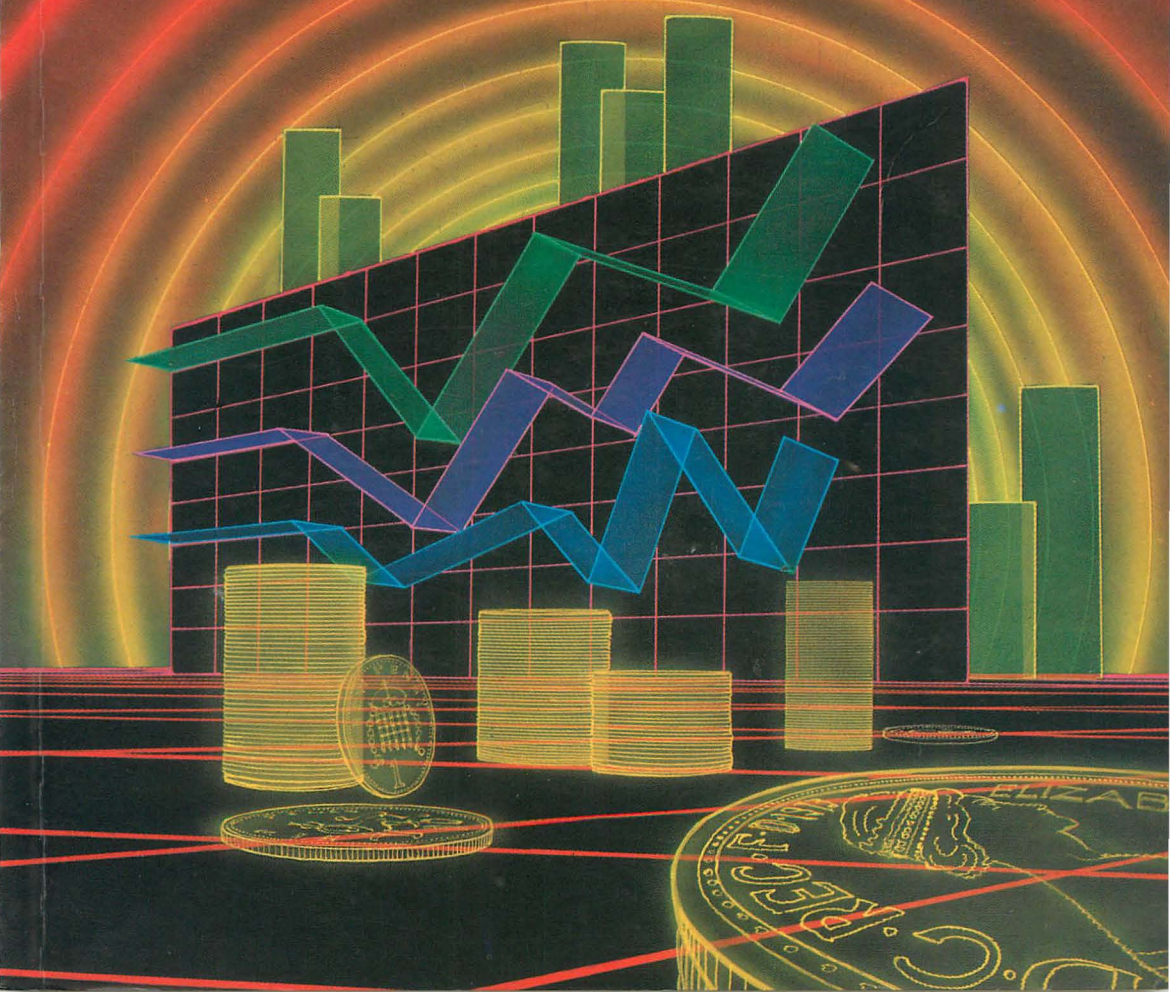


**SUSAN CURRAN AND  
MARGARET NORMAN**

# **BUSINESS SYSTEMS ON THE COMMODORE 64**





# **Business Systems on the Commodore 64**

**More Books on the Commodore 64 from Granada**

**COMMODORE 64 COMPUTING**

*Ian Sinclair*

0 246 12030 4

**THE COMMODORE 64 GAMES BOOK**

*Owen Bishop*

0 246 12258 7

**SOFTWARE 64**

**Practical Programs for the Commodore 64**

*Owen Bishop*

0 246 12266 8

**40 EDUCATIONAL GAMES FOR THE COMMODORE  
64**

*Vince Apps*

0 246 12318 4

**ADVENTURE GAMES FOR THE COMMODORE 64**

*A. J. Bradbury*

0 246 12412 1

**INTRODUCING COMMODORE 64 MACHINE CODE**

*Ian Sinclair*

0 246 12338 9

**COMMODORE 64 GRAPHICS AND SOUND**

*Steve Money*

0 246 12342 7

**COMMODORE 64 DISK SYSTEMS AND PRINTERS**

*Ian Sinclair*

0 246 12409 1

# **Business Systems on the Commodore 64**

**Susan Curran and Margaret Norman**

**GRANADA**

London Toronto Sydney New York

Granada Technical Books  
Granada Publishing Ltd  
8 Grafton Street, London W1X 3LA

First published in Great Britain by  
Granada Publishing 1984  
Reprinted 1984

Copyright © Probit Consultancies Limited 1984

*British Library Cataloguing in Publication Data*  
Curran, Susan

Business systems on the Commodore 64.

1. Commodore 64 (Computer)    2. Business—Data processing

I. Title    II. Norman, Margaret

651.8'4    HF5548.4.C6

ISBN 0-246-12422-9

Typeset by V & M Graphics Ltd, Aylesbury, Bucks  
Printed and bound in Great Britain by  
Mackays of Chatham, Kent

All rights reserved. No part of this publication may  
be reproduced, stored in a retrieval system or  
transmitted, in any form, or by any means, electronic,  
mechanical, photocopying, recording or otherwise,  
without the prior permission of the publishers.

# Contents

<i>Acknowledgements</i>	vi
1 Introduction	1
2 Computerised Accounts	24
3 Stock Control and Other Money-oriented Programs	56
4 Spreadsheets	75
5 Databases and Filing Systems	90
6 Word Processing Programs	122
7 Other Applications	146
<i>Appendix 1: Interfacing Devices for the Commodore 64</i>	153
<i>Appendix 2: Business Programs for the Commodore 64 – A List of Known Products</i>	154
<i>Appendix 3: Hardware Credits</i>	159
<i>Appendix 4: Suggested Further Reading</i>	160
<i>Glossary of Technical Terms Used in the Book</i>	161
<i>Index</i>	165



# Acknowledgements

All of the programs we review in this book were provided by the suppliers listed in Appendix 2. Our thanks to them all for their assistance.

Special thanks are due, too, to the following organisations and individuals:

Sumlock Bondain of Norwich, who provided some general advice, and helped us to obtain Anagram's accounting and stock control programs.

Anglia Computer Centre, Norwich, who provided the sample printout from a Vic printer used in Fig. 1.2.

And finally, Richard Miles, our editor at Granada Publishing.

Susan Curran and Margaret Norman



# Chapter One

## Introduction

The Commodore 64 microcomputer first appeared in the UK early in 1983. That means that it's not the newest computer around today; but it *is* one of the very best choices for the small businessman or businesswoman, or as an executive's small personal computer.

Why is this? There are a number of important reasons. First, it's a Commodore machine. Commodore has become known as a stable and reliable manufacturer of home computers. Their distribution network stretches worldwide, and their size and reputation acts as an assurance that the company is likely to be around as long as its computers: something that's not true for every computer manufacturer! By buying Commodore, you can rely on a large company's back-up for your computer.

Secondly, the Commodore 64 is a remarkably cheap small computer. When it was first launched, its low price smashed the price barrier for computers with sufficient internal memory capacity to be suitable for serious, small business and similar applications. Before the Commodore 64, machines with 64K of combined RAM (random access internal memory) and ROM (read-only internal memory) cost £1000 or more. The Commodore 64 sold at less than half that. Since its launch, the price has been almost halved again, and as we write it is still the cheapest computer in its memory class by a large margin.

These two reasons – Commodore's size and stability, and the computer's remarkably cheap price – certainly help to explain why the Commodore 64 has been a phenomenally successful computer, right across the world. And in turn, those worldwide sales have helped to ensure that many of the very best software writers have rushed to produce quality products for the machine. Having the best software is even more important, in many ways, than choosing the best computer, and the Commodore 64's growing software base has helped to consolidate its leading position.

## 2 *Business Systems on the Commodore 64*

This is one reason why it makes sense to choose an established computer, rather than a newly launched one. It takes time for the software market to catch up with a new computer. That market has certainly caught up with the Commodore 64, and a wide range of high quality, competitively priced programs are now available. We will be looking at many of them in depth in this book.

Finally, the Commodore 64's position as a well-established, large selling computer has enabled it to build up a solid base of peripheral support. Printers, plotters, modems and disk drives of many kinds – all essential devices for businesspeople using computers – are readily available for the machine.

If you've already bought your Commodore 64, then – congratulations! The machine you have bought is an excellent example of its type, and provided that the type is the one you need, you've almost certainly made a good buy. If you haven't bought your computer, we hope that this book will persuade you that the Commodore 64 is the machine for you. In either case, we'll introduce you to some of the many ways in which the machine can help you in your business – and private – life.

### **A small personal computer**

We have begun by praising the Commodore 64, and rightly, we believe, because it is a quite exceptional computer of its type. You won't be satisfied with the machine, however, unless it is true that this is the type of computer you need. We will try to explain briefly, then, just where the Commodore 64 and other similar machines fit into the spectrum of large and small, cheap and expensive machines.

This is a cheap computer. That's no shame: in fact, it's a remarkable thought when you consider that computers with comparable power cost many thousands of pounds less than ten years ago, and millions of pounds thirty years ago. At the same time, though, it would be wrong for you to expect expensive computer performance from the machine. It can rival some machines costing up to five times as much. It can't rival – and you can't honestly expect it to rival – machines costing more than that, including the more expensive machines in Commodore's own range.

The machine's limitations come on a number of fronts. Though it is a robust machine in normal, everyday use, it is in no way a heavy-duty machine. You might compare it with a portable typewriter, in contrast to a heavy office machine. The smaller, lighter machine

gives good service, and suits many professionals well, but it doesn't strictly rival the bigger model. The C64 display, for instance, is of modest, not exceptional quality, and if you compare it with that of an expensive microcomputer, you will recognise its limitations. However, it is perfectly adequate for a wide range of uses.

One well-known problem with the machine is its tendency to overheat. It is not designed to be run all day, every day, as are conventional business computers, and if the computer is kept on for long periods overheating may well occur. (This is a particular difficulty with early machines: later models have a more efficient heat sink.) You will easily recognise the signs of overheating: first the display corrupts (the solid colour changes to off-diagonal stripes), and then the program in memory corrupts and errors occur. As soon as the first signs appear, you must exit from the program you are running and turn the machine off until it no longer feels hot when you touch its underside. The best policy, of course, is to avoid this situation by keeping the computer in a reasonably cool room, and turning it off at the mains (first saving all your work to cassette or disk) every time you take a break.

The Commodore 64 is designed to work with a range of low-priced printers and disk drives. These devices in turn give a modest performance at a low price. It would be foolish to try to compare the quality of the print produced by the Commodore 1525 dot matrix printer with that of a top class daisywheel printer. The price differential (up to four times as much for the higher class machine) is an indication of the difference. The storage capacity and working speed of the Commodore 1541 disk drive is much less than that of a top quality floppy disk drive, and an intensive user will certainly recognise the difference between the two. However, the cheaper device works reliably and effectively within its limitations.

Perhaps most important, you should recognise that the professional support that your dealer can give you will be much less than it would be for a 'traditional' business computer costing several thousand pounds. Your dealer's sales margin is naturally much less, and though many specialist dealers can and will take great care in advising you on the choice of computer and software, you cannot expect hours of free consultancy from your dealer. It is up to you to ensure that you've selected suitable programs; up to you, even, to connect the various parts of your system and ensure that it works correctly. (Your computer manual, and this and other books you can buy on the machine, will help you here – or you may choose to pay for specialist advice.) And if the computer fails to work correctly

#### 4 *Business Systems on the Commodore 64*

at any point, it will be up to you to return it to the dealer, and to wait for it to be repaired. You cannot expect an engineer to visit your premises to service a machine of this type; you may, indeed, have to wait several weeks for a repair to be carried out.

We should emphasise that though the Commodore 64 is a cheap computer, it should certainly work correctly in every respect when you receive it. Do check it out thoroughly yourself, especially if you didn't see the dealer do so before selling it to you. If you have any problems that you don't understand with the machine or its peripherals, *do* return it promptly and ask for advice. If you are still not satisfied, then request a replacement. Even reputable computer manufacturers like Commodore sometimes fall down in their quality control, and it is not unknown for substandard machines to go on sale. However, there is absolutely no need for you to suffer one of them. If your machine has obvious display faults, or fails to load programs correctly, for instance, then you can and should return it to the dealer.

If your computer works properly when you receive it, it should continue to do so reliably: computer breakdowns are comparatively rare events today. However, the very fact that the Commodore 64 comes into the 'domestic' rather than the 'business' class for servicing back-up does limit its uses in business. It's fine for doing your small business accounts at regular (weekly or even monthly) intervals. You would be ill-advised, though, to give it so central a role in your business that you could not endure its absence for repair for a week or more. If this is the case, you may well find that a more expensive system is really what you need. It's not fair to the C64, an excellent computer in its way, to expect *too* much of it.

If you plan to use a number of these computers in your business, you may find it worthwhile to purchase one or more spare machines, to be used on a replacement basis as and when repairs are needed.

You will find that software writers, on the whole, recognise the machine's limitations and have tailored their offerings to the type of business which is most likely to find it a good choice. The C64 is an ideal choice for single person or part-time businesses run from home, for instance. It would do fine as a low-cost word processor for a journalist or author. It can prove an excellent personal computer for an executive who wants a machine he or she can use both in the office and at home (though the standard model is not a portable computer, in the sense of being usable on the train, say). It is *not* suitable for running accounts or stock control for a large company. The accounting and stock control programs designed for the C64

handle only relatively small numbers of clients and amounts of stock. It is not strong on networking, and cannot support terminals as more expensive computers often can. In short, if the program you want isn't available, it may well be the case that you are simply looking at the wrong computer!

Above all, the Commodore 64 makes sense as a *first* business computer. It is a machine that can help you learn about computing, and about how computing can help you in your work. There are good examples of all of the major types of business program available for the machine. Without risking a fortune, you can use the Commodore 64 to test the waters of computing, and discover which tools you find most useful. If you do find later that you could make good use of (and could afford!) a more powerful and 'heavy-duty' system, then your investment has certainly not been wasted: you will still find many uses for this machine both at work and at home. Do the household accounts on it, by all means; lend it to the kids for educational purposes; and don't forget that it's great for game players, too!

## Using this book

It has often been said, but let's say it again: using a computer is rather like driving a car. The more you know about how it works, the better the performance you will be able to extract from it. But if you don't want to know anything about the internal workings at all, then you will still be able to make it function perfectly adequately on a day-to-day basis, perhaps calling in occasional expert help when problems crop up which are beyond your understanding.

This is a car-buyer's guide, a driver's guide. It is not a maintenance guide. We make no attempt to tell you anything about how computers in general, or the Commodore 64 in particular, work. (If you would like to know, there are many other books that can help you: see Appendix 4 for some suggestions.) We do not try to teach you programming, not because it can't be useful to business users (of course it can!), but simply because it's beyond the scope of this book. We concentrate almost entirely on the use of the Commodore 64 to run off-the-shelf business application packages.

However, we *have* tried to do more than merely list the packages available, their features and limitations. We try to show you what the different types of package are used for, and how they can be integrated into your own business, whatever it might be. We discuss

ways of handling the transition from a manual accounting system to a computerised system; we introduce the basic principles of financial planning using computerised spreadsheets; we describe the uses of word processors, and point out their advantages over conventional typewriters. In this way, we hope that the book will prove to be a useful introductory guide to business people who are new to computing, to the Commodore 64, or very probably to both. It may be the only book on the Commodore 64, except for hardware and software manuals, that you ever need. Alternatively, as your experience grows you may wish to supplement it with a variety of more advanced and specialist books.

Following this introductory chapter, each chapter takes a major type of computer program suitable for business use. It begins with a general introduction to the field, and then goes on to discuss specific programs which are available for the Commodore 64 (and which we have tested on the machine) in detail. A selection of programs of each major type are discussed; in Appendix 2 we list these together with other programs which were available at the time of writing, but which we did not test. These chapters are all self-contained, and you may read them in any order you wish.

Though it is possible to divide computer programs up into these broad classes, it is also important to recognise that there is a great deal of overlap between them. To control your stock movements, for instance, you might use either a specific stock control program, or a stock control routine programmed using a programmable database, or even an outline of stock movements drawn up on a spreadsheet. Mailing lists can be generated on either databases or word processors; invoices can be drawn up on either of these, or using suites of accounting programs. We came across hybrid programs combining features of several types, though in all cases one particular program type dominated, and we used that to classify the program. We have tried throughout to make it clear what uses particular programs are, and are not, suitable for.

Virtually all the programs we discuss were written specifically for the Commodore 64 computer. Some of them are also available in more extensive versions, to run on some of the higher-priced Commodore business machines. A very few are available in truncated versions to run on the cheaper Vic-20 home computer. Most are not available in versions designed for computers manufactured by other computer companies.

It is possible to adapt the Commodore 64 so that it can run the CP/M operating system, a very popular and well-established

standard operating system in the small business microcomputer field. A very wide range of programs of the same general types are available to run under CP/M. You may be familiar with the names of some of them: WordStar, VisiCalc and dBase II are very popular examples. CP/M business programs can be excellent, though they tend to be fairly expensive. However, the CP/M option was not widely available when we wrote this book, and the programs we review do *not* require this adaptation. They are all able to run on the basic machine, working with suitable peripherals (a cassette or disk drive, and often a printer).

Unless you have good reason to do otherwise, we recommend that you choose programs tailored specifically for the Commodore 64, and not CP/M programs, for your system. C64 programs can make the best possible use of the machine's special features, and they tend, in our experience, to be better value for this particular machine than are CP/M programs, which are aimed at the 'lowest common denominator' of a wide range of different computers.

## Setting up your computer system

In order to run any programs, you will need to set up a complete computer system around your Commodore 64 computer. We will explain briefly what you are likely to require.

We will assume here, as in many places throughout the book, that you are using a standard model Commodore 64. However, standard 64 programs run perfectly on the newer portable SX64, and you can, of course, base a business system around that machine. The portable includes its own display and disk drive, and your system as a whole will naturally look different.

First, you must select a suitable working location. You will need a large desk or similar flat surface for the computer and the various peripheral devices that work with it. It isn't generally possible to stack these devices on top of one another. Sometimes, indeed, you may have to place them some distance apart to prevent electrical interference. Make sure that the light is suitable for viewing a monitor or television: light falling directly onto the screen will cause obvious problems. And make sure that you have plenty of power sockets close at hand. Each device generally needs a separate mains power supply, and you will need at least four sockets, and maybe six or more. You do *not* need to connect a conventional television aerial. You may, however, want to connect your system to the

telephone in order to send data to other computers or to access Prestel, and if you are considering this you will need a telephone, and probably a standard 'jack' plug connection to it, nearby.

'Modular' computer systems like those built around the C64 are flexible, but they can also be untidy, with astonishing quantities of trailing wires. Though the computer itself is a neat machine, some of the expansion devices that work with it look extremely rough and ready. A number of manufacturers produce special consoles or plinths which enable you to tidy up the equipment, hiding messy expansion boxes and reducing the complexity of the wiring needed. Some of these also provide a range of suitably fused power sockets, and if your office is not already well equipped, you may wish to explore this field.

Any system suitable for business use will be quite complex to set up, and we recommend that you leave your system permanently connected together, in a special area of your work room. Hauling the components out of a cupboard and arranging them around the family television or on your writing desk before each work session is *not* a good idea.

Clear some shelf space for storage of floppy disks or cassette tapes and the various hardware and program manuals you will acquire. You will also need to set aside an area in a secure (and preferably fireproof) cupboard for storage of duplicate data disks or cassettes.

## **Your hardware requirements**

The Commodore 64 comes with a power lead and with a slim user manual. The manual is reasonably adequate if you plan to use only commercial programs on the computer. (Note, however, that there are a number of uncorrected mistakes in it: not all the demonstration programs work, for instance.) It is not sufficient to teach you to program, and it does not contain all the technical details you will need if you wish to set up a very elaborate system of peripheral devices. We strongly advise you to invest in the *Commodore 64 Programmers' Reference Guide*, which is sold separately. This tells you everything else you might reasonably wish to know about the computer.

The basic Commodore 64 has a number of connection points, or ports, which can be used to connect peripheral devices to it. ('Peripheral' is the name given to any device intended to be attached to a computer and controlled through it.) Your C64 manual

describes the ports available on the standard machine, and their uses.

The machine is designed primarily to run with Commodore's own-brand peripheral devices, and you can attach devices recommended by Commodore for use with the 64, such as the 1525 printer and the 1541 disk drive, directly to the machine via its ports, with confidence that they will work correctly. It is possible to attach more devices than there are ports, by 'daisy-chaining' them: that is, by attaching one device to the port supplied on another one. Setting up a system using a variety of Commodore equipment, including two or more 1541 disk drives, a cassette player, and any of the compatible printers and plotters, should cause no problems, but you may need to enlist your dealer's help to ensure that everything is working correctly.

It is possible to use devices supplied by Commodore primarily for use with their more expensive computers. This, however, involves obtaining a special interface – a piece of equipment that plugs into the computer, via any of the ports provided, and then provides a range of more elaborately programmed ports into which other devices can be plugged. Most Commodore disk drives (hard and floppy) and printers require an IEEE interface – a serial interface more elaborate than that built into the 64.

It is also possible to use devices supplied by other manufacturers (particularly printers and plotters, but usually not disk drives), but Commodore's character coding system is a little different from the 'industry standard' versions, and as well as providing a new interface it is necessary to do some code conversion. (Sometimes this is done by the interface itself; sometimes you need to run a program that does it.) The standard interfaces used by most manufacturers come in two 'flavours': (a) serial or RS232 (which is broadly the same as Commodore call the IEEE interface), and (b) parallel or Centronics. We mention some devices in Appendix 1, but your dealer can advise you on the exact equipment you will need.

Interfaces can be surprisingly expensive, as indeed can ordinary cables. (You will need to budget separately for cables if you are using equipment which has not been recommended by Commodore.) The simplest printer cable can cost up to £50, and a full-scale programmable interface up to £120.

Any software you buy will have been designed to work with specific printers and storage devices. Many commercial programs include interfacing software, often referred to, for instance, as 'printer driver' routines. These reduce the complexity of the

independent interfaces needed to run different printers. The software manual should explain in detail which devices are supported, and it is essential to ensure that the devices you buy are among those supported by the software you select. Again, you should consult your dealer before making a final choice.

You need to connect three major types of device to the computer. First, a *display* – a television or monitor. Second, a *secondary storage medium* – a cassette player or disk drive. And third, a *printer*. Of course, you can connect a wide variety of other devices, including modems, plotters and stereo systems, but in general these are not necessary to run the types of program we describe.

The Commodore 64 will work with either a domestic television (a portable model is ideal) or a video monitor. If you are planning to use the machine intensively, you will find that a monitor provides a more stable, easy-to-watch display. Colour monitors are expensive, however, and to get a good picture on one you may need to modify the computer's display controller. Monochrome monitors are not unduly expensive (from £100), and are normally fine for general business purposes, but you may regret the lack of colour, and you may run into difficulties when using some programs which make extensive use of colour.

If you use a television you can, of course, continue to use it to watch normal TV programs when the computer is not in use. However, you should avoid continually changing the leads plugged into the television's aerial socket: it is not designed for this sort of use. If you want to switch between an aerial lead and a computer TV display lead, then buy a switchable device which plugs into the aerial socket, allowing you to connect both and switch over at will.

If you wish to obtain an 80-column text screen using the computer – as you can with a separate '80-column board', which will cost you about £100–£150 (see Appendix 2) – then you will need a monitor, not a television set. These 80-column screens are very handy: you can see twice as much information as you can on the basic 40-column version, and can, for instance, read text that will be printed across the width of an A4 sheet of paper. Again, not all programs work with all available 80-column boards: your dealer will advise you.

A secondary storage medium is essential because data held in the computer's internal memory is lost as soon as you turn the power off – as you should do automatically as soon as you complete a work session, in order to prevent the machine from overheating. Before you switch off the power, you must transfer all data you wish to retain to cassette tape or to a floppy or hard disk.

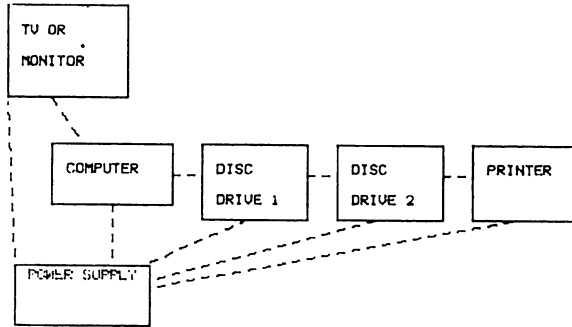
Cassette tape is a cheap but inflexible means of storage. The Commodore 64 works with Commodore's own C2N 'Datassette' cassette unit and can only be used with other cassette players if you obtain a special adaptor. We advise you to stick to the Commodore device, which costs about £40, unless you have good reason to do otherwise. Data transfer is slow, and it can take several minutes to load programs or data files from cassette. Loading failures are comparatively common, though material is rarely lost completely, and can generally be retrieved if the loading process is repeated. It is possible to perform serious applications using a cassette recorder as your only secondary storage medium, but it is not easy, and if you plan to use the machine intensively we strongly recommend that you obtain a disk drive. Some cheaper business-type programs are designed for use on cassette-based systems, but many of the more expensive ones come in disk versions only.

Floppy disks will be the storage choice of most business users. The C64's serial port can be used to connect a Commodore 1541 floppy disk drive to the computer. The 1541 drives 5¼ inch single-sided, single-density floppy disks, and each disk can contain a maximum of 170K bytes (that is, a little over 170 000 characters) of data. This is a comparatively modest amount of storage, but it is adequate for many small-scale business applications. Access to data on the disk normally takes only a few seconds. The disk drives currently cost £220–£250 each. They come with a manual noted more for its mistakes, again, than for its comprehensibility. (Don't worry: as long as you make sense of the instructions on formatting disks, loading, saving and copying files and programs, you are unlikely to need to follow the more complex details about random and sequential files.)

The serial port is designed so that a number of devices (up to five) can be attached to the computer through it and each other, in a 'daisy chain' arrangement (see Fig. 1.1). In this way, you can use more than one disk drive. A second disk drive is very useful: it enables you to copy data onto a back-up disk, for example, without continually swapping disks during the back-up operation. Most users will find little advantage in using more than two drives.

Commodore's more expensive floppy disk drives – the 4040, and 8050, for instance – tend to work faster, and hold more data. They have more powerful disk operation systems built in, and this makes them a little more flexible in use. You can use these drives with the machine if you obtain a suitable interface. If you need to refer to a large database (the type of application we discuss in Chapter 5) you

## 12 Business Systems on the Commodore 64



*Fig. 1.1.* A typical Commodore 64 computer system. Commodore printers are connected to the last disk drive in the series, other printers to the last disk drive via the interface or to other ports via the interface. Many interfaces need power supplies.

may find it necessary to invest in a hard disk drive. Hard disks are not removable (as are floppy disks) from the drive, but they hold considerably more data: the Commodore 9060 hard disk can hold 5 Mbytes (that is, 5 million characters) of data. It will also set you back by more than £2000! The 9090 holds 7.5 MB, and costs about £2750.

Note, again, that not all programs are designed to work with these alternative disk drives, so check before you buy.

You will certainly need a printer. Commodore printers designed for use with the 64 (primarily the 1525 and 1526) are connected through the serial port in daisy chain with your disk drive(s). Other printers need interfaces which may use any combination of the machine's ports. (Check to ensure that the interface won't use a port that you need for some other purpose, or that it incorporates a new version).

Cheap dot matrix printers like the 1525 (costing about £230) produce legible, but not letter quality, print at the modest pace. The print tends to look rather 'dotty', and the characters are not well formed: they lack true descenders, and 'p's and 'q's, for instance, sit above the line of text. These printers are not really suitable for high volumes of work, and if you plan to do a great deal of word processing you should look further afield. Good quality dot matrix printers like the 1526 (costing £350 upwards) work fast and are versatile, though the print quality is still only moderate. Daisywheel printers (about £400 for the cheapest, £1000 or more for the best models) produce typewriter-style, letter quality print, but the cheaper models often work very slowly. Among the popular printers from other manufacturers supported by much Commodore 64 software are the Epson FX80 and

MX80, good quality dot matrix printers suitable for a wide range of general office duties, and the Qume and Diablo daisywheel printers.

Figure 1.2 shows how the print quality from a representative sample of printers (a cheap dot matrix machine, a better quality dot matrix machine, and an expensive letter quality printer) varies. Figure 1.2 (a) is from a Seikosha Vic printer, a cheap dot matrix printer (about £250). Note that lower-case 'p's and 'g's, for instance,



Fig. 1.2. Three samples of print from three different qualities of printer: (a) the Seikosha Vic printer, (b) the Epson FX80 printer and (c) the Tandy Daisy Wheel II printer.

do not have proper descenders. However, it has a full range of in-built graphic symbols. Figure 1.2 (b) shows what you get from the Epson FX80, a better quality dot matrix printer (about £400). This can produce italics and proportionally spaced print. When suitably programmed (not easy!) it can handle graphics. It can also produce near-letter-quality print through overstriking. Figure 1.2 (c) is from the Tandy Daisy Wheel II, a letter-quality daisywheel printer (about £900). It is not programmable, though it can handle proportional spacing and different typefaces by swapping daisy wheels. This particular model is difficult to interface to the Commodore 64. Note, incidentally, that it will be difficult or impossible to produce Commodore-style graphics (e.g. to copy on-screen bar charts) on non-Commodore printers.

You may wish to use a *modem*, a device which enables you to connect your computer to the telephone system, or a plotter. If so, you will find some further advice in Chapter 7.

As you will have realised, the Commodore 64 itself makes up only a small part of the cost of your complete system. And to the hardware costs we've outlined you must, of course, add not only the cost of your software, but also the cost of disposables: cassette tapes, floppy disks (up to £5 each, though they are reusable, fortunately),

printer paper and ribbons, etc. If you're planning to use, say, a word processing program and a spreadsheet program on your machine, we would advise you to start by buying two packs of ten disks. If you'll be working with cassette tape, get twenty fairly short (C20 or less) tapes. Don't forget to insure your system, either!

Table 1.1 gives you an indication of the cost of some typical small business systems built around the Commodore 64.

*Table 1.1.* Costs of typical small business systems (with approximate hardware prices as of January 1984).

(1) Minimum system:

---

Commodore 64	£ 200
1 × 1541 disk drive	£ 220
b/w portable TV	£ 80
Commodore 1525 printer	£ 230
	£ 730

---

(2) The systems we used for this book:

---

Commodore 64	£ 200
1 × 1541 disk drive	£ 220
Colour portable TV	£ 200
Micro World printer interface	£ 80
Epson FX80 printer	£ 400
	£1100

---

(3) A more powerful system:

---

Commodore 64:	£ 200
2 × 1541 disk drives	£ 440
Monochrome monitor	£ 130
80-column board	£ 130
Interpod interface	£ 125
Brother daisywheel printer	£ 450
	£ 1475

---

Naturally we couldn't test every possible computer system based on the Commodore 64. We both use very similar systems, with a portable television for display, a single 1541 disk drive, and an Epson FX80 dot matrix printer connected to the computer by a Micro World 302 interface (distributed by Impex: see Appendix 1). This handy device enables the printer to appear to the computer either as a Commodore-type printer or as a normal Epson, depending upon program requirements. We found that the vast majority of programs we tested accepted this combination. To set it up did mean a small soldering job, however, which might deter some users. We have Commodore cassette players, and a Commodore printer/plotter; however, few of the programs we tested came in cassette form, and none made use of the plotter capabilities, though a very few were able to treat the plotter as an alternative printer.

## **Choosing and using software**

Unless you are a very professional programmer, you will certainly need to buy programs in order to make your Commodore 64 function as a business computer. You should budget for software when planning the cost of your system.

Computer programs that will run on the Commodore 64 normally come in three forms: on cassette, on floppy disk, or in cartridge form. You should ensure that you know which form you are going to get.

Cartridge programs are preferable. They have three great advantages. One, they are robust and not subject to corruption as are cassettes and disks. Two, they do not take up large amounts of the computer's internal memory, so they leave more room for 'workspace' and data storage. And three, they do not need to be loaded; the program runs the instant the computer is switched on, if the cartridge is in place.

Cartridge programs will generally work with either cassettes or disks, though you will find that cassettes are not as suitable (and sometimes, not at all suitable) for use with some complex programs. The cartridge slots into the hole at the rear left (as you look back-on) of the computer: some are quite a tight fit. You should only insert or remove the cartridge when the computer is not switched on. Finally, cartridge programs tend to cost the most: allow for this when looking at program prices. If you will be using the program intensively, and have the option of obtaining a cartridge version,

you will almost certainly find that it's worth paying the extra.

Cassette programs are generally intended for use on systems without disk drives. They tend to be simpler, and cheaper, than disk-based programs. Loading can take five minutes or more, and loading failures are not uncommon. Once loaded successfully, the programs generally work reliably.

It is possible for cassettes to be corrupted, and you should treat all your program cassettes with great care, removing them from the player once the program has been loaded, and storing them in labelled boxes. You do not normally receive a back-up copy of a cassette program, though sometimes the same program is recorded on both sides of the tape to provide a simple back-up. If the tape is not 'protected', or if you have access to a reel-to-reel tape recorder, then you can make your own back-up onto a new tape, or possibly disk. (This should, of course, be for your personal use only, and you should take note of any copyright messages included in the packaging or manual.) If the program does become corrupted and fails to load successfully after repeated attempts (say, five or more), then return it to the supplier and request a replacement. There may be a fee charged for this service.

Most business programs we reviewed came in floppy disk form. Different disk drives 'format' their disks in different ways, and if ordering a disk program you should ensure that it is formatted for the type of drive you use – particularly if this is not the standard 1541 drive. The 1541 works slowly by floppy disk standards: a complex program will take a minute or two to load.

Floppy disks are even more vulnerable than are cassettes, and a flaw anywhere on the disk can prevent you from reading any data written on it. In consequence, taking great care of your disks, and maintaining a back-up copy of your program, is crucial. Always keep the disks in their protective sleeves in a strong box. Never bend them or touch the exposed portions of the surface. Never, never, put the disk on the flat top of the disk drive. Write only on the labels with a special disk pen, or before you stick the label on the disk.

Disk back-up is a tricky issue, because software producers are understandably anxious to prevent unauthorised copying and outright piracy. While most of the disk-based programs we've seen for other computers are not protected, and can be copied for back-up purposes, we found that almost all the C64 review programs we looked at *were* protected against copying. (Don't try to copy a disk that is clearly marked as protected: you may corrupt the program by doing so.) However understandable this may be, it is a major

inconvenience to regular, honest users, and we do deplore this trend.

If your program disk is protected, you *should* receive two copies: one for normal use, and one back-up. If the first copy is then corrupted, you can then make immediate use of the back-up while sending the corrupted disk back to the distributor for replacement. A few distributors (including Commodore themselves in some cases) do not automatically provide a back-up disk. Some require you to register as a user, and then pay up to £10 for a back-up. Some give no details on how back-ups can be obtained, or provide only an American support address.

To fail to provide a free back-up automatically, or to charge an excessive price for one, is unfair. We deplore such policies, and can only advise you to think very carefully before purchasing any program sold on this basis. To guide you, we try to mention in our reviews how back-ups of different programs are handled. Please note, however, that by mentioning where programs are not protected, we do not intend to encourage illicit copying of programs. If you make illicit copies, you are merely encouraging software suppliers to pursue a more restrictive policy, which is far more inconvenient for you, the user. Please do obey to the letter the licence given you to copy programs for your own use only.

One final note on back-ups. Perhaps because of their unsatisfactory policies on program back-ups, many program manuals omit to stress the importance of also backing up all data disks you create while using a program. Your data, too, is vulnerable, and you should make at least one back-up of every data disk you create. (A rotating set of three or more back-ups is a safer arrangement: every time you copy the work disk onto the oldest of the back-ups.) To copy disks on a single drive is slow and tedious, but this is very important, and you should do it at the end of every work session without fail. Keep your back-up disks in a safe place, separate from your working disks.

Note that many disk-based programs are compatible with data files held on cassette. This can be useful if you transfer from a cassette-based system to a disk-based one: you will still be able to read and work with your existing files. Disk and cassette-based versions of the same program are not always identical, however: often the disk version, as well as being slightly more expensive, is more powerful.

Programs suitable for business use generally cost from £20 to £100 and we found that, by and large, there is a correlation between the cost and the quality. Databases and word processors at the lower

end of this price range, for example, are not as powerful as those at the top end, and you should bear this in mind when selecting programs. A few cassette-based programs cost between £15 and £30, but our impression is that these are not really intended for intensive business use. The computer industry has always been prone to a little exaggeration, and if you read about a complete word processing program for £10, for instance, you should treat the claim with caution. The program in question may bear little resemblance to a £100 version. Though your normal consumer rights do, of course, apply when you buy software, most manufacturers are careful to limit their responsibility should a program turn out to be unsuitable for the purpose for which you intended it.

Program costs may seem high but, in fact, they compare very favourably with the typical costs of business computer programs on other microcomputer systems. A typical CP/M word processing program costs from £200 to £300; its equivalent on the C64 offers much the same capability for from £60 to £100. The large user base of the Commodore 64 means that the programs tend to be good value. And as competition between similar programs increases, prices can fall quite dramatically.

Even if your budget stretches to it, do not buy too many programs initially. Each program takes some time to master. It's advisable first to get to grips with the program you expect to use most intensively (an accounting system? a word processor?) and only then start to consider which other programs you need. You will probably find that the capabilities of the programs you buy are not exactly what you expected, and that once you've grasped one program, you'll have a much better idea of what you really need to get next.

Programs for the Commodore 64 are available from many sources. Most retailers keep only a very small selection of business programs in stock, though they should be able to order others for you on request. Many programs are sold largely, or exclusively, by mail order through computer magazines.

A good business-oriented personal computer magazine (such as *Practical Computing* or *Personal Computer World*) will contain dozens of advertisements for programs and for system peripherals that could be of use to you. Some magazines are oriented specifically towards Commodore computers. Our impression is that, at present, the general magazines tend to be of higher editorial quality, but the Commodore ones can score in the sheer quantity of relevant material. We advise you to look at a selection: they will give you a good 'feel' for the type of material available.

We have compiled a list of all the programs we know are currently available for the Commodore 64, in the broad categories we discuss. These cover the majority of 'business' applications of the computer, but they do not cover its graphics in any depth: currently the only graphics programs available (barring small graphic elements in some programs like 'Practicalc' and 'Magpie') are not particularly business-oriented. They do not include programs written to run under the CP/M operating system, which – as we noted earlier – will run on the Commodore 64 with a CP/M adaptor. The entire list is reproduced as Appendix 2, together with known suppliers' names and addresses. (One supplier is listed for each program: this may not always be the originator, and indeed will not be so in the case of American-written programs. Often there are other suppliers, too.) Inevitably, the list is incomplete, and will become more so as new products are announced.

### **The programs we review**

We requested review copies of programs of most, though not all, of the programs listed, and have reviewed in the text all those programs that we received before our deadline. If a program is not reviewed, that is not intended to be an adverse reflection upon its quality, or upon the services provided by the distributor. In general, distributors responded promptly and courteously to our requests for review copies. Acknowledgements to providers of review copies are in Appendix 3.

All the programs we discuss were tested on the Commodore 64-based computer systems we described above. Not all programs would run to their fullest extent, unfortunately: Commodore-type graphics can't be printed on our system, for instance, and data files couldn't be as large as those possible on a system with a more powerful disk drive. We tested every program we describe, but our tests were not always exhaustive. Where limitations of time or equipment prevented us from checking aspects of program operation, we have relied on information provided in the manuals, and occasionally by reviewers in the reputable microcomputer magazines *Personal Computer World*, *Practical Computing* and *Personal Computer News*. To the best of our knowledge, the programs work as we describe, but should a manual have described a feature that does not work properly in the actual program, we may not have picked up this discrepancy. We hope our reviews will prove

helpful, but we cannot, of course, be held responsible in any way if a program fails to work as we suggest it will.

Our main aim has been to give you an impression of the type and general quality of the different programs, and to discover their broad suitability for different purposes.

Note, too, that many programs are continually 'under development', and that some features in later versions of a program may be slightly different from the features of the version we reviewed. A version of a program in a different medium (cassette instead of disk; cartridge instead of disk) may also differ in some ways.

Co-authors always develop their own, unique method of working together. We work at a distance, and we divided the programs into subject fields for review. Margaret Norman reviewed the accounting, stock control and spreadsheet programs. Susan Curran reviewed the word processors, spelling checkers and databases. Susan wrote these introductory chapters, and edited the final version of the manuscript.

We've tried to keep our reviews suitable for beginners to read, but in some places we have discussed advanced features that we haven't been able to describe fully in the introductions to each review chapter. We feel this will be useful to more knowledgeable readers – but if you don't understand all our points, sorry!

## **General features of programs**

Some general aspects of program quality, and more general programming features, may not emerge well from our subject-division, so we summarise them here.

Most important of all to you, as a business user, is the reliability of the programs you buy. The general standard of programs we reviewed was high, but many programs do have 'bugs' when they are released for sale. If you find that the program operates in a way which appears to contradict the manual and your common-sense expectations, contact the originator (most manuals give you a contact address or phone number) and ask for help. Where we encountered bugs, we mention them, but inevitably we will not have noticed some in our comparatively brief tests.

Not all programs protect the user fully from errors: some crash if you simply press the wrong key. A good program will ignore your miskeyed instructions, or politely ask you to try again. A good program will 'protect' all dangerous operations (such as erasing a

file) by double-checking before performing them. A good manual will explain to you what to do if things do go wrong, and suggest how you can retrieve at least some of your work in the event of a major disaster. Many programs fall short of a reasonable standard in this area, and where we felt those we reviewed did so, we have tried to point this out.

Some business-type programs are written in machine code, which is difficult to program, but fast in operation. Others are written in the BASIC high-level language that is built into the Commodore 64. This can make programs slow to run, and delays between each operation can be exasperating when you use a program frequently. One plus, however, is that you may be able to amend sections of the program yourself if you don't like certain features! A few BASIC programs are 'compiled', an operation which increases their speed but makes them no longer transparent to the user. We haven't always mentioned how a program is written, but we've tried to give an idea of its speed of operation.

Many programs lay great stress on user security, with up to three different levels of passwords to protect data in files. We remain a little uncertain about the stress placed on this feature. Most Commodore 64s will be single-user machines, and many users will find that a disk storage box with a lock is quite sufficient in the way of security. If you do feel the need to protect confidential files from the curious but unauthorised, however, this is a feature to look for.

We've mentioned before, but will briefly repeat at this point, that not all programs work with all computer systems. Check to see if your chosen programs need a colour television or monitor, or if they will work adequately in monochrome. Will they support your disk system? And most important, will they work with your printer, particularly if it is not a Commodore model? We didn't have space to describe in detail what configurations each program will work with, and you must check this aspect for yourself.

Programs vary considerably in the amount of expertise they expect from the user. Some assume you've barely unpacked your computer, some seem to expect you to be a competent programmer already. We try to explain which are which in our reviews! It can be confusing, however, if you are immediately presented with reams of instructions that you don't understand. If you are a complete beginner, we suggest you read our notes on 'getting started' below before you begin work with your new computer system.

## Getting started

*Somebody* has to set up your computer system, ensure that all the components work together properly, select suitable programs, and discover how to get them running. If you are lucky, that somebody may be a dealer or consultant. Often, it will have to be you. You must expect to spend a considerable amount of time sorting out your system, and discovering the essentials that you need to know. Even if you don't intend to do any programming, you still need to understand a fair amount about your system before you can use it successfully.

If you are a newcomer to computing, our suggestion is that you should start by reading the first 30 pages of your Commodore 64 User Guide, if you haven't already done so. These give a good general introduction to the machine and to such aspects as changing the screen colour, loading and saving programs. Next, look at the manuals that come with your programs. Some manuals include very good instructions about setting up your system; if yours are full and start clearly, read the introductory sections(s). Next, if you have an 1541 disk drive, read the first four chapters (up to page 18) of the manual. This is rather heavier going, but much of the material is essential to you. Don't worry unduly if you don't understand all of it at this stage. Then read the manuals that come with the rest of your system hardware (other disk drives, printers, interfaces); and finally, read the remaining general sections of your program manuals.

Before getting down to work, you *must*:

- Ensure that your system is correctly connected, that all necessary power supplies are in place, and that all devices communicate with the computer in some way.
- Understand how to power up the system. (Instructions seem to vary, but the main points are that you should switch on the actual computer last of all, and ensure that no disk is in the disk drive when you switch on or off.)
- Know how to load and save programs using the cassette player or disk drive that you will be using. If you are using a floppy disk drive, you must know how to 'initialise' new disks, copy individual files and programs, and back-up entire disks. You should have at least one prepared disk or empty tape ready before you begin work.

If your program is not in cartridge form, then you should also have discovered whether the program can be copied. (Your manual or the disk/cassette will tell you if it cannot.) If it can be, copy it

immediately, and put the original away in a safe place. Use the copy only – the original should be used only for making a new copy, should the first become corrupted.

Once you've made these preparations, you will be ready to start using, and enjoying, your business computer system.

## Chapter Two

# Computerised Accounts

Every business, no matter how large or small, must keep some financial records, to satisfy the demands of the tax inspectorate if not for its own sake. Some businessmen keep the books themselves; others employ bookkeepers or accountants to do this for them. Some people take a pride in having a neat, accurate record of all their transactions while others find themselves working long into the night before their accounts are due in, trying to decipher scrawled notes on cheque stubs. Whichever category you belong to, the right computer programs can make the task of keeping your finances straight a lot easier for you.

There is a bewildering array of accounts programs on the market. Some of these are aimed at one-man operations, others at larger businesses. There are programs which will do all your accounts for you, right through to the trial balance or even the balance sheet stage, and programs which are designed to deal with just a single task – stock control, for instance.

In this chapter and the next we'll be looking at some of the main types of programs available, discussing what kinds of business they are suitable for and what their advantages and disadvantages are, and examining in detail one or two actual programs of each type. Some of the factors to be taken into account when selecting programs, and the problems that are likely to arise in switching over from a manual system to a computerised one, will be covered too.

This chapter is concerned mainly with programs to help you keep the day-to-day records from which your Annual Accounts are prepared. Chapter 3 then deals with programs for other accounts-related procedures such as stock-keeping and invoicing, and looks at ways in which these can be incorporated into an integrated system. First, though, comes a brief look at accounts in general. What can the computer do in this field, and what is best left to a human being?

## **A little background information**

This chapter has been written for two quite different classes of reader. First and foremost, it's for small businessmen and women who are exploring the possibility of computerising part or all of their accounting operations. Secondly, however, it's for accountants who deal with small business accounts, and want to get a feel for the types of program available so that they can advise their clients whether computerisation is feasible, and what type of program they should look for. The two types of reader obviously have slightly different requirements, and this section is intended primarily for those who are not experienced or qualified in accountancy.

Obviously I can't talk about accounts programs without using a few technical terms. I'll begin by outlining the terms used and their broad meanings. I cannot attempt to teach you all about book-keeping in a book of this type, however. If you feel your knowledge of accounting procedures isn't adequate to enable you to follow what has been written, then you will almost certainly find that it isn't adequate to enable you to set up a computerised accounting system without expert help, either! You will need to learn a little more, or to consult a specialist. I don't know of any books for the general reader which deal in depth with computerising small business accounts, but there are plenty of specialist books on accountancy in general, and small business accounts in particular, to which you can refer. If you already understand the principles of double-entry book-keeping, then please skip this section.

The simplest form of book-keeping system involves the use of a single Cash Book, in which you enter receipts and payments, analysed in columns where necessary to help you keep track of your expenditure under different broad headings and of your different types of sale. You then simply tot up the column totals to find out how much money you've taken in and paid out. This system may be adequate for a very small business, but even for these accountants generally recommend the use of a double-entry system instead.

In double-entry accounting, each transaction is entered in two separate accounts – one to record where the money came from, and the other where it went to. So, for instance, when you pay one of your suppliers you will credit your bank account with the money paid out and debit the supplier's account with the money he has received. When one of your customers pays you, you will debit your cash account and credit the customer's account. (In double-entry book-keeping, the account from which the money comes is always

credited, and the account to which it goes is debited. This goes against the way which seems logical to many non-accountants, but it is standard practice, and you can expect computer programs to follow it.) Goods are an asset of your business, just as your money in the bank is: they are dealt with in just the same way as money. When you receive an order from a supplier, your Purchases account will be debited and the supplier's account credited.

Double-entry accounts are kept in the form of ledgers – there is normally a Sales Ledger, Purchases Ledger, Impersonal Ledger and, of course, a Cash Book. The Impersonal Ledger contains all the accounts which don't belong in any of the other ledgers (accounts for various business expenses, capital accounts, etc.). At the end of each accounting period each ledger account is totalled, and the balances are posted to the Trading and Profit and Loss Accounts or Balance Sheet.

The Trading Account shows the gross profit made during the year, that is, sales less the cost of sales, (stock purchases, adjusted to allow for the difference between opening and closing stock levels). The Profit and Loss Account shows the net profit or loss, that is, the gross profit less expenses. The Balance Sheet shows the book values of assets, liabilities and capital at the year end. In other words, it indicates what money is invested in the business, and in what form it is held (fixed assets, stock, bank and cash balances, creditors and debtors). It's useful – indeed, necessary – for even a small business to draw up all these different documents.

A double-entry system like this has several advantages over a single-entry system. First, it provides you with an in-built check on the accuracy of your calculations. As each transaction is entered as both a debit and a credit, the total of all the debits should always equal the total of the credits. (Of course, balancing the accounts in this way is no guarantee that there are no mistakes in them: there may be mistakes that don't show up, such as postings to the wrong account, or errors which cancel each other out. You need to check further before you can be certain that all is well.) Second, it makes it much easier to keep track of individual accounts. You can find out easily if one of your customers owes you money by looking up his account in your Sales Ledger, or check on the increase in your electricity bills over the last year by finding the appropriate account in your Impersonal Ledger.

If you keep full ledger accounts, then preparing the Profit and Loss Account and Balance Sheet becomes a comparatively simple

task. All you need to do is to set out the totals you take from each different account. You may well be able to do this yourself, and if you choose to leave it to your accountant you should find that his fees for the job will be much lower than they would be if he were to be given just a Cash Book to work from.

The other accounts books you are likely to come across are the Day Books (in which sales, purchases and returns are entered before being posted to the appropriate ledger account), and the Journal, in which miscellaneous transactions and adjustments are recorded. One special account which also deserves mention is the Suspense Account. This can best be described as a dumping ground for any entries whose proper home is not immediately obvious. In an ideal world, it wouldn't be needed, but in real life there are bound to be a few occasions when it will prove necessary. If you don't know where a payment or receipt belongs it's better to put it in the Suspense Account than to just leave it out until you find its proper place, and risk forgetting about it altogether. You can move the entry to its proper home later, making a Journal entry to record the transfer.

### **The computer's role**

A computer can be programmed to store data, to retrieve it on demand, and to manipulate it and use it to perform calculations. It can also be made to output data in various forms, on screen or on a printer. It has no in-built knowledge of accountancy, but the programmer, if skilful, can impart much of his or her knowledge to it and instruct it to perform most of the routine operations necessary to produce a set of accounts. If you've been keeping accounts by hand, you will know just how many routine tasks there are: ensuring that entries are correctly echoed in different accounts, running trial balances, checking on your cash position or on outstanding debts, and so on. The computer can help you with all these mundane but necessary tasks. Imagine the pleasure of never having to add up columns of figures by hand again!

The hard part of keeping accounts for a small business is not doing the arithmetic, though, but setting up the system to be used. This involves deciding what records should be kept and what form each one should take, and how these records should be used to produce the final accounts. This is true whether you are setting up either a manual system or a computer-based one.

You probably already realise that there is a trade-off between

designing a perfect account system for your business, that tells you exactly what you want to know in every conceivable circumstance, and settling for an 'off the peg' system, designed by somebody else. In manual accounting, the off-the-peg system might be a structured accounts book, or a system suggested to you by your accountant. It won't perform quite as superbly, but in compensation you won't have spent as long setting it up – and it will be easily comprehensible to others (your accountant, the VAT inspector) who have encountered it before. In computerising your accounts, you have much the same choice to make again: you can go for the ready-made, or invest the extra in time and/or money in order to get the custom-designed solution. Different programs demand different amounts of work from you in setting your accounts up, and in return they offer you varying degrees of flexibility.

Once a computerised system has been set up, using it should be comparatively easy – just a matter of feeding in data. (It's always true, of course, that the results you get out can be no better than the data you feed in, so it's important to ensure that you enter accurate information.) If the system has been designed well and the program to implement it has been written well, then it should be clear to the user how and in what form each piece of information should be fed in. The computer won't remove the chore of data entry, but it will save you from unnecessary duplication of entering tasks, and it will do all the calculations required for you.

Most of the programs we will be looking at are *menu-driven*. That is to say, they will offer you a list or menu of different options from which you can select the one you want. Your first choice will probably be between loading existing data from disk or starting a new data file; then you may be asked if you want to enter a receipt or a payment, to examine your bank account or to print a report. Often a selection from one menu will take you straight to another menu; if you choose 'print', a list of the various tables and reports you can have printed will probably appear.

For data entry, a special 'form' is often used. The screen will be divided into little boxes, with labels to indicate what you have to put into each (name, address, invoice number, amount, etc.). The structure of this form may be pre-programmed, or you may have to design it yourself. The little boxes are known as *data fields*; they may contain text or numbers, or perhaps a combination of both (e.g. a stock code). Some fields will probably have to be filled in on every form, while completing others may be optional. Every invoice, for example, will need an invoice number and an amount, but for cash

sales the customer's name could be omitted. It may be possible to set default values for some fields, to be used if no entry is made (to set the standard VAT rate at 15%, for instance). Some may be automatically filled in for you – if you enter the number of units and the price per unit, the total price will magically appear!

The data on the form, once you've completed it, forms one 'transaction' on the system. The computer will deal with that transaction, updating disk or cassette files, recalculating totals and so on, and then let you continue with the next transaction, presenting you with a blank form again.

Programs with this kind of structure are generally easy to use, but they may lack versatility. You could find that as well as not meeting all your preferences, they don't even meet all your requirements. You may find that the Print menu does not include the type of report you want, or that there is no obvious means of dealing with returned goods or investment income. Often the omissions or shortcomings are not obvious when you take a quick look at the program before buying it; they only become apparent when you want to run that once-yearly report, or when an unusual transaction has to be dealt with.

There are other types of program available where the structure is not laid down so rigidly for you (spreadsheets and programmable databases, for example, both of which are discussed in later chapters of this book), and many of these can be used as a basis for designing your own made-to-measure accounting system. (Read the reviews of 'Magpie' and of 'Superbase 64' in Chapter 5 to get a feeling for the type of program we mean.) If you choose to use one of these, however, you will probably have to design your own accounting system from scratch. You will have to decide for yourself whether the problems caused by using an inflexible system would be sufficient to justify all that extra work – and whether your accountancy knowledge (or budget, if you prefer to pay someone else to do the job) is up to it!

## **Accountants and audits**

If you are using a computer to help you prepare your accounts, does this mean you will no longer need a human accountant? No, of course not. Useful though a computer may be, you could not possibly expect it to provide the same range of services as a firm of chartered accountants.

For a start, there will almost certainly be some matters arising from the accounts on which you will need advice. What about the purchase of your new computer system? You may know that the cost of the hardware should be treated as an investment rather than an expense, but what about the software? And do you know the rate at which your computer should be depreciated in your accounts? You are highly unlikely to find the answers to questions like these in a program manual.

In the case of a limited company it is a legal requirement that the accounts should be audited. Your accountant must check them thoroughly, satisfy himself that they are full and accurate and give a fair picture of the company's financial position, and sign a statement to this effect. The legal requirements are less stringent if your business is not registered as a limited company, but you must still satisfy the tax inspector that your profit figures are accurate and your claims for expenses are legitimate. This is something which is best done by someone who is very familiar with the relevant legislation – in other words, your accountant. If you try to do it yourself, you could very easily overlook something and end up paying far more tax than is necessary!

It makes more sense to see the computer, not as your accountant's rival, but as his or her ally. Your accountant can help you select a suitable computer program; the computer, in turn, can help your accountant to do a better job for you. Auditing accounts is, of course, much quicker and easier if they have been prepared using a computer than if they have been drawn up by hand, provided that you have printed out all the necessary statements and reports during the year and filed them carefully. (If you are using a purpose-written program, the manual should give you adequate guidance here.) Computer printouts are much more legible than most people's handwriting, and the accuracy of their arithmetic is less open to doubt. The importance of preserving all your printouts needs stressing. Unless you preserve all your data files on disk (which, for the average small business, would mean using an awful lot of different disks during the year) it will be extremely difficult and time-consuming, if not impossible, to obtain copies of missing data.

Good accountants will offer their clients a wide range of services besides the preparation and auditing of annual accounts. If you have money to invest, they will help you to organise your investments. If you need to borrow money or to find investors in your own business, they can often arrange loans and advise you on long-term sources of finance. They will advise you on your plans for

expansion, help you to register your business as a limited company or to float a new share issue, deal with your insurance problems, and much more besides ... No, of course they can't be completely replaced by a computer.

### **What are you looking for?**

In order to select the right accounts program or programs for your business, you need to know two things – what you want, and what is available. If you are lucky, you will be able to find precisely the program you want; more probably, you will have to compromise a little. Anyway, we'll start by considering how you can decide what your ideal program would be like.

First, it's a good idea to take a long, hard look at the books and other records you keep at the moment (or those that your accountant keeps for you). The transfer from a manual system to a computerised one will obviously be easier if the new system closely resembles the old one. That's not to say, though, that if the system you are using at the moment is a bad one, you should stick to it. In fact, you almost certainly won't be able to, as the vast majority of accounts programs are written to deal with good, efficient systems, not bad ones. Even if your present system is adequate, you may feel that the changeover to a computerised system gives you a good opportunity to make some improvements. Using the computer to do the arithmetic makes it much more feasible for you to obtain regular status reports and trial balances, for instance, and you may want to rethink your system so as to give scope for this.

However, whether you intend changing it or not, your present accounting system must be your starting point and it is important that you should have a reasonable idea of what it does and how it does it. If you don't have this knowledge, then I strongly recommend that you computerise only with the detailed advice of your normal financial advisor.

Look not only at the system as a whole, but also at individual parts of it, and consider their relative size and importance. What is your biggest headache? Is it keeping track of your stock, or completing your VAT returns? Do you have a lot of different suppliers and relatively few customers, or vice versa?

Once you have a clear picture of what tasks are to be performed, you can start thinking about how to computerise them. Do you want to switch all your accounting functions over to a computer at once,

or to do it stage by stage? Perhaps you would like the computer to take over your stock control to begin with – then once you are happy with that part of the operation, you will introduce a Sales Ledger program as well. If there is a single aspect of your operation that seems to stand out as being particularly important, you will probably want to look first at some of the single-function programs that are available; if not, then an integrated program may suit you better.

What about the special facilities you would like your software to have? Consider, for example, what kind of printed output you will want from the programs you use. All the programs I will look at will produce hard copies of your records on request; some are designed to produce special reports at monthly or yearly intervals as well. But do you also want to print out invoices on special forms, or to use the customers' names and addresses on your Sales Ledger accounts for mailing purposes? Would it be useful to be able to print out some of your data graphically – perhaps in the form of a bar chart – to use for display purposes, or at meetings? It is possible to use specialised programs to do these things, but if they can be done by the accounts programs themselves, without the need to re-enter all the relevant data in another program, considerable time savings can be made.

Bear in mind any plans you may have for expansion in the future. It's better to spend a little more money now on software that will handle your needs for years to come, than to settle for something that may seem adequate at the moment but will need replacing if you gain a few extra customers or introduce new stocklines. Changing over from one system to another is a time-consuming and expensive process, and not one which you would want to repeat too often!

### **Sources of advice and help**

Apart from this book, and your own accountant, there are plenty of sources of help for the new computer user. Unless you are something of a recluse, you will almost certainly already know several people who own and use computers themselves. Talk to them about it when you get a chance, and you may well pick up some useful tips. Other small businessmen should prove to be particularly valuable sources of information, so if you belong to a local Chamber of Commerce or similar organisation, try sounding out your fellow members – and if you don't belong, perhaps you should consider joining.

You may hear tales of woe from some of the people you talk to,

but try not to let these put you off too much – there are plenty of success stories as well if you look for them.

Local computer users will be able to tell you about your local computer dealers, who should prove to be another source of help. A good dealer will be able to tell you about many of the programs available, and to demonstrate at least some of them to you.

There are a good many computer magazines on the market, some of which contain useful articles and program reviews. Many magazines are aimed at computer hobbyists or games players rather than business users, so take a look at the list of contents before buying them (or look at the copies in your local library).

### **The Commodore 64 – its strengths and limitations**

You've chosen – or at least, are considering – a small computer to handle your accounting operations. We must stress yet again that you cannot expect too much of the Commodore 64 – and that though the machine itself and the better programs for it have a lot to offer, it does not rival much bigger and more expensive computers. Remember that only one person can use the Commodore 64 at once. If different aspects of your accounts are currently handled by several different people, how are you going to site the computer, and allocate time on it – both for updating your books, and for checking – for example on supplier accounts? Remember that entering data on a computer like this takes time. You'll find it difficult to share the machine with a secretary who wants to use it for word processing.

Most of the programs I review are very clearly oriented to small businesses, and if your business is not small than you will probably find that a different computer will be better able to handle your accounts – though the Commodore 64 may still have many applications elsewhere in your business.

Finally, bear in mind the rest of your system. Accounts programs do not all make the efforts that word processors, for instance, do to support wide ranges of printers. A printout from a cheap Commodore printer may be fine to show to your accountant, but it might not appeal for invoices – and you may find it difficult to use your own forms or letterhead, for instance, in a printer designed to work with continuous fanfold paper.

## **Training and back-up**

If you were to invest in a mainframe computer and a suite of programs for it, you could expect to be given quite a lot of support and help by the manufacturer or supplier. But we are talking about a microcomputer system, with a vastly smaller price-tag. Obviously, the same service cannot be supplied here. Your choice of programs is being made, not in consultation with a Commodore representative who has spent some time studying your requirements, but with the help of this book and, possibly, a little advice from your local computer dealer or your accountant. Your training in the use of your system will probably also come from books – from the manuals supplied with the equipment and software you have chosen. The standard of these manuals, then, must be an important factor in program selection. It is no use buying a program which will do all sorts of amazing things if you can't work out how to use it! So, before you buy, try to get hold of a copy of the manual and make sure that it is clearly written and explains all the program functions fully.

The manuals which accompany most accounting programs are, for some unaccountable reason, of much poorer quality than are those which accompany most other business application programs for the Commodore 64. I indicate in my reviews where documentation is of a totally unacceptable standard, but you should be aware that the norm is low, and that few programs are as well documented as you might expect from their hefty price tags.

What about supplier support? Accounting programs must take some account of legal requirements on tax and on the reporting of company accounts. If the program is altered to take account of changes in legislation or tax rates, will the new version be issued to you automatically or will you have to buy it? What about upgrades – will these be offered to you free of charge, on a part-exchange basis, or not at all? Is there a User Group, which will enable you to have regular contact with other users of the system? It's well worth checking up on all these points, and on the size and reputation of the software house by which the program is produced. Just imagine how awful it would be to have your system operating well, then to crash your program, only to find that replacement copies were unobtainable. It doesn't bear thinking about, does it?

## **Types of programs available**

The programs on the market can be roughly grouped into three categories – (a) the all-in-one programs (e.g. Micro-Simplex, Quick-Count's Cash Traders' Book-keeping), (b) the ledger programs (Anagram Systems' Sales Ledger and Purchases Ledger, the Impex Company Pac programs), and (c) the miscellaneous programs for stock control, financial planning, etc. (Commodore's Easy Stock, Future Finance). There is inevitably a certain amount of overlap between these categories; some of the ledger programs available are designed to be used in conjunction with other programs in the same series and so could be regarded as subsections of an all-in-one system, and some of the all-in-one programs prove on closer examination to be not just one program but a set of programs on a single disk, which are automatically loaded by the 'master' program when menu selections are made. However, this categorisation, approximate though it is, gives us a useful starting point for examining the different options.

The miscellaneous programs will be looked at in the next chapter. I'll concentrate here on the mainstream accounts programs in the first two categories.

### **All-in-one accounts programs**

In this category I will be looking at single programs, or sets of closely interlinked programs on a single disk, which are intended to handle all the accounts of a small business. Both the systems I review are aimed at retailers, but could be used for other businesses as well. However, they are not suitable for use if you grant your customers credit as they will not handle individual customers' accounts.

These programs will prepare your VAT returns (if you are on one of the schemes they cover), and provide you with the information you need to prepare your Trading and Profit and Loss accounts. The Quick-Count program can also be used to prepare your final accounts. Micro-Simplex will draw up a draft Profit and Loss Account, but leaves you (or your accountant) to complete the final accounts by hand.

These programs require you to enter each transaction once only, but that does not mean that they use a single-entry book-keeping system – full double-entry accounts are kept in both cases. It is as if you were writing your transactions in a Day Book, and leaving the

computer to post them to the appropriate ledger accounts. You get two entries for the price of one this way!

The amount of book-keeping knowledge needed to use a system of this type varies widely. The Micro-Simplex system assumes no knowledge; even such terms as purchases are carefully explained in the program manual. The Quick-Count program, on the other hand, expects users to have a fair amount of basic knowledge – so if you know nothing about book-keeping, and don't want to have to learn about it, I would advise you to take a look at Micro-Simplex first.

The programs are menu-driven, so all you have to do to use them is to select the right options for the information you want to feed in, view on the screen or printout, then follow the instructions given.

### *Micro-Simplex*

This system comes on disk only, with a very comprehensive A5-size loose-leaf manual, and closely follows the format of the Simplex 'D' Account Book, with which many readers will probably be familiar. Users of the system are advised to look at a copy of this book if they don't already use it.

A form is provided in the manual for you to return to register as a user. On receipt of this, you are sent a free back-up copy of the program disk. Details of a Users' Club are also given in the manual, and membership costs £25 a year. For this, though, you are issued free of charge with any amended or upgraded versions which are produced during the year, and you are sent copies of a newsletter. My review package didn't include a copy of this, so I can't tell you if it's worth having or not.

The instructions appear to cover everything you could possibly want to know, and quite a bit more besides. There are sections on setting up the system and on how to handle the transfer from a manual system as well as detailed descriptions of all the program functions, complete with screen pictures and sample printouts. The only major omission I could find concerned the use of non-standard printers. There is no option to select print parameters in the program, so I plugged in my Epson with some trepidation. However, it worked well. (An Epson used with a different interface might not work; a non-Commodore printer would certainly need a full interface.) The reports are printed entirely in upper-case (presumably to avoid printer compatibility problems), to a column width of 80 characters. (See Figs. 2.1, 2.2 and 2.3 for sample printouts.)

The manual does not have a full index – just a list of chapters and a

A DEMONSTRATION USER

PAGE: 1

-----  
 WEEK NO: 14                      COMMENCING: 03 04 83

RECEIPTS  
 -----

DAY	DATE	GROSS DAILY VARIABLE	TAKINGS ZERO	OTHER RECEIPTS
SUNDAY	: 030483	20.57		
MONDAY	: 040483	37.53	10.00	5.60
TUESDAY	: 050483			
WEDNESDAY	: 060483			
THURSDAY	: 070483			
FRIDAY	: 080483			
SATURDAY	: 090483			
TOTALS		58.10	10.00	5.60

DEPARTMENT	SUN	MON	TUE	WED	THU	FRI	SAT	TOTALS
GROCERY	4.25	5.00						9.25
BUTCHERY	3.32	8.03						11.35
GREEN GROCERY	6.00	7.78						13.78
WINES & SPIRIT	7.00	26.72						33.72
TOTALS	20.57	47.53						68.10

DAY	DATE	PAID TO BANK
SUNDAY	: 030483	
MONDAY	: 040483	15.60
TUESDAY	: 050483	
WEDNESDAY	: 060483	
THURSDAY	: 070483	
FRIDAY	: 080483	
SATURDAY	: 090483	
TOTALS		15.60

Fig. 2.1. Sample printout 'receipts' from Micro-Simplex.

list of contents at the start of each chapter – so it is not ideal for reference purposes. The system is very user-friendly, however, so once you have got used to it, it shouldn't be necessary to refer to the manual too often.

Micro-Simplex is not just one program, but a master program and about a dozen sub-programs, the appropriate one of which has to be loaded whenever an option is selected from the main menu. This is a usual system with complex programs, as it conserves memory space for use with data. It makes for a lot of disk changing if you have a single disk drive and are to use several different options at one sitting. It can also prove annoying if, say, you discover after

---

people with minimal knowledge of book-keeping and accountancy. The final accounts cannot be produced by the computer as there is

#### 40 *Business Systems on the Commodore 64*

no means provided of making adjustments to cover depreciation, private use of motor vehicles etc., or of entering opening balances other than those for the Bank and Cash accounts. Some instructions are given on how to prepare the final accounts, but it is presumably expected that this will be left to an accountant.

The Profit and Loss Account is used as a clearing-house for VAT in this system, so payments to H.M. Customs and Excise and VAT on capital items appear as expenses. This is an unusual and rather awkward arrangement which may prove confusing to people whose previous accounts have not shown VAT payments, and it could make comparisons with previous years' accounts difficult.

Overall, Micro-Simplex can be recommended to cash traders who are looking for an easy introduction to computerisation, and are prepared to retain the services of an accountant to tidy up the loose ends.

#### *Quick-Count Book-Keeping System for the Cash Trader*

This program, which costs £89.70 including VAT, is available on disk or cassette. I tested the disk version. The manual is designed primarily for the cassette version, which was not helpful. In general, one would expect that a business person willing to pay this price for a program should also be prepared to shoulder the modest (and very well worthwhile) extra cost of a disk drive.

The program manual is very small and thin, only 18 pages, which for a program claiming to handle the entire accounts for a small business is not very much. The introduction tells you that familiarity with basic book-keeping and with the computer itself is required. In fact, the amount of book-keeping knowledge required is quite considerable; unless you know how to prepare a set of final accounts by hand, you are unlikely to be able to do so using this program.

I was supplied with two successive versions of this program, the second being an updated and revised version. Both versions were sent through the post with very inadequate packaging. The first disk was visibly buckled, and I had great difficulty in loading. The second caused fewer problems, but this lapse did not inspire confidence.

The first version of the program contained a number of bugs: the sheet accompanying the second version listed several of them, including some so serious as to make the program unworkable. It indicated that most had been cured. However, bugs do not seem to have been entirely eliminated in the second version; the program crashed long before I reached the final accounts stage. Hopefully, a third version will eventually be produced which will do all that the

entering your purchases and returning to the main menu that you have overlooked one invoice.

The system caters for VAT schemes A,B,C,D,E and F, and gives full instructions on how to prepare the quarterly returns for each of these schemes. The company automatically notifies H.M. Customs and Excise of every new user, so when your VAT Inspector next visits you he should already know that you are using it. Provision is also made for the preparation of non-VAT accounts, for people who are not registered for VAT. (The same company produces programs for larger Commodore business computers covering schemes G,H and J.)

Printouts are not produced automatically when data is entered, but can be called for at any time. The programs have been error-trapped to prevent you from starting a new week without printing out your data at least once, a reasonable requirement if you are to provide an adequate audit trail for your accountant. The reports available to cover the current week's transactions are Receipts/Paid to Bank, Payments for Business Stock, Payments other than for stock, weekly Cash/Bank reports, and full reports covering all of these plus a Bank Reconciliation and Other Receipts. VAT returns can be printed after preparation using the VAT option called from the main menu. An Audit Trail (a list of all payment transactions during the quarter) can be produced at the same time. Summaries of all transactions for the year to date (excluding the current week) can be printed at any time.

Takings can be analysed under up to ten different departmental headings. Other receipts are not analysed, as it is assumed that these will be few in number, but particulars of each can be entered. Payments for business stock can also be analysed under ten headings – not necessarily the ones used for takings. For other payments there are forty headings, twenty-three of which are allocated by the program and cannot be changed. (These include rent, rates, light and heat, postage, motor expenses, travelling, wages, drawings, capital items – in fact, just about everything you can think of.) All these are reasonable statistics for a program of this type.

The system deals with unpaid bills, so you can enter bills as soon as you receive them instead of waiting until they are paid. It does not, however, handle credit sales or the use of credit cards.

The preparation of the final accounts has been made as easy as possible, bearing in mind that the system is designed to be used by people with minimal knowledge of book-keeping and accountancy. The final accounts cannot be produced by the computer as there is

no means provided of making adjustments to cover depreciation, private use of motor vehicles etc., or of entering opening balances other than those for the Bank and Cash accounts. Some instructions are given on how to prepare the final accounts, but it is presumably expected that this will be left to an accountant.

The Profit and Loss Account is used as a clearing-house for VAT in this system, so payments to H.M. Customs and Excise and VAT on capital items appear as expenses. This is an unusual and rather awkward arrangement which may prove confusing to people whose previous accounts have not shown VAT payments, and it could make comparisons with previous years' accounts difficult.

Overall, Micro-Simplex can be recommended to cash traders who are looking for an easy introduction to computerisation, and are prepared to retain the services of an accountant to tidy up the loose ends.

#### *Quick-Count Book-Keeping System for the Cash Trader*

This program, which costs £89.70 including VAT, is available on disk or cassette. I tested the disk version. The manual is designed primarily for the cassette version, which was not helpful. In general, one would expect that a business person willing to pay this price for a program should also be prepared to shoulder the modest (and very well worthwhile) extra cost of a disk drive.

The program manual is very small and thin, only 18 pages, which for a program claiming to handle the entire accounts for a small business is not very much. The introduction tells you that familiarity with basic book-keeping and with the computer itself is required. In fact, the amount of book-keeping knowledge required is quite considerable; unless you know how to prepare a set of final accounts by hand, you are unlikely to be able to do so using this program.

I was supplied with two successive versions of this program, the second being an updated and revised version. Both versions were sent through the post with very inadequate packaging. The first disk was visibly buckled, and I had great difficulty in loading. The second caused fewer problems, but this lapse did not inspire confidence.

The first version of the program contained a number of bugs: the sheet accompanying the second version listed several of them, including some so serious as to make the program unworkable. It indicated that most had been cured. However, bugs do not seem to have been entirely eliminated in the second version; the program crashed long before I reached the final accounts stage. Hopefully, a third version will eventually be produced which will do all that the

manual claims for it. As I received version 2 only shortly before this book was completed, this review covers all the facilities described in the manual, including those which I was not able to test due to the reliability problems.

The manual contains minimal instructions on setting up the system – in fact, minimal instructions on everything – and is well below the standard one would expect for a program in this price-range. No information is given on availability of back-up copies of the program disk, or on how to recover data if the program crashes. If everything worked precisely as it should, the instructions might prove just adequate, but at present, without further information the system really isn't usable.

The one section which is covered in more detail here than in the Micro-Simplex manual is printer selection. All data is printed out as it appears on the screen, and a Commodore or standard ASCII printer, (with a suitable interface, of course), or a Commodore graphics printer can be used for this. The policy of automatically printing everything means that the printouts are rather voluminous, and finding the information you need from them will involve wading through a lot of irrelevant material. (It also means that you can't update your files should your printer be out of order.) However, it can be useful to have a hard copy of all the entries, as it should then be possible to trace any errors which have been made during data entry.

This, unlike Micro-Simplex, is a single program, so very little disk-changing is required. It follows the usual menu format. The selection of options is simple and, if you accidentally select the wrong one, pressing the up-arrow key will normally return you to the menu. Mistakes made in entering data can also be corrected by using the up-arrow to return to the previous item. Confirmation of each item is required: press Y to have the item accepted, or N to re-enter it.

The program allows you to use up to seventy-nine different accounts, nineteen for the Trading Account and thirty each for the Profit and Loss Account and Balance Sheet. Descriptions are already allocated to a considerable number of these. After each entry, you are asked to which account the item is to be allocated: it is possible to split a single entry between several different accounts if required.

A Journal is provided to allow initial balances to be entered and adjustments to be made. This follows closely the standard Journal format (see Fig. 2.4).

## JOURNALS 01.01.84

=====

DATE 01.01.84

TRANSACTION NO	1
DEBIT A/C	50 FIXED ASSETS
CREDIT A/C	77 OPENING BAL CTL
NARRATIVE	BALANCE B/F
AMOUNT	200*****
TRANSACTION NO	2
DEBIT A/C	56 STOCK
CREDIT A/C	77 OPENING BAL CTL
NARRATIVE	BALANCE B/F
AMOUNT	150*****
TRANSACTION NO	3
DEBIT A/C	57 DEBTORS CONTROL
CREDIT A/C	77 OPENING BAL CTL
NARRATIVE	BALANCE B/F
AMOUNT	96*****
TRANSACTION NO	4
DEBIT A/C	59 CURRENT BANK A/C
CREDIT A/C	77 OPENING BAL CTL
NARRATIVE	BALANCE B/F
AMOUNT	105*****
TRANSACTION NO	5
DEBIT A/C	60 CASH A/C
CREDIT A/C	77 OPENING BAL CTL
NARRATIVE	BALANCE B/F
AMOUNT	33*****
TRANSACTION NO	6
DEBIT A/C	77 OPENING BAL CTL
CREDIT A/C	68 CAPITAL
NARRATIVE	BALANCE B/F
AMOUNT	500*****
TRANSACTION NO	7
DEBIT A/C	77 OPENING BAL CTL
CREDIT A/C	72 CREDITORS CNTRL
NARRATIVE	BALANCE B/F
AMOUNT	84*****

Fig. 2.4. Printout 'journal entries' from 'Book-keeping for the Cash Trader'.

VAT schemes A and B are covered by this program. If you are using a different scheme, then the VAT returns must be prepared by hand and the appropriate Journal adjustments made. For the schemes which are covered, a VAT report is produced consisting of four sections: a summary of inputs for the quarter, split by VAT code, a summary of outputs, split into goods and special, a display of total sales (which can be adjusted to allow for goods taken for own use etc., and asks you to enter any zero-rated sales), and the final VAT account. The program automatically debits the Takings account and credits the VAT account with the amount of output tax, so VAT does not appear in the final Profit and Loss Account.

TRIAL BALANCE AT 01.01.84  
 =====

A/C DESCRIPTION	DR	CR
=====		

(no Trading, Profit and Loss Account entries)

50 FIXED ASSETS		
	200.00	
56 STOCK		
	150.00	
57 DEBTORS CONTROL		
	96.00	
59 CURRENT BANK A/C		
	105.00	
60 CASH A/C		
	33.00	
68 CAPITAL		500.00
72 CREDITORS CNTRL.		84.00
	-----	
	584.00	584.00
	=====	

Fig. 2.5. Printout 'trial balance' from 'Book-keeping for the Cash Trader'.

Credit card sales, using both the Access/Visa and American Express/Diners' Club systems, can be dealt with using the credit card suspense account provided. However, the instructions provided are as brief and inadequate here as elsewhere.

A Trial Balance can be produced at any time. (See Fig. 2.5 for an example of an opening Trial Balance). Full final accounts, both Trading and Profit and Loss Account and the Balance Sheet can be produced (but as I stated earlier, I was unable to get this far). The final accounts omit any nominal ledger accounts with zero balances, but a full list of all nominal ledger accounts can also be printed.

In theory, this is a well-constructed program offering good facilities to cash traders who are also competent book-keepers. In practice, though, it cannot be recommended until such time as the program has been thoroughly debugged and the manual rewritten and greatly expanded.

### **Ledger programs**

In this section I will be looking at programs which are designed to keep the accounts on a single ledger – in other words, at Sales, Purchases and Nominal Ledger programs. These programs are not intended to keep all your company's accounts (with the possible exception of the Impex Nominal Ledger program) but to computerise just one aspect of them. I will be looking at two different series of programs, one produced by Anagram Systems and one by Impex Designs Ltd. The programs in each series are self-contained, but they may be used in conjunction with others in the same series to form a complete accounting system.

Both these series also include Stock Control programs, but these will be examined in the next chapter. Here I am concerned only with the ledger programs.

Using a ledger program generally requires as much book-keeping knowledge as does keeping the same ledger manually. The programs are obviously intended for businesses which already keep these ledgers, so this shouldn't pose any problems. If you do not have sufficient credit sales or purchases to keep track of to justify keeping the relevant ledgers manually, then you are hardly likely to want to keep them on a computer.

What should a Sales Ledger or Purchases Ledger program actually do? Well, its primary function is obviously to keep track of customers' or suppliers' accounts. The program should enable you

to set up accounts for a considerable number of customers or suppliers, and to post invoices, payments, credits, returns and discounts to these accounts as required. You should be able to examine a particular account, to obtain a list of the balances of all the accounts, and to obtain a list of all accounts with non-zero balances. It is also helpful to be able to enter codes on each account or each invoice under which the sales or purchases can be analysed.

If you are going to enter all your suppliers' or customers' names and addresses into the program, then it is useful if these can be utilised for other purposes as well – for printing labels for mailing, for instance. A good program will allow you to do this, as well as printing out invoices, remittance advice notes, etc. when required. However, in using these particular programs on the Commodore 64 you may not be able to lay out your documents exactly as you would choose on your own letterhead.

Nominal Ledger programs are slightly different. The Nominal Ledger generally contains the accounts in which income, expenses, profit and loss of the business are recorded, and also accounts concerned with the assets and liabilities of the business – fixed assets, stock, capital accounts, etc. In fact, it contains all those accounts which have no place in the Sales and Purchases Ledgers. A Nominal Ledger program should keep track of these accounts for you, and enable you to make postings to them, either directly or through a Journal.

The Nominal Ledger accounts are those from which the Profit and Loss Account and Balance Sheet of the business are drawn up, and a Nominal Ledger program may help you to do this, in much the same way as did the programs I looked at in the last section.

If you run the type of small business in which you have comparatively few sales and purchases to deal with, then you may find that you can computerise your accounts adequately using a Nominal Ledger program alone. Susan Curran handles the accounts of her two-person writing/consultancy business in this way, for instance.

The Impex Sales and Purchase program is not, strictly speaking, a ledger program as it records transactions individually rather than under suppliers' or customers' accounts, but it has a similar structure to a ledger program and so has been included in this section.

### *Impex Sales and Purchase*

This program is available on disk only, and comes with a very thin A4-size loose-leaf manual – only 5 pages! Even together with the

instructions for the other programs in Impex's 'Company Pac', it barely adds up to a pamphlet full of documentation.

The program can be used for either sales or purchases; if it is to be used for both, then a separate data disk must be used for each. These disks must be formatted when the program is first run, but this doesn't take very long to do. Adequate instructions are given for this procedure.

The program disk actually contains three programs, the main sales and purchase ledger program and separate programs for laying out and printing invoices or credit notes. As the main menu of the main program contains a print invoice option, it is presumably intended that the program used to lay out invoices should be run before the main program, but the manual does not make this clear. (The instructions actually follow those for the main program.) My attempts to create an invoice layout file were in any case totally unsuccessful, as the program repeatedly crashed mid-way through the procedure.

The format used for entering new invoices in the main program is shown in Fig. 2.6. For some reason, the VAT percentage has been omitted from the printout – it did appear on the screen. The code

```

RECORD      2

INV. NO. 0002.....  DEPT. 1.   STATUS I
CUSTOMER JOE BROWN.....
ADDRESS  ANYSTREET.....
        ANYCITY.....

INV DATE 01.01.1984   DUE   31.01.1984
        ££ ££   ££           ££ ££   ££
        TOTAL EXCLUDING VAT           20.00

VAT %   .....   VAT AMOUNT           3.00

        TOTAL INCLUDING VAT           23.00

```

*Fig. 2.6.* Printout from Impex 'Sales and Purchase' – invoice entry.

entered in the Status field is I, for invoices issued but not yet paid, P for paid invoices, C for credit notes issued or Q for refunds given. If the status entered is C or Q, the program automatically precedes the figures with a minus sign. If the total excluding VAT and the VAT percentage are entered, the VAT amount and total including VAT

appear automatically. Similarly, if you enter the total including VAT and the percentage, or the total excluding VAT and the VAT amount, the remaining figures are provided for you.

The department number shown on the invoice may be any number between 1 and 99, and is used for analysis. It would be possible to enter a different number for each supplier or customer, or to use the numbers to differentiate between different sales areas or categories of goods. Departmental analyses are given whenever lists of transactions are printed. The options available from the main menu are: enter new invoice, amend record, display/print record, delete record, enter payments/receipts, list unpaid invoices and credits, list all transactions for period, clear old transactions, print look-up tables, Nominal Ledger and print invoice. The first of these options is described fairly fully in the manual, and the next six are described briefly (but are, in any case, fairly self-explanatory). No details were given of the remaining four options. It is possible that a page was missing from my copy of the manual, but the five pages I did have were numbered sequentially.

This program does enable you to keep track of unpaid bills, and the departmental analysis available could be very useful. The ability to print invoices would also be useful if it could be made to work. However, with its present program bugs and poor documentation, this package really cannot be recommended.

### *Impex Nominal Ledger*

This program, also supplied on disk only and with a mere three A4-size pages of documentation, bears some resemblance to the all-in-one programs discussed earlier as it is apparently intended to be used mainly for the preparation of final accounts. It can be used on its own or in conjunction with the other programs in the series – an option is provided to read in data from the purchase, sales and stock data files.

The documentation is again inadequate. The instructions for setting up new files for the Sales and Purchase program appear to have been repeated here by mistake, which causes confusion before you have even started. Each of the menu options – open/amend nominal accounts, trial balance, Journals, recall old trial balance, reports/Profit and Loss/Balance Sheet, year-end routines, read purchase, sales or stock files, change return layout – is described very briefly; no examples are given.

The first task facing the user is to decide on the number of nominal accounts to be used. The instructions state that this must be

between 205 and 1000, which seems to me to be far more than any small business could possibly need. I accidentally entered 30, and the program appeared to accept this – no error message came up.

The nominal account descriptions and opening balances are entered next. All positive amounts are treated as debits, and negative amounts as credits. Inexperienced book-keepers may have some difficulty here in deciding which balances should be positive and which negative; the instructions give very little guidance on this. You are advised to enter zero balances on all the accounts. Presumably the figures from the previous year's Balance Sheet should then be fed in by Journal entries. The program keeps you informed of the total trial balance as the individual balances are entered.

All entries are printed out as they are made. There appears to be no means of disabling the printout, so the program can only be used with a printer connected. (Prepare for large ribbon and paper bills!) No information is given on which printers can be used, again a poor feature for any program let alone one in this price bracket. My Epson FX80/parallel interface proved to work, and I assume that the program will work with all printers that can emulate Commodore printers, but possibly not with printers attached to other than the serial port. If you are in any doubt, you should check whether your own combination will work with your dealer or with Impex before parting with your money.

No special provision is made for the preparation of VAT returns, but the balances on the appropriate nominal accounts (Purchases VAT, Sales VAT, VAT Control A/c) could be used for this purpose.

The program unfortunately crashed before I had got very far with it, so I was unable to test all its facilities. However, it appears that producing a set of accounts this way would not be an easy task, and would require a considerable amount of book-keeping knowledge.

### *Anagram Software Sales Ledger*

This package consists of a program disk and 35-page A5-size manual in a sturdy cardboard box. The package is available for disk users only; the disk, as usual, cannot be copied but one free replacement copy can be obtained.

The manual is clearly written. The program functions are all adequately described, and appendices cover system attributes (the screen layout, use of keyboard etc.), the structure of the records held, and error messages. Brief details are also given of special

stationery designed for use with the package, for printing invoices and credit notes.

Before using the main program, you must first run the file create program, to set up your data file disk. This is a lengthy procedure – it takes about fifteen minutes for a single disk. The number of customer accounts which can be held on a single disk depends on the amount of activity on each account, but one data disk should prove adequate for most small businesses. (You can use more if required.)

The next task is to enter general information such as the company's name and address, VAT rates, printer defaults, for use when printing invoices (a reasonable range of printers is catered for) and details of sales areas. The program crashed each time I tried to enter sales area details. Every time this happened the data file was corrupted and I had to spend another fifteen minutes re-formatting the data disk. Consequently, I did not try it too many times, and settled for testing only those functions which did not require sales area details.

The program crashes were rather surprising as the Anagram programs generally appear competent and are pretty well idiot-proofed. If you press an unacceptable key you are normally politely informed of the fact, and if you omit to complete an essential data field or request information on a non-existent account this is picked up by the program and corrected as well. It is an unfortunate comment on the general quality of the other programs I reviewed that this basic requirement for any commercial program should deserve special praise here.

Every series of programs seems to have its own particular format for dates. Some require you to enter the day, then the month, then the year, giving two figures for each; others require the American format with the month first, then the day. Here you have to enter two figures for the day, then three letters for the month, then four numbers for the year (do they expect the program to still be in use in the year 2000?).

The accounts are referenced by the customer's name, rather than by account numbers – a friendly touch when it comes to accessing accounts – and an open-item accounting method is used. This means that each payment must be allocated to a particular invoice, not just to the relevant account. This allows paid invoices to be cleared periodically (normally monthly) to make room for more transactions.

A suspense account and unallocated credit account are provided, to be used for credits and payments which cannot be allocated

immediately to the appropriate customer's account. The suspense account can also be used to correct posting errors; if you have posted cash to the wrong account, you can transfer it to suspense and then to the correct account.

The main program follows the usual menu format, so it is very straightforward to use. Each screen also has an associated 'help' screen, accessed by pressing the left-arrow key, to tell you what functions are available. Menu selections are made by moving a cursor to the required option, rather than by entering the option number. The Return key is used to move the cursor, and Shifted Return to select the option – an odd choice of keys, I thought. However, it is possible to return directly to the main menu if you select the wrong option by mistake.

The main menu options are: ledger processing, customer processing, suspense account, sales area processing, general processing, report processing and file maintenance. These headings are not as self-explanatory as one might wish; it is not obvious from the menu which option should be selected to print an invoice, for instance.

The ledger processing option menu covers printing and posting invoices and credit notes, posting or altering payments, unallocated credits and account enquiries. A sample invoice printed with this option is shown in Fig. 2.7. Customer processing is used for viewing the index of customers and adding, amending or deleting customer accounts. Accounts can only be deleted if the balance on the account is zero and there have been no transactions in the current month, for obvious reasons.

The reports available are a sales list for a single day or the current month; a cash list showing all cash payments, discount given and items posted to and from suspense; a list of current balances, either for all customers or just for those with non-zero balances; an aged debtors list, split up to show the time for which the invoices have been outstanding; customer statements; suspense account transactions for the current month; and customer names and addresses, which can be printed on plain paper complete with telephone numbers and other relevant details, or on gummed labels for mailing list purposes.

This program, and its sister Purchase Ledger program, are obviously intended for rather larger businesses than are most of the other programs I review. It would only be worth investing in such a program if you have a considerable number of account customers to keep track of, or if you have a smaller number of customers but

From: Test Company	Telephone No. 0123 4567
74 High Street	VAT Reg No. 000000000
Anytown	
Wessex	
WX1 2YZ	
	Order reference 0001
To: John Smith	
1 High Street	
Anytown	
Wessex	Urgent

I N V O I C E No. 1		Date 31Jan83	Tax point 31Jan83		
-----					
Qty	Description	Price	%Disc	Total	VAT %
---	-----	----	----	-----	-----
10	Small widgets	0.75		7.50	15.00
		Nett Total		7.50	
		Carriage		1.00	
		VAT		1.28	
		Total due		9.78	
				-----	

Fig. 2.7. Printout from Anagram 'Sales Ledger' – sample invoice.

sufficient transactions on each account to make typing invoices a significant task.

The program is well written and presented, and if it were not for the bug which prevented me from entering sales area details, it could be recommended for those businesses, such as wholesalers and small manufacturers, which would find its facilities useful.

### *Anagram Software Purchase Ledger*

This package is outwardly very similar to the Sales Ledger package; the box is the same, and the manual covers similar ground. The same lengthy file creation procedure is required here, too.

The resemblance between the two programs also extends to the accounting method used (open-item) and the referencing of accounts by name rather than by number. Here, though, remittance notes are printed rather than invoices, and accounts are analysed not by area but under different nominal headings. The program automatically sets up and maintains Bank, Discounts received, Purchases returned and VAT (Input) accounts, and you can add as many more nominal accounts as you think necessary. The sales area processing option which caused me such problems in the sales ledger program has therefore been replaced here with a nominal account

processing option, and there is also a ledger processing (nominal account) option which allows single- or double-sided entries to be made direct to the nominal accounts.

Very little guidance is given in the manual on the use of these nominal accounts. I would have liked to have seen some examples included in the manual of the accounts which might be used by typical businesses. Without such examples or more comprehensive instructions, some users may find it difficult to make full use of the facilities the program offers.

It is possible to split an invoice between up to six different nominal accounts – very useful if, for example, you are buying a new car (a fixed asset) and paying road tax (motor expenses) at the same time.

One difference between this package and the Sales Ledger is that, whereas the Sales Ledger disk contains a single main program (together with the File Create program), the Purchase Ledger, being rather more complex, is split between two programs. Selection of the report printing or file maintenance options from the main menu requires the second program to be loaded. Returning to the main menu from these options obviously requires the programs (and, of course, the program and data disks) to be exchanged again. Clear instructions for carrying out this procedure are given within the program, but it is inevitably time-consuming, so it is a good idea to carry out all your report printing and file maintenance in one go if you can.

The reports which can be obtained here are an invoice list, a payment list (all for either a single day or the month to date), a list of current supplier account balances, a list of settlement discounts available (useful for deciding which accounts to pay first), a list of all accounts outstanding for more than a given number of days, full nominal accounts, summaries of nominal accounts or lists of nominal account transactions for the current month, and suppliers' names and addresses, on plain paper or gummed labels. Examples of lists of invoices outstanding and discounts available are shown in Fig. 2.8.

A suspense account is not provided automatically, but a nominal suspense account could obviously be set up if required. An unallocated debits facility is automatically provided, however.

The ability to handle nominal accounts as well as purchase ledger accounts makes this a very powerful program. It is a little slow to use, but can be recommended for serious consideration.

Anagram Purchase Ledger  
 DISCOUNTS AVAILABLE for 2 Feb 1983 Printed 2Feb83 Page 1

Name	Inv.no.	Date	Gross End date	Discount
ABC Wholesalers	01310003	10Jan83	115.00 7Feb83	5.00
T. Brown & Sons	02020001	27Jan83	74.90 10Feb83	2.50
Widget Supply Co.	02020002	28Jan83	51.75 25Feb83	2.25
	02020003	30Jan83	26.40 27Feb83	1.15
Total				10.90

+++ END OF PRINT +++

Anagram Purchase Ledger  
 Invoices outstanding for 3 day(s) or more Printed 2Feb83 Page 1

Name	Inv.no.	Date	Balance	Sub total
ABC Wholesalers	01310002	28Dec82	54.00	
	01310003	10Jan83	115.00	169.00
T. Brown & Sons	02020001	27Jan83	74.90	74.90
Wessex County Council	01310001	20Oct82	254.86	254.86
Widget Supply Co.	02020002	28Jan83	51.75	
	02020003	30Jan83	26.40	78.15
Total				576.91

+++ END OF PRINT +++

Fig. 2.8. Printout from Anagram 'Purchase Ledger' - 'invoices outstanding/discounts available'

## Summary

After reading these program reviews you cannot fail to be aware that the standard of the accounts programs available on the Commodore 64 is variable at present, and a significant proportion of the programs on the market leave a great deal to be desired. The standards of program documentation vary considerably. A few programs have excellent manuals, but others do not give you all the information you would need to make full use of all the program facilities unless you are an expert at both accountancy and computing, and are prepared to spend a lot of time and effort finding out what to do – and more importantly, what not to do in order to avoid program crashes.

New programs, new versions of existing programs, and new editions of program manuals are being produced all the time, so there are good grounds for hoping that the situation will improve. Any program with serious bugs in it will obviously cause great inconvenience to dealers as well as to end-users. If, therefore, you are reading this book some time after it was written (in January 1984) and the programs described here are still available, it is reasonable to hope that at least some of the problems I encountered with them will no longer exist. If any of the programs described here, or any of the other programs you have heard about or seen advertised, appear to have the facilities you need, then do try to obtain up-to-date copies of the relevant manuals. You should also try to see demonstrations of the actual programs if at all possible, before deciding whether they are suitable for your purposes.

Particularly if you are not a trained accountant, you will have realised, even from trying to follow my brief and sometimes superficial descriptions of program features, how much assistance you will need in making this type of program meet your individual needs. It is important to bear in mind that some programs are produced by very small organisations or even by individual programmers working from home. The standard of support you can expect from these organisations – and, indeed, from large ones – varies greatly. Your supplier may not even be in business by the time your disk corrupts, or you discover a deeply rooted bug in the program. In this case, you will be left alone not merely to start again with a new program, but to recover your data from the wreck of your existing system.

What if you haven't found just what you want? Well, first you should consider how realistic your expectations are. The Com-

modore 64 is a small business computer, and cannot be expected to perform all the same functions as a much larger and more expensive computer. Perhaps you should be looking instead at programs available for larger computers. Commodore produce a whole range of machines, and there are a great many available from other manufacturers too, of course. If you are satisfied that the task you want to computerise can be handled by a computer of this size (and reading this far should have given you a fair idea of what the C64 can do), then there are several options open to you.

Some of the later chapters in this book give details of more general programs (spreadsheets and databases) which you may find useful. They won't lead you by the hand through the preparation of your accounts in the way that some of the programs in this chapter will do, but they can be used for a surprising range of applications. In particular, let us direct you to Superbase 64, an excellent programmable database reviewed in Chapter 5. It is perfectly possible to set up a fairly complex accounting system using this package, even if you are not an expert programmer; and indeed, systems ready written by programmers for use with the package should be available shortly after we write this. Once programmed to perform a specific application, Superbase would appear little different from a competent ledger program.

Precision Software, who market Superbase, have provided not only a program and manual that are welcome reminders of how high standards can be, but also a properly staffed and efficient customer support department, dedicated to sorting out your queries. None of the accounting programs reviewed in this book are in the same class as either this program or the quite different, but equally impressive, Magpie database. We can strongly recommend both programs to you.

## Chapter Three

# **Stock Control and Other Money-oriented Programs**

This chapter deals with stock control, with miscellaneous accounts programs, and also with the problems of setting up a computerised system and switching over from a manual accounting system.

There are a number of accounting and general financial procedures which might appear to be obvious targets for computerisation, but for which programs are not currently available on the Commodore 64. I do not, for instance, know of any programs which are designed specifically to handle wages, though there are some more general programs available which could be adapted to this task.

In this section I will be looking first at those areas where specialised programs are available, stock control and financial planning.

The ways in which wages, handling of investments, calculation of interest payments on loans, mortgage accounts, rental accounts, royalty payments, insurance and other similar miscellaneous applications can be computerised are examined later.

### **Stock control**

Keeping track of stock is a major headache for many small businesses. The annual stocktake is often the only time when accurate information is available about what exactly lies in the dark recesses of the stockroom or warehouse. Imagine how useful it would be to have these figures just a few keypresses away all through the year, to be informed regularly which items are overstocked, which need reordering and which are not selling. Just think how much simpler it would be to maintain an accurate picture of your financial position if you could find out at any time how much your stock is worth without having physically to count each item.

A good stock control program will allow you to enter details of a

large number of different stock items, including cost and selling prices and reorder levels; to record orders and stock movements, and to obtain a list of items which need to be reordered; a valuation of all your stock at cost price or selling price; or a full stocklist against which items can be checked off during stocktaking, simply and easily.

With this kind of help, you should never again find yourself accidentally reordering items with which you were already overstocked, wasting money by holding unnecessarily large stocks of slow-moving items, or unable to fulfil an order when you hadn't even realised that some of your stocks were running dangerously low.

The two programs reviewed here are Commodore's Easy Stock and Impex Designs' Stock Control. These programs belong to the same two series as the ledger programs reviewed in Chapter 2. Easy Stock, though marketed by Commodore, is actually produced by Anagram Software (and is also sold by them as an integral part of their business system). Both programs can be used alone, or they could form part of an integrated system with other programs from the same series.

### *Easy Stock*

This program bears an obvious family resemblance to the Anagram Software ledger programs – the screen layout and use of functions keys are very similar – but comes differently packaged, with a manual produced by Commodore.

Any owner of a C64 will know that Commodore's computer manuals leave a lot to be desired. Surprisingly, their program manuals do not generally suffer from the same faults; this substantial A4-size spiral-bound manual is a model of clarity. All Commodore program manuals are laid out in the same general way: they contain a brief general introduction to the system and the program, a training section, and a reference section, followed by any necessary appendices and, usually, an index. The Easy Stock manual is well illustrated with screen pictures, which takes you through a comprehensive example of the program's use, and includes a section covering the changeover from a manual system, glossary and full index. It is rather long-winded in places and repeats itself a good deal (the training and reference sections both cover the same ground, though in a slightly different order), but having too much information on how to use the program is definitely better than having too little.

The size of the manual may fool you into thinking that this is a very complicated program but, in fact, once the system has been set up and the details of stock items have been entered, it is very simple to use. All you have to do is to enter details of orders and stock movements, and request the reports you need.

The program disk contains three programs, the main Easy Stock program, a File Create program and a program enabling you to make back-up copies of data disks. This back-up program cannot, of course, be used to copy the program disk itself, though no warning is given to this effect in the manual, and no details are given of how extra copies of the program may be obtained. Commodore's normal policy, however, is to make a charge (about £10) for back-up copies of programs.

When the system is first set up, the File Create program must be used to format the data disk(s). As with the other Anagram programs, this takes fifteen to twenty minutes per disk, so it's fortunate that it only has to be done once. Each data disk can hold details of up to 550 different stock items, so in many cases only one disk will be needed. Once this data disk has been prepared, the system start date, VAT rates and printing defaults have to be added. The page describing how to enter printing defaults was missing from the training section of my copy of the manual. I don't know if this is a common fault, but the information is in any case repeated in the reference section, so the omission did not cause any serious problems.

The main program is menu-driven. The main menu options are: stock item processing, in movements, out movements, raise order, stocktaking, price changes, report printing, printing defaults, add/alter tax rates, file usage (used to discover the amount of unused space on the data disk), start of month processing, change of disk or date, and closedown. Many of these options lead you to secondary menus; it is, however, possible to return direct to the main menu at any time. Selection of menu options is by movement of a cursor, not by entry of the option number.

The stock processing option allows you to add, amend or delete stock items, or to examine the stock index or the details of a single item. Items are referenced by number rather than by description, but the stock index can be used to find the number for a particular item. Each individual record contains the reference number; stock item description (up to 35 characters); tax rate applicable; storage location (up to ten characters); quantity description (e.g. kg, boxes); up to two sales analysis codes (for analysing sales under type of

product, supplier, etc.); last movement date; minimum stock level; cost price; selling price (which need not be higher than the cost price); mark-up (calculated by the program); number in stock; cost value and selling value (again calculated by the program); quantity on order; and sales and purchases for the current month and year. Only the reference number field is mandatory, i.e. any or all of the other details can be left blank if required. The entry of data is error-checked, and the program tells you if you have made any invalid entries.

The in movements, out movements and raise order options are self-explanatory. For these, when you have entered the item number the screen display gives you the item description, the quantities currently in stock and on order, the minimum stock level and the price, and you merely have to fill in the number booked in, booked out or ordered. Goods must be ordered before being booked in, as the quantity on order is automatically reduced by the quantity booked in.

This program cannot be used to print orders, a surprising omission as the Sales and Purchase Ledger programs do print their equivalents (invoices, remittance advice notes).

The stocktaking option is used to adjust recorded stock levels after a physical stocktake, not to produce a stocktaking list – this comes under report printing. The other reports available are stock level highlights, giving stock levels either for all items or only for items below minimum stock level; stock movement analysis, giving a valuation of purchases or sales for the current month or the year to date; inactive stock report, giving items inactive since a specified date; price lists (cost price and selling price, or selling price only); sales analysis reports, using one or both of the analysis codes provided; and stock valuation reports, inclusive or exclusive of VAT. Examples of the stock level highlights and the sales analysis reports are shown in Fig. 3.1 and 3.2.

Overall, this is a very comprehensive stock control program, the only noticeable omission from its facilities being its inability to print orders, and is well worth considering if you have a large range of stock items to keep track of.

### *Impex Company-Pac Stock Control*

This, like the other Impex Company-Pac programs, is supplied on disk only. It comes with two and a half A4-size pages of instructions. It would be a gross exaggeration to describe these as a manual.

## STOCK LEVEL HIGHLIGHTS

Printed: 10 Jan 1983

Stock item	Description	Q/Dsc	Minimum	In stock	On order
1	White gloss (1/2lt)	tin	50.00	45.00	0.00
10	White emulsion (1 lt)	tin	50.00	79.00	0.00
11	White emulsion (2 lt)	tin	50.00	58.00	0.00
12	Pink emulsion (2 lt)	tin	20.00	59.00	0.00
13	Grey emulsion (1 lt)	tin	20.00	24.00	0.00
2	white gloss (1 lt)	tin	35.00	39.00	0.00
21	Wallpaper paste (small)	pkt	30.00	59.00	10.00
22	Wallpaper paste (lge)	pkt	100.00	213.00	0.00
3	Black gloss (1/2lt)	tin	25.00	32.00	5.00
31	Wallpaper 0143 (blue)	roll	30.00	30.00	0.00
32	Wallpaper 1622 (green)	roll	30.00	51.00	5.00
4	Black gloss (1 lt)	tin	20.00	28.00	5.00
41	Brush (1/2 in)		25.00	16.00	10.00
42	Brush (1 in)		30.00	41.00	0.00
43	Brush (2 in)		40.00	89.00	0.00
44	Brush (3 in)		50.00	81.00	0.00
5	Red gloss (1/2 lt)	tin	20.00	23.00	0.00
6	Jasmine gloss (1/2 lt)	tin	20.00	17.00	10.00
7	Azure gloss	tin	20.00	25.00	5.00

+++ END OF PRINT +++

Fig. 3.1. Printout from Easy Stock - 'stock level highlights'.

Code 1	Code 2	This month		Since 1Jan83	
		Units	Value	Units	Value
1	3	38.00	69.19	72.00	115.34
2	1	36.00	18.54	36.00	18.54
3	1	15.00	49.50	26.00	88.00
4	2	19.00	31.89	39.00	73.16
Totals			169.12		295.04

+++ END OF PRINT +++

Fig. 3.2. Printout from Easy Stock - 'sales analysis'.

The loading instructions are given at the end, for reasons which remain unclear to me. Perhaps you are supposed to read through the other instructions (not a very arduous task) before attempting to load the program. The instructions also contain a number of typing/spelling mistakes – ‘sotck’, ‘emendments’, ‘smae’. Finding so many errors in a document of this length does not inspire much confidence in the program it describes.

Fortunately, there are less errors in the program than in its documentation. It is a very straightforward menu-driven program, with a single menu from which options are selected by entering the appropriate number.

When the program is first loaded, you are asked whether a file has already been set up; if not, then a new disk can be entered and formatted (a much faster procedure here than with Easy Stock, as a simpler file structure is used). No information is given on the number of records which can be held on a single data disk – time constraints prevented me from finding this out by trial and error, as it is presumably several hundred. The main menu screen does, however, tell you the amount of memory still available. No option is given to

```

RECORD      2

REF. NO. 2.....

ITEM      LARGE TEDDY BEARS.....

SUPPLIER ANYTOY COMPANY.....

ADDRESS  1 HIGH STREET.....
          ANYTOWN.....

PHONE    0123 4567...

RE-ORD.  LEVEL 10          ON ORDER 5

QTY. IN STOCK 8.....

COST PRICE          2.95  VAL.      23.60

SELLING PRICE       4.25  VAL.      34.00

LOCATION A3..... PROFIT %  44.0677966

```

*Fig. 3.3. Impex 'Stock Control' – record format.*

format a second disk, but this can be done if required by re-running the program. The menu includes a file disk change option, so obviously more than one data disk can be used.

The other main menu options are: enter new stock items, amend stock record, display/print, delete item, goods ordered, goods received/despached, list all stock, print reorder list, and display look-up table (which shows the disk track and sector where each record is located).

The screen format used for most of these options is shown in Fig. 3.3. It gives the stock item reference number and description, supplier's name, address and telephone number, reorder level and number on order, cost and selling prices and location. The value, at cost price and at selling price, and the profit percentage are filled in automatically. None of the data fields are optional, but you can enter garbage (just a random character) in any but the reference number field. No checks are made to ensure that you enter numeric data in the numeric fields, but if you enter a letter rather than a number for the cost price or selling price, the program automatically substitutes a zero for this.

Stock movements are entered directly into the screen record, by altering the relevant figures. For the goods on order and quantity in stock, you can enter either the new figure or the increase or decrease, preceded by a plus or minus sign. The program does not keep any records of past stock movements.

Sample stock lists and reorder lists are shown in Figs. 3.4 and 3.5. These are less clearly labelled than the printouts from most accounts programs. The columns on the stock list contain (from left to right) the record number, number in stock, reference number, description, location, purchase value and selling value.

The display look-up table option would also benefit from the addition of some labels. As it stands, it is a totally incomprehensible list of numbers.

This program is very easy to use, despite the scarcity of instructions, but as its range of functions is far smaller than that offered by Easy Stock, and its price-tag is not correspondingly smaller, Easy Stock would seem to be a much better buy.

Before opting for either program, I'd advise you to read through our reports on databases in Chapter 5. Almost any database program could be adapted to provide simple stock control functions; the programmable databases could perform all the functions of the programs described above. If you could find additional uses for a database, you may well find this type of program to be a wiser buy.

			PURCHASE	SELLING
1	13	1		
2	8	2	32.50	45.50
3	4	3	23.60	34.00
4	12	4	7.00	11.00
5	16	5	47.40	63.00
6	26	6	5.60	8.80
7	17	7	14.30	20.80
8	16	8	22.95	31.45
9	8	9	64.00	92.00
10	5	10	180.00	256.00
11	7	11	23.25	31.75
12	13	12	10.15	13.30
13	2	13	30.55	38.35
			2.40	3.70
TOTALS:			463.70	649.65

Fig. 3.4. Impex 'Stock Control' - stock list printout.

ITEMS REQUIRING RE-ORDERING

ITEM CODE	RE-ORDER LEVEL	QTY IN STOCK	QTY ON ORDER	QTY REQUIRED
5	25	16	5	4
6	30	26	0	4
9	10	8	0	2
10	5	5	0	0
11	10	7	0	3

Fig. 3.5. Impex 'Stock Control' - reorder list printout.

## **Financial planning**

Running a business – any business – inevitably involves making financial decisions. You must decide what to buy, what to sell, what prices to charge your customers, how many staff you need and what to pay them, whether to buy or rent your business premises and how much you can afford to pay for them, and what equipment to invest in. All these decisions, and many others, have a large financial element. If you are to maximise your profits (or minimise your losses), then it is important that these decisions should be made on a rational basis, not simply by following your instincts. You need solid information, facts and figures to work from.

This is the essence of good financial planning – knowing, not just guessing, what effects different decisions will have on your cash flow and profitability. As with almost all information-related tasks, the computer can help you to improve the quality of your knowledge.

Obtaining the necessary facts and figures on which to base your decisions inevitably involves performing a lot of calculations, and this is where the computer comes in. Using a computer program to do the hard work for you makes obtaining the figures you need a comparatively simple matter, as it can perform calculations which would take you hours in a matter of seconds. You can examine the probable effects of dozens of different changes in your pricing structure, and see how various changes in the rate of inflation, or interest rates, will affect your financial position, with very little effort.

Spreadsheet programs, which are described in Chapter 4, are a very useful tool for financial planning which is discussed further in that chapter, together with a simple example. Here I will be looking at a more specialised program which, though not as versatile as a spreadsheet, is in many ways easier for a newcomer to this field to use.

## **Future Finance**

This program is produced by Finsama Ltd., and marketed by Commodore. (It's currently packaged in with the 1541 disk drive by some distributors.) Like the other Commodore business programs reviewed in this book, it comes with a large, very comprehensive manual. This appears quite daunting at first, but there is a very long training section designed to lead you through all the program's facilities in easy stages. By the time you reach the end of the training exercises, the task of setting up a financial model for your own business doesn't seem nearly so difficult.

The manual also contains a full reference section, a helpful hints section, various appendices, a glossary and a full index. You are likely to have to refer to the reference section quite frequently, as a program of this complexity will inevitably take some time to get used to.

Two copies of the program disk are supplied, and further copies can be purchased as required (but the manual doesn't say how much they cost).

To use the program, you have first to set up a model of your company's financial position, by entering figures for your sales, purchases, expenses, tax liabilities, etc. on the appropriate screens. You can then change any of these figures, and flick through the various screens to see how the changes you have made affect other figures – your profits and cash flow, for instance. You can set up more than one model – use a different model for each department, or for each product range you deal in – and combine two or more of these models if you wish.

The program has a multiple menu format; from the main menu you can select the profit menu, cashflow menu, filer menu or report menu. The profit menu options allow you to enter up to fifteen different sales items, with their cost and selling prices and expected sales volumes for up to twelve time periods, and up to thirty different expense items for the same periods, and to see the resultant net profit. Once the figures required for the profit report have been entered, you can turn to the cashflow menu and enter details of up to ten purchase items, then view the cashflow report and the tax report.

The filer menu, accessed from the main menu, allows you to file, retrieve or delete a model, view the directory of a data disk, format a new disk or consolidate (combine) two or models. The models to be consolidated must all be stored on disk; you cannot consolidate a model currently in memory and one on disk, as the consolidation option is handled by a separate program. Consolidated models must be saved on disk and reloaded by this program – they cannot be loaded by the main Future Finance program, so the consolidator program has its own report menu to allow these models to be examined.

The more advanced features of this program include facilities to enter sales credit periods (which can have a drastic effect on cash flow), and growth rates, with which you can set any of the input data to increase (or decrease) by a given percentage each period.

The screen display can be printed at any time (see Fig. 3.6 for a sample display), and a number of reports are also available (from

DISPLAY F3 : SALES

PERIOD	ITEM VOLUME	ITEM SALES	TOTAL SALES
1	8	92	92
2	9	104	104
3	9	104	104
4	10	115	115
5	12	138	138
6	12	138	138
7	12	138	138
8	14	161	161
9	15	173	173
10	17	196	196
11	18	207	207
12	18	207	207
	154	1773	1773

1. SWEATER M

*Fig. 3.6.* Future Finance screen display.

the report menu accessed from the main menu). The sales report gives the number and description of each sales item, its tax rate, selling price and cost price, volume sales, total sales value, total cost and total gross profit over all the periods the model covers, and totals of all these figures for all sales items. The purchases and expenses reports give the item number and description, the tax rate, total cost and total amount actually paid over all periods, for all purchases and expenses items respectively.

Several 'help' screens are provided, to remind you what functions are available. Four of these can be obtained at any time from the main Future Finance program, by pressing f6 then the relevant number (1 to 4), and another one can be obtained from the Consolidator program, just pressing f6. These are very useful, and should save a lot of thumbing through the manual.

This is a well-written and carefully constructed program. The comparatively small numbers of purchases and sales items it permits obviously limits the size of businesses that can use it. If you feel the number of items would not be adequate for your needs, then you should look instead at some of the more powerful spreadsheet

programs available. The amount of time required to read through such a long manual and get to grips with all the program's facilities may also put some people off. However, many small businesses would find this program a great help in rationalising their financial decision-making.

## **Other applications**

You may want to use your computer to do something for which you cannot find a special program. Unless you are prepared to buy a computer for which a suitable program is available, or you have sufficient programming knowledge to be able to write what you want yourself, your best option is to use a general-purpose program.

Chapters 4 and 5 cover two different types of program – spreadsheets and databases – which can be adapted to perform a variety of functions. Some word processing programs are also surprisingly versatile, with useful but limited calculation and sorting facilities. There is little point in reviewing the contents of such programs here, but some useful points can be made about their application to accounting tasks.

In order to use a general-purpose program, you must know exactly how to perform the necessary calculations, and to set them out logically. The accounts programs I have reviewed have all been menu-driven programs, which have made it clear to the user what data is to be entered, and in what form it is required. There was no need for the user to know how the program manipulated that data in order to obtain the desired results. No similar guidance can be expected from these programs, however; you must decide for yourself what formulae are to be used for the calculations, and learn how to enter them in a form which the program will understand.

General-purpose programs vary considerably in the facilities they offer and the range of calculations which they can perform. For most accounting applications, only comparatively simple formulae will be needed – the ability to handle trigonometric functions, or statistical functions, will be irrelevant. It is obviously important, though, to ensure that the program you select can do what you want it to do. Check that it can handle numbers of a sufficient size, and formulae of a sufficient length.

If you have been used to performing the calculations you want done by hand, then putting them on a computer should not present any insuperable problems. Just think carefully about what it is that

you do, and try to break it down into small stages. If someone else has been doing the work for you – your secretary, accountant or whoever – then perhaps you can enlist their help, or even rely upon them to handle the task on the computer for you. You may also be able to find useful information in books on accountancy. You don't necessarily have to understand everything that is written in them, only enough to enable you to identify the formulae you need.

### **An integrated system**

If you are planning to use more than one program to handle your accounts – a stock control program and an all-in-one accounts program, perhaps, or a Sales Ledger program and a Purchases Ledger program – then it is obviously desirable that they should fit together well. You will want to be able to feed data from one program into another with the minimum of effort, to make the sales figures from your stock records agree with the Sales Ledger figures, to ensure that the VAT figures produced by the various programs all tie in, and so on.

Getting your programs to interlink to form an integrated accounts system is likely to be easiest if all the programs you use come from the same software house. (This should make the task of learning to use them all easier too, as they will probably have similar screen layouts, function keys, etc.) It is worth compromising a little over individual programs in order to achieve this; if you greatly prefer Supplier A's sales ledger to Supplier B's version, but marginally prefer Supplier B's stock control program, then it is worth sacrificing a few desirable but not essential stock control functions in order to buy both programs from Supplier A.

It's quite feasible, if you select programs that work in a similar way, to use data files created by one program with a second one. Of course, this is true not only of the programs in your accounts suite, but of other programs you might buy. You may want to integrate a financial report into a document prepared by word processor, for instance. There are a number of ways of transferring files, and we discuss them in more depth in Chapter 7.

It is obviously necessary that all the programs you select should use the same time periods. They must all start at the same date, and all produce reports and summaries at the same intervals, whether weekly, monthly or quarterly. Trying to use one program which divides your financial year into 52 weeks, and another which divides

it into 12 months, is a recipe for disaster. Ends of weeks and ends of months rarely coincide!

Requiring programs not only to perform their own functions well, but also to fit together well, may seem now to be introducing an unnecessary complication into the selection procedure. A little time and effort spent ensuring good integration at this stage, however, can save a great deal of trouble in the future.

### **Changing over to a computerised system**

Once you have found your way through the minefield of program reviews, advertisements, advice from friends, colleagues and assorted experts, and sundry other sources of information to select the programs you will use to keep your accounts, you may feel inclined to sit back and congratulate yourself on having successfully completed a tricky job. But you haven't finished yet – choosing the programs is only the first stage! You still have to discover how to set about putting them to work.

The first thing to decide is when to introduce the new system. Not today, or tomorrow – you must give yourself time first to study the programs and the manuals supplied with them. The more familiar you are with the programs before you actually start using them, the better your chances of success will be.

First work through any training exercises given in the program manuals (and persuade anyone else who will be using the programs to work through them too), then try putting in some data of your own. It is a good idea to try feeding in the information used to prepare your last set of accounts, if you have it available, to see if the results you get out agree with the actual accounts. If they don't agree, then try to find out why not. Have you missed out some vital piece of information? Did your accountant make some final adjustments which are beyond the scope of the programs you are using? Or do the programs use a slightly different accounting system?

When you have tested your program(s) on old data, then you may like to try some current data. Use your new system in parallel with the old one for a while, to give any problems time to show up before you start relying on it totally to keep your financial records for you.

### **Timing - all-in-one programs**

Virtually all all-in-one accounts programs require you to start using the system at the start of VAT quarter, if not at the start of a financial year. If your VAT quarters do not coincide with your financial year, then it is well worth trying to have them moved. H.M. Customs and Excise can generally be persuaded to agree to this, as having a VAT quarter straddling the year end causes considerable headaches when you come to produce your annual accounts.

If you can arrange to be running the two systems in tandem when your financial year ends, then the changeover should be quite easy. You can either clear any existing figures out of the system at the beginning of the new year and start all over again, or run the year end procedures built into your program. Nearly all these programs have such procedures built in; if they aren't provided in the program itself, then the manual should give you adequate instructions.

If your start date is just a month or so after the beginning of your financial year, then it is probably worth entering all the records you have kept manually for that period into the program. The complications you will avoid by doing this should amply justify the time it takes you.

If your year end is too far away, and you can't face running two systems at once for that long, then a little more work will be required. You will probably have to prepare (or ask your accountant to prepare) a set of accounts for the part-year up to your changeover date, in order to obtain the initial balances you need to feed into the program. These part-year accounts can be amalgamated with the accounts produced by the computer at the end of the year.

If your accounts are prepared manually, then they are unlikely to be finalised until several weeks, or even months, after the end of your financial year. This will mean that when you switch over to the computer, you will not be able to enter all the necessary figures right away. It may be possible to enter temporary approximations into the program, then to amend these when the accounts are finally ready. If, however, you have run one or more end-of-period processings by the time your accounts are ready, to clear memory space for more data to be entered into the program, you may find you are unable to make backdated changes. Any necessary adjustments will then have to be made to your first set of computer-prepared accounts after these have been produced. Once you are using your computer to prepare your accounts, then you will, of course, be able to get them ready much more rapidly, so such

problems should not arise in subsequent years.

You will need to accumulate a lot of other data to feed into your program as well. It may take you some time to collect together the names, addresses and telephone numbers of all your suppliers and customers, for instance – and you will need a complete list of your debtors and creditors, as well as stock figures and the balances on your bank and cash accounts.

### **Introducing other accounts/financial programs**

If you are planning to use an all-in-one accounts program then your changeover will normally have to be carried out in one go – it won't be possible to put your accounts on to the computer a little bit at a time. If you are introducing a ledger program or stock control program, though, this latter may well prove to be the best approach. You may be able to add each of your customers to a computerised sales ledger when they next order from you, or to add one category of stock to your stock control program at a time.

Ledger programs, like all-in-one programs, will normally have to be introduced at the start of a VAT quarter, if not at the start of a financial year. If you opt to add suppliers or customers gradually, rather than all at once, you will have to keep comparable manual records for those who are not put on the computer straight away, and to enter year-to-date figures as well as the current month's figures into the program, where necessary, when you do put them in.

You need not normally start using a stock control program at the start of a financial year (unless you are intending to use it to keep track of your sales as well as your stock, in which case this might be necessary), but you will obviously have to start off with accurate stock figures if you want the program's reports to be accurate. A physical stocktake, therefore, will have to be carried out immediately before the program is introduced. It will also be necessary to know how much stock you have on order, of course.

A little preparatory work can make the program work much more effectively for you. It is well worth spending some time working out how you want to reference different stock items, as using a logical numbering system will save you spending a lot of time hunting through the program's index for the item you need. The sales analysis codes, if the program you are going to use incorporates these, will also need planning. You should draw up lists of the analysis codes and the suppliers, departments or whatever you

intend them to refer to – and this is something which needs to be done well before you start entering data into the program. Entering the right reference numbers and codes in the first place is a lot quicker and easier than going through all your records to change them later.

Some of the programs available have special stationery requirements. You may need to obtain order forms, credit notes, gummed labels, etc. in a form which your printer will take. It's no good waiting to get hold of these until you are ready to start printing on them; if your firm's name and address has to be printed on each form, for instance, this will probably take some time to do.

There is just one type of program which doesn't need careful timing for its introduction. You can start financial planning whenever you like!

### **Doing the donkey-work**

After you have decided how and when to make the changeover, your work is still not finished. There still remains the task of typing all the necessary data into the computer. If you have to type in details of all your customers, all your suppliers and all your stock, then this will obviously be a time-consuming business. It may mean working late every evening for a week or so, or spending a weekend pounding away at the computer keyboard.

By now you will probably be thinking that turning your accounts over to a computer is a lot more trouble than it's worth. After all, you could keep beautiful records by hand if you spent this much time on them – and it would be a lot cheaper as well. But you must remember that all of this only has to be done once. You can regard the time you spend selecting and setting up your computer system as an investment. Put in some time and effort now, and your computer will go on churning out figures, reports, VAT returns and annual accounts for you, not just this year but for many years to come. And by improving your efficiency, giving you access to up-to-date figures on your business finances, stock holdings and so on whenever you want them, and helping you to rationalise your financial decision-making, it will more than pay for itself, not only in time but in increased profits too.

# Chapter Four

## Spreadsheets

If you are doing financial calculations – or any other calculations, for that matter – using a pencil and paper, then the usual way of setting about it is to arrange the figures in rows and columns. Look at one of your bank statements and you will see that it is arranged in this way, with different columns containing details of the payment or receipt: the amount of a payment, the amount of a receipt, the date and the balance in the account, and with each row containing a separate item. Your statement may not look exactly like that shown in Fig. 4.1, but you will recognise the general principles involved.

Details	Payments	Receipts	Date	Balance
Balance forward			6JAN	510.26
Counter credit		335.27	9JAN	845.53
Cheque 567891	129.00		12JAN	716.53
Cheque 567892	24.32		12JAN	692.21

*Fig. 4.1.* A bank statement is a good example of columnar layout.

You can think of a computerised spreadsheet as being much like a sheet of paper, divided into rows and columns, on which you can enter text or numbers. There are several great advantages to using a computer rather than a pencil and paper, though. You can change the data you write as often as you like, without messing up the sheet. And you need not do the actual calculations yourself; tell the computer which items you want added, subtracted, divided or multiplied and it will do all the hard work for you. The computer remembers the formulae you use, and will recalculate if you change the figures.

This means that it is very easy to determine the effects of altering one or more figures. If, say, you have entered details of your

monthly income and expenditure on the spreadsheet (you'll see how to do this later in this chapter) you can find out very rapidly what effect an increase in your rates or mortgage payments, or a rise in salary, will have on your cashflow. Working by hand, a change like this would mean painstakingly recalculating the whole sheet. Using the computer, pressing just one or two keys will do the job for you.

A row and column layout may sound restrictive, but on a good program it should not be. It's possible to choose for yourself how many rows and columns you will have, up to the maximum size that the program allows. (Don't choose many more than you need: large spreadsheets mean that recalculations take a long time, and they may mean that you exhaust the computer's memory, and inadvertently crash the program. A good program will warn you as memory is being used up, but some don't do so very effectively.) Most programs let you decide how wide the columns should be; some let you vary the width from column to column. You can write headings into the 'cells', and in some programs you can run headings across several adjoining cells. By leaving blank rows and columns, you can lay out your work neatly, and the printed spreadsheet should be perfectly acceptable as a management report.

You should have the facility to save your data and/or formulae on a cassette or disk then reload the spreadsheet later if required, and this enables you to design and save regular report formats. You should be able to print a hard copy of your spreadsheet whenever you want. (Either this or the screen version should indicate the calculated data *or* the formula you specified for their calculation. This then lets you check over your formulations at leisure.) You may also be able to sort entries into alphabetic or numeric order, and search for a given entry (thus using the program as a simple database), or even to present data graphically, in the form of a bar chart.

Where spreadsheets really score over accounting and stock control programs is in their versatility. An accounts program may be able to perform the function for which it is written very efficiently, but is generally limited to just one function or a narrow range of functions. A spreadsheet, however, can do pretty much whatever you want it to do. You must bear in mind, though, that you will need to tell it precisely what to do. Some of the accounts programs we looked at in the last chapter required practically no knowledge of book-keeping from the user as they were written to lead you stage-by-stage through the process, giving you clear instructions at each point. A spreadsheet won't give you instructions in this way – you

won't find yourself presented with menus of options to choose from, but will have to decide for yourself which calculation to perform when. There's no need to panic when you're first presented with that blank screen, however; the manual will give you some examples to get you started.

This lack of built-in structure means that spreadsheets are particularly valuable if the tasks you want to computerise are non-standard ones. If you cannot find an accounts program which will keep your records in the way in which you have kept them in the past, or if you are on one of the less common VAT schemes and cannot find a program which caters for it, then a spreadsheet is well worth considering. You will, of course, have to design and keep to your own auditing and back-up procedures. If you want to use the same data to perform a number of different calculations without having to re-enter your figures each time, then again a spreadsheet presents a useful option. If you don't want to go to the expense of buying a whole range of programs to perform distinct but related tasks, or if you feel you don't have time to learn to use a large range of programs, then read on.

## Spreadsheet layout

A spreadsheet, as we have already seen, is the computer's equivalent of a large sheet of paper divided into rows and columns. It is composed of little boxes, (normally called *cells*), the number of boxes being the number of rows multiplied by the number of columns. Each of these cells will be referenced by the column and row to which it belongs. Generally the columns are numbered 1,2,3... and the rows are lettered a,b,c... (or if there are more than twenty six rows they will have a two-letter reference - aa,ab,ac...az,ba,bb...), starting in both cases from the top left-hand corner. Thus the box in the top left-hand corner will have the reference a1, the box immediately below it will be b1, and the box to its right will be a2. (There are several variations on this system. You may find that the columns are lettered and the rows numbered, or that the numbers start from 0 instead of 1 on some sheets.)

The maximum number of cells you can have depends on the column width and, obviously, on the size of the computer's memory. Most spreadsheet programs on the Commodore 64 enable you to have a maximum of about 2000 cells, so you could have, say, 20 columns and 100 rows, or a long thin sheet with 4 columns and 500

rows. You will normally be asked to select the number of rows and columns you want as soon as you have loaded the program. Bear in mind that some of the rows and columns will contain headings rather than numeric data. If, say, you are using the spreadsheet for monthly income and expenditure figures, you will need a minimum of 14 columns, one for the names of the items, one for each month in the year and one for totals. You may also need to use extra rows to format the sheet for printing – underlining a set of figures, for instance, will take up a row.

As the visual display on a Commodore 64 is a mere 40 columns by 25 rows, obviously the larger spreadsheets will not fit on the screen. Part of the screen is in any case reserved for program instructions and commands, so the area of the sheet which is visible to you at any one time will be only about three or four columns and ten or so rows. There will be some means provided for moving this viewing area around the whole sheet, so you can see whatever part you want. Generally a cursor is provided to do this; the cursor will move from one cell to another when you press the cursor (arrow) keys on the computer keyboard. If you try to move the cursor off the visible part of the sheet, you will find that instead of the cursor moving in the direction you have indicated, the whole screen will scroll in the opposite direction. For example, if the screen is displaying columns 2 to 5 with the cursor in column 5, pressing the cursor right key will leave you with columns 3 to 6 displayed and the cursor in column 6. Often there is also some means of jumping from one part of the sheet to another by, say, entering the reference of the cell you want to appear in the top left-hand corner of the screen.

If you've used the top row and the left-hand columns for headings, scrolling may mean that these disappear from view. Some programs enable you to 'freeze' these on screen, so that they are always visible – a very handy feature.

## **Spreadsheet calculations**

We have seen that a spreadsheet is a large sheet divided into cells into which we can put alphabetic or numeric data. So how do we get it to perform calculations for us? Well, to do this we have to enter formulae in some of the cells instead of data.

The exact form of the formulae to be used obviously varies from one program to another, and will be explained in the program manual. The range of operations which the formulae can cover also

varies. For example, some programs allow you to use trigonometric functions while others permit only the standard arithmetic operations. We'll look here at some simple formulae which should be covered by virtually all programs.

The formulae normally consist of a combination of figures, cell references and operators. One of the simplest formulae you can use will add the contents of two cells together and place the result in a third cell. If we want to add the contents of cell c1 and c2, and place the result in c3, the procedure is usually to move the cursor to cell c3, then enter the formula (c1+c2, +c1+c2, &c1:c2 or similar). This calculation could be performed by entering the actual numbers in cells c1 and c2 in the formula rather than the cell references, but the number in c3 would then remain unchanged if the contents of c1 or c2 were to be altered; using the cell references gives us the ability to automatically re-calculate the result whenever necessary. As I mentioned earlier, it's possible to check to see what formulae you've entered into each cell, though how this is done varies from program to program.

A slightly more elaborate formula could be used to calculate the VAT on an item, given the net selling price. We could enter in cells a2, a3 and a4, NET, VAT and GROSS, then enter the name of an item in cell b1, its net selling price in b2, and calculate the contents of b3 and b4. Figure 4.2 gives an idea how this would look.

	1	2	3	4
a		NET	VAT	GROSS
b	ITEM	120.00	(+b2*15/100)	(+b2+b3)
				or (+b2*115/100)

*Fig. 4.2.* Calculating VAT on an item.

Some programs will immediately calculate the results and replace the formulae in cells b3 and b4 with the appropriate figures. With others, you may have to enter a special command to tell the computer to perform the calculations. (Generally the whole sheet will then be re-calculated.)

If we were to want to work out the VAT on a large number of items, we would obviously have to put similar formulae to those in cells b3 and b4 in the corresponding cells in other rows – cells c3

and c4, d3 and d4, etc. Normally a special function is provided to replicate formulae like this over a given range of cells, so they need not be typed in over and over again.

If the VAT rate were to be altered from 15% to 12.5%, all we would have to do would be to alter the formulae in cells b3 and b4, duplicate them over the required range again, then ask the computer to recalculate the sheet. Just three or four entries would give us the new figures for hundreds of different items!

### **Financial planning for small companies**

A spreadsheet can be used for keeping records and performing calculations; for helping you to keep track of your income and expenditure, and to prepare the necessary income tax and VAT records and returns. But as well as dealing with what has happened in the past, it can also be used to look into the future – to help you to predict the outcome of various financial decisions. Would an investment in new equipment improve the financial standing of your business, or would it lead instead to serious cashflow problems? If you were to move to larger premises and take on more staff, would the probable increase in sales lead to increased profits or be swallowed up by the higher overheads? Would the increase in sales resulting from a reduction in your gross profit margin mean higher or lower profits in the long run? A spreadsheet can help you to find the answers to these and many other questions affecting business finances, by enabling you to see the effects of altering one or more figures in your accounts, quickly and simply.

A spreadsheet isn't, of course, like a crystal ball. It can't really see into the future but can only perform calculations based on the figures and formulae you put into the program – and the accuracy of the results will obviously depend on the accuracy of the assumptions you make. It can't tell you how much more you will sell if you reduce your selling price by a given percentage, but if you tell it what the *expected* increase in sales is, it can tell you very quickly how your profits would be affected. It can do this over and over again for as many different figures as you care to feed in, so you can see which combination of figures will lead to the best expected outcome. Similarly, it can't tell you what the Chancellor will do in his next budget, but it can provide you with an easy means of determining what effects various alterations in tax rates would have on your

financial situation. You will, therefore, have a firm basis on which to decide how best to respond to the changes when they come.

A simple example should make it clearer to you how the system works. We'll begin with some sales and expenses figures for an imaginary company; the figures given are not actual figures, as we are looking into the future, but estimates based on records of past performance. (These figures cover a period of only three months, but for a real application you would obviously want to use a longer period than this.) Figure 4.3 shows the spreadsheet layout for this example.

The formulae in cells b3,b4,f3 and f4 show that we are initially assuming constant sales, rent and rates. Next we'll fill in some more formulae; we'll assume an initial gross profit margin of 20% to

	1	2	3	4	5
a		JAN	FEB	MAR	TOTAL
b SALES		3000	(b2)	(b3)	
c Cost of Sls.					
d GR. PROFIT					
e EXPENSES:					
f Rent & Rates		150	(f2)	(f3)	
g Light & Ht.		70	60	50	
h Wages		100	100	110	
i Travelling		30	30	30	
j TOTAL					
k NET PROFIT					
l Bal. b/f		0			
m Bal. c/f					

Fig. 4.3. A financial planning example: sales and expenses.

determine the cost of sales, then deduct this figure from the sales to give the gross profit. Adding up the various expenses and deducting the total from the gross profit will give the net profit. This, added to the balance brought forward, will then give us the balance to carry forward to the next month.

The formulae need not, of course, all be entered separately – those on the first column can be duplicated in the next column, and the top formula in the totals column ( $b_2 + b_3 + b_4$ ) can be replicated in rows c to k. Remember that the balances in rows l and m are not totalled in the same way as the other figures; the balance brought forward in the totals column should be that given in the first column, and the balance carried forward should be that given in the last column of monthly figures. (The time saved by replicating the formulae will not be very great in this example, but would be much more significant on a larger sheet.) Figure 4.4 shows the appropriate entries.

	1	2	3	4	5
a		JAN	FEB	MAR	TOTAL
b SALES		3000	(b2)	(b3)	(b2+b3+b4)
c Cost of Sales		(b2*100/120)	(b3*100/120)	(b4*100/120)	(c2+c3+c4)
d GR. PROFIT		(b2-c2)	(b3-c3)	(b4-c4)	(d2+d3+d4)
e EXPENSES:					
f Rent & Rates		150	(f2)	(f3)	(f2+f3+f4)
g Light & Ht.		70	60	50	(g2+g3+g4)
h Wages		100	100	110	(h2+h3+h4)
i Travelling		30	30	30	(i2+i3+i4)
j TOTAL		(f2+g2+h2+i2)	(f3+g3+h3+i3)	(f4+g4+h4+i4)	(j2+j3+j4)
k NET PROFIT		(d2-j2)	(d3-j3)	(d4-j4)	(k2+k3+k4)
l Bal. b/f		0	(m2)	(m3)	(l2)
m Bal. c/f		(k2+l2)	(k3+l3)	(k4+l4)	(m4)

*Fig. 4.4.* Replication of formulae.

Once the formulae have been calculated, you should see a fairly healthy picture with the balances growing steadily. Now let's see the effect of some alterations. What if sales, instead of remaining constant, increase by 5% per month? Figure 4.5 shows the formulae for this change.

b SALES                      3000                      (b2\*105/100)                      (b3\*105/100)  
 (b2+b3+b4)

*Fig. 4.5.* Formulae for a recalculation.

Recalculate, and the figures look even better. But what if this rise in sales were to be achieved by reducing the gross profit margin from 20% to 15%, at the start of February? (See Fig. 4.6.)

c Cost of Sales    (b2\*100/120) (b3\*100/115)                      (b4\*100/115)  
 (c2+c3+c4)

*Fig. 4.6.* Formulae for another recalculation.

How do the figures now compare to our original ones? Is reducing the profit margin by this much a good idea? If it resulted in sales of £3500 in February and March, would it be worthwhile? Alter cells b3 and b4 again to find out.

What if the business were to move to larger premises in March, with the rent and rates increasing by £100 per month and an expected increase in sales of £1000 per month – would this move be profitable? You can get the answer by changing b4 and f4. When should the balances be high enough to permit an investment of £500 in new equipment, without going into the red? If the interest on an overdraft is 1.5% per month, would it be better to buy this equipment in January for cash, or on hire purchase with 26 monthly payments of £20 each? (You'll need to have a lot more columns on your spreadsheet to answer that one.)

The kind of information that you can obtain by playing about with your figures in this way can be of immense value in helping you to run your business efficiently and profitably (and it comes in handy at home too – would it really be cheaper to buy a washing machine than to go to the laundrette? How long will double glazing take to pay for itself, if it cuts your fuel bills by 10%?). Unless you are already a financial wizard, you'll probably find yourself quite surprised by some of your results.

## Spreadsheet programs

If you've now been convinced that you need a spreadsheet, then the next task facing you is to decide which one to get. The programs available, though all following the same basic structure, vary

considerably in cost and in the extra facilities they offer. I will look at three of the programs on the market, one fairly simple spreadsheet and two more complex ones.

### *Busicalc*

This is a standard spreadsheet program. It doesn't offer much in the way of extras, but will do everything I have described so far in this chapter efficiently enough.

This program is available on disk or cassette. Its lack of sophistication is evident right from the start – no title screen is displayed during loading, and the program doesn't auto-run. There is a small 32-page manual supplied with it. This begins with a short introduction to spreadsheets in general and Busicalc in particular, then moves on to a very simple example of the program's use before giving a detailed description of all the functions available. The order in which formulae are evaluated and the method used to store data on tape or disk are clearly explained. An appendix gives a more complex example of how the program can be used for cashflow forecasting.

Busicalc allows you to have up to 99 rows on your spreadsheet, and as many columns as the computer's memory space will permit. No exact figure is given for the maximum number of cells but it is suggested that there should be space for about 2000 on the Commodore 64. The column width is selectable, from 5 to 18 characters. The on-screen width is the same for all the columns, but it is possible to select different widths for various columns when printing the sheet, to improve its appearance and legibility.

The program prompts and user inputs are shown on separate lines at the top of the screen. The functions available are accessed by the / key. They are Jump (to a specified box); Save (on disk or tape); Load; Replicate (which allows data or formulae in a single cell, row, column or rectangle to be duplicated in other parts of the sheet); Insert (which allows you to put in a new row or column at a specified point); Delete (for removing a row or column); Print; Auto (enables or disables automatic calculation of formulae on entry); Walk (which programs the cursor to move to a new cell automatically after data entry – though this can be done more easily by pressing one of the cursor keys instead of Return); Format (for printed output) and Memory (which determines the amount of memory space which is free).

The operators available for use in formulae are the normal arithmetic ones (+, -, \*, / and ~) and also &, to sum a row or column,

> to select the maximum value in a given area, < to select a minimum and £ to calculate a mean. All formulae must start with one of the operators – this is something which is not stressed in the manual, but if you omit the first operator (i.e. enter  $b2+b3$  instead of  $+b2+b3$ ) then the expression will be interpreted as text, not a formula, and will not be evaluated.

Formulae are evaluated from left to right, ignoring the usual order of precedence of operators. For instance,  $+a1+a2*b2$  will calculate the sum of  $a1$  and  $a2$  and multiply the result by  $b2$ . Brackets cannot be used to change the order of operations, so great care must be taken to enter the operators and operands in the correct order.

Formulae are normally evaluated on entry, unless automatic calculation has been disabled by use of the Auto function. Pressing '!' forces recalculation of the whole sheet. For a large sheet this takes some time, but it is possible to recalculate just the cell in which the cursor is placed by pressing Shift and Return.

The cursor keys are normally used to move the box cursor around the sheet, but an Edit mode (accessed by CTRL/9) is available which allows them to be used to move the cursor on the input line instead, for editing input. Other nice touches in this program include facilities for formatting printed output by selection of the number of decimal places required in calculated values, optional insertion of commas in large numbers, the inclusion of 'literals' (percentage signs or similar) after calculated results, and insertion of long headings into a single cell. A fairly wide range of printers is catered for.

The comparative simplicity of this program makes it easy to understand and use, so if these specifications meet your requirements, it could be just what you are looking for.

### *Busicalc 2*

This is an upgraded version of Busicalc, with all the facilities of its baby brother and quite a lot more besides. Further upgrades are planned for the future, so do check with your supplier before committing yourself to a particular version, to get up-to-date information on what is available.

The manual supplied with this program is much more substantial than the Busicalc manual, with forty-two A4-size pages. As well as giving details of the new facilities in this version, some old ground is covered in much greater detail. The section dealing with printing, for example, has been greatly expanded to explain which options should be selected for different models of printer. The examples

given here, however, have not been changed much and so do not illustrate the use of many of the new functions.

This spreadsheet can have from 20 to 999 rows and from 2 to 125 columns, provided that the total number of cells does not exceed 2500. No maximum column width is given in the manual but I found that the program would not accept column widths greater than nine characters. This is quite enough, however, as Commodore BASIC is only accurate to nine significant figures, and it is possible to insert more than nine text characters into a cell of this size then format individual columns to greater widths before printing the sheet.

The screen display has been improved to permit a choice of seven different colour combinations. A very useful facility enabling you to fix part of the sheet on the screen while the remainder scrolls – so that, for instance, the row and column headings are always visible – has also been included.

The list of operators available includes @, to count the number of non-empty boxes in a given area, and \$ for calculating standard deviations. A considerable number of mathematical functions have also been provided – these are the trigonometric functions Sin, Tan and Cos, Pos, Neg and Zero for testing the value of expressions, square root(Q), Absolute value, Integer, Fix and selection of a Random number. (Each can be entered using the initial capital letter shown, or the equivalent BASIC keyword). Brackets can be used in formulae – up to twenty levels of them – which makes determining the correct formula to enter much easier.

Disk users are well catered for – a full range of disk commands is provided, so it is possible to format a disk or delete, copy or rename a file from within the program. Files can be saved on disk or tape as calculated values or as formulae; the program permits the use of up to three user-defined functions, and these can be saved separately if required.

The program's Insert and Delete commands have been expanded to allow more than one row or column to be put into or taken out of the sheet at once, and there is also an Erase command, which allows all or any part of the sheet to be cleared, and a Quit command, which enables you to exit from the program without switching the computer off. (You can then re-run the program and start again if you wish). The last new command is Find, which will locate a specific entry very quickly. This is obviously very useful if the program is to be used for stock lists, price lists, etc.

Overall, this is a powerful and well-documented program which,

considering the range of facilities it offers, is surprisingly easy to use, and it is well worth taking a close look at.

### *Practicalc 64*

This is another powerful spreadsheet program, which again is available on tape or disk. The manual supplied is small but quite fat (eighty-four pages). It is less clearly laid out than the *Busicalc 2* manual, but covers similar ground. The application example given is a departmental sales analysis. It is used to illustrate a large proportion of the functions and commands available, but the fact that descriptions of the commands it does not use are distributed between the training exercises makes these exercises at times rather difficult to follow. The commands available from the main options menu are described in alphabetical order, which makes for easy reference but means that, for instance, the methods used for loading files previously saved on tape or disk are introduced before the methods for saving files. The descriptions of individual command are, however, very clear.

Up to 250 rows and 100 columns are allowed, provided that the number of cells does not exceed 2000. The spreadsheet size is determined at the start of the program, as with *Busicalc*, but the column width can be changed at any time without losing the data on the sheet. The minimum width is 3 characters, and the maximum 38.

User prompts and input are again shown at the top of the screen. The function keys (f1, f3, f5 and f7) are used to access the program's main facilities. The f1 key is used to designate input as a formula (so formulae need not start with an operator), and also for the direction function. This enables the user to enter prompts for subsequent users of the sheet, so they can enter fresh data without further instruction.

Pressing f3 produces the main options menu. The commands available here are B (to blank an individual cell); C (to clear the entire sheet); D (to delete a single row or column); F (to format an individual cell); G (to set a global format, for the entire sheet – except for those cells which have been individually formatted); I (to insert a row or column); J (to change the justification of text); L (load); M (to move the contents of a row or column into another row or column, or to copy the contents of a single cell into another cell); P (print); S (save); T (to fix a row or column on screen, i.e. to prevent it from scrolling, or to change the width of an individual column); X (sort); and @ (search). Pressing the space bar after f3 gives the

amount of memory available for labels and formulae.

The other two function keys, f5 and f7, are used for replication of data, cell format or formulae, and for escape from any function respectively.

The mathematical functions and operators available for use in formulae are much the same as for *Busicalc 2*: +, -, \*, /, †, SUM, AVG (average), MAX, MIN, COU (count the number of numeric entries in a given range), LOG, EXP, ABS, INT, SGN, SQR (square root), RND (random number), SIN, TAN, COS, and ATN. The operators <, > and = can be used in true/false expressions, returning a result of -1 if true and 0 if false. The standard order of precedence of operators is followed in formulae, but brackets can be used to change the order if required. Formulae are not automatically calculated on entry; typing '!' results in calculation of the whole sheet.

The number formats available (selected by F or G from the f3 options menu) are integer, dollar format – two decimal places – and floating decimal. Numbers are shown in exponential form when necessary, i.e. when the column width is not sufficient for them to be written in full. They can also be depicted graphically, as a bar chart or histogram, using high or low resolution graphics. In low resolution, each unit is represented by an asterisk, provided that the column width is sufficient. (If not, an error message will be shown.) In high resolution, shaded rectangles are used, and numbers up to eight times the column width can be represented. These graphic representations can, of course, be printed together with the rest of the sheet if a suitable printer is available.

The sort and search options (X and @) deserve further explanation, as these are surprisingly powerful. The sort option allows all or part of a column to be sorted into alphabetic or numeric order, from highest to lowest or lowest to highest. This option leaves blank cells in place rather than placing them all together at the lower end, so the spacing of information in the sheet is preserved. Data in other columns is moved as necessary, and formulae are re-referenced where possible, though some range functions (such as SUM) may have to be changed. The sort option allows you to search a single row or column, or the whole sheet, for a given number or text string, and permits the use of wild cards for text entries. The < and > symbols can be used when searching for numeric entries.

The program caters for a wide range of printers, but the instructions for entering print command options are very complicated. You are required to know the baud rate of your printer, the

characters used to select expanded or condensed printing etc., to perform calculations using this data, then to look up the appropriate codes to enter in special tables. This may seem rather daunting if your printer is a non-standard one.

This program represents a good option if you think you may need the special facilities – sorting, searching, printing bar charts – which it offers.

## Chapter Five

# Databases and Filing Systems

My subject in this chapter is *databases*. I should explain that this term is used quite loosely in a microcomputer context, and that by no means all the systems I discuss would be classed as proper databases by those familiar with larger and more powerful mainframe computers, however.

A database, according to this fairly loose definition, has two purposes. First, it holds an ordered set of information, in a file format, and – naturally – enables you to enter and retrieve information and to update the file. Second, it enables you, at least to some extent, to manipulate the information in the file: to calculate totals, to output reports summarising the information, to print invoices, or whatever. Some systems perform the first of these tasks, but not the second. I would describe them strictly as filing systems, and reserve the term ‘databases’ for more ambitious programs. However, the range of manipulative facilities that the programs provide varies greatly.

Databases can be extremely powerful and versatile programs. With a good database program, you may be able to do much or even all of your invoicing and stock control, your budgeting, generating mailing labels or even simple form letters, and keeping track of all your miscellaneous files and records. It is difficult to conceive of any type of business that could not find a use for this type of program.

However, databases are not easy programs to use. It is normally up to the user to design the structure of his or her file, and to program the manipulations to be carried out to it. This is at least as difficult as writing a short program in BASIC, and you will find it much easier to use a database program if you have at least an elementary knowledge of BASIC programming. If you don’t have this, you may prefer to look for a ready-programmed application module, a secondary program that ‘tailors’ the database to a specific application. Such modules are produced for most powerful

database programs, for applications such as club management, patient or customer record keeping, invoice recording and chasing, and so on. Your dealer will be able to advise you exactly of what is currently available. Alternatively, you can start with a simpler and less powerful program, that will enable you to learn the general principles – and doubtless show you why you need a better one to succeed it!

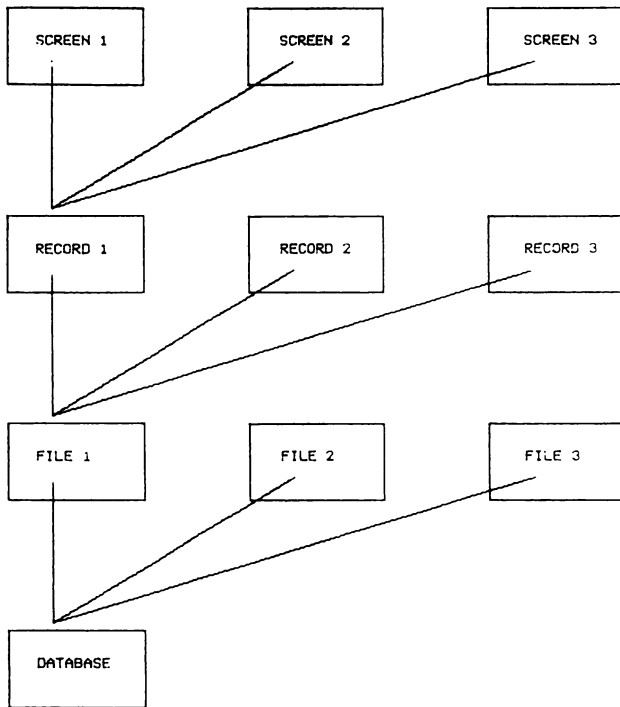
## Filing facts

You will almost certainly be familiar with the principles of a card file. A box holds a set of record cards, on each one of which you write the details that make up a particular record: the particulars of a book or record, useful names and addresses, the details of a patient or client, and so on. Database and filing programs usually stick to this terminology, and talk of ‘files’ that contain a number of ‘records’. The file is normally given a file name, and can be stored on disk (or sometimes on tape) just like any other data file.

A few programs specifically simulate cardboxes. Each record consists of a blank screen, perhaps ruled to imitate a file card. It’s up to you to write whatever you fancy on the screen. The cards will be filed either numerically or alphabetically according to the data on the first line. You then flick through the ‘index of first lines’, or search for a particular title, in order to track down the record you want. Programs like this are easy to use, but they don’t lend themselves to complex manipulation of the stored data. All you can do with a record is to look at it, amend it, or perhaps print it. They are filing programs, not databases. They would be suitable replacements for most manual card-indexes.

All databases, and many filing programs, structure their contents more precisely. Think of a printed form, with blanks waiting to be filled in. Each blank, in database terminology, is a *field*. Each field will have a number, and often a title which tells you what sort of data will go into it: name, address, amount outstanding, date, and so on. There’s generally a maximum amount of information that will fit into any one field. Sometimes information is required in a still more precise format, and you see instructions like ‘Enter Date (DD/MM/YY),’ or ‘Give Reference No. (8 digits)’. Filling some fields may be optional; others will need completion on every single record.

Database records work in just the same way. Each record is divided into fields, and each field has a name and/or a number, and



*Fig. 5.1.* Database structure.

normally a maximum length. You create records by entering data into a screen 'form' (terminology varies from program to program) very much like a printed form. The layout normally includes the field names, and perhaps has headings and other markings as well. A good form layout will make it clear to you just how much data, and of what type, you should enter into each field. The individual records are then stored on disk (cassette is not normally an appropriate medium), in a way that enables them to be retrieved in a more or less flexible fashion. The records are often numbered, and normally indexed by one or more 'key' fields.

Often it's possible to specify whether a field will contain alphabetical information, numerical information, or a date; some programs divide the possibilities up still further. A good program will then reject an unsuitable entry like 'not sure' for 'amount owing'. Often, again, it's possible to specify whether a field is 'forced entry', or whether filling it is optional. Many programs allow you to set up 'default' values for fields (today's date, '0' for amounts, the same details as were included in the previous record) to make the task of typing in data less onerous.

Some programs keep a very close correspondence between the records (that is, the actual data) and the 'form' in which they are displayed. (In the program *Simply File* for instance, the 'form' is no more than a list of fields: no attempt is made to lay it out more elaborately.) Others tend to make a distinction between the two. It is often possible to display information from the same record on two or more different 'forms', so that the layout, or the fields chosen for display, can be varied for different purposes. For instance, an address file might be rearranged, minus telephone number and other incidental information, into a format suitable for printing labels; the information in a customer account status file might be adjusted to form the basis of a monthly customer account statement. This approach (taken furthest by *Magpie*, as we shall see) can be confusing, but it is very flexible once you master its operation.

Organising the data on disk is a complex task, and different programs tackle it in different ways. Many programs, including *Magpie* and *Infomast*, actually store the details of the file format, and the data on the different records, on completely different disks. This is not an advantage: it can involve a lot of disk-swapping if you use a single-disk system, and it takes up a lot of disks! The complexity of the way in which data is stored will also affect the maximum number of records that can be held on a typical 170K disk.

Programs specifically designed to hold addresses and other 'mailing list' information sometimes set up a suitable 'form' or 'screen' for you and your only task is to complete this accordingly. Figure 5.2 shows a typical screen layout for a record in such a file. This

```

LASTNAME      <BLENKINSON          >

FIRSTNAME(S) <WILLIAM              >

ADDRESS1     <25 SHORTHORN DRIVE    >

ADDRESS2     <NETHER MIDDLETON      >

ADDRESS3     <STAFFS                    >

ADDRESS4     <                          >

PHONE NO.    <1234 56789         >

```

*Fig. 5.2.* A very simple form for an 'address book' file. This one is produced on *Superbase 64*. The size of each field (i.e. the amount of information that can be entered) is given by the '<>' markers.

is obviously a very simple form: you will come across many more complex ones. It's important to ensure that US-originated programs in particular have a structure that's suitable (or can be amended to be suitable) for your uses. Sometimes, for instance, they only allow a two-digit state code where you'd like to enter a longer county name.

More general-purpose programs leave you to decide for yourself how the record and/or forms should be set up, though they may give you some initial 'templates' to help you get started. (All the programs I review either included an address file form, or gave detailed instructions for creating one.) Figures 5.3 and 5.4 show two different screen layouts generated by the Superbase 64 database program: one to hold data on customer accounts, and one to hold data on invoices. Both have been copied using a 'copy screen'

```

MODE   SELECT  N,L,P,F,K,C,M,O,A,R,D,+--

      CUST. REF      <BLO/10075 >

      NAME           <BLOGGS, JOE      >

      PHONE          <01-765 9878 >

      ADDRESS        <12 PARK ROAD      >
      TOWN           <ST JOHN'S WOOD   >
      COUNTY         <LONDON NW1      >

      CREDIT LIMIT   < 100.00>

      DATE LAST INVOICE <14JUN83>

      DATE CASH LAST RECEIVED <01MAY83>

      BALANCE        <                >

```

*Fig. 5.3.* Records screen produced by Superbase 64.

command. The top line gives the menu options for selecting a record to be viewed: Next, Last, Previous, First, etc. – a menu explains the meaning of each. '<>' signs show the length of each field.

These examples are used in Superbase's demonstration, but they are only examples: you can set up any layout you wish to fit the type of information you wish to file. (Note, too, that the rather cryptic

```

MODE  SELECT N,L,P,F,K,C,M,O,A,R,D,+
CUSTOMER INVOICE CARD

CUST  <CRANSTOUN          >ORDER<457897  >
ADDR  <105 DALMALLY RD.> DATE <25AUG83>
TOWN  <CROYDON.          > DISC < 10>
COUNTY <SURREY.        > VAT  <15%>
PCODE <ST5 RF8           >
PHONE <01 773 3058      >

GOODS <65 COPIES OF SUPERBASE>

COST  < 99.99>
C1 < 6499.350>  C2 < 5849.42>
TOTAL < 6726.83>

```

*Fig. 5.4.* Another record screen produced by Superbase 64.

'invoice card' isn't meant to be an invoice: a separate 'form' layout can be designed for printing the invoices themselves.)

The amount of information that you can hold in a record varies. Sometimes there is a maximum number of characters; sometimes you are restricted only by the amount that will fit onto the screen; some times you are restricted by 'form' layouts that don't correspond precisely to the screen size. In Superbase 64, for instance, you are allowed to link screens, and have a multi-screen record. (Think of this as a set of index cards, clipped together.) In Magpie, you can set up a supersized form, and have the screen 'scroll' up and down and across to show all the information contained on it.

There is often a short maximum length (say, under 30 characters) for key fields. This helps to improve the efficiency of, and reduce the space taken up by, indexes. There is sometimes a fairly short maximum length for all record fields. Sometimes, in contrast, you can set up a lengthy 'memo' as part of a record, either in a long field, or through a separate option. This might be handy, for instance, for

listing the various contacts you have in a large firm whose address you have on file; for making a note of contract details, or of the standard charges of a contractor; or even for writing diary-type 'reminders' for yourself. (Index them by date, and check the current 'diary page' each day.)

Programs also vary in the validation checks (e.g. for entry into forced-fields, and for suitable entries to numeric and date fields) which they carry out when you enter data into a record. They vary in the clarity of the record layout, and in the flexibility they give you in designing the layout and in entering and correcting data. They vary in their provisions for data security, an issue we discussed in Chapter 1. These points should be clearer to you when we come to discuss specific programs. More than this, however, programs vary massively in the efficiency with which they enable you to locate and display different records.

### **Finding specific records**

Demonstration systems, such as your dealer may show you, typically contain only a very few records – perhaps only a dozen. On these short files, you can expect any program to locate records rapidly. When it comes to searching files with hundreds of records, however, the performance of programs varies very markedly.

Any program should allow you to 'page' through the records one by one, in numerical order or in alphabetical order according to the main 'key' field – which might, say, be 'name'. Some programs sort the records, automatically or on demand, alphabetically or numerically according to alternate key fields – for example, in descending order of amount owing. You will be able to page through in this order, too. It should also be possible to look virtually instantly at any record, by giving its key field contents or its number.

This is fine if you want to locate a person whose name you know. It's not so fine if you can't remember the name of the person who lives at number 24, or of the plumber you need at midnight. To add flexibility, a good program should be able to 'search' not only the key field, but all fields of the record in order to find a string of data that you specify. (Sometimes you indicate in what field your 'search string' will appear. Sometimes you don't, which is more flexible but slower.) A good search routine will include the 'wild cards', '?' for 'any single character' and '\*' for 'any string of characters' so that you can cater for names you half-remember, or

alternate spellings you are not certain of, by asking the program to look for 'Johns\*' (maybe Johnson or Johnstone?), or 'W?ld\*' (Wild, Wyld or Wyld?) A good routine will also stop at a 'best match', if no exact fit can be found.

Powerful database programs often go further than this. Rather than looking just for a single 'match', or for the 'next match', they will find and keep note of a group of records that meet a certain criterion. As well as searching for a match, they will search for records using greater than (>) and less than (<) criteria, so that you can find, for instance, records in which 'total outstanding >£500'. They allow you to AND and OR multiple search criteria, asking the program to find, for instance, records in which 'address field 3 = London OR Croydon', or in which 'address field 3 = London' AND 'total outstanding >500'. Once the program has found these records, you may be able not only to flick through them but also to save them separately in a temporary or permanent file for further processing of the kind we discuss below.

Programs vary widely in the way in which they handle such abstraction. Some programs will print the key field contents or numbers of the records that are selected. Others enable you to page through them automatically. Others will print any selected details that you request, in report form. Which of these methods is best depends upon the uses you plan to make of the system.

## **Manipulating stored data**

Any good program should enable you to amend existing records without completely retyping them, to delete unwanted records and to add new ones. (Deleting records is the trickiest of the three. A few programs have no facility for this, and you need to track down unwanted records and blank them out or overwrite with new details.) Programs without complex reporting facilities will often let you print out any record on demand; more elaborate programs may not support this. A powerful program may let you split long files into two, or amalgamate existing files. It will not be confused if two records have the same key field contents, though it may warn you if this happens.

Many programs will let you work with more than one 'form' for displaying records at once, though the terminology they use to describe this facility varies. Only a very powerful program will let you work with more than one data file at once. This is a very

desirable feature. You might, for instance, copy selected fields from records in an existing file into a new file, with a different record format and other unique fields. You might want to update two or more files concurrently, writing data from the 'invoices' file into the 'customer account status' file, for example. Linking files in this way brings us towards the territory of the 'relational database'. Programs of the type that run on the Commodore 64 will not be able to go more than a little way in this direction. Even the best such program won't normally be able to update several files simultaneously for you though it may be able to switch between them while you update them alternately. It will be your responsibility to ensure that you keep file contents consistent.

It is normal for a database-type program to allow three other types of manipulation. First, it may allow you to carry out calculations on the individual records or on the file as a whole. Second, it may allow you to 'program' a sequence of commands into a short program that can be 'run' automatically, to simplify a regular task like the monthly updating of client account files. And third, it may allow you to design report forms and generate reports on file contents. We will look at each of these operations individually.

### **Calculation facilities**

In handling financial records in particular, you will frequently want to carry out simple or not so simple calculations. You may want to maintain a running total of a client's amount owing, for instance, or to calculate a VAT amount or a fixed percentage discount. Many programs will do this automatically for you. You tell the program – in varying ways – how to calculate the discount, the VAT amount or the total, and then in entering data to the record you simply leave these fields blank. The program gets to work, and completes the fields for you. Most programs offer at least simple addition and subtraction, multiplication and division; by combining these commands in simple ways, you can build up to more complex calculations. Some offer a more powerful range of in-built arithmetical capabilities, and in this case you may be able to use the program much as you would a spreadsheet.

It's often desirable to maintain a running total of field contents for the file as a whole, and most programs again will produce this for you. It may be handy if you can automatically generate an average value. You might want to find the largest or smallest value in a set

field, or the total amount owing by all debtors of more than two months' standing. Some programs, at least, can do all these things for you.

Some programs automatically recalculate figures every time you change the data in a relevant field. This is useful, because you don't have to give a specific command. It's helpful, however, if the program doesn't automatically save to disk the newly calculated figures. In that case, you can manipulate your records on a 'what if' basis without affecting your existing files. In other (generally less powerful) programs, it's up to you to order a recalculation of some or all records. This can take several minutes on a large file.

With some programs, the calculations you request can be specified in the data entry fields on a blank record form. You can see this type of approach in Fig. 5.5, which shows the calculations, as well as other details, specified for part of an invoice file on Superbase 64. With others, you program the calculations separately,

```

PRESS RETURN TO CONTINUE
END OF PAGE
FILE DEFINITION : DEMO/INV
  £      NAME      TYPE      FORMAT
/ CALCULATION

  1  NO.           KEY      LENGTH
 12
  2  REF          TEXT     LENGTH
 10
  3  DATE         DATE     LENGTH
  7
  4  GOODS        TEXT     LENGTH
 20
  5  PRICE        NUMERIC  +££££.£
£
  6  AMOUNT       RESULT   +££££.£
£ [GOODS]*[PRICE]
  7  DISC.        NUMERIC  +££
  8  TOTAL        RESULT   +££££.£
£ [AMOUNT]-[AMOUNT]*([DISC.]/100)
  9  TAX          CONSTANT LENGTH
  4  15%
 10  DUE          RESULT   +££££.£
    
```

Fig. 5.5. Format of a file form. The Superbase 64 'Status' option show you exactly how each 'file form' is set up: number and name of each field, its length, type of field (key, text, numeric, result or date) and field format - that is, the way in which numbers will be presented.

-----				
	rec=0	INFOFAST.R	Ver. 1.3	
-----				
	a	76.4		n
	b	789		o
	c	60279.6		p
	d			q
	e			r
	f			s
	g			t
	h			u
	i			v
	j			w
	k			x
	l			y
	m			z
-----				

Command :

*Fig. 5.6.* Infomast's 'Calculator' screen (simulated, not dumped to printer - see text). In this example, variables a and b have been assigned numeric values. 'c' contains the result of 'a\*b'. The next command (e.g. assign new value, zero variables, return to another section of program) is entered on the bottom line.

either by writing a conventional program in the database's 'language' (we discuss this in more detail below), or by working on a 'calculator' screen. Figure 5.6 shows Infomast's calculator screen. It contains 26 variables, each of which can be given a numeric value, or assigned the value of a field in the record in memory, or assigned a value through an expression like 'a = b\*c' where a, b, c are either variables or record fields. Calculations performed on this screen can be either independent of the stored record ('what if'), or they can be fed back into it, updating the file. You can store variable values and definitions, and you can even use the calculator as a simple programmable calculator, without setting up a data file at all.

## Programming databases

The simplest programs I looked at take you through the operations involved in setting up and updating files on a sequential, question-and-answer basis. 'Simply File', for instance, works largely like this. More elaborate programs take one or both of two more approaches.

One is the 'menu' approach: the other is the 'programming' approach.

You will doubtless be familiar with menus. The program tells you what options are available to you, and by pressing a suitable key you activate one of them. Your choice may lead you to a more detailed menu, or to a specific record or other activity. Menus are easy to use, especially if you are not a very regular user of a program: it's always reasonably clear to you what key you should press. (Some menus, of course, are rather more cryptic than others!) However, they can be slow, particularly if you need to work through a sequence of menus in order to define your precise requirements.

The menu approach reaches its peak in 'Magpie', a superbly planned menu-based program in which any activity you set up is promptly reflected in the sets of overlapping menus that appear on screen. Even program-writing is handled almost entirely through menus from which you select the next command to appear in your program.

Programs which are not so reliant on menus invite you instead to give a command which is not prompted on screen. You need to know what the commands are, or to refer to the manual to check on them. The advantage is that there may be more commands available than could reasonably be summarised on a single-screen menu. (It's helpful if one command is 'help'!) Another advantage is that it may be possible for you to string together sets of commands into programs, not dissimilar to BASIC programs, which you can then run as a whole.

You can think of a programmable database as offering a sort of special computer language. That language may include much of the in-built BASIC language, or it may be quite independent of it. You can then write programs in this special language, and have the database program save them and run them as you wish. A skilled programmer can turn a programmable database into a 'turnkey' system, which guides end-users effortlessly through what would otherwise be complex sequences of activity needed, for instance, to update two related files or generate a periodic report.

Superbase 64 and Magpie are both very powerful programmable databases. Infomast also has some programmable features, but it is not nearly as powerful. Simply File is not programmable, and to my knowledge Easy File is not either. A programmable database can offer you enormous power and flexibility, and it should enable you to turn your filing program into one that will handle activities such as stock control, invoicing and the maintenance of selective mailing

lists with ease. This type of program is a worthwhile investment for you if you *either* have the knowledge (and time) needed to program your applications yourself, *or* have access to ready-written programs based upon it. If you are not certain that you come into either of these categories, you may find it very difficult to make full use of such a program.

### **Generating reports and other output**

The result of any such operation forms a simple 'report' which the system makes to you of its status. It is simple though. If you want a full-scale report to be generated, then you must get to work and tell the system exactly what to do in detail.

The screen layout you use for entering data into the file may not be the screen layout that's most convenient for getting data *out* of the file. A powerful database program will have a separate option that allows you to design output formats – for invoices, mailing labels, reports, etc. – in detail. You should be able to include new headings, giving the type of report and the date, for instance. You should be able to rearrange the layout of the different fields. You may be able to have the entire file sorted on a different field before the output is produced. And, of course, you should be able to include calculations on the file as a whole in your report format.

A database that has very full reporting facilities comes close, again, to the territory of a spreadsheet. Most of the better known management reporting programs for business computers are, in fact, based around spreadsheets rather than databases, but programs such as Superbase 64 and Magpie prove that a database approach can be just as, if not more, powerful.

Figure 5.7 shows a typical report produced by Simply File. Figure 5.8 is another produced by Superbase 64. These are, of course, just examples of a very wide range of possible layouts.

Just as important as designing the report is obtaining a copy of it! It's important to ensure that the program will be able to print the report on the printer that forms part of your system. Printer support provided by programs varies widely, and though virtually all programs will output reports or copies of records to directly linked Commodore printers, not all will support other types of printer. We discussed this issue in detail in Chapter 1.

It is also helpful if you can design the output layout to fit, not your screen, but the size of the printed page. The best programs let you

MONTHLY SALES & RE-ORDER ANALYSIS

30TH OCTOBER 1982

ITEM	STOCK LEVEL	MONTH SALES	AVG WEEKS SALES WAIT	ORDER NOW	COST HERE	STOCK VALUE	NOTE
B	0	0	.0	0	.00	.00	
B	5	0	.1	23	15.20	76.00	
B	3	0	.5	2	5.90	17.70	
H	1	0	.0	3	135.00	135.00	
H	11	6	4.2	5	20.64	227.04	
H	46	12	3.5	12	859.75	38628.50	
H	6	0	.0	3	2.65	15.90	
H	19	0	.7	8	11.30	214.70	
H	12	10	3.3	17	1.96	23.52	
H	17	0	.5	2	14.50	246.50	
H	3	1	2.2	5	47.60	142.80	
H	14	3	1.0	10	23.23	311.22	
H	8	0	.3	5	23.34	186.72	
H	1	0	.0	0	217.99	217.99	
S	12	0	13.7	0	135.00	1620.00	
S	5	0	.2	5	15.46	77.30	
S	2	0	.3	5	30.50	61.00	
S	5	0	.1	5	25.56	127.80	
S	3	0	.1	5	19.00	57.00	
S	11	0	.3	8	15.15	166.65	
S	84	0	1.3	8	11.24	944.16	
S	8	10	3.4	0	10.62	84.96	
S	10	5	1.7	5	14.23	142.30	
S	4	4	1.8	6	3.45	13.80	
S	1	0	.0	5	17.96	17.96	
S	123	38	12.7	6	28.20	3468.60	
TOTALS:							
				89	51.9	47235.12	
AVERAGES:							
					64.79	1816.35	

Fig. 5.7. 'Monthly Sales and Re-order Analysis': a fairly complex report produced by Simply File, complete with totals and averages. Note that ordering here is by item code.

Date: 17JAN84

## Stock activity report

Code	Description	Date	Qty	Cost	Value
mx80	Epson MX80 Matrix Printer	01DEC83	29	260.00	7540.00
rbn	Ribbon for MX80	01DEC83	127	3.00	381.00
bbcent	BBC Centronics Lead	03NOV83	15	8.00	120.00
c64	Commodore 64 Colour Computer	02NOV83	72	150.00	10800.00
ieint	IEEE488 interface Epson	25JUN83	4	50.00	200.00
kaga12	Kaga 12 in Monitor	15MAR83	25	75.00	1875.00
1541	Single 5.25 in Disc drive	01FEB83	95	150.00	14250.00
juki	Juki Daisywheel Printer	12DEC82	4	200.00	800.00
kaga12c	Kaga 12 in Colour Monitor	00JAN00	10	150.00	1500.00
rsint	RS 232 Interface Epson	00JAN00	7	50.00	350.00
vidmon	video monitor	00JAN00	6	55.00	330.00
089	widget	00JAN00	5	56.00	280.00
tractor	Tractor feed for MX80	00JAN00	10	25.00	250.00
vid2	hvh	00JAN00	5	33.00	165.00

End of report

Fig. 5.8. Typical report on stock activity, produced by Superbase 64. This is sorted by date, with dummy dates (for no activity to date) coming last. Though not shown, it's possible to subtotal and total fields. Note that the printer can be defined for upper/lower-case, though records elsewhere in chapter were printed in upper-case only.

design a report with more than forty characters to a line, and vary spacing so that you can print a page full of sticky labels accurately. Finally, it's helpful if you can opt to have the report output on screen, or to disk, for occasions when you can't have, or don't want, immediate printed output.

## **Programs reviewed**

I have reviewed four programs under the general heading of 'databases'. The programs vary greatly, in scope as well as in power and price, and all but one contain features that go well beyond the traditional field of the filing program. Superbase 64 and Magpie, the two most powerful programs, would both be suitable as the core of a computer system. They can be programmed to perform a very wide range of data handling operations, including, for instance, the stock control activities discussed in Chapter 4. Infomast is a cheaper and more limited program, but it contains a simple word processor, and this could increase its appeal to you if you do not intend to buy a separate word processing program. It is ideal for generating short form letters. Simply File is a more conventional filing program, and I have therefore reviewed it first as a 'benchmark'.

Easy File, the filing package that Commodore will be distributing, was not available for review at the time of writing, though I did receive preliminary details of it. My understanding from the details provided is that it will be a powerful filing system, with more extensive search and reporting facilities than Simply File offers, but without the full programmability of Superbase 64. The features of the programs reviewed are summarised in Table 5.1.

### *Simply File*

Simply File is a fairly simple database program produced by Simple Software, who also produce Simple Write (reviewed in Chapter 6). The program, which costs about £69, is available on disk only, to run on a range of Commodore computers and disk drives from the 64 upwards. It includes some features that enable its files to be used by both the Simple Write and Wordpro word processors; and its unprotected BASIC program listing can be amended or added to if required. (Naturally, it would be unwise to attempt this unless you are a competent programmer.)

The disk contains a wide variety of separate program modules and several sample data files. It's possible to copy any selection of

*Table 5.1 Features of database/filing programs*

	Infomast	Magpie	Simply File	Superbase 64
Program format	disk	cartridge	disk	disk
Protected program?	not clear	n/a	no	yes, 2 copies (spare £5)
Disk/cassette support	1541 disk only	floppy disk	floppy disk	floppy/hard disk
Printer support	1515 only	good including parallel driver	CBM and serial	good
Max. record size	30 fields	6100 chars	20 fields (can increase)	1100 chars/127 fields
Search facilities	fair	must be programmed	fair	very good
Calculation facilities	fair	fair	limited	good
Programmability	yes, limited	yes, extensive	no	yes, good
Report facilities	only via text editor	must be programmed	good	good
Other comments	in-built text editor	windowed menus multi-file handling graphics		multi-file handling
Manual	ring binder - fair	ring binder - fair	floppy binder - fair	ring binder - excellent

required modules onto a work disk, which would then hold the files created as well. This neat approach cuts down the need for the complex disk exchanges which crop up when using some other database programs on a single disk system. Obviously, the maximum space for a file is reduced if a large variety of program files are held on the same disk.

With the program comes a plain but clearly-written floppy bound manual. This starts, rather disconcertingly, with elaborate details of the different disk and computer combinations on which the program will run: only once you've surmounted these does it move into a short tutorial. The manual includes very full details on file structures, and hints on amending the program listing. It does not have an index, and this is a pity: there are no help facilities in the program, and the main menu is not self-explanatory, so users will need to refer back to the manual regularly.

Simply File allows you to use a single data file at once, and there are no facilities for comparing or exchanging the information held in different files. Each file has a single basic 'form' associated with it, but it is possible to design separate label or report layouts using different program modules.

Switching between modules removes the original program from memory, and it is necessary to reload and rerun it frequently while performing a complex series of operations on a single file, as well as when swapping data files. However, all files are constantly updated on disk, and this causes no disruption to data files. It is necessary – as with most programs – to go through a specific exit routine in order to close files and complete housekeeping tasks, but if the program crashes it is usually possible to preserve your work intact by running the exit routine separately. I found the program very reliable, and in the course of my testing I did not inadvertently lose any stored data.

Simply File is not a particularly visually appealing, or 'screen-oriented' program. It isn't possible to design a specific screen layout for records; you simply name the fields, and the program sets them out in a fairly neat but utilitarian layout for you. The fields, which come one beneath the other, need not all fit on screen at once. The program cannot be colour-coded, and there are only limited facilities for adding additional informative or decorative material to records or screens. When the program starts up, you are given the usual option to open an existing file, or set up a new one. No disk directory is available, which is a weak point. (If you don't know the precise name of the file you want to open, you must exit from Simply File to check

on it, unless you have an utility program that lets you check it without overwriting the database program.)

Setting up a new file involves selecting a maximum number of records, and maximum number of characters per record. You also choose the number of fields and their names, but there is no facility for specifying the lengths of fields. This could be a disadvantage, as it is difficult to make it clear on screen in what format the input to a field is required. The characters available can be allocated to the different fields in any order you wish, allowing for a 79-character maximum to any one field. You do not specify alpha, numeric or other field types, and the program therefore does not check data along these lines. You cannot 'force' field entry, and it is possible to leave even key fields blank. (Blank fields are sorted at the front of the file.)

Any number of fields can be designated as keys, and the file is sorted according to each key field. Changing key field data requires caution, as the record is not then re-sorted. A special program module, however, will perform a re-sort if necessary. It's not possible within the main program to amend the file layout or change the key fields, but this is practicable with some juggling of file formats and use of additional modules.

Data is entered to records strictly in sequential order, and correcting an earlier field necessitates the re-entry of the entire record. There is a separate option for changing or deleting records. Records can be retrieved by specifying their number, by browsing through any specified key order, or by specifying a search string in the key field only. It isn't possible to give more elaborate search criteria, though much more comprehensive selection criteria are available in the reporting module. Records can only be printed via the report or label-printing routines. It isn't possible to specify default entries, though it is possible to replicate existing records and then amend some details of them. A special 'TYPE' field, in which you put a one-digit code, allows you to select groups of records for inclusion in a mailing list.

Calculations can be performed either on records or as a preliminary to producing a report, without affecting the records in memory. Up to 20 calculation steps can be programmed, and programs strung together if necessary. Each step is in a rather restrictive format of (no. or field) = (no. or field) (operation) (no. or field), e.g.  $F4 = F2 + F3$ . Numbers are not automatically formatted to a chosen number of decimal places. It is necessary to program around this restriction using INT, a clumsy business which means

that, in the manual, a sample calculation of 15% VAT takes four steps. A range of arithmetical operations (including RND, INT and SIN) are provided for, and it would be possible to program in more. Once calculations are programmed, the program automatically carries them out on selected records or on the entire file.

The report production module is very efficient. You can design headings (which are automatically centred), column layout and spacing, and specify totals and averages, though not subtotals. Layouts up to 160 columns are supported. You can also specify precise formats for numerical data. One difficulty is that, again, all design steps are carried out sequentially. It is necessary to plan your column layout on paper, before typing in the entries to the system. (With more flexible programs, you can edit your layout on screen.)

Printer support is moderate. The program does not include a full parallel interface and, indeed, by default it works in capitals only to cut down incompatibility problems. It is possible to send a single initial ASCII code string to the printer, but not to incorporate further strings in the report format (as you might wish to do to obtain special printer features such as boldprint).

Records for inclusion in reports, or for calculation, can be specified according to greater/less than or equals to criteria on any field, or by pattern matching. It is possible to AND and OR criteria, and this facility should be flexible enough for any purposes.

In summary, Simply File is a plain but well-written program. It does not offer the flexibility or programmability of the more powerful programs I review, but it is easy to use, reliable, and suitable for a wide variety of purposes.

### *Infomast*

Infomast is a database system produced by Rabbit Software. It is ambitiously billed as a database, programmable calculator and word processor, and it does indeed contain elements of all three, but it is primarily a database. Though it is a perfectly adequate database, its calculation and word processing facilities really do no more than provide the usual calculation and report presentation capabilities that you would expect from a database. The calculator, though neat, works to only nine significant digits, and has no advanced mathematical functions, so it is no substitute for a hand-held programmable calculator. And the word processor, though an adequate 'text editor' for setting report data in context or for writing short form letters, does not offer the power or flexibility of a regular word processor.

Infomast originally sold at about £80, but its price has now dropped dramatically to £20. This greatly increases its appeal. It doesn't compare in power with Superbase 64, for instance, but at this lower price it provides a more modest database system which could meet the needs of less intensive users. It could even meet casual word processing needs, if you don't wish to invest in a proper word processing program. The program is disk-based, and there is no cassette version. One point to note is that it supports only the Vic 1515 printer, and the printer options will not work properly with more elaborate set-ups including printer drivers and interfaces. (To reproduce the Infomast calculator page that I used as Fig. 5.5, I had to retype it: the version that was dumped direct to my printer was corrupted by Commodore control codes.)

The word processing part of Infomast is separate from the main database/calculator program, and I will look at it afterwards.

Infomast comes with a neat but chronically ungrammatical manual, in a sturdy ring binder. It provides a good training course, but little in the way of reference material. However, the program's help facilities are adequate, and you should not need to refer to the manual often once you have mastered it.

The main program allows you to set up single files of a fair size: a single key field is permanently held in memory, and the rest of the file can be searched on disk. Each record can consist of up to 255 characters, divided into a maximum of 30 fields, and displayed on a single screen. You can select the field lengths, names, and the screen layout, though this process is done sequentially and it can be frustrating if you make a mistake halfway through. The record layout is plain but clear. It is not possible to highlight entries or change the colour scheme, but the cursor position and field length are clearly marked during data entry.

It's possible to alter records once they have been added, and to add new records up to the file maximum, but not to delete records. In order to delete, you would need to overwrite the record with a new one.

One curious point is that only one file can be held on a disk. In fact, two disks are needed for each file: one 'work' disk (which can also hold files from the word processor) and one 'data' disk. The disks are wiped when the file is first created, and no files from other programs can be held on them. This does make the program very expensive in terms of disk usage, and you should bear this in mind if you are thinking of creating several short files. The program also, unusually, writes to the master program disk, which is not write-

protected. It is not clear from the manual whether the program itself is protected. I did not copy it for fear of corrupting my only copy, but regular users would certainly need to make, or buy, a spare.

You can set up default values for the fields, print a record, and search for one or more strings anywhere in the records, not just in the key field. You cannot search for groups of files that meet 'less than or greater than' criteria, but you *can* total fields on this basis, a handy feature. Though fields can be designated as alpha, numeric or date, there is no apparent validation of data, and the program does not complain if you write words in numeric fields, for instance. Nor can you 'force' data entry into particular fields. You can, however, protect the entire file with a password.

The 'calculator' function provides a separate screen with 26 alpha variables, to each one of which a value can be assigned. The value can be a number, the value in a specific field of the record last displayed, or an equation (e.g.  $a = c + b^2$ ) can be evaluated. It is also possible to put values from variables back into records, and in this way total fields, for example, can be completed. It's necessary specifically to order the calculation. Calculations can be performed on individual records, or the series of calculations can be saved as a program, including instructions for them to be performed on a group of records or the entire file. A small subset of the BASIC language only is permitted in these programs, but the facilities for editing them are good. Programs and variable values can be saved to disk as separate files.

Totals can be generated on the file as a whole, but there is no provision for more elaborate arithmetic. I couldn't find a short way to set up 'number of records' as a program variable.

There are no report generation facilities in the basic program. In order to produce reports (other than copies of records) it is necessary to use the word processor program. This is loaded and run separately, and the word processor documents are saved as separate files. They can then be merged with data from any record in any Infomast database file.

The word processor is really a 'text editor', a more simple type of program. It isn't possible to perform drastic editing on long continuous text. Insert operations, for instance, run the risk of losing letters at the end of a line, and there is no way of moving text from one point to another. It checks keyboard entry slowly, and there is a marked delay before characters typed do appear on the screen. However, it is possible to type ahead – at least for several words. Page width and tabs can be set, and the program performs a word wrap.

The cursor of the word processor remains at the middle of the screen, and the text is continually scrolled around it: an idea intended to simulate a typewriter, which may be less appealing to regular programmers than to regular typists. The program is strongest on report-style formatting features such as detailed tabbing, centring and right-justifying text.

The word processor could certainly be used for printing short form letters, like the example shown in Fig 5.9. However, it isn't possible to set it up to produce a continuous run of letters using data from different records; each record must be selected manually. This limits its usefulness, though perhaps a more drastic limitation is the rather poor print quality of the 1515.

```
~01
~02
~03
```

Dear ~01,

This is a short form letter to illustrate how the form letter facilities of Infomast work. Yours sincerely,

Susan Curran

*Fig. 5.9.* A form letter using Infomast. Infomast is ideal for producing short form letters like this, though it is not suitable for heavy editing of long documents. You select the appropriate record from your data file, and the numbered fields selected in the document are then merged from the record into the document to produce a personalised letter.

My main reservation about Infomast concerns its reliability. I did not succeed in completing a single test run of the program without encountering a program crash, and thought I would expect the incidence of mishaps to drop dramatically after a 'running-in' period, I still found this disturbing. The 'break' combination of RUN/STOP and RESTORE is not disabled, and pressing this when the system appears to 'lock' returns you promptly to BASIC. Miskeyed commands produce a rather alarming flashing warning message, and attempts to print without previously preparing the printer and program will 'hang' the entire system. Completion of a session requires a lengthy series of swaps between work and data disks, and as I never got as far as this, I ended up with blank disks to show for several hours' work. The manual, annoyingly, gives no suggestions as to how to recover files after a crash. In a long 'serious' work session, such a program failure could cause a minor disaster.

*Magpie*

Magpie is a very unusual database-type program produced by Audiogenic. It comes in cartridge form, which makes it fast to use, and it has a remarkable hierarchy of menus which pop up and partially overlay each other, in an attractive style reminiscent of 'software environments' found on much more elaborate computer systems. At any time it's possible to see exactly what sequence of menu choices you made in order to reach your current point in the program.

Almost all commands in Magpie are given through menu choices. The menus are controlled by a cursor: you move up and down the menu and then press 'Go' when you hit the right choice. F3 acts as 'up', F7 as 'down', and F5 as 'go' – a very speedy and simple system. You may occasionally press the wrong key, but you won't be able to select a nonexistent command! And if you do stray from the wrong track, each menu has an EXIT option to move you back to the previous one.

Magpie comes up initially with a very basic set of menus, but the idea of the program is that you should write your own applications, and that as you design forms, enter data into data files or plan program sequences, the menus are adapted to act as directories to the options available. Every data file, every program you design, promptly appears in the appropriate menu! The disadvantage to this approach is that, unless you commission someone else to do the work for you, or buy a ready-programmed system based on Magpie, you *must* do some programming in order to produce a system which works. This is in contrast to the approach in Simply File or Superbase 64, where it is often not necessary to program at all in order to use the system.

In effect, you set up, and then save to disk, a 'system' which consists of a set of forms, a set of data files, possibly a set of indexes sorting the filed information on different fields, possibly some individual 'pages' (records on which additional processing has been performed on screen), and a set of programmed 'procedures' which allow you to manipulate the files. It's possible to edit existing systems and save them as new, slightly different systems (or to edit and replace old systems); it's also possible to use data files with more than one system, so long as the form layout used is the same, or nearly so, in both cases.

With the Magpie cartridge comes a 'help' disk that gives you brief details of how each in-built command works, and provides two ready-written systems: one address book system, and one simple

'maths and graphs' system (but more on this later). You can copy and amend these systems to gain a head start in designing your own.

Programming in Magpie is not done in BASIC. Instead, there's a separate high level language, each command of which is taken from another set of menus. It has some powerful features, and is well-structured: you can set up named subprocedures, for instance, and nest these within each other. However, it has failings, too. It's necessary to build up programs out of in-built commands whose syntax is very inadequately explained in the manual, and to order these very precisely. The arithmetic commands are limited to basic arithmetic, and you cannot include brackets in expressions: the functions are evaluated strictly left-to-right. There are no multiple commands: it's strictly one line, one command. And as a result, it's quite tricky to set up multiple selection criteria, though this is possible with careful programming.

Apart from those provided in the sample systems, there are very few in-built procedures in Magpie. If you want to search for a record in a file, you must first write a procedure which describes the flexibility of the search options you want. If you want to print out a screen, you must first write a procedure that describes selecting the form, the data to appear on it, and printing the combination. Once you've mastered the programming procedures, you can perform very powerful data manipulations, swapping or comparing the data in different files, reformatting data for reporting, even setting up mini 'spreadsheets' on screen and saving them as special 'pages' on disk.

Magpie comes with a neat ring-bound manual, which takes you through the programming included in the two sample systems, and then provides a more general tutorial. It stretches to 95 pages, but I found it very heavy going after the first few introductory pages, which give a clear introduction to the theory behind databases. There are some brief appendices but no index, and someone not used to programming might well become extremely confused by sections of it. As a fairly experienced programmer, I found the manual inadequate to describe the very powerful features that the program offered.

It wasn't entirely clear to me, for example, which files you should keep on separate disks, and why; how to distinguish between setting up a new system or file and accessing an existing one; how reports giving totals and subtotals can be generated, and so on. Some of the command titles that appear on the menus are rather cryptic. There's 'Get System', for instance, and 'Create System', but no 'Amend

System'. In learning to program, I found several times that when I merely intended to open an existing file I inadvertently recreated it, destroying all the existing contents. (If you want the program to ask 'Are you sure?' before destroying a file, you have to program that too!)

The calculation options are particularly tricky, and though they, too, are powerful there are only a few brief examples (not all of them worked through) in the manual. Once more, in learning how to set up calculation pages I lost quantities of information by accident, through misordering my program procedures, and found it very difficult to program the precise calculations I required.

Magpie certainly demands an extended learning phase, then, in which you must be prepared for accidents. With practice, the programming would doubtless become much more transparent, and I had no doubt that given a week or two (rather than a couple of days) to concentrate on the program, I could have handled an impressive variety of applications on it. Once programmed, the systems are commendably easy to maintain and manipulate. You can secure all dangerous menu options with a password, and the system should be perfectly crashproof. In general, error trapping was good; the system checked for input to numeric fields, and responded with an understandable message when I tried anything stupid. Only a major blunder in disk operations, use of the RUN/STOP key during disk access (there is a warning in the manual against this), or failure to set up a printer correctly, would be likely to crash it.

It's possible to open two data files, and use two different forms, at the same time; and it's possible to include more than two files and forms in a system, selecting combinations from those available for use at any point. This permits you to swap data between files, and enables you to design special formats for functions such as label printing. It's also possible to program a wide variety of reporting options. However, the program doesn't have built-in full report generation capabilities, and it would take a determined programmer to produce a full-scale report of the complexity and variety of layout that a program like Superbase 64 can provide.

One interesting feature is that form size is not limited to screen size. The form can hold up to 6100 characters of text and fields, roughly the contents of an A4 sheet of paper, and you can choose its width and length within this limitation. The screen then acts as a window on an overlarge form, and scrolls up, down and across it very smoothly. In this way, you can review the precise layout of an





wasn't able to program the limited printer control options to produce graphic characters on my printer, though this is not an unreasonable limitation.

Magpie is an exciting and interesting program, then, and a very attractive one in use. If you are willing to put in the fairly substantial effort needed to master the program, you will find it a very worthwhile buy and you might, indeed, find that, with a word processor, it fulfils all your software requirements. If you are not willing to devote this type of effort to the program, then you may still find it a good choice if your dealer can help you to locate a ready-programmed system that runs on Magpie. I must emphasise, however, that without such a ready-programmed system, it is *not* in any way a program that you can buy off-the-shelf and run as part of your business system. It needs – and certainly repays – work.

### *Superbase 64*

Superbase 64 is a database system produced by Precision Software. Precision devised Easyscript, the word processing program that Commodore market themselves for the 64, and the two programs are compatible in some ways.

Superbase comes in disk form and, of course it is only suitable for use on disk-based systems. It costs £99. For this you get two program disks (the back-up can be replaced for a modest £5 if you ruin a disk) and a very comprehensive ring-bound manual including a good training section, a reference section, technical appendices and – as a pleasant change from most manuals – a very full index. This manual was the best of all those we encountered in reviewing programs for the Commodore 64. It is possible for non-programmers to work through the training section and set up simple files from scratch. However, more advanced sections assume some prior knowledge of BASIC, and BASIC programmers will be able to squeeze much more capability out of the system.

The program has a dual command structure. There is a set of menus, and you can work through these using the function keys to select your commands, or you can type in commands, individually or in combination, on the 'command line' of the screen. In this latter way it is possible to build up simple programs, but it is also possible to write more complex programs using a special program generator option. The menu option is simple for beginners (though some of the options provided are not self-explanatory); the command option adds speed and power for experienced users.

There are very full help facilities built into the program, and it's

possible to add to these as you build up files and applications.

Files in Superbase 64 are organised into databases, each database consisting of a maximum of fifteen separate files. It's possible to link files in the same database, and to pass information between them automatically through a suitable program. It's also possible to 'import' and 'export' information to and from the database as a whole: for instance, to read in data created by another database program, or to incorporate data into an Easyscript document. In this way, full-scale business applications such as invoicing and stock control can be built up. Some of these ready-written applications will be sold in conjunction with Superbase, as specialist user programs.

You can, of course, design your own record layout. A record can contain up to 127 fields, spread over up to 4 linked screens. The maximum number of characters per record is 1108, but these can be allocated (within reason) as you wish to the different fields. It's possible to incorporate descriptive text onto the record screens, and to embellish them with colour coding, reversed-out lines and special borders. You can also write free-format 'memos' and link these with records, if you want to add additional information to some of the records in your file.

Fields can be a alpha, numeric (choose your number format), or date/calendar (a fixed format). Unsuitable input to numeric or date fields is rejected by the system. It's possible to 'force' data entry to any field (except the key field, which *must* be forced entry). You can also specify calculations to be performed in 'total fields', with a maximum descriptive length of a generous 79 characters. It's possible to duplicate fields, so that the key field of the record could be reproduced on each of the four screens. The record design routine is simple to operate, and you can edit your design freely. You can even change the format of existing files, adding new fields, for instance, or extending existing fields.

The length of files is limited only by the amount of disk space available, and since the program will work with Commodore hard disks as well as the full range of compatible floppy disk drives, this means that files could be very substantial indeed.

Superbase has a very full set of file editing commands, and you can add records, delete records and change existing records as freely as you might wish. You can even save the existing contents of the database on file for archival purposes, before amending it. The 'search' capabilities are also very full: it's possible to specify search data in one or more fields, or in any field of the record, to use ANDs and ORs, greater/less than and equal to criteria, and to use wild

cards in defining the search phrase. The program worked well in searching through moderate sized (100-200 record) files; it was not tested with larger files. Naturally, searches would be slow if you worked with very large files.

Once searched for, selected records can be browsed through, or the records that meet the criteria given can be listed in temporary or permanent form. It's possible to specify which field contents should be included in the list, and even where the fields are to be printed (on paper or on screen). This facility alone makes it possible to create simple reports on database activity, but there is also a full report-creation option which allows you to design your report format, set out headings and subheadings, include totals and subtotals, and so on. These reports can be directed to the screen or to any of a wide range of printers supported by the program. (In addition, a screen dump can be ordered at any point in the program: I used this facility to obtain most of the Superbase illustrations included in this chapter.)

An entire file can also be sorted in ascending or descending order, on any specified field. The result of the sort is again given in list form, and this too could be used in a report facility. It's possible to sort all, or a specified part, of a file. Sorting (as opposed to the less demanding searching operation) is a powerful feature not fully supported by the other programs I review.

The calculation feature too is impressive. As well as the normal arithmetical functions, it's possible to include BASIC trigonometric and string functions in defining the calculation. Calculations are performed automatically on records in memory, but disk files are not updated automatically (there is a command for updating them, of course). This enables you to try out calculations on a file in a 'what if' manner, without affecting the stored file in any way. Calculations can be remarkably complex, and it's possible to store results in BASIC variables for further processing.

Superbase's programming option enables you to use not just Superbase's 40-odd in-built commands, but most of the features of Commodore BASIC as well. 4K of memory is available for programs, so programs of quite considerable length can be built up. It is perfectly possible to program your own menus, for instance, so that you can set up a fully-defined application system of your own. A suitable program could automatically handle the tasks of linking files, and updating one of them once data in the other had been amended. Inevitably this type of programming is a complex operation, and though it would be perfectly possible for practised

BASIC programmers to devise their own custom-made record maintenance programs, it would be a daunting task for those not familiar with programming.

As an example of the power of Superbase applications, their 'dealer demo' disk contains a sample system that includes invoicing, stock control, maintenance of customer accounts and the generation of activity reports. All of these applications are linked by a custom-written menu structure, so that a casual user can use the system with minimal training. This demo system doesn't include all the features that would be needed for a full-scale business application, but such ready-programmed applications are likely to be widely available.

By making use of the simpler menu-driven features of Superbase, it would be possible, then, for users to design their own files in any format they might reasonably require. By making full use of the program, it would be possible to develop extremely powerful programs to handle virtually all information-based applications.

Superbase 64 appears to be extremely reliable, and I encountered no problems in setting up and manipulating a couple of different files. It would be possible to run into difficulties if, for instance, you switched disks containing different databases without going through the correct disk-changing procedure. Assuming that users take reasonable care, however, the program seemed very robust. There is a good range of error messages, and the manual gives advice on how to recover from errors.

In summary, this is an exceptionally good program. Within its scope it performs superbly, and I have no real criticisms to make of it. I would recommend it without hesitation for any database-type application that might reasonably be handled on the Commodore 64, and indeed for a range of more general applications as well.

## Chapter Six

# Word Processing Programs

A word processing program enables you to use your Commodore 64 and printer as a 'super-typewriter'. You can compose letters, memos and reports on screen, edit them as heavily as you wish, save them on disk or cassette, and then print an error-free, well laid-out master as often as you need to do so. With many word processing programs, you can go further and produce personalised form letters and mass mailings.

Anyone with a Commodore 64 and a printer will be able to find uses for a word processing program – the only real question is which one you should buy! I will try to explain how the programs vary, and give you some general advice before reviewing six specific programs in detail.

### Understanding word processors

A 'file' in a word processing program is generally a document: a piece of text which you wish to treat as a whole. Only moderate length documents can be handled by most programs, so a document might consist of a short article or book chapter, or a business letter. Sometimes a document consists of a more structured set of text, such as a list of names and addresses. Documents are given file names, and stored on disk or cassette. New documents can be created, and old documents recalled for editing and/or printing.

Screen editing is the core of word processing. By editing your work while referring to the screen display, you can ensure that you produce an error-free document, laid out to your precise requirements. This makes word processors particularly handy for inaccurate typists. Those who (like me) have difficulty in producing a mistake-free letter can be sure that vital and less vital documents are not marred by overtypings and messy corrections. Screen editing is

even more important if you're a creative writer; you can take your work from a rough draft to a final polished version, editing as heavily as you wish, without its needing a single retype.

The Commodore 64 has an unusually good 'screen editor', which enables you to move the cursor around the whole screen display and edit program listings (overtyping, inserting and deleting characters) very freely. By no means all computers offer this feature, and it makes life much easier for word processor writers. You will find the screen editor Insert/Delete and cursor control commands incorporated into all but one of the programs I describe. Using the screen editing facilities from BASIC, it is not at all difficult to write a short program that prints text for you. However, a good word processor does much more than you could hope to do yourself with a simple program on these lines, and the ease and convenience of use it offers should more than justify the price tag. It should enable you to correct mistakes, and to insert, delete and move from place to place (or copy from place to place) in a document comparatively large chunks of text (several paragraphs at least). I describe these as 'blocks' of text.

It's also important that the program should enable you to move freely and rapidly around your document. As well as line-by-line and column-by-column cursor movement, most programs provide special rapid-movement commands. Another common feature is a 'search' command, which enables you to search for a specified string of characters anywhere in the document, and perhaps replace it with another string. (You can use this to save typing, including an abbreviation for a repeated long name or phrase and then substituting the full version.) A good search command will allow you to specify whether upper-and lower-cases are important or not: a more rudimentary version will find exact matches only.

The word processor's other task is to arrange text neatly ('format' it) so that it will look attractive when printed out. It is helpful if the text also looks neat and readable on screen, so that you can review and revise it easily while editing. However, the 40-column screen display and the 80 columns or more of text that fit onto a typical A4 sheet do not match well. Often, the text on screen will not look exactly like the text as it is printed, and some programs opt to include 'print codes' rather than attempting to reproduce the printed appearance on screen. Some users find this a major inconvenience; others learn to live with it.

It is usual for you to be able to designate margin and tab settings, perhaps by marking them on a screen 'ruler', or by replying to

questions asked in a set-up menu. Most programs provide a 'decimal tab', which aligns the decimal points in columns of numbers, as well as the conventional kind. You should be able to revise the settings at any point, so as to lay out your work in special ways (for instance, numbering paragraphs, indenting quotations, or setting out columns of figures). And you should be able to 'reformat' previously typed material.

'Word wrap' is the name given to the automatic control of the right-hand print margin. The program should move onto the next line words that will not fit within it. Words are only split in two via a controlled hyphenation routine. They are not arbitrarily split at the right margin, as they are in program listings, and there is no need to press 'Return' in order to start a new line: the program does so automatically. ('Return' is normally pressed to signal a forced end of line – for instance, at a paragraph end.) All reputable word processing programs offer this feature, but a few programs do not word wrap on screen, only when printing. This is an inconvenience; it makes it much harder to read and edit your text on screen.

More advanced formatting and manipulative facilities offered by most programs include right-justifying (lining up both margins by adding extra spaces between words), and centring text between the margins. A few programs contain other features such as simple column totalling commands. (Don't plan to do too much columnar work on a C64 word processor, though. If you work with accounting reports, for instance, you should be looking for a spreadsheet program instead.)

## **Printing text**

Different printers need different instructions to enable them to work correctly, and any word processor will include a printer driver routine that automatically sends prepared files of text for output by at least one printer. Check to see which printers are supported by any program you consider. The ranges vary widely, though the Commodore printers recommended for use with the 64 are generally supported by all programs. If you wish to use a different printer (a Juki daisywheel, say, or an Epson dot matrix printer), you may find that your program contains the necessary printer driver. If it does not, an interface will often act as a good alternative. Remember that a printer driver routine built into the word processor may not be

usable if you wish to use your non-standard printer with other types of commercial program, or with your own programs.

Not all programs which nominally support named printers can make full use of their facilities. Some have far more restrictive facilities than others for sending special codes to the printer. You may find it difficult to access a special italics mode, for instance, or to combine 'enhancement' features such as bold print and underlining on the same sheet.

Most Commodore 64 programs cannot handle 'background printing' – that is, the printing of one file while another is being edited. Without this facility, you cannot use the computer for any other purpose while printing is in progress, and if you have long files and a slow printer, this can be a considerable inconvenience. Many programs will handle a long unattended print (if you have a continuous-paper printer), printing multiple copies of documents, or linking documents in a print queue.

## Screen handling

One drawback of the Commodore 64 as a word processor is the size of its screen. It will normally display only 40 characters to a line, while a typical A4 printed sheet may have 80 or more characters to the line. As a result, it is difficult to get a close correspondence between the appearance of text on screen and its appearance when printed. There are three possible solutions to this problem:

- (1) The text is displayed on screen at 40 characters to the line. Formatting instructions are included in the text file and, before printing, the text is formatted by the computer to fit the desired margins. Only when the print run is performed does the user see exactly how the formatting instructions look when carried out. This is an appealing solution when continuous text is being edited; it can be confusing when heavily formatted and tabulated material is being prepared.
- (2) The text is set out on a notional 'page' 80 or more characters wide, and the screen provides a horizontal as well as vertical 'window' onto that page. By scrolling across the text, it is possible to see every part of it, but it isn't possible to read down the page of text without scrolling. It can be difficult to review what was been written, but this is compensated for by the ability to check on the exact

layout that will be printed, and the fact that no pre-print formatting is required.

(3) The system hardware is modified, to enable the computer to display 80 characters to the line – normally on a black and white monitor, rather than a television set. Entire text of up to normal A4 width can then be viewed on screen exactly as it will be printed. This is a comparatively expensive option, but well worthwhile if the system is to be used intensively for business applications. Most 80-column boards can be used with a range of programs (including data bases and spreadsheets), and not just with word processors.

Some programs combine solutions (1) and (2), and allow you to switch between different ‘views’ of the same document – using one ‘view’ for editing, and one to check on the print layout.

The smoothness of scrolling, and the general speed with which the screen is updated, can vary markedly from one program to another. These screen handling features may appear trivial, but they make a great difference to the user, and they should play a large part in your choice of program.

## **Pages of text**

When printing text, it is normal to break it up into page lengths. Some programs handle all text within documents in ‘pages’; you can normally only view one page on the screen at once. Other programs treat documents as a continuous whole, and determine page breaks only when formatting for a print run. Each approach has its strengths and shortcomings. It’s important to ensure that you can determine for yourself where page breaks will occur, usually by giving a ‘forced page’ command. It’s also handy if you can give a ‘block lock’ or similar command, to ensure that pages don’t break at inconvenient points such as immediately after a subheading or in the middle of a table. With a few programs where page breaks aren’t shown on screen, it’s necessary to draft print documents and then adjust the page breaks before printing a final copy.

Many programs also enable you to set up standard ‘headers’ and ‘footers’: standard lines saying, for instance, ‘Chapter 10’, or giving a letter recipient’s name, which will appear on every page of a document. A program with full header and footer control will position these automatically for you as the page breaks change. It should also enable you to include the current page number – and to

start numbering from a page other than 1 (which is useful if your document is, say, 'Chapter Two').

### **Supplementary text**

It is normally only possible to work with one document file at a time using a cheap (less than £100) word processing program. It should be possible, however, to view the disk directory without exiting from the document stored in memory, or disrupting it in any way. Some programs do not achieve this. With some programs, it is possible to set up a separate workspace in memory. This is used either to store supplementary notes, or for 'help' information, or to cope with second files that are to be 'merged' with the first file. It will, however, reduce the space available for the main document: ideally, its length should be variable so that you can on occasion edit long documents.

Most programs will enable you to 'merge' all (or sometimes a specified part) of documents held on disk with the document being edited. This can be handy for 'boiler-plate' operations, in which standard paragraphs are used in different combinations in different documents such as leases and contracts.

Another operation which demands file merging is the handling of form letters, in which variable information (such as names and addresses) is inserted into a fixed letter outline. The ability to produce form letters is a major selling point for word processors, and if you ever need to send similar letters to groups of individuals (sales letters to clients, circulars to club members, standard acknowledgements of orders received, etc.) then you should look out for a program that specifically includes routines for producing them.

Most programs make some attempt to handle form letters, but this is a surprisingly tricky area, and few general-purpose word processing programs offer the flexibility of a purpose-designed mailing list system. It is often difficult when using a word processor to adapt a standard name and address list for use in a variety of different letter outlines, in some of which you may need to use a field from the file (say, a name) more than once, to merge the fields in an unusual order, or to omit a field. (Fig. 6.1 explains this in more detail.) The simplest programs just zip down the list of fields, merging first field 1, then field 2, then field 3, and so on. It is even more difficult for the computer to select only some entries from a large standard file (extracting contacts in a particular area, say, or clients owing more than a fixed sum) for merging and printing. Databases are

Form Letter Handling

Form letter 'merge' files of (for example) names and addresses are normally sequential files that look much like this:

```
Mr Joe Bloggs
25 High Street
Warrington
(blank line)
(blank line)
Joe
(record separator symbol)
Mr Harry Smith
Widget Handling Ltd
Chatham House
Main Road
Maidstone
Harry
```

-- and so on. Different programs adopt different conventions to separate the different fields: one field to a line, a 'separator' symbol, field names, etc. Not all specifically separate records as above. The above example is one field per line: hence the blank lines where record 1 has no address lines 3 or 4.

The data in the merge file is merged into a letter outline like this:

```
(Name)
(Address 1)
(Address 2)
(Address 3)
(Address 4)
```

```
Dear (Salutation),
--etc.
```

Again, conventions for marking merge points vary. Programs that don't name file fields don't name merge points: they just take data sequentially from the merge file, like this:

```
@
@
@
@
@
```

```
Dear @,
```

--where '@' is a symbol used for 'merge next field now'. More sophisticated programs do name merge points. They may then be able to use data from a record out of sequence, to omit certain fields, or to repeat a field contents in different places in the letter outline.

In a good program, it's possible to merge at any point including the middle of a line of text. It should also be possible to merge fields of different lengths into continuous text, and format the text suitably, with no 'filler' gaps.

*Fig. 6.1.* Form letter handling.

generally better at selecting entries from files than are word processors, and if this is a central feature of your particular application you may find that a database/word processor combination, or even a database with some word processing features, like Infomast (reviewed in Chapter 5) is what you need. I discuss the pros and cons of working with combinations of programs in Chapter 7.

Some powerful programs make very heavy weather of form letter handling, and you may find the instructions for setting up and merging files quite difficult to follow.

## **Spelling checkers**

Spelling checkers are becoming increasingly popular. These programs review a document file, checking the words in the document against a dictionary, and indicating the words that are not recognised. These may be misspellings, or they may, of course, be words that are simply not included in the dictionary. (In this case, you should be able to add them to it.) Though a spelling checker is no substitute for a proof-reader, and will not be able to catch every grammatical error in a document, it is a useful program, particularly if spelling is not your strong point.

As well as checking spelling, most such programs provide a word count (useful for journalists), and many produce additional statistics on word usage: the average length of sentences or words, for instance, and the frequency with which words are used. Many business users will find these to be of little more than curiosity value, but they can be extremely helpful to students and serious creative writers.

Not all spelling check programs are the same! They vary markedly in ease of use, and some demand (for instance) much more disk-swapping than do others. They also vary in the size of their in-built dictionaries, and in the ease with which you can amend or extend these.

Spelling checkers are usually sold as separate programs, though some word processors (including the Commodore 64's 'Script 64', which is not reviewed here) do include spelling check routines. If you buy a spelling checker separately from your word processor, you should ensure that the two will work properly together.

## **General program quality**

In selecting a program, don't get too carried away by a long list of commands. If your work is not particularly demanding, you may find many of them of little use to you. It is at least as important to find a program that works smoothly and well, that allows you to edit text quickly and in ways that seem natural to you, and that you will enjoy

working with. Even apparently minor points like the screen layout and colour choice (often variable to suit your needs) may prejudice you for or against a program.

There is great variety in the ease of use of editing commands. Some programs are well suited to professional typists, copy- or audio-typing material at speed; others are better suited to hunt-and-peck typists who compose letters on screen. Programs with complex command sequences can be very difficult to use on an occasional basis.

You should check on the length of documents that can be edited. Some programs have a surprisingly short maximum length, and this can be an annoyance if you regularly compose long reports or write long articles or books.

Though most programs are reasonably reliable, some are markedly better than others in recovering from user errors such as incorrect or meaningless command sequences. A good program will not lose your text in any circumstances bar a major system breakdown. It will warn you when memory is becoming full, so that you can take steps to complete or split your document. It will also warn you if any operation – for instance, exiting from the program before saving your document on disk or cassette – could lose you much or all of your text.

Finally, the quality of manuals varies greatly. As it will take you some time to master the program, it's important to ensure that the manual is effective in teaching you, and efficient in providing reference once you have learned the basics. I found the quality of word processor manuals to be much better than that of other types of program manual, but there is still a wide gulf between the best and the worst.

It isn't possible to sum up any program fully simply by listing its features. However, I have tried in Table 6.1 to describe the main aspects of the performance of programs I've reviewed.

## **Programs Reviewed**

There is a very large number of word processor programs available for the Commodore 64, and I have reviewed six of them in this chapter. The reviews are given in alphabetical order. All of the programs offer broadly the same facilities, but there are substantial differences in their approach and ease of use.

Table 6.1. Features of word processing programs.

	Easyscript	Quick Brown Fox	Simply Write	Vizawrite	Wordcraft 40	Wordpro
Program format	disk/cassette	cartridge	disk or cassette	disk or cartridge	cartridge	disk
Protected program?	yes, single copy (backup £10)	n/a	no	yes, single copy (b/uf9)	n/a	yes, single (b/u avail)
Text formatting approach	40-col screen + preprint format (can display on screen)	32-col text 40-col view	40-col plus formatting (no view)	scrolling screen can override to 40-cols	toggles between 40-col and scroll screen	40-col plus formatting (no view)
Printer support	fairly wide range	good, parallel interface included	good, parallel interface included	good, parallel interface included	good, parallel interface included	CBM + serial only
Disc drive/cassette support	both	both	both	both	both	disk only
Variety of editing commands	good	fair	limited	good	limited	fair
Quality of editing commands	good	poor	fair	good	good	good
Maximum document length	764 lines	800 lines	687 lines	875 lines	341 lines	329 lines
Form letter facilities	yes, fair	no, though boiler-plating/on-screen fill	yes, fair	yes, fair	yes, fair	yes, poor
Other comments		communications facilities	alpha sort	reads other wp files		numerical commands
Manual	floppy binder-fair	ring binder good	floppy binder fair	floppy binder good	ring binder fair	coverless binder - fair

### *Easyscript*

Easyscript is the word processing program that Commodore sell themselves. It was produced by Precision Software, and has similarities with other Precision products such as Superbase. However, the manuals for Easyscript and Easyspell, its sister program, are the standard Commodore type, with separate learning and reference sections within a floppy ring binder. With them comes a handy disk-sized quick reference card.

Easy script is in many ways the 'standard' word processor for the Commodore 64. It is currently given away with the 1541 disk drive, and this will ensure that a large number of C64 users work with the program. It is typical of the programs we reviewed in its general approach, and fairly average, or slightly above average, in its power and ease of use.

Though the Easyscript manual consistently refers to a cartridge, the program in fact is currently distributed in disk form only. It is, however, possible to save text files on cassette should you wish to do so. Only one (copy protected) disk is provided, and the fee for a back-up copy is a steep £10.

The program is one that doesn't lay out text in the print format on screen. The screen display is normally 40 columns, and words are not wrapped on screen, which makes it quite difficult to read the text. It is possible to extend the screen display up to 240 columns, which is very handy if you wish to edit wide columnar material. The screen then scrolls horizontally. Print margins are set separately, and it is possible to view the print layout by doing an 'output to screen' in which there is a proper word wrap. You can't edit the file during the screen output, but must return to edit mode to correct any errors that you notice.

Like many of its rivals, Easyscript allows you to choose your own screen colour combination for editing.

Easyscript uses fairly standard formatting commands. These are preceded by a special character (produced by the F3 key), and consist of mnemonics such as '1m10' for 'left margin at column 10'. This means that they do clutter and misalign the text, but are easy to check and revise. There are good block move and block duplicate commands. The insert command is less good: you can insert either single characters or entire lines of text, but you cannot use a single command to open up a space into which you can type new text in the middle of a document. It's possible to do any editing you might require, but with some effort. I also found that editing one paragraph tended to mess up the format of the succeeding

paragraph. While inserting and deleting, it was easy to accidentally remove the paragraph indent, for instance. This is a rather clumsy feature.

Among the useful extras are conditional forced page commands and a reverse-existing-case command (which would, for instance, change Basic into BASIC with a single key stroke). Vertical as well as horizontal tabs can be set, which are useful for tabbing down a fixed form. The horizontal tabs, curiously, apply to screen columns and not to print columns: so if you adjust the left margin from column 1 to column 10, a tab set at column 6 will now be at column 15.

There is a very flexible set of commands for moving the cursor rapidly around the text, and for panning up, down and across the text.

Easyscript has no obvious omissions among the editing commands, and I found it reasonably easy to use. There are no 'extra special' features such as column totalling or sorting routines. There is a run-of-the-mill form letter facility, adequate for simple applications, but which does not easily allow individual records from a file to be selected for merging. As there is no 'extra text' space in memory, the 'fill file' is merged with the main text file from disk. The 'search' command is fairly basic: it is not case-sensitive, and has no 'wild card' options. It will search a linked series of files, but in doing so will destroy the file currently in memory unless it has been saved.

One of Easyscript's shortcomings is in printer support. Though parallel printers with suitable interfaces can be supported, there is no parallel printer driver routine included as there is in many other programs, so it would be necessary to purchase an expensive interface to carry out the necessary code conversions. Various ASCII codes can be sent to printers, but it is not possible to both underline and enhance text. Good features are the ability to link files for printing, and to print multiple copies of files automatically.

Easyspell, the spelling checker program, is designed to be used with Easyscript, though it is not currently given away free with it! This program comes on two disks: one with the program itself (this time, for some reason, a back-up is provided free), and one with the dictionary. A 20 000 word dictionary is provided, though a 32 000 word one is available on request. It is possible to build up a single supplementary user dictionary, but not to amend the main dictionary in any way: a curiously restrictive feature.

Though it is a competent program, Easyspell is maddeningly slow

to use – particularly in comparison with Vizaspell, the other spelling checker I tested. It's normal to want to check a document when you have it in memory and have just finished editing it. With Vizaspell, you call up the spelling checker (a single disk manages to hold Vizaspell, Vizawrite and a 30 000 word dictionary) and it gets to work immediately on your document. With Easyspell, the act of loading the program removes your document from memory: so you must recall it, then go through a complex series of swaps between program, text and dictionary disks in order to check the text, revise it, and add any new words to the user dictionary. It would take a dedicated writer to perform this laborious task regularly. If you feel the need for this type of program, I would recommend that you look closely at the Vizawrite/Vizaspell combination before investing in Easyspell, even if you already possess Easyscript.

### *Quick Brown Fox*

First, some praise. Quick Brown Fox is by far the best presented of all the word processing programs I reviewed. It comes in a cartridge which can be switched on and off, so that there is no need to remove it before returning to BASIC. It has a beautifully printed and laid-out ring-bound manual, with full and clear – if maddeningly ‘jokey’ – instructions and explanations and a good ready-reference card. It also comes with a ‘training disk’ though this proves on inspection to contain three short documents, and not any kind of computer-aided training course. It is also commendably cheap, at £60, and it is possible to edit documents of a healthy length – up to 800 lines of text or so.

Now the bad news. Quick Brown Fox is by far the worst of the word processors I reviewed in action, and is indeed the only one that I could not recommend for the average user. It is more difficult, slower, and less pleasant, to use than any of its rivals.

One reason for this failing is that, though QBF is sold largely as a specialist word processor for the 64 and the Vic-20, it is designed to work with a wide variety of computers, and thus eschews almost all use of the Commodore screen editor functions and special keys. It isn't possible to use the ‘insert’ key in the usual way while typing text, for instance; it's necessary to go into a special ‘line edit’ mode in order to make insertions, or to make any changes at all to other than the current text line. The main function key is not one of the many Commodore control or function keys, but the shifted #, which is singularly inconvenient. It isn't even possible to change the screen colour from its dismal white on black. There is no additional use of

colour for prompts or highlighting, but this could be a helpful feature if you were working with a monochrome monitor.

In the 'type' mode in which text is entered, the screen gives no indication of your position within the document, either row or column, or, unless they are visible within the same block of text, of your margin settings. Curiously, the main menu doesn't disappear when you start to type. The menu is short and extremely plain, and you just get to work beneath it. Text is not formatted on screen, and not even paragraph returns are reflected on the screen display. This also, strangely, uses only 32 of the 40 screen columns unless you use an 80-column card with the package.

QBF is by no means the only commercial word processor that forces users to move from a 'type' mode into a separate 'edit' mode in order to edit text. However, few actually erase the screen and then present the text one line at a time for editing, as this program does. It's a technique reminiscent of the much-criticised program line editors used by Microsoft BASIC and some other computer languages, and it drastically disrupts the flow of thought. It's only possible to edit from your current cursor position, from the start of a document, or from a specific phrase you have searched for. Movement between lines is one by one, up or down, and if you move up the computer retypes the line each time you move. This is truly painful.

In order to view the text in a mode more closely resembling that in which it will be printed, it is necessary to go into a 'view' mode – in which, again, no editing is possible. Only a very few lines are displayed at once, and there is no horizontal scrolling, only an awkward split-line arrangement, which still makes it very difficult to tell exactly how highly formatted text will look when output. It's not possible to scroll upwards during this process.

QBF supports block moves, copies and deletes, but it is necessary to return to the main menu and then type – blind – a phrase that uniquely identifies the start and end of the block. Text can only be moved forwards, not backwards. New files can only be appended at the end of existing text, but 'boiler-plate' paragraphs within such a file can be incorporated at any point.

The program also takes an awkward approach to tabs. There are fixed tabs at every tenth column, but variable tab stops cannot be set; instead, it is necessary to include a 'tab to column x' command every time a tab is required. An example of a columnar layout is included in the manual, but I found it extremely and unnecessarily complicated.

General formatting commands are very comprehensive, and there is support for proportional spacing on printers which can achieve this. It's possible to send special controls to a printer, and to underline, boldface, overstrike and so on at will. There is a special printer driver routine incorporated for parallel printers. One failing is the total lack of an 'end of page' command. However, there is an unusual special print mode in which only complete paragraphs are printed on a page – unless a paragraph is more than a page in length. This would be handy for journalists.

One unusual feature of the program is its support for electronic mailing. With a suitably equipped system, it would be possible to send QBF text files from one computer to another. If this possibility really excites you, it may be worthwhile for you to try the package. Our systems are not equipped with modems, and we were not, unfortunately, able to test out this aspect of the program.

QBF supports 'boiler-plating', within the limitations of its file merge arrangements. It is possible to personalise letters by inputting name and address or similar data from the keyboard during the print routine. However, there are no normal form letter handling routines.

In summary, this is a very disappointing program considering the obvious care that has gone into its presentation. Though some users may find it satisfactory, it is difficult to imagine any class of user that would not fare better with any of the other programs we have reviewed.

### *Simply Write*

Simply Write is the cheapest of the word processing programs I review – unless, that is, you obtain Easyscript free with your disk drive! It costs about £35, and is available in both disk and cassette versions. Versions of the program are available for the Vic-20 and for other Commodore computers, and compatibility has been retained wherever practicable.

Simply Write is written largely in BASIC, with machine code subroutines, and it is not protected. If you have sufficient programming experience, you can modify the program in various ways to enable it to fit your needs. You can also take back-up copies without difficulty. Do remember, however, that you should not make copies for friends or colleagues.

The program does not format on screen. The display is fixed at 40 columns, and within this the program wraps all but the odd long word to the next line. Unusually, spaces before words are carried to

the start of the next line, giving a rather strange jagged left margin punctuated by broken words. The left-most column is left free for control purposes. There is no easy way to change the display colour, but the actual display (white on blue) is clear and uncluttered.

The program uses the F1 function key to toggle between the well laid-out main menu and the text screen. It's possible to access all menu functions without disturbing the text in memory. However, the menu functions do *not* include a disk directory. It isn't possible to view the disk directory at all once you've started the program without losing not just the text in memory but the entire program, unless you've previously loaded a utility that lets you do so. This is a real inconvenience.

As with most other programs that take the offscreen formatting approach, you must give special formatting commands to tell the program how to set out text for printing. Oddly these can only be one to a line, (even each tab stop must be given individually) so they may take up quite a chunk of your text line allocation. You must also be careful not to include carriage returns after them; you have to get used to using the cursor down key instead. The commands are clear and reasonably comprehensive, and include tabs, margin settings, page length, numbering and page headers, conditional page break, and so on.

Tabs are not reflected on screen; there is no 'ruler', and they are marked in the text by a control character, not by a physical movement. If you want to tab several times along a line, you must start each tab on a new line – again, without including a carriage return between lines. This is a rather clumsy arrangement.

Text is not automatically reformatted on screen after insertions or deletions, and it is necessary to give a 'format' command to tidy it up. Insertions that would not fit onto the existing line arbitrarily break it at the cursor position; it is necessary to reformat in order to close it up again. The program generally responds quite slowly; there is a noticeable delay before letters are echoed on screen when typing at speed, for instance. However, reformatting of individual paragraphs is fast.

One omission is any command for underlining or highlighting text. In order to send printer sequences that would achieve this, it is necessary to redefine keys on the keyboard: again, a slightly clumsy feature. (This is, however, extremely handy if you want to set up a 'foreign language' keyboard.) The command would then not be clearly discoverable from the text on screen, and subsequent editing would require great care. Apart from the lack of easily accessible

control sequences, support for various printers is good, and different versions of the program supplied will work with most printer/interface combinations. The program will also output graphics on Commodore printers. There are no commands for previewing the text before printing, or for outputting it as a special format disk file for use with other programs.

Block operations are supported, though curiously it isn't possible to copy a block without first saving it to disk or cassette. (The file it forms can then be 'appended' to the end of the existing document, and this block transferred to the required point in the text.) Only entire lines can be handled, but as it is easy to produce a temporary line break using the Insert command, this is not a particular inconvenience. Much more of an inconvenience is the way in which blocks are marked. They are not highlighted; instead you type a square bracket in the left-hand margin, and as soon as you move the cursor this disappears. There is then no way to check where the markers have been set. Once blocks have been marked, it is disconcertingly easy to delete them.

The program will hold a fairly generous 687 lines of text, with clear warnings when this limit is approached. However, the speed of response slows, and the time taken by the regular 'garbage collection' routine increases, as the text grows longer. The program recommends that you write documents of about 100 lines each, and then link them for printing.

It is also possible to link documents for producing mailing lists, and this is a reasonably versatile facility comparable to those found on the other programs reviewed. The manual gives this feature rather scant attention. It's a 41-page manual in a floppy cover, clearly written – though not really a tutorial in any sense – and with an index. There are also some training documents on the disk.

One glaring omission in the program is the lack of any search and replace command. Cursor movement and paging commands generally are quite good, though I felt the lack of any command to move the cursor to the end of the text.

In summary, Simply Write is a competent program with some good features, and some rather clumsy ones. In my view it is not comparable in power with the best of the programs I reviewed. However, it is very easy to use within its limitations, and the price differential may make it a first choice for many less demanding users.

### *Vizawrite*

The Vizawrite word processing program comes on either disk or cartridge, though it can be used (and most obviously the cartridge version would be used) to store documents on tape as well. The disk is protected and only one copy is supplied, though a second copy will be provided for an additional fee. Vizaspell, the associated spelling program, can be purchased separately or together with Vizawrite (on disk only). This is not protected, and the manual assumes that users will make a number of copies to store on their document work disks.

I tested the disk version of Vizawrite, with Vizaspell.

Vizawrite is a very well presented program, and it formats text on screen. There is no separate preprint formatting routine, and a minimum of control characters are shown on screen. With few exceptions, what you see is what you get! Its approach to the few necessary control characters is very neat; each one is designated by a separate graphic (not in the normal Commodore set), and when the cursor passes over the graphic, a letter mnemonic is displayed instead. Control characters can be edited just as can normal text, and can, for instance, be included in search and replace strings.

Vizawrite scrolls horizontally, but here it has a strange weakness. It persists in performing the horizontal scroll even if the document width is less than 40 characters, so there is no way of avoiding it when editing a narrow document. This is a little disconcerting, though not a major fault. The normal document width can be overridden at any point, and the document displayed at 40 columns for review. This is an excellent feature; it's easy to swap between view modes and read chunks of a document at 40 characters to the line. Word wrap is properly performed in this review mode, and documents can be edited in it. (You can even print in this mode, though your output may not be quite what you expect!) The cursor doesn't remain at the same position in the text when this operation is performed, which is a slight inconvenience.

Vizawrite's other peculiarity is its use of faint dots to designate typed spaces. This helps to make it clear where the actual text appears on screen. Full-stops are clearly distinguishable as brighter dots. The screen colours are adjustable, and blocks of text are highlighted when defined in white. The program will remember the screen colours associated with different documents.

This is a page-oriented word processor, with – unusually – no fixed page length. You just type until you feel there's enough text on the page, then ask for a new page. It's up to the user to paginate

sensibly, and this could be a chore, but it does mean that no formality is required in adding text to the bottom of an existing page. Text can easily be moved from page to page, and blocks can even be highlighted across page boundaries. There are very flexible separate header and footer pages, on which several lines of header and footer information (including page numbers) can be kept separate from the main text.

Another unusual feature of the program is a separate 'work' page, which again can be of any length, though only one page is available. This is not printed directly, but it could be used for storing notes to be incorporated at points in the main text, or for developing sets of information to be merged with the main text. The work page *is* saved on disk or cassette with the main document.

Vizawrite's editing commands are very good. They are straightforward and memorable, and there is a wide and sensible range of them. Confusingly, they are only summarised in the middle of a manual that has no index! However, a 'help' document can be loaded into the work page to remind you of them. Among the commands are a search and replace with several options (case sensitive or not, single or repeated occurrence of a phrase), a good 'indent' command that survives reformats, and a command that allows you to check the amount of memory still available, so that a full memory will not come as a rude shock. There are very full facilities for sending printer control codes, using mnemonics or ASCII codes as necessary for different printers.

A default 'ruler' which sets margins at columns 4 and 74, appears at the start of each document. This can be edited without entering a separate mode, and a copy of the last version can be recalled for further editing at any point in the document. This makes it easy to prepare tightly formatted text, and reformatting is fast and automatic. There is a decimal tab, but there are no arithmetic or column manipulation facilities.

The program includes a parallel printer interface, and this is sensibly held on disk as a separate routine, so that it can be accessed from BASIC and from other programs. A user with a parallel printer would need only a cheap cable, not an expensive interfacing device, in order to use it for text. It is very easy to set printing features, though curiously it's only possible to get double-spaced documents by fiddling with the line-feed settings.

File merge facilities are good. Files to be merged can be held on the work page as part of the same document, on disk as a separate document, or sequentially, as they might be if the information came

from a different type of program such as a database. It is possible to introduce 'ignore field' markers, so as to selectively cut down a merge file, but fields are not named in any way, so that data to be merged must be taken sequentially from the file. This flexibility would be quite adequate for handling simple form letters, and the commands are very easy to use, though manual examples are on the brief side.

Most unusually, Vizawrite recognises the existence of other word processing programs, and it can be used to edit files created by Easyscript and a number of other programs. I found myself making good use of this feature when my Easyscript disk crashed, and personally I found editing Easyscript files using Vizawrite preferable to editing them on Easyscript itself. My only difficulties came in printing out the files; here I suffered a couple of system crashes, though without losing text. I'm not sure if this is the result of a deep-seated 'bug' in the program, or if they were isolated problems. Vizawrite also has good links with BASIC and with the disk operating system, though disk formatting and similar chores can be performed within the program itself. Checking a disk directory does not affect the document held in memory.

Vizaspell, the accompanying spelling checker, is also an impressive program. It's fast and easy to set in action. It reports on the variety of words used in a document, and will list them either alphabetically or in order of frequency of use. Numbers (though not average lengths) of sentences and paragraphs are given, and the word count would prove very useful to journalists writing to pre-ordained lengths. The program has an integral 30 000 word dictionary (generous by spelling checker standards) and it is easy both to amend this, and to edit the document once words not in the dictionary have been located. Finally, it's possible to create and edit supplementary dictionaries using Vizawrite itself, and to search the dictionary in order to check spellings, using wild cards if necessary. (It would be handy for a crossword fiend!) Vizaspell can automatically be called up from within Vizawrite, and like its sister program, is highly recommended.

### *Wordcraft 40*

Wordcraft 40 is adapted from a word processor originally written for the Commodore Pet, and it will be particularly attractive to those with Pet word processing files. It is a cartridge based program, (from Audiogenic, who produce Magpie, reviewed in Chapter 5)

and is very easy to use. It can be used with either tape or disk files, and it is easy to switch files between the two media.

The program comes with a good quality manual in a ring binder, which guides the user very fully through the stages of setting up and using the system. Its very fullness perhaps obscures the fact that the program's features, though well designed, are fairly basic. There are quite good form letter commands, but no other 'extras'. As it is a cartridge, it is fairly understandable that this program should nevertheless be so expensive. Also, it is written in machine code, which makes it very fast in operation.

An obvious lack in the manual is any easy reference section. Many of the commands are not immediately memorable, and a quick reference sheet to sort out the F7s and F8s, the \*s and the ?s, would be useful.

The program works in page form, and it is easy to set up pages, end them on demand (though not 'conditionally', so as to ensure that page breaks do not come in awkward places), and move text from one page another. Text from only one page can be displayed on screen at any time. There is a sadly short maximum document length of 341 lines, and no command to link files from disk for a long unattended print run. The header and footer commands are rudimentary and do not include, for instance, automatic page numbering.

Wordcraft 40 takes an excellent approach to the 80 column problem. It is possible to set the width of your document at 40 columns, so that all of it is displayed on screen for editing and revision, and then to switch it instantly to 80 columns (or any other width up to 99 columns) and scroll across to check on tab settings and other layout details. Most print details are included in the document, in coded form. Some additional details are given as part of the preprint routine, but there is no need for a lengthy preprint formatting routine.

The printer support is unusually balanced. Wordcraft supports a wide range of printers, and includes a parallel interface. (There is, however, no visible way to use the interface outside the wp program, as there is on Vizawrite.) It's possible to designate individual pages to be printed, and to send ASCII codes direct to the printer to set special settings, which can be useful on printers with special features. However, the support for more common features is limited. It's only possible *either* to embolden *or* underline on a single page, not both. And if you choose to embolden, you can't also double space. Variable spacing (other than double) is not directly supported,

though it might be managed through the ASCII codes. The program will right justify, though it prints ragged right as a default.

The various printer prompts in the text all appear in the same way on screen, as reversed out letters or solid blocks. It is necessary to go into a separate mode in order to discover what the various codes symbolised by the blocks actually are, and to amend them if necessary. In this mode, all changes of tab setting are recorded, which is confusing. All in all, this seems a rather clumsy feature.

No tabs are automatically set, but it is not difficult to set and remove tabs. It's also possible to indent paragraphs easily, and to change right and left margins without affecting the overall document width. As the document width is altered for printing, all centring, tabulation and indent commands are adjusted automatically. This is an excellent feature.

One slightly exasperating point is that Wordcraft does not, like most programs, use the Return key to signal the end of a paragraph. Instead, it is necessary to use the F7 function key, which is awkward for a touch typist.

It's possible with this program to merge individual pages of documents stored on disk into the document you are editing, a feature which would be useful for boiler-plating. It's also possible to select individual fields from files for merging, and this makes a reasonably flexible and easy to use form letter facility.

Overall, I found this to be a well-designed, fast acting and easy to use program, without exceptional power. It would be an excellent choice if you plan to use a system with a single disk drive and a parallel printer that you will only be using with other programs containing printer drivers. It would also make the basis of a powerful and flexible system, if used in conjunction with the compatible Magpie programmable database.

### *Wordpro 3 Plus/64*

Wordpro 3 Plus/64 is a US-written program distributed in the UK by Wego Computers. The manual and accompanying documentation are US-written, and the all-important information on warranties and obtaining a back-up of the single copy protected disk were also US-oriented only - hopefully UK back-ups are available! The program is available only on disk, at a rather high price of about £80. A well printed ring-binder type manual is supplied without the binder; presumably you buy your own, which seems rather mean at the price.

Wordpro is not an on-screen formatting program; the screen

display does not scroll, even to give a taster of what the printed output will look like, and there is no way of reviewing the effect of formatting instructions before printing out, which is a poor feature. It's possible to set margins to give pages wider than 40 columns, but curiously there seems to be no way of setting tabs beyond column 40, whatever the right margin setting. This must make the program exasperating, to put it mildly, for columnar work.

As with Easyscript, Wordpro does not word wrap on screen, and this messy touch mars what is otherwise a neat screen display. Formatting instructions are given in special format lines, in alpha coded form, and are – barring the tabular problem mentioned above – very comprehensive. The program is not page-oriented, and no page breaks are shown on screen: again, it is necessary to draft print to find out where they will come. There are comprehensive commands for setting and overriding page lengths, and for incorporating headers and footers. There is also a 'conditional page break' command, which should reduce the risk of a page break occurring at an inconvenient point.

Unlike most of its rivals, Wordpro has a proper Insert mode, in which you can zip around the document with the cursor and insert text at any point without overwriting. You can toggle between this and the overwrite mode, and this makes small editing changes and additions very convenient. The otherwise comprehensive editing commands are slightly spoiled by the fact that it is only possible to carry out block moves, duplications and saves to disk on whole screen lines of text. Most other programs allow you to specify the exact words and characters which will form part of the block. As a result, you can't shuffle the words on a line in Wordpro, without deleting and retyping some of them.

The program responds fast, and text is continuously adjusted to the 40-column screen format during insertions and deletions.

Wordpro, like Vizawrite, has a separate 'work' page, into which additional text can be written. Wordpro's work page can be of any length less than the main text length, but the length has to be specified on start-up and cannot be dynamically adjusted. As the program has a very low maximum text length of 329 40-column lines, the division between the two areas needs planning with care. Wordpro's extra text contents are *not* saved (as are Vizawrite's) with main text files. They can, however, be saved as separate files.

One great plus is that the extra text area can be used not only for help documents and for merge documents, but also for standard paragraphs and phrases that will be used frequently in typing a long

document. In writing this review, for instance, I could have typed a note like 'a|=word processor' onto the extra text page. A three-key command would then have reproduced this phrase in the main document. Entire paragraphs of standard text can be handled in the same way, and the size of the extra text area is the only limitation to the number of phrases or paragraphs handled. This is a very powerful feature, which greatly improved my impression of the program.

The merge facility itself is not well designed for form letters. It is not possible to select records for merging automatically, as it is, to a limited extent, on Vizawrite and Wordcraft 40; it is necessary to delete unwanted records before merging. The facility is much better suited to 'boiler-plate' applications, though production of very straightforward form letters would certainly be possible.

Blocks of text, as well as entire files, can – allowing for memory limitations – be saved on disk as separate files.

Other good features of Wordpro are its column addition and subtraction commands, and a good set of global commands for searching and replacing through, and printing, linked sets of files. The search and replace function is moderate: it contains a wildcard feature, but does not have a case-sensitive option.

A poor feature is the lack of crash-proofing features. Unless you take steps to load the disk directory into the (empty) extra text area, for instance, it will overwrite the text in main memory, and there is no effective confirmation required before this drastic operation takes place. There are also no prior warnings before memory is filled. And duplication of blocks of text will – unlike block moves – overwrite existing text in the destination area without warning.

You should be aware, finally, that although Wordpro's support is good for printers connected through the Commodore 64's serial port, the program will not recognise printers connected to the user port or any other port. A number of interfacing devices and cables do use other ports, and if you are using a non-Commodore printer, you should check carefully to ensure that your configuration will work properly.

## Chapter Seven

# Other Applications

In this final chapter, I briefly discuss two additional fields of application for the Commodore 64 which will be of particular interest to business users. First, I discuss the setting up of complex software systems in which data files created by one program can be accessed and manipulated by other programs; and secondly, I discuss computer-to-computer communications. These are superficially quite different topics, but in fact they have features in common that make it reasonable to relate them in the same chapter. Finally, I go on to look at programming in BASIC, and to consider how necessary the ability to write simple programs is for business users.

### Using different programs together

The Commodore 64 is a single-tasking computer. In other words, it can normally only run one program at a time. Some attempts have been made to set up complex 'program environments' in which it is possible to switch from one type of application to another, and back again, with minimal formalities, but as yet these have not been entirely successful. (Commodore have been developing the 'Magic Desk' system, intended to achieve this, for some time, but I understand that there have been difficulties in producing a satisfactory system, and it is not yet available in the UK.) As a general rule, if you want to switch from, say, a word processor to a spreadsheet then you must exit from the word processor program – losing the information held in the computer's memory as you do so – and then load the spreadsheet.

This can make it awkward for you to use data produced from using one program – a spreadsheet full of figures that you'd like to incorporate in a management report written with a word processor,

for instance – with another one. It is not impossible, however. Each program stores its data in the form of files on disk or cassette, and if the programs are designed in a similar way, they may set up their files similarly. Even if the programs are quite different, they may use the same basic file format. Many programs, for instance, create simple sequential disk files, using the facilities incorporated into the Commodore disk operating system. (A sequential file is basically just a long list of data, named and stored on disk.) There is then nothing to stop you working with these files outside the program which created them, either by giving your own commands in BASIC, or while running a program that is able to handle their contents.

As a simple example, you can use the Vizawrite word processing program to edit document files created using some other word processing programs. You can't read the foreign file into memory just as if it were a Vizawrite document: when you start up Vizawrite, you have to select the 'Create New Document' option. Then you can merge a document created by, say, Easyscript into your empty workspace. The document will contain control symbols that Vizawrite doesn't recognise, but you can edit these out and substitute Vizawrite's own recognised symbols. The result can be printed or saved as a conventional Vizawrite file.

In a program that handles data in a 'tighter' format than does a word processor – a spreadsheet, for instance, that expects to find cell contents described in a fixed order and using fixed conventions – it may not be possible to do the necessary editing of the sequential file, removing unrecognised control messages and adapting the format, within the destination program. Instead, you would need to use a specific program routine to help bridge the gap between the different data conventions, before reading the file into the destination program. You might find such a routine ready-written, either independently or as a menu option in the source program. Alternatively, you could write your own simple BASIC program to read and edit the file. Some program manuals give you very full details of how their sequential files are set up, and with this type of information it is not difficult to write the necessary bridging program. Of course, you would only wish to attempt this task if you already understood, or were willing to learn, the fundamentals of programming in BASIC.

Many programs do not store all their data in the form of standard sequential files. Databases in particular often use the more complex random file format, which cannot be read in the same simple way. Other programs have developed special codes and data formats to

help conserve disk space or to suit specific processing requirements. Often, however, it's possible to produce conventional sequential disk files using these programs, with a special menu option. You can then read these into the destination program in just the same way.

As an example, you might want to use a file of names and addresses created using the Superbase 64 database as a 'merge' file to enable you to create a set of form letters with the Easyscript word processing program. You'd need to instruct Superbase to select the names and addresses you want to use – a task for which it is very well suited – and then to 'output them to file': that is, to save their contents in the form of a sequential data file. You would read this file through Easyscript, perhaps edit it if necessary, and proceed with the merging and printing operations in the usual way.

In summary, it *is* perfectly possible to swap data created by different programs, and when you are dealing with sizeable data files it can be well worth doing so. (If you're only talking of one or two addresses, or half a sheet of figures, you may find it not worthwhile.) With programs that are 'tuned' to each other's data requirements, this can be a very straightforward business. With other programs, it can require a little more work; and if you are not a programmer yourself you may find this to be a real drawback. With some very specific programs that are not designed to work together, you will probably not find this to be practicable at all.

## **Computer-to-computer communications**

Communications between computers can be handled in either of two main ways. They can be handled through the setting-up of a special network, with linking wires and communications protocols of its own; or they can be handled through the public telecommunications system. The Commodore 64 is not specifically designed to support a networking system, and the latter is generally the easier option.

All that you need in order to connect the Commodore 64 to the public telephone system is a suitable *modem*. This is a device that converts the computer's binary signals into the analog waveform signals that the telephone system handles (and vice versa, as well). The modem connects to your telephone, either via a jack plug, or through an 'acoustic coupler', a device which you literally couple to the telephone receiver. Commodore themselves produce a 'Vicmodem'; a number of other companies also produce suitable

devices. Using a modem, with a suitable program of course, you can then send data – for example, the contents of a word processing document file or a sequential file created by another program – along the telephone wires. Another computer – which need not be a Commodore 64 – can, if it is suitably equipped to decode your signals, then read your data into memory, and hence perhaps into files of its own.

This brief description skates over a lot of practical difficulties. There is a great deal of programming involved in co-ordinating the sending and receiving of signals, either by keeping the two computers synchronised or by setting up a complex protocol to warn the recipient computer of the arrival of a message. Only a very competent programmer would want to undertake this task, which is far more complex, for instance, than simply editing a sequential file as I described above. Programs are certainly available to do these tasks, but they are still comparatively thin on the ground.

Only one of the programs we review in this book – Quick Brown Fox, a word processor – specifically supports this type of communication, and includes appropriate program routines. Using a separate communications program, you could, of course, send a sequential file (or other suitably formatted file) created by any other program to another computer. You may find this field worth exploring if you are anxious to exchange information rapidly between two Commodore 64s on comparatively rare occasions. However, if you are looking for a computer system in which a terminal is permanently ‘on line’ to host computer (and, for example, frequently updates a database held on the main computer), then the Commodore 64 is almost certainly not the computer you should be using: it is not designed for this type of activity. (Your dealer can advise you here, of course.)

Do note, by the way, that you don’t need to resort to electronic mail in order to read files created on one Commodore 64 on another one. We wrote large sections of this book, for instance, by sending floppy disks containing word processor files to each other through the mail in special, cheap and widely available ‘disk mailers’.

One purpose for which you may wish to use a modem is to link your Commodore 64 to Prestel, to the Prestel-based ‘Micronet’ home computer network, or to another commercial viewdata-type system. These are public databases, held on large mainframe computers, which you can access (and through which you can send messages) using a modem, a special program and your Commodore 64. A modem/viewdata software kit for the Com-

Commodore 64 can turn it into a cheap and effective viewdata terminal. You might find it extremely useful to have ready access to the public news and current affairs pages on Prestel (stock prices, train times, hotel bookings and so on), or to join one of the 'special interest groups' (including many groups of business users) which maintain private pages on the system.

## **Programming in BASIC**

The Commodore 64 User Guide tells you about the fundamentals of programming in BASIC, the most popular high level computer language, and the language built into your computer. If you are not familiar with BASIC programming, you may like to take a look at the programming chapters now. You'll see that it's not difficult at all to write short, simple programs.

The User Guide can give you a taste of programming, but if you plan to learn to program, even on a very casual basis, I'd advise you to invest in a proper tutorial book that teaches Commodore BASIC. (The dialects of BASIC used by other computers are often markedly different, so ensure that you get a Commodore-biased book.) You will also need the Commodore 64 Programmer's Reference Guide. This isn't a tutorial, but it gives you a vast amount of useful information about your computer, how it works, and how to program it.

Understanding a little about BASIC programming will certainly be helpful to you. It enables you to test out your system, for instance, and find out if your printer and disk drives work properly. It enables you to write short (maybe only five- or ten-line) programs to print messages on the screen, print envelopes on your printer, and produce diagrams like the ones in this book on a plotter. Even if you have a very comprehensive library of commercial software, you'll find it handy occasionally to be able to tell the computer what to do directly, outside the confines of a commercial program. And perhaps most important, it enables you to understand what is going wrong when your purchased program crashes and you get an error message on screen. This happens to everybody sometimes. If your programs are less than top quality, it may happen with remarkable frequency. If you understand the error message and something of how the program is designed and its files are created, then you will often be able to salvage the work you did before the crash. Without this vital knowledge, you may lose hours of hard work.

There's a lot to be said for being able to write short, simple programs, then. Complex programs are a different matter.

Complex computer programs are difficult and time-consuming to write. It can take several man-months to produce an adequate word processor program, for example. Consequently, there is no sense in your writing your own program, or having one specially written for you, if an alternative is available. The obvious course is for you to purchase a ready-written program. As we have tried to show you in this book, good commercially available database, spreadsheet and word processing programs can cope with many, perhaps all, of your small business computing needs. Accounting programs tend to be more variable in standard, and you may find them less satisfactory, but a well-chosen program will again suit many different businesses.

Databases and spreadsheets in particular are general-purpose tools, and it takes some effort to turn them into the basis of a special-purpose system that meets your particular requirements. Programming a database, or setting up the formulae that turn a spreadsheet into a financial planner, may not be what you think of as 'computer programming'. That's what these jobs are, though: they are part of the task of programming your computer system to do what you want it to do.

It's generally not too difficult to do this type of very high-level programming yourself, but it does take time to learn how, and you may feel that you simply don't have the time to spare. Sometimes the programming language provided has close links with BASIC; in other cases, it is entirely different and you need to master it from scratch.

It's perfectly possible to commission a local software house to turn a selection of off-the-shelf programs into a suite that works effectively for you. A professional programmer will take less time than you would, starting from scratch, to program a database like Magpie or Superbase 64 (see Chapter 5) to provide a stock control system tailored to your types and quantities of stock, for instance. You may cavil at the chore of turning a blank spreadsheet into an effective financial planning tool. Your computer dealer, or your accountant, may be able to point you to a specialist who can do the job for you, rapidly, efficiently and not too expensively. If you want to use files created by one program as input to another, in the way we discussed above, then a professional will take very little time to work out how it can be done, and write the necessary program to adapt the file contents.

Many databases are specifically designed to be programmed. In

effect, they provide a 'high level language' in which you (or somebody else working for you) then write subprograms which the main database program will run for you. Most other business application programs are not designed to be programmed in quite the same way. Some, however, are written in such a way that they can be tailored more precisely to your requirements simply by adapting the basic program listing. If a program is written in BASIC, and the listing is not protected, you can edit it just as you could if you had written it yourself. If you want to allow for more file fields, wider spreadsheet columns, or to support a different printer feature, then you may be able to modify the program so that it works in the way you wish. If the program is written in machine code rather than BASIC, or if it has been compiled to help it run faster, then you will not find this practicable unless you are an expert.

It's not easy to find your way around long, complex program listings, but the manuals of programs that can be amended in this way often help you here. They explain which sections can be amended, and even outline the amendments you may wish to make. The 'Simply' set of programs (Simply Write and Simply File) take this approach, for instance.

You will soon recognise programs written in BASIC, even if the program manual doesn't tell you in what language a program is written. Typically, they are programs that you first load and then run – while with machine code programs, giving the load instruction will run the program automatically. To edit them, you simply load and list the program instead of running it. Of course, it makes sense to edit only a copy of the original program you bought. That way, nothing is lost if you slip up, and later you can revert to the original version.

In summary, don't take it for granted that because you have no wish to program professionally, understanding the fundamentals of programming is not important to you. You can certainly manage without, but if you take the trouble to learn a little about programming in BASIC, you'll certainly find your effort repaid.

## Appendix 1

# Interfacing Devices for the Commodore 64

As we mention in Chapter 1, it is necessary to use special interfacing devices to improve upon the Commodore 64's in-built range of parts, in order to connect parallel printers, non-Commodore serial printers, IEEE disk drives etc. Devices we have heard of include:

*DAMS IEEE 488*, an expansion board which connects to the cartridge slot. Price £49.95. Phone 051 548 7111.

*Interpod*, which links to the serial port. This is a more adjustable device. Price £125. Phone 0993 812700.

*Impex/Micro World parallel interface*, a switchable device for sending a full range of codes to parallel printers. It plugs into the serial port. A similar device is available for serial printers. Price £79.95 plus VAT. Phone 01 900 0999.

*SPT parallel conversion program and cable*. Price £35 plus VAT. Phone 0621 668484.

*Commodore IEEE cartridge*, designed more specifically for linking additional Commodore devices. Price £34.95.

It is impossible to advise you on the choice of a device without knowing exactly what hardware and software you plan to use. Before buying any interface, you should consult your dealer, and ensure that the device will do what you wish it to.

## Appendix 2

# **Business Programs for the Commodore 64 – A List of Known Products**

Not all products in this list have been reviewed, and the inclusion of a product is no guarantee of its quality or suitability for the applications mentioned. Products reviewed in this book are marked with an asterisk. Approximate prices (as at January 1984) are given, but we cannot guarantee their accuracy and they are, of course, subject to change. To the best of our knowledge they include VAT and may include postage. They do not include the cost of back-up copies where these are not automatically included. Where two prices are given, these are for different media in the order listed. Addresses of producers or known suppliers are given at the end of the list.

### **Accounts Programs**

#### *Impex:*

Account-Pac, double entry book-keeping, disk/tape, £25/£29.  
Company Pac\*, ledgers/stock control, disk, module 1 £76,  
modules 2/3 £58 each.

#### *Anagram:*

Anagram Sales/Purchase ledgers\*, disk, £75 each.

#### *Quick-Count:*

Book-keeping for the Cash Trader\*, disk/tape, £90.

#### *Kobra:*

Kestrel Sales/Purchase ledgers, £99 each.

#### *Micro-Simplex:*

Micro-Simplex\*, book-keeping, disk, £172.50.

#### *Mr Chip:*

Mr Chip Sales/Purchase Ledgers, tape/disk, £15/£17.

#### *SIP:*

SIP Accounting System, tape, £25.

#### *NDS:*

The Home Accountant, disk, £47.

## **Composite Programs**

### *Viza Software:*

Vizastar 64: spreadsheet/database/graphics, £99.95.

### *Rabbit Software:*

Infomast\*: database/calculation/word processing, disk, £19.95.

### *Audiogenic:*

Home Office 64: word processing/database, tape, £15.

## **Databases**

### *Dialog:*

Catalog, tape, £17.

### *Commodore:*

Easy File, disk, price tba.

### *Impex:*

Inquire Pac, (included in 'The Word'), disk, £57.

### *Audiogenic:*

Magpie\*, cartridge, £100.

### *Kobra:*

Mailpro, disk, £69.

### *Marketing Micro:*

Practifile, disk.

### *Simple Software:*

Simply File\*, disk, £69.

### *Precision Software:*

Superbase 64\*, disk, £99.

## **Financial planning**

### *Commodore:*

Future Finance\*, disk, £75.

### *Dialog:*

Journal, tape, £20.

## **Spelling checkers**

### *Commodore:*

Easy Spell\*, disk, £75.

*Impex:*

Script 64 (including wp), disk, £78.

*Viza Software:*

Vizaspell\* (for use with Vizawrite below), disk, £68 (or £99 together with Vizawrite).

## **Spreadsheets**

*Kobra:*

Calc Result, cartridge, £95.

Easy Calc, cartridge, £69.

*Supersoft:*

Busicalc\*, disk/tape, £45.

Busicalc 2\*, disk/tape, £80.

*NDS:*

Ominicalc, disk, £63.

*Marketing Micro:*

Practicalc\*, disk/tape, £25/£30.

PS (the Programmable Spreadsheet), disk/tape.

## **Stock control**

*Marketing Micro:*

Inventory 64, disk.

*Kobra:*

Kestrel Stock Control, £99.

*Impex:*

Stock Control\* (also as part of 'Company Pac'), disk, £58.

## **Word processors**

*Commodore:*

Easyscript\*, disk, £75 (currently free with 1541 disk drive).

*NDS:*

Heswriter, cartridge, £29.

*Kobra:*

Paperclip, cartridge, £86.

*SPT Electronics:*

Quick Brown Fox\*, cartridge, £60.

*Impex:*

Script 64, disk, £78 (including spelling checker).

*Simple Software:*

Simply Write\*, disk, £35.

*Audiogenic:*

Wordcraft 40\*, cartridge, £90.

*Impex:*

Wordmanager, (as in Video Pak 80), disk/tape, £46.

*Wego:*

Wordpro 3 Plus/40\*, disk £80.

*Viza Software:*

Vizawrite\*, cartridge/disk, £79/£65, (or £99 together with Vizaspell).

## **Hardware/software packs**

*Impex:*

CP/M, Z80 board, video pak as below, disk-based CP/M software, £259.

The Word, 80 column screen/word processing/database, disk, £224.

Video Pak 80, 80 column screen on monitor/word processing/communications, disk/tape, £144.

*SPT Electronics:*

80-column board, £154.

## **Suppliers**

Anagram Systems, 60A Queen Street, Horsham, West Sussex RH13 5AD (0403 59551).

Audiogenic Ltd., 34-36 Crown Street, Reading, Berks RG1 2SN (0734 586334).

Commodore Business Machines (UK) Ltd. 675 Ajax Avenue, Slough, Berks SL1 4BG (0753 79292).

Dialog Software, 20 New Road, London WC2H 4LA (01 289 6904).

Impex Designs (UK) Ltd., Metro House, Second Way, Wembley, Middlesex, HA9 OTY (01 900 0999).

Kobra Micro Marketing, P.O. Box 28, Henley-on-Thames RG9 1PF (04912 2512).

Marketing Micro Software, Goddard Road, Whitehouse Industrial Estate, Ipswich, Suffolk IP1 5NP (0473 462721).

Micro-Simplex Ltd., Freepost, Macclesfield, Cheshire SK11 6YA  
(0625 615000).

Mr Chip Software, 1 Neville Place, Llandudno, Gwynedd LL30  
3BL (0492 79026).

NDS (Nationwide Discount Software), PO Box 28, Tunbridge  
Wells, Kent TN1 2YU (0892 36832).

Precision Software Ltd., 6 Park Terrace, Worcester Park, Surrey  
KT4 7JZ (01 330 7166).

Quick-Count Ltd., 15 Neeld Crescent, London NW4 3RP (01 202  
5486).

Rabbit Software Ltd., Unit 11, Forward Drive, Wealdstone, Middx  
HA3 8NU (01 863 0833).

SIP (Shore Industrial Plastics), 1-13 Corsham St., London N1 (01  
250 1976).

Simple Software Ltd., 15 Havelock Road, Brighton, Sussex BN1  
6GL (0273 504879).

SPT Electronics Ltd., Tollesbury, Essex CM9 8SE (0621 668484).

Supersoft, Winchester House, Canning Road, Wealdstone, Harrow,  
Middx HA3 7SJ (01 861 1166).

Wego Computers, 22A High Street, Caterham, Surrey (0833 49235).

Viza Software, Ltd., 9 Mansion Row, Brompton, Gillingham, Kent  
ME7 5SE (0634 813780).

## Appendix 3

# Hardware Credits

When it comes to using computers in our own businesses, we do almost practise what we preach! Much of the book was written on Commodore 64 computers, using the Easyscript and Vizawrite word processors, and the peripheral hardware we described in Chapter 1. (Not all of it was checked with the accompanying spelling checkers!) We exchanged floppy disks by post to enable us to review each other's work. Some sections of the manuscript were written instead on Susan's more powerful Torch computer, using the CP/M-based WordStar word processor. Good as the Commodore 64 and much of its software is, it still doesn't rival this much more expensive business microcomputer in general ease of use.

The manuscript was edited and typeset in the conventional way but the illustrations are photoset from originals we drew up ourselves. The diagrams were drawn on the Commodore 1520 printer/plotter. Tables and more text-oriented figures were produced on Epson FX80 and TRS-80 Daisy Wheel II printers. Wherever possible, we printed directly from the programs under review, but where this was not feasible, we produced an impression of the screen displays using a word processor.

## Appendix 4

# Suggested Further Reading

General background to computing:

Susan Curran and Ray Curnow, *The Penguin Computing Book*, Penguin.

Peter Rodwell, *The Personal Computer Handbook*, Dorling Kindersley.

Specific books on the Commodore 64:

*Commodore 64 Programmers' Reference Guide*, Commodore

Ian Sinclair, *Commodore 64 Computing*, Granada.

Pete Gerrard, *Using the 64*, Duckworth.

Ian Sinclair, *Commodore 64 Disk Systems and Printers*, Granada.

Basic programming tutorials:

The best general book for business users we can recommend is: Clive Prigmore, *30 Hour Basic*, NEC.

More specific Commodore-oriented books are listed in the C64 User Guide

On business applications:

Susan Curran, *Word Processing for Beginners*, Granada.

Rose Deakin, *The Database Primer*, Century.

# A Brief Glossary of Technical Terms Used in the Book

*ASCII*: A widely used code that covers alpha/numeric characters and control instructions. Normally used to handle data communications (e.g. between computer and printer or another computer). Commodore ASCII is different from standard ASCII, which most other manufacturers use.

*BASIC*: A computer programming language that is built into the Commodore 64.

*board*: Integrated circuit board (in this context) containing circuitry which can be added to the computer (e.g. an 80-column board contains circuitry necessary to generate 80 columns of characters on screen). In the C64, add-on boards are added to the computer from outside, not slotted into the computer case.

*bug*: Fault (real or apparent) in a computer program.

*cartridge*: Solid-state circuit containing a computer program, which plugs into the computer via a specially designed 'cartridge slot'.

*column*: The number of columns is a measure of the number of characters displayed across the screen: normally 40 on the Commodore 64 (can be increased to 80 with an '80-column board').

*command* Instruction to the computer, given either in BASIC or in another language (could be a language supported or created by an application program).

*CP/M*: A popular business-oriented computer operating system (see *operating system*).

*crash*: Used here to designate any program breakdown or system breakdown. A program crash stops the program run and often loses all data held in memory.

*cursor*: The small marker on a video screen (might be an underline symbol, or a coloured or flashing box) that indicates where the next screen operation will take place.

*daisy wheel*: Print element containing letter/symbol impressions in a daisy-like configuration; a printer using such an element.

*database*: Program that stores, sorts and orders data.

*disk drive*: Hardware device that enables the computer to read data written on floppy or hard disks.

*dot matrix*: A printer that generates characters by the impression of small dots on paper.

*file*: Set of data held in a specific format on cassette or disk. See *sequential format*: (1) To prepare a floppy disk for use, using a special program. (2) Layout of text on screen or paper; control sequences used to adapt layout via a word processor program.

*floppy disk*: Secondary storage device for data.

*function*: (among other uses) Arithmetical/logical expression that can be evaluated, e.g.  $2*2$ .

*Hard disk*: Secondary storage device for data.

*hardware*: The actual computer and associated equipment.

*interface*: Either a built-in port, or a separate hardware device required for successful interfacing.

*interfacing*: Enabling different hardware devices (e.g. computer and printer) to work together as part of the same computer system.

*K*: 1024 (a measure of RAM capacity, so 1K means the ability to hold 1024 bytes (characters) of data).

*load*: To put a program (or data file) into the computer's memory. Loading some programs automatically runs them, too; with others you must give a separate 'RUN' command.

*machine code*: The code in which instructions for the computer are written. Programs may be written in machine code, or written in a high level language like BASIC, and 'compiled' or 'interpreted' into machine code by the computer, a slower operation.

*menu*: Many programs are structured using menus: lists of choices given on screen, from which the user selects an action.

*modem*: Modulator/demodulator. Device required for sending data via the telephone system.

*monitor*: In this context, an alternative name for a visual display unit.

*operating system*: The software that handles the computer's internal operations and disk/peripheral activities. The C64 has an in-built cassette operating system. A disk operating system is provided with (in) Commodore disk drives. It is also possible to use the expanded C64 with the CP/M operating system (see above).

*parallel interface*: A device that provides the computer with a parallel port.

*parallel port*: A port that sends several bits of data at once.

*parallel printer*: A printer that requires a parallel port to connect it to the computer.

*peripheral*: Hardware device that can be attached to the computer and can communicate with it.

*plotter*: Device for drawing characters or images on paper under computer control.

*port*: Socket or circuit edge by which peripheral devices are attached to the computer (or to each other).

*programming*: Writing sequences of instructions for the computer, which can then be performed by giving a single command.

*RAM*: Random access memory: the computer's working memory. Measured in kilobytes (K or KB) = 1000 characters, or megabytes (MB) = one million characters. An important measure of the computer's processing capability.

*row*: On screen, a measure of the number of lines of data that can appear (24 on the C64).

*scroll*: To displace the screen image horizontally or vertically, giving the impression that the screen provides a window onto a larger image held in memory.

*sequential*: Manner of accessing information bit by bit, in sequence. Sequential files are files held on disk or cassette in a strict, unalterable sequence. All cassette files are sequential; disk files may be randomly accessible instead.

*serial interface*: A device that provides the computer with a serial port of a fixed specification.

*serial port*: A port that enables the computer to send data sequentially.

*serial printer*: Printer that requires a serial port to connect it to the computer.

*software*: Broadly speaking, computer programs.

*spreadsheet*: Program that simplifies the calculation of large 'spreads' of figures: rows and columns on which repetitive calculations are performed.

*string*: Set of data (alpha, numeric or symbolic) which the computer treats as a whole.

*system*: The computer and its associated hardware and software.

*toggle*: To use the same command sequence to move between two or more different modes of program operation: e.g. between 'insert characters' and 'overwrite existing text' modes in a word processing program.

*variable*: Letter or letter/number combination used by the computer to designate a changeable piece of data.

*word processing*: Using the computer to manipulate, store and print out text.

# Index

- accountants, 24–5, 27, 29–32, 34–5, 40, 54, 71, 72
- accounting: all-in-one programs, 34–44
  - changing to computerised system, 72–4
  - general-purpose programs, 69–70
  - integrated programs, 70–71
  - manual systems, 31–2, 72
  - programs general, 4–6, 20, 24–55, 69–74, 151
- address files, 94, 113, 122, 127–8, 148
- Anagram Systems, 35, 154, 158
  - Easy Stock, 57–9
  - Purchase Ledger, 50–53, 59, 154
  - Sales Ledger, 44, 48–51, 59, 154
- analysis, departmental, 39, 47, 73–4
- sales, 58–9, 73, 87
- ASCII, 41, 109, 133, 140, 142, 143, 161
- Audiogenic, 113, 141, 155, 157
- audits, 30, 77
  - audit trail, 39
- back-up, disk/cassette, 8, 11, 16–17, 22–3
  - of specific programs, 34, 41, 48, 58, 67, 106, 111, 118, 131, 132, 136, 139, 143
- balance sheets, 24, 26, 35, 41, 48
- BASIC, 21, 86, 90, 101, 105, 111, 112, 114, 118, 120–21, 123, 134–6, 140, 146, 147, 150–52, 161
- boilerplating, 127, 135, 136, 145
- Bookkeeping for the Cash Trader, 35, 40–44, 154
- breakdowns, 4
- Brother, 14
- bugs, program, 20, 40–41, 51, 54, 141, 161
- Busicalc, 84–5, 156
- Busicalc 2, 85–7, 156
- Calc Result, 156
- calculations, 69–70, 75, 77–80, 90, 98–100, 102, 106, 108–9, 111, 115, 120
- cartridges, 15–16, 20, 161
  - programs in cartridge form, 13, 134, 141, 154–7
- Cash Book, 25, 39
- cassettes, 9, 10–11, 22–3
  - programs in cassette form, 16, 20, 154–7
- Catalog, 155
- cells, spreadsheet, 77
- Centronics, 9
- Chamber of Commerce, 32
- club management, 91
- colour, 10, 21, 86, 107, 110, 116, 130, 132, 134–5, 139
- columns, display, 10
  - on spreadsheets, 75–8
  - on word processors, 123–4, 132, 135, 136, 139, 142, 144
- Commodore, 1
  - cassette player, 11, 15
  - disk drives, 3, 9, 11–12, 14, 22, 66, 119
  - interface, 153
  - modem, 148
  - other computers by, 6, 39, 55, 105, 136, 141
  - plotter, 15, 41, 159
  - printers, 3, 9, 12, 14, 33, 41, 110, 138
  - Programmer's Reference Guide for 64, 8, 150
  - software, 17, 35, 57–61, 66–9, 118, 132–4, 146, 155–7
- communications, 148–50
- compiled programs, 21
- consoles, 8
- consultants, 3

- corruption (program), 3, 16
- cost: of computer, 1, 2
  - of disposables, 13-14
  - of interfaces/cables, 9, 153
  - of peripherals, 3, 10-14
  - of programs, 7, 17-18, 40, 58, 105, 110, 118, 134, 136, 143, 154-7
  - total system, 14
- CP/M, 6-7, 18, 19, 157, 159, 161
- crash, program, 20-21, 40-41, 46, 48, 49, 54, 112, 141, 145, 150
- credit handling, 35, 39, 44, 49-50, 67
- credit notes, 46, 49, 74
- cursor, 78, 85, 110, 112, 113, 133, 138, 139, 161
- daisy chaining, 9, 11, 12
- DAMS, 153
- data, 28-9
  - entry of, 33, 92
  - see also* database
- database, 6, 11-12, 17, 20, 55, 63, 69, 90-121, 147, 151
  - features of programs summarised, 106
  - programmable, 29, 55, 63, 100-2, 111
  - relational, 98
- dBase II, 7
- dealer, computer, 3, 9-10, 18, 22, 33, 34
- debtors, lists of, 47, 50, 99
- depreciation, 30, 40
- design of systems, 27-9, 113-4, 119
- Diablo, 13
- Dialog, 155, 157
- disks/disk drives, 2, 3, 9-12, 16-17
  - capacity of, 11-12
  - care of, 16, 22-3
  - cost of, 11-12
  - directory, 107, 127, 137, 141, 145
  - handling, 86, 110, 141
  - hard, 12, 119
  - programs on, 20, 40, 105, 110, 118, 131, 132, 139, 154-7
  - swaps needed by single drive systems, 37, 41, 52, 93, 107, 112, 129, 134
- display, 3, 10
- word processor, 123-6, 132
  - see also* colour, monitor, television
- double-entry accounting, 25-7, 35-6
- Easy Calc, 156
- Easy File, 101, 155
- Easyscript, 118, 119, 131, 132-4, 136, 141, 148, 156, 159
- Easyspell, 132, 133-4, 155
- Easy Stock, 35, 57-61
- editing commands, wp, 131-3, 135-45
- editor, screen, 122-3, 134
- electronic mail, 136, 148-50
- Epson, 12-15, 36, 48, 116, 117, 124, 159
- error checking, 59, 63, 92, 96, 111, 115, 121
- expansion, planning for, 32
- field (data), 28-9, 63, 91-2, 110, 116, 119, 127-8
  - key field, 95, 96, 108
- file: creation of, 49, 51, 58, 62, 90
  - disk structure, 11, 62, 93, 105, 107, 147, 148
  - handling, *see* database
  - in wp, 122
  - transfer between programs, 70, 119, 146-9
- filing programs, 90-91; *see also* database
- financial planning, 6, 35, 66-9, 74, 80-84, 151
- final accounts, preparation of, 24, 29, 35, 39-40, 71
- Finsama, 66
- form (database), 92-5, 97, 107, 113, 115-16
- form letters, 90, 105, 112, 127-9, 133, 136, 140, 143, 145, 148
- formatting: discs, 11, 46
  - numbers, 85, 88, 108-9
  - text, 112, 123-6, 132-3, 135-7, 139-40, 142-4
- Future Finance, 35, 66-9, 155
- graphics, 13, 19, 32, 76, 88, 114, 116-18
- headers/footers, 126-7, 137, 140, 142, 144
- help: program facilities, 68, 101, 107, 110, 113, 118-19, 140
  - general sources of, 32-3, 71
- Heswriter, 156
- Home Accountant, The, 154
- Home Office, 64, 155
- IEEE, 9, 153
- Impex, 15, 35, 44, 48, 153-7
  - Company Pac, 46, 59, 154, 156
  - Nominal Ledger, 47-9, 154
  - Sales/Purchase Ledgers, 45-7, 154
  - Stock Control, 57, 59, 62-5, 156
- Infomast, 93, 100, 101, 105, 106, 109-12, 128, 155
- Inquire Pac, 155

- insurance, 14, 31  
integrated programs, 70-71  
interfaces/interfacing, 9-10, 12, 36, 145,  
153; *see also* printer drivers  
Interpod, 14, 153  
Inventory 64, 156  
investments, 30-31, 52, 83  
invoices, 28, 33, 45-7, 49, 52, 74, 90,  
94-5, 101-2, 119, 121
- Journal, 155  
Juki, 124
- Kestrel programs, 154, 156  
Kobra, 154-7
- label printing, 45, 50, 74, 93, 102, 105,  
107, 108, 115  
ledgers, 26-7, 36  
programs, 35, 44-53, 55, 70, 73  
loading programs, 22, 62, 84, 152
- machine code, 21, 136, 142, 152, 161  
magazines, computer, 18, 19, 33  
Magic Desk, 146  
Magpie, 19, 29, 55, 93, 101, 102, 105,  
106, 113-18, 141, 143, 151, 155  
mailings, 32, 45, 90, 101-2, 122, 127-8,  
138  
manuals, 6, 8, 11, 19-22, 30, 36, 40-41,  
45-9, 55, 57-9, 66-7, 71, 84-6,  
106-7, 110, 112, 114, 118, 131-2,  
134, 138, 140, 142-3  
general standard of, 34, 54, 130  
manual accounting systems, 31, 36, 44,  
56  
stock control systems, 57  
Marketing Micro, 155-7  
memory, checks on availability of, 62,  
130, 140  
menus, 28, 35-7, 47, 50, 58, 62, 67, 69,  
87, 101, 113-14, 118, 135, 137  
Micro Simplex, 35, 36-40, 41, 154, 158  
Micro World, 14-15, 153  
Micronet, 149  
Microsoft, 135  
modem, 2, 136, 148-50, 161  
monitor, 7, 10, 14, 21, 161  
Mr Chip, 154
- NDS, 154, 156, 158  
networking, 5, 148  
Nominal Ledger, 44-5, 47, 51-2; *see also*  
Impex, ledger
- Omnicalc, 156
- operating system, 6-7, 161; *see also*  
CP/M
- order printing, 59, 74  
overheating, 3
- pages, in wp, 126-7, 136, 139-40, 144  
numbers of, 126-7, 137, 142
- Paperclip, 156  
parallel interfaces, 9, 116, 136, 140, 142,  
153  
passwords, 21, 111, 115  
payroll, 56  
peripherals, 2, 8-15  
Personal Computer News, 19  
Personal Computer World, 18, 19  
personal computing, 4  
plotters, 2, 9, 15, 150  
illustrations drawn up on, 12, 92, 159  
ports, 9, 12; *see also* interfacing,  
parallel, serial  
portability, 4, 7  
SX64, 7  
power requirements, 7, 22  
Practical Computing, 18, 19  
Practicalc 64, 19, 87-9, 156  
Practifile, 155  
Precision Software, 55, 118, 132, 155,  
158  
Prestel, 8, 149-50
- printers, 2, 3, 9, 21, 150  
daisy wheel, 12-14, 159  
dot matrix, 12-15, 159  
driver software, 9-10, 116, 124-5,  
131, 133, 136, 140, 142  
program support for, 33, 36, 41, 49,  
58, 85, 88-9, 102, 106, 109, 110,  
116, 124-5, 131, 133, 138, 140, 142  
special features on, 109, 117, 125, 133,  
136, 137-8, 140, 142-3
- printing, background, 125  
printouts, 32, 39, 41, 48, 76, 97  
keeping, 30  
reproduced on book, 37, 38, 42, 43,  
46, 51, 53, 60-2, 64-5, 68, 93, 99,  
103-4
- programming, 5, 21, 22, 69, 90, 105, 146,  
147, 150-52; *see also* databases,  
programmable
- Programmer's Reference Guide to 64, 8,  
150
- PS, 156
- Purchase Ledger, 35, 44-53  
Anagram, 35, 44, 50-53  
Impex, 45-7  
*see also* ledger

- Quick Brown Fox, 131, 134-6, 149, 156  
 Quick-Count, 35, 36, 154, 158  
 Qume, 13
- Rabbit Software, 109, 155, 158  
 RAM, 1  
 reliability, program, 20-21, 41, 107, 112, 121, 130  
 repairs, 4  
 reports, management, 28-9, 31, 32, 39, 50, 52, 58, 59, 63, 67-8, 70, 76, 93, 97, 101-5, 106-9, 111, 115, 120-21  
   *see also* printout  
 retailers, 35  
 RS 232, 9
- Sales Ledger, 32, 35, 44-51  
   Anagram, 44, 48-51  
   Impex, 45-7  
   *see also* ledger  
 Script 64, 129, 155, 157  
 scrolling, 78, 86, 87, 95, 125-6, 132, 135, 139, 144  
 searches, 76, 86, 88, 96-7, 106, 108, 111, 119-20, 123, 133, 138, 140, 145  
 Seikosha, 13  
 serial port, 9, 12, 48, 145, 153  
 Simple Software, 105, 155, 157, 158  
 Simply File, 100-3, 105-9, 113, 152, 155  
 Simply Write, 105, 131, 136-8, 152, 157  
 SIP, 154, 158  
 software, general, 15-21  
   cost of, 17-18  
   media for, 15-17  
 sorting, 69, 76, 88, 102, 120  
 speed: of disks/cassettes, 11, 16  
   of printers, 12  
   of programs, 11, 126, 133-4, 137, 138  
 spelling checkers, 20, 129; *see also*  
   Easyspell, Vizaspell  
 spreadsheets, 6, 14, 20, 29, 55, 68-9, 75-89, 98, 102, 114, 146, 147, 151  
 SPT, 153, 156-8  
 stationery, 33, 49, 74  
 stock control, 4-6, 20, 24, 31-2, 35, 44, 56-66, 70, 73, 86, 90, 101, 119, 121, 151  
 Superbase 64, 29, 55, 93-4, 99, 101-2, 104-6, 113, 115, 118-21, 132, 148, 151, 155
- Supersoft, 156, 158  
 support from dealers/program suppliers, 32-3, 54-5  
 system, computer, 7-15  
   complexity of, 8  
   siting of, 7
- tabulation, 123-4, 133, 135, 137, 140, 143  
 Tandy, 13, 159  
 tax, 24, 30, 34, 67, 80-81; *see also* VAT  
 telephone, 8, 148-50  
 television, 7, 10, 14-15, 21  
 time periods, 70-71  
 timing for introducing new system, 71-4  
 Torch, 159  
 training, 34, 71, 87, 110, 118, 134, 138
- upgrades/updates, 34  
 user groups, 34, 36  
 User Guide (64), 22, 150, 160
- VAT, 28, 29, 31, 35, 39, 40, 43, 46-8, 51, 58, 70, 72-3, 77, 79-80, 98, 109, 154  
 Video Pak 80, 157  
 Visicalc, 7  
 Viza Software, 155-8  
 Vizaspell, 134, 139, 141, 156  
 Vizawrite, 131, 134, 139-42, 147, 155-7, 159
- wages, 56  
 Wego, 143, 157, 158  
 wholesalers, 51  
 Word, The, 157  
 Word Manager, 157  
 word processing, 4, 6, 14, 17-18, 20, 33, 69, 70, 105, 109-12, 118, 122-47, 149, 151  
   general features of programs, 131  
 word wrap, 111, 124, 132, 136-7, 139, 144  
 Wordcraft 40, 131, 141-3, 157  
 Wordpro 3 Plus/64, 105, 131, 143-5, 157  
 WordStar, 7, 159
- 80-column boards, 10, 126, 135, 157

**APPLE II****APPLE II PROGRAMMER'S HANDBOOK**

0 246 12027 4 £10.95

**AQUARIUS****THE AQUARIUS AND HOW TO GET THE MOST FROM IT**  
0 246 12295 1 £5.95**ATARI****GET MORE FROM THE ATARI**  
0 246 12149 1 £5.95**THE ATARI BOOK OF GAMES**  
0 246 12277 3 £5.95**BBC MICRO****ADVANCED MACHINE CODE TECHNIQUES FOR THE BBC MICRO**  
0 246 12227 7 £6.95**ADVANCED PROGRAMMING FOR THE BBC MICRO**  
0 246 12158 0 £5.95**THE BBC MICRO: AN EXPERT GUIDE**  
0 246 12014 2 £6.95**BBC MICRO GRAPHICS AND SOUND**  
0 246 12156 4 £6.95**DISCOVERING BBC MICRO MACHINE CODE**  
0 246 12160 2 £6.95**DISK SYSTEMS FOR THE BBC MICRO**  
0 246 12325 7 £7.95**HANDBOOK OF PROCEDURES AND FUNCTIONS FOR THE BBC MICRO**  
0 246 12415 6 £6.95**INTRODUCING THE BBC MICRO**  
0 246 12146 7 £5.95**LEARNING IS FUN: 40 EDUCATIONAL GAMES FOR THE BBC MICRO**  
0 246 12317 6 £5.95**TAKE OFF WITH THE ELECTRON AND BBC MICRO**  
0 246 12356 7 £5.95**21 GAMES FOR THE BBC MICRO**  
0 246 12103 3 £5.95**PRACTICAL PROGRAMS FOR THE BBC MICRO**  
0 246 12405 9 £6.95**THE COLOUR GENIE****MASTERING THE COLOUR GENIE**  
0 246 12190 4 £5.95**COMMODORE 64****BUSINESS SYSTEMS ON THE COMMODORE 64**  
0 246 12422 9 £6.95**ADVENTURE GAMES FOR THE COMMODORE 64**  
0 246 12412 1 £6.95**COMMODORE 64 COMPUTING**  
0 246 12030 4 £5.95**COMMODORE 64 DISK SYSTEMS AND PRINTERS**  
0 246 12409 1 £6.95**THE COMMODORE 64 GAMES BOOK**  
0 246 12258 7 £5.95**COMMODORE 64 GRAPHICS AND SOUND**  
0 246 12342 7 £6.95**COMMODORE 64 WARGAMING**

0 246 12410 5 £6.95

**SOFTWARE 64: PRACTICAL PROGRAMS FOR THE COMMODORE 64**  
0 246 12266 8 £5.95**INTRODUCING COMMODORE 64 MACHINE CODE**  
0 246 12338 9 £7.95**40 EDUCATIONAL GAMES FOR THE COMMODORE 64**  
0 246 12318 4 £5.95**DRAGON****THE DRAGON 32 AND HOW TO MAKE THE MOST OF IT**  
0 246 12114 9 £5.95**THE DRAGON 32 BOOK OF GAMES**  
0 246 12102 5 £5.95**THE DRAGON PROGRAMMER**  
0 246 12133 5 £5.95**DRAGON GRAPHICS AND SOUND**  
0 246 12147 5 £6.95**INTRODUCING DRAGON MACHINE CODE**  
0 246 12324 9 £7.95**ELECTRON****ADVANCED ELECTRON MACHINE CODE TECHNIQUES**  
0 246 12403 2 £6.95**ADVANCED PROGRAMMING FOR THE ELECTRON**  
0 246 12402 4 £5.95**ADVENTURE GAMES FOR THE ELECTRON**  
0 246 12417 2 £6.95**ELECTRON GRAPHICS AND SOUND**  
0 246 12411 3 £6.95**ELECTRON MACHINE CODE FOR BEGINNERS**  
0 246 12152 1 £7.95**THE ELECTRON PROGRAMMER**  
0 246 12340 0 £5.95**HANDBOOK OF PROCEDURES AND FUNCTIONS FOR THE ELECTRON**  
0 246 12416 4 £6.95**PRACTICAL PROGRAMS FOR THE ELECTRON**  
0 246 12362 1 £7.95**21 GAMES FOR THE ELECTRON**  
0 246 12344 3 £5.95**40 EDUCATIONAL GAMES FOR THE ELECTRON**  
0 246 12404 0 £5.95**TAKE OFF WITH THE ELECTRON AND BBC MICRO**  
0 246 12356 7 £5.95**IBM****THE IBM PERSONAL COMPUTER**  
0 246 12151 3 £6.95**LYNX****LYNX COMPUTING**  
0 246 12131 9 £6.95**MEMOTECH****MEMOTECH COMPUTING**  
0 246 12408 3 £5.95**THE MEMOTECH GAMES BOOK**  
0 246 12407 5 £5.95**ORIC-1****THE ORIC-1 AND HOW TO GET THE MOST FROM IT**  
0 246 12130 0 £5.95**THE ORIC PROGRAMMER**  
0 246 12157 2 £6.95**THE ORIC BOOK OF GAMES**  
0 246 12155 6 £5.95**TI99/4A****GET MORE FROM THE TI99/4A**  
0 246 12281 1 £5.95**VIC-20****GET MORE FROM THE VIC-20**  
0 246 12148 3 £5.95**THE VIC-20 GAMES BOOK**  
0 246 12187 4 £5.95**ZX SPECTRUM****AN EXPERT GUIDE TO THE SPECTRUM**  
0 246 12278 1 £6.95**INTRODUCING SPECTRUM MACHINE CODE**  
0 246 12082 7 £7.95**LEARNING IS FUN: 40 EDUCATIONAL GAMES FOR THE SPECTRUM**  
0 246 12233 1 £5.95**MAKE THE MOST OF YOUR ZX MICRODRIVE**  
0 246 12406 7 £5.95**THE SPECTRUM BOOK OF GAMES**  
0 246 12047 9 £5.95**SPECTRUM GRAPHICS AND SOUND**  
0 246 12192 0 £6.95**THE SPECTRUM PROGRAMMER**  
0 246 12025 8 £5.95**THE ZX SPECTRUM AND HOW TO GET THE MOST FROM IT**  
0 246 12018 5 £5.95**WHICH COMPUTER?****CHOOSING A MICROCOMPUTER**  
0 246 12029 0 £4.95**LANGUAGES****COMPUTER LANGUAGES AND THEIR USES**  
0 246 12022 3 £5.95**EXPLORING FORTH**  
0 246 12188 2 £5.95**INTRODUCING LOGO**  
0 246 12323 0 £5.95**INTRODUCING PASCAL**  
0 246 12322 2 £5.95**MACHINE CODE****Z80 MACHINE CODE FOR HUMANS**  
0 246 12031 2 £7.95**6502 MACHINE CODE FOR HUMANS**  
0 246 12076 2 £7.95**SOFTWARE GUIDES****WORKING WITH dBASE II**  
0 246 12376 1 £7.95**USING YOUR MICRO****COMPUTING FOR THE HOBBYIST AND SMALL BUSINESS**  
0 246 12023 1 £6.95**DATABASES FOR FUN AND PROFIT**  
0 246 12032 0 £5.95**FIGURING OUT FACTS WITH A MICRO**  
0 246 12221 8 £5.95**INSIDE YOUR COMPUTER**  
0 246 12235 8 £4.95**SIMPLE INTERFACING PROJECTS**  
0 246 12026 6 £6.95**PROGRAMMING****COMPLETE GRAPHICS PROGRAMMER**  
0 246 12280 3 £6.95**THE COMPLETE PROGRAMMER**  
0 246 12015 0 £5.95**PROGRAMMING WITH GRAPHICS**  
0 246 12021 5 £5.95**WORD PROCESSING****CHOOSING A WORD PROCESSOR**  
0 246 12347 8 £7.95**WORD PROCESSING FOR BEGINNERS**  
0 246 12353 2 £5.95**FOR YOUNGER READERS****BEGINNERS' MICRO GUIDES: ZX SPECTRUM**  
0 246 12259 5 £2.95**BEGINNERS' MICRO GUIDES: BBC MICRO**  
0 246 12260 9 £2.95**BEGINNERS' MICRO GUIDES: ACORN ELECTRON**  
0 246 12381 8 £2.95**MICROMATES****SIMPLE ANIMATION**  
0 246 12273 0 £1.95**SIMPLE PICTURES**  
0 246 12269 2 £1.95**SIMPLE SHAPES**  
0 246 12271 4 £1.95**SIMPLE SOUNDS**  
0 246 12270 6 £1.95**SIMPLE SPELLING**  
0 246 12272 2 £1.95**SIMPLE SUMS**  
0 246 12268 4 £1.95**GRANADA GUIDES: COMPUTERS**  
0 246 11895 4 £1.95

## GET DOWN TO BUSINESS WITH THE 64!

This practical introduction to the Commodore 64 as a small business computer sets out accounting applications, invoicing, stock control, spreadsheet programs, database programs, word processing, the integrated office and likely future developments. Details are given of the software available and how you should go about using your Commodore 64 to the best advantage. Practical examples are provided so you can get off to a good start and a wide range of software is reviewed for you to make the best choice for your particular needs.

### *The Authors*

Susan Curran led a varied business career before becoming a senior insurance underwriter in the City of London. She is now a full-time writer, specialising in computers and their applications.

Margaret Norman has considerable experience of small business accounts. She is a freelance writer and computer programmer.

More books on the Commodore 64 from Granada

### **COMMODORE 64 COMPUTING**

*Ian Sinclair*

0 246 12030 4

### **INTRODUCING COMMODORE 64 MACHINE CODE**

*Ian Sinclair*

0 246 12338 9

### **COMMODORE 64 GRAPHICS AND SOUND**

*Steve Money*

0 246 12342 7

### **SOFTWARE 64 Practical Programs for the Commodore 64**

*Owen Bishop*

0 246 12266 8

Front cover illustration by Angus McKie

**GRANADA PUBLISHING**

Printed in Great Britain

0 246 12422 9

**£6.95 net**