The Advanced User Guide

for the Acorn Electron

Adrian C. Dickens BA,
Churchill College,
Cambridge University

Mark A. Holmes BA,
Fitzwilliam College,
Cambridge University

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The Authors gratefully acknowledge Acorn Computers Limited for their kind permission to reproduce the complete Electron circuit diagram. The Authors would like to point out that Acorn Computers reserve the right to make improvements in the specification of its products. Therefore the circuit diagram and other contents of this book may not be in complete agreement with the product supplied.

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Contents

Introduction

1 The Acorn design philosophy 7

Operating system routines and vectors

2 Operating system calls 9
3 OSBYTE calls 16
4 OS WORD calls 87
5 Filing system calls 94
6 Operating system vectors 110
7 Interrupts 135

Paged ROM firmware

8 Paged ROM formats 143
9 Language ROMs 148
10 Service ROMs 152
11 *ROM filing system ROMs 172

Memory usage

12 Memory allocation and useage 183

Hardware

13	An introduction to hardware	192
14	Inside the Electron	197
15	Outside the Electron	207

Appendices

A	VDU code summary	219
B	PLOT routine functions	221
C	Screen MODE layouts	223
D	OS calls and vectors	230
E	Plus 1 ROM connector	232
F	Complete circuit diagram	234

Bibliography 236

Glossary 237

Index 243

Introduction

The *Advanced User Guide for the Electron* has been designed to be an invaluable reference guide for users of the Electron computer. The original *Electron User Guide* provides a description of BASIC on the Electron and reaches the point at which programming in Assembly Language is introduced, along with a very brief introduction to the available system calls. The Advanced User Guide takes over at this point by providing a thorough, well indexed and cross referenced description of all the available facilities and how to use them. This will allow the serious programmer to make the most of his/her machine, whilst keeping within the Acorn Guidelines to ensure compatibility with other machines in the Acorn BBC Micro series.

It is inevitable that a machine like the Electron should be partially overpowered by it's *big brother* the BBC Micro. However, many of the facilities which are provided on the larger machine can also be added on to an Electron. A whole new series of operating system calls have been provided to take account of this, and are described within these pages.

What may not at first sight be so apparent is that in many ways the Electron has more expansion potential than a BBC Micro! This is because *all* of the 6502 bus lines are available to expansion modules via the expansion connector. A full description of this connector, including interfacing details for paged ROMs and other devices have therefore been included.

The authors have tried to provide a book which will be found by the side of all enthusiastic Electron programmers. All material is in an easily accessible referenced format. Where appropriate, examples are presented and discussed. In particular, there is a large section concerned with the use of paged ROMs. It is intended that this should help programmers to build up the necessary skills for producing their own exciting software in ROMs.

All of the information contained in this book has been checked on an Electron fitted with Electron OS1.00 and BASIC 2. Where appropriate, an Electron Plus 1 expansion module was also used.

1 The Acorn Design Philosphy

A glance through the back pages of any microcomputer magazine will reveal a large number of machines ‘For Sale’. This is a reflection of the speed at which the industry moves; the all-new whizz-bang machine can become yesterday’s micro in as little as a year. The manufacturer has to tread a careful path; on the one hand he is committed to improving his products, but on the other he must not render his existing range obsolete.

The Acorn design philosophy has been to produce a system right from the start which would allow for growth in both the software and hardware. All users should be aware of this if they wish their own software and hardware to be compatible with the complete range of available systems, from a humble Electron right up to a machine with Econet, second processor, hard disks etc. Ensuring compatibility is not hard, it simply requires a little self-discipline in your approach.

The rules as such are simple. If your software needs to access anything outside its own domain (that is the memory and other resources it has been provided with) then use the officially supported operating system routines. The second is to make no assumptions about the environment your program will run under. This includes the amount of memory available, the processor and any other software / hardware components which might be there. Run-time enquiries have been built into the system to allow you to discover these facilities.

Programs which run in RAM, say a simple Basic program, may discover that there is not enough memory available for them. A test for this should be made at the start of the program, since they should not be allowed to crash and should never use any memory outside their allocation. Programs placed in ROM should not make assumptions about their eventual run-time environment either. They may find themselves copied over the Tube and running in RAM on another processor!

One of the most common situations on the BBC microcomputer

where incompatability arises, is where software is designed for use on non-Econet machines and then used on such machines. This ultimately denies the software producer a sale and denies the Econet machine owner use of a particular program. This is a situation which can be avoided by intelligent software design and reasonable product testing. The Electron contains fewer pitfalls in this respect, but where software is destined for a wider distribution, the programmer should think about different machine configurations and potential problems.