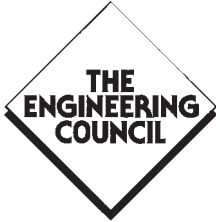




CONTROL POST-16

Version 1



The Engineering Council
10 Maltravers Street
LONDON
WC2R 3ER

© The Engineering Council

First published by The Engineering Council 1995

ISBN 1 898126 01 1

All rights reserved. This book is copyright material but permission is granted to make photocopies of pages for classroom use provided that the copies are used exclusively within a purchasing institution. No other reproduction, storage in a retrieval system or transmission in any form or by any means may be made without prior permission from The Engineering Council.

AUTHORS

The Engineering Council acknowledges original contributions made to the development of this publication by:

Alan Jarvis F.Eng.
Andy Bardill
Torben Steeg
Nigel Leighton
John Cave

Design and layout by Peter Stensel

Line illustrations by James Wilkinson and Peter Stensel

Series Editor
John Cave Middlesex University

CONTENTS

Introduction to Control	1
UNIT 1 Monitoring and control systems	3
UNIT 2 Stepper motor control and applications	19
UNIT 3 Signals from strain: designing and making 'overload protection' systems	39
UNIT 4 Designing and making a servomotor control system	55
UNIT 5 An environmental control system: automatic watering	79
UNIT 6 Electronic 'cam' timer	89

STUDY FILES

1. Decade counter (CMOS 4017)	105
2. The programmable logic controller (plc)	107
3. The TEP PLC	111
4. The TEP bit by bit controller	141
5. Possible applications of the bit by bit controller	159
6. The pulse duration modulation (p.d.m.) servo	165
7. Prototyping control systems using systems electronics boards	169
8. Mathematical representation of control systems	173
9. Continuous control	183
10. Sequential control	185
11. Investigating control systems using alpha boards	191
12. Stepper motor driver SAA 1027	203
13. Timing diagrams	205
14. Programming a washing machine cycle	207
15. Making a printed circuit board	211
16. Logic gates	217
17. Transducers	219
18. The Field Effect Transistor (FET)	233