

1. INTRODUCTION

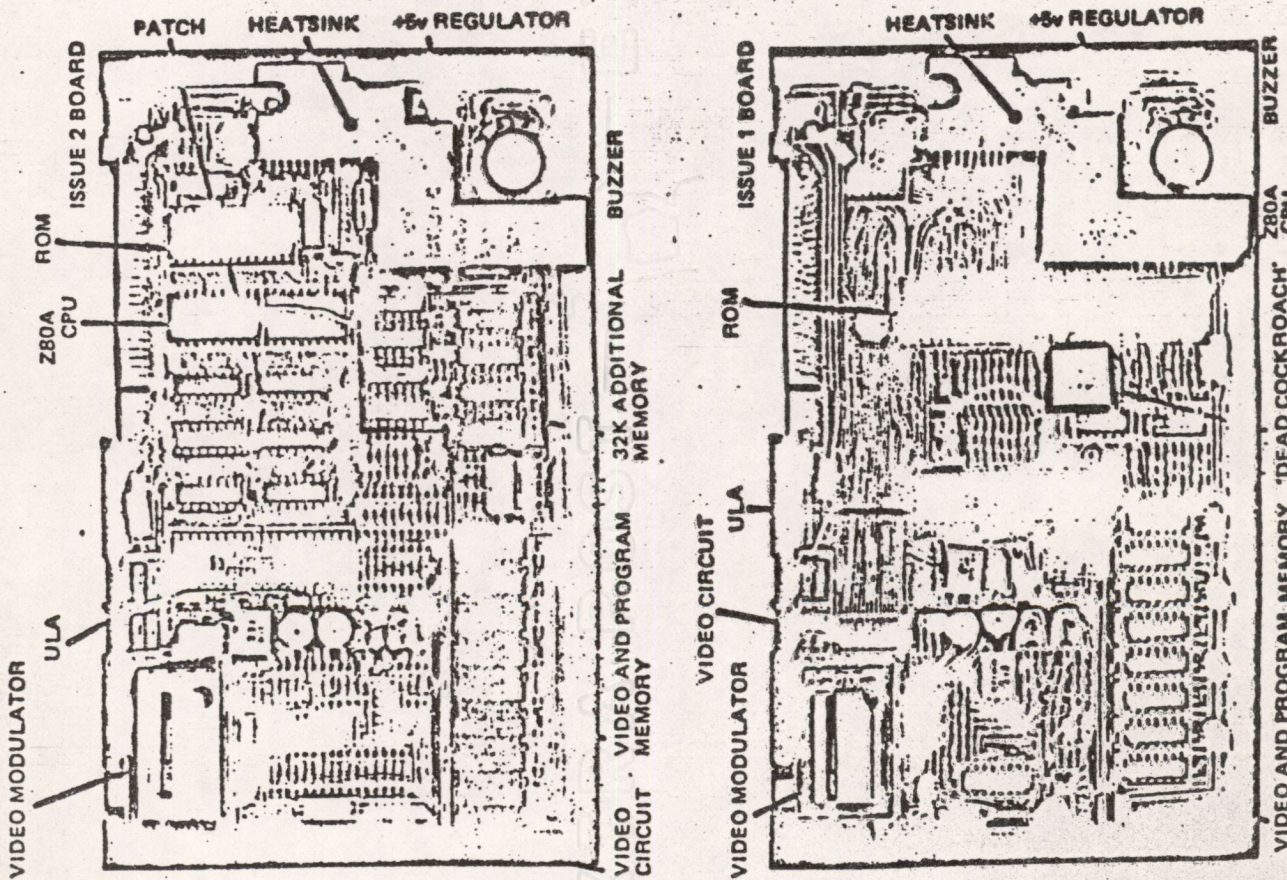
The ZX Spectrum as supplied includes an introductory booklet and a Basic programming manual. These books together contain virtually no detailed information on the hardware aspects of the computer. This book fills in that gap by providing an in depth look into how the Spectrum works. For the absolute beginner who knows nothing about computer hardware, this book provides a good introduction to what makes a computer tick. For the advanced electronics wizard who is desperate to use his Spectrum to perform all sorts of weird and wonderful tasks, this book also holds the key, by providing invaluable circuit diagrams and operational descriptions.

Starting off by explaining the fundamental principles behind the Spectrum's operation, the book progresses with full descriptions of how each part works and how all of the parts interrelate. After a complete explanation of all the edge connector signals, simple illustrative experiments making use of these signals are given. The remainder of the book consists of practical circuits which you can build. Constructional hints, drawings and photographs are included to help beginners with no previous experience.

All of the Spectrum circuit diagrams contain component numbers such as TR4. These are generally the codes printed by the components on the Spectrum circuit board. There is a full layout diagram of the Spectrum board together with marked positions for each component in Appendix D. The complete circuit diagram can be found in Appendix E. You should refer to these appendices if you wish to find the position of any components. The component codes given for the additional hardware projects refer to the parts list for the project, not to the main Spectrum parts list.

Before we start delving deeper into the intricacies of hardware, a few words of warning will be given. The Spectrum contains a lot of sensitive and expensive chips. These will not be damaged provided that you take adequate precautions. If you are adding any kind of interface to the Spectrum, always switch off all power supplies before making the connection to the Spectrum. Always switch on the Spectrum before or simultaneously with any external power supplies. Finally, if you are testing various voltages inside the Spectrum or on its edge connector, take care not to short any pins together by mistake. Check and double check everything you do!

PLEASE NOTE — whilst every effort has been made to ensure that all information given in this book is correct, no responsibility can be accepted for any errors which may have occurred. All Spectrum circuits are the copyright of Sinclair Research Limited. Other designs and programs are the copyright of the author.



VIDEO AND PROGRAM MEMORY 'DEAD COCKROACH' CPU
BUZZER
Z80A CPU
HEATSINK +5v REGULATOR
ISSUE 1 BOARD
ROM
VIDEO CIRCUIT ULA
VIDEO MODULATOR
ISSUE 2 BOARD
PATCH HEATSINK +5v REGULATOR
VIDEO AND PROGRAM MEMORY 32K ADDITIONAL MEMORY BUZZER

PLATE 1 - PHOTO OF MAIN SPECTRUM BOARD & ANNOTATIONS