average"

"Sales" 3950 329.166666666667

Matching Unique Data

The second type of equation is the "match unique data" equation, which generates one row or column for each occurrence of unique data.

Using the view shown in Table 7-1, suppose that you want to know total sales, by employee, for each of the three months.

A review of the data shows that, although there are twelve records in the view, there are only four unique entries in the [Employee] field. You must specify a row match equation for each employee name.

In ANGOSS, there are two ways to create "match unique data" equations:

- Identify the unique data and enter the equations manually.
- Instruct ANGOSS to generate the rows (or columns) automatically.

Let's discuss the manual method first. To create the row match equations and titles manually, enter the following:

Row Match Equations	Titles
[Employee]="Bill"	Bill
[Employee]="Marty"	Marty
[Employee]="Rita"	Rita
Employee]="Lois"	Lois

These equations generate one row of data for each employee in the database.

Another review of the data shows that only three months occur in the [Month] field. Manually enter the following summary definitions, column match equations, and titles:

Summary	Column Match Equations	Titles
Sum[Amount]	[Month]="Apr"	April
Sum[Amount]	[Month]="May"	May
Sum[Amount]	[Month]="Jun"	June

When you execute the cross-tab definition file, the resulting text output is as follows:

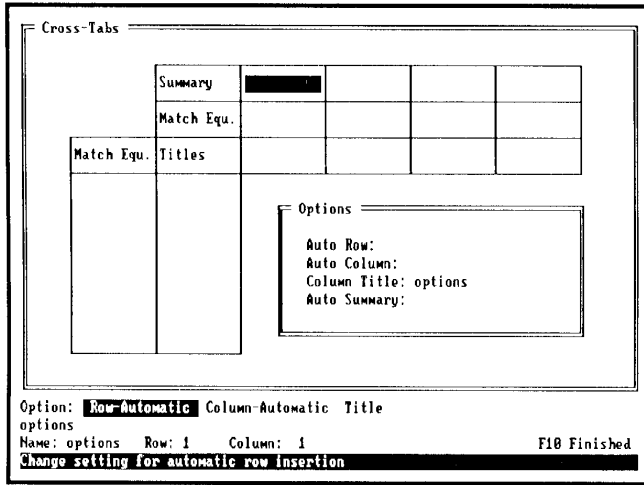
```
"sales" "April" "May" "June"
"Bill" 50 50 600
"Marty" 100 50 300
"Rita" 400 800 100
"Lois" 600 500 400
```

An easier way to create a definition containing "match unique data" equations is to instruct ANGOSS to generate the rows and columns automatically. To do this, use the Options menu on the Cross-Tabs window.

To use the Options menu:

1. From the Cross-Tab menu, select the Options keyword. A menu of options is presented, as shown in Figure 7-7.

Figure 7-7. Options menu and Options window



2. Select Row-Automatic; then select Define to specify the row match equation. Recall that when you defined the row equations manually, you used the [Employee] field. When the prompter appears, select the [Employee] field.
3. Select Options again. Then select Column-Automatic Define to specify the column match equation and the summary definition. When the prompter appears, select the [Month] field.
4. From the menu of Summary options that appears after you choose the Column-Automatic field, select Sum, and then specify that the calculation is to be performed upon the [Amount] field.
5. Press **F10** to complete the definition.
6. Execute the cross-tab definition. The resulting output, sent to a text file, should resemble the following:

"sales" "Apr" "May" "Jun"

"Marty" 100 50 300

"Bill" 50 50 600

"Lois" 600 500 400

"Rita" 400 800 100

Matching Other Data

The third type of equation, "match other data," is used to generate a row summarizing data that is not selected by other row match equations, or to generate a column summarizing data that is not selected by other column match equations. To specify such an equation, select the Rejects option on the Cross-Tab menu.

For example, suppose that you create a cross-tab definition containing the following row match equations and titles:

Row Match Equations	Titles
[Category]="Nonfiction"	Nonfiction
[Category]="Fiction"	Fiction
Rejects	Other

NOTE: Use the Rejects keyword on the Cross-Tab menu to specify a Rejects expression.

The definition also contains the following summaries, column match equations, and titles:

Summary	Column Match Equations	Titles
Sum[Amount]	[Month]="Apr"	April
Sum[Amount]	[Month]="May"	May

The resulting text output is as follows:

```
"sales" "April" "May"
"Fiction" 400 500
"Nonfiction" 600 800
"Other" 150 100
```

By reviewing the records in the view, as shown in Table 7-1, you can see that **400** represents the total sales for records having **Fiction** in the [Category] field and **Apr** in the [Month] field.

Likewise, **600** represents the total sales for records having **Nonfiction** in the [Category] field and **Apr** in the [Month] field.

The number **150**, on the row labeled **Other**, represents the sales for records having **Apr** in the [Month] field and having neither **Fiction** nor **Nonfiction** in the [Category] field. In this example, **150** also happens to be the total periodical sales amount for April.

Rejects with Auto Row. If no row match equations are entered, the Rejects option used in conjunction with the Auto Row setting provides grand totals for the columns generated in the matrix. This result occurs because ANGOSS processes match equations first, then Rejects, and then the Auto Row setting.

To illustrate using the Rejects option with the Auto Row setting, suppose you create a definition having the following column match equations:

Summary	Column Match Equations	Titles
Sum[Amount]	[Month]="Apr"	April
Sum[Amount]	[Month]="May"	May

Next, you position the cursor in the row match equation area and select the Rejects option from the Cross-Tab menu. You enter **Total** as the row title.

Instead of defining individual row match equations, you select Options Row-Automatic Define, and choose the [Category] field.

After the definition is executed, the resulting text output is as follows:

```
"sales" "April" "May"
"Total" 1150 1400
"Periodicals" 150 100
"Nonfiction" 600 800
"Fiction" 400 500
```

Notice that, in this instance, the numbers on the **Total** row represent totals for the generated columns, **April** and **May**.

Removing a Cross-Tab Definition

To delete a cross-tab definition file, select Data Cross-Tab Remove and specify the name of the file to be deleted.

The FILELOOKUP Function

The FILELOOKUP function searches records in an active view that you specify for data you specify in a search field. The search field must be a key field. When the function finds the record satisfying the search criteria, it returns data in another field that you specify. For example, suppose you want to know the salary of Jim Evert in a currently loaded view titled employee. You could use the FILELOOKUP function in the following format:

```
FILELOOKUP([name],[salary],"Jim Evert")
```

In response to this entry, the Database searches records in the employee view for the name "Jim Evert" in the [name] field. The [name] field must be a key field. When the record meeting this criterion is found, the Database returns the value in the [salary] field.

As another example, suppose you have an Invoice view in which you want to access the description of an item by part number from another active view called "Parts." Two of the fields in Parts are shown; [Part#] is a key field in Parts.vw.

```
[Part#] [Descr]
```

The viewed named Invoice contains (along with other fields) fields named [Part Number] and [Description]. Make the [Description] field a calculated field containing the following formula:

```
FILELOOKUP([parts.part#],[parts.descr],[Part Number])
```

Now, when you enter a valid part number in the [Part Number] field of your Invoice view, the appropriate description is inserted in the [Description] field.

If you apply the FILELOOKUP function to a view that is not the current view, you must precede each field name with the view name (e.g., [parts.part#]).

NOTE: FILELOOKUP supports searching on minus key fields.

For more information about the FILELOOKUP function, see the *ANGOSS Formula Reference*.

ANGOSS Statistical Database Functions

ANGOSS Database has two groups of functions specifically designed to provide statistical information on data in a database: the File SDb functions and the Table SDb functions. File SDb functions (such as FILESUM, mentioned in the discussion of queries in *Chapter 5*) perform calculations on a particular field from every logical record in a data-file. Table SDb functions perform calculations on a particular field in a view table. Using Table SDb functions outside of table areas may produce unexpected results.

Refer to *Using Statistical Database Functions* in *ANGOSS Formula Reference* for more information and examples. The functions are also listed alphabetically in *Function Reference* of *ANGOSS Formula Reference*.

Chapter 8: ANGOSS Integration

One of the best reasons to use the ANGOSS Software System is its powerful integration capabilities. You can transfer information contained in ANGOSS Database to any other ANGOSS module. ANGOSS Database information can be converted to many different file formats, so you can import your information from software packages other than ANGOSS using the File Import commands. Likewise, ANGOSS can export information to other software packages by use of the File Export commands. Version 2.65C also allows for data to be updated through an ODBC connection - data files can be attached to an ODBC compliant database and data can be accessed from ODBC compliant software through project processing.

This chapter is organized into two sections:

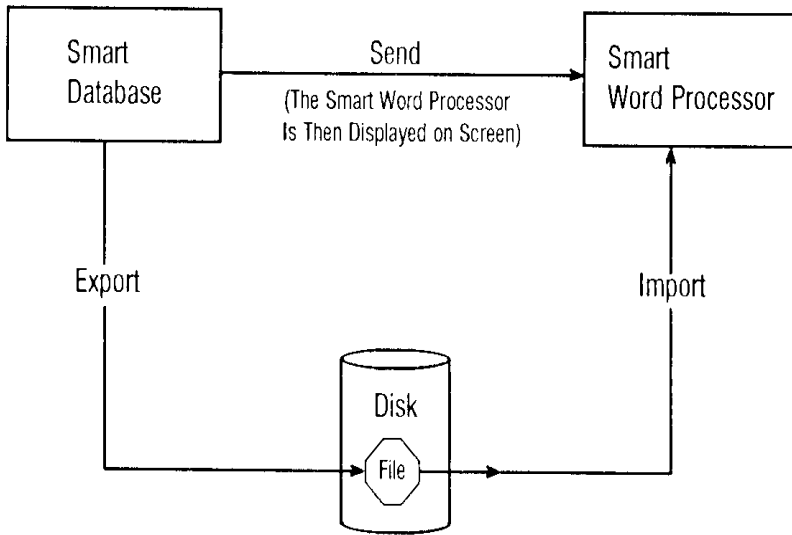
- Integration with Other ANGOSS Modules
- Integration with Other Software

Integration with Other ANGOSS Modules

ANGOSS Database offers three commands that allow you to transfer database information between ANGOSS modules: Data Send, File Import, and File Export.

The following diagram illustrates the difference between integration using the Send commands and the Import and Export commands.

Figure 8-1



Notice that the Data Send command transfers the data from the Database module and immediately accesses the selected module. The File Export command transfers the data from the Database to a file that can be used now or later. File Import allows you to use files created outside ANGOSS Database.

Using Data Send

The Data Send commands allow you to access any other ANGOSS module and transmit Database information to it. When you select Data Send, specify whether you want to send database records (All) or summarized data (Crosstab).

Sending Database Records

To send records from your database to another module, select Data Send All. The following menu appears:

Options: Communications Spreadsheet Wordprocessor

Specify the module you want to send to and whether you want to send the records as Data or as Text. The option you should choose depends upon the module you are sending to and how you will be using the information. Refer to the module headings for more discussion of the Data and Text options.

After selecting the Data or Text option, you must select the fields whose data you want to send. A prompter is displayed showing available fields. To select the fields you want, press **F6**. When the desired fields have been selected, press **Enter**.

The Database also offers you the opportunity to specify a project file to execute upon entry to the target module. If you do not want to execute a project file, press **Enter** in response to the prompt.

Sending Records to the Word Processor

If you select Data Send All Wordprocessor, you are asked to choose whether to send information as Data or as Text.

Data. Choose the Data option when you want to use your database records for merge printing. Once you've chosen the Data option, the information you send is stored in a file named after the original data-file, but with an .iff extension. The .iff file is not loaded when the program enters ANGOSS Word Processor; however, you can immediately start a merge print.

IMPORTANT: The .iff file is a temporary file. Once you leave the application to which you sent your data, the .iff file is erased. If you wish to use the same data again some other time, you will have to send it again. If you anticipate having to reuse data sent from ANGOSS Database, you should use File Export rather than Data Send.

Field data sent with the Data option is surrounded by quotation marks. A data-file of two records containing the fields "Name," "Number," and "Phone" would appear as follows if you loaded it after entering the Word Processor:

"Name "	"Number "	"Phone "
"George "	"234 "	"(913) 642-7469 "
"Tom "	"578 "	"(913) 642-4723 "

Text. Choose the Text option when you want the records to be inserted directly into a document. When you choose to send the records as Text, the sent data is displayed on the screen when you reach the Word Processor. Data sent in the Text format is separated by spaces.

With the Text option, choose to send data in either row format or column format. For example, if you send the data-file from the previous example using the Row-Format option, you would see the following display when you reached ANGOSS Word Processor:

Name	Number	Phone
George	234	(913) 642-7469
Tom	578	(913) 642-4723

If you sent those same records to ANGOSS Word Processor using the Column-Format option, the display would appear as follows:

Name	Number	Phone
George	234	(913) 642-7469
Tom	578	(913) 642-4723

If you want to use information sent as Text at another time, you must save it in a document or a text file.

Sending Records to Communications

You can send Database information to ANGOSS Communications for transmission to another terminal. After you select the Communications option, select the Data option or the Text option, as appropriate. Both the Data and Text options require that you select a format option: Row-Format or Column-Format. See the explanation of all of these options under ***Sending Records to the Word Processor.***

Sending Records to the Spreadsheet

When you send data to ANGOSS Spreadsheet, you must select either the Column-Format or the Row-Format option and specify the fields whose data you want to send. See the explanation of these options under *Sending Records to the Word Processor*.

Sending Summarized Data

To send summarized data from the output generated by a cross-tabulation operation, first create a cross-tab definition with the Data Cross-Tab Create command. Then select Data Send Crosstab. You are prompted to enter the name of the cross-tab definition file to be executed.

The following menu appears:

Options: Communications Spreadsheet Wordprocessor

Sending Summarized Data to Communications

To send cross-tabulated data to the Communications module, select the Communications option. You are prompted to enter the name of a project file to execute upon entry into the Communication module. If you do not want to execute a project file, press **Enter** in response to the prompt.

Sending Summarized Data to the Spreadsheet

To send cross-tabulated data to the Spreadsheet module, select the Spreadsheet option. You are prompted to enter the name of a project file to execute upon entry into the Spreadsheet. If you do not want to execute a project file, press **Enter** in response to the prompt.

Sending Summarized Data to the Word Processor

To send cross-tabulated data to the Word Processor module, select the Wordprocessor option. You are prompted to enter the name of a project file to execute upon entry into the Word Processor. If you do not want to execute a project file, press **Enter** in response to the prompt.

Using File Import

The File Import command can be used to read a file created outside of ANGOSS Database. By executing File Import, you can read data into a view with a single data-file from a file stored in one of five possible file formats: ASCII, dBase II or III, Fixed, ANGOSS, or 3.10 ANGOSS.

ASCII and Smart

To read in ASCII or Smart formats, you must have an existing data-file associated with the current view into which you can read the data. If you intend to use the Ascii option, you must also make certain that the file you wish to import meets the following criteria:

- Each record must end with a carriage return/line feed combination
- Fields must be separated by commas
- Alphanumeric fields and fields containing conventional date and time data must be surrounded by quotation marks
- Numeric fields must not be surrounded by quotation marks
- The end of the file must be marked by ^Z (Control Z)
- Fields must not contain embedded double quotation marks

A sample record in standard ASCII format would look like this:

```
"alpha","inverted",100,"02/15/1964","09:00:00"
```

Use the Smart option if you intend to import a file that was exported from another ANGOSS module. The Smart file format differs from ASCII format only in that spaces, rather than commas, are used to separate fields. A sample record in Smart format would look like this:

```
"alpha" "inverted" 100 "02/15/1964" "09:00:00"
```

Once you've selected either the Ascii or Smart format option, you can choose to "skip" certain fields that you do not want read from the import file by entering 0 at the position of the field in the field list you specify. This capability allows flexibility for reading incompatible field formats.

After you enter the name of the import file to be read, a prompter showing available data-file fields appears at the bottom of the screen, accompanied by the "attach/remove" prompt.

Use the pointer in the file prompter to identify the fields in your data-file that will receive data from fields in the import file. Since the fields in the import file may or may not have field names, import file fields are referenced by their position in a record.

Press **F6** to select a name or **F7** to deselect a name. You can also enter directly the names of the fields at the corresponding import file field positions, separating each pair of adjacent field names with a semicolon (see the example below).

Press **F10** or **Enter** when you have finished selecting the data-file fields that will accept the import file fields.

Consider the following example showing two incompatible record formats:

Field Number	ANGOSS Database File	Import File
1	[Name]	Name
2	[Address]	Address
3	[City]	City
4	[State]	State
5	[Zipcode]	Zipcode
6	[Phone]	SSN
7	[Age]	Phone
8	Sex]	

Fields 1 through 5 are the same in each data-file, but fields 6 and 7 differ. The data item in field 6 of the Database data-file is the same as the item in field 7 of the import file.

Suppose you want to use File Import to read fields 1 through 5 of the import file into fields 1 through 5 of the data-file, leave the [Age] field in the data-file empty for now, and then read the phone number in field 7 in the import file into field 6 of the data-file. The following field list accomplishes this:

[Name;Address;City;State;Zipcode;0;Phone]

Each field name or field number in a field list refers to a field name or field number in the data-file, while the position of each name or number in the field list references the position of the corresponding field in the import file. The 0 in the sixth position instructs the program to "skip" the sixth field in the import file (i.e., the [SSN] field). The seventh and final entry in the field list ([Phone]) instructs the program to place the seventh field in the import file into the [Phone] field (field 6) of the data-file.

Dbase

Because a data record structure already exists for a dBase file, ANGOSS Database defines a compatible record structure and creates a corresponding data-file as the imported file is being read.

Fixed

To read in Fixed formats, you must have an existing data-file associated with the current view into which you can read the data. When reading in Fixed format, you cannot "skip" fields. You must read each field in sequential order. In files with fixed length fields, each field is allocated a specified length, regardless of how much data it contains. When you import fixed files, the Database uses two methods for reading field information, depending upon whether the field is alphanumeric or numeric.

If the field is alphanumeric (or inverted), the Database uses the field storage width of the destination field in the ANGOSS data-file to determine how many characters to read. If the field is numeric (including date, time, or counter), the Database uses the display width of the destination field. The difference is based on the fact that the storage width for numeric fields is always 8 bytes, so if you change the display width on the view into which you are importing the fixed data, you can read more or fewer than eight characters into a numeric field.

ANGOSS Database expects the length of each record in the import file to equal the length of each record in the data-file. If the record in the import file is longer than a record in the data-file, the extra characters are ignored. If the import file record is shorter than the data-file record, the Database just proceeds to the next record of the import file, reading the next data item into the current field of the current data-file record.

310-Smart

Because a data record structure already exists in an Smart 3.10 file, ANGOSS Database defines a compatible record structure and creates corresponding data-files as the imported file is being read. When you select the File Import command, you are asked to enter the filename of the file you wish to import. Next, you are prompted to enter a new name for the data-file that will be created when the file is imported.

As the file is being imported, the 3.10 keys are converted. In addition, 3.10 fields that were designed to hold Social Security numbers are converted to alphanumeric fields with a length of 11 and an input mask with the format ###-##-#### on the standard view. 3.10 phone fields are converted to alphanumeric fields with a length of 14 and an input mask in the format (###) ###-####. Calculations are imported along with their associated fields.

Using File Export

By executing the File Export command, you can write data from the current data-file into a new file using one of six available file format options: Ascii, Dif, M-Sylk, Smart, Text, or 3-Dbase.

If you select any option but 3-Dbase, you must select either Row-Format (to write the records in the view along rows) or Column-Format (to write the records in the view in columns).

You must specify the fields whose data you wish to export by either selecting fields from a displayed file prompter or entering the names of the fields directly, separating each pair of adjacent field names with a semicolon. Then enter the target file specification.

ASCII

Each record in an ASCII file is terminated with a carriage return and a line feed. Fields in an ASCII file are separated by commas. Alphanumeric fields are surrounded by quotation marks, while numeric fields are not. The end of an ASCII file is marked by a ^Z (Control Z). The following is a sample record in ASCII file format:

```
"text field",1000,"text field",300,400.25
```

DIF

Data Interchange File format is used primarily for transmitting data to non-ANGOSS spreadsheet programs (e.g., VisiCalc).

M-SYLK

Microsoft Symbolic Link format is also used for transmitting to non-ANGOSS spreadsheet programs (e.g., Multiplan).

Smart

Use the Smart file format when you want to write the data from a data file to an import file, and then use the File Import command to read the file from disk to a worksheet in ANGOSS Spreadsheet, or to a document in ANGOSS Word Processor.

Each record in an Smart file is terminated with a carriage return and a line feed. Fields in a ANGOSS file are separated by spaces. Alphanumeric fields are surrounded by quotation marks, while numeric fields are not. The end of a Smart file is marked by a ^Z (Control Z).

NOTE: The only difference between ASCII and Smart file formats is the ASCII use of commas instead of spaces between fields. The following is a sample record in Smart format:

```
"text field" 1000 "text field" 300 400.25
```

Text

Text format is similar to Smart format, but does not insert quotation marks around text items. Use the Text option to write an import file that can be read into a document or text file in ANGOSS Word Processor. The following is a sample record in Text format:

```
text field 1000 text field 300 400.25
```

3-Dbase

dBase III files are limited to a maximum of 128 fields, and alphanumeric fields over 254 characters in length are truncated when converted to 3-Dbase format.]

Integration with Other Software

Import and Export

In addition to using File Import and File Export to integrate data between ANGOSS modules, you can also use these commands to read or write data to and from software other than ANGOSS.

The File Import command allows you to read files stored in ASCII format, Dbase format (dBase II or dBase III), Fixed format, and ANGOSS 3.10 format. Select File Import, select the appropriate file format option, and enter the name of the file to be imported. Refer to the *Using File Import* section of this chapter for more information.

Similarly, you can use File Export to write a file in a number of formats that can be read by other software packages. Select File Export and choose one of the following options: Ascii, Dif (Data Interchange Format), M-Sylk (Multiplan), Text, or 3-Dbase (dBase III). Refer to the *Using File Export* section of this chapter for more information.

ODBC

ODBC connectivity is only available in version 2.65C and later.

With ODBC, data from one source can be accessed by another. While this can be accomplished by physically copying the data, it is better to establish a link between the two data sources where the management of the link takes place seamlessly (and this is what happens when an ODBC connection has been properly implemented). Sometimes it is best to explain via an example:

A SmartWare user has data in a SmartWare database. The user wishes to make this information available to a Microsoft Access application. The user also wishes to use the Access application to update the SmartWare database. Within the Access application, the user has defined a table with fields defined within Access. The user also wishes to include fields from a SmartWare database. Since Access supports ODBC and assuming that the user has installed the Access ODBC drivers, the user can proceed to link the SmartWare database to the Access table. After doing so, the user can operate on any field (Access or SmartWare) and be assured that the effects will show up on both sides accordingly.

The above example describes SmartWare in use as an ODBC server - that is, data from the SmartWare file is linked to the Access file. In this case, Access plays the role of a client. To reverse the relationship, you will need to be familiar with the SmartWare Programming Language (SPL). In fact, with programming, any SmartWare module (not just the database) can access data from an ODBC client. See the *Project Processing* and *Formula Reference* manuals for more information.

Defining an ODBC Data Source

In ODBC, a data source is that which is associated with a specific driver. The following is an example of how you would make a SmartWare data file available to the ODBC manager (this assumes that you have installed the ODBC components):

Assume that we have a SmartWare table called "test.db" and that the table is located in the directory "C:\DATA\ANGOSS\DB". We now need to define our Data Source Name (DSN) so that it will become available to any application supporting ODBC.

Depending on whether you are using WIN95 or WINNT, the ODBC Data Source Administrator selection is in either the control panel folder or in the start menu. If you have installed the Microsoft ODBC 3.0 Driver Package under the default installation options, you will find the selection in "start/programs/odbc/32bit ODBC Administrator". Once you have initiated the program, you will see the following tab dialogs (there are more but we don't care about them right now):

```
User DSN | System DSN | File DSN | ODBC Drivers
```

For this example, we will assume that many users will want access to this DSN. Therefore, choose the "System DSN" dialog to define our data source.

Upon selecting the "System DSN" you will be presented with a listing of all the currently defined DSN entries. If there are none, don't worry, you are about to create one. To the right of the listing window, you will notice three action buttons: "Add...", "Remove" and "Configure..." Choose the Add option.

After choosing the Add option, you should see the "Create New Data Source" window. The driver listings sub-window lists all the installed drivers. In this instance, we wish to choose the ANGOSS SmartWare entry by clicking on the listing with the mouse. After doing so, choose the Finish option.

After choosing Finish, you should see the "Setup" dialog which contains four entry fields:

Data Source
Database
Host
Port

The last two entries can be ignored, but the first two entries must be provided. The "Data Source" is merely a label you provide to give meaning to a user when they are selecting a DSN entry from within an ODBC compliant application. For our purposes, we will enter the following:

Data Source SmartWare Test Data

The Database entry is for specifying where your table resides on the file system. In this example, provide the following:

Database C:\DATA\ANGOSS\DB

When done, press the OK button to return to the Administrator level. You should now see an entry in the form:

Name	Driver
SmartWare Test Data	ANGOSS SmartWare Driver (*.db)

This completes the example - you can exit the administrator. The new DSN entry will now be available to all your ODBC applications.

How to Link SmartWare to Other ODBC Programs

This walk-through example utilizes the sample data source in the ODBC subdirectory. The following assumptions are made:

1. We are creating a new Access table (using Microsoft Access 97).
2. We will be linking in an existing SmartWare data file.
3. We have already setup a DSN entry through the ODBC administrator.
4. The DSN Data Source field will have the following entry

ANGOSS SW Sample Data (fixed)

The DSN Database field will point to

<install drive>:\swodbc\data

Step 1

Start Access. You will be presented with a dialog that asks if you wish to open an existing database or create a new one. Select "Blank Database" under "Create A New Database Using"

Step 2

Enter the filename you wish to give this new database. In this case, enter "testfix.mdb" and click on the Create button.

Step 3

You will now be presented with a dialog window having the title "testfix: Database". Within this window you will see multiple tab dialog selection objects. The tables dialog tab will be the active dialog upon entry and this is what we want, so select "New".

Step 4

A "New Table" dialog will appear with a listing of possible table types to choose from. Select "Link Table" and click on OK.

Step 5

A dialog window with the title "Link" will appear. At the bottom left corner of the dialog, you will see a selection for File Types. Select the down arrow under "Files of Type".

You will now see a listing of possible file types. At the bottom of this list will be an entry entitled "ODBC Databases()". Select "ODBC Databases()"

Step 6

You will now see a dialog window entitled “Select Data Source”. Within this window you will see two tab dialog options: “File Data Source” and “Machine Data Source”. Select “Machine Data Source”

You will now see a listing of DSN entries. You should also see an entry for “ANGOSS SW Sample Data (fixed)”. Select it and click on OK

Step 7

You will now be presented with a listing of SmartWare tables to choose from. Under the installed samples you will see two entries: “swfixed” and “swvarlen”. Select “swfixed” and click on OK.

You will now be presented with a list of possible fields within the SmartWare table. They should be: itemname, qty, update, time, and counter.

Note the title of the dialog window - "Select Unique Record Identifier". This is an important concept to understand. For management of records, Access requires a means to differentiate each record, hence the use of the word "Unique". For this table, the counter is guaranteed to be unique. Select the field "counter".

Note: At the bottom of the dialog, it mentions that you may choose up to ten fields to help identify uniqueness. This is only necessary if you are dealing with a SmartWare table which allows duplicate keys within its main index. In other words, some tables require several fields in combination to actually provide uniqueness.

Step 8

We should now be back at our main table dialog entitled "testfix: Database". Displayed in the table listing area should be an entry "swfixed". Select "Open".

You should now see the following table:

itemname	qty	update	time	counter
item1	1	3/20/97	10:00:00	1
...
item999999~(E	999999	1/1/01	00:01:00	11

We have now successfully completed the task. If you feel inspired, try loading up SmartWare and viewing the table while you edit the table in Access.

How to Establish an SQL Interface to a SmartWare Data file

This walk-through assumes that you have installed the ODBC components. Also, it is not the intention of ANGOSS to provide a course in SQL - that goes beyond the scope of this manual. What is shown here is an example of application independent functionality provided by SQL.

Step 1

Under the start menu, choose

```
Programs\odbc\ODBC Test
```

Step 2

You will now see a window entitled "ODBC Test (ANSI)". The ANSI reference is with regard to the type of SQL supported by the test application (there are other standards for SQL). The first thing you want to do is connect to a data source. This can be accomplished through the menu item "Conn". Select "Conn/Full Connect"

Step 3

You will now see a selection of DSN entries one of which is our ANGOSS sample DSN. Select "ANGOSS SW Sample Data (fixed)". You should see a message similar to the following:

```
Successfully connected to DSN 'ANGOSS SW Sample Data (fixed)'
```

Step 4

Now that you have successfully connected, you are ready to issue a SQL command. To keep things simple, select everything from our SmartWare table.

You will notice a flashing cursor in the window above the message window. Ignore this window, it is for other purposes. We will use a menu item to initiate our SQL statement for now. Select "Stmt\SQLExecDirect".

You will now see a dialog window appear with the following items:

```
StatementText:      <input window>
StatementLength:    0
```

We will enter our statement directly into the StatementText field. Enter "select * from swfixed" and click on OK.

You should now see the following message appear in the message window:

```
SQLExecDirect:
```

```
In: Statementhandle = 0x00301250,
StatementText = "select * from swfixed", Statementlength = 23
```

```
Return:SQL_SUCCESS=0
```

The statement handle may be different, so don't worry about it.

Step 5

Now that you have successfully issued a select statement, you might wonder what it is you actually have. To view what we have acquired, select the following menu item: "Results\Get Data All"

You should see something scroll by in the message window. If you scroll up, you will see that the entire output should be something like this:

```
Get Data All:
"itemname", "qty", "update", "time", "counter"
"Item 1", 1, 1997-03-20, 10:00:00, 1
"Item 2", 2, 1997-03-21, 20:00:00, 2
"Item 3", 3, 1997-03-21, 03:20:00, 3
"Item 4", 4, 1997-03-21, 11:11:00, 4
"Item 5", 5, 1997-02-16, 16:00:00, 5
"Item 6", 6, 1997-01-27, 18:00:00, 6
"Item 7", 7, 1997-03-21, 12:00:00, 7
"Item 8", 8, 1996-12-25, 23:59:00, 8
"Item 9", 9, 1997-03-21, 08:30:00, 9
"Item 10", 10, 1997-04-28, 00:01:00, 10
"Item 999999~(Extra Description Text)", 999999, 2001-01-01,
00:01:00, 11
11 rows fetched from 5 columns.
```

Step 6

In the Input Window, type the following command:

```
select itemname from swfixed where itemname = 'item 10'
```

Now select the following menu item: "Stmt\SQLExecDirect"

You will now see the familiar dialog window. From there, we want to select the <input window> as our statement. If this is not what you see on the line, then click on the down arrow and select this option and then click on OK.

You should see the following output in the message window:

SQLExecDirect:

```
In:      Statementhandle = 0x00301250,
        StatementText = "select itemname from swfixed where itemname =
        'it...", Statementlength = 55
Return:      SQL_SUCCESS=0
```

Step 7

Now we want to see what we have, so select the following: "Results\Get Data All"

You should see the following in the message window:

```
Get Data All:
"itemname"
0 rows fetched from 1 column.
```

What happened? Well, you have to be careful - if we look at our original statement, we will see the problem. The data we are looking for is "itemname = 'Item 10' with a capital I for item.

Modify the statement and change the lowercase i to an uppercase i.

This gives us the following command.

```
"select itemname from fixed where itemname = 'Item 10'
```

Issue the command using the same sequence as we did before.

Now if we get the data we should see the following:

```
Get Data All:
"itemname"
"Item 10"
1 row fetched from 1 column.
```

Which is what we expected from the beginning.

Chapter 9: ANGOSS Database Command Reference

This chapter, *ANGOSS Database Command Reference*, explains the purpose and format of each ANGOSS Database command. Menu keywords are presented in the same order in which they appear on the ANGOSS Database keyword menu.

Four of the keywords, Tools, Help, Remember, and Quit, are applicable to all ANGOSS modules. Discussions of these keywords are general, with details being limited to Database usage. For more information, refer to *ANGOSS Software System* and *Project Processing*.

If you have not used a database program before, we suggest that you read the user oriented section, consisting of the first eight chapters of *ANGOSS Database*. You may also want to use the Database Tutorial.

Using Database Commands

When you enter ANGOSS Database, you will see the following keyword menu:

Data File Order Print Tools Window Help Remember Quit

To execute a command, select from the keywords and the appropriate keyword options.

To cancel a command while selecting options and prompts, press either **Esc** or **Alt Z**. To repeat execution of the previous command, press **F9**. To edit the format of the previous command, press **Alt X**. The revised command will be executed when you press **Enter**.

Classifying Commands by Function

This section classifies commands and command groupings by function.

Getting Help

Help	Furnishes help on special topics and on the current command. Also runs the Database Tutorial.
------	---

Creating or Modifying a Database

File Create	Accesses the View Definition Window so that you can use the View Definition Window commands to create a new view.
File Modify	Accesses the View Definition Window so that you can use the View Definition Window commands to modify an existing view.

The View Definition Window Commands

Attach	Attaches existing data-files and fields to either a new or an existing view.
Create	Creates data-files and fields. Also creates tables, boxes, lines, calculations, menus, rules, or notes for a view.
Delete	Deletes a specific item or a block of items from a view.
Edit	Edits fields, tables, boxes, lines, calculations, menus, rules, or notes for a view. Also defines the linking fields between two files.
Input-Order	Changes the order in which the cursor moves from field to field during data entry.

Move	Moves a specific item or a block of items on a view.
Paint	Defines the permanent colors for a view.
Replicate	Creates a new, empty data-file using the structure of an existing data-file

Entering and Revising Data

Data Enter	Changes from Command Mode to Enter/Update Mode, positioning the cursor in the first field of a new, empty record.
Esc	Changes from Command Mode to Enter/Update Mode, positioning the cursor in the first field of the currently displayed record.

Finding Records and Data

Data Find	Finds records having data equal to, greater than, less than, or containing search criteria.
Data Query	Selects records based upon selection criteria, and creates a new index or data-file.
Data Goto	Displays the view, view page, record, table, or window you select and makes it current

Arranging Records in a View

Order Key	Creates and maintains keys.
Order Sort	Creates sort indexes of records.

Order Manual	Creates an index consisting of manually selected records.
Order Change	Displays records in key, index, or physical order.

Removing Data

Data Delete	Toggles the status of the current record between active and inactive.
Data Utilities Purge	Permanently erases inactive records from a data-file.

Recovering Damaged Files

Data Utilities File-Fix	Reconstructs damaged views or data-files.
-------------------------	---

Printing

Print Current-Record	Prints information about the current record
Print View	Prints all the records in data-files attached to the current view.
Print Report	Defines and prints a variety of form, tabular, and combination reports.

Transferring Data

File Import	Imports a file into the current view. The imported file can be in ASCII, fixed-length, ANGOSS, 3.10 ANGOSS, or dBase II or III format.
File Export	Exports data to a disk file in ASCII, DIF, M-SYLK, ANGOSS, text, or dBase III format.
Data Send	Interactively integrates database records or summarized data with other ANGOSS modules.
Data Transact	Transfers data from one file to another, or updates data in a destination file.
Data Utilities Append	Appends data from a source view to the end of another view.

Obtaining File Information

Data Utilities Information	Lists specifications for the current view.
File Display-Active	Lists all currently active views.

Performing File Functions

File Activate	Activates a view.
File Load	Activates a view and displays it in the current window.
File Unload	Saves changes and then removes a view from memory.
File Save	Saves changes without removing a view from memory.
Tools File commands	Copies, erases, lists, or renames specified files.

Controlling Window Display

Window Paint	Specifies temporary colors for various elements of a view.
Window Split	Splits the current window into two windows.
Window Close	Closes the current window if multiple windows are present.
Window Zoom	Provides a "close-up" of a split window. Also returns a zoomed window to normal size.
Window Link	Allows the user to link two views manually.
Window Unlink	Removes a link established by the Window Link command.

Data Commands

The Data commands allow you to manipulate the data in your views and data-files. You can browse through records, perform cross-tabulation calculations, deactivate and reactivate records, and enter new data. You can select records based upon their contents, combine the data in two views to create a brand new view, or transfer data between two views. You can also send data to another ANGOSS module.

Data provides the following options:

Browse. Displays data in a view with each record occupying a single line and data for each field occupying a different column.

Cross-Tab. Creates a cross-tabulated summary of a view.

Delete. Toggles the record status of the current record between active and inactive status.

Enter. Allows you to enter new records at the end of the current file.

Find. Searches a field or set of fields in the current data-file for a specified data item equal to, greater than, less than, or containing a search data item.

Goto. Changes the current page, record, table, view, or window.

Query. Selects certain records for review.

Relate. Defines, executes, or undefines a relation that creates a new view from two other views.

Send. Sends data from the Database to another ANGOSS module and exits to that module.

Transact. Executes a formula in a transaction definition file, causing data updates and transfers based on matching data in the linking fields between two views.

Utilities. Performs various database maintenance operations, including appending records from one view to another, changing count in a counter field, reconstructing damaged standard views or data-files, and purging deleted (inactive) records. Also provides a list of information about the current view.

Data Browse

Use Data Browse to review multiple records in a standard view format called "Browse Mode." In Browse Mode, each record occupies one line, and each field occupies a column.

In normal Browse Mode, the fields are displayed in columns as wide as the defined field width. In compressed Browse Mode, the display of fields wider than 14 characters is truncated. Pressing **Alt F4** toggles between normal and compressed Browse Modes.

The highlighter indicates the current record. You can use the **up arrow** and **down arrow** keys to move the highlighter to the next or previous logical record. The **Home** and **End** keys move the pointer to the first and last displayed records. **Ctrl Home** moves the pointer to the first record in the logical order of the view; **Ctrl End** moves to the last record in the logical order of the view.

The **right arrow** and **left arrow** keys move the display horizontally one field to bring more fields into view. **Ctrl right** and **Ctrl left** move the display horizontally one screen width. **PgUp** and **PgDn** move the display up and down one window height.

NOTE: If you access Browse Mode while in a view with a table area, only the first record from the table is displayed.

Data Browse All, Fields, and Off

Select the Data Browse All option to turn on Browse Mode for all fields in the current view. All fields are available; ANGOSS displays as many fields (and as many records) as will fit in the current window. Scroll to the right to see additional fields; scroll down to see additional records.

Select Data Browse Fields to select only certain fields for display. You are prompted to select the fields to be shown.

Select Data Browse Off to turn off Browse Mode for the current window. All fields become available, and the current record is redisplayed in the active view format.

Figure 9-1. Browse Mode

Donor	Name	Address	City	ST
212	Timothy Curtis	321 Carlton Avenue	Jonesboro	AL
324	Henrietta Swan	22 East Cumberland Parkwa	Ivanhoe	NY
497	Carl Jamison	907 Hummel Drive	Carthage	NY
119	Helga Peterson	8 Knistler Way	Utica	NY
765	Georgia Owens	27 North Bryers	Albany	CA
876	Candace Wallace	888 Tyrone Place	Wycroft	TX
326	James Harrison	10 Appaluosa	Meyers	FL
144	William Jefferies	71 St. Agnes	Memphis	TN
912	Robert Stone	90 Willow Road	Shawnee	KS
444	Hillary Baker	3423 West 49th Street	Charleston	SC
608	Hugh Ogiby	66 Pacific Way	Harrisville	TX

Menu: **Data** File Order Print Tools Window Help Remember Quit

View: donor3.vw Window:1 Rec:1 (1)

Browse Cross-Fabs Delete Enter Find Goto Query Relate Send Transact Utilities

Data Cross-Tab

Use Data Cross-Tab to perform summarized statistical calculations from data stored in the current view. The calculations to be performed are defined and saved in a cross-tab definition file. You can then execute the definition to output the summarized data either to a data-file or to an ANGOSS text file.

Cross-Tab Options

Data Cross-Tab provides the following keyword options:

Create. Creates a Cross-Tab definition file that contains selection criteria and summary definitions.

Execute. Executes a Cross-Tab definition file.

Modify. Modifies an existing Cross-Tab definition file.

Remove. Deletes a Cross-Tab definition file.

Cross-Tabulation Overview

Suppose that you request a summary of telephone, travel, and postage expenses for the first three months of the year. You receive the following information:

Month	Telephone	Travel	Postage
Jan	400	800	200
Feb	450	850	250
Mar	300	700	100

From this table you can see that the total telephone expense for January is 400. You can also see that the total travel expense for March is 700. In fact, by using the row and column headings you can find the appropriate value for any combination of month and expense.

Notice that the value 400 represents the sum of expenses occurring in January AND having the expense type "telephone." The value 700 represents the sum of expenses occurring in March AND having the expense type "travel."

The Data Cross-Tab command provides the same sort of summarized information. To use Data Cross-Tab:

1. Create a cross-tab definition file.
2. Specify the selection conditions and the summary calculations to be performed.
3. Execute the definition file to obtain the resulting output.

For the example described in the overview, the selection conditions that specify the month are entered as "row match equations." The selection conditions that specify the type of expense are entered as "column match equations." The calculations to be performed are entered as "summary definitions."

For more information about row and column match equations, and summary definitions, see the section entitled *Cross-Tabulating Data* in *Chapter 7*.

Data Cross-Tab Create

Select Data Cross-Tab Create to create a cross-tab definition file. You are prompted to enter a name for the definition file. The Cross-Tabs Definition screen then appears.

Figure 9-2. Cross-Tabs Definition Screen

Cross-Tab

Summary	Sum[Amt]	Sum[Amt]	Sum[Amt]	
Match Equ.	[Type] = "phone"	[Type] = "travel"	[Type] = "postage"	
Match Equ.	Titles	Telephone	Travel	Postage
[Month] = "Jan"	Jan			
[Month] = "Feb"	Feb			
[Month] = "Mar"	Mar			

Options

Auto Row:

Auto Column:

Column Title: Month

Auto Summary:

Figure 9-2 shows a completed cross-tab definition appropriate for the example described in the overview of this command. Notice the two areas labeled `Match Equ.` The row match equations are

entered below the `Match Equ.` label on the left. The column match equations are entered in the areas to the right of the other `Match Equ.` label. The calculation expressions are entered in the areas to the right of the `Summary` label.

The Cross-Tabs Definition screen has two modes, Command Mode and Enter Mode. Press **Esc** to toggle between Enter and Command Mode.

Enter Mode. Enter Mode allows you to bypass the options on the menu by simply typing in the appropriate area of the screen. Use the arrow keys to move the cursor. You can enter match equations, titles, and summary definitions in Enter Mode. The Options window is accessible only from Command Mode.

Press **F6** to display a list of fields. Press **F2** to edit an expression. Press **F10** to complete the definition.

Command Mode. In Command Mode, the Cross-Tab Definition screen provides the following menu of keywords:

Insert Delete Edit Options Summaries Rejects Quit

Use the arrow keys to move the cursor to any column or row of the definition screen outside the **Options** box. Press **F10** to complete the definition.

Cross-Tab Keyword: Insert

Use the Insert keyword to insert a new blank row or column at the current cursor position on the Cross-Tab Definition Screen.

Cross-Tab Keyword: Delete

Use the Delete keyword to delete the entire row or column at the current cursor position on the Cross-Tab Definition Screen.

Cross-Tab Keyword: Edit

Use the Edit keyword to enter or edit match equations and titles.

Match Equations. A match equation is an expression describing conditions that are to be met to generate a row or column of cross-tabulated output. Row match equations control the generation of rows. Column match equations control the generation of columns. An implied

AND operator exists between each row match equation and each column match equation in a definition.

A match equation can be any valid formula. Press **F6** to display a prompter of available fields. After you select a field, complete the expression.

Examples:

[Month]="Apr"

[Type]="phone"

[Amt]>100

Notice that text expressions require quotation marks, while numeric expressions do not. Also, be sure to enter upper and lower case characters appropriately.

Titles. Enter titles for the Row match output under **Titles** in the second column of the definition screen. Enter titles for the Column match output at the right of **Titles**. After you select Edit, type the title in the Control Area. The title will be inserted at the appropriate location when you press **Enter**.

To remove a title (while leaving the remainder of the definition intact), select Edit and press **F8** (delete line).

To remove both the match equation and title, position the cursor in the row or column to be deleted and select Delete.

Cross-Tab Keyword: Options

The Cross-Tabs Options window allows you to define simple, quick, cross tabulation definitions. The primary purpose of the Options window is to provide automatic "match unique data" expressions. Select the Options keyword to access the Options window of the screen. The Options menu, shown in Figure 9-3, appears.

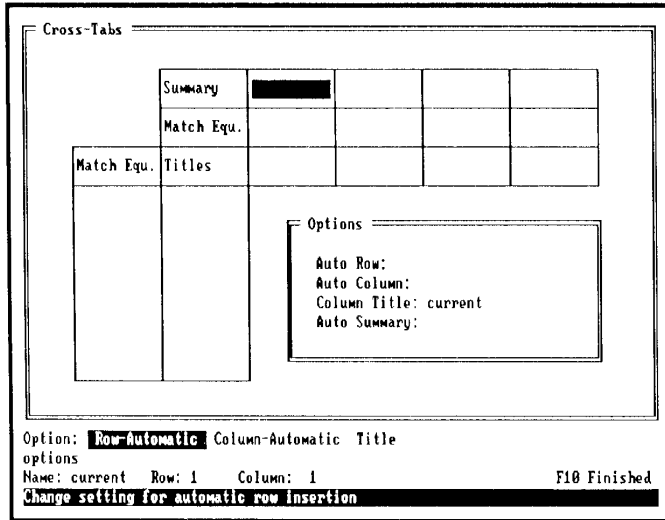
Row-Automatic affects the definition that appears at the right of `Auto Row`. Column-Automatic affects the definition that appears at the right of `Auto Column`, and the summary definition that appears at the right of `Auto Summary`. Title provides the general title for the leftmost column of any cross-tab output.

If you select Row-Automatic or Column-Automatic, select Define to create or change the definition, or select Undefine to remove the definition.

If you enter a field name at `Auto Row`, the Database generates one row of output for each unique entry in the field. The generated row includes the result of every column match equation and

corresponding summary definition specified on the definition screen. Rows generated by the Row-Automatic option appear after rows of output generated by manually defined row match equations.

Figure 9-3. The Cross-Tabs Options Menu



If you specify a field name at the right of `Auto Column`, the Database produces an additional single column of output for every unique entry in the specified field.

The output from the Auto Summary definition appears under the columns generated by the Auto Column field specification. This output appears following any columns generated by manually defined column match equations.

NOTE: The Auto Row option and the Auto Column/Auto Summary option are equivalent to "match unique" in previous versions of the ANGOSS Database.

The Auto Row Option. To specify a field for `Auto Row`, select a field from the prompter list of available fields. The Database enters the field name at the right of `Auto Row` in the **Options** area.

To remove the current auto row field, select `Options Row-Automatic Undefine`.

The Auto Column/Auto Summary Option. To specify a field for `Auto Column`, choose a field from the prompter list. You are then asked to choose an `Auto Summary` definition type from one of the summary definition types (e.g., `S-Sum`) listed on the menu. After you select the type, you are prompted to select the field on which the calculation is to be performed. The auto column and auto summary definitions are then inserted in the `Options` window.

To remove the current auto column field and summary definition, select `Options Column-Automatic Undefine`.

Column Title. Enter the title describing the first column of output (the heading to appear above the row match titles) at `Title`. Type the title as it is to appear in the output. The Database then enters that title for you at the right of `Title` in the **Options** area.

Cross-Tab Keyword: Summaries

Enter a summary definition above the column match equation to which it pertains. To enter the definition, select `Summaries`. An option list of the summary definition types is displayed.

If you select `Sum`, `Average`, `Count`, `Variance`, `Standard-Deviation`, `Sum-Squares`, `Minimum`, or `Maximum`, a prompter appears showing available fields. When you select a field, the Database enters the full summary definition (e.g., `Sum[Quantity]`) in the row to the right of `Summary` in the current column. If you select `Remove`, nothing is entered.

NOTE: If you edit a definition created in an earlier version of ANGOSS, the `Count` option is displayed as `Count []`. If you execute the cross-tab definition without editing this setting, ANGOSS counts the records in the main data-file. If you edit the setting, you must then specify a field.

To remove the summary definition for a column, select `Summary` and select `Remove`.

Valid summary definition types and their meanings are listed in Table 9-1.

Table 9-1

Summary Definition Type	Action
A-Avg	Averages information.
C-Count	Counts occurrences
M-Max	Specifies maximum value.

Summary Definition Type	Action
N-Min	Specifies minimum value.
S-Sum	Sums information.
D-Std-Dev	Specifies standard deviation.
Q-Sum-Squares	Specifies sum of squares.
V-Variance	Specifies statistical variance.
R-Remove	Removes a summary definition.

Cross-Tab Keyword: Rejects

You can specify Rejects as a column match equation or a row match equation. This is equivalent to "match others" in previous versions of ANGOSS Database.

If you enter Rejects as a row match equation, the Database evaluates each column match equation for records that cannot be selected by the other row match equations. The result is presented in an additional row of output.

If you enter Rejects as a column match equation, the Database evaluates each row match equation for records that cannot be selected by the other column match equations. The result is presented in an additional column of output.

To enter Rejects at the current cursor position, select Rejects.

NOTE: The Database does not check Auto Rows and Auto Columns when determining if a record is a reject. All match formulas are processed first, then Rejects and then Autos.

Cross-Tab Keyword: Quit

Select the Quit keyword to leave the Cross-Tabs definition screen. You are asked whether you want to abandon the current changes. Specify **y** to exit without retaining the changes. Specify **n** to remain in the Cross-Tabs definition screen.

Data Cross-Tab Execute

Select Data Cross-Tab Execute to create either a space delimited (Smart) text file or a new data-file based upon a cross-tab definition. You are prompted to specify the definition file to execute.

Select Smart if you want to create a file that can be read into another module. Select Data-File if you want to create a new data-file containing the summarized data.

Data Cross-Tab Modify

Select Data Cross-Tab Modify to change a Cross-Tab definition file and the summary definition it contains.

Data Cross-Tab Remove

Select Data Cross-Tab Remove to delete a Cross-Tab definition file and the summary definition it contains.

Data Delete

Use Data Delete to toggle the current record(s) between active and inactive status. An inactive record can be withheld from data processing activity but remains physically present in the data-file.

The two options of Data Delete are Record and Table-Record. When the cursor is outside a table area, always select the Record option. When the cursor is located within a table area, select Record if you want to delete all information relating to the current record, including the records in a table area. Select Table-Record if you want to delete only the record highlighted in the current table.

The Delete status of a main data-file record is indicated by the word `Del` in a small box in the lower right corner of the screen. Deleted table records cease to be displayed in the table area, giving the visual effect of being deleted.

NOTE: If two or more data-files are attached to a view, the extent of the deletion of a view record is controlled by the `Delete status tied to main data-file` setting in the Edit Links menu. If delete status is tied to the main data-file, appropriate records are deactivated (or reactivated) in both the main data-file and the driven file. If delete status is not tied to the main data-file, the record is deactivated (or reactivated) in the main data-file only.

Table 9-2 shows how the Edit Links setting works when deleting records from different types of views.

Table 9-2

View Description	Edit Links	Result of Data Delete Record from the main view
One data-file	none	Current record in the main data-file is deleted/activated.
Two data-files, no table	NO	Main data-file record is deleted/activated; driven data-file record is not affected.
Two data-files, no table	YES	Main data-file record is deleted/activated; driven data-file record is also deleted/activated.
Two data-files, one in a table.	NO	Main data-file record is deleted/activated; table records are not affected, but can be deleted/activated with Data Delete Table-Record, or with Ctrl F8 in Enter/Update Mode.
Two data-files, one in a table.	YES	Main data-file record is deleted/activated; all table records pertaining to the view record are automatically deleted or activated

Records can also be deleted by using the Replace Delete action of Data Query. Unlike the Data Delete command, Replace Delete always deletes records; it does not toggle a record's delete status between active and inactive.

Data Enter

Use Data Enter to add new records to the current view and its data-files. The Database is placed in Enter/Update Mode, and a new blank record appears in the current window. The cursor is positioned in the first field of the new record. You can begin entering new data, or if you wish, you can move backwards in the view to modify existing records.

COMMENT: Pressing **Esc** while in Command Mode invokes Enter/Update Mode, and positions the cursor on the current record, ready for modification.

NOTE: If the current window is one of multiple windows on the screen, it expands to fill the Data Window Area.

To enter the data for a record, just type information into the appropriate fields. If you prefer, you can press **Alt T** to access the Field Text Editor, which works just like the Tools Text-Editor.

Table 9-3 lists additional keys that help you enter data.

Table 9-3

Key	Action
Ins	Toggles Insert Mode ON and OFF.
Del	Deletes the character at the current cursor position.
Backspace	Deletes the character to the left of the current cursor position.
F2	Enters the current system date into the current field
Alt F2	Enters the current system time into the current field
F7	Reformats a multi-line field so that a word is not broken at the end of a line
F8	Deletes all characters on the current line of a field
F9	Repeats data from the same field of the previous record

Press **Enter** (or **F10** if you have entered multi-line data) to move the cursor to the next field. (If **Yes** has been selected for the Field Definition Menu item `Automatic Advance on Full Field?`, the cursor automatically moves to the next field when you fill the current field to capacity.)

If your view is larger than one page/screen, the next page/screen appears as soon as the cursor leaves the last field on the current page.

If you are entering table records, press **F10** after the last table entry to exit the table area.

When you finish entering new view records, move the cursor to the first available position in the next blank record and press **Esc** to return to Command/View Mode.

All previously entered records are saved. If you leave the cursor positioned within the last record entered, that record is not automatically saved when you press **Esc**. If you have entered information into the record, you are asked if you want to save changes to the current record. If you answer **no**, the record is not saved.

To exit Enter/Update Mode immediately (automatically saving changes), press **Ctrl Enter**.

Data Find

Select Data Find to search one or more fields in the current view for a specified data item and to display the records in which the data is found. The data search item cannot exceed 80 characters.

When you select Data Find, a prompter list of available fields is displayed. You can instruct ANGOSS to search multiple fields by pressing **F6** to create a list of fields. Pressing **F7** allows you to remove a field from the list.

The **F2** key toggles between Prompter mode, which allows you to point to fields to be selected, and Editor mode, which allows you to type field names (even those containing spaces) manually. Press **Enter** or **F10** to complete the field list.

NOTE: All fields being searched must be the same type.

Data Find Comparison Options

After you finish entering the field list, the following comparison options appear:

Equal. Search for data that exactly matches the specified search item.

Greater-Than. Search for data that is greater than the specified search item.

Less-Than. Searches for data that is less than the specified search item.

Partial. Attempts to match the search item with every sequence of characters in the field. For example, "Kemp" could be entered as a search item in order to find records containing the data items "James D. Kempton" and "Kemp Photograph, Inc" in a field. The Partial option can be used only for alphanumeric or inverted fields.

Data Find Search Type Options

Next, specify the search type. A prompt appears asking you to select from the following options:

B Backward F Forward G Global I Ignore Case W Whole Words Only

Enter one or more option letters in logical combination for the search you wish to conduct.

Backward	Searches from the current record back toward the front of the data-file.
Forward	Searches from the current record forward to the end of the data-file.
Global	Searches the entire data-file from beginning to end, given current logical record order
Ignore Case	Searches without regard to upper or lower case. For alphanumeric or inverted fields only.
Whole Words Only	Searches for whole words. For alphanumeric or inverted fields only.

If you do not enter an option, a case-sensitive search starts at the current record and proceeds toward the end of the data-file in logical record order.

When a record containing the search data is found, you are asked if you want the Database to search for the next occurrence of the search item. If so, press **Y**. If not, press **N** to return to Command/View Mode with the "found" record in the current window.

If you want to interrupt a search while it is in progress, press **Ctrl Z**. To continue the search using the previous options, press **Alt R**.

Performing a Binary Search

A B-tree search is much faster than a sequential search of the file. The conditions for performing such a search are as follows:

- The search field list can consist of only one field.
- The field being searched must be a data-file field, not a view field or project processing variable.
- The field being searched must be a key field, and the view must be ordered to that key.
- You cannot use the Ignore Case option.

If you use the Equal option, ANGOSS searches for an exact match. If no match is found, ANGOSS notifies you with a message.

Data Goto

Use Data Goto to change the current page, record, table, view, or window.

Goto Options

Data Goto provides the following options:

Page. Changes the page/screen that appears in the current window.

Record. Changes the record that appears in the current window.

Table. Goes to and makes current a table area in the current view.

View. Displays an active view in the current window.

Window. Changes the current window.

Data Goto Page

If you select Data Goto Page, you can choose between the options Next and Previous. If you select **Next**, the next sequential page appears in the current window. If you select **Previous**, the previous page appears. These options are provided for use with Project Processing. In normal operation, use **PgDn** to display the next page and **PgUp** to display the previous page.

Data Goto Record

If you select Data Goto Record, you can select **Record-Number** and then enter the number of the record that you wish to access. You can also select **Next** or **Previous** to move forward or backward between records. As an alternative to the Data Goto command, **F6** can be used to display the next record and **F5** can be used to display the previous record.

The First and Last options of Data Goto do not appear on the screen but can be used in Project Processing.

Data Goto Table

If you select Data Goto Table, you are then prompted to enter a table name. When you do so, the highlighter moves into the table area and the table becomes current.

Data Goto View

If you select Data Goto View, you are then prompted to enter a view name. When you do so, the view becomes current.

If the highlighter is in a table area, you can select View and enter the current view name to deactivate the table and return to the view.

Data Goto Window

If you select Data Goto Window, enter the number of the window you want to go to. Remember that you can use **Alt F8** to display the next window and **Alt F7** to display the previous window.

Data Query

Select Data Query commands to create, execute, modify, or remove a query definition. There are three main uses for queries:

- To select records based upon criteria that you supply and store the records either in an index or in a new data-file.
- To generate statistical information without creating any new files.
- To perform an action upon existing records without creating any new files. You can replace the contents of fields, or you can change the active/inactive status of records.

Refer to *Chapter 5 of ANGOSS Database* for additional information and examples of queries.

Querying Options

Data Query provides the following options:

Create. Creates a reusable query definition that is saved in a query definition file.

Execute. Creates an index of the records selected from the current view, based upon the query definition, or creates a new data-file containing the queried records. Also performs actions or statistical calculations on existing records.

Modify. Modifies a query definition file.

Now. Creates a definition and executes the query in a single command.

Remove. Deletes a query definition file.

Data Query Create

Select Data Query Create to create a query definition and store it in a query definition file. You are asked to enter the name of the definition file and then to choose between the New and Similar options.

Select **New** if you intend to create the query definition from scratch. Select **Similar** if you want to create a query definition similar to an already existing query definition. If you select Similar, a prompter showing the existing query definitions appears, and you select the query definition that you want to use.

The Query Editor then appears. It will contain no expressions if you are creating a new definition, but will display expressions from the copied definition file if you are creating a similar definition.

The Query Editor

The Query Editor, which resembles a view in Enter/Update mode, allows you to enter one or more selection criteria expressions in either of two areas of the Query Editor.

Table 9-5 lists keys that can be used within the Query Editor.

Table 9-5

Key	Action
Esc	Quit and abandon changes
F1	Help
F3	Goes to previous field

Key	Action
F4	Goes to next field
F6	Displays prompter showing available fields
F8	Deletes information in current field
F10	Saves current query definition
Alt Q	Displays a window for entering or editing a view expression
Alt F2	Clears entire query definition
Alt P	Prints current query definition
Alt T	Accesses a text editor in the Control Area.
Alt W	Writes current query definition to a disk file in ASCII format under a name you specify.

You can enter an expression directly into a field in the Query Editor, or you can press **Alt Q** to invoke the View Expression window, which is similar to the Tools Text-Editor and uses the same function keys. If you use the View Expression window, press **F10** to return to the Query Editor after the expression has been entered. When the View Expression window contains an expression, the word *View* is displayed on the Status Line.

Query expressions can contain literal or constant data, field references, calculations, functions, logical and relational operators, and some special words and symbols.

Boolean functions, such as ISSTRING, ISBLANK, DELETED, and NOT, return either "true" or "false" and are especially useful for query definitions. Relational operators can be used to compare values, as shown in Table 9-6.

Table 9-6

Operator	Meaning
=	equals
==	equals without regard to case
!	contains
!!	does not contain
>	is greater than
>=	is greater than or equal to
<	is less than
<=	is less than or equal to
<>	does not equal

IMPORTANT: To search for a value that is less than a negative number, always put a space between the less-than symbol (<) and the negative number. For example, < -10 instructs ANGOSS to search for values that are less than -10. If you omit the space, ANGOSS interprets the expression as a replace action. In the -10 example, the values in the field will be replaced by the number 10.

Besides selecting records, you can create query definitions that perform statistical calculations based upon data in the records. Use the File SDb functions, such as FILESUM, in the expression. Refer to *ANGOSS Formula Reference* for more information on using FILE SDb functions.

You can also define queries that perform actions upon existing records. You can change the data in selected records, or you can change the active/inactive status of records. Entering action expressions suppresses the generation of additional files.

ANGOSS allows you to use either of two types of query expressions: Query By Example (QBE) expressions or full formula expressions. QBE expressions are always entered in the fields displayed on the Query Editor. Full formula expressions typically are entered in the View Expression window, but can also be entered directly in fields on the Query Editor.

Query By Example

QBE expressions provide ANGOSS with examples of data to be selected. For example, typing **Smith** in a [Name] field instructs ANGOSS to select any records with "Smith" as the data in the [Name] field. The implied field reference is to the current field.

It is only necessary to enclose text data in quotation marks if there is a risk that the text might be interpreted as part of a calculation.

Project Variables in QBE Expressions. When processing a QBE expression containing text data, ANGOSS first searches for a project variable name that matches the text data. If a matching variable name is found, ANGOSS interprets the text as a variable. If a matching variable name is not found, ANGOSS interprets the text as text. To guarantee that ANGOSS correctly interprets a project variable name, use a project variable only in a full formula expression (e.g., [] = varname).

QBE expressions have an implied "AND" between fields. If, in the same query specifying "Smith" in the [Name] field, you also enter **MO** in a [State] field, you are instructing ANGOSS to select records in which [Name] equals "Smith" and [State] equals "MO".

High and Low. High and Low are simple, stand-alone expressions that can be used in QBE style definitions. High selects the record in which a particular field contains the largest value. Low selects the record having the lowest value. You can also use the format **High n** or **Low n**, where **n** is the number of highest or lowest records to select. "Tying" records are included in the group of high or low values.

Range Operator. The range operator **..** is a special relational operator, available only in QBE style definitions. Used before a value (**..10**) the range operator means "less than or equal to" the value. Used after a value, the operator means "greater than or equal to" the value. The expression **5..10** means greater than or equal to 5 and less than or equal to 10.

QBE Patterns. QBE patterns are wildcard strings. The asterisk (*) matches any sequence of characters. The question mark (?) matches one character.

Examples:

*g?	matches any string of data having "g" as the next to the last character
PN??	matches any 4-character string beginning with "PN"
r*y	matches any string beginning with "r" and ending with "y".
r**y	is legal as the equivalent of r*y.

In date strings, the asterisk matches any individual day, month, or year. In time strings, the asterisk matches any hour, minute, or second specifications. The question mark cannot be used in date or time strings.

Wildcard dates are composed of the elements that can be used in custom date formats. For example, a wildcard entry of **Tuesday** will select all records having "Tuesday" in the date field, even though the entry is in a format such as **05/04/1989**. Legal combinations are shown in Table 9-7.

Table 9-7

Wildcard	Use
dayname	to match a particular day of the week, e.g., Tuesday
mon month	to match a particular month, e.g., May
yy yyyy	to match a particular year, e.g., 89 or 1989
d/mon	to match date and month, e.g., 4/May
mon/yy mon/yyyy mm/yy	to match month and year, e.g. May/89, may/1989, or 5/89
mon/d/yy d/mon/yy mm/d/yy d/mm/yy yy/mm/d	to match month, date, and year, according to the date format being used

The / can be replaced by -, , or a space. The characters represented by **m**, **d**, and **y** can be numbers or *.

The format for wildcard time is the same as for constant time entries except for the presence of wildcard characters.

Example:

hh

hha or hhp

hh:mm or hh:mma or hh:mmp

hh:mm:ss or hh:mm:ssa or hh:mm:ssp

The characters **hh**, **mm**, or **ss** can be numbers or *****.

IMPORTANT: Because multiplication of date and time expressions is valid, quotation marks must enclose a date or time string that begins with an asterisk.

QBE Summary Statistics. Enter the File SDb function directly into the appropriate field. An example of a summary statistic expression that might be entered in an [Amount] field is **filesum**, which would return the sum of the values in the [Amount] field.

QBE Actions. Actions consist of deleting or activating records, or replacing field data. Type **<-activate** or **<-delete** to change the active/inactive status of records. To replace field data, type the symbols **<-** followed by the replacement value.

You can combine a QBE selection expression in the same field with a summary statistic and an action expression if you separate them with commas. For example, typing **<100,<-delete,filesum** in the [Amount] field would select all records in which the [Amount] field is less than 100, delete those records, and provide the total of the [Amount] fields from the records selected.

Full Formula Expressions

In contrast to QBE expressions, full formula expressions require complete formulas. In other words, you must supply both sides of an "equation." Field references must be specified where needed; the current field is not implied as with QBE expressions. Enclose text strings with quotation marks.

Examples:

[Amount] = 100

[Name]== "Jones"

[Name]< "G"

[Amount] >= 200 and [Amount] <= 800

not(deleted)

Notice that in the example using the NOT and DELETED functions, no field reference is needed.

Full Expression Summary Statistics. Summary statistics cannot be obtained from a query definition using a full formula expression. Use a QBE style definition instead.

Full Expression Actions. The action options are **replace [field]** = followed by a value, **replace activate**, and **replace delete**. Do not use a comma between the selection expression and the replacement action. If you omit selection criteria, the replacement is performed on every record. Enclose text strings in quotation marks.

Examples:

[Salesman] = "Wilson" replace [Salesman] = "Madison"

[Salesman] = "Madison" replace activate

[Amount] < 1 replace [Amount] = 0

Data Query Execute

Use Data Query Execute to perform the tasks specified in a query definition. You are prompted to enter the name of the definition file to execute.

Data Query Execute Index

If you select the Index option, you are prompted to enter a name for the index to be created. The Database begins the selection process, comparing the selection criteria to each record in the current view. If a record meets the criteria, the record number is stored in the index file. When all the records have been processed, the Database displays the selected records through the newly created index.

As the records are processed, the number of records searched and the total number of records in the file are displayed in the Control Area of the screen.

When the query is finished, the Query Summary box is displayed. The Query Summary box shows the number of records searched, the number of matches found, and the name of the index created.

NOTE: If you need to retain an index in its original state, use a unique name for each index that is created. On the other hand, if you want to create a temporary index file, you can reuse the index name in a query, as long as the view is not currently in order by that index.

Data Query Execute Data-File

If you select the Data-File option, you are prompted for the name of the new data-file. Records conforming to the criteria in a specified query definition file are placed in the new data-file. You are also prompted for the fields to include.

NOTE: If one of the new data-file fields is a calculated field, only the result, not the formula, is placed into the new field.

Statistical Summary Data

If the query definition requests statistical summary information, you are asked to specify the name of the definition file to process, but the output options Index and Data-File are not provided. Instead, the query begins processing immediately. When the query is complete, the Query Summary box lists the number of records searched, the number of matches found, and the result of the statistical calculation, e.g., `Count of [Customer]: 10`.

Query Action Results

If the query definition requests a replacement action, you are asked to specify the name of the definition file to execute, but the output options Index and Data-File are not provided. The query action is performed upon existing records in the data-file. The query begins processing immediately and when completed, the Query Summary is shown, listing the total number of records searched, the number of matches found, and the number of replacements made.

Data Query Modify

Select Data Query Modify to modify an existing query definition file. Query definitions can be changed and reused; it is not necessary to create a new definition file each time, unless you want to keep a particular definition.

You are prompted for the name of the definition file to modify.

Data Query Now

Select Data Query Now to create a query definition, execute the query, and display the records through the new index, all in one step. Use the Now option when you want to select records quickly and you really have no need for the query definition in the future.

When you select Data Query Now, the Query Editor is displayed. You can enter expressions just as you would using Data Query Create. Press **F10** to finish the definition; the Database immediately queries the current view.

ANGOSS displays in the Control Area the number of records searched and the total number of records in the current view. When the query is finished, the Query Summary is shown, listing the number of records searched, the number of matches found, and the name of the index created, "qnow."

COMMENT: If additional index files are created, they are given the name **qnowX**, where X is a number.

The Database automatically retains the most recent Now query definition in qnow.dfq.

Data Query Remove

Select Data Query Remove to delete a query definition file. A prompter list of definition files is shown. Index files are still accessible with the Order Change Index command.

Data Relate

Use the Data Relate commands to create a new standard view and data-file by combining data from two views. The content of the new file is determined by a relationship you define between the two source files. The relationship can be drawn according to one of four relation types: Intersect, Not-Intersect, Subtract, and Union.

To define a relationship, you must be able to relate the two original views by way of "link fields." Link fields must be of the same field type. The following conditions must also be met to establish and use a relational link:

- The two views to relate must be active.
- The link field(s) in the view you specify as View #2 must be key field(s).

In addition, if the link field of View #1 is a key field, the relation types Intersect, Not-Intersect, and Subtract will be processed more quickly.

NOTE: Relation definition links are temporary and are used only during the execution of the Data Relate Execute command.

The new view and data-file are assigned a record structure based upon the fields in one or both of the source views. The new view will be in key order. You indicate the fields to be included when you define the relation. Link fields from View #2 are automatically included in the new view.

You can specify fields in one or more table areas of View #1 as link fields, and specify fields to be included in the new view from both View #1 and View #2. If multiple table areas are specified, they are processed in reverse order of reference in the definition.

Data Relate Options

Data Relate provides the following keyword options:

Create. Creates a relate definition, saving it in a relate definition file.

Execute. Creates a new view based on a predefined relate definition.

Modify. Modifies a relate definition file.

Remove. Deletes a relate definition file.

Data Relate Create

To use Data Relate Create, both source views must be active. When you select Create, you are asked to enter the name of a new relate definition file. The Relate Definition Menu appears with no entered information. It lists the possible relate options you can specify for your new view. The following items appear in the menu. A pointer appears next to the first line:

View 1:

Link field(s):

View 2:

Link field(s):

Relate Type: **Intersect** Not-Intersect Subtract Union

New Database:

New Database Fields:

The Related Views. Enter the name of the first view next to `View 1:` and the name of the second view next to `View 2:`. You can press **F6** to display a supporting menu with the names of all currently active views. Use the pointer to identify a view for selection, then press **F10** or **Enter** to select the view.

The Link Fields. Enter the link field(s) of View #1 and View #2. Remember that each link field of View #2 must be a key field. You can press **F6** to display a menu with the names of all currently active fields in the corresponding view. Use the pointer to identify a field for selection, then press **F6** again to select the field. To unselect a field, press **F7**.

Through the selection of link fields, you can define two different types of relations: one-to-one and many-to-one. In a one-to-one relation, only one match is allowed between the data items of two link fields. In a many-to-one relation, there may be multiple matches from View #1 to a single item in View #2.

One-to-One Relations. One-to-one relations use one or more link fields. To define a one-to-one relation, you must specify the same number of link fields in each view. The first field is the primary link and each subsequent field is a secondary link. The secondary links in View #2 must be minor keys for the key field. The primary and secondary links for View #2 must have the same respective field types as those specified for View #1. Secondary links further distinguish those records that have identical data items in the primary link field. For example, you could define a social security number field as the secondary link for a name field. If your view contains several identical entries in the name field, the Database uses the social security number to differentiate the records. A match requires both identical names and social security numbers.

In the example relation, [Name] is a key field in the emp view. [SocSec] is its minor key. [Name] in the emp view corresponds to [Salesman] in the inv view. [SocSec] in the emp view corresponds to [SS#] in the inv view. For a match to occur when the relation is executed, the corresponding fields must both contain identical data.

Emp.vw

[Name]	[SocSec]
John Brown	112-99-3392
John Brown	112-08-1001
Bill Smith	408-34-7755
Bill Smith	121-32-6789
Jim Smith	121-99-3393

Inv.vw

[Salesman]	[SS#]
John Brown	112-99-3392
John Brown	112-08-1001
Bill Smith	408-34-7755
Bill Smythe	143-22-6369
Jim Smith	121-99-3393

The link fields would be specified as follows:

View 1: **inv**

Link field(s): **[Salesman;SS#]**

View 2: **emp**

Link field(s): **[Name;SocSec]**

Relate Type: Intersect

In our example, three matches occur as follows:

[Name]	SocSec]	Salesman]	[SS#]
John Brown	112-99-3392	John Brown	112-99-3392
John Brown	112-08-100	John Brown	112-08-1001
Jim Smith	121-99-3393	Jim Smith	121-99-3393

Many-to-One Relations. Many-to-one relationships involve one link defined for View #2 and more than one link for View #1. All links in View #1 must have the same field type as the link in View #2. The multiple links in View #1 are not secondary links but separate primary links back to the link in View #2.

Secondary links are allowed if you specify for each link in View #1 primary-secondary multiples that correspond to the primary-secondary structure of the key in View #2. For example, if you specify a primary and two secondaries for the link in View #2, you must also specify a primary and two secondary link fields for View #1.

In this sample relate definition, fields [subst1] and [subst2] of each record in material.vw are compared to field [subst] in inventory.vw. If **either** [subst1] or [subst2] in material.vw contains data identical to that of [subst] in inventory.vw, a match occurs. If data in both [subst1] and [subst2] of material.vw matches the record(s) in inventory.vw, a two-record match occurs.

The following example data shows the link field settings and records from the two source views.

View 1: **material**

Link field(s): **[subst1;subst2]**

View 2: **inventory**

Link field(s): **[subst]**

View 1 View 2

[subst1] [subst2] [subst]

Wood Wood Wood (Match 2 Records)

Paper Rock Paper (Match 1 Record)

Rock Rock Stone (No Match)

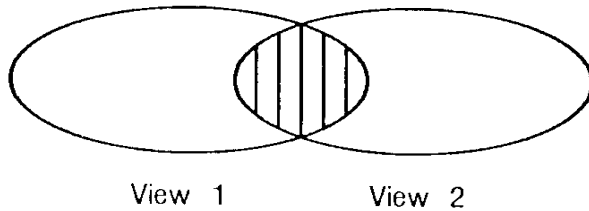
For an Intersect relate type, this example results in the creation of three records for the new view.

Many-to-one relations are useful when you have more than one field per record to link with your other view. A more detailed example of a many-to-one relation appears after the discussion of the remaining items on the Relate Definition Menu.

Relate Type. Select a relate type from *Intersect*, *Not-Intersect*, *Subtract*, and *Union*. Relate type determines which records are placed in the new view when the relation process is executed.

The `Intersect` relate type puts a record in the new view for every match between the link field(s) of the two source views.

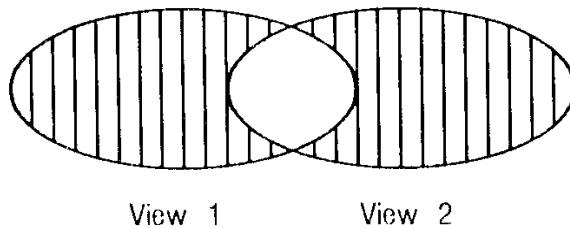
Figure 9-4



The `Not-Intersect` relate type puts records in the new view for each item of link field data in View #1 that does **not** have matches in View #2 and each item of link field data in View #2 that does **not** have matches in View #1.

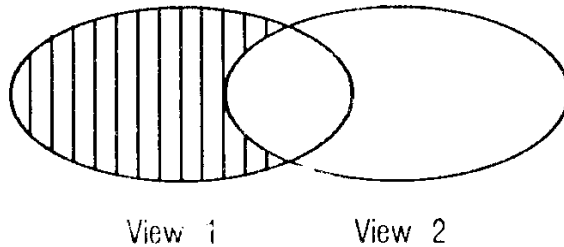
NOTE: Records in a view created by a `Not-Intersect` relation are equivalent to those in a view created by a `Union` relation minus those in a view created by `Intersect`.

Figure 9-5



The `Subtract` relate type creates new records for each item of link field data in View #1 for which there is no match in View #2.

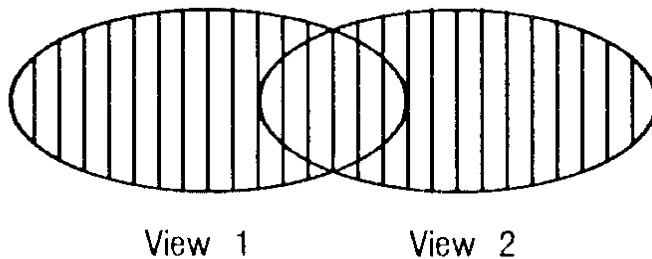
NOTE: The records in a view created by a `Subtract` relation are equivalent to those in a view created by `Not-Intersect` minus the records from View #2.

Figure 9-6

The Union relate type places records in the new view:

- for every match found between the two source views
- for every data item in the link field of View #2 not matched in View #1
- for every data item in the link field of View #1 not matched in View #2

NOTE: The records in a view created by a Union type relation are equivalent to those in a view created by Intersect plus those in a view created by Not-Intersect.

Figure 9-7

New Database. On this line of the Relate Definition Menu, enter a name for the new view.

New Database Fields. With the pointer on this line of the Relate Definition Menu, you can select the fields for your new view. Records containing data in these new fields from one or both of the source views are created in the new view, according to the conditions of the relate

type. The link fields of View #2 are automatically included in the new view. Use **F6** to display the available fields.

Use **F3** and **F4** to change the menu of fields shown in the prompter from the fields of one view to the other.

After you press **F10**, a second window appears underneath the relate definition. This new window contains a columnar list of the fields to be included in your new view. In the column titled New Name, assign names to the new fields by typing the names opposite the source field. Name duplications are marked by asterisks (*) at the left of the duplicate source field names. Eliminate all duplicate field names by renaming one of each set.

After you review and change the new view's field names, press **F10** to complete the definition and return to Command/View Mode. Or, to return to the first relate definition screen, press **Esc**.

Data Relate Examples

As an example, assume you want to use Data Relate to combine two personnel file views into a new view titled **combo**. One view titled **employee** contains general information about the employees. The other view titled **history** contains data on the employees' job histories and salaries. [**Name**] is specified as the link field in both views.

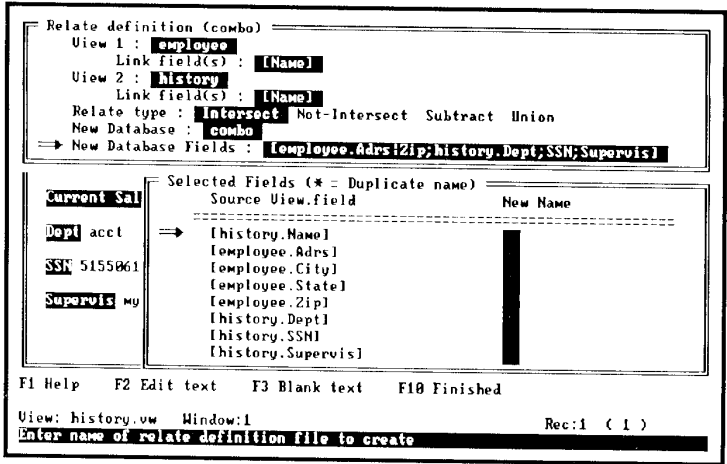
View: employee	View: history
[name]	[name]
[adrs]	[former employee]
[city]	[former salary]
[state]	[date hired]
[zip]	[current salary]
[phone	[dept]
[age]	[SSN]
[birthday]	[supervis]

The entry on the New Database Fields line could be **[employee.adrs|zip;history.dept;SSN;supervis]**. The entire relate definition for this example appears in Figure 9-8.

The resulting record structure would be as follows:

View: combo
[name] link field
[adrs] (from Employee)
city] (from Employee)
[state](from Employee)
[zip](from Employee)
[dept] (from History)
[SSN](from History)
[supervis](from History)

Figure 9-8



An Example of a Many-to-One Relation. Many-to-one relations enable you to specify more than one primary link in one of the views. In this example, suppose you are a college administrator who has a view of class listings and a view of students enrolled in those classes:

View #1: enroll

Rec:	[student]	[class1]	[class2]	[class3]
1	Charlotte	C210	L109	M101
2	Suzanne	C201	M101	W105
3	Jon	C100	X900	W105

View #2: class

Rec.	[class no.]	[class descr.]
1	C100	Intro microcomputing
2	C201	Applied data manag.
3	C210	Word processing
4	L109	Graphics design
5	M101	Spreadsheet math
6	R151	World religions
7	W105	Western civ

You are using a many-to-one relation to compare three link fields [class1], [class2], and [class3] in the enroll view with one link field [class no.] in the class view. The new fields are to be [class descr.] from the class view and [student] from the enroll view. Specifying an intersect relation, you generate the following master class listing view:

View: clmaster

Rec.	[class no.]	[class descr.]	[student]
1	C210	Word processing	Charlotte
2	L109	Graphics design	Charlotte
3	M101	Spreadsheet math	Charlotte
4	C201	Applied data manag.	Suzanne
5	M101	Spreadsheet math	Suzanne

Rec.	[class no.]	[class descr.]	[student]
6	W105	Western civ	Suzanne
7	C100	Intro microcomputing	Jon
8	W105	Western civ	Jon

You can also specify a not-intersect relationship to list those classes for which no one signed up and those students using invalid class numbers (not found in the class view). The resulting view would appear as:

View: not_int

Rec.	[class no.]	[class descr.]	[student]
1	R151	World religions	
2	X900		Jon

Data Relate Execute

Select Data Relate Execute to create a new view from the fields in two source views according to the relate definition you stored in a predefined definition file. Both source views must be active when the command is executed.

After you select the definition file, the program begins the relation process. First, ANGOSS creates the structure of the new data-file, based upon the specified fields in the source views. Then, data from the source views is transferred to the new data-file. When execution is complete, the new (standard) view is displayed in the current window, with a message indicating how many records it contains. The record format (fixed or variable length) is the same as that of View #2.

NOTE: If a link or a new field is a calculated field, only the result, not the formula, is placed into the new field.

If links or new data-file fields have been specified from a table, each record in the table is processed before the next view record is read. After each of these table records is read, the entire view record (i.e., the fields outside the table area plus all records in the table area) is related to the other view.

If fields from more than one table are specified, records from the last table in the view are read while the other tables remain constant. For example, assume there are two tables: Table A and Table B. The records in Table B are read and compared to the first record in Table A. After all Table B records have been read, ANGOSS moves to the second record in Table A and reads all the Table B records again. This process, which continues until all records in every table are read, generates all possible record combinations.

Data Relate Modify

Select Data Relate Modify to edit a relate definition file. You are prompted to specify the name of the file to modify. The Relate Definition Menu then appears, providing the same options as those provided by Data Relate Create.

Data Relate Remove

Select Data Relate Remove to delete a relate definition file. You are prompted to specify the name of the file to remove. Removing the definition file has no effect on the source views or the new standard view and data-file.

Data Send

Data Send moves information from the Database to another ANGOSS module and exits to that module. You can send information to the Communications module, to the Spreadsheet, or to the Word Processor.

Send Options

Data Send provides two options: Data Send All and Data Send Crosstab.

Data Send All. Sends the data in the selected fields from all records in the current view's driver data-file to another module.

Data Send Crosstab. Sends the text output resulting from a cross-tab operation on the current view's data to another module.

Data Send All

Data Send All allows you to select the fields to be included in the send operation; records consisting of data in the selected fields are then sent to the module you specify.

Send All Communications

You can send Database information to ANGOSS Communications for transmission to another terminal.

If you select the Data Send All Communications option, you must choose whether to send information as Data or as Text.

Data. Selecting the Data option causes the information you are sending to be stored in a temporary file with an .iff extension. Database information stored in this format is generally used for merge printing in ANGOSS Word Processor. Field information is surrounded by quotation marks. The .iff file is not loaded when the program enters ANGOSS.

Once you've sent information to ANGOSS Communications using the Data option, you can transmit the resulting .iff file to another ANGOSS user via ANGOSS Communications. The remote operator can then use the .iff file for merge printing.

IMPORTANT: The .iff file is a temporary file. Once you leave the application to which you sent your data, the .iff file is erased. If you wish to use the same data again some other time, you will have to send it again. If you anticipate having to reuse data sent from ANGOSS Database, you should use File Export rather than Data Send.

Text. When you select the Text option, the data you send to Communications is stored in a permanent file that can be transmitted at a later date. Field information is not surrounded by quotation marks as it is when you select the Data option.

Both the Data and Text options prompt you to send data either in Row-Format or in Column Format. For examples of these formats, see the discussion under Data Send Spreadsheet or Data Send Wordprocessor Text. Next, you must select from a prompter the fields whose information you want to send. Press **F6** to select each field and **F10** when you are finished.

Last, you are also prompted to specify a project filename to execute upon entering ANGOSS Communications. If you do not wish to execute a project, just press **Enter**.

Send All Spreadsheet

If you select the Data Send All Spreadsheet option, you must select the Column-Format or Row-Format option and specify the fields whose data you want to send. Notice in the following example how data appears in the Spreadsheet window when you have selected the Row-Format option:

Name	Number	Phone
George	234	(913) 642-7469
Tom	578	(913) 642-4723

If you send those same records to the Spreadsheet using the Column-Format option, the display would appear as follows:

Name	George	Tom
Number	234	578
Phone	(913) 642-7469	(913) 642-4723

After specifying the fields to send, you are prompted to enter a project file to execute upon entering ANGOSS Spreadsheet. If you do not want to execute a project file, just press **Enter**. When you complete this last entry, all views and data-files are unloaded. The specified data is sent to the Spreadsheet and appears on the Spreadsheet window. If you specified a project to be executed upon entry, the project is executed.

Send All Wordprocessor

If you select Wordprocessor, you must then select either the Data or Text option.

Data. Choose Data when you want to use your information for merge printing. If you choose the Data option, the data will be found in a file named after the original data-file, but with an .iff extension. The .iff file is not loaded when the program enters ANGOSS Word Processor; however, you can immediately start a merge print.

IMPORTANT: The .iff file is a temporary file. Once you leave the application to which you sent your data, the .iff file is erased. If you wish to use the same data again some other time, you will have to send it again. If you anticipate having to reuse data sent from ANGOSS Database, you should use File Export rather than Data Send.

Information sent using the Data option is surrounded by quotation marks. A data-file of two records containing the fields "Name," "Number," and "Phone" sent to ANGOSS Word Processor would appear as follows if you loaded it after entering the Word Processor:

“Name”	“Number”	“Phone”
“George”	234	“(913) 642-7469”
“Tom”	“578 “	“(913) 642-4723”

Text. Choose Text when you want to insert data directly into a particular document. When you choose the Text option, the data you send is displayed on the screen when you reach the Word Processor. Data sent in Text format is separated by spaces.

With the Text option, you can choose to send data in row format or in column format. For example, if you send the data-file from the previous example to ANGOSS Word Processor after selecting the Row-Format option, you would see the following display when you reached the Word Processor:

Name	Number	Phone
George	234	(913) 642-7469
Tom	578	(913) 642-4723

If you send those same records to the Word Processor using the Column-Format option, the display would appear as follows:

Name	George	Tom
------	--------	-----

Number	234	578
Phone	(913) 642-7469	(913) 642-4723

After selecting Row-Format or Column-Format, you must specify the fields whose data you want to send. Finally, you are prompted to enter a project file to be executed upon entry to ANGOSS Word Processor. If you do not want to execute a project, just press **Enter**.

When you complete this last entry, all views and data-files are unloaded. The specified data is sent to the Word Processor, and the data you sent with the Text option appears in the Word Processor Window. If you specified a project to be executed upon arrival, the project is executed.

Data Send Crosstab

Data Send Crosstab allows you to send the output resulting from a cross-tab operation on the current view's data to another module. Select the module from the option menu.

If you select Data Send Crosstab, you are prompted to specify the name of the cross-tab definition file to be used. Use Data Cross-Tab Create to create the definition file to be executed.

Send Crosstab Communications

You can send cross-tabulated output to ANGOSS Communications for transmission to another terminal.

If you select Data Send Crosstab, you are prompted to enter a project file to execute upon entry into the Communication module. If you do not want to execute a project file, just press **Enter**. The cross-tab output is sent as a text file to the Communication module. If you specified a project to be executed upon entry, the project is executed.

Send Crosstab Spreadsheet

You can send cross-tabulated output to ANGOSS Spreadsheet.

If you select Data Send Crosstab, you are prompted to enter a project file to execute upon entry into the Spreadsheet module. If you do not want to execute a project file, just press **Enter**. The cross-tab output is sent as a text file to the Spreadsheet module. If you specified a project to be executed upon entry, the project is executed.

Send Crosstab Wordprocessor

You can send cross-tabulated output to ANGOSS Word Processor.

If you select Data Send Crosstab, you are prompted to enter a project file to execute upon entry into the Word Processor module. If you do not want to execute a project file, just press **Enter**. The cross-tab output is sent as a text file to the Word Processor module. If you specified a project to be executed upon entry, the project is executed.

Data Transact

Select Data Transact to transfer data between views based on a formula you define.

The view that initiates a transaction is called the "driver" view. The other views are called "driven" views.

The source of the data may be a single field or a formula. The field receiving data is a "destination field." A destination field can be in the driver view or the current driven view.

Creating a transaction definition requires that you specify "link fields." These are fields in the driver and driven views that cause a transaction to occur when matching data is found. The following conditions must be met in order to establish and use a transaction link:

- The driver and driven views must be active.
- Paired link fields must have the same field type (e.g., alpha, numeric, etc.).
- The link field in the driven view must be a key field and cannot be in a table.
- A destination field can be in a table only if it is in the same table as the driver link field. A destination field can never be in a table of a driven view.

When you execute Data Transact, the Database moves to the first record in the view specified as the "driver view." It processes transactions one link group at a time. A link group is a group of consecutively defined link definitions having driver fields in the same view area (main area or table area) and each driving a different view. Link definitions are described in detail below.

The actions under a group are processed only if all links in the group have at least one match (duplicates can exist in different numbers for each link). Requiring the group to match completely ensures that all or none of a simple transaction record is processed. This allows better restarts and repeat executions.

Delete on match occurs only when one or more defined link groups match.

A table area in the driver view can be processed only if a link has been defined from the field(s) in the area. Repeating areas in driven views are not processed.

NOTE: In Novell's Transaction Tracking System, the actions defined under a group are processed as one TTS transaction.

Data Transact Options

Data Transact provides the following options:

Create. Creates a transaction definition, saving it in a transact definition file.

Execute. Executes a transaction definition.

Modify. Modifies a transaction definition.

Remove. Deletes a transact definition file and the transaction definition it contains.

Data Transact Create

Select Data Transact Create to create a transaction and store it in a transact definition file. You are asked to enter a name for the new file.

The Transact Definition Menu then appears. It is divided into three parts as follows: Driver Definition, Link Definition, and Action Definition.

Driver View: (DRIVER DEFINITION)

Delete Driver View record on match: **No** Yes

Audit: **None** Printer File

Audit File Name:

Driver link field: (LINK DEFINITION)

Driven view name:

Driven link field:

Destination View.Field: (ACTION DEFINITION)

Source (View.Field/Formula):

Use the following keyboard keys when working with the Transact Definition Menu:

Key	Action
F2	Edits text.
F3	Blanks text.
F5	Displays the formula editor when on a source line of the Action definition
F6	Displays a prompter showing fields or views.
F7	Inserts an Action or Link group
F8	Removes an Action or Link group.

The driver definition items appear only once in the definition. A link definition may appear any number of times in the definition. An action definition also may appear any number of times.

As soon as you make a valid entry in any line of the last link definition, the system appends another blank link definition and action definition at the bottom of the menu. Therefore, you can define multiple link definitions.

As soon as you make a valid entry in any line of the last action definition for any link definition, the system adds a blank action definition. Therefore, you can define multiple actions for each link definition.

You can also insert a link definition or an action definition. To do this, move the arrow to the link or action definition that will follow the inserted definition and press **F7**. A blank definition of the same type as the definition to which the arrow points is inserted.

To remove a link or action definition, point the arrow at any line in the definition to remove and press **F8**. If the definition being removed is a link definition with actions defined, you are asked to verify that you want the link and actions removed. If you answer Yes, the link and action definitions are removed. If you answer No, they are not removed.

The following are true of a transaction definition:

- Only one Driver view can be in a transaction.
- You can define any number of links.

- The Driven view specification for each link may differ, but each driven view must be active.
- You must define one or more actions under each link.
- The Destination field can be in either the driver or the driven view of the link for which the action is defined.
- The Source specification can be either a formula or a field specification. A field specification here indicates a transfer of data from that field as the action in the transaction.

Transaction Driver Definition

With the pointer at the first line of the driver definition, `Driver View:`, specify the name of the driver view for this transaction. If you press **F6**, you can select a view from a prompter list of all currently active views.

On the `Delete Driver View record on match: No Yes` line, you can instruct ANGOSS to delete every record in the driver view for which a match is found when the transaction is executed. The deleted records are not used the next time the transaction is run. This option allows you to use only records entered since the last transaction. If a Table area is involved in a transaction, then subject to limitations set in the Edit Links menu of the File Create or File Modify commands, only the view's main file record will be deleted when a match occurs. (See Data Delete Record for information about effects on table records.)

On the `Audit :None Printer File` line, you can specify whether you want to print an audit report of processed data. You can write the report to a file or print the report. If you print to a file, you must provide a file name on the `Audit File Name:` line. An audit report generates information in the following format:

Transaction Audit Report

Definition: name.dft (where "name" is the definition file)

Date: DD/MM/YY Time: HH:MM:SS

A : B

J : K

C : D Key: E

F.G <H> = I

A	Is the name of the driver view
B	is the record number of a record in driver view A
J	is the name of a table (when one is being processed)
K	is the number of a record in the table J (when a table is being processed)
C	is the name of the driven view.
D	is the record number of a record in the driven view C for which a match in the link field was found
E	is the data in the link field of the driver view record B
F	is the name of the view containing the field G, which is affected by action resulting from the match
G	is the name of the field which is affected by action resulting from the match
H	is the old data in the field G.
I	is the new data in the field G which resulted from the action

The following is an example of a transaction audit report:

Transaction Audit Report

Definition: employee.dft

Date: 08/23/88 Time: 14:43:31

emp_1 : 1

emp_2 : 4 Key: Allen

[emp_2.dept] <Finance> = Sales

[emp_2.salary] <\$17,000> = \$18,300

emp_1 : 2

emp_2 : No Match Key: Polk

emp_1 : 3

emp_2 : 2 Key: Morris

[emp_2.dept] <Marketing> = Sales

[Emp_2.salary] <\$15,500> = \$16,200

emp_1 : 4

emp_2 : No Match Key: Woodrow

End of Audit Report

Transaction Link Definition

On the `Driver link field:` line, you can specify link field(s) for the driver view. Secondary link fields are allowed. If you press **F6**, you can display a prompter showing the names of all currently available fields.

On the `Driven view name:` line, you can specify the name of a driven view for this transaction. If you press **F6**, you can display a prompter showing the names of all currently active views.

On the `Driven link field:` line, you can specify the link field for your driven view. It must be a key field. Press **F6** to display a prompter showing fields from the driven view. If secondary link fields were specified, minor key fields must be specified here.

Multiple Links to a Table Area. If you define multiple links from two or more views into a table area of the driver view, save processing time by making the link definitions for them

consecutive on the Transact Definition Menu. Do this because the Database processes the links in the order of their appearance on the Transact Definition Menu. In this case, the Database has to make only one pass through the records in the table area. If the link definitions are not consecutive, (i.e., if link definitions for links outside the table area are inserted between these link definitions), the Database has to make multiple passes through the table area records.

Transaction Action Definition

On the `Destination (View.Field)` : line, enter the name of the destination field for the link. Since the field can be in either the driver or the driven view, the view must be specified (e.g., `Employee.Address` specifies the [Address] field in the view entitled Employee). Use **F6** to display a list of available fields. Use **F3** and **F4** to toggle the prompter's display of field names among the active views.

On the `Source (View.Field/Formula)` : line, enter the name of the source field for a data transfer from that field, or enter a formula specifying a result for the destination field. Since a source field can be in either the driver or the driven view, the view must be specified. Use **F6** to display a list of available fields.

Data Transact Execute

Select Data Transact Execute to perform a data transfer, based on the transaction in a transact definition file. The driver and all driven views must be active. You are prompted to enter the name of the transact definition file to execute.

Data Transact Modify

Select Data Transact Modify to edit a transact definition file. You are prompted for the name of the definition file to modify. The settings provided by the Data Transact Create command are also available when you modify an existing definition file.

Data Transact Remove

Select Data Transact Remove to delete a transact definition file. You are prompted to enter the name of the definition file to be deleted.

Data Utilities

Use the Data Utilities commands to perform various database maintenance operations.

Data Utilities Options

Data Utilities provides the following options:

Append. Appends data from a second view to the end of the current view.

Change-Count. Sets a new count for the next record entered into a counter field or renumbers all current values in a counter field.

File-Fix. Reconstructs lost or damaged standard views or data-files.

Information. Displays the specifications for the view in the current window.

Purge. Removes all inactive records from a data-file, returning the available disk space previously occupied by those records.

Recalc-All. Updates all calculations in a view.

Data Utilities Append

Use Data Utilities Append to add records from a source view to the end of a destination view. The source view must be active; the destination view must be in the current window. The views do not have to have identical structures. The Append command restructures data taken from the source to match the structure of the current view.

NOTE: You can use Data Utilities Append only with single data-file views.

Before you execute Append, load or activate the source view, then load the destination view. When you select Append, you are prompted to specify the name of the source view, aided by a prompter. The Append Definition Menu then appears. It allows you to modify the way in which the source view is appended. The Append Definition Menu relates the source fields to the destination fields in a columnar format. The source field names appear in the left column and the destination names appear at the right.

When the Database creates the Append Definition Menu, it compares field names in the source and the destination views. If it finds matching field names, it assumes a corresponding transfer and lists the matching fields in adjacent columns. If it cannot find a matching source name for a field, a blank line appears in the source column opposite the unmatched destination field. Figure 9-9 shows an example of the Append Definition Menu.

Figure 9-9

Restructure Definition	
Source field	Dest. field
Name	name
City	adrs
State	city
Zip	state
Phone	zip
	phone
	age
	birthday

Age
birthday

F1 Help F7 Insert a field PgUp Prev group Up arrow Prev line
 F10 Finished F8 Delete field PgDn Next group Down arrow Next line
 Source c:\data\cust.uw Destination c:\data\employee.uw

To add or change a pre-defined field transfer, use the pointer to identify the source field you want to modify.

If you want to insert a source field name, press **F7** to display a prompter showing available fields in the source file. Then use the pointer in the prompter to identify a field name, pressing **Enter** or **F6** to select the name for the source field column.

If you want to delete a source field name and remove the defined transfer, press **F8** while the pointer is next to the source field you want deleted.

When you finish entering the append definition, data from each of the defined source fields is placed in its corresponding destination field, creating one new record for every record in the source file. The records are added to the end of the current view.

NOTE: If the source view has been ordered in key or index order, the records are appended in that order. However, if the source and destination views have the same data-file, records are appended in physical order. If duplicate key values are not allowed, duplicate key record values are skipped.

Data Utilities Change-Count

Use Data Utilities Change-Count to set the value of a counter field for the next new record, or to renumber all current values in the counter field of one of the current view's data-files. You are prompted to enter a new count, which must be a number from 1 to 2,000,000,000.

Next. Select Next to set the value of the counter field for the next record entered into the data-file. This only affects records entered after the command is executed.

Renumber. Select Renumber to set the starting value for renumbering the counter field within all records currently in the data-file, starting from the first physical record.

Data Utilities File-Fix

Use Data Utilities File-Fix to reconstruct lost or damaged standard views and data-files when the view displays garbled data or faulty formatting, or when the view cannot be loaded or activated because of error conditions. File-Fix, which cannot be used on active views or data-files, provides the options Data-File and View.

Data-File. Select Data-File to recreate the PIX file for a variable-length data-file or to remove all the old versions of a variable-length data-file's updated records. Keys for the data-file are also rebuilt.

Each variable-length data-file has a PIX (physical index) file. A PIX file maintains essential information about the physical location of all variable-length records in a data-file. Each PIX file receives the same name as its associated data-file and a .pix extension.

You are prompted to enter the name of the data-file.

View. If you do not have a backup copy of a view, select the View option of File-Fix to rebuild the standard view attached to a given data-file.

IMPORTANT: File-Fix View rebuilds a standard view from scratch by examining the contents of the data-file. Since calculations, jump rules, colors, and other attributes are stored with the view, these features are lost if the view is restored using this method. If possible, restore a view file from backup rather than using the File-Fix View option.

You are prompted to enter the name of the standard view to be restored.

Data Utilities Purge

Use Data Utilities Purge to remove all inactive records from a data-file, making available the disk space previously occupied by those records. (Records can be deactivated by executing Data Delete.)

You are prompted to enter the name of the data-file (which cannot be active) to be purged. Since Purge rewrites the entire data-file, you are notified that deleted records will be made irrecoverable and are prompted to continue. If you answer **y**, the command executes. If you answer **n**, no records are purged.

Utilities Information

Select Data Utilities Information to display specifications for the current view and its data-files in the View Information window.

Figure 9-10

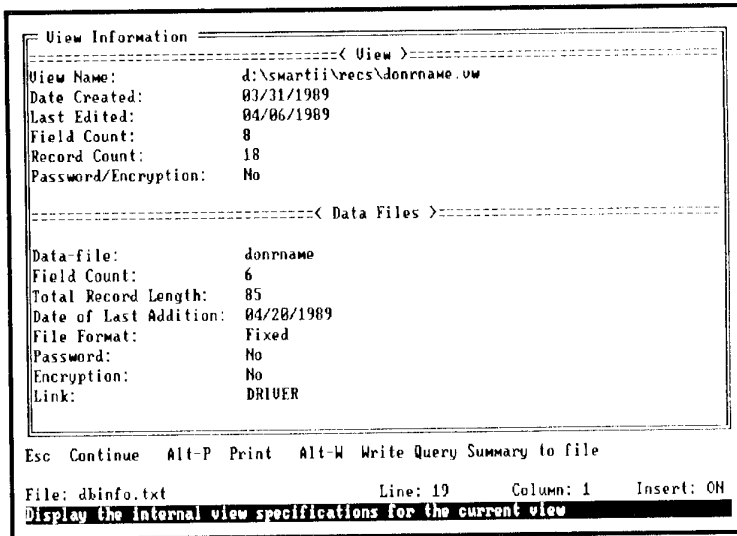


Figure 9-10 shows some of the information provided by the View Information window, which is divided into six sections for the currently active view:

- View
- Data-Files
- Keys on Driver Data-File

- Keys on Driven Data-Files
- Tables
- Fields

You can send the information to a printer by pressing **Alt P**, or you can save the information to disk by pressing **Alt W** and specifying a name for the file.

NOTE: If the view is in Browse Mode, only the fields selected to be browsed are listed in the View Information window.

View

This section provides information about the current view.

View Name. The name of the view is shown here. If the view is not in the current directory, the complete path is shown.

Date Created. This item shows the date that the current view was created.

Last Edited. This item shows the date of the most recent modification to the view definition.

Field Count. Field Count shows the number of fields present on the view.

Record Count. This item shows the number of records contained in the view's driver data-file.

Password/Encryption. *Yes* indicates that the view has been assigned a password and is therefore encrypted. *No* indicates that no password has been assigned.

Data-Files

The Data-Files section of the View Information window provides information about each attached data-file, including link definition information. The following information is presented for each data-file attached to the view.

Data-File. The name of the data-file is shown here. If the data-file does not reside in the same directory as the view, the complete path is given.

Field Count. The number of fields in the data-file is shown. Fields are included in the count, regardless of whether they are attached to the view.

Total Record Length. This item shows the combined length of all of the fields in the data-file, regardless of whether the fields are attached to the view.

Date of Last Addition. This item shows the date on which the most recent data entry activity occurred.

File Format. *Fixed* indicates fixed-length format. *Variable* indicates variable-length format.

Password. *Yes* indicates that a password has been assigned to the data-file. *No* indicates that no password has been assigned.

Encryption. *Yes* indicates that the data-file is encrypted. *No* indicates that the data-file is not encrypted.

Link. If the data-file is the main data-file or is the only data-file associated with the view, the entry for this item is *DRIVER*. If the data-file being described is a driven file, the link is shown in one of the following ways:

FIELD-> [Filename.FIELD_A]

FIELD-> FIELD_A

FIELD is the name of the link field in the driver file. [Filename.FIELD_A] indicates that FIELD_A, the link field from the driven file, is not on the current view; Filename is the name of the driven data-file. FIELD_A (without brackets and filename) indicates that FIELD_A is on the current view.

Keys on DRIVER Data-File

This section describes the keys from the driver file that have been defined for the current view. The categories are repeated for each major key. If no keys are defined, this section does not appear.

Major. This item shows the name, length, and data type of a field designated a major key field.

Minor. This item shows the name, length, and data type of a field designated a minor key field in a key definition.

Data-File. This item provides the name of the data-file that contains the major and minor key fields.

Duplicates. *Yes* indicates that duplicate entries are allowed in the key. *No* indicates that duplicates are not allowed.

Keys on DRIVEN Data-Files

This section describes the keys from the driven files that have been defined for the current view. The categories are repeated for each major key. This section appears only when a driven key field is present on the view.

Major. This item shows the name, length, and data type of a field designated a major key field.

Minor. This item shows the name, length, and data type of a field designated a minor key field in a key definition.

Data-File. This item provides the name of the data-file that contains the major and minor key fields.

Duplicates. *Yes* indicates that duplicate entries are allowed in the key. *No* indicates that duplicates are not allowed.

Tables

This section lists the name of each table on the current view and the name of the data-file from which each table is built.

Fields

This section provides structural information about the fields associated with the current view. The categories are repeated for each field.

NOTE: For more information regarding field attributes, refer to the discussion of the Field Definition Menu in the *File Commands* section of *Chapter 9*.

Field Number. This item shows the field's input order position.

Field Name. The name of the field being described is shown here.

Is a Major in a Key. This item indicates whether the field is a major key field.

Data-File. The name of the data-file in which the field resides is shown here.

Contained in Table. This item indicates whether the field is used in a table on the current view. If the field is used in a table, the name of the table is shown. `No` indicates that the field is not used in a table.

Field Type. This item tells the type of data that can be stored in the field.

Data-File Field Width. This item shows the maximum number of characters that can be entered or stored in the field.

NOTE: The storage size of a numeric field is always 8 bytes, regardless of the number of characters entered or displayed.

Screen Field Width. This item shows the maximum number of characters that the field has been designated to display on the screen.

Title Placement. Title Placement shows the location of the field name on the view: `Above-Field` or `Left-of-Field`. If the field name is not visible on the view, this item is `none`.

Entry Status. The settings for this item are:

- `Read/Write`, which grants standard read/write permission to the field
- `Read-Only`, which prohibits the user from entering data into the field
- `Mandatory-Entry`, which requires the user to enter data into the field
- `Project-Write`, which prohibits the user from entering data into the field, but allows programs to do so

Auto Adv on Full. `Yes` indicates that, during data entry, the cursor advances to the next field as soon as the field becomes full. `No` indicates that the cursor remains in the field until the user presses **F10** or **Enter**.

Display Format. This item shows the settings used to control the display of data in the field. The settings represent (in order):

- numeric precision
- alignment
- numeric type
- numeric options

For example, `2r$P` displays a field entry with two decimal places, right alignment, and a currency symbol; negatives are denoted by parentheses. For more information, refer to the section on **Field Display Format** in the discussion of the Field Definition Menu in **Chapter 9**.

Input Mask. This item shows the settings used to control valid input into the field. The basic template for an input mask character is `nMc`, where `n` is an optional repeat-count indicator, `M` is the mask character, and `c` is an optional case-modifier. A mask character represents one character position in an input stream. For more information, refer to the **Input Mask** section in the Field Definition Menu discussion in **Chapter 9**.

Data Entry Message. If a prompt or reminder message is to be displayed during data entry, the text of the message is shown here. Otherwise, this item shows none.

Default Equation. If a default equation has been defined for the field, the equation is shown here. If the field has no default equation, this item shows none.

Menu Type. Menu type can be `Bar`, `Popup`, or `Data-File`. If the field has no menu attached, this item shows none.

Menu Choices. If Menu Type is `Bar` or `Popup`, the selection entries on the menu are listed here. If Menu Type is `none` or `Data-File`, the Menu Choices item does not appear.

Menu Returned Field. If Menu Type is `Data-file`, the data-file field from which data is obtained is shown. If Menu Type is not `Data-File`, this item is not listed.

NOTE: When a field name is enclosed in brackets, the field is a data-file field; the name of the data-file precedes the name of the field. When the field name is not enclosed in brackets, the field is on the current view and the name shown is the field name displayed on the view.

Menu Display Fields. If Menu Type is `Data-File`, the data-file fields displayed on the menu are listed here. If Menu Type is not `Data-File`, this item is not present. The field reference conventions described in the previous note also apply to the Menu Display Fields item.

Calculation Type. If the field has a calculation attached, the type of calculation is shown here. Calculation types are: `Immediate`, `Wait`, and `Manual`. If no calculation is attached to the field, this item is none.

Calculation Equation. The expression defining the calculation to be performed is shown here. If Calculation Type is `none`, this item is not listed.

Rules. Yes indicates that the field has one or more rules attached. Rule Type, Rule Equation, and Color/To/Msg categories are repeated for each rule. No indicates that no rule is attached.

Rule Type. A rule can be one of three types: Color, Error Check, or Jump. If the Rules item is No, this item is not listed.

Rule Equation. The rule equation expression is shown here. If the Rules item is No, this item is not listed.

Color/To/Msg. If the Rule Type is Color, this item shows the pair of numbers representing foreground and background colors to be used. If the Rule Type is Error Check, this item shows the message to be displayed. If the Rule Type is Jump, this item shows the destination field. If the Rule item is No, this item is not listed.

Data Utilities Recalc-All

Use Data Utilities Recalc-All to update all calculations in a view. (In a table, only the first record is recalculated.) This command can be useful if you add a new calculation to a view and want to quickly and easily update all records. Records are recalculated in the current view order. This means that if the view is currently in index order, only records in the index will be recalculated.

File Commands

File commands allow you to create, modify and manipulate views, data-files, fields and their structures.

File provides the following keyword options:

Load. Reads a view and its associated data-files from the disk into memory, displaying the view in the current window on the screen.

Create. Creates new views, data-files, fields, etc.

Modify. Edits an existing view and its associated data structures.

Save. Saves the current view's data-files to disk.

Unload. Removes one or all active views and their associated data-files from memory.

Activate. Reads a view and its associated data-files into memory.

Display-Active. Displays the names of all views and data-files currently active.

Import. Reads data into the current data-file from a disk file using one of five available disk file formats.

Export. Writes data from the current data-file into a disk file using one of six available file formats.

Password. Attaches or removes password protection to/from a view or its associated data-files.

File Load

Select File Load to read a view and its associated data-files from the disk into memory, displaying the view in the current window. If a view is in the current window when you load a second

view, the first view is not unloaded, but remains active in background memory. Load provides the options Custom-View and Standard-View.

Custom-View. Select Custom-View to load a view specially designed by you or another user.

Standard-View. Select Standard-View to load a view automatically created by ANGOSS for a particular data-file.

You are then prompted to enter the filename of the view you want to load.

File Create

File Create, which establishes a new view, is the command to use as the first step in creating a new database. Part of the creation process includes creating a new data-file, in which to store data entered through your view, or attaching an existing data-file to the new view. *Important Database Concepts* in *Chapter 2* of this book gives an overview of the creation process for views and data-files. If you have not already done so, please review this important discussion.

After executing File Create, you are first prompted to enter a name for the view. Enter a name different from that of any other existing view. Then choose between the options New and Similar.

New or Similar. Choose New to create a new view from scratch. Choose Similar to use an existing view as a template to create the new view.

NOTE: A view created from the Similar option will be identical to the existing view. The same data-files will be attached; the same fields will be key fields; calculated fields will be the same, and so forth. If you want the view to be different from the source view, you can make changes through the View Definition window.

Custom-View or Standard-View. If you choose Similar, you must decide whether a Custom-View or a Standard-View will be used as the template. After choosing between the Custom-View and Standard-View options, a prompter appears showing the names of existing views. Select the name of the view to use as a template.

Password or No-Password. Whether you initially selected New or Similar, you must specify whether you want password protection for the new view. If you select No-Password, no password is assigned to the view. If you specify Password, the Database will also "encrypt" the view on disk (provide an additional level of protection by making the data unreadable unless the password is entered).

COMMENT: Specify in Tools Preferences Database whether you want the standard or alternate form of encryption.

You are then asked to enter up to 16 characters for your password. The Database will prompt you to enter the password a second time for verification.

When you have finished with the password option, the View Definition Window appears. The name of the view is shown next to the word `View:` in the lower-left corner of the screen.

Once you have defined the basic foundation of your view, you can use the View Definition Window keywords to create a data-file, define data-file fields and create items such as tables, rules, boxes and notes within your view. For more information, see the section entitled ***The View Definition Window*** later in this chapter.

File Modify

File Modify allows you to edit, add to or delete parts of an existing view.

Custom-View or Standard-View. After selecting the File Modify command, specify whether you want to modify a Custom-view or a Standard-view. You are then prompted to specify the name of the view to be modified. You cannot modify a view that is in more than one window. After you select the view, the View Definition Window appears.

COMMENT: ANGOSS retains a copy of your file in memory until restructuring is complete. Allow enough memory for both versions.

NOTE: File Create and File Modify give you access to the same View Definition keywords discussed in the next section.

For more information about modifying a view see ***Modifying a View*** in ***Chapter 3*** of this manual.

The View Definition Window

The View Definition Window is a special editor that gives you access to a unique set of View Definition commands. It permits you to create or modify one specified view and its structural definition. You can create a maximum of 1000 fields on a view. If you are creating a new view, no items appear on the view. If you are creating a Similar view, or modifying an existing view, the view you have specified appears in the Window.

The following View Definition Window keywords appear:

Attach. Attaches an existing data-file or field to the current view.

Create. Creates a new structure for the current view (i.e., a box, calculation, data-file, etc.).

Delete. Deletes a block area or a specific item from the current view.

Edit. Edits an item of the current view definition.

Input-Order. Changes the order in which users enter data into fields on the view.

Move. Moves a block area or a specific item to a different location on the current view.

Paint. Changes the colors used in selected areas of the display screen.

Replicate. Detaches the current data-file and creates a new, empty data-file. Also duplicates a field for use with the current view.

IMPORTANT: The instructions for the View Definition Window keywords are arranged alphabetically, rather than in a step-by-step sequence.

If you are creating a view, first select View Definition keywords Create Data-File to create a new data-file in which to store the data. Or select Attach Data-File to attach an existing data-file to the view. At that point, you can select Create Field with the Data-File option to create fields for the data-file. You can also define other items for the view or edit existing items. The important thing to remember is that a data-file must be created or attached to the view before you create or attach fields or other field related items. If you need additional step-by-step information, refer to *Chapter 3* of this manual.

View Definition Keyword: Attach

The View Definition keyword Attach is used to attach an existing data-file or field to the current view. A data-file itself must be attached to a view before any of the data-file's fields can be attached.

Attach Data-File

Select the View Definition keywords Attach Data-file to attach an existing data-file to the current view. A prompter list of existing data-files in the current directory is then displayed. Move the

pointer to the data-file you wish to attach to your view and press **Enter**, or enter the name of the data-file manually. The data-file is now attached to the view.

Attach Field

The View Definition keywords **Attach Field** allow you to attach fields to the view you are creating or modifying. Before attaching a field to a view, the data-file that contains it must be attached. Move the cursor to the position on the screen where you want the field to appear before executing the command.

A prompter then appears listing the fields in the data-files attached to the view. You can type the field name manually or you can use the cursor keys to point to the field you want to select. In addition, the following keys can be used to help you select a field.

Key	Action
F2	Toggles between Prompter and Editor mode. Either mode allows you to type a field name, but only Editor mode allows you to type a field name containing a space
F3	Displays fields from the previous data-file list if multiple data-files are attached
F4	Displays fields from the next data-file list if multiple data-files are attached
F10 or Enter	Completes the selection of a field

F6 and **F7** are normally used for selecting and unselecting fields for a field list, which is not a valid entry for this command.

If the name of the field you specify is identical to that of a field already on the view, you are prompted to enter another name.

View Definition Keyword: Create

Use the View Definition keyword Create to create a new data structure for the current view.

Create Box

The Create Box option on the View Definition menu allows you to define rectangular areas on the view. After you select the Box option, choose either the Double or Single option.

Double or Single. The Double option draws a box using double lines; the Single option uses a single line.

Optional Foreground Color. To give the box a foreground color, enter a number from the list of colors that appears at the bottom of the screen. You can press **Enter** to accept the default color. If you accept the default color, you can later change the color of the box with the Window Paint commands. If you set a color for the box with this prompt, that color cannot be painted. It can only be changed by executing File Modify and changing this setting.

At the prompt, move the cursor vertically and horizontally to produce a box or line. Use **F2** to reset anchor if necessary. You can create a maximum of 3200 boxes and notes on one view.

NOTE: Boxes and lines have the lowest priority of all items on the view, allowing other items to overwrite all or part of a box or line.

Create Calculation

When you select Create Calculation, a prompter appears showing available fields. After you select a field, you must choose an option from among Immediate, Wait, or Manual.

When you edit an existing calculation (using the Edit Calculation command), an additional option, Same, is displayed with Immediate, Wait, and Manual. Selecting Same instructs ANGOSS to retain the current calculation type.

Immediate. If you select Immediate, the Database calculates the value of the field when the cursor arrives at the field. The Immediate option is selected automatically if you do not select one of the other options.

Wait. If you select Wait, the Database performs the calculation and waits with the cursor in the calculated field until **Enter** is pressed.

Manual. If you select Manual, the Database enters the calculated value into the field when the data entry user presses **Alt F5**. The user then can accept or change this entered value.

NOTE: During data entry, calculation may occur twice: once when the cursor passes through a calculated field, and again when the record is saved. If a calculation contains the ASK function, the user may be asked for data multiple times. You can use the DBINFO function to determine whether the calculation is being called while the record is being saved.

Example:

```
IF DBINFO(db_recalc) <> TRUE
    THEN ASK ("Enter name")
ELSE NOCHANGE
```

The Formula Editor appears allowing you to enter the formula you wish to attach to this field. The result of this calculation will become the contents of your calculated field.

The Formula Editor

The Formula Editor, which is very similar to the Text Editor of the Tools commands, temporarily displaces the display of the View Definition Window.

You can reference fields in a formula by name, as in [Price] * [Quantity]. If a field has been assigned an alias, use the alias in a formula. You can also reference fields by field number ([3] * [4]) although this is strongly discouraged. You can enter a field list (e.g., [Name;Address;City;State]) by using brackets and semicolons. You can also specify a range of fields (e.g., [Name|City], meaning fields [Name] through [City]) with the brackets and the vertical bar. To reference an external field, include the view name followed by a period along with the field name (e.g., [Invoice.Cust#]).

IMPORTANT: A custom view and its standard view are closely "linked" during the initial creation process. If you create fields for both views, assign an alias to a field in the custom view, and then use the alias in a calculation, the calculation becomes invalid for the standard view, and therefore, is deleted.

Formulas can contain numbers and other expressions, numeric operators (+ for addition; - for subtraction; * for multiplication; / for division; ^ for exponentiation), and ANGOSS functions (e.g., SUM, AVG). For more information on using formulas in ANGOSS, refer to ***ANGOSS Formula Reference***.

Use the Cursor Movement keys to move around the Formula Editor. In addition, the keys listed in Table 9-9 can be used to facilitate creating or editing a formula.

Table 9-9

Key	Action
Del	Deletes character at current cursor position
Backspace	Moves cursor left one character, deleting the character
Ins	Toggles Insert Mode On or Off
F1	Access ANGOSS Help
F2	Shows list of additional function keys
F3	Allows you to perform a search in the Formula Editor
F4	Allows you to perform a search and replace operation in the Formula Editor
F5	Calculates the formula and displays the result in the Control Area
F6	Displays a list of available fields which can be selected
F7	Inserts a line. The line contains any data currently in the delete buffer
F8	Deletes a line and places the line's contents into the delete buffer
F9	Repeats previous Find or Replace command
Alt F2	Clears the Formula Editor
Alt G	Allows you to go to a specified line
Alt F3	Allows you to read in another file. This is particularly useful if you want to use a complex formula created in the Text Editor
Alt I	Inserts an area of copied or deleted data
Alt C	Copies an area of data
Alt P	Prints the formula
Alt D	Deletes an area of data
Ctrl Y	Deletes a line without storing data in the delete buffer

Key	Action
F10	Stores the defined calculation for the field and exits the Formula Editor
Esc	Exits the Formula Editor without saving the calculation

Create Data-File

Create Data-File allows you to create a new data-file for the current view. When you are creating a new database, select this option before you begin defining fields. You are prompted to specify a name for the data-file.

IMPORTANT: It is not a simple matter to change the name of a data-file or to move it to a new directory after it has been created. Both standard and custom views store within them the names of all attached data-files. If the data-file is in a different directory than the view, the path to the data-file is also recorded in the view. If you move or change the name of the data-file, the view will not be able to find it anymore. If you must to rename a data-file, create a new standard view and data-file using File Create <name> Similar followed by Replicate Data-file. Then copy the data itself into the new file with Data Utilities Append.

Then choose whether the data-file is to be Fixed-Length or Variable-Length.

Fixed-Length. If you select Fixed-Length, the records in your new data-file are required to be the same length. Each field in a fixed-length data-file is allocated a specific length, regardless how much data is entered into any field.

Variable-Length. If you select Variable-Length, the records in your new data-file are not required to be any particular length. A field in a variable-length data-file is only allocated as much disk space as needed to save the data entered.

NOTE: In general, a fixed-length data-file requires more disk space while providing faster data access times. A variable-length data-file requires longer access times while increasing disk storage efficiency.

Password or No-Password. Specify whether you want to attach a password to the data-file and, if so, whether to encrypt the data-file for further protection. The password can be up to 16 characters long.

COMMENT: Specify in Tools Preferences Database whether encryption should be in standard or alternate form.

When the command is completed, the new data-file is established and ready to accept any fields, field calculations, etc., that you wish to create for it using the View Definition Window.

IMPORTANT: If you create or attach more than one data-file to a view, the Database does not allow you to leave the View Definition Window until you have established links among the data-files. Establish links by executing the Edit Links command.

Create Field

Move the cursor to the position you want for your new field on the view before executing Create Field. After you select Create Field, you are prompted to define a name for the field. Enter a unique name that does not exceed 20 characters. Spaces can be used in a name. A prompt then appears asking you to specify whether this field will be a Data-File field, a View field, or a Project-Processing variable.

Data-File. Select Data-File if you want data entered through this field to be stored in the data-file on disk. If you are creating a new database, this is the option to use to create fields for your data-file.

View. Select View if you do not want the field's data to be stored in the data-file on disk. For example, you may want to see the results of a calculated field when view records are displayed, but you have no need of storing the result amounts. The calculated field could be defined as a View field.

Project-Processing. Select Project-Processing if you want to create the field as a Project Processing variable. In this case, data entered into the field is also not stored on disk but is accessible from outside the view.

After you specify Data-File, View, or Project-Processing for the field, the Field Definition Menu appears. It shows the field options you can specify for your new field.

Field Definition Menu

On the Field Definition Menu the name of the field is displayed at the top of the screen. If the field is a data-file field, the name appears in the format view.field (where EMP.Name specifies the [Name] field in the data-file EMP). If the field is a view field or a project variable, only the field name appears (e.g., Name).

Field Type

Select from one of the available field types. Two types, Inverted and Alpha, are for alphanumeric data. The remaining field types are for numeric data in various formats. The default is **Alpha**.

Inverted. An inverted field, which can contain any keyboard characters, is sorted by the last word in the field. For example, if "John Smith" is entered into an inverted field, "Smith" rather than "John" would be used in a sort.

COMMENT: To force the sort to use a specific word rather than the last word in the field, insert a backslash (\) before the word to be used, as in "The \Smith Company".

Alpha. An alpha (or alphanumeric) field can contain any keyboard characters. A long alpha field will extend to the rightmost edge of the current window and then wrap to additional lines as necessary.

IMPORTANT: Quotation marks (") are used as field delimiters in ASCII and ANGOSS file formats. Using quotation marks in alpha fields, although valid, could cause problems in importing and exporting files.

Numeric. A numeric field can contain numbers. You can enter up to 255 characters into a numeric field, but ANGOSS "rounds" the value so that it is expressed to 15 significant digits.

Counter. A counter field contains an automatically assigned sequential number for each record.

Date. A date field is a special type of numeric field. A date can be entered using alpha characters, as in August 15, 1990, or 15 August 1990. A date can also be entered using numeric characters, as in 8/15/90 or 8-15-90. Date entries are interpreted according to the Date Style setting in Tools Preferences Global. The display defaults to Date2 format unless you specify otherwise with a Field Display Format specification.

Time. A time field is a special type of numeric field. Time can be entered in either 12-hour or 24-hour format. The display is based upon the Time Format setting in Tools Preferences Global, unless you specify otherwise with a Field Display Format specification.

Field Width

For numeric fields, Field Width represents display width and the number of characters that can be entered into the field. You can specify a value from 1 to 255; however, because numeric fields cannot wrap to additional lines, the field's position in the view may dictate fewer than 255 positions.

COMMENT: Storage width for a numeric field is always 8 bytes, regardless of display width.

When you first create a numeric field, you enter the display width here. Be sure to allow room for additional characters, such as commas and currency symbols, that might be displayed. Later, if you decide to edit the field, you can change the display width by marking the positions on the view; you cannot, however, change the setting from this menu.

For alpha (and inverted) fields, Field Width represents storage width, i.e., the number of characters that can be stored. Alpha fields, which can wrap to additional lines, can contain several thousand characters. Inverted fields can contain up to 100 characters.

When you first create an alpha field, the value you specify for Field Width determines both storage width and display width. Later, if you choose to edit the field, you can alter the display width by marking the positions on the view. Storage width can be altered by changing the setting in the menu.

NOTE: Display width and storage width need not match for alpha fields. For example, if the display width is larger than the storage width, the highlighter marking the field in Enter Mode extends past the last point at which you can type characters.

Field Title Placement

Title Placement allows you to specify where the field name should be displayed in relation to the field itself.

None. Select None if you do not want the field name to appear at all.

Above-Field. Select Above-Field to position the field name over the field.

Left-of-Field. Select Left-of-Field to position the field name to the left of the field. This is the default setting.

Extended Field Options

If you move the pointer to Extended Field Options and select **Yes**, you can access an additional set of options. Otherwise, you can press **F10** to complete the current selections and exit the Field Definition Menu.

The extended field options are as follows:

View Field Name

This option allows you to change the name that will be displayed on the view in place of the actual field name. For example, you may wish to name a field "Acct#" in the standard view/data-file, but you want "Account Number" to appear on the current view.

IMPORTANT: If the renamed field is used in a calculation, the calculation must be revised to reference the new name. If, during the process of creating a new data-file (i.e., before you exit the View Definition Window), you rename a field and therefore revise a calculation, you invalidate the formula in the standard view. An error message is displayed informing you that the calculation will be deleted from the standard view.

The maximum length of the new name is 20 characters. Spaces can be used.

Field Attributes

This option allows you to select an access/entry attribute for the field.

Read/Write. The initial default is Read/Write, granting standard read/write permission to your field.

Read-Only. If you select Read-Only, the content of the field is displayed but no data can be entered.

Mandatory-Entry. If you select Mandatory-Entry, the user is required to enter data into the field to complete the record.

Project-Write. If you select Project-Write, the field will appear read only to the user while in update mode. A project processing program will be able to write data into the field.

Automatic Advance on Full Field

You can choose whether you want to use the "automatic advance" feature during data entry. If you select **Yes**, the cursor will advance to the next field as soon as the field becomes full. If you select **No**, which is the default setting, the cursor will remain in the field until the user presses **Enter** or **F10**.

Field Colors

Title foreground, background color: 0,0

Data foreground, background color: 0,0

With the color settings, you can change the foreground (characters) and background colors used in the display of the field name (Title) or the input data (Data) on the view. Press **F6** to show a list of numbered colors at the bottom of the screen. You will first be prompted for a background color, and then a foreground color. To select a color, enter the appropriate number. If you wish to accept the default colors, press **Enter**.

NOTE: If you select colors on these settings, they cannot be changed by the Window Paint command. The colors can only be changed by modifying the file and changing these settings. If you accept the default colors for these settings, you can later change them temporarily with the Window Paint commands. Painted colors are only good for the current session. If you unload and then reload the view, the colors revert to those specified in the view definition.

Field Display Format

You can define a display format (maximum of 100 characters) for a field. This allows you to enhance the display of data so that text, numbers, dates, times, and other types of entries are displayed properly. A list of available format characters appears when you press **F6**.

Specify the Field Display Format settings in the following order:

Precision, Alignment, Type, Options.

Example:

2r\$p

Do not use spaces or commas to separate the settings. For example, 2r\$p specifies a precision of two decimal places, right alignment, the use of the currency symbol, and the use of parentheses for negative values. If the user types the number 10 in the field, \$10.00 will be displayed and aligned against the right side of the field. If the user enters -10, the value is displayed as (\$10.00)

Precision. The Precision specification can be a number between 0 and 15 that indicates the number of places displayed right of the decimal in a number. If you enter no precision, the display precision specified at the `Default numeric format:` item in Tools Preferences Database is used. To display whole numbers, specify 0 (zero) as the precision.

Alignment. The Alignment setting can be one of the following:

L	Left Justification
---	--------------------

R	Right Justification
M	Middle (Centered) Justification

These align the data within the supplied width of the field. If no alignment is specified, left justification is used. In a numeric field, if the Field Display Format causes the data to be too wide, asterisks are shown across the width of the field.

Type. Numeric fields can have one of the following Type specifications:

\$	Dollars
%	Percent
E	E-Notation
H	Histogram or bar format
,	Commas (valid only when precision is specified)
Dn	Date Format, where n = 1, 2, or 3
Tn	Time, where n=1 for 12-hr. format and n=2 for 24-hr. format
dd	Numeric Day showing two characters for single-digit days (e.g., 04)
d	Numeric Day showing one character for single-digit days (e.g., 4)
day	Text day of the week (e.g., Thursday)
mm	Numeric Month showing two characters for single-digit months (e.g., 06)
m	Numeric Month showing one character for single-digit months (e.g., 6)
mon	Text Month (3-characters)
month	Text Month (all characters)
yy	Numeric Year (2-digit)

File Commands

yyyy	Numeric Year (4-digit)
D	Custom date specification followed by format for custom date (e.g., Dmm/yy).

NOTE: Date formats must begin with an uppercase D, e.g., Dmm/dd/yy or D2.

If you enter more than one Type specification, the last (rightmost) Type specification is used.

Numeric Options. Numeric fields can have one of the following Options:

F	Fill with *
Z	Single blank space for zero
P	Parentheses around negative number
B	Negative number with cr, positive number with db
C	Negative number with cr

The P, B, and C Options specifications are applied only if you also enter an appropriate Type specification (i.e., \$, %, or E).

All other data characters are treated as literals (i.e., characters like /, -, or "spaces"). If you want any of the above specifications treated literally, precede them with \.

Consider the following examples:

An entry of 32694 into a field with display format specifications Dd/m/yy would appear as 6/7/89.

An entry of 100 into a field with display format specifications 2M\$F would appear as **\$100.00**.

An entry of 5 into a field with display format specification H would appear as +++++.

An entry of .1 into a field with display format specification % would appear as 10%.

An entry of -100.2 into a field with display format specifications 0P would appear as (100).

Field Input Mask

The Input Mask setting allows you to control the format and validity of data that is entered into a field. A mask character controls one position in an input stream. You can also control groups of characters by defining mask options.

You can specify an input mask string of up to 100 characters for any field; the mask should be appropriate for the field type (i.e., do not specify an alphabetic mask for a numeric field).

NOTE: Input masks are permitted on date fields, but they require special consideration. If you define an input mask for a date field, be sure the mask is compatible with the display format. For example, if the input mask is **AAA ##, #####**, the display format should be **Dmon dd, yyyy**. If the mask and the display format do not match, the mask is used during Enter Mode but is ignored during Update Mode, allowing free-form input in the field. If you do not define a mask for a date field, either alphabetic or numeric dates can be entered. The dates must be entered according to the Date Style setting on the Global Preferences Menu.

The basic template for specifying a mask character is **nMc**, where **n** is an optional repeat-count indicator, **M** is the mask character, and **c** is an optional case-modifier.

A list of mask characters and symbols is displayed when you press **F6**.

Repeat-count Indicators. A repeat-count indicator is an asterisk followed by a number. The number indicates how many character positions are to use the mask specification immediately following the indicator. A repeat-count indicator can **precede** the mask characters A, N, X, #, or a list. For example, *5A equals AAAAA.

Mask Characters. A mask character denotes the type of input data that is valid for each position in a field. A mask character can be one of the special characters described in Table 9-13. A mask character can also be a literal character, or can be comprised of a list of characters.

Table 9-13

Special Mask Character	Meaning
A	Alphabetic character only
#	Numeric character only

Special Mask Character	Meaning
N	Alphanumeric character
X	Any character

Literal Characters. A literal character pre-enters a character in a particular position in a field. For example, parentheses and hyphens are commonly specified as literal characters in the input masks of fields storing telephone numbers.

To use a special mask character as a literal character instead of the mask it represents, you must place a backslash (\) in front of it. For example, if you want to use the letter **A** as the letter **A**, and not to specify an alphabetic character, you must precede it with a backslash.

Lists. A list specifies a set of characters, any of which is acceptable input for the particular character position. A list is indicated by brackets: []. A range of characters can also be specified inside a list (i.e., [a-m]). The ! symbol is used to exclude a character from a list. For example, [a-t!i!m] allows lowercase a through t, except for i and m.

Case-modifiers. Valid case-modifiers are U and L; they force the input characters to uppercase or lowercase, respectively. They can only **follow** the mask characters A, N, X, or a list.

Options. An option controls a group of character positions, rather than a single position. Option markers { } indicate a set of input characters that, once begun, must be completed. For example, {###} requires that if data is entered in any of the three positions, data must also be entered in the other two positions.

Options can be nested, as in the following example:

```
{###{##}###}
```

```
123 45 678
```

If input position 1, 2, 3, 6, 7 or 8 is filled, all other positions except 4 and 5 must also be filled. Positions 4 and 5 remain optional. If 4 or 5 is filled, all eight positions must be filled.

Data Entry Message for Field

You can specify a prompt or reminder message (maximum of 100 characters) for a field. Data entry messages are displayed during data entry.

Default Equation for Field

You can enter a default calculation formula (maximum of 255 characters) for a field. During data entry in Enter mode, the calculation is performed and the result inserted in the field whenever the cursor moves to the field and finds it blank. The user has the option of accepting the result or entering an overriding value. In Update mode, recalculation is performed only if the user blanks the field, moves the cursor out of the field, and then moves back.

Data inserted in a field by the default calculation is not affected by the field input mask.

Create Menu

Use Create Menu to define a menu of selection items for a field on the current view. Use Edit Menu to modify an existing menu on the current view.

You can create a bar menu, a popup menu, or a data-file menu. A bar menu lists the choices at the field location on the view. A popup menu is a prompter list of items that appears when the cursor moves to the field. A data-file menu is a type of popup menu that lists the records from a data-file as menu entries.

During an Enter/Update session, a pop up menu is displayed automatically when the user enters field. A choice can be made by using the arrow keys to point to the desired item and then pressing enter.

When displaying a bar a menu, ANGOSS highlights the currently selected entry. If the field is blank, then none of the items are highlighted. When in Enter/Update mode, a user can select the desired item by moving the highlighter (Space or plus to move right, back space or minus to move left).

When in Enter/Update mode, data-file menus can be invoked by pressing **Alt F5** or data can be typed in directly. After invoking the pop up menu, the cursor keys can be used to select the desired item or a search can be done on any of the key fields by moving the highlighter to the appropriate column and entering the search value. Press **Enter** when the desired item is highlighted.

To define a menu, select Create Menu. When the prompter list of fields is displayed, select the field to which the menu is to be attached. Then select Bar, Popup, or Data-File.

To revise a menu, select Edit Menu. When the prompter list of fields is displayed, select the field attached to the menu being edited. Then choose the type of menu you want: Same, Bar, Popup, or Data-File.

Bar Menu Type

If you select Bar, a highlighted menu area is displayed next to the field name. You can press **F4** to resize the area to avoid overlapping another field. Since the number of characters that can be stored is based upon field width, you may want to make the field as wide as the longest option on the menu to avoid truncation of data. You can specify a maximum of 500 characters of text. Type the selection items, separating one from the next with a space; the items themselves cannot contain a space. Press **F10** to complete the definition.

NOTE: You cannot have a bar menu on a standard view; ANGOSS converts the bar menu to a popup menu.

Popup Menu Type

If you select Popup, the Popup Menu Editor (which is similar to the Tools Text Editor) is displayed. Enter the selection items on the Popup Menu Editor, separating one from another with a semicolon. If you prefer, you can omit the semicolons by entering one item per line. Popup items can contain spaces. The maximum number of choices on a popup menu is 64. Press **F10** to complete the definition.

Data-File Menu Type

If you select Data-File, you are prompted to specify the name of the data-file containing the fields to be used on the menu.

The data-file must already be attached to the current view, but cannot be the main data-file. The data-file's standard view must be available.

If the data-file is attached to the view only for use by the menu, use Edit Links to set `Process Key Links?` to **no** for the menu data-file; it is not necessary to define linking fields.

Display Fields. After you specify the data-file, you are prompted to select the field or fields from which data is to be displayed on the menu.

Return Field. After you specify the display fields, you are prompted to specify the field from which data is to be returned. The return field need not be one of the display fields.

Menu Location and Size. After you specify the return field, define the location and size of the menu. The default size, represented by a box in the center of the screen, is based upon the fields selected to be displayed. Use the cursor movement keys to move or to resize the menu. **F3** toggles between moving and resizing modes.

Press **F10** or **Enter** to complete the definition.

Advanced developers can create a project processing routine which causes the data-file menus to be automatically invoked when the user enters an empty field. This requires that a project be loaded during DATA ENTER or DATA UPDATE. Create the following project with REMEMBER TOOLS EDIT:

```
' Function must be public for reference in view.
public automenu()
function automenu()
    ' Put the menu-invoking key into buffer.
    smartpoke $_key {ALT-F5}
    ' Replace field with nothing.
    return blank
end function
```

REMEMBER LOAD this project (IN-MEMORY is recommended). FILE CREATE or FILE MODIFY the view to contain the Data-file menu. In the Field Definition Menu, at the "Default equation for field:" prompt, type:

```
automenu()
```

When entering data, if the field is blank, the Data-file menu will be automatically invoked by the function. The project MUST be loaded during DATA ENTER/UPDATE, or the error message "Project file function not loaded" will be displayed. Note that this scheme cannot be used with a calculation to always force the menu.

Menus and calculations cannot both be defined for a field.

To insure that data manually entered into a field is found in the Data-file menu, a rule could be created. This will require that the standard-view for the Data-file menu be present during DATA ENTER/UPDATE. Create an error-check rule for the field with the following equation:

```
FILELOOKUP([lookup_vw.fld],[lookup_vw.fld],[menu_fld])=[menu_fld]
```

For example, if you have an INVOICE view with a PART# field using the Data-file menu to lookup PART# in the INVENTORY file, your equation would look like:

```
FILELOOKUP([INVENTORY.PART#],[INVENTORY.PART#],[PART#])=[PART#]
```

You'll then want to enter an appropriate message in the "Enter the message to display when equation fails" area, something like:

Item not found in lookup table; press **Alt F5** to see list.

File Commands

This REQUIRES that the [lookup_vw.fld] (in our example, [INVENTORY.PART#]) be a key field. This will also allow the user to quickly locate an item in the Data-file menu by typing partial data to be found. Remember that the lookup_vw (INVENTORY) MUST be FILE LOADED or FILE ACTIVATED before using DATA ENTER/UPDATE, or the error message "Bad search field" will be displayed.

Same Menu Type

An additional option, Same, is listed when you select Edit Menu instead of Create Menu. Select Same when you want to change the contents of the menu without changing the menu type.

NOTE: The Same option does not invoke the prompter list of data-files for a data-file menu. To change the data-file referenced by the menu, use Create Menu Data-File to select another data-file.

Create Note

Create Note allows you to insert a body of text onto the view. Notes can provide headings, instructions, reminders, or other types of information for the user.

Move the cursor to a starting position on the view where the note is to appear. Then select Create Note. A prompt allowing you to enter an optional color appears. The available colors are displayed for you. You can press **Enter** to accept the default colors.

NOTE: If you accept the default colors, you can later temporarily change the colors using Window Paint. If you assign colors in the view definition, they can only be changed by modifying the file.

Next, a highlighted area is displayed. This is where you will type the text of the note. To override the default area for the note, press **F4**. This allows you to redefine the note area without changing the anchor. When you press **F10** to complete the entry, the note is automatically resized to occupy as little area as is necessary.

Create Rule

Select Create Rule to define conditions that will change the field color, generate a message or move the cursor to another field based upon data entered. You can create a maximum of 2000 rules on a field. Once you have selected the rule field, the field name is displayed in the border area of the Rule Definition Menu. The following items appear in the menu:

Rule Type: **Color** Error Check Jump

Rule Equation:

Enter Foreground, Background Color: 0,0

Rule Type. You can select which kind of rule to define. Notice that when you move the Rule Type selection highlighter to Error-Check, the prompt on the bottom line changes to Enter the Message to Display When Equation Fails. If you move the highlighter to Jump, the prompt on the bottom line becomes Enter the name of the field to jump to:.

If you select...	You can create a conditional...
Color	change in field color
Error-Check	message to be displayed.
Jump	jump to a specific destination field

Rule Equation. Specify the condition for changing the field color or jumping to another field, or for displaying a message when the formula fails, by entering a formula that evaluates the data entered in the current field. QBE expressions, such as those discussed in *Chapter 5*, can be used in a rule equation.

It is not necessary to use the name of the current field in the formula. For example, to change the current field's color when the value entered is greater than 1000, you could enter the formula **> 1000**.

You can reference other fields in the formula. For example, if the field above the current field is called [Amount], you could use a formula such as **> [Amount]** to compare the value entered in the current field to the value in [Amount]. Press **F6** for a list of available fields.

To correct the formula, type over the existing characters, or press **F2** to edit. Press **F3** to blank the formula.

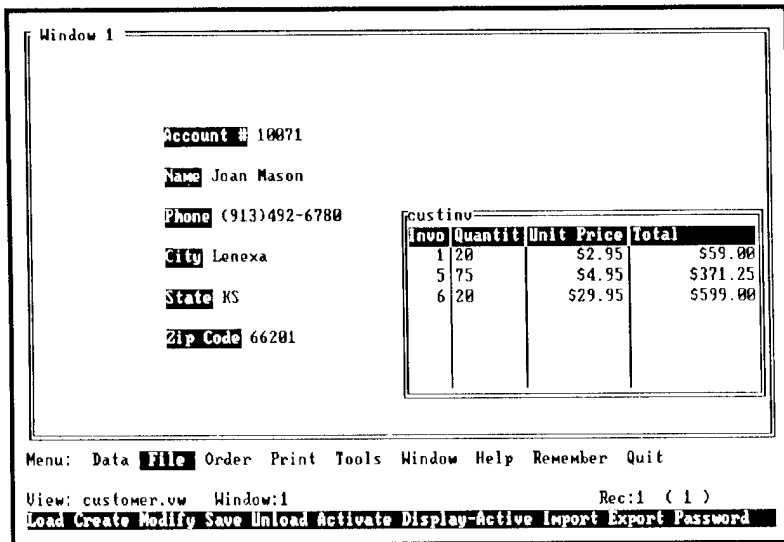
Rule Details. The bottom line of the Rule Definition Menu allows you to specify the details of the action to be taken. If you selected Color as the Rule Type, you can change the foreground and background colors used to display data in the field. Press **F6** for a list of colors. If you selected Error-Check, you can type a message that will be displayed. If you selected Jump, you can enter the name of the destination field. Press **F6** for a list of available fields.

Press **F10** to complete the rule definition.

Create Table

Create Table allows you to create a table area for the current view. This area cannot be less than four lines or greater than 19 lines. Table areas display fields in standard view format, thus allowing you to review and compare the field entries of multiple related records. You can scroll through a table if you need to see more records. You can create a maximum of 126 table areas on a view. Figure 9-11 shows an example of a table area on a view.

Figure 9-11. View with table



IMPORTANT: The records you want to display in a table must be from a data-file that is attached to the view.

First, move the cursor to a starting position on the view. Then select Create Table from the View Definition Menu, and at the prompt, enter a name for the table. Next specify table length by moving the cursor from its anchoring position down to the bottom of your proposed table area; press **Enter**. The Table Definition Menu appears with the following items:

Table Titles. Specify whether you want field names displayed at the top of each column.

Table Column Separator. Specify whether you want vertical lines to separate the columns in the table.

Table Foreground, Background Color. You can enter numbers representing the foreground (characters) and background colors to be used in the table. Press **F6** for a list of available colors.

Table Cursor Foreground, Background Color. You can enter numbers representing the foreground and background colors for the table cursor. Press **F6** for a list of available colors.

When you finish specifying items in the Table Definition Menu, press **F10** to clear the window from the screen. The empty data structure for the new table then appears on the view, ready to accept the fields that you attach or create. The table highlighter is also displayed. Bear in mind that the commands you execute at this point directly affect the table area.

To attach a field, execute Attach Field and select the field to be attached. To create a field, execute the Create Field command and specify the name and options just as you normally would. Fields attached or created are placed in the table area to the right of the current cursor position. The table expands as you include more fields.

When you create a field for a table, you can create a data-file field, a view field, or even a project processing variable field (which could be tricky, due to the way a project variable is loaded during project execution.) When you attach a field to a table, you can only attach a data-file field since you are selecting fields from the standard view.

The following commands cannot be used while the table is active:

- Create Box and Edit Box
- Create Note and Edit Note
- Create Table

When you have finished creating or attaching fields, field calculations, etc., within the table, press **F10** to return to normal view definition. The cursor reappears on the view at a position just outside the new table.

NOTE: Only one data-file can be referenced by a table.

View Definition Keyword: Delete

Use the View Definition keyword Delete to delete from the current view all items within a specified area or to delete a single data structure item (i.e., field, table, etc.). Choose between the options Block and Item.

Delete Block

Select the Block option to delete one or more items in a specified area. Move the cursor from its anchoring position to outline the area to be deleted. To establish a new anchoring position, press **F2**. Press **Enter** to complete the area definition. Use caution; anything touching the box will be deleted.

If the block includes more than one item, a verification prompt appears. If any field is included in the block, you are asked if you want to delete the field(s) from the data-file or from the current view only.

NOTE: If you delete field(s) from the data-file, the Database breaks all connections to views on which the fields may have appeared.

Delete Item

If you select Delete Item, you can choose to delete a box, calculation, data-file, field, menu, note, rule, or table. Select the specific item to delete from a prompter listing.

NOTE: If you want to delete a box, a line or a text note, you must position your cursor on some part of that item before you execute Delete Item.

Delete Item Box. If you select Box and the cursor is positioned on some part of a box on the view, that box is deleted from the view.

Delete Item Calculation. If you select Calculation, you must specify the field containing the calculation. A prompter list showing the fields in the current view is displayed to help you. When you select the field, the associated calculation definition is deleted.

Delete Item Data-File. Select Data-File to detach a data-file and associated fields from the current view. You can select the data-file from a prompter listing.

Delete Item Field. If you select Field, you can specify the field to delete, aided by a prompter showing the fields attached to the current view.

When you delete a field, you must indicate whether you want to delete the field from the view only (leaving it in the data-file) or from the data-file (which also deletes the field from the view). Deleting a field from the data-file causes the file to be restructured and could result in some data loss.

NOTE: Deleting a field from the standard view always results in the removal of the field from the data-file, regardless of which option you select. The fields available through the standard view cannot differ from the fields present in the data-file.

Delete Item Menu. If you select Menu, specify the field containing the menu from a prompter showing the fields available in the current view. When you select a field, the Database deletes the associated menu from the current view.

Delete Item Note. If you select Note and the cursor is positioned on some part of a note, that note is deleted from the view.

Delete Item Rule. If you select Rule, you must specify the field containing the rule. A screen listing the rules defined for the selected field appears. Move the pointer to the rule you want to delete. Press **F8** to delete the rule. You can delete more than one rule.

Delete Item Table. If you select Table, a prompter listing tables in the current view appears. Select the table to be deleted. Delete Item Table deletes the table and the fields inside the table from the current view, but does not delete the fields from the data-file.

View Definition Keyword: Edit

Select the View Definition keyword Edit to edit the data structures of the current view definition. If you want to edit a box, a line, or a text note, you must position the cursor on some part of that item before you execute Edit Box or Edit Note.

For details about the screens and prompts you can expect when editing a box, calculation, menu, or note, see the appropriate discussion under the section titled *The View Definition Window*.

Edit Field

The Edit Field option is similar to the Create Field option, except that you can resize the width of the field with the cursor before the Field Definition Menu appears.

The display width of a numeric field can be modified by moving the cursor on the view. The display width of an alpha field can be modified by moving the cursor, and the storage width of an alpha field can be reset in the Field Width option of the Field Definition Menu.

When you edit a field, the Control Area displays the number of lines and columns currently within the marked area.

Edit Links

Edit Links allows you to create or modify the link definition between two data-files so that their corresponding records can be accessed simultaneously through one view. A view containing more than two data-files will have multiple pairs of link fields defined.

When you select Edit Links, the View Link Definition Menu appears. You may also use Edit Links to change the location of attached data files.

Main data-file. The main data-file is the data-file associated with the custom view containing one or more "driver" fields. A driver field controls access to a record in another file by providing lookup criteria. ANGOSS selects the first data-file you create or attach to the view as the main data-file, but you can change this default selection.

Driven data-file. The "driven" data-file is the file to be searched for a record matching the data in the driver field.

Delete status tied to main data-file. If you select Yes for this option, the Data Delete command will affect records in both the main data-file and this driven file. If you select No, only the main data-file will be affected by Data Delete.

Process Key Links. If you select Yes, you are activating the link between two data-files. If you select No, the link is deactivated, even though linking fields have been selected. The records from the driven data-file will not appear on the view.

Field in driven data-file to link to. Enter the name of the field to be used as a link from the driven data-file. This field should correspond in content (although not necessarily in name) to the field selected as the driver field. To display a list of available fields, press **F6**. If the field you want to use has already been defined as a major key with minor key fields attached, you need specify only the major key field for this setting.

You can link fields with alpha data (e.g., alpha and inverted fields), but the widths of the link fields must be identical. You can also link fields with numeric data (e.g., counter, numeric, date, and time fields). You cannot link table areas to each other.

ANGOSS will make this field a key field in the driven data-file.

Driver fields on view to link from. Enter the name of the field from the main data-file to be used as a link. This field must also be present on the current view. Press **F6** for a list of available fields.

Substituting a data-file. The Edit Links command also allows you to detach a data-file and attach another data file, with an identical field layout. All fields remain unaffected. You may not substitute a data file that you are modifying and you may not reorder the data-files while substituting. This feature was implemented in v2.52.

Calculating a data-file and path. If the first character of the data-file is an equal sign, the following characters must be a text expression which evaluates to a file name without an extension. A path may be included. The intention of this feature is to allow the path to be calculated based on a public variable. This feature makes it easy to organize data files and supports applications written for both DOS and Unix. The calculation is only evaluated when the data file is loaded and during the Edit Links command. This feature was implemented in v2.52.

NOTE: Use the calculated data-files with extreme caution. A run time error in the formula could result in the making the custom view unloadable and unfixable.

Press **F10** to complete the definition. If a key is to be created from the driven key field, a Key Definition Menu appears. You can accept or modify the key definition just as you would using Order Key Add.

NOTE: Remember that the use of a table involves a one-to-many relationship. When defining the link field from the table's data-file (i.e., the driven file), be sure to allow duplicate key values, so that all appropriate records can be displayed in the table.

View Definition Keyword: Input-Order

Select the View Definition keyword Input-Order to change the order in which the cursor moves from field to field. The initial default order is the order in which the fields were created or attached to the current view.

When you select Input-Order, the cursor moves to the first field, according to current input order. Each field's sequence number is shown to the left of the input area line and in the Control Area.

The following menu appears at the bottom of your screen:

F3 Prev Fld F4 Next Fld F6 Increment flds Alt R Auto row Alt O Original order

Use **F3** and **F4** to move from field to field. When you reach a field whose input sequence is to be changed, delete the number currently there, and type a new number in its place. The input order of other fields will be adjusted automatically when you move the cursor off the field. For

example, if you specify a new input order of 1 to a field whose input order was 3, fields 1 and 2 become fields 2 and 3 in the new input order.

Use **F6** to increment the current field by one. The input order of all other fields will adjust accordingly. In other words, field 1 becomes field 2, field 2 becomes field 3, and so on.

Use **Alt R** to resequence the fields according to their locations on the screen (from top left to bottom right). This feature is especially helpful when you have rearranged items on the view.

Use **Alt O** to return the original input order, i.e., the sequence before you selected Input-Order.

To exit without changing, press **Esc**. Press **F10** to save the specified order and return to normal view definition.

View Definition Keyword: Move

Select the View Definition keyword Move to relocate a block area or a specific data structure item (e.g., box, field, note, table, etc.) to a different place on the current view. When you select Move, you must choose either the Block or Item option.

Move Block

Move Block moves one or more items in a specified area of the view, using the cursor to identify the block and then to specify the new location for the block. The Control Area shows the number of lines and columns within the block area while you are defining the block. Any item that touches the block area will be moved.

When executed within a table, the Block option moves columns appropriate for the area specified.

Move Item

Move Item moves a specified box, field, note, or table on the current view. If you want to move a box, a line, or a textual note, position the cursor on some part of that item before you execute Move Item Box or Move Item Note.

COMMENT: If you move fields, you may want to reset the input order by selecting Input-Order from the View Definition Window.

Select the option appropriate for the type of item to be moved: Box, Field, Note, or Table. If you select Field or Table, specify the name of the field or table.

The item is then marked with a line or a box; use the cursor movement keys to relocate the item on the view.

View Definition Keyword: Paint

Select the View Definition keyword Paint to change the colors of the window border, the data, graphics, titles, or the window background. The colors assigned through this option become a view's default colors, although the user can override them temporarily with the Window Paint commands.

For details about each of the options, see the discussion about the Window Paint commands.

View Definition Keyword: Replicate

Select the View Definition keyword Replicate to create a matching data-file or field for use with the current view. Replicate only copies structure. Use Data Utilities Append to transfer data.

Replicate provides the options Data-File and Field. If you want to replicate a field, first move the cursor to the location on the view that you want the replicated field to occupy before you execute the Replicate Field command.

NOTE: You do not have to use the Replicate Data-File command prior to using the Replicate Field command.

Replicate Data-File

When you execute the Data-File option of the View Definition keyword Replicate, the program creates an empty data-file with a record structure matching the original. If necessary, you can alter the new data-file structure before saving the view definition. Altered or not, the new data-file is attached to the current view; the original data-file is detached.

Replicating a data-file is particularly useful when you want to enter records into a small data-file instead of directly into a large master file. First, you would create a view similar to the master. Next, execute Replicate Data-file on the new view; this detaches the master data-file from the new view but creates another data-file with a structure matching the master. After you have entered records into the new data-file, execute the Data Utilities Append command to concatenate the records in the small data-file to the master. If you need to enter data into a smaller file on a regular basis, reuse the similar view each time you execute the Replicate Data-File command.

File Commands

When you select Data-File, you specify which data-file attached to the current view is to be replicated. A prompter showing the available data-files is displayed.

You are prompted to enter a name for the new data-file that will be created. Choose whether the new data-file is to have fixed-length records or variable length records. Then, specify whether the data-file is to be password protected and, if so, whether you want it encrypted. Prompts appear for you to enter the password. The command is executed when you press Enter.

Replicate Field

After you move the cursor to the position on the view you want the replicated field to occupy, select Field and specify the field to be replicated, aided by a prompter showing the fields in the current view.

After you select a field to copy, you are asked to enter a name for the new field. Then select one of the following field categories.

Data-File. Select Data-File to create a data-file field. You are prompted for the name of the data-file.

View. Select View if the field is to exist only on the view; a view field's data is not stored in a data-file.

Project-Processing. Select Project-Processing to create a field that is a project processing variable.

File Save

File Save saves on disk changes or additions to your data (and some internal file information), without removing the view or its associated data-files from memory or from the window. If you are operating in a single user environment, you may want to execute File Save at regular intervals to keep the file as current as possible, in case of power failure or other abnormal exit condition.

File Unload

File Unload removes one or more active views and associated files from memory. File Unload also saves the data and additional internal file information on disk. If you are operating in a single user environment, you should unload your files when you have completed a data entry session.

File Unload provides the options All and View. Select All to remove all active views and their associated data-files from memory. Select View to remove a specific view and its associated data-files from memory.

NOTE: If a data-file is associated with more than one of the currently active views, it remains in memory until all of its associated views have been unloaded.

File Activate

Select File Activate to put a view in memory. If the current window is empty, the view is displayed in it. Use the Data Goto View command to bring an activated view into the current window.

Activate provides the options Custom-View and Standard-View. Select Custom-View to place a custom view in memory. Select Standard-View to place a standard view in memory.

File Display-Active

Select File Display-Active to list the names of all currently active views and data-files. This Index of Open Data Files includes:

- the names of all views in memory
- the names of all data-files associated with active views
- the current order of each view. If in sequential order, "Physical" is displayed. If in key order, "Key:field" is displayed, where "field" represents the name of the key field. If in index order, the name of the index file is displayed.
- the number of records in each data-file

Figure 9-12. Index of Open Data Files

Index of Open Data Files			
View	File	Order	Records
c:\smartii\files\invoice.vw	Invoice	Physical	8
c:\smartii\files\customer.vw	Customer	Physical	3
	Invoice		8

Enter any key to continue

View: customer.vw Window:1 Rec:1 (1)

Display a summary of all currently active views

To return to the normal screen display, press any key.

File Import

Select File Import to read a file created outside of ANGOSS Database into the current data-file. Using File Import, you can read disk files in ASCII, dBase II or III, fixed, Smart, or 3.10 ANGOSS formats. You can only import into a view with one data-file.

File Import Ascii and Smart

Select File Import Ascii to read in files stored in standard ASCII format. Select File Import Smart to read in files written out in space delimited format from another ANGOSS module. To use these options, you must make certain that the file you wish to import meets the format criteria listed in *Chapter 8* under the section titled *Ascii and Smart*.

NOTE: To read in ASCII or Smart formats, you must have an existing data-file associated with the current view into which you can read the data.

When you select either the Ascii or Smart format option, the Database allows you to "skip" certain fields that you do not want read from the import file. Do this by entering 0 at the position of the field in the field list you create. See the example in the section titled *Ascii and Smart* in **Chapter 8**. This capability is convenient for reading incompatible field formats.

After you enter the name of the import file to be read, a prompter of available data-file fields appears at the bottom of the screen. Use the pointer in the prompter to identify fields to receive the data from the import file. Since the fields in the import file may not have field names, import file fields are referenced by position in a record. Use **F6** to attach a field to the field list and **F7** to remove a field from the field list. You can also type the names of the fields, relative to import file field position, separating each pair of adjacent field names with a semicolon. Press **F10** or **Enter** when you have finished selecting the data-file fields that will accept data from the import file fields.

File Import Dbase

Select File Import Dbase to import dBase II or dBase III files. Because a data record structure already exists in a dBase file, ANGOSS Database defines a compatible record structure and creates corresponding data-files as the imported file is being read.

NOTE: Memo fields that exceed 5000 characters in length in the dBase files are truncated to 5000 characters when read into the Database data-files.

File Import Fixed

Select File Import Fixed to read a fixed length file.

NOTE: To read in files stored in fixed length format, you must have an existing data-file associated with the current view into which you can read the data.

When reading in Fixed format, you cannot "skip" fields. You must read each field in sequential order. In files with fixed length fields, each field is allocated a specified length, regardless of how much data it contains. When you import fixed files, the Database uses two methods for reading field information, depending upon whether the field is alphanumeric or numeric.

If the field is alphanumeric (or inverted), the Database uses the field storage width of the destination field in the ANGOSS data-file to determine how many characters to read. If the field is numeric (including date, time, or counter), the Database uses the display width of the destination field. The difference is based on the fact that the storage width for numeric fields is always 8 bytes, so if you change the display width on the view into which you are importing the fixed data, you can read more or fewer than eight characters into a numeric field.

ANGOSS Database expects the length of each record in the import file to equal the length of each record in the data-file. If the record in the import file is longer than a record in the data-file, the extra characters are ignored. If the import file record is shorter than the data-file record, the Database proceeds

to the next record of the import file, reading the next data item into the current field of the current data-file record.

File Import 310-Smart

Because a data record structure already exists in an Smart 3.10 file, ANGOSS Database defines a compatible record structure and creates corresponding data-files as the imported file is being read. When you select the File Import command, you are asked to enter the filename of the file you wish to import. Next, you are prompted to enter a new name for the data-file that will be created when the file is imported.

As the file is being imported, the 3.10 keys are converted. In addition, 3.10 fields that were designed to hold Social Security numbers are converted to alphanumeric fields with a length of 11 and an input mask with the format ###-##-#### on the standard view. 3.10 phone fields are converted to alphanumeric fields with a length of 14 and an input mask in the format (###) ###-####. Calculations are imported along with their associated fields.

File Export

Use File Export to write data from the current data-file into a new file using one of six available file formats. Using File Export, you can create disk files in ASCII, dBase III, DIF, SYLK, ANGOSS, or text formats.

For all formats except dBase III, the following options will appear when the File Export command is executed:

Row-Format. Writes the records of the data-file along rows.

Column-Format. Writes the records of the data-file in columns.

You must specify the fields whose data is to be written. Use the pointer to identify an ordered list of field names from the prompter. Press **F6** to select a name or **F7** to unselect a name. Or type the names of the fields, in order, separating each pair of adjacent field names with a semicolon.

If the list of fields is long, use the vertical bar (|) to specify a range of consecutive fields, e.g., [Name|Zip].

Press **F10** or **Enter** when you have finished selecting the field order for your new disk file. Then you must specify a name for the file.

File Export Ascii

Select File Export Ascii to write a file out in standard ASCII format. Each record in an ASCII file is terminated with a carriage return and a line feed. Fields in an ASCII file are separated by commas. Alphanumeric fields are surrounded by quotes, while numeric fields are not. The end of an ASCII file is marked by a ^Z (Control Z). The following is a sample record in ASCII file format:

```
"text field",1000,"text field",300,400.25
```

File Export Dif

Select File Export Dif when you want to write a file out in DIF format. DIF (Data Interchange File) format is used primarily for transmitting data to non-ANGOSS spreadsheets (e.g., VisiCalc).

File Export M-Sylk

Select File Export M-Sylk when you want to write a file out in Microsoft's SYLK (Symbolic Link) format. The M-SYLK option is also used for transmitting to non-ANGOSS spreadsheet programs (e.g., Multiplan).

File Export Smart

Use File Export Smart to write a file out in space delimited format. Using this command creates a file that can be imported into another ANGOSS module. Using File Export ANGOSS is useful when you want to transfer information to another ANGOSS module; File Import is used to read data into a worksheet in ANGOSS Spreadsheet or into a document in ANGOSS Word Processor. The resulting file can also be sent to ANGOSS Communications for transmission to a remote operator.

Sometimes using File Export for transferring to another ANGOSS module is preferable to using Data Send. Using Data Send Data results in a temporary .iff file that is erased once the target module is exited. By using File Export, a permanent file is created that can be reloaded at another time.

Each record in a space delimited (Smart) file is terminated with a carriage return and a line feed. Fields in a Smart file are separated by spaces. Alphanumeric fields are surrounded by quotation marks, while numeric fields are not. The end of a Smart file is marked by a ^Z (Control Z). The only difference between ASCII and Smart file formats is the ASCII use of commas instead of spaces between fields. The following is a sample record in Smart format:

```
"text field" 1000 "text field" 300 400.25
```

File Export Text

Select File Export Text when you want to write data out into text file format. Text format is similar to space delimited format, but there are no quotation marks around text items. Use the Text option to write a file that can be read into a document or text file in ANGOSS Word Processor. The following is a sample record in Text format:

```
text field 1000 text field 300 400.25
```

When exporting fixed-length records with the Text option, each field is assigned a fixed width, regardless of the size of the data in it. In this way, the columns are always lined up as shown in the following example:

```
John Smith 35 AMCE Supply100.45
```

```
Evelyn Jamison 42 Smith's Florist 257.12
```

```
Tim Lee 27 Harper's 431.09
```

File Export 3-Dbase

Select File Export 3-Dbase to write a file out in dBase III format. Each ANGOSS field type is converted to the nearest equivalent field type in dBase III. ANGOSS time fields are converted to character format fields in dBase and given a length of 8 characters.

NOTE: Files in dBase III are limited to a maximum of 128 fields. Alphanumeric fields over 254 characters are truncated when converted to dBase III format.

File Password

Select File Password to attach password protection to a view or data-file in the current window, or to remove it. After a password has been assigned to a view or a data-file, the Database prompts each user for the assigned password before allowing the user to access the view or data-file. File Password provides the options Data-File and View.

File Password Data-File

If you select Data-File, you can assign or remove a password and encryption to the data-file. An encrypted file is stored in unreadable form on the disk. Encryption thus provides a second level of protection for your data.

Enter a data-file name, aided by a prompter showing the data-files attached to the current view.

File Password View

The View option assigns or removes a password to the current view and automatically encrypts or de-encrypts the view.

File Password Attach Option

If you select Attach and the view or data-file has no password, you must enter a new password that includes up to 16 characters. You must enter it twice for verification. If you chose the Data-File option, you must also specify whether or not you want the data-file encrypted.

If you select Attach and the view or data-file has a password, you must enter the old password that you want to change. You have three chances to enter the password correctly before the program aborts the command. After you enter the old password, you must enter the new password twice for verification. If you chose the Data-File option, you must also specify whether or not you want the data-file encrypted.

File Password Remove Option

If you select Remove, and the view or data-file has a password, you must enter the password to remove. You have three chances to enter the password correctly before the program aborts the command. After you enter the old password, password protection is removed. The password and encryption are removed simultaneously.

Since the data-file is rewritten to disk when encryption is removed, it is a good idea to back up an encrypted version before executing the Remove option.

File Commands

Order Commands

The Order commands allow you to organize your data in various ways.

Order provides the following options:

Key. Adds, deletes, or rebuilds a key for records in a data-file.

Sort. Defines, executes, or undefines the criteria that sort the records in a view.

Manual. Indexes and orders records selected individually from the current view's data-files.

Change. Specifies the order in which you review or process the records of the current main data-file.

Order Key

Select Order Key to add, delete, or rebuild a key for records in a data-file. A key field is a designated field whose data (in alpha or numeric sequence) is used to arrange the display and processing order of records in view. Each key can be composed of a major key field and up to fifteen subordinate fields called "minor key fields." A minor key field is referenced for assignment of record order when the data in the major key field of two or more records is identical. A maximum of fifteen major keys can be included in a view's key file.

Once a key has been defined, records can be viewed in key order at any time by means of the Order Change Key command.

Order Key Options

Order Key provides the following options:

Add. Creates a new key for a data-file.

Delete. Removes and deletes an existing key.

Rebuild. Rebuilds all keys in the key file.

Order Key Add

If you select Order Key Add, a prompt showing the available fields appears. A "k" appears next to each field already defined as a major key field. Specify a list of one or more fields that are to make up the key. This can be done by pressing **F6** to highlight the field at the prompt, or by typing in a list of fields, separated by semicolons. The first field selected is the major key field. Any subsequent fields entered in the field list are considered minor key fields. Press **F10** when you have completed the list.

After you select the fields, the Key Definition Menu appears.

The Key Definition Menu

The Key Definition Menu allows you to refine the definition of the key you are creating. It first displays an option to allow or disallow entry of records with duplicate key field values.

NOTE: If duplicates are not allowed, and a duplicate key value is found, the key will not be created. Also, commands such as File Import and Data Utilities Append skip each record containing a duplicate entry in a key field.

Figure 9-13 shows an example of the Key Definition Menu.

The Key Definition Menu furnishes a three-column list that includes:

- a list of field names you have selected, with the major key field at the top of the list
- the sorting orientation for the field name in the first column
- the length of an alpha or inverted key field (the maximum number of character positions the Database will reference to place records in the appropriate sequence). No length specification is shown for numeric fields because they are sorted by numeric value and not by the number of character positions searched.

To change the sorting orientation for a field, use the pointer to identify the field you want to modify. Type **A** to change the orientation to ascending or type **D** to change it to descending.

Figure 9-13. Key Definition Menu

Window 1

Account # 10071

Name Joan Mason

Phone (913)492-6780

City Lenexa

State KS

custinv				
Inv#	Quantit	Unit Price	Total	
1	20	52.95	\$59.00	
5	75	54.95	\$371.25	
6	20	529.95	\$599.00	

Key Definition

⇒ Allow Duplicate Keys: No **Yes**

Field title	Asc/Descending	Length in key
Name	A	25

F1 Help F10 Finished Esc Abandon

View: customer.vw Window:1 Rec:1 (1)

Enter key to add

To lessen the number of character positions to be searched (and speed up the ordering process), you may want to enter a smaller number, if fewer characters can adequately determine the correct order for .the file.

NOTE: The maximum number of characters in any one field that will be referenced in a key sort is 100. The total number of characters that can be referenced for all fields is 500.

Order Key Delete

If you select Order Key Delete, a prompter showing available fields is displayed. A "k" appears next to each major key field previously defined. Use the pointer to identify the key to be deleted and press **Enter** to select the name, or type the name of the field directly. Press F6 to mark multiple keys for deletion. When you finish, the Database removes the key from the key file.

Order Key Rebuild

Select Order Key Rebuild if the key file has been lost or damaged. It rebuilds every key in the key file. If the current view has more than one data-file attached, only the key file of the main data-file is rebuilt.

Order Sort

Select Order Sort to define the criteria for sorting the records in the current view, store the sort criteria in a sort definition file, create an index file based on the chosen sorting criteria, and order the records according to the sort criteria.

Sort processes only those records present in the current logical order (unlike Key, which processes all records in the view). Sort arranges records according to the alpha or numeric order of data in a designated major sort field and optional minor sort fields.

The sort definition file specifies the fields to use for sorting criteria (e.g., sort by [State] and then by [City]). The sort index file is a list of record numbers arranged in a particular sequence. Viewing records in index order means looking at records as they appear through an index.

You can view or process records in index order at any time using the Order Change Index command.

IMPORTANT: Unlike a key file, a sort index is not updated automatically when records are revised or new records are added. You must create a new, more current version of the index.

Order Sort Options

Order Sort provides the following options:

Create. Creates reusable sorting criteria, saving them in a sort .definition file.

Execute. Arranges the display and access order of records selected from the current view's data-files.

Modify. Modifies a sort definition file.

Now. Orders the records in the current view without saving the .sorting criteria.

Remove. Deletes a sort definition file and the sorting criteria that .it contains.

Order Sort Create

Select Order Sort Create to create sorting criteria and then store them in a sort definition file. You are asked to enter a name for the new sort definition file.

You are prompted to build a field list to specify the order in which fields will be used to sort records. A prompter showing available fields is displayed to aid you. The first field selected is the major

sort field; any additional fields are minor sort fields. When you finish your selections and press **Enter**, the Sort Definition Menu appears.

Sort Definition Menu

The Sort Definition Menu lists the fields you have selected. To the right of each field name are two default settings: one signifying ascending or descending order, the other signifying the length of the field. You can use the cursor keys to point to and change the displayed settings.

Figure 9-14 shows an example of the Sort Definition Menu.

The screenshot shows a window titled "Window 1" containing a customer record and a "Sort Definition" menu. The customer record fields are: Account # 10071, Name Joan Mason, Phone (913)492-6780, City Lenexa, State KS, and Zip Code 66201. An inset window titled "custinv" displays an invoice table with columns Invo, Quantit, Unit Price, and Total, containing three rows of data. Below the customer record is the "Sort Definition" menu with the following items:

Field title	Asc/Descending	Length in key
Name	⇒A	25
Account #	A	9

At the bottom of the window, there are function keys: F1 Help, F10 Finished, and Esc Abandon. The status bar shows "View: customer.ov Window:1" and "Rec:1 (1)". The prompt "Enter fields by which to sort" is visible at the bottom.

The first item is for the sort type. The default is A for Ascending. If you desire a descending sort, enter D.

The second item represents the total length of an alpha or inverted field. Use this setting to control the number of character positions that will be referenced to perform the sort operation. This item cannot exceed 100 characters (if the field length was defined as equal to or greater than 100 characters, the Database displays 100 as the default). If you wish to create the sort definition to reference fewer than the total number of characters in the field, enter a smaller number to override the default setting.

Order Commands

The sum of lengths for all fields cannot exceed 500 characters. No length specification is made for numeric, date, time, or counter fields because they are sorted by total (not partial) numeric value. An implied, internal length of 8 bytes for a numeric field is included in tallying the 500 character limitation.

Order Sort Execute

Select Order Sort Execute to create a sort index file from a sort definition file. A sort index file lists the current sorted order of records.

When you select Order Sort Execute, ANGOSS presents the following menu of sorting methods:

Dictionary Smart

Dictionary. The Dictionary sort option orders uppercase and lowercase characters together.

Smart. The Smart sort option orders uppercase characters before lowercase letters.

You are prompted to enter the name of the sort definition file to be referenced. You can reuse the same sort definition file as often as necessary, a procedure especially useful for Project Processing applications.

You are then prompted to enter a new sort index filename. Whether you should enter a new name or the name of an existing index depends upon how the index is to be used. An index is a "snapshot" of the records as they exist at a given point in time. If you need to retain a particular version of the records, specify a unique filename for each index. If you do not need "frozen" records, you can reuse the name of an existing index, as long as the view is not currently ordered by the same index. Be aware that if you do reuse an index, its existing data is overwritten.

After you specify an index, the Database begins the sorting process. First, the word "Sorting" appears at the bottom of the screen. If the sort must work in two or more areas of memory and then combine the data in each, the message "Merging" appears. When the sort is completed, and the sort index file is recorded on disk, the records appear in the window in sorted order, and you are returned to the command level.

Order Sort Modify

Select Order Sort Modify to modify an existing sort definition file. A prompter showing available sort definition files appears. When you select a sort definition file, the procedure is the same as the definition process described for the Create option.

Order Sort Now

Select Order Sort Now both to enter sorting criteria and to sort the current view. Use the Now option when you want to sort records quickly and you anticipate no need for the sorting criteria in the future. Now creates a sort definition and a sort index file in a one-step operation, but it does not save the sort definition in a sort definition file. It does not allow you to use both ascending and descending sort types in the same definition, or to set the number of characters that will be referenced for each field in the definition.

When you select Order Sort Now, ANGOSS presents the following menu of sorting methods:

Dictionary Smart

Dictionary. The Dictionary sort option orders uppercase and lowercase characters together.

Smart. The Smart sort option orders uppercase characters before lowercase letters.

After you select the sort method, you are asked to enter a new sort index file name.

You are then shown a prompter from which you can select sort fields. Press **F6** to select a field for the sort field list; press **F7** to remove a field from the sort field list. You can also use **F2** to toggle between Prompter mode and Editor mode for specifying fields. Press **Enter** or **F10** to complete the selection process.

Next, you are asked to select either Ascending or Descending as the order.

When you press **Enter**, the sorting process proceeds. The records are displayed in index order when the sort is finished.

Order Sort Remove

Select Order Sort Remove to permanently remove a sort definition file and its sorting criteria from the disk. You are prompted for the name of the sort definition file to be deleted.

NOTE: Deleting a sort definition file does not delete the index created from it. You can still access the index by executing Order .Change Index.

Order Manual

Use Order Manual to select individual records displayed in standard view format and create an index file. You are asked to enter an index filename, which can be a new index or an existing index that you wish to modify. Press **F7** to select (highlight) or deselect a record for inclusion in the index. To

Order Commands

abort, press **Esc**. When you press **F10**, all selected records are placed in the index, and the records in the data-file are ordered according to that index.

If the current view is in key order when you execute Order Manual, the view remains in key order while you select records. If the current view is in index order, the view reverts to physical order while you select records.

If you execute Order Manual and specify one of the current view's existing indexes, the records from the index are preselected for the Order Manual command. You can then press **F7** to deselect records that are not to be included.

Order Change

Use the Order Change commands to display records in an existing key or index order, or to revert the display of records to physical order.

Order Change Options

Order Change provides the following options:

Key. Displays all records in the current view by a previously created key.

Index. Displays records from the current view according to a previously created sort or query index.

Physical. Displays records in the current view in physical (sequential) order.

Order Change Key

If you select Order Change Key, a prompter appears showing fields, with a "k" displayed next to each currently defined key field from the main data-file. When you pick a key field, the records are reordered according to the corresponding key, and the first record in that key order becomes the current record.

When you enter or modify key field data through a view in key order, ANGOSS updates the key file immediately, (i.e., as soon as you move the cursor off the record, and before the next record appears). Because updating the key file involves positioning the record in the appropriate location, the "next" and "previous" records may have changed.

Order Change Index

Index files can be created by the Order Sort, Order Manual or Data Query commands. When you select Order Change Index, you are asked to enter an index filename, aided by a prompter that lists existing index files. After you enter the name of the index file, the records are redisplayed according to the index, and the first record in the index order becomes the current record.

Order Change Physical

If you select Order Change Physical, the records of the data-file are returned to the physical or sequential order in which they were entered. The first physical record becomes the current record.

Order Commands

Print Commands

The Print commands allow you to output data from the Database to the screen, to a disk, or to a printer in a number of different formats. Two predefined formats are available, as well as custom report formats that can be designed to meet your needs.

Print provides the following options:

Current-Record. Prints a copy of the current record in list, page, or view format.

View. Prints a copy of every record in the current view's data-files in list or report format.

Report. Creates, modifies, outputs, or removes a custom report definition file.

IMPORTANT: Non-report Database printing is controlled by the `Default Paper Profile`: setting on the Hardware Preferences menu. Execute `Tools Preferences Hardware` to display this command. Report printing is controlled by the `Paper Profile`: setting on the Report Definition menu.

Print Current-Record

Print Current-Record prints information about the currently displayed record.

Print Current-Record List

The List option of Print Current-Record prints each field of the current record on a new line. It also includes the logical number of the record and indicates whether or not the record is active. Figure 9-15 shows an example of output from the List option of Print Current-Record.

Figure 9-15. Print Current-Record List

```
Record#:1 Act: Y
Name: John Taylor
Account #: 176
Phone: 212-573-5846
City: New York
State: NY
Zip: 10004
```

NOTE: If you execute Print Current-Record List on a record with a view table in it, all records from the table will print out with the record, and will be indented five spaces. Figure 9-16 shows an example of output including a record with a view table.

Figure 9-16. Print Current-Record List with a View Table

```
Record #: 7 Act: Y
Donor #: 121
Name: Robin Murphy
Address: 494 Lee Street
City: Lenexa
State: KS
Zip: 66219
    Date: 02/15/1989
    Amount of Donation: $100.00

    Date: 03/21/1989
    Amount of Donation: $75.00

    Date: 04/17/1989
    Amount of Donation: $100.00
```

Print Current-Record Page

Print Current-Record Page prints the current page of the record in the current screen format. It furnishes the options All and Data.

All. Print Current-Record Page All prints the entire page/screen, including field titles, text, and graphic characters. All does not print the command list or help lines. Figure 9-17 shows an example of output from Page All:

Figure 9-17. Print Current-Record Page All

```
Account # 176
Name John Tyler
Phone 212-573-5846
City New York State NY
Zip 10004
```

Data. Print Current-Record Page Data prints the data as it is displayed on the screen, but only the data in the fields is printed. No text, graphics, or field titles are printed. This option is useful for printed forms if the screen design matches the design of the form. Figure 9-18 shows an example of output from Page Data:

Figure 9-18. Print Current-Record Page Data

```
176  
John Tyler  
212-573-5846  
New York      NY  
10004
```

NOTE: If you select Print Current-Record Page with a standard view loaded, the output will consist of all the records that are currently on the screen in tabular format.

Print Current-Record View

Print Current-Record View prints all pages of a multipage view in the format it appears on the screen. It provides the options All and Data. The All option prints data, field titles, text, and graphics, while the Data option prints data only.

You can use the following project file to print the entire file in Print-Current-Record View format.

```
data goto record first  
while record <= records  
    print current-record  
    data goto record next  
end while
```

NOTE: If you execute Print current-Record View with a standard view loaded, you will get all pages of the record the cursor is on in list format.

Print View

Print View allows you to print all the records in data-files attached to the current view. This information can be printed in a simple list format or in a tabular report format.

IMPORTANT: If you place your records in key order, that is the order they will be printed in. Likewise, if you place your records in index order, only those records in the index will be printed.

Print View List

Print View List prints each record of the current view in the current logical order of records. Figure 9-19 shows an example of list format.

Figure 9-19. Print View List

```
Record #: 4 Act: Y
Name:: Robin Murphy
Company:: Bird Room, Inc.
Address:: 494 Lee Street
City:: Lenexa
State:: KS
Zip:: 66219
```

```
Record #: 5 Act: Y
Name:: Mike Wright
Company:: Wright & Sons
Address:: 5468 King Street
City:: Kansas City
State:: MO
Zip:: 64108
```

Any view table records on the view are indented five spaces when the list is printed. This allows you to easily identify view table records.

Print View Report

Print View Report prints each record of the current view in a predefined, columnar report format. Figure 9-20 shows an example of Report format.

Figure 9-20. Print View Report

Name:	Company:	City:
George Smith	Plainview Co.	Kansas City
Beverly Jones	Willard, Inc.	Kansas City
Howard Kneilson	Flotsam-Jetsam	Kansas City
Robin Murphy	Bird Room, Inc.	Lenexa
Mike Wright	Wright & Sons	Kansas City

View table records appear as additional columns with each record in the table area(s) occupying a line of output. All table records that correspond to a particular view record are printed before the next view record is printed.

Selecting Fields

After selecting either the List or Report option, a prompter list of available fields appears. Specify which fields you would like to print in your list or report. Move the pointer arrow using the arrow keys. To select a field to print, position the pointer next to it, and press **F6**. After you have specified all the fields you wish to print, press **Enter**.

Printing to Screen

Once you have specified the fields to print, choose either the Screen or Printer option. The Screen option allow you to output your data to the screen. The records will scroll through the screen in the format you have specified. You can control the scrolling speed by pressing a number. The higher the number, the faster the scroll rate (0 = 10). To pause scrolling, press any other key. Resume scrolling by pressing any key. The Screen option is an excellent way to "preview" your data before selecting the Printer option to send it to a printer.

Outputting to Printer

Select the Printer Option when you are ready to send data from the fields you have selected to a printer in List or Report format.

Print Report

Print Report allows you to define, modify, execute, or remove custom report definition files. Creating these files is more complicated and time consuming than using one of the predefined formats, but the results can make the effort worthwhile. By creating a report definition, you can specify multiple formats to be printed in the same report; the printing of fonts; and the insertion of additional text, calculations, breakpoints, and summary information.

The Database provides three types of custom reports: a table report, a form report and a combination report, which includes both a form and table on the same page. Many additional report options provide even more flexibility over the content and format of your report.

IMPORTANT: Report definitions are not tied to a particular view. As long as the field titles and overall record structure are consistent, a report definition can be used on any number of views. A view you intend to print with this definition must be loaded when you create and execute the file.

Table Report

In a table report, each record occupies a line, and each field is printed in a column. The following is a sample table report format.

Sample table report format.

Name	Address	City	State	Zip
John Doe	300 Main St.	Kansas City	MO	64114
Bill Fold	1243 Oak St.	Kansas City	MO	64114
Jim Nasium	2343 W. 112	Kansas City	MO	64114

Form Report

In a form report, fields can be placed anywhere on the page. This format can be used for mailing labels and preprinted forms. The following is an example of form report format:

John Doe (816) 482-4921 134-35-7403
Director, Product Services Rm. 137

Combination Reports

You can also create a combination report that includes both table and form formats. The following invoice is a common example of this type of report.

John Doe
ACME Service
419 West Main Street
Kansas City, MO 64114

Quantity	Description	Unit Price	Total
10	Office Chairs	95.00	959.00
10	Desks	159.00	1590.00
10	File Cabinets	69.00	690.00
Grand Total			3239.00

The name and address section of the invoice is a form report, and the itemized list of purchases is a table report.

Print Report Options

Report provides the following command options:

Create. Defines a custom report format.

Execute. Outputs a report to a printer, a disk file, or to the screen, based on a predefined report definition.

Modify. Edits an existing report definition.

Remove. Removes an existing report definition.

Print Report Create

With Print Report Create you can design a report definition that meets your specific needs. To begin creating a report definition, first load the view you wish to print a report from. Then execute Print Report Create, enter a name for the new report definition file, and choose between the New and Similar options.

Create New. Select the New option if you intend to create the report definition from scratch.

Create Similar. Select the Similar option if you want to create a report definition similar to an already existing report definition. If you select Similar, a prompter showing the existing report definitions appears so you can select the report definition that you wish to use as a template.

Report Definition Menu

After choosing between New or Similar, the Report Definition menu appears. Options in the menu at the bottom of the window include:

Form Table Page Edit-Fonts Remove-Fonts

IMPORTANT: Most of the options that will be discussed under Report Definition can be accessed under both Print Report Create and Print Report Modify. In both cases, the options work the same. The only difference is that if you use them under Print Report Create, you will be creating a new definition; if you use them under Print Modify you will be editing an existing definition.

Form Definition

If you wish to define a form on your report page, select the Form option from the Report Definition menu. A blank Form Definition Screen appears.

IMPORTANT: You cannot execute the Form option until you have specified that there will be a form on the page. This is done with the Page option on this menu. Defining your page with the Page option is discussed later in this chapter.

A form can include database fields, text items, calculated items, page numbers, or labels. To define a form you insert one or more of these items into a form area on your screen that you specified on your page definition. You can also duplicate, update, move, and remove a form field or item.

To begin the form definition, use the arrow keys to position the cursor at the upper left corner of the area where you want to place a calculation, field, label, or text. Then select the appropriate option from the Form Definition menu.

Calculation

If you select Calculation, you are prompted to move the cursor to the lower right corner of the area to be defined and press **Enter**. When you do this, the defined area is shaded on your screen. Then you are prompted to enter the calculation at the bottom of the screen. You can press **F5** to access the Formula Editor if you need to enter more complicated formulas.

Pressing **F6** displays a prompter showing available view fields. Select a field by moving the pointer arrow to it, or type the field name. Press **Enter** to enter that field into the current position in the formula you are creating. The calculation will occur during report printing. The same functions available for calculated fields are available here (see *ANGOSS Formula Reference Guide* for details).

At any point, you can press **Esc** to abandon your calculation and return to the Form Definition menu. Or, when you have completed your calculation, press **F10** or **Enter**.

Calculated Options

The Calculated Options screen is then displayed. The settings on this screen are as follows:

Flag the Display on Overflow: Yes **No**

This specifies whether an error message is to appear if calculated information overflows the defined area. **Yes** causes the program to stop and issue a message if an overflow condition exists; pressing any key continues the reporting process. **No** truncates any overflow without issuing an error message.

Justify: **Left** Center Right

This permits justification of the calculated information within the defined area.

Numeric Results

Calculations producing numeric results display the following additional prompt:

Display: **General** Formatted Date Time Histogram

Neither **General** nor **Histogram** displays any more prompts. **Histogram** shows a series of pluses (+) or minuses (-) for the calculated value (e.g., -3 appears as ---).

Formatted Results

If you select **Formatted**, the following additional prompts appear:

Precision: **0**

Special Formatting: **None** Dollars Percent E-Notation

Negative Formatting: **Minus** Parentheses Credit Debit

Use Commas: Yes **No**

Check Protection: Yes **No**

Blank when value is Zero: Yes **No**

The **Precision**: prompt defines the precision for the result of your calculation. Enter a number between 0 and 15 to set the numeric precision you want for the result.

The **Special Formatting**: prompt specifies whether numbers are printed with a currency notation, a percent sign, in E-notation, or without special formatting.

The **Negative Formatting**: prompt specifies how negative numbers are formatted. You can choose to place a negative sign in front of the number, surround the number with parentheses, or print "cr" or "db" next to the number (to indicate credit or debit).

The **Use Commas**: prompt specifies whether or not numbers are printed with commas.

The **Check Protection**: prompt fills out a number to the full area width with asterisks (e.g., *****\$100.00). This is useful for printing checks.

The **Blank when Value is Zero**: prompt specifies whether the calculated result is to appear blank if it is zero or whether zero is displayed.

Date Results

If you select **Date**, the following additional prompt appears:

Print Commands

Date Format: Date-1 **Date-2** Date-3

These date formats refer to those set on the Global Preferences menu, accessed with Tools Preferences Global. You can specify what format you want a date to be displayed in.

Time Results

If you select Time, the following additional prompt appears:

Time Format: **12-Hour** 24-Hour

Here you specify whether times will be displayed in a 12- or 24-hour format.

To record your entries, press **F10**. To abandon them, press **Esc**. Either action returns you to the Form Definition menu.

Field

The Field option allows you to insert a field into an area. A prompter displays available fields and prompts you to select the field to insert. Move the pointer arrow to the field you desire, and press **F6** or **Enter** to select it.

A line appears on the screen showing the width of the field you have selected. You can accept the size by pressing **Enter**, or use the cursor keys to resize the area and then press **Enter**.

NOTE: To print a multi-line field, containing indentations or other spacing, it is very important to specify the proper length for the field. In order for the field to print in the report **exactly** like it does on the screen, the width in the report must match the display width of the field. Let's assume you have a 300 character field in the data file, that is displayed on the screen in six lines of fifty characters. When that field is placed into the form, you need to make the field 50 characters wide. If you make the field 49 characters wide, any leading spaces on the first line of the field will be stripped out and you will lose your formatting. If you make the field 55 characters wide, the lines will wrap differently, and your formatting will also be disturbed.

Display Options

The Display Options screen then appears, offering the following settings:

Flag the Display on Overflow: Yes **No**

This specifies whether an error message is to appear if field information overflows the defined area. **Yes** causes the program to stop and issue a message if an overflow condition exists. Pressing any key continues the reporting process. **No** truncates any overflow without issuing an error message.

Justify: **Left** Center Right

This permits justification of the field information within the area you defined.

If the field contains numeric information, the same set of additional prompts appear that are displayed for the Calculation option. See the previous discussion under *Calculation* for information about these prompts.

To record your entries, press **F10**. To abandon them, press **Esc**. Either action returns you to the Form Definition menu.

Label

Using the Label option, you can specify several fields for an area. It does not permit each field to be formatted individually as the Field option does. However, if you have more than one field on the same line in close proximity to each other, it is often best to set them up as a label, rather than as individual fields.

For example, if you specified the fields [City],[State], and [Zip] to print on one line, each field occupies a specific position. If the length of the city fluctuates, the spacing of the line can look odd. If you specify all three fields as one line in a label, the spacing is dynamic, and the [State] and [Zip] fields will adjust their position to the length of the data in the [City] field.

A prompt appears asking you to define the area in which you want to place the label. The line and column indicators at the bottom of the screen can help you determine the size of the area. Then press **Enter**.

Placing Fields

You can place fields in your label by pressing **F6** to display a prompter list of available fields. Move the pointer to the field you wish to print on that particular line of the label, and press **Enter**. If you wish to select more than one field for a line, use **F6** to highlight the fields and then press **Enter**. Press **Enter** again to move the cursor to the next line of the label and continue selecting fields for all lines.

Only one field list can be placed on any one line of the Label area. But a field list can contain one or more fields.

NOTE: When a label is printed, any field that contains no data is ignored.

Print Commands

A number of basic text editing keys are available to help you create or edit your label. Table 9-14 gives a brief description of each key.

F3	Finds a specific character string
F4	Searches for and replaces an item within the label
F5	Inserts the result of a calculation at the current cursor position
F7	Inserts a blank line or the last deleted line at the current cursor position
F8	Deletes the line at the current cursor position

You can abandon the Label definition at any time by pressing **Esc**. To record your Label definition, press **F10**.

Label Options

The Label Options menu then appears, offering the following settings.

Justify: **Left** Center Right

This allows justification of the field information within the area you defined.

Flag the Display on Overflow: Yes **No**

This specifies whether an error message appears if field information overflows the defined area. Answering **Yes** informs the program to stop and issue a message if an overflow condition exists. Pressing any key continues the reporting process. Answering **No** truncates any overflow without issuing an error message.

Obtain the Next Record Before processing the Label: Yes **No**

This is mainly for printing multiple records on one form. If you select **Yes**, a new record is read from the file before this area is printed. For example, when printing three-across mailing labels, you need to obtain new records before the second and third labels are printed across the page. For more information about the use of this option, see the discussion of mail labels in *Chapter 6*.

You can define multiple label areas on a report using the same sequence.

To record your form definition, press **F10**. To abandon it, press **Esc**. Either action returns you to the Form Definition menu.

Page-Number

The Page-Number option allows placement of a page number on the report page. You are asked to define where you want to place the page number. Once the area is defined, press **Enter**.

Page-Number Options

The Page-Number Options screen then appears, offering the following settings:

Page number control string: **Page ***

Optional text can be defined to accompany the page number. This text should include an embedded asterisk. Wherever the asterisk is positioned in the text, the page number is printed. For example, the entry **Page *** prints "Page 11", "Page 12".

NOTE: If the control string you enter is too long to fit into the area you defined, a warning message will be generated when you try to leave this screen.

Justify: **Left Center Right**

This allows the justification of the page number within the area you defined.

Flag the Display on Overflow: Yes **No**

This specifies whether an error message appears if the page number overflows the defined area. **Yes** instructs the program to stop and issue a message if an overflow condition exists. Pressing any key continues the reporting process. **No** truncates any overflow without issuing an error message.

To record your page number definition, press **F10**. To abandon it, press **Esc**. Either action returns you to the Form Definition menu.

Text

The Text option allows you to place text on the form. When you select the option, a default size box appears. Use the cursor keys to resize the box to the area you want your text to occupy. Press **Enter**. You can type text anywhere in the box you have defined. The same editor keys discussed in Table 9-14 are available to you here. When you finish typing the text, press **F10**.

Text Options

The Text Option screen then appears offering the following setting:

Justify: **Left** Center Right

This allows you to justify the text inside the area you defined.

NOTE: When you finish, the box is resized to be as small as possible while containing the text entered and honoring justification boundaries.

Dupe

The Dupe option can save you time by duplicating a Calculation, Field, Label, Page-number, or Text area. You duplicate not only the appearance of the item, but also any optional settings you have specified for that definition.

The area duplicated is that in which the cursor resides when you select Dupe. If the cursor is not on an area containing a duplicable item, you are placed in a mode to define the area. Use the cursor keys to create a box surrounding the item(s) you wish to dupe. You can restart this marking process by pressing the **F2** (anchor) key.

Press **Enter** when the items you wish to duplicate are within the box. Then use the cursor keys to move the box to the location you wish to place the duplicate items. Press **Enter** to complete the duplication and return to the Form Definition menu.

Move

Move enables you to move a Calculation, Field, Label, Page-number, or Text area.

The area moved is that in which the cursor resides when you select Move. If the cursor is not on an area containing a movable item, you are placed in a mode to define the area. Use the cursor keys to create a box surrounding the item(s) you wish to move. You can restart this marking process by pressing the **F2** (anchor) key.

Press **Enter** when the items you wish to move are within the box. Then use the cursor keys to move the box to the location where you wish to place the moved items. Press **Enter** to complete the move and return to the Form Definition menu.

Remove

Remove permits you to remove a Calculation, Field, Label, Page-number, or Text area from your form definition. Position the cursor on the item you wish to remove and select the Remove option. The item disappears from the screen.

You can remove multiple items by placing your cursor near, but not on the items when you select Remove. Then you can use the cursor keys to define an area containing all the items you wish to remove. Press **Enter** when the box contains the appropriate items. If you specify removal of multiple items at once, a prompt is issued asking you to verify your wish to remove all the items.

NOTE: Whatever the cursor is on when the Remove option is selected is automatically removed. Be sure your cursor is in the proper position before selecting the option.

Update

The Update option allows you to edit many of the elements you have placed on your Form.

Calculations. If you select the Update option when the cursor is on a calculation, the equation for that calculation appears in the command area at the bottom of the screen or in the Formula Editor so you can edit it. Press **F10** when you are finished editing. The Calculation Options menu appears, and you are able to edit the settings for Overflow status, Justification, and Display formatting.

Fields. If you select the Update option when the cursor is on a field, the Display Options menu appears and you can edit the Overflow status and Justification settings.

Labels. If you select the Update option when the cursor is on a label, you can edit the contents of the label. This includes deleting or adding fields and inserting or deleting blank lines in the label. Press **F10** when you are finished editing. The Label Option menu appears, and you can edit the Justification, Overflow status, and record processing settings.

Page Number. If you select the Update option when the cursor is on a page number, the Page Number Options menu appears and you can edit the Control String, Justification, and Overflow Status settings.

Text. If you select the Update option when the cursor is on a text block, you can edit the contents of the text block. Press **F10** and the Text Options menu appears, allowing you to edit the Justification setting.

Set-Font

You can use various fonts to improve the appearance of your form. With the Set-Font option, you can establish the characteristics of the default font, or change the existing font for items on your form.

Set-Font Default. The Default option allows you to set the font for any new items that will be entered.

Set-Font Change. The Change option allows you to set the font for one or more existing items that you specify. If the cursor is not positioned on a defined item when you select Set-Font Change, you are first asked to specify the existing items by marking out an area using the cursor.

Font Prompter

For both Set-Font options, the font prompter, which lists available fonts, appears. Either select a font from the list or press **F6** to define a new font. If you press **F6**, the Font Selector is displayed.

NOTE: Initially, only the 12 point Standard font is listed on the font prompter.

Font Selector

The first item on the Font Selector is the current font family. If you want a font family other than the one shown, press **F6**. A prompter of available font families is displayed. Select one of the available font families.

The remainder of the items on the Font Selector include options for character set, character size (in points), width, slant, weight, modifications, baseline shift, and color. If you specify superscript or subscript for Baseline Shift, an additional prompt appears requesting a "position" entry, in points, that assigns a distance above or below the baseline.

The source for the selected font family is also displayed (e.g., Internal-font for the standard font family). Options that appear in parentheses are not supported by the currently selected printer (previously chosen by way of Tools Preferences Hardware). If you select parenthesized options, the system will match those choices as closely as possible with available options for your printer. The availability prompt shows whether the font is available for portrait or landscape printing, or both.

When you specify font characteristics on the Font Selector and then press **F10** to accept the settings, you also record a newly available font. A new font, using the next available number, is added to the font prompter; an edited font is listed under the same number but reflects the revised attributes.

When the form is printed, if the contents of an item (e.g., a field) are larger than the area specified, the information is truncated. A message may appear depending on the setting of an overflow flag.

Table Definition

If you wish to define a tabular report, select the Table option from the Report Definition menu. The Table Definition menu then appears.

IMPORTANT: You cannot execute the Table option until you have specified that there will be a table on the page. This is done with the Page option on this menu. Defining your page with the Page option is discussed later in this chapter.

You can establish what information you wish to print in the columns of your tabular report, format those columns, and group the data in the columns in a logical manner. Calculations, text, titles, breakpoints, and summary information can also be added to your report table.

Columns

Defining a table requires you to select fields to print and to specify the width and position of columns to print them in. Start the process by selecting Columns from the Table option list. The Columns option list then appears:

Calculation Field Text Move Remove Update Set-Font

Move the cursor to the position of the column where you want to place a calculation, field, or text.

Columns Calculation

If you select Columns Calculation, you are prompted to enter a formula at the bottom of the screen. You can press **F5** to access the Formula Editor if you need to enter a more complex calculation.

Press **F6** to display a list of available fields. Select a field by moving the pointer to it, or type the field name. Press **Enter** to enter that field into the current cursor position in the formula you are creating. This calculation occurs during report printing. The same functions available for calculated fields are available here (see *ANGOSS Formula Reference* for more detail). Press **Enter** when you have completed entering the formula.

Calculated Options. The Calculated Options screen then appears. The settings on this screen also appear after you define a field or text item. The following settings are offered.

Column width:

This defines the width of the column. The column width can be any size from 1 to the maximum page width. Other constraints are that it be wider than the length of the longest heading line and that it fit on the page with the other defined columns. A default number is usually offered, but you can edit it.

Heading

Line 1:

Line 2:

Here you can type in headings for the column you are defining. If you are defining a column using a database field, the second heading is automatically filled with the field title. This can be edited if desired.

Justification: **Left** Center Right None

Choose the justification you desire for the column heading.

Data

The following two settings affect the data that will be printed under the column heading.

If the Display Overflows the Column Width: **Wrap** Truncate

This setting specifies what happens to text that exceeds the defined column width. If the **Truncate** option is selected, only as much text as fits in the defined column is printed. If the **Wrap** option is selected, all of the text is printed in a column under the field title. Sentences are broken between words. There is no limit on number of lines to be wrapped.

Justification: **Left** Center Right

Here you can select justification for the data in the column.

The following items appear for Calculation definitions and for Field definitions, but not for Text definitions:

Display: General **Formatted** Date Time Histogram

Precision: **0**

Special Formatting: **None** Currency Percent E-Notation

Negative Number Formatting: **Minus** Parentheses Credit Debit Reject

Use Commas: Yes **No**

Blank when Value is Zero: Yes **No**

These options have already been discussed in the section entitled *Calculation* under *Form Definition*. Consult that section for more information.

The only setting not previously discussed is the Reject option in the `Negative Number Formatting`: item. This outputs a blank when the content of the field or the result of the calculation is a negative value.

When you have completed your settings on any of these screens, press **F10** and you will be returned to the Columns Option menu.

Columns Field

This option allows you to place a field from the current view into one of the columns on your report. A prompter list of available fields appears and you are asked to select the one you want to print.

NOTE: To print a multi-line field, containing indentations or other spacing, it is very important to specify the proper length for the field. In order for the field to print in the report **exactly** like it does on the screen, the width in the report must match the display width of the field. Let's assume you have a 300 character field in the data file, that is displayed on the screen in six lines of fifty characters. When that field is placed into the table, you need to make the field 50 characters wide. If you make the field 49 characters wide, any leading spaces on each line of the field will be stripped out and you will lose your formatting. If you make the field 55 characters wide, the lines will wrap differently, and your formatting will also be disturbed.

The Field Options screen then appears. The settings on this screen are the same as those discussed under Columns Calculation.

Columns Text

The option allows you to type in text that will be typed in a column on the report. When you select the Text option, the Text Options screen appears.

Text:

Enter the text that you want to print in this column at this prompt. The other settings on this screen have already been discussed under Columns Calculation.

Columns Move

Columns Move repositions a column to a new position. Position the cursor on the column you wish to move and select the Move option. Then move the cursor to the new position for this column and press **Enter**. The column moves to a new position and you are returned to the Columns option list.

Columns Remove

Columns Remove removes a column definition from the report. Position the cursor on the column to remove and select the Remove option. The column is then removed.

Columns Update

Columns Update allows you to change the option settings that are defined for a column. Position the cursor on the column to edit and select the Update option. The previously defined item list is displayed, and you can edit the current settings. After finishing the edit, press **F10** to record changes or **ESC** to abandon them. Either action returns you to the Columns option list.

Columns Set-Font

You can use various fonts to improve the appearance of the data in your columns. With the Set-Font option, you can establish the characteristics of the default font, or change the existing font for items on your form.

Set-Font Default. The Default option allows you to set the font for any new columns that will be entered.

Set-Font Change. The Change option allows you to set the font for one or more existing columns that you specify. The cursor must be positioned on a defined column when you select Set-Font Change, or an error message will be generated.

For information about the Font Prompter and Font Selector, see the discussion of Set-Font under *Form Definition* earlier in this chapter.

Breakpoints

Breakpoints are used to divide a table into similar subgroups of records, according to the data in a "break field". For example, you may want your sales reports grouped together according to territory. In order to accomplish this, you specify [Territory] as a break field.

Multiple breakpoints, each on a different break field, would subdivide each territory into smaller pieces (e.g., salesmen). You can designate up to 15 breakpoint definitions.

IMPORTANT: In order for breakpoints to print properly, the view must be ordered according to the field that is a break field. If you have defined multiple breakpoints, the order in which the break fields were selected must correspond to the order of major and minor fields in the key or sort.

For more information about when to use breakpoints and to see examples of printouts using breakpoints consult *Chapter 6: Printing Database Information*.

When you select the Breakpoints option from the Table Definition menu, the Breakpoints option list appears:

Add Remove Update Set-Font

Breakpoints Add

Breakpoints can be set when you are creating or modifying a report. When you select the Add option, a line appears at the top of the screen identifying the break by number. You are asked to move the highlighter to the field you wish to designate as the break field for this breakpoint. The cursor keys, space bar, or backspace key can be used to move the highlighter.

Press **Enter** when the highlighter is on the proper field. Or, you can press **F6** to display a prompter list showing available fields and select the break field from the list.

The indicator "key" then appears under the break field, and the Totals Options screen appears.

Totals Options. The following settings can be made on the Totals Options screen for each break that you define:

Output lines

Line 1: Blank **Underscore** Double Results Omit

Line 2: Blank Underscore Double **Results** Omit

Line 3: Blank Underscore **Double** Results Omit

Line 4: Blank Underscore Double Results **Omit**

Line 5: Blank Underscore Double Results **Omit**

Up to five output lines can be printed for each break. Each line can be defined independently to contain a blank space, an underscore, a double underscore, the results of a defined summarization (e.g., sum, average, etc.) or to be omitted. For example, if you want to have a sum performed on the data in one subgroup of records, the result (total) can be printed before the next subgroup of records is printed. These five settings allow you to control the spacing and appearance of that result.

Result Line Label: **Total**

This is an optional label which can be printed next to the result line you specified in the previous setting. If you are not printing a result, or do not wish a label for your result, use **F3** to blank this setting. **Total** appears as a default title, but you can edit it.

Result line labels may be calculations. To use a calculation, enter the first character of the label as an equal sign (=), followed by an expression. This label text is calculated each time the report is

printed. Labels are printed in the column to the left of the column containing the result. If there is not enough room on the page to the left of the result, the label is automatically wrapped to the next format line (Blank, Underline, Double, Results) of the current break. After the last format line is printed, any unprinted portion of the break label is ignored.

Lines to Skip After Break: 0 1 2 3 4 5 New-Page

You can select the number of lines to skip after each break. Zero to five lines can be selected, or you can skip to the top of a new page after each break. This setting is of particular importance when you are printing combination reports. For example, if you are printing an invoice with a form at the top of the page and a table at the bottom, in order for the proper form and table items to print together, this setting must be on **New Page**. For more information, read the discussion of *Combination Reports* in **Chapter 6**.

Suppress Printing of Duplicate Field Entries: **Yes No**

This allows you to suppress printing of duplicate field entries for consecutive records. For example, if you are printing a report of the sales of each salesman, you might only want the salesman's name to appear once even if he has multiple sales. If you are setting up a breakpoint using the [salesman] field, each salesman's sales will be grouped together, and his name will only appear once in that grouping.

If you select **Yes**, the field entry is only printed once each time a new name is encountered. **No** causes the field entry to be printed every time. An illustration of the two options appears in Figures 9-21 and 9-22.

Figure 9-21. Duplicate Entries not Suppressed

[Salesman]	[Amount of Sale]
Jones	\$749.35
Jones	\$588.27
Jones	\$423.33
Kelly	\$960.77
Kelly	\$125.99
Smith	\$344.66
Smith	\$755.90
Smith	\$611.23

Figure 9-22. Duplicate Entries Suppressed

[Salesman]	[Amount of Sale]
Jones	\$749.35
	\$508.27
	\$423.33
Kelly	\$968.77
	\$125.99
Smith	\$344.66
	\$755.98
	\$611.23

Print the Record Count: Yes **No**

You can print the number of records in each group by answering **Yes**.

Print the Calculation Names: Yes **No**

You can perform multiple summarization operations on each subgroup of records created by a breakpoint. (All summarization types are discussed later in this chapter.)

For example, you may wish to know the total sales for each salesman, and the average dollar amount of his sales. This could be done by performing a sum operation, and an average (Avg) operation on the same breakpoint. All summarizations defined for the breakpoint will be grouped together to conserve vertical space. To avoid confusing multiple summarizations for a single column, you can choose **Yes** for this item. The name of the summary operation will be printed to the left of the result. Figure 9-23 shows how labels would be printed.

Figure 9-23

Print Commands

Donor #	Date	Amount of Donation
121	02/27/1989	\$ 25.00
	03/06/1989	\$100.00
	04/12/1989	\$ 50.00
	04/28/1989	\$ 60.00

	Sum	\$235.00
	Avg	\$ 58.75
	Cnt	4
		=====

There is a way to print unique labels with these multiple summary operations that involves declaring more than one breakpoint for the same break field. This will be discussed later in this chapter.

Print the Totals when the Break contains only One record? Yes **No**

Specify whether or not you want totals printed when there is only one record in the subgroup created by the break.

Position the First Printed Character (optional):

Line:

Column:

You have the option of positioning the five output lines you set up with the first settings on this screen at any point in the table. If the position has already been passed by the printer when the operations are calculated, the break summarizations are printed on the next page. The default settings of 0 for both Line and Column cause summarizations to be printed on the next available line.

After you have specified your settings on the Totals Options screen, press **F10**. An option list showing all the summary options that can be performed on a breakpoint are displayed.

You must move the highlighter to the field on which the operation will be performed. For example, if you want to total each salesman's sales figures, [Salesman] would be the break field, so that all the records will be grouped according to salesman. However, you want to know the total dollar amount of sales. You want to perform a sum operation on the [Amount of Sales] field.

Once the highlighter is on the appropriate field, press the letter that corresponds to the operation you wish to perform. Table 9-15 shows the available keys and their corresponding summarization types.

Table 9-15

Key	Summarization Type
A	Average
C	Count
M	Maximum
N	Minimum
S	Sum
D	Standard-Deviation
Q	Sum-Squares
V	Variance
R	Remove

To clear a summarization on a column, move the highlighter to the Remove option and press **Return**. If more than one summary option exists, a prompter will appear and you can move the arrow to the option you want to remove.

Multiple Summarizations

You can specify more than one operation to be performed on each subgroup of records. Just press additional letters in the order you want the result of the corresponding operation to be printed. Unless you have the prompt `Print the Calculation Names:` set to **Yes** on the Totals Options screen, no labels will print with the additional summarizations.

Calculation results are printed using the column's formatting except for Count, which prints a number aligned to the left of the column's decimal point.

After specifying a summarization type(s) for the chosen field, press **F10** to record this break or **Esc** to abandon it. Either action returns you to the Breakpoints option list.

Unique Summary Labels

There may be times when you want more than the summary abbreviation to label your multiple summaries. You can define your own labels for multiple summaries, such as those shown in Figure 9-24.

Figure 9-24. Unique Summary Labels

Donor #	Date	Amount of Donation
121	02/27/1989	\$ 25.00
	03/06/1989	\$100.00
	04/12/1989	\$ 50.00
	04/28/1989	\$ 60.00

	Total	\$235.00
	Average Donation	\$ 58.75
	Number of Donations	4
		=====

Adding Break Lines

In order to define a unique label, you must add a "break line" to the existing breakpoint for each summary operation you are going to perform. This is done by selecting the same break field to be a breakpoint each time. You can only specify a breakpoint for each field once. Each subsequent time you select that same field to be a break field, you simply create a new line for the same break.

When you set up the breakpoint, you select a field such as [Salesman] to be the break field. On the Totals Options screen, adjust your settings to reflect how you would like this result to be printed. Bear in mind that any subsequent summary results will be printed directly after this result. You may want to avoid printing a line or leaving numerous spaces after the result. After pressing **F10**, you can choose a summarization option. Select only one operation. Press **F10** to return to the Breakpoint Option list.

To add another break line, select the Add option, and select the same field as the break field. Press **Enter**. Notice that the line at the top of the screen now shows both a break number and a line number. The Totals Options screen then appears. Adjust the settings to reflect how you would like the results of this summary to be displayed. Remember that this result will be printed immediately after the result of the operation you have already defined for this breakpoint. At the prompt **Result Line Label** : type in the unique label you wish to attach to this result. Press **F10**. Move the highlighter to the field you want the summary operation to be performed on, and then select the appropriate key for the operation you desire.

You can continue adding break lines for each summary operation you want to perform.

Multiple Breakpoints

As previously mentioned, multiple breakpoints allow you to further subdivide grouping of your records. You can create additional breakpoints by selecting the Add option. You can scan the existing breakpoints for this table by using **F3** and **F4** to display the previous and next breaks, respectively. If you press **Enter**, on any break other than the last one, the break you are defining will take that break number, and the existing break will be moved to the next number. In other words, you do not erase a break definition by defining another one over it.

The order of multiple breakpoints is important. As the Database processes the records to print a report, it sorts the records first by the first breakpoint, then by the second, etc. By rearranging your breakpoints, you may change the meaning or the value of the printed data.

IMPORTANT: Before executing a definition with multiple breakpoints, the view must be ordered according to a key or sort. The order in which the break fields were selected must correspond to the order of major and minor fields in the key.

Breakpoints in Combination Reports

Breakpoints play an important role in combination reports. A common type of combination report is an invoice. A form at the top includes the name and address, and a table on the page gives a detailed list of purchases. The trick in printing invoices is to make sure that the purchases printed match the name and address on the form. By establishing the proper breakpoints and setting the Totals Options to call for a new page after each break, this can be accomplished.

For a detailed discussion of creating a combination report, read *Chapter 6: Printing Database Information*.

Breakpoints Remove

The Breakpoints Remove option permits you to remove a defined breakpoint. You can scan the defined breakpoints using **F3** and **F4** to display the previous and next breaks, respectively. After locating the correct breakpoint to remove, press **Enter** to remove the definition. Press **F10** when you have deleted all the breaks that you wish to remove. Press **Esc** if you want to return to the Breakpoints option list without removing a Breakpoints definition.

NOTE: If you have already deleted one or more breaks, pressing **Esc** does not reinstate them.

Breakpoints Update

The Breakpoints Update option edits an existing Breakpoints definition. You can view all the existing breakpoints by using **F3** to move to a previous break and **F4** to move to the next break.

After locating the breakpoint you wish to edit, press **Enter**. You then have the option of changing the break field for this break. The currently defined break field is highlighted. If you wish to retain this break field, select it again by pressing **Enter**, otherwise move to the new break field and press **Enter**.

The Totals Options screen then appears and you can edit the previous settings. After you complete the edit, press **F10**. At this point you can remove, add, or change the summary options defined for this break. Move the highlighter if you wish to change the field the operation is done on. Use the **R** to remove any unwanted operations. Then press **F10**. You can edit other breakpoints, or press **F10** again to return to the Breakpoint option list.

NOTE: If you have already modified and saved one or more breaks, pressing **Esc** does not restore them to their original settings.

Breakpoints Set-Font

With the Set-Font option, you set or change the font for the result line label or the result of the summary operation you have specified for a breakpoint.

Set-Font Default. The Default option allows you to set the font for any new items that will be entered. As soon as you select the option, the Font Prompter appears.

Set-Font Change. The Change option allows you to set the font for one or more existing items that you specify. After you select the Change option, you must go to the break you wish to change. Use the **F3** key to move to a previous break and **F4** to move to the next break. When the proper break number is displayed at the top of the screen, press **Enter**. A Font Prompter will appear. At this point you are setting the font for the result label that will be printed with this break.

Select the appropriate font, or press **F6** to define a new one. Next you are asked to press **Enter** if you wish to change the font of the calculated result that will be printed with the result label. If you do, press **Enter** and a Font prompter will appear. If you don't want to change the font for the result, press **F10**.

When you have completed changing fonts for this break, press **F10**. You can then go to another break to edit the fonts, or press **F10** to return to the Breakpoint Options list.

For information about the Font Prompter and Font Selector, see the discussion of Set-Font under *Form Definition* earlier in this chapter.

Grand-Totals

A grand total performs a summary operation just like those defined under breakpoints. The only difference is that breakpoint summaries are performed on a subgroup of records, while a grand total is performed on all records in the report. For example, if you want to calculate and print the total dollar amount of sales from all territories, you would specify a grand total on the [Amount of Sales] field. Grand totals can be set for one or more fields.

When you select Grand-Totals, the following option list appears:

Add Remove Update Set-Font

Grand-Totals Add

Grand-Totals Add can be used to add a grand total to a report during the creation or modification of the definition. Execute Grand-Totals Add and the Grand-Totals Options screen appears.

Grand Totals Options. On this screen, you have many of the same options available on the Breakpoint Options screen.

Lines to Skip Before Grand Totals: 0 1 2 3 4 5 New-Page

You can select the number of lines to skip between the body of the table and the grand total result. Zero to five lines can be selected, or you can skip to the top of a new page before printing the grand total.

Output lines

Line 1: Blank **Underscore** Double Results Omit

Line 2: Blank Underscore Double **Results** Omit

Line 3: Blank Underscore **Double** Results Omit

Line 4: Blank Underscore Double Results **Omit**

Line 5: Blank Underscore Double Results **Omit**

Up to five output lines can be printed for grand total. Each line can be defined independently to contain a blank space, an underscore, a double underscore, the results of a defined summarization (e.g., sum, average, etc.), or to be omitted. For example, if you want to have a sum performed on all the records in the report, the result (total) can be printed at the end of the report. These five settings allow you to control the spacing and appearance of that result.

Result Line Label: **Grand Total**

Print Commands

This is an optional label which can be printed next to the result line you specified in the previous setting. **Grand Total** appears as a default label, but you can edit it or blank the label text with **F3**.

Result line labels may be calculations. To use a calculation, enter the first character of the label as an equal sign (=), followed by an expression. This label text is calculated each time the report is printed. When printed, calculated labels that do not fit at the left of the left-most total column are automatically wrapped to the next format line (Blank, Underline, Double, Results). After the last format line is printed, any unprinted portion of the label is ignored.

Suppress Printing of Duplicate Field Entries: **Yes No**

This allows you to suppress printing of duplicate field entries for consecutive records.

If you select **Yes**, the field entry is only printed once each time a new name is encountered. **No** causes the field entry to be printed every time.

Print the Record Count: **Yes No**

You can print the number of records in your report by answering **Yes**. If the report contains only one record, no count is printed.

Print the Calculation Names: **Yes No**

You can perform multiple summary operations for each grand total.

For example, you may wish to know the total sales figure for the report and the average dollar amount of those sales. This could be done by performing a sum operation, and an average (Avg) operation on the same grand total. All summarizations defined for the grand total will be grouped together to conserve vertical space. To avoid confusing multiple summarizations for a single column, you can choose **Yes** for this item. The name of the summary operation will be printed to the left of the result.

NOTE: If you are performing a grand total on the left-most column in the table, there may not be room for the name of the operation to print to the left of the result. If possible, you can move your columns to allow room for the names to print.

Figure 9-25 shows how the labels would be printed.

Grand Total	Sum	\$25,987.00
	Avg	\$ 2,165.58
	Cnt	12

Print the Grand Totals when the Report contains only One record? Yes **No**

Specify whether or not you want totals printed when there is only one record in the report.

Position the First Printed Character (optional):

Line:

Column:

You have the option of positioning the five output lines you set up with the first settings on this screen at any point in the table. If the position has already been passed by the printer when the operations are calculated, the grand totals are printed on the next page. The default settings of 0 for both Line and Column cause summarizations to be printed on the next available line.

NOTE: If you are performing grand totals on several columns, there may be a problem getting all results and totals to print in the same area. They may overlap. You may be able to use this prompt to adjust the positions of the result lines.

Summary Types. After completing the settings on the Grand Totals Options screen, press **F10**. The same list of summary options that is available for breakpoints is now displayed. See Table 9-14 under *Breakpoints* for a list of summarization types.

You must move the highlighter to the field on which the operation will be performed. For example, if you want to know the total dollar amount of sales for the whole report, you would perform a sum operation on the [Amount of Sales] field.

Once the highlighter is on the appropriate field, press the letter that corresponds to the operation you wish to perform. You can choose more than one summary for the same field. Just continue selecting the letters in the order you want the corresponding operation result to be printed. Press **F10** when you are finished selecting operations. You are then returned to the Grand-Totals option list.

Grand-Totals Remove

With Grand-Totals Remove, you can clear a selected Grand-Totals line definition. Execute Grand-Totals Remove, and the last grand total definition is displayed. You can use **F3** to move to previous definitions, and **F4** to move to the next definition. When the proper definition is displayed, press **Enter**. The definition is then removed. Press **F10** when you have deleted all the definitions that you wish to remove. Press **Esc** if you want to return to the Grand-Totals option list without removing a Grand-Totals definition.

NOTE: If you have already deleted one or more definitions, pressing **Esc** does not reinstate them.

Grand-Totals Update

The Grand-Totals Update option edits an existing Grand-Totals definition. You can view all the existing breakpoints by using **F3** to move to a previous break and **F4** to move to the next break.

After locating the grand total you wish to edit, press **Enter**. The Grand Totals Options screen then appears and you can edit the previous settings. After you complete the edit, press **F10**. At this point you can remove, add, or change the summary options defined for this grand total. Move the highlighter if you wish to change the field the operation is done on. To remove a summary operation, position the highlighter on the field above the operations, and press **R** to remove an operation. If more than one operation is attached to this field, a prompter box appears around the options, and you can designate which one you want to remove by pointing to it and pressing **Enter**. You can edit other grand totals, or press **F10** to return to the Grand Totals option list.

NOTE: If you have already modified and saved one or more grand totals, pressing **Esc** does not restore them to their original settings.

Grand-Totals Set-Font

With the Set-Font option you set or change the font for the result line label or the result of the summary operation you have specified for a grand total.

Set-Font Default. The Default option allows you to set the font for any new items that will be entered. As soon as you select the option, the Font Prompter appears.

Set-Font Change. The Change option allows you to set the font for one or more existing items that you specify. After you select the Change option, you must go to the grand total definition you wish to change. Use the **F3** key to move to a previous definition and **F4** to move to the next definition. When the proper definition number is displayed at the top of the screen, press **Enter**. A Font Prompter will appear. At this point you are setting the font for the result label that will be printed with this grand total.

Select the appropriate font, or press **F6** to define a new one. Next you are asked to press **Enter** if you wish to change the font of the calculated result that will be printed with the result label. If you do, press **Enter** and a Font prompter will appear. If you don't want to change the font for the result, press **F10**.

When you have completed changing fonts for this break, press **F10**. You can then go to another grand total to edit the fonts, or press **F10** to return to the Grand Total Options list.

For information about the Font Prompter and Font Selector, see the discussion of Set-Font under *Form Definition* earlier in this chapter.

Titles

The Titles option on the Table Definition menu is used to define headings, footings, and other miscellaneous information for the table reports.

Headings and Footings can contain Word Processor style Print Control Codes (PCC):

Table 9-16: Word Processor style Print Control Codes (PCC):

%L	Left Justification
%C	Center Justification
%R	Right Justification
%P	Is replaced by the current page number
%D	Is replaced by the date the report was printed.
%T	Is replaced by the time the report was printed
%F	Is replaced by the name of view that is loaded when execution occurs
%[#BU]	Specifies a font for the text immediately following the control code.(# must be a valid font number.) The font number must be surrounded by brackets and can be followed by B or U to boldface or underscore text.

Headings and Footings can also include calculations entered by typing an equal sign (=) at the start of the line. Titles are calculated just before they are printed using current field values. (If you need a single equal sign at the beginning of the line or after a PCC, precede the character with a "%".)

When you select the Titles option, the Title Definition screen appears, offering the following settings:

Heading

Justification: Left **Center**

Line 1:

Line 2:

Line 3:

Blank Lines After the Heading: 0 **1** 2 3

Print Commands

You can define up to three lines to be printed at the top of the page. These titles may be left or center justified. Up to three blank lines can be printed after the title (before the data begins).

Footing

Line 1:

Line 2:

Line 3:

Blank Lines Before the Footing: 0 1 2 3

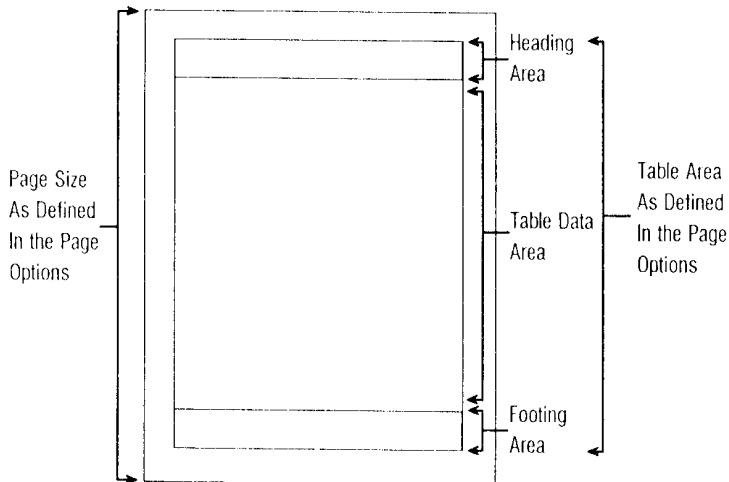
You can define up to three lines of footings to be printed at the bottom of the page. Up to three blank lines can be printed before the footings.

Lines to enclose report? Yes **No**

If you choose to enclose the reports with lines, the lines are printed after the title and before the footing on each page.

Figure 9-26 illustrates the layout of the report title options:

Figure 9-26



Press **F10** to record or **Esc** to abandon a Titles definition. Either action returns you to the Table Definition menu.

Set-Font

You can use various fonts to improve the appearance of your table. With the Set-Font option, you can establish the characteristics of the default font, or change the existing font for items on your table.

Set-Font Default. The Default option allows you to set the font for any new items that will be entered.

Set-Font Column-Headings. The Column-headings option allows you to change the existing font for all column headings in the table.

Set-Font Heading-Titles. The Heading-Titles option changes the existing font for all Headings.

Set-Font Footing-Titles. The Footing-Titles option changes the existing font for all Footings.

For information about the Font Prompter and Font Selector, see the discussion of Set-Font under *Form Definition* earlier in this chapter.

Font Prompter

For all Set-Font options, the Font prompter appears listing the available fonts. Either select an available font or press **F6** to make a new font. If you press **F6**, the Font Selector is displayed.

Font Selector

The first item on the Font Selector is the current font family. If you want a font family other than the one shown, press **F6**. A prompter of available font families is displayed. Select one of the available font families.

The remainder of the items on the Font Selector include options for size (in points), width, slant, weight, modifications, baseline shift, and color. If you specify superscript or subscript for Baseline Shift, an additional prompt appears requesting a "position" entry in points that assigns a distance above or below the baseline.

The source for the selected font family is also displayed (e.g., internal-font for the Standard font family). Options that appear in parentheses are not supported by the currently selected printer

(previously chosen by way of Tools Preferences Hardware). If you select parenthesized options, the system will match those choices as closely as possible with available options for your printer.

When you use the Font Selector to specify font characteristics and press **F10** to set the font for existing or new items, you also record a newly available font. The new font is assigned the next number available on the Font prompter list.

When the table is printed, if the contents of an item (e.g., a field) are larger than the area specified, the information is truncated. A message may appear depending on the setting of an overflow flag.

As soon as you have selected the new font, you will be returned to the Table Definition menu.

Page Definition

The first step in report definition is defining the printed page. Select the Page option from the Report Definition menu. The Page Definition Screen appears.

Settings on the Page Definition Screen are as follows:

Paper Profile:

A Paper Profile is made up of the page size and paper path you want to use to print a file. The paper path tells ANGOSS where the printer will find the paper for this job, and how it will move it through the printer. For example, you can specify the use of a tractor feed, or manual feed; choose between several paper trays; or specify the use of an envelope or single sheet feeder. Page size tells ANGOSS whether you will be printing an 8-1/2 by 11 inch page, an envelope or a custom page size.

This paper profile will control printing of Database Reports. Non-report printing in the Database is controlled by the default paper profile on the Hardware Preferences menu.

The following steps explain how to select a paper profile.

STEP 1: With the cursor on Paper Profile:, press F6.

A two-column, pop-up box is displayed listing available paper paths and sizes. Figure 9-27 illustrates this box.

Figure 9-27

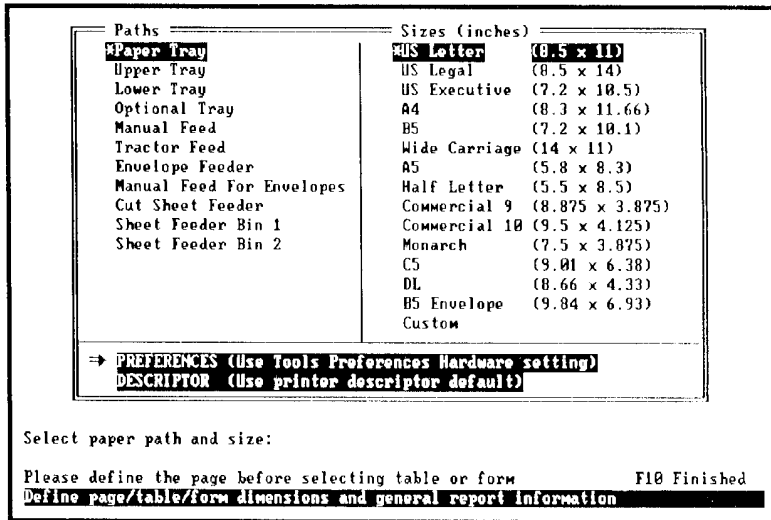


Table 9-17 explains some of the selections in this box.

Paper Paths

Item	Definition
Paper Tray	If your laser printer has only one tray, select this path
Upper Tray	Paper will be taken from the upper tray of a laser printer
Lower Tray	Paper will be taken from the lower tray of a laser printer
Optional Tray	If you have purchased a special attachment to allow you to add a second tray to your printer, select this path to use that optional second tray

Item	Definition
Manual Feed	Paper will be manually fed into the printer
Tractor Feed	A tractor feed device will be used to move paper through the dot matrix printer
Envelope Feeder Attachment	An attachment will be used to feed envelopes into the printer
Manual Feed for Envelopes	Envelopes will be manually fed into the printer
Cut Sheet Feeder Attachment	If your dot matrix printer has only one sheet feeder attached, select this option
Sheet Feeder Bin 1	Paper will be coming from Sheet Feeder Bin 1 to a dot matrix printer
Sheet Feeder Bin 2	Paper will be coming from Sheet Feeder Bin 2 to a dot matrix printer

Paths that are appropriate for the current printer are highlighted. As you move the arrow down the list of paths, the appropriate paper sizes for that path are highlighted.

Notice that one path and one paper size are marked by an asterisk. This indicates that these are the default path and paper size as listed in the current descriptor file which you selected on the Hardware Preferences menu.

ANGOSS gets information about appropriate selections and the default path and page size from the currently selected printer descriptor file. If you wish to change the default settings, or if you know your printer supports a particular path or size that is not highlighted, you may want to edit the appropriate descriptor file. Read *Editing Descriptor Files* in *ANGOSS Software System* for more information.

STEP 2: Use up arrow, or down arrow to move the pointer through the path selections. When the arrow points to the appropriate path, press Enter or right arrow.

To select the default path and paper size, move the arrow to the word **DESCRIPTOR** at the bottom of the box. To select the same settings you specified on the Hardware Preferences menu, move the arrow to **PREFERENCES** at the bottom of the screen. If you point to either of these words, the path and page size they represent are highlighted as a reminder.

If you set the paper profiles within each module to the PREFERENCES selection, you can change all the profiles by making changes in one place, the Hardware Preferences menu.

If you do not wish to select DESCRIPTOR or PREFERENCES, select a highlighted path. The arrow then moves to the Page Size column.

STEP 3: Select one of the highlighted sizes and press Enter.

If you select **Custom** in the Size column, a prompt is displayed on the command line. Enter the width and length of the custom paper size in inches.

You are returned to the Page Definition screen and your selections appear, separated by a comma, at the `Paper Profile:` prompt. If you select a size or path that is not supported by the current printer, a warning message will be generated when you execute a Print command. You can abandon printing and change to a more appropriate profile, or continue. If you continue the print job, the printer driver will select the "default" profile for your printer as specified in the current descriptor file.

Orientation

Select **Portrait** to print the document across the width or horizontal side of the page. Select **Landscape** to print the document "sideways," across the length of the page. Landscape printing can only be accomplished if your printer supports it.

Page numbers: Left Right Center Left-right Right-left **No-numbers**

Start page number:

The first prompt specifies where the page number is printed. All page numbers are printed at the bottom of the page. For example, **Center** prints each number at the bottom middle of each page. The **Left-right** and **Right-left** options alternate page numbers on each side of the page. This is useful if the report will be in a book. The default page number placement is **No-numbers**.

The second prompt specifies the starting page number. The default is 1.

Lines per inch: **6 8**

This specifies the space between printed lines. You can choose six lines per inch or eight lines per inch.

Form Page Option. To include a form (free form layout of fields) on this page, answer **Yes** to the following prompt. If you are defining a report that includes only a table, answer **No**.

Is There a Form on the Page: Yes **No**

Print Commands

If you answer **Yes**, the following prompts appear concerning the form definition:

Location of the Upper Left Corner of the Form

Line:

Column:

Location of the Lower Right Corner of the Form

Line:

Column:

Enter the line and column numbers of the form boundaries. The boundaries entered must fall within the boundaries of the page.

Table Page Option. To include a table (columnar layout of fields), answer **Yes** to the following prompt. If you are defining a report that includes only a form, answer **No**.

Is there a Table on The Page: Yes **No**

If you answer **Yes**, the following prompts appear concerning the table definition.

Location of the Upper Left Corner of the Table

Line:

Column:

Location of the Lower Right Corner of the Table

Line:

Column:

Enter the line and column numbers of the table boundaries. These boundaries must fall within the boundaries of the page.

NOTE: When defining both a table and form on a page, special care must be given to their position in relation to each other. The table can overlap the form dimensions in anyway except to completely obscure it. Be sure to adjust the line and column positions for the table and the form.

Double space body of table: Yes **No**

Enter **Yes** to double space the body of the table. Enter **No** if you want single spacing.

Combination Report Option. If you specify both a Form and a Table on the page, the following prompt will appear.

On Combination Reports:

Start the Table Overflow at the Top of Page: **Yes No**

Reprint the Form on Page Overflow: **Yes No**

If the table overflows the bottom of the page, you must decide where to start the overflow on the next page. The **Yes** option causes the overflowed portion to start at the top of the new page. The **No** option causes the overflowed portion to start at the first defined line of the table. You also have the option of reprinting the form on the new page if overflow occurs.

NOTE: If you have both of these options set to **Yes**, and your form is positioned above the table on the page, both the form and the table will try to reprint at the top of the overflow page. In this situation, the form or the table should overflow, but not both.

Views with View Tables. If you define a report for a view that has a view table on it, the following prompt will appear on this screen.

Process records from View Table (leave blank for View Records):

If you want to include view table records in your report you must enter the name of the table after this prompt. To assist you, a box appears at the bottom of the screen, which lists the view tables attached to the current view. If you do not wish to include view table records in your report, leave this setting blank.

Use **F2** to edit text and **F3** to blank text. After finishing the page definition, press **F10** to record it, or press **Esc** to abandon all changes. In either case, you return to the Report Definition Window.

IMPORTANT: The printer you will be using to print the report should be the current printer selected in Tools Preferences Hardware. Different types of printers have different hardcoded margins. If you create the definition with one printer and then switch to another when you print it, some of your data may be truncated. You may be able to overcome this problem by adjusting the position of forms and tables on the page.

You can now define a Form, a Table, or both. Select the type of report you wish to define.

Edit-Fonts

To change font characteristics for one of the available fonts, use Edit-Fonts on the Report Definition menu. For example, if you use Edit-Fonts to change the characteristics of available font #4, the new characteristics apply for all instances in the report where font #4 is specified.

After you select the number of one of the available fonts, the Font Selector appears showing the current characteristics of that font. For information about the Font Selector, see the previous discussion of Set-Font under *Form Definition* earlier in this chapter.

Remove-Fonts

To remove a font definition, use Remove-Fonts on the Report Definition menu. The Font prompter appears listing currently available fonts, along with a prompt to enter the font number(s) to remove. You can type the font number(s), or you can use the cursor keys to point to a font number and press **F6** to mark that font.

Only unused fonts can be deleted, and these are marked with an asterisk (*). If you want to mark all fonts not used in the current report, press **F8**. This highlights each of those fonts. To remove all fonts marked for removal, press **F10**.

IMPORTANT: The size of the font you have defined as Font #0 determines the character spacing the Database expects for the whole report. If you use larger or proportionally-spaced fonts your data may be truncated or may overtype other data on the report. You may be able to overcome this problem by adjusting the horizontal and vertical spacing of your report. To make a compressed report, all fonts that you use must be specified as compressed, including Font #0.

Print Report Execute

Print Report Execute allows you to output a report using an existing report definition. If you have not already done so, create a report definition using Print Report Create.

NOTE: Print Report skips deleted records, printing only those records that are active.

When you select Print Report Execute, a prompter appears listing all existing report definition files in the current directory. Select the report definition you wish to execute by typing in the name, or selecting it from the prompter list.

Print to Disk

Select Disk to output the report to disk. You must then enter the name of the disk file to contain the report. Printing to disk only prints the text of the report. No printer control codes or font information are included in the output file. It is a text representation of the defined report in standard text file format.

Print to Printer

Select Printer to send the report to a printer. The printer currently selected in Tools Preferences Hardware is the printer the report will be sent to. This should be the same printer that was selected when the definition was created. If you use a printer other than the one you had selected when the report was defined, you may have different margins and some of your data may be truncated.

Print to Screen or Text-Screen

Select Screen to display the report as it appears on the printed page. Select Text-Screen to quickly scroll data on the screen. These are excellent ways to preview your report before sending it to a printer.

In Text-Screen, you can control the rate at which the information scrolls on the screen by typing a number between 1 and 10 (for which you press **0**)-the higher the number, the faster it scrolls. Press **Esc** if you want to stop the scroll; press any other key to pause.

After determining the report output type, decide whether you want to print it in Detail, or Totals-Only format.

Detail printing. If you select the Detail option, all information on the report will be output.

Totals-Only. If you select the Totals-Only option, only the totals from breakpoints and grand totals will be printed. Each individual record will not appear. This can be useful if you only need total information and do not want the details cluttering up the report.

Then you specify at which page you want the printing to start and stop and how many copies you would like.

You can enter an integer for each of these prompts or press **Enter**. If you press **Enter** to all prompts, you will print from the first page to the last page, and make one copy of the report.

When you respond to the last prompt, the Database begins to output the report.

Print Report Modify

Print Report Modify allows you to edit a report definition. When you select Modify, a prompt appears asking you to enter a report definition file name. A prompt is displayed showing the existing report definition file names. Select the file you wish to modify from the prompt, or type in the name.

The Report Definition Window then appears. All items within the Report Definition Menu operate the same whether you are creating or modifying a file. The only difference is that with Print

Print Commands

Create you are creating a new definition file, and with Print Modify, you are editing an existing definition.

Print Report Remove

Print Report Remove deletes a report definition you no longer need from the disk. After you select Remove, a list of report definition names appears. Select the name of the report you wish to remove from the prompt, or type in the name. It is then removed.

Tools Commands

The Tools commands allow you to perform calculations, create and use directories, perform various file operations, set hardware and operating defaults, create and use macros, and manipulate printer fonts.

Only the Tools Preferences Database options are discussed here. Refer to the Tools command discussion in *ANGOSS Software System* for detailed information regarding the other Tools commands.

Tools Preferences

The Tools Preferences commands are used to configure default settings. When you select Tools Preferences, you must specify whether you want to set Global, Database, or Hardware defaults. For information on the Global and Hardware options, refer to *ANGOSS Software System*.

Tools Preferences Database

Tools Preferences Database displays a definition menu containing settings that control how ANGOSS Database performs whenever it is accessed. Any changes that you make to the settings control the way the Database performs until the settings are changed again.

Table 9-18 lists the keys and corresponding actions that may be used to move through the definition menu, specify options, respond to prompts, and record selected settings:

Table 9-18

Key	Action Invoked
F1	Display Help information
F2	Edit text on the prompt line. (Use arrow keys to move cursor while editing.)

Key	Action Invoked
F3	Delete text currently on the prompt line
F10	Exit the definition menu and store the settings
Esc	Cancel the command and restore the original settings. (ANGOSS then displays the prompt <code>Cancel without updating? (y/n)</code> . The original settings are restored only if you answer <code>y</code> .)
down arrow	Move the pointer to the next option
up arrow	Move the pointer to the previous option
Ctrl Home	Move the pointer to the top of the definition menu
Ctrl End	Move the pointer to the bottom of the definition menu
PgUp	Move to the previous page of definition items
PgDn	Move to the next page of definition items
Home	Move to the top of the current screen
End	Move to the bottom of the current screen
Spacebar or +	Move the highlighter to the right one option
Backspace or r -	Move the highlighter to the left one option

The Database preferences are as follows:

Default Numeric Format

At this prompt, you can specify information such as the numeric precision and justification that will be the default for the Database. This default format is overridden by any display format you specify for a numeric field during view definition. Press **F6** to see a list of format options. For more information about numeric display format options, refer to *Field Display Format* under *Create Field* in the *File Commands* section of this manual. An example of a format might be `2r`. This specifies a numeric precision of two and right justification.

Number of Key Buffers

You can specify additional key buffers to be loaded with each file. Key buffers consume memory (approximately 3K per buffer) but speed key processing and some other types of Database activities.

These buffers are allocated when the file is loaded. The memory remains allocated whether your records are in key order or not. In single user situations, increased key buffers can cause you to run out of memory prematurely.

You may want to increase this number before performing a key-intensive activity or a batch file import. However, you may want to reduce this number to a minimum before loading multiple files or executing a project that consumes much memory.

In networking situations, to ensure the accuracy of the key file, it must always be read from disk. Setting more than three key buffers is unnecessary.

Default Data Path

The path name of the directory where you want your data stored can be entered at this prompt. To avoid complications in file maintenance, do not store data in the same directory in which you installed your ANGOSS program files.

Macro File Load

If you want to automatically load a macro file each time you access ANGOSS Database, enter the name of the macro file at this prompt.

Automatic Load of View

If you want to automatically load a view each time you access ANGOSS Database, enter the name of the view at this prompt.

Project File to Run on Entry

If you want to automatically load a project file each time you enter ANGOSS Database, enter the name of the project file at this prompt.

Encryption driver

You can choose to use either the standard ANGOSS encryption driver or an alternative one that you have loaded yourself.

IMPORTANT: Do not select `Alternate` unless you are absolutely certain that an alternate encryption driver has been loaded. Otherwise, you risk losing data.

Window Commands

The Window commands can be used to manage display of one or more windows in ANGOSS Database.

Window provides the following options:

Split. Splits the current window into two or more windows.

Close. Removes the current window from the screen.

Zoom. Expands the current window of a multiple window display to fill the Data Window Area or returns it to its normal size after expansion.

Border. Toggles the window border display on or off.

Paint. Changes the colors used in selected areas of the display screen.

Link. Links the display of records in two or more windows.

Unlink. Dissolves a link that has been established between the current window and another window.

Window Split

Window Split allows you to split the Data Window Area into two or more windows. This allows you to load a number of views into different windows in order to move between them or compare them quickly and easily.

Window Split acts directly on the current window to split it into two separate windows. Each time you use Window Split, the new window is automatically numbered in sequence.

Window Split Horizontal

You can split a window horizontally by moving the cursor to the desired split location and then pressing **Enter**. If window borders are present, the current window appears within a double-line border.

Window Split Vertical

You can split a window vertically by moving the cursor to the desired split location and then pressing **Enter**. If window borders are present, the current window appears within a double-line border.

NOTE: If there is a view active in the current window when you split it, the view will appear in both windows. You can then move to the new window by using Data Goto Window and specifying the window by number, or the Quick Key **Alt F7**. Once there you can execute File Load or Data Goto View to bring a different view into the new window.

Window Close

Window Close removes the current window from the screen. As the window closes, the remaining windows expand to fill the vacated area. The number of the current window is in the Status Line at the bottom of the screen.

If you close a window that contains a view, that view remains active. To access the view and its associated data-files, you can use the Data Goto View command. To remove the view from memory, use the File Unload command.

NOTE: Under some special circumstances, the Database is unable to close a particular window. Closing another window first may correct the problem.

Window Zoom

Window Zoom is a toggle command that expands the current window of a multiple window display to fill the Data Window Area. Executing Window Zoom again returns the window to its normal size.

Window Border

Window Border is a toggle command that allows you to switch the window number and border display around the current window on or off. When you first access the ANGOSS Database, the window border is on. Executing Window Border the first time turns the border off. To turn the border back on, execute Window Border again.

When the window border is off, there is additional room to display data in the current window. The Database can display 25 windows with borders on a standard display screen. More windows can be displayed in the same space if their borders are turned off.

Window Paint

Window Paint can be used to change the colors displayed in selected areas of the screen for the current window.

NOTE: If colors were set for items such as fields, boxes, or notes during the view definition process, those items cannot be painted. The only way those colors can be changed is by modifying the file and changing the appropriate settings. If you accepted the default colors for those items, then they can be painted.

Any colors you change with Window Paint are in effect for the current session only. If you change colors using Window Paint, unload, and then reload the view, the colors revert to those specified in the last File Create or File Modify procedure. To change colors permanently, execute File Modify.

Window Paint Options

Paint provides the following options:

Border. Changes the color of the border surrounding the current window.

Cursor. Changes the background and foreground color of the block cursor on a standard screen, a browsed view, or a table.

Data. Changes the color of the displayed data in the current view.

Graphics. Changes the color of any text or graphic items (boxes or lines) in the current view.

Titles. Changes the background and/or foreground colors of the titles in the current view.

Window-Area. Changes the color of the background in the current window.

When you select one of the Paint options, a list of numbered colors appears at the bottom of your screen accompanied by a prompt to enter a color. Enter the number of a new color.

If you select Cursor or Titles, you are asked to enter a background color and a foreground color.

Window Link

Window Link allows you to simultaneously display corresponding records from different views, in separate windows. This can be a fast and efficient way to find and view corresponding records in two or more views.

The following conditions must be met before a window link can be established:

- The two views must have a "common" field for the link.
- The link field in the second view must be a key field.

In order to link two views, you must define a pair of linked fields. Linked fields have a common data type, and they contain individual data items common to both views.

With the link established, each time you access a new record for the current window, the Database attempts to find a corresponding record in the second view by matching data items in the linked fields. If no match is found, the Database issues an audible beep (unless Beep is turned off in the Tools Preferences Global Definition Menu).

COMMENT: Remember, the current window is surrounded by double lines. You will be linking the current window.

Before executing Windows Link, load the views you wish to link into separate windows. One of the windows contains what will be the "driver" view. This is the view you want to look at a record in and then have the link find the record that matches it in the second view. Make the window containing the "driver" view the current window.

Then execute Window Link. A prompter list of available fields in the current window appears. Select the "link field", the field both views have in common. Another prompter list appears, showing all active views. Select the name of the view to which you want to link the current view.

Another prompter list appears showing the fields in the view you just selected. Select the "link field" in this view. The link should be complete. As you move the cursor throughout the current view, the records in the view in the linked window should move.

NOTE: You cannot link to a view that is in index order. An index created by a query may not have all the records available, making a link impractical.

Links are associated directly with the view. Because of this, links are maintained even if a view is placed in the "background." This would occur if File Load or Data Goto View is used to bring another view into the same window.

Cascading links are possible. You can have one view linked to a second, the second linked to a third, and so on. However, if Window 1 is linked to Window 2, then Window 2 cannot be linked to Window 1. This circularity of linking is not allowed.

NOTE: Linking is generally disabled during some batch processing operations such as transactions and relates.

Window Link can also be used to link two windows that contain the same view. Linking a view to itself is useful to view two different pages of the same view record at the same time.

Window Unlink

Selecting the Window Unlink command eliminates all links for the current window. If you have created links for several windows, you must make each one the current window before executing Window Unlink.

Window Commands

Help, Remember and Quit Commands

Help Commands

The Help commands invoke ANGOSS' extensive on-line help information. The following options are available:

About-Help. Displays information on how to use ANGOSS' on-line help feature.

Contents. Displays a table of contents for the on-line help.

Index. Displays an index of topics included in the on-line help information.

On-Error. Displays help text for specified error messages.

Tutorial. Invokes the Database Tutorial.

Help About-Help

The Help About-Help command displays the information explaining how to use ANGOSS' on-line help feature. On-line help includes context-sensitive help information as well as help for program error messages.

Help Contents

The Help Contents command displays a table of contents for ANGOSS' on-line help. Initially, only the first level of headings appears. Press **F4** to display the next level of headings and continue to do so until you reach the heading level you want. Select the topic for which you want help information and press **Enter**. The help information related to that topic is displayed. To return to the table of contents, press **F4**. To leave help and return to the keyword menu, press **F10**. To get to the Index, press **F3**.

Help Index

The Help Index command displays an index for ANGOSS' on-line help. Initially, only the first level of the index is displayed. To reach the second level, press **F3**. To return to the first level, press **Esc**.

You may search the index for a particular word or phrase, if necessary, by pressing **F7** and entering the string you want to search for. The string cannot be longer than 40 characters. Press **F9** to repeat the search.

When you have selected a topic, the related help information appears. To return to the index, press **F3**. To leave help and return to the keyword menu, press **F10**. If you want to get to the table of contents, press **F4**.

Help On-Error

The Help On-Error command displays help text for specific error messages. At the prompt, enter the number corresponding to the error message and press **Enter**. The appropriate help information is displayed.

Appendix A of Project Processing gives a list of system error messages and their corresponding numbers.

Help Tutorial

Help Tutorial invokes the tutorial for the Database module. You may use the tutorial in a step-by-step process to learn the entire module, or you may use it to learn about one particular aspect of the module.

IMPORTANT: Because ANGOSS Tutorials run within the module they describe, it is important that you unload all active files with the File Unload All command before entering the tutorial. When you execute Help Tutorial, you will be prompted to unload all files before continuing.

You are then prompted to enter your name. This is optional, however if you do, the program will keep track of what lessons you have completed.

The Tutorial menu then appears. If you would like a brief lesson in how tutorials work, select **Using Tutorials**. If you want to select a lesson, use the cursor keys to move the prompter arrow to

the lesson you want and press **Enter**. You can go through the lessons sequentially, or pick a lesson that interests you.

After you complete a lesson, you are returned to the Tutorial menu.

Remember Commands

The Remember commands allow you to create, edit, and run Project Processing files. Project Processing is an automated method of executing a sequence of commands.

Refer to ***Project Processing*** for detailed information on using the Remember commands.

Quit Commands

The Quit commands allow you to leave a module to enter another module or return to the operating system. The Quit options vary depending upon which module you are leaving. Obviously, the module you are leaving does not appear among the Quit options on the screen.

Options for Quit include the following:

Quit. Returns to the operating system.

Main-Menu. Returns to the Main Menu of ANGOSS Software System.

Communications. Leaves the current module and enters the ANGOSS Communications module.

Spreadsheet. Leaves the current module and enters the ANGOSS Spreadsheet module.

Wordprocessor. Leaves the current module and enters the ANGOSS Word Processor module.

If you have selected the Quit keyword and decide that you do not want to leave ANGOSS Database, press **Esc**.

Help, Remember and Quit Commands

Index

Symbols

.iff file 8 - 3, 9 - 45

A

Accessing

- database 4 - 1
- index 5 - 10

Action Expressions 5 - 28

Activating views 4 - 2, 9 - 97

Active files, displaying a list of 9 - 97

Active records 9 - 16

Adding

- breakpoint result lines 6 - 30
- breakpoints 6 - 25, 6 - 27, 9 - 137
- grand totals 6 - 31, 9 - 145

Alignment

- in headings and footings 6 - 32, 9 - 149

Alpha Fields 9 - 75

Alphanumeric Fields 3 - 7

- editing 3 - 29
- entering data 4 - 8
- field width 3 - 8
- multi-line fields 4 - 9

ANGOSS, entering 2 - 1

Appending

- data 3 - 33, 5 - 31
- records 9 - 55

ASK 9 - 70

Attaching

- data-files 3 - 30, 3 - 35, 9 - 68
- fields 3 - 35, 9 - 69
- to table 3 - 42

Attributes, field 9 - 77

Audit File 7 - 12

Autohelp 2 - 7

Automatic Advance 3 - 9, 9 - 77

Automatic file backup 2 - 22

Automenu 9 - 85

B

Backup, Automatic 2 - 22

Block

- deleting 9 - 90
- moving 9 - 94

Boolean Functions 5 - 21

Border, window 9 - 167

Box

- creating 3 - 24
- deleting 9 - 90

Break Field 9 - 136

- selecting 6 - 25

Breakpoint 9 - 136

- adding 6 - 25, 6 - 27, 9 - 137
- editing 9 - 144
- fonts 9 - 144

in combination reports 9 - 143

multiple 6 - 27, 9 - 143

multiple summaries 9 - 141

output lines 6 - 25, 6 - 28

remove 9 - 143

result lines 6 - 28

summary options 6 - 25, 6 - 28, 6 - 30, 9 - 139

updating 9 - 144

Browse data 4 - 21

Browse Mode 4 - 21, 9 - 7

- moving cursor 4 - 22

Browsing

all fields 9 - 8

data 9 - 7

selected fields 9 - 8

turning off 9 - 8

C

Calculated Fields 4 - 11

Calculating, a data-file and path 9 - 93

Calculation 9 - 70

assigning to a field 3 - 18

creating 3 - 18

deleting 9 - 90

editing 3 - 18

field text editor 4 - 9

immediate 3 - 18

in headings and footings 6 - 33, 9 - 149

manual 3 - 18

report form definition 9 - 124

report table definition 9 - 133

same 3 - 18

update 9 - 64

updating 9 - 131

wait 3 - 18

Changing

colors 9 - 95

count 9 - 57

key 5 - 4

record count 5 - 32

Closing windows 5 - 36, 9 - 166

Color

changing 9 - 95

fields 9 - 78

window 5 - 36

Column-format

in Data Send All Communications 8 - 4, 9 - 44

in Data Send All Spreadsheet 8 - 5, 9 - 45

in Data Send All Wordprocessor 8 - 4, 9 - 46

Columns

moving 6 - 24

moving in report definition 9 - 135

removing from report definition 9 - 136

selecting fields 6 - 23

setting fonts 9 - 136

widths 6 - 24

Combination Reports 6 - 8, 6 - 34

breakpoints 9 - 143

page definition 9 - 157

printing overflow 6 - 36

Combined Reports

form positioning 6 - 35

table positioning 6 - 35

Command Mode 2 - 8

Commands, building 2 - 8

Control Area 2 - 6

Control codes 6 - 32, 9 - 149

Converting 3.10 files 8 - 8

Copying

a view 3 - 30

data-file structures 3 - 32

Counter Fields 3 - 7, 9 - 75

resetting 4 - 11

Creating

a cross-tab definition 7 - 16

a matching data-file 9 - 95

a sort 9 - 108

box 3 - 24, 9 - 70

calculation 9 - 70

cross-tab 9 - 10

database 3 - 1, 9 - 66

data-file 2 - 19, 3 - 3, 9 - 68, 9 - 73

fields 2 - 19, 3 - 4, 9 - 74

line 3 - 24

menu 9 - 83

notes 3 - 24, 9 - 86

print report definitions 9 - 123

- printed forms 6 - 20
- query 9 - 23
- relate 9 - 32
- relate definitions 7 - 7
- rule 9 - 86
- sorts 5 - 8
- transactions 7 - 11, 9 - 49
- view tables 3 - 41, 9 - 88
- views 2 - 19
 - for existing data-files 3 - 30
 - from scratch 9 - 66
 - from template 3 - 30, 9 - 66
 - with Data Relate 7 - 1
- Cross-Tab 7 - 14, 9 - 9
 - Command Mode 9 - 11
 - creating 7 - 16, 9 - 10
 - Definition Menu 9 - 11
 - Enter Mode 9 - 11
 - executing 7 - 19, 9 - 16
 - match equation 9 - 11
 - editing 9 - 11
 - match unique data 9 - 12
 - matching all 7 - 20
 - matching other 7 - 25
 - matching unique 7 - 22
 - modify 9 - 16
 - Options 9 - 12
 - column-automatic 9 - 12
 - row-automatic 9 - 12
 - Title 9 - 12
 - Options window 9 - 12
 - rejects 9 - 15
 - rejects option 7 - 25
 - remove 9 - 16
 - removing 7 - 27
 - summary 9 - 14
 - titles 9 - 12
- Current date, in headings and footings 6 - 32, 9 - 149

- Current time, in headings and footings 6 - 32, 9 - 149
- Current window 2 - 7
- Cursor
 - movement 4 - 4
 - moving in browse mode 4 - 22
- Custom Print Reports 6 - 7
- Custom View, loading 9 - 66

D

- Data
 - appending 5 - 31
 - browse 4 - 21
 - editing 4 - 6
 - entering 2 - 9, 3 - 40, 4 - 3, 4 - 7
 - finding 4 - 23
 - organizing 5 - 1
 - updating 2 - 9, 4 - 4
 - viewing 3 - 39, 4 - 17
- Data Browse 4 - 21, 9 - 7
- Data Browse All 9 - 8
- Data Browse Fields 9 - 8
- Data Browse Off 9 - 8
- Data Commands 9 - 6
 - Cross-Tab 7 - 14
 - Relate 7 - 1
 - Transact 7 - 10
- Data Cross-Tab 9 - 9
- Data Delete 4 - 25, 9 - 16
- Data Enter 9 - 17
- Data Find 4 - 23, 9 - 19
 - equal 4 - 23
 - greater-than 4 - 23
 - less-than 4 - 23
 - partial 4 - 23
 - search options 4 - 23
- Data Goto 4 - 20, 9 - 21
- Data Goto View 4 - 2

- Data Path, default 9 - 163
- Data Query 9 - 22
- Data Relate 9 - 31
- Data Send 8 - 1-8 - 2, 9 - 43
- Data Transact 9 - 48
- Data Utilities 9 - 55
- Data Utilities Information 9 - 58
- Data Window 2 - 5
- Database
 - accessing 4 - 1
 - creating 2 - 19, 3 - 2, 9 - 66
 - sample application 3 - 2
 - definition 1 - 1
 - exiting 2 - 23
 - important concepts 2 - 12
 - statistical functions 7 - 28
- Database Utilities 5 - 30
- Data-File 2 - 12
 - attach 9 - 68
 - attaching 3 - 30, 3 - 35, 9 - 68
 - create 9 - 68
 - creating 2 - 19, 3 - 3, 9 - 73
 - creating similar empty 3 - 32
 - deleting 9 - 90
 - driven 3 - 37
 - driver 3 - 37
 - encryption 3 - 4
 - fields 9 - 74
 - fixed-length 3 - 4
 - linking 2 - 17, 3 - 36
 - password 3 - 4, 9 - 73
 - replicating 3 - 32-3 - 33
 - variable-length 3 - 4, 9 - 73
- Data-file and path, calculating 9 - 93
- Data-file, substituting 9 - 93
- Data-Files
 - fixed-length 9 - 73
- Date fields 3 - 7, 9 - 75
- Dates, entering 4 - 10
- DBINFO 9 - 70
- Deactivating, records 4 - 25
- Default data path 9 - 163
- Default equation 3 - 16
 - field 9 - 83
- Default settings 9 - 161
- Defining
 - a table report 9 - 133
 - keys 5 - 3
 - query 5 - 14
- Definition menus 2 - 10
- Delete status 2 - 7
- Deleting
 - block 9 - 90
 - block from a view 3 - 26
 - box 9 - 90
 - calculation 9 - 90
 - data-file 9 - 90
 - duplicate records 5 - 29
 - elements from a view 3 - 26
 - field 9 - 90
 - from linked data-files 4 - 25
 - item 9 - 90
 - item from a view 3 - 27
 - keys 9 - 107
 - menu 9 - 91
 - note 9 - 91
 - records 4 - 25, 9 - 16
 - records with query actions 5 - 28
 - rule 9 - 91
 - table 9 - 91
 - table records 4 - 25, 9 - 16
- Destination, transaction 7 - 13
- Detail printing 9 - 159
- Disk, printing to 9 - 158
- Display Format
 - alignment 3 - 10
 - examples 3 - 12
 - fields 9 - 78

- literal characters 3 - 12
- options 3 - 12
- Precision 3 - 10
- type 3 - 11
- Display Screen 2 - 5
- Displaying
 - active views 4 - 2
 - list of open files 9 - 97
- Documentation
 - formatting conventions 1 - 3
 - using 1 - 3
- Driven data-File 3 - 37
- Driver data-File 3 - 37
- Driver View, transaction 7 - 11
- Duping labels 6 - 13
- Duplicate records, deleting 5 - 29
- Duplicating Items, form definition 9 - 130

E

- Edit Links 3 - 43
- Editing
 - breakpoints 9 - 144
 - data 4 - 6
 - fields 9 - 91
 - alphanumeric 3 - 29
 - numeric 3 - 29
 - fonts 6 - 38, 9 - 157
 - grand totals 9 - 148
 - items on a form 6 - 19
 - links 9 - 92
 - match equations 9 - 11
 - report definitions 6 - 18
 - table records 4 - 16
 - views 3 - 27, 9 - 67
- Encrypting data 9 - 102
- Encryption 9 - 66, 9 - 163
 - data-file 3 - 4
 - view 3 - 2

- Enter Mode 9 - 17
 - exiting 4 - 17
- Entering 4 - 7
 - ANGOSS 2 - 1
 - data 3 - 40, 4 - 3, 9 - 17
 - multi-file views 4 - 13
 - multi-line fields 4 - 9
 - repeating entries 4 - 11
 - dates 4 - 10
 - numbers 4 - 7
 - table records 4 - 16
 - text 4 - 7
 - time 4 - 10
- Entry Order 3 - 23, 9 - 93
- Escape Key 4 - 4
- Example Files, using 2 - 3
- Execute, transaction 9 - 54
- Executing
 - a cross-tab definition 7 - 19
 - cross-tab 9 - 16
 - print definition 9 - 158
 - query 5 - 29, 9 - 29
 - relate 9 - 42
 - relation 7 - 9
 - sort 5 - 9, 9 - 110
 - transactions 7 - 14
- Exiting Database 2 - 23
- Exporting
 - ANGOSS formats 8 - 9
 - ASCII 8 - 9
 - dBase III 8 - 10
 - DIF 8 - 9
 - M-SYLK 8 - 9
 - text format 8 - 10
- Exporting a file 9 - 100
 - 3-Dbase 9 - 102
 - ANGOSS 9 - 101
 - ASCII 9 - 101
 - DIF 9 - 101

- M-Sylk 9 - 101
- text 9 - 102
- Expressions
 - action 5 - 28
 - full formula 5 - 20
 - QBE 5 - 16
 - query 5 - 15
- Extended Field Options 3 - 8, 9 - 76

F

FETCHFIELD 5 - 29

Field

- attributes 9 - 77
- automatic advance 9 - 77
- colors 9 - 78
- date 9 - 75
- default equation 9 - 83
- deleting 9 - 90
- display format 9 - 78
- editing 9 - 91
- field list 2 - 20
- form definition 9 - 126
- input mask 9 - 81
- inverted 9 - 75
- message 9 - 83
- references 2 - 20
- table definition 9 - 135
- text editor, calculation 4 - 9
- time 9 - 75
- titles 9 - 76
- types 9 - 75
- view field name 9 - 77
- width 9 - 75

Field Definition Menu 3 - 6, 9 - 74

Field Options Menu 6 - 23

Field References 9 - 71

Field Text Editor 9 - 18

Fields 2 - 12

- alpha 9 - 75
- attaching 3 - 35, 9 - 69
 - to table 3 - 42, 9 - 89
- automatic advance 3 - 9
- calculated 3 - 18, 4 - 11
- colors 3 - 10
- conditional 7 - 1
- counter 4 - 11, 9 - 75
- creating 2 - 19, 3 - 4, 9 - 74
- data-file 9 - 74
- data-file fields 3 - 6
- default equation 3 - 16
- definition menu 3 - 6
- display format 3 - 10
- editing 3 - 28
- entry order 3 - 23
- extended options 3 - 8
- field name 3 - 9
- field titles 3 - 8
- field types 3 - 7
- field width 3 - 7
- input mask 3 - 13
- menus 3 - 19
- message 3 - 16
- numeric 9 - 75
- project processing 9 - 74
- project processing variables 3 - 6
- replicating 3 - 33
- rules 3 - 23
- special attributes 3 - 9
- specifying in formulas 3 - 18
- updating 9 - 131
- view 9 - 74
- view fields 3 - 6

File

- activating 9 - 97
- display list of 9 - 97
- information 5 - 33
- loading 9 - 65

- repairing 5 - 32
- saving 4 - 17, 9 - 96
- unloading 4 - 17, 9 - 97
- File Activate 4 - 2, 9 - 97
- File Create 2 - 19, 9 - 66
- File Display-Active 4 - 2, 9 - 97
- File Export 8 - 1, 8 - 9
- File extensions 2 - 21
- File Import 8 - 1, 8 - 6, 9 - 98
- File Load 4 - 1, 9 - 65
- File Modify 9 - 67
- File Relationships
 - many-to-one 2 - 17
 - one-to-many 2 - 17
 - one-to-one 2 - 17
- File Save 9 - 96
- File Unload 9 - 97
- File-Fix 9 - 57
- FILELOOKUP 7 - 27
- Filenames, in headings and footings 6 - 32, 9 - 149
- Finding data 4 - 23, 9 - 19
- Fixed-Length 3 - 4
 - Data-Files 9 - 73
- Font
 - adding to font prompter 9 - 132
 - breakpoints 9 - 144
 - changing in headings and footings 6 - 32, 9 - 149
 - creating graphics 6 - 20
 - defining 9 - 132
 - editing 6 - 38, 9 - 157
 - families of 9 - 132
 - grand totals 9 - 148
 - in form reports 6 - 17
 - in Report Tables 6 - 34
 - in reports 6 - 38
 - labels 6 - 15
 - listing available 9 - 132
 - printer limitations with 9 - 132
 - prompter 6 - 16, 9 - 132, 9 - 151
 - removing 6 - 38, 9 - 158
 - selector 6 - 16, 9 - 132, 9 - 151
 - setting 9 - 131
 - setting in columns 9 - 136
 - Standard 9 - 132
 - table definition 9 - 151
- Footings 9 - 149
 - table titles 6 - 32
- Form Definition
 - adding text 6 - 17
 - calculation 9 - 124
 - duping 6 - 13
 - duplicating items 9 - 130
 - editing 6 - 19
 - fields 9 - 126
 - labels 6 - 12, 9 - 127
 - moving items 6 - 18, 9 - 130
 - page number 9 - 129
 - removing items 6 - 19, 9 - 130
 - selecting fields 6 - 17
 - text 9 - 129
 - updating 6 - 19
 - updating items 9 - 131
 - using fonts 6 - 17
 - using graphics 6 - 20
- Form Reports 6 - 7
 - printing 9 - 122
- Forms 9 - 122
 - defining 6 - 36
- Formula Editor 3 - 18
 - field references 9 - 71
- Full Formula Expressions 5 - 20
 - Boolean functions 5 - 21
 - relational operators 5 - 21
 - summary statistics 5 - 27
- Functions, table 3 - 42

G

- Going to 9 - 21
 - a page 9 - 21
 - a record 9 - 21
 - a table 9 - 22
 - a view 9 - 22
 - a window 9 - 22
- Goto
 - page 4 - 21
 - record 4 - 21
 - table 4 - 21
 - view 4 - 2, 4 - 21
 - window 4 - 21
- Grand Totals 6 - 31
 - adding 6 - 31, 9 - 145
 - editing 9 - 148
 - fonts 9 - 148
 - output lines 6 - 31
 - removing 9 - 147
 - result lines 6 - 31
 - summary options 6 - 32, 9 - 147
 - updating 9 - 148
- Graphics, using in forms 6 - 20

H

- Headings 9 - 149
 - table titles 6 - 32
- Help
 - about help 9 - 171
 - index 9 - 172
 - moving within 2 - 4
 - on error 9 - 172
 - related topics 2 - 4
 - table of contents 9 - 171
 - tutorial 9 - 172
 - using 2 - 4

I

- Importing
 - ANGOSS formats 8 - 6
 - ASCII 8 - 6
 - Dbase 8 - 8
 - Fixed 8 - 8
- Importing a file
 - ANGOSS 9 - 98
 - ANGOSS 3.10 9 - 100
 - ASCII 9 - 98
 - Dbase 9 - 99
 - fixed length 9 - 99
- Inactive Records 2 - 7, 9 - 16
- Index
 - @query 5 - 8
 - accessing 5 - 10
 - sort 5 - 8, 9 - 108
 - updating 5 - 6
- Information about files 5 - 33
- Information, obtaining structural 9 - 58
- Input Mask 3 - 13
 - case modifiers 3 - 15
 - common examples of 3 - 15
 - date field usage 9 - 81
 - definition of 9 - 81
 - list examples 3 - 14
 - lists 3 - 14
 - mask character 3 - 14
 - option groups 3 - 15
 - repeat count 3 - 14
- Input Order 9 - 93
 - changing 3 - 24
- Integration
 - with other ANGOSS modules 8 - 1
 - with other software 8 - 10
- Intersect 7 - 2, 7 - 4
- Inverted field 3 - 7, 9 - 75

J

Justification, in headings and footings 6 - 32, 9 - 149

K

Key

- adding 9 - 106
- changing 5 - 4
- defining 5 - 3
- deleting 9 - 107
- duplicate entries 5 - 3
- field width 5 - 4
- major 5 - 2, 9 - 105
- minor 5 - 2, 9 - 105
- rebuild 9 - 107
- removing 5 - 6
- sort order 5 - 3
- updating 5 - 2

Key Buffer 9 - 163

Key Definition Menu 9 - 106

Key Order 5 - 4

L

Labels

- creating 6 - 37
- duping 6 - 13
- fonts 6 - 15
- form definition 9 - 127
- selecting fields 6 - 12
- updating 6 - 13, 6 - 19, 9 - 131
- uses for 6 - 15

Landscape 6 - 11, 9 - 155

Lines, drawing 3 - 24

Link Definition Menu 3 - 37

Link Definition, transaction 7 - 12

Link Fields 2 - 18, 3 - 36, 3 - 38

Linking

- data-files 2 - 17, 3 - 36
- view in multiple windows 5 - 37
- windows 5 - 37, 9 - 168

Links, editing 9 - 92

Literal characters 3 - 12

Loading

- custom views 9 - 66
- files 9 - 65
- macro file 9 - 163
- standard views 9 - 66
- view exclusively 4 - 1
- views 4 - 1

Logical Order 5 - 1

Logical Record Numbers 4 - 18

M

Macro files, automatic loading 9 - 163

Mail Labels

- one-up 6 - 8
- printing 6 - 8, 6 - 13
- three-up 6 - 13

Major Key 5 - 2, 9 - 105

Mandatory-Entry fields 3 - 9

Many-to-many relationships 2 - 17

Many-to-one relationships 2 - 17

Match equations

- editing 9 - 11
- in cross-tabs, types of 7 - 20

Menus

- bar 3 - 19
- creating 3 - 19, 9 - 83
- data-file 3 - 21
- deleting 9 - 91
- editing 3 - 23
- popup 3 - 20
- same type 3 - 23

Merge printing, in Word Processor 8 - 3,
9 - 45

Message, for field 9 - 83

Minor Key 5 - 2, 9 - 105

Modify, cross-tab 9 - 16

Modifying

files 9 - 67

query 9 - 30

relates 9 - 43

report definitions 6 - 18, 9 - 159

sort 9 - 110

transactions 9 - 54

views 3 - 27

Moving 9 - 94

between active views 4 - 2

between records 4 - 5, 4 - 19

between windows 5 - 35

block 9 - 94

block on a view 3 - 25

columns 6 - 24

columns in table definition 9 - 135

cursor

browse mode 4 - 22

from field to field 4 - 5

within a field 4 - 4

element of a view 3 - 25

item 9 - 94

item on a view 3 - 25

items in form definition 9 - 130

items on a form 6 - 18

through a database 4 - 20

Multi-file Views, entering data 4 - 13

Multiple files, viewing 2 - 15

N

Network driver, and loading views 4 - 1

Non-Intersect 7 - 2

Notes 3 - 24

creating 9 - 86

deleting 9 - 91

Not-Intersect 7 - 5

Numbers, entering 4 - 7

Numeric 9 - 75

Numeric fields

editing 3 - 29

entering data 4 - 8

field width 3 - 7

O

ODBC 8 - 11

One-to-many relationships 2 - 17

One-to-one relationship 2 - 17

Operating system, accessing 2 - 21

Order

logical 5 - 1

physical 5 - 1

query 5 - 11

records 5 - 2

Order Change 9 - 112

Order Key 9 - 105

Order Key Add 5 - 3

Order Manual 9 - 111

Order Sort 5 - 8, 9 - 108

Ordering

by query 5 - 30

record manually 9 - 111

records to a key 9 - 112

records to an index 9 - 113

records to physical order 9 - 113

view, before printing 6 - 25

Organizing data 5 - 1

Output Lines 6 - 25

breakpoints 6 - 28

grand total 6 - 31

P

Page Definition 6 - 17, 6 - 23, 6 - 35

combination reports 9 - 157

form on the page 9 - 155

form report 6 - 9

lines per inch 9 - 155

page number 9 - 155

paper profile 9 - 152

table on the page 9 - 156

view tables 9 - 157

Page Number

form definition 9 - 129

in headings and footings 6 - 32, 9 - 149

page definition 9 - 155

updating 9 - 131

Page size 6 - 9, 9 - 152

Paint 9 - 95

Painting windows 5 - 36, 9 - 167

Paper path 6 - 9, 9 - 152

Paper Profile, default 6 - 9, 9 - 152

Password protection

attaching 9 - 103

data-file level 9 - 102

removing 9 - 103

view level 9 - 103

Passwords

assigning to existing files 3 - 4

data-file 3 - 4, 9 - 73

new views 9 - 66

standard views 3 - 4

view 3 - 2

Physical Order 5 - 1

Physical Record Numbers 4 - 18

Portrait 6 - 11, 9 - 155

Practice Sessions 1 - 3

Preferences, Database 2 - 10

Preprinted forms

form definition 6 - 17

page definition 6 - 17

printing reports on 6 - 16

reviewing the report 6 - 18

Print

combination reports 9 - 122

creating report definitions 9 - 123

current record

list 9 - 115

page 9 - 117

view 9 - 118

custom reports 9 - 121

detail 9 - 159

executing report definition 9 - 158

form reports 9 - 122, 9 - 124

modify 9 - 159

remove 9 - 160

table reports 9 - 121

to disk 9 - 158

to printer 9 - 159

to screen 9 - 120, 9 - 159

to text-screen 9 - 159

totals only 9 - 159

view

list 9 - 119

report 9 - 120

Print control codes 6 - 32, 9 - 149

Print Definition File 6 - 7

Print Execute 9 - 158

Print Report

form definition 6 - 12

page definition 6 - 9

Printer Selection 6 - 12

Printing

before printing 6 - 1

combination reports 6 - 8, 6 - 34

creating forms 6 - 20

current record

list format 6 - 2

- page format 6 - 3
 - view format 6 - 4
- current view 6 - 5
 - list format 6 - 5
 - report format 6 - 6
- custom reports 6 - 7
- form reports 6 - 7
- landscape 6 - 11, 9 - 155
- mail labels
 - one-up 6 - 8
 - three-up 6 - 13
- portrait 6 - 11, 9 - 155
- predefined formats 6 - 1
- preprinted forms 6 - 16
- printed forms 6 - 20
- table report 6 - 7
- tables 6 - 22
 - to screen 6 - 5, 6 - 24
 - to the screen 6 - 18
 - totals only 6 - 33
 - view tables 6 - 2, 6 - 4-6 - 5, 6 - 23
 - with fonts 6 - 38
- Project files 9 - 173
 - to run on Entry 9 - 163
- Project processing fields 9 - 74
- Project processing variables 3 - 6
- Project variable in QBE expression 9 - 26
- Project-Write 3 - 9, 9 - 77
- Purging
 - deactivated records 4 - 26
 - deleted records 5 - 33
 - inactive records 9 - 57

Q

QBE

- actions 9 - 28
- expressions 5 - 16
- high and low 9 - 26

- patterns 9 - 26
- range operator 9 - 26
- summary statistics 5 - 27, 9 - 28
- Query 9 - 22
 - creating 9 - 23
 - define 5 - 14
 - execute 9 - 29
 - executing 5 - 29
 - expressions 5 - 15, 9 - 24
 - modify 9 - 30
 - ordering 5 - 30
 - performing actions 5 - 28
 - records 5 - 11
 - removing 5 - 30, 9 - 31
 - summary statistics 5 - 27
 - to data-file 9 - 29
 - to index 9 - 29
 - view expressions 5 - 14
- Query by Example 5 - 16, 9 - 26
- Query Editor 5 - 14, 9 - 23
- Query Now 9 - 30
- Query Summary 5 - 29
- Query Summary Box 9 - 29
- Quick Keys
 - using 2 - 6
 - viewing lists of 2 - 6
- Quit 2 - 23, 9 - 173

R

- Read/Write fields 3 - 9
- Read-Only fields 3 - 9
- Rebuilding Keys 9 - 107
- Record Numbers
 - logical 2 - 7, 4 - 18
 - physical 2 - 7, 4 - 18
- Records 2 - 12
 - appending 9 - 55
 - changing counts 5 - 32

- changing order 9 - 112
- deactivating 4 - 25
- deleting 4 - 25, 9 - 16
- deleting duplicate 5 - 29
- deleting with query actions 5 - 28
- inactive 2 - 7
- indexing 5 - 6
- logical 5 - 1
- moving between 2 - 9
- order 5 - 2
- ordering 9 - 105
- ordering manually 9 - 111
- physical order 5 - 1
- purging 5 - 33
- query 5 - 11
- selecting with a query 5 - 22
- sorting 9 - 108
- Referencing fields 2 - 20
- Rejects, cross-tab 9 - 15
- Relate
 - creating 9 - 32
 - examples 9 - 38
 - executing 9 - 42
 - modifying 9 - 43
 - removing 9 - 43
 - type 9 - 35
- Relate Definitions, creating 7 - 7
- Relating data 7 - 1, 9 - 31
- Relation
 - executing 7 - 9
 - removing 7 - 10
- Relation Types
 - intersect 7 - 2
 - not-intersect 7 - 2
 - subtract 7 - 2
 - union 7 - 2
- Relational Views 3 - 33
- Remember 9 - 173
- Remove, sort 5 - 11
- Removing
 - a key 5 - 6
 - a relation 7 - 10
 - breakpoints 9 - 143
 - columns 9 - 136
 - cross-tab 9 - 16
 - fonts 6 - 38, 9 - 158
 - grand totals 9 - 147
 - items in form definition 9 - 130
 - items on a form 6 - 19
 - print definitions 9 - 160
 - queries 5 - 30
 - query 9 - 31
 - relates 9 - 43
 - sort 9 - 111
 - transaction 7 - 14, 9 - 54
- Renumber records 9 - 57
- Repairing
 - damaged files 9 - 57
 - files 5 - 32
- Replicating
 - data-file 3 - 32-3 - 33
 - data-files 9 - 95
 - field 3 - 33
 - fields 9 - 96
 - when to use 9 - 95
- Report Definition
 - editing 6 - 18
 - editing, page 6 - 18
 - form definition 6 - 12
 - modifying 6 - 18
 - page definition 6 - 9, 6 - 23
 - table report 6 - 7
 - tables 6 - 22
- Report Definition Menu 6 - 9, 6 - 17, 9 - 123
- Report Table, titles 6 - 32
- Result Lines
 - adding 6 - 30

- breakpoints 6 - 28
- grand total 6 - 31
- multiple 6 - 29
- Row-format
 - in Data Send All Communications 8 - 4, 9 - 44
 - in Data Send All Spreadsheet 8 - 5, 9 - 44
 - in Data Send All Wordprocessor 8 - 4, 9 - 46
- Rules
 - color change 3 - 23
 - creating 9 - 86
 - deleting 9 - 91
 - error message 3 - 23
 - jump 3 - 23
- S**
- Saving, files 4 - 17, 9 - 96
- Screen, printing to 9 - 120, 9 - 159
- Searching
 - comparison options 9 - 19
 - fields 9 - 19
 - optimizing 9 - 20
- Selecting, records 5 - 22
- Send
 - data 8 - 3, 9 - 44, 9 - 45
 - text 8 - 4, 9 - 44, 9 - 46
- Sending
 - All
 - to Communications 8 - 4, 9 - 44
 - to Spreadsheet 8 - 5, 9 - 44
 - to Word Processor 8 - 3, 9 - 45
 - Crosstab
 - to Communications 8 - 5, 9 - 47
 - to Spreadsheet 8 - 5, 9 - 47
 - to Word Processor 8 - 5, 9 - 48
 - data 8 - 2
 - text 8 - 2
- Setting
 - default data path 9 - 163
 - default numeric format 9 - 162
 - defaults 9 - 161
 - key buffers 9 - 163
- Similar Views 3 - 31
- Sort
 - creating 5 - 8, 9 - 108
 - executing 5 - 9, 9 - 110
 - index 9 - 108, 9 - 110
 - modifying 9 - 110
 - quick 9 - 111
 - records 5 - 6, 9 - 108
 - remove 5 - 11, 9 - 111
 - type 9 - 109
- Sort Definition Menu 9 - 109
- Source, transaction 7 - 13
- Splitting windows 5 - 35, 9 - 165
- SQL 8 - 15
- Standard Views, loading 9 - 66
- Statistical Database Functions 7 - 28
- Status Line 2 - 6
- Structural information 9 - 58
- Substituting, a data-file 9 - 93
- Subtract 7 - 2, 7 - 6
- Summarized
 - Sending to Communications 8 - 5
 - Sending to Spreadsheet 8 - 5
 - Sending to Word Processor 8 - 5
- Summarizing data with Cross-Tab 7 - 14
- Summary Labels 9 - 142
- Summary Options
 - breakpoints 6 - 25, 6 - 28, 6 - 30, 9 - 139
 - grand totals 6 - 31-6 - 32, 9 - 147
- Summary Statistics
 - full expressions 5 - 27
 - with QBE 5 - 27

Summary, cross-tab 9 - 14

T

Table 2 - 18

- attaching fields 3 - 42, 9 - 89
- colors 9 - 89
- column separators 3 - 42, 9 - 89
- creating 9 - 88
 - on a view 3 - 41
- definition 3 - 41
- definition menu 3 - 42
- deleting 9 - 91
- functions 3 - 42
- print report 9 - 121
- relationships 3 - 41
- setting colors 3 - 42
- titles 3 - 42, 9 - 88

Table Definition

- breakpoints 9 - 136
- calculation 9 - 133
- columns 9 - 133
 - selecting fields 6 - 23
- fields 9 - 135
- fonts 9 - 151
- text 9 - 135
- titles 9 - 149

Table Records

- deleting 4 - 25, 9 - 16
- editing 4 - 16
- entering 4 - 16
- viewing 3 - 41

Table Reports 6 - 7

Text

- creating for Word Processor 8 - 4, 9 - 46
- entering 4 - 7
- form definition 9 - 129
- table definition 9 - 135

updating 9 - 131

Time fields 3 - 7, 9 - 75

Time, entering 4 - 10

Titles

- cross-tab 9 - 12
- field 9 - 76
- footings 6 - 32
- headings 6 - 32
- report tables 6 - 32
- table 3 - 42
- table definition 9 - 149

Tools Preferences 9 - 161

Totals Only, printing 6 - 33, 9 - 159

Transaction 7 - 10, 9 - 48

- audit file 7 - 12, 9 - 51
- creating 7 - 11, 9 - 49
- destination 7 - 13
- driver view 7 - 11
- execute 9 - 54
- executing 7 - 14
- link definition 7 - 12
- modifying 9 - 54
- multiple links 7 - 13
- removing 7 - 14, 9 - 54
- source 7 - 13

Tutorial 9 - 172

- using 2 - 3

U

Union 7 - 2, 7 - 3

Unlinking windows 5 - 39, 9 - 169

Unloading

- a view 9 - 97
- files 4 - 17

Update Mode 9 - 17

- exiting 4 - 17

Updating

- breakpoints 9 - 144

- calculations 9 - 131
- data 4 - 4
- fields 9 - 131
- form calculations 6 - 19
- form fields 6 - 19
- form labels 6 - 19
- form page number 6 - 20
- form text 6 - 20
- grand totals 9 - 148
- items in form definition 9 - 131
- items in table definitions 9 - 136
- items on a form 6 - 19
- keys 5 - 2
- labels 6 - 13, 9 - 131
- page number 9 - 131
- text 9 - 131

Utilities Change Count 9 - 57

Utilities Purge 9 - 57

V

Variable-Length 3 - 4

Variable-Length Data-Files 9 - 73

View Definition Window 2 - 19, 3 - 3, 9 - 67

View Expression Window 9 - 24

View Fields 3 - 6, 9 - 74

View Tables, printing 6 - 2, 6 - 4-6 - 5

Viewing

- data 3 - 39, 4 - 17

- multiple data-files 3 - 33

- table records 3 - 41

Views

- activating 4 - 2

- automatic loading 9 - 163

- creating 2 - 19, 3 - 2

- existing data-files 3 - 30

- from scratch 9 - 66

- from template 3 - 30, 9 - 66

- creating a box 9 - 70

- creating a calculation 9 - 70

- custom views 2 - 13

- definition window 3 - 3

- deleting elements 3 - 26

- displaying active 4 - 2

- editing 3 - 27, 9 - 67

- loading 4 - 1

- loading exclusively 4 - 1

- modifying 3 - 27

- moving elements 3 - 25

- password protecting 9 - 66

- printing 9 - 119

- relational 3 - 33

- standard view 2 - 14

W

Windows

- border 5 - 37, 9 - 167

- close 9 - 166

- closing 5 - 36

- current 2 - 7

- identifier 2 - 5

- link 9 - 168

- linking 5 - 37

- paint 9 - 167

- painting 5 - 36

- splitting 2 - 5, 5 - 35

- horizontal 9 - 166

- vertical 9 - 166

- unlink 5 - 39, 9 - 169

- zoom 5 - 36, 9 - 166

Z

Zooming, windows 5 - 36, 9 - 166