

contents

Preface	ix
1 the computer	1
Input	2
Store	2
Arithmetic unit	4
Output	4
Control unit	4
Other hardware	6
The matchbox computer – storage	6
2 arithmetic instructions	8
Dry check	9
3-Address instructions	9
Economy of storage	12
Output instructions	12
The matchbox computer – output	13
3 flow charts	15
Types of data	18
Input instruction	19
The matchbox computer – input instruction	19
Drawing flow charts	19
Stages in writing a program	20
Graph plotting	23
Stored programs	24
The matchbox computer – program store	24

4	jump instructions	26
	Jump instruction	27
	The matchbox computer – input	27
	Modified input instructions	30
	Counter	33
	Replacement instruction	38
	Summary of allowable instructions	40
5	conditional jump instructions	41
	Decision box	41
	Conditional jump instruction	43
	Multiplication	43
	Alternative conditional jump instructions	52
	False data	55
	Division	57
	The matchbox computer – false data	59
6	subroutines for functions	61
	Square root	61
	Degree of accuracy	63
	The matchbox computer – subroutines	67
	Trigonometrical functions	68
	The matchbox computer – arithmetic unit	70
	Full summary of allowable instructions	72
7	from problem to program	73
	appendix	97
	Running your programs on a computer	97
	solutions to exercises	103
	Index	127