

CONTENTS

APPLICATION

DUCKS & DROIDS A new series begins on robotics, this week tracing its development from the mechanical inventions of the 18th century



601

HARDWARE

LIGHT WORK Epson's PX-8 is a competitively-priced lap-held computer



609

SOFTWARE

INVASION FORCE As well as being a successful game, Space Invaders brought computing to the public's attention



615

COMPUTER SCIENCE

REPEAT PERFORMANCE We learn how LOGO employs the principle of recursion to produce complex designs from simple commands



604

JARGON

FILTER TO FLOATING POINT
A weekly glossary of computing terms



608

PROGRAMMING TECHNIQUES

ROUTINE CHECK UP We suggest ways of testing your completed programs



606

PROGRAMMING PROJECTS

USEFUL POINTERS We conclude our look at user-defined characters by discussing ways of improving the programs



616

MACHINE CODE

MATCH-MAKING Our course for the 6809 continues with a look at machine code calls to subroutines



618

WORKSHOP

DUAL CONTROL Using the two boxes that we have built in previous weeks, we control the movement of a Lego car powered by two motors



612

REFERENCE CARD A valuable reference card that complements the machine code course

INSIDE
BACK
COVER

Next Week

• The programming techniques series is succeeded by a new series on integrated software. We review the market leaders such as Symphony and Framework.

• Our robotics series moves on to consider feedback control in robot movement — how does a robot follow the straight and narrow?



QUIZ

- 1) What was 'Elektro'?
- 2) What are 'stubs'?
- 3) What is a 'high-pass filter'?
- 4) What does 'CMOS' stand for, and what is its significance?

Answers To Last Week's Quiz

- 1) An array is dynamically dimensioned when its extent in the DIM statement is defined at run time by some input variable, rather than being a predetermined absolute number, for example: DIM A\$(X,Y).
- 2) NOWRAP is a LOGO command that causes the screen turtle to halt at the screen boundary, rather than 'wrapping-round' to the opposite edge of the screen.
- 3) On the Spectrum, LET X=USR "A" returns the start address of the eight-byte table defining the first user-defined graphics character.
- 4) When the output of a system is fed back into the system to control the inputs, this is called feedback control.

COVER PHOTOGRAPH BY IAN MCKINNELL; DALEK AND ROBOT KINDLY LOANED BY FORBIDDEN PLANET, 58 ST GILES HIGH ST, LONDON WC2; FURNITURE COURTESY OF PRACTICAL STYLING AT CENTREPOINT, LONDON WC2

Editor Mike Wesley; Art Director David Whelan; Technical Editor Brian Morris; Production Editor Catherine Cardwell; Art Editor Claudia Zeff; Chief Sub Editor Robert Pickering; Designer Julian Dorr; Art Assistant Liz Dixon; Editorial Assistant Stephen Malone; Sub Editor Steve Mann; Researcher Melanie Davis; Staff Writer Steve Colwill; Contributors Geoff Bains, Harvey Mellor, Mike Curtis, Steve Colwill, Chris Naylor, Graham Storrs; Software Consultants Pilot Software City; Group Art Director Perry Neville; Managing Director Stephen England; Published by Orbis Publishing Ltd; Editorial Director Brian Innes; Project Development Peter Brooksmith; Executive Editors Chris Cooper, Maurice Geller; Production Controller Peter Taylor-Medhurst; Circulation Director David Breed; Marketing Director Michael Joyce; Designed and produced by Bunch Partworks Ltd; Editorial Office 14 Rathbone Place, London W1P 1DE. © APSIF Copenhagen 1984; © Orbis Publishing Ltd 1984; Typeset by Universe; Reproduction by Mullis Morgan Ltd; Printed in Great Britain by Artisan Press Ltd, Leicester

HOME COMPUTER ADVANCED COURSE - Price UK 80p IR £1.00 AUS \$1.95 NZ \$2.25 SA R1.95 SINGAPORE \$4.50 USA and CANADA \$1.95

How to obtain your copies of HOME COMPUTER ADVANCED COURSE - Copies are obtainable by placing a regular order at your newsagent, or by taking out a subscription. Subscription rates: for six months (26 issues) £23.80; for one year (52 issues) £47.60. Send your order and remittance to Punch Subscription Services, Watling Street, Bletchley, Milton Keynes. Bucks MK2 2BW, being sure to state the number of the first issue required.

Back Numbers UK and Eire - Back numbers are obtainable from your newsagent or from HOME COMPUTER ADVANCED COURSE. Back numbers, Orbis Publishing Limited, 20/22 Bedfordbury, LONDON WC2N 4BT at cover price. AUSTRALIA: Back numbers are obtainable from HOME COMPUTER ADVANCED COURSE. Back numbers, Gordon & Gotch (Aus) Ltd, 114 William Street, PO Box 767G Melbourne, Vic 3001. SOUTH AFRICA, NEW ZEALAND, EUROPE & MALTA: Back numbers are available at cover price from your newsagent. In case of difficulty write to the address in your country given for binders. South African readers should add sales tax.

How to obtain binders for HOME COMPUTER ADVANCED COURSE - UK and Eire: Please send £3.95 per binder if you do not wish to take advantage of our special offer detailed in Issues 5, 6 and 7. EUROPE: Write with remittance of £5.00 per binder (incl. p&p) payable to Orbis Publishing Limited, 20/22 Bedfordbury, LONDON WC2N 4BT.

MALTA: Binders are obtainable through your local newsagent price £3.95. In case of difficulty write to HOME COMPUTER ADVANCED COURSE BINDERS, Miller (Malta) Ltd, M.A. Vassalli Street, Valletta, Malta. AUSTRALIA: For details of how to obtain your binders see inserts in early issues or write to HOME COMPUTER ADVANCED COURSE BINDERS, First Post Pty Ltd, 23 Chandos Street, St. Leonards, NSW 2065. The binders supplied are those illustrated in the magazine. NEW ZEALAND: Binders are available through your local newsagent or from HOME COMPUTER ADVANCED COURSE BINDERS, Gordon & Gotch (NZ) Ltd, PO Box 1595, Wellington. SOUTH AFRICA: Binders are available through any branch of Central Newsagency. In case of difficulty write to HOME COMPUTER ADVANCED COURSE BINDERS, Intermag, PO Box 57394, Springfield 2137.

Note - Binders and back numbers are obtainable subject to availability of stocks. Whilst every attempt is made to keep the price of the issues and binders constant, the publishers reserve the right to increase the stated prices at any time when circumstances dictate. Binders depicted in this publication are those produced for the UK market only and may not necessarily be identical to binders produced for sale outside the UK. Binders and issues may be subject to import duty and/or local taxes, which are not included in the above prices unless stated.