

No.3 Spring 1982

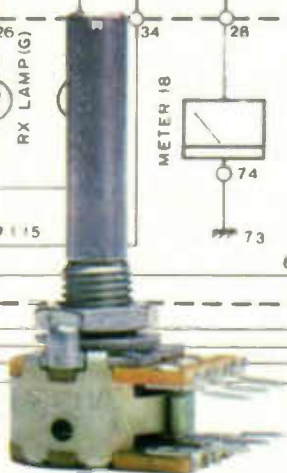
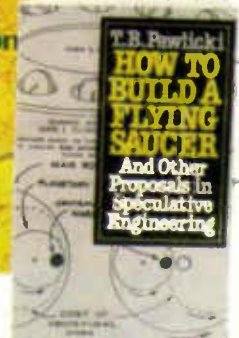
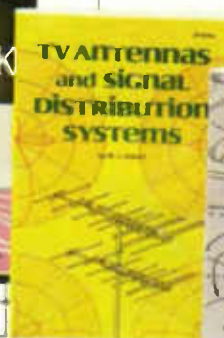
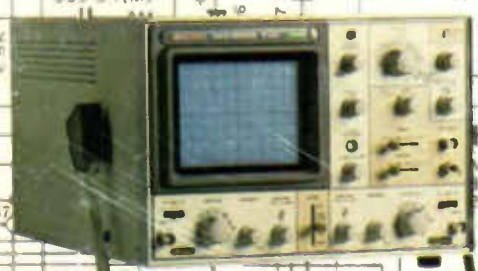
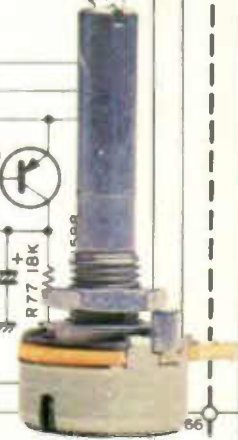
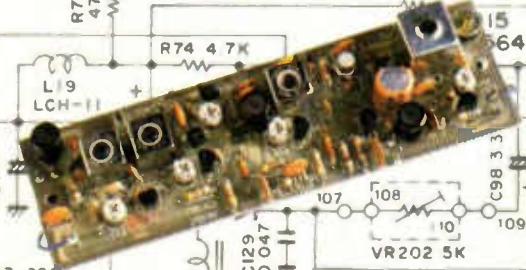
AMBIT INTERNATIONAL'S

# WORLD of RADIO & ELECTRONICS

CONCISE PARTS CATALOGUE

70p

**NICAD BATTERY BONANZA**  
See Back for Details



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Packed full of excellent Projects, Reviews and Features, a few copies of Britain's newest and most innovative Radio/Electronics magazine are still available —

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ASCII LCD Display	(Apr '82)

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# The WORLD of RADIO & ELECTRONICS

## "YOU CAN'T POSSIBLY DO THAT..."

Ambit's **World of Radio & Electronics**, and **Radio & Electronics World** have confounded quite a lot of established dogma in both the publishing and components supply business. We set out seven months or so ago to completely revitalize the way in which the UK electronics/communications and computing community is informed and supplied with some of the more interesting and innovative new ideas and parts.

Our basic philosophy has been to try and expand the market and its 'mentality', and broaden awareness of new techniques and technologies. It may be very cosy to try and build a publication around a range of devices that can be described as 'common or garden' but so much innovation is ruled out by this criteria as to preclude the novel and interesting. Most professional engineers worth their salt will at least have an inkling of what's going on, and so will tend to dismiss such publications as insubstantial and irrelevant.

After seven months, we feel we can claim to have been successful in our overall philosophy, although we are the first to admit that the success has led to some quite unacceptable delays in processing orders and dealing with general enquiries. The scale of reorganization required to cope with even the midterm problems has been enormous. The original computer programmes have been completely re-written to stand a chance of handling the projected size of the database after 12 months, and the organization of our buying, stock and storage systems has been completely revised from first principals.

## BLUE CHIP SERVICE

By the time this catalogue is published, we hope to be offering a 24 hour service for stock lines as a matter of course. However, we are aware that a need exists for guaranteed 'lightning' service, which we are instigating with this issue under the title of 'Blue Chip'. We do not want this to be equated to first and second class post, but more appropriately to 'Datapost' and first class post: i.e. Fast and extremely fast.

The system works as follows — CWO orders for blue chip service are processed and packed (first class letter post) within 6 (working) hours of receipt, and are surcharged according to:

Value up to £ 10 (goods)	+ 30%
Value up to £ 20 (goods)	+ 25%
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Value up to £ 50 (goods)	+ 10%
Value up to £100 (goods)	+ 5%
Over £100	no surcharge

The maximum number of line entries per 'Blue Chip' order is 15. If the order exceeds 15 lines, then you may submit it as two or more orders, calculated according to the above schedule — although a single postal charge will suffice. We would like to offer Datapost facilities, but our local Post Office surcharge is presently £7.50 — so we're working on it.

Even with this surcharge scheme, you will still find that our prices compare favourably with any other supplier's — and our range is still quite unique from a single source — in the world!

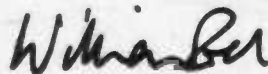
## OUT OF STOCK

It's only to be expected that some **R&EW** Project Packs will be colossally more popular than others. So we have introduced a new category known as the 'SuperPack', where the economies of scale have permitted us to package and present them in a totally comprehensive fashion. The original aim of the Project Pack was simply to provide a collated shopping list for the parts for a given feature, without necessarily engaging in things like custom hardware etc. After all, anything requiring custom manufactured parts can easily fall into the 'out of stock' syndrome mentioned above. 5-7 'new products' a month is a lot for anyone to handle.

So, when it's apparent that there is a substantial demand for a Project Pack (or Data Brief support pack), we will be presenting it as a 'SuperPack'. The first such SuperPack was the Z8 development system board — and we shall be representing some of the earlier Project Packs in this style in due course.

## YOUR LOCAL REPRESENTATIVE

We have been approached by several retail shops to see if they could handle **R&EW** Project Pack kits; but whilst we were having trouble keeping up with direct demand, this didn't seem like such a good idea. However, we feel that the tendency for most large towns to have a component retail shop is growing, and we shall be appointing several shops as Project Pack centres when we have been able to process the requests.



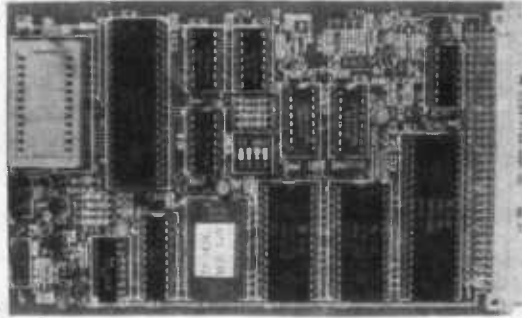
William Poel  
Managing Director

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Each voucher may be redeemed for £1 for each £15 of the total order value – excluding VAT

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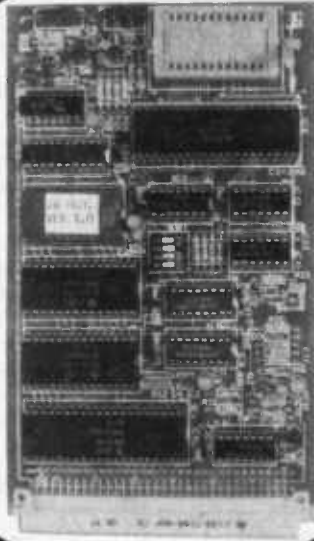
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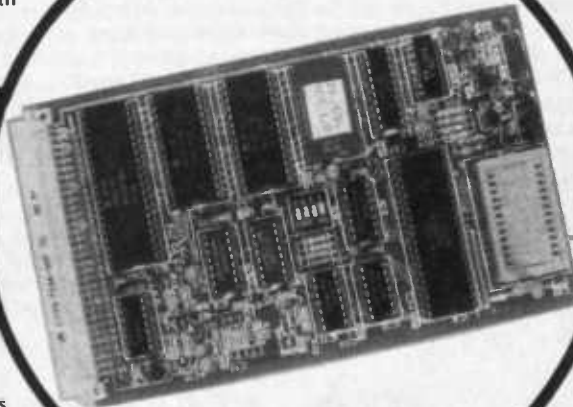
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For further notes on terms and conditions – see the inside back cover of the catalogue

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# BATTERIES

## RE-CHARGEABLE BATTERIES



### DATA

'D'	33 x 61mm	1.2v nom	4.0 AH
Sub 'D'	33 x 61mm	1.2v nom	1.2 AH
'C'	26 x 49mm	1.2v nom	2.2 AH
PP3	27 x 16 x 50mm	8.4v nom	110 mA
'AA'	14.5 x 50mm	1.2v nom	500 mA

Top quality Berec NiCads, fully protected against user abuse.

The operating temperature range is from -30°C to +50°C. The Sub 'D' is a full size D container with lower capacity 1.2 AH cell fitted, suitable for consumer applications.

### PRICES

	Stock No.	1-9	10-49	50-99	100+
AA	01-12004	80p	74p	68p	65p
C	01-12024	2.35	1.99	1.82	1.76
Sub D	01-12034	2.15	2.05	1.97	1.86
D	01-12044	3.05	2.85	2.65	2.47
PP3	01-84054	3.70	3.50	3.31	3.19

## NICAD CHARGERS

**NEW**

### NICAD CHARGER CH4/50

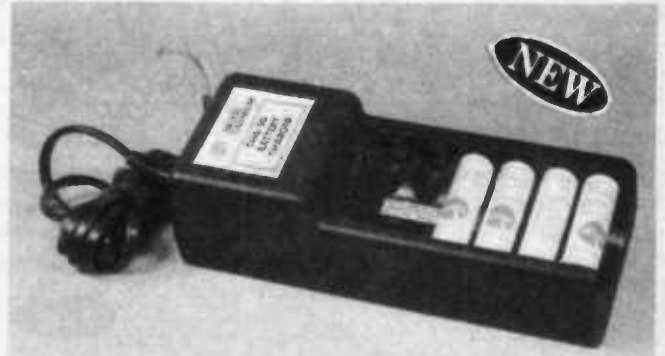
Designed to recharge up to 4 x AA cells in 14-16 hours for fully discharged cells. Batteries can be left on charge continuously without damage. Conforms to BS3456.



Stock No.	1-9	10+
01-00409	4.95	4.40

### AA CELL NICAD CHARGER CH6-50

Designed to recharge 6 x AA (.5AH) cells within 16 hours.



Type	Stock No.	1-9	10+
CH6-50	01-16500	10.95	9.65

### D CELL NI-CAD CHARGER CH2/400

Designed to recharge 2 x 'D' (4AH) cells within 16 hours.



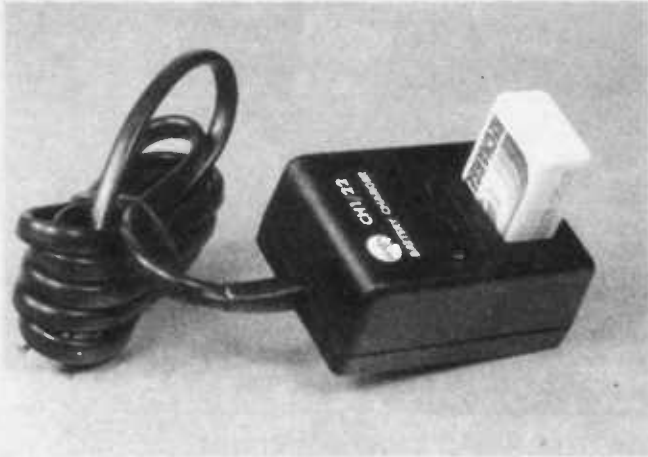
Type	Stock No.	1-9	10+
CH2/400	01-12400	9.55	8.45

# BATTERIES

## NICAD CHARGER CH1/22

Specifically designed to recharge PP3 type NiCads. It will recharge a discharged battery in 14 to 16 hours. Conforms to BS3456.

**New**

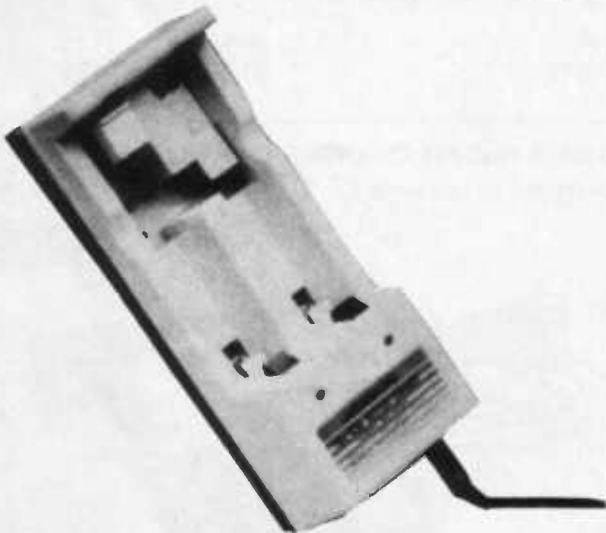


Stock No.	1-9	10+
01-00159	4.95	4.40

## NICAD CHARGER BC2204

Will recharge AA, C, D and PP3 cells with automatic voltage selection. Will recharge following combinations: 4 x D, 4 x AA, 4 x C, 2 x PP3, 2 x D + 2 x C, 2 x D + 2 x AA, 2 x D + 1 x PP3, 2 x C + 2 x AA, 2 x C + 1 x PP3, 2 x AA + 1 x PP3.

**New**

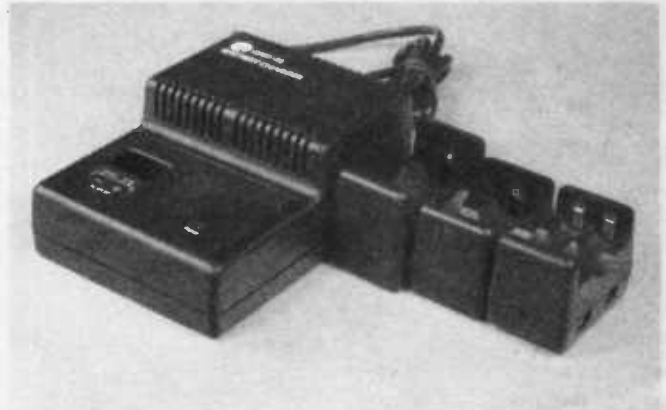


Stock No.	1-9	10+
01-02204	7.45	6.95

## MULTIPURPOSE NI-CAD CHARGER CH6-M

This highly versatile charger will charge any combination of cells with unique plug in "cell modules". Any variation of cell size can be used up to a max of 16Ah total. In addition a built in socket is provided for charging 1 x PP3 Ni-Cad. Max cells are: 32 x AA size, 8 x C size or 4 x D size (or any combination thereof). Built in indicator.

**New**



Type	Description	Stock No	1-9	10+
CH6-M	Charger	01-06124	13.95	11.95
CA1/400	1xD (4AH)	01-16124	1.75	1.55
CA1/200	1xD (2AH)	01-26124	1.75	1.55
CA2/50	2xAA (.5AH)	01-36124	1.75	1.55

## MULTIRATE NI-CAD/LEAD ACID CHARGER

Ideal combination charger for either sealed lead acid or nicad batteries. Selectable 2V, 6V or 12V lead acid or Ni-Cad. Selectable charge rates of 10, 22.5, 50, 100, 175, 250, 400 and 500mA. Output by built in sockets. Built in indicator.

**New**



Type	Stock No	1-9	10+
CH3-10	01-31000	32.45	29.75



# BATTERIES

## BATTERY HOLDERS

To take 4 x U7 (AA) cells.  
Uses PP3 type connector.



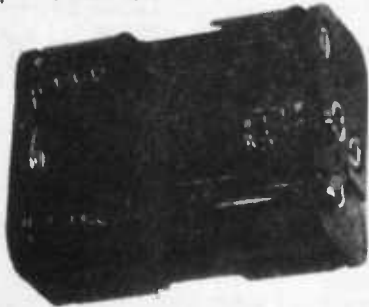
Stock No.	1-24	25+
01-04108	25p	22p

Takes 4 x U7 (AA) cells



Stock No.	1-24	25+
01-04208	25p	22p

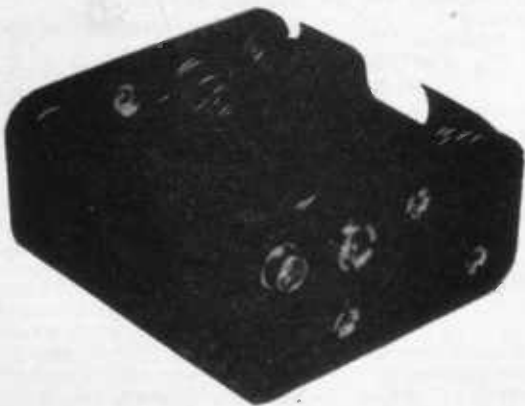
To take 6 x U7 (AA) cells.  
Uses PP3 type connector.



**New**

Stock No.	1-24	25+
01-06060	35p	28p

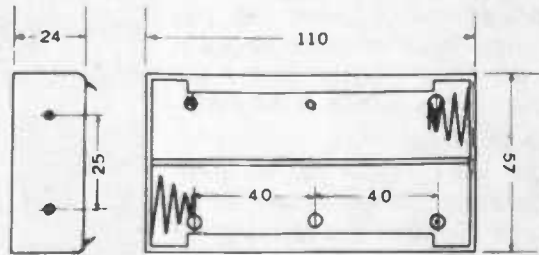
Takes 8 x U7 (AA) cells  
Uses PP3 type connector.



Stock No.	1 off
01-06108	45p

To take 4 x HP11(C) cells.  
Wire lead connections

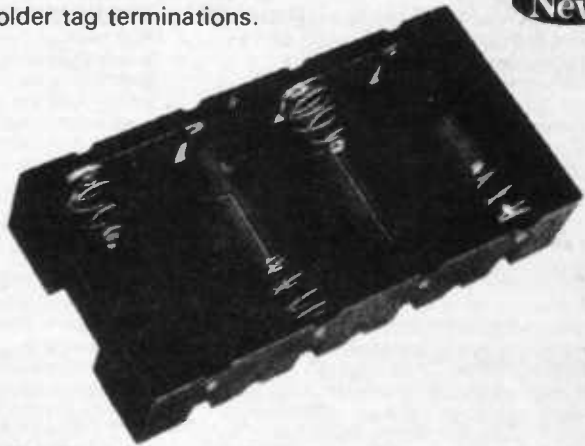
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To take 4 x HP2(D) cells.  
Solder tag terminations.

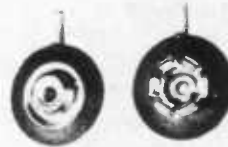
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This book provides the radio amateur with a practical understanding of the design measurement and adjustment of antenna systems. The majority of circuitry detailed is value based.

By H D HOOTON. 1977. 192pp. Paperback.  
Stock No: 02-21466 Price: £6.95

### BEGINNERS HANDBOOK OF AMATEUR RADIO

Designed for either the classroom or individual study, this handbook takes the beginner in amateur radio through the license preparation and study phase, and into the operation of a novice amateur radio station. Subjects discussed include the history of amateur radio; learning the International Morse Code; passing FCC license examinations; radio communication theory; principles of electricity and magnetism, theory and practical aspects of vacuum tubes, transistors, amplifiers, oscillators, transmitters, receivers, transmission lines and antennas, amateur radio practices and operating procedures etc. etc.

By C LASTER. 1979. 384pp. Paperback.  
Stock No: 02-02156 Price: £9.70

### CB RADIO CONSTRUCTION PROJECTS

These projects include add-on accessories, operating aids, test instruments to monitor the output of your equipment, the devices are simple and also inexpensive. No prior knowledge of electronics is required to complete these projects, and a minimum of tools is necessary.

By L BUCKWALTER. 1976. 126pp. Paperback.  
Stock No: 02-20952 Price: £2.75

### FERROMAGNETIC CORE DESIGN AND APPLICATION HANDBOOK

The work within the chapters of this book is dedicated expressly to engineers, technicians, and college students who are presently or soon to be involved professionally with electronics. The chapters include basic theory and practical circuit examples in which toroids, rods, slugs, and pot cores are used. Emphasis has been placed on the practical aspects of magnetic core materials from low frequencies through UHF. The RF engineer or technician will find this volume invaluable in his or her daily efforts.

By M F 'DOUG' DeMAW. 1981.  
251pp. Hardback.  
Stock No: 02-40881 Price: £16.45

### QUESTIONS AND ANSWERS ABOUT CB OPERATIONS

This book acts as a standard reference book as well as a good introduction to all aspects of CB. Good value for money.

By L G SANDS. 1972. 112pp. Paperback.  
Stock No: 02-20893 Price: £2.65



### MICROWAVE DEVICES AND CIRCUITS

Any professional engineer engaged in communications will be well aware of the rapid growth of microwave systems. The recent advances in low cost microwave technology have accelerated this already rapid growth, so a really thorough book like this is a valuable reference work for anyone seeking to either learn from scratch, or refresh existing know.edge.

By S Y LIAO. 1980. 530pp. Hardback.  
Stock No: 02-58120 Price: £24.70

### MICROWAVE THEORY AND APPLICATIONS

This book enables the student engineer or laboratory technician to have a thorough understanding of transmission theory and its applications with a minimum of mathematics. The book contains a lot of useful information and has 21 laboratory experiments.

By S F ADAM. 1969. 513pp. Hardback.  
Stock No: 02-58148 Price: £17.95

### TV ANTENNAS AND SIGNAL DISTRIBUTION SYSTEMS

An invaluable guide to selecting and installing TV antennas and signal distribution systems. Packed with easy-to-understand information on using these systems to produce high quality TV reception. Many of the antennas described have been personally tested by the author.

By M J SALVATI. 1979. 256pp. Paperback.  
Stock No: 02-21584 Price: £7.65

## GENERAL BOOKS

### ABC's OF INTEGRATED CIRCUITS

Covers the fundamentals of integrated circuits. Suitable for the newcomer to the subject, with many simple constructional circuits.

By R P TURNER. 1977. 95pp. Paperback.  
Stock No: 02-21462 Price: £4.15

### ACTIVE FILTER COOKBOOK

A practical, user-orientated treatment of active filters. This book explains what active filters are, and how they work, and gives detailed information on design analysis and synthesis techniques. It explores some interesting applications for active filters in brainwave research, electronic music, quadrature art, and psychedelic lighting.

By D LANCASTER. 1975. 240pp. Paperback.  
Stock No: 02-21168 Price: £10.45

### ANALOG I/O DESIGN

This book provides a comprehensive approach to the design of analog systems primarily for computer input/output applications. The nine chapters are organized to provide a gradual and logical exposition.

By P H GARRETT. 1981. 259pp. Hardback.  
Stock No: 02-02080 Price: £17.20

### BASIC ELECTRICITY/ELECTRONICS VOL 3

Understanding Electronic Circuits 2nd Edition  
By Training & Retraining. Paperback.  
Stock No: 02-02150 Price: £9.70

### BEGINNERS HANDBOOK OF IC PROJECTS

Caught up in the rush of new and wonderful developments in electronics, writers and publishers often lose sight of the unending parade of beginners who are struggling to master the fundamentals of building, troubleshooting, and testing electronic projects. This is a book especially written for those beginners who have the feeling that they are being left behind and overwhelmed with complex and sophisticated circuitry.

By D L HEISERMAN. 1981. Paperback.  
Stock No: 02-07428 Price: £9.70

### BUILDING AND INSTALLING ELECTRONIC INTRUSION ALARMS

Countermeasures to offset crime are suggested in this book written for the novice who wants to install a security system in his home and the technician who wishes to enter the lucrative field of security electronics.

Counter measures outlined include electromechanical intrusion alarms, sensors and switches, closed-circuit television, proximity alarms, power supplies, telephone attachments, and alarms for the protection of automobiles.

By J E CUNNINGHAM. 1977.  
128pp. Paperback.  
Stock No: 02-21465 Price: £4.55

### CMOS COOKBOOK

...tells all you need to know to understand and profitably use this inexpensive and genuinely fun-to-work with digital logic family.

By D LANCASTER. 1977. 416pp. Paperback.  
Stock No: 02-21398 Price: £9.05

### COMPLETE GUIDE TO READING SCHEMATIC DIAGRAMS

This popular book is now in its second edition. With the rapid and far reaching developments in solid-state and integrated circuits the opportunity has been taken to include many important new circuits to add to the standard ones which are so essential.

By J DOUGLAS-YOUNG. 1980.  
303pp. Spiral bound  
Stock No: 02-04244 Price: £11.20

### DESIGN OF OP-AMP CIRCUITS, with experiments

A complete introduction to almost every op-amp application. It teaches the reader all there is to know about op-amp circuits with a series of 37 methodical experiments covering linear circuits, differential amplifiers, integrators, comparators, oscillators, non-linear circuits and active filters.

By H M BERLIN. 1977. 244pp. Paperback.  
Stock No: 02-21537 Price: £7.65

### DESIGN OF PHASE-LOCKED LOOP CIRCUITS, with experiments

The design of the basic PLL circuits is described; detector, phase comparator, and voltage-controlled oscillator circuits are detailed. Contains many practical circuits using the 560-series devices and the CMOS 4046 chip. With over 15 experiments.

By H M BERLIN. 1978. 256pp. Paperback.  
Stock No: 02-21545 Price: £7.65

### DESIGN OF VMOS CIRCUITS, with experiments

The vertical metal oxide semiconductor or VMOS, is a new and exciting device that may be a giant step towards the ideal active circuit element. This book written to whet your appetite, features 11 chapters on the VMOS and its characteristics. Chapter 11 presents a series of experiments that demonstrate a number of the concepts discussed in earlier chapters.

By R T STONE et al. 1980. 176pp. Paperback.  
Stock No: 02-21686 Price: £8.35



## EFFECTIVELY USING THE OSCILLOSCOPE – Third Edition

This book emphasises practice not theory. Information is presented without frills, showing you how to do various jobs with your equipment as efficiently as possible. This book has a two fold purpose to help you understand how to make waveform tests with an oscilloscope and to show you how to analyze the waveforms produced by defective circuits. By R G MIDDLETON. 1981. 168pp. Paperback. Stock No: 02-21794 Price: £6.95

## HOW TO BUILD A FLYING SAUCER

This book will delight everyone from physicists to the insatiably curious. Each chapter deals with such questions as "how the pyramids and Stonehenge were really built", or "whether the alchemists really transmuted iron to gold" and "...if the Russians can trigger earthquakes in the US". The book reveals the known technology and forgotten inventions that show how many 'impossible' inventions of the past might actually be accomplished today. By T B PAWLICKI. 1981. 151pp. Paperback. Stock No: 02-40246 Price: £5.20

## HOW TO BUILD YOUR OWN STEREO SPEAKERS

A comprehensive book that covers all aspects of DIY speaker construction, from theory and circuit characteristics through to construction and practical systems. By C ROBIN. 1978. 190pp. Paperback. Stock No: 02-87989 Price: £5.20

## INTEGRATED CIRCUIT PROJECTS

Many relatively straightforward projects around ICs to introduce these fearsome 'black boxes' to the unwary. By R P TURNER. 1977. 160pp. Paperback. Stock No: 02-21439 Price: £4.55

## LINEAR INTEGRATED CIRCUITS

Finally, a practical reference on linear-integrated circuits written in an easy-to-read style for the technician, the engineer, and the student. The operational amplifier and its application in various areas are covered in depth, including testing and breadboarding, power amplifiers consumer/communications circuits, regulators, digital interfacing, phase locked loops, A/D and D/A conversion and more. By S D PRENSKY et al. 1981. 354pp. Hardback. Stock No: 02-40845 Price: £14.95

## LOGIC AND MEMORY EXPERIMENTS USING TTL – Books 1 & 2

These two books give a detailed 'hands-on' introduction to the use of 7400 series devices including memories, display and arithmetic elements. The emphasis is on learning through experimental experience. Book 1 covers digital gating and truth tables through to multiplexers and sequencers while book 2 covers LED displays, drivers, though to tri-state logic and the delights of open collector outputs, flip-flops, monostables to memories and arithmetic elements. By D G LARSEN & P R RONY. Book 1: 1978. 352pp. Paperback. Stock No: 02-21542 Price: £8.35 Book 2: 1979. 384pp. Paperback. Stock No: 02-21543 Price: £9.05

## 99 PRACTICAL ELECTRONIC PROJECTS – 2nd Edition

16 groups of projects are presented to illuminate the path for the beginner. From audio amplifiers, test equipment, and photography projects, to automotive projects. Most projects can be constructed for less than £5.00. By H FRIEDMAN. 1979. 128pp. Paperback. Stock No: 02-21635 Price: £4.55

## ONE EVENING ELECTRONICS PROJECTS

A guide for beginners, illustrated with many projects that can be built from easily obtained component, and tools that can be found in most homes. By C R GRAF. 1980. 128pp. Paperback. Stock No: 02-21699 Price: £4.55

## OP AMP HANDBOOK

This book is written for the electronics technician and the student engineer under the assumption that the readers have a grasp of the fundamentals of DC/AC theory and other simple electronic theory. Amongst the many circuits are various self assessment multichoice 'quizzes' for the reader to gauge his/her progress. By F W HUGHES. 1981. 294pp. Hardback. Stock No: 02-63729 Price: £16.45

## OPERATIONAL AMPLIFIER CHARACTERISTICS AND APPLICATIONS

This book is primarily written for students and electronic engineers, dealing with practical and theoretical aspects of almost every unusual and common op amp. It is a well presented book with worked examples, plus a section of problems with answers. By R G IRVINE. 1981. 462pp. Hardback. Stock No: 02-63775 Price: £18.70

## OSCILLOSCOPES

You the reader or student, will find this a very different book from the others on the market dealing with vital test equipment subjects. For only briefly are you told what an oscilloscope is, while you are shown in great detail what it does and why. The contents of this highly informative book originates from the author's direct experiences in the intensive use of such equipment, beginning with DC oscilloscopes in the early 1950's spectrum analyser, work on recent video and two way radio, beginning in 1976. By S PRENTISS. 1981. 161pp. Paperback. Stock No: 02-53548 Price: £8.20

## PRACTICAL LOW COST IC PROJECTS – 2nd Edition

Complete parts lists and schematics for 38 different IC projects, most of which can be inexpensively built in a few hours by the relatively inexperienced. Projects include walky-talkies and an electronics 'fuzz' box for guitars. By H FRIEDMAN. 1979. 96pp. Paperback. Stock No: 02-21599 Price: £4.15

## PRINCIPLES OF BIOMEDICAL INSTRUMENTATION AND MONITORING

By R J TRAISTER. 1981. 322pp. Hardback. Stock No: 02-56113 Price: £18.70

## SCRS & RELATED THYRISTOR DEVICES

The purpose of this book is to provide electronic engineers, technicians and experimenters with a practical understanding of thyristor devices. The material – fundamentals, theory of operation, specifications, and applications – is organized primarily as a self-study text to assist in the design or maintenance of electronic circuits that involve thyristors. By C LASTER. 1981. 136pp. Paperback. Stock No: 02-21806 Price: £9.05

## TTL COOKBOOK

By D LANCASTER. 1981. Paperback. Stock No: 02-10358 Price: £8.35

## SON OF CHEAP VIDEO

Don Lancaster leads the unwary through the wiles and wheezes of the low cost approach to producing a VDU. The author's well known style helps to provide guidance and advice on the black art of video for the computer user and enthusiast. Transform your computer graphics into a format suitable for a standard TV set. By D LANCASTER. 1980. 224pp. Paperback. Stock No: 02-21723 Price: £8.95

## SECURITY ELECTRONICS – 2nd Edition

A book that covers up-to-date advances in electronic security systems. Subjects range from intruder detection to alarms, bugging and debugging devices etc. By J E CUNNINGHAM. 1977. 192pp. Paperback. Stock No: 02-21479 Price: £5.25

## THE 555 TIMER APPLICATIONS SOURCEBOOK

A practical and informative guide to the world famous 555 timer IC. A host of applications (including many unusual circuits) for using this device in applications ranging from voltage regulation to signal generation. By H BERLIN. 1976. 160pp. Paperback. Stock No: 02-21538 Price: £5.25

## UNIQUE ELECTRONIC WEATHER PROJECTS

This book contains a collection of practical weather-related projects that the builder can build and use, each project having been tested by the author himself. By T FOX. 1978. 136pp. Paperback. Stock No: 02-21484 Price: £6.25

## COMPUTER BOOKS

### THE ADA PROGRAMMING LANGUAGE

A book written for programmers or students already familiar with languages such as Fortran, PASCAL and PL-1. It describes the ADA language that has been sponsored by the US Department of Defence this support will make ADA a major language in the next few years. By J C PYLE. 1981. 290pp. Paperback. Stock No: 02-03921 Price: £9.95

### ADVANCED COMPUTER DESIGN

The author of this book, a lecturer on computer studies at Queen Mary College, University of London, has divided the subject into three main categories. The first section deals with encoding and execution of problem-oriented or high-level programming languages. The second section discusses the provision of high-speed operations on numeric and non-numeric data. The third section deals with the reduction and containment of programming costs. By J K ILIFFE. 1982. 469pp. Hardback. Stock No: 02-01125 Price: £18.95

### APPLE BASIC FOR BUSINESS FOR APPLE II

This book has presented problems from the business data processing and environment as a reason for learning BASIC. Of course, not all facets of a problem can be explained at once, since different parts require different approaches and tools. But step, by step as it looks at the many facets of a problem and introduces the necessary BASIC statements the student will collect the tools needed to solve all these problems. By A J PARKER & J F STEWART. 1980. 300pp. Paperback. Stock No: 02-02261 Price: £11.20

### APPLESOFT LANGUAGE

For Apple II micros that use microsoft language, this book covers programming in non-technical language from elementary concepts to advanced techniques. By B & G BLACKWOOD. 1981. 254pp. Paperback. Stock No: 02-21811 Price: £7.65

### THE ARCHITECTURE OF CONCURRENT PROGRAMS

Presents a systematic way of developing reliable, concurrent computer programs in the abstract structured program called Concurrent Pascal. Gives an introduction to the common principles of computer operating systems, and its associated sequential and concurrent processes. Not one for the beginner. By P B HANSEN. 1977. 314pp. Hardback. Stock No: 02-44628 Price: £19.45

# BOOKS

## ATARI ASSEMBLER

For novices with some knowledge of BASIC programming, this introduction to using the ATARI also gives basic information on programming in assembly language.  
By D & K INMAN. 1981. 270pp. Paperback.  
Stock No: 02-02366 Price: £9.70

## BASIC BUSINESS SOFTWARE

Describes how small businesses can benefit from computerisation. What sort of software is required, and how to choose the appropriate software. Further chapters discuss the operation of many programs such as 'inventory control' or 'general ledger'.  
By E G BROONER. 1980. 142pp. Paperback  
Stock No: 02-21751 Price: £8.35

## BASIC PROGRAMMING ON THE BBC MICROCOMPUTER

This comprehensive book has been written with particular reference to the BBC Microcomputer, the amazingly versatile home computer which has been causing so much interest and enthusiasm in the computing world. As the book uses non-technical language and does not assume previous experience of computing nor special mathematical training, it is particularly suitable for beginners.  
By N & P CRYER. 1982. 200pp. Paperback.  
Stock No: 02-06640 Price: £5.95

## CALCULATOR CLOUD: PROGRAMMING METHODS FOR YOUR PROGRAMMABLE

This book presents methods and techniques for using hand held programmable calculators that have the algebraic (AOS) entry method. Its 'hands-on' approach allows you to follow the text and work through the examples with your calculator — as you read. Since it is impossible to design a 'hands-on' book to be used with every one of the many programmable calculators available, this book is designed specifically to be used with the Texas Instruments TI-59 calculator. It is easily adaptable to the TI-58, SR-52 and SR-56.  
By M D WEIR. 1981. 235pp. Paperback.  
Stock No: 02-11040 Price: £6.70

## CIRCUIT DESIGN PROGRAMS FOR THE TRS-80

Written for the reader with an understanding of Level II BASIC. It features a variety of useful programs that will enable the user to solve a myriad of problems such as RMS and average values, periodic waveform, inverse Laplace, Fourier, design of matching pads, attenuators, active filters, heatsinks, integrated circuit timer, zener diode regulator, and bipolar transistor circuits.  
By H M BERLIN. 1980. 144pp. Paperback.  
Stock No: 02-21741 Price: £10.15

## COMPUTER GRAPHICS PRIMER

Describes one of the most exciting developments in home computers — Computer Graphics. Computer graphics is the ability to create complex drawings, plans, maps and schematics on the screen of a television. Three well illustrated (in colour) chapters discuss 'Perspectives', 'Basic Concepts' and 'Graphics Programming' written for the Apple II.  
By M WAITE. 1979. 184pp. Paperback  
Stock No: 02-21650 Price: £10.45

## COMPUTER LANGUAGE REFERENCE GUIDE

This book assumes you have some knowledge of one of the following languages: ALGOL, COBOL, FORTRAN, LISP, PASCAL, PL/1. It devotes a chapter to each language and shows the reader the basic concepts and keywords of each one. It has a useful keyword dictionary in the last chapter.  
By H L HELMS. 1980. 110pp. Paperback  
Stock No: 02-21786 Price: £5.55

## CP/M PRIMER

This book forms a very useful introduction to the world's most widely supported disk operating system (DOS). It even contains a 'tear-out' and fold-up reference card. A must for the computer enthusiast and user.  
By S M MURTHA & M WAITE. 1980. 99pp. Spiral Bound.  
Stock No: 02-21791 Price: £10.45

## CRASH COURSE IN MICROCOMPUTERS

Because of its content and unique form of presentation, the reader is provided with a solid background in microcomputers quickly and effectively. This course arranged as a series of lessons in a self-teaching format, featuring 14 units and 2 appendices that will teach the average 'consumer' — as effectively as the scientist with a PhD — how to deal with complete microcomputer systems. Each unit includes self-test review questions and answers.  
By L E FRENZEL Jnr. 1980.  
264pp. Spiral Bound.  
Stock No: 02-21634 Price: £13.95

## DIGITAL CIRCUITS AND MICROCOMPUTERS

Basic introductory material is illustrated in this book by two hundred line-drawings. Combinational circuits are discussed in detail and sequential circuits are explained. Examples and numerous exercises are supplied.  
By D E JOHNSON et al. 1979.  
369pp. Paperback.  
Stock No: 02-21407 Price: £10.95

## DIGITAL CONTROL USING MICROPROCESSORS

A systematic introduction to the principles and methods of digital control, this advanced book provides a thorough guide to designing systems based on microprocessors. It is suitable for both students who require a modern approach to digital control design and for experienced engineers who wish to change from analog compensators to microcontrollers.  
By P KATZ. 1981. 300pp. Hardback  
Stock No: 02-21219 Price: £18.95

## DIGITAL LOGIC DESIGN AND APPLICATIONS

This is a laboratory manual which has been developed to provide experiments in applied logic network and design. Altogether there are 22 experiments. Each one commences with an introductory paragraph which outlines the purpose of the experiment and this is followed by a brief introduction and a listing of the components used. The procedure of the experiment is then outlined.  
By L B McCURDY et al. 1981.  
122pp. Paperback.  
Stock No: 02-23819 Price: £9.70

## AN END USERS GUIDE TO DATA BASE

By J MARTIN. 1981. Hardback  
Stock No: 02-27712 Price: £18.45

## EXPERIMENTS IN ARTIFICIAL INTELLIGENCE

An intriguing and interesting book containing a number of clever programs as well as much descriptive detail. Programs include a checkers program computer verse, and a natural language program called 'Doctor' with which you have a conversation.  
By J KRUTCH. 1981. 110pp. Paperback.  
Stock No: 02-21785 Price: £6.25

## HANDBOOK OF SEMICONDUCTOR MEMORIES

By M M CROVIC. 1981. Hardback  
Stock No: 02-27601 Price: £18.45

## THE HEXADECIMAL CHRONICLES

A book of instant look-up tables for 52 of the most important micro code, base and number conversion, and calculations.  
By L FRENZEL. 1981. 300pp. Paperback.  
Stock No: 02-21802 Price: £12.55

## GUIDEBOOK TO SMALL COMPUTERS

If you are contemplating buying a small computer system for your home, office, or business, this book can save you time and trouble. It contains all the information necessary for a prospective buyer to make an intelligent selection of a small system.  
By W BARDEN Jnr. 1980. 128pp. Paperback  
Stock No: 02-21698 Price: £4.85

## HOW TO OEBUG YOUR PERSONAL COMPUTER

Tried and tested techniques and procedures for non-expert debuggers.  
By J HUFFMAN & R BRUCE. 1980.  
192pp. Paperback.  
Stock No: 02-29248 Price: £5.95

## HOW TO PROGRAM AND INTERFACE THE 6800

An in-depth introduction to microprocessors and microcomputers in general and the Motorola 6800 microprocessor family in particular. Covers 6800-based microcomputers-learning systems. Over 30 'real-world' experiments demonstrate applications as the concepts are being explained.  
By A C STAUGAARD Jnr. 1980.  
416pp. Paperback.  
Stock No: 02-21684 Price: £11.15

## HOW TO TROUBLESHOOT AND REPAIR MICROCOMPUTERS

Microcomputer and peripheral system repair made simple for advanced computer hobbyists and technicians.  
By J D Lenk. 1980. 304pp. Paperback.  
Stock No: 02-29817 Price: £5.95

## INTIMATE INSTRUCTIONS IN INTEGER BASIC

Although written specifically for the Apple II user, this book may be used with modifications, for any microcomputer using the BASIC language, sorting, flowcharting, graphics, loops, functions and variables are among the many topics discussed.  
By B & G BLACKWOOD. 1981.  
158pp. Paperback.  
Stock No: 02-21812 Price: £5.55

## INTRODUCTION TO MICROCOMPUTERS FOR THE HAM SHACK

The author introduces the reader to the dawning era of 'computercations' or the widespread introduction of computer technology into electronic communications. By reading this book, the reader can take the first step toward the application of microcomputers to amateur radio.  
By H L HELMS Jnr. 1979. 96pp. Paperback.  
Stock No: 02-21681 Price: £4.15

## LOGIC DESIGN OF COMPUTERS

The authors intention is to provide an understandable and orderly development of the subject, in an informal style while assuming no background in circuit theory, semiconductor physics, or abstract algebra.  
By M P Chinitz, 1981, 413pp, Paperback  
Stock No: 02-21800 Price: £11.15

## MICROCOMPUTER INTERFACING WITH THE 8255 PPI CHIP

This self-instructional text is designed to introduce the reader to the Intel 8255 Programmable Peripheral Interface (PPI) through discussion and experiments. Much of the material is applicable to PPIs in general and tells what the 8255 is, where it fits in a microcomputer system, why it is used, and how it is used.  
By P F GOLDSBROUGH. 1979. 224pp. Paperback.  
Stock No: 02-21614 Price: £6.95

## MICROCOMPUTER DICTIONARY — 2nd Edition

Over 100 line drawings and photographs illustrate the up-dated entries in the second edition of this book.

By C J Sippl, 1981, 606pp, Paperback  
Stock No: 02-21696 Price: £11.15

## MICROPROCESSOR SOFTWARE, PROGRAM CONCEPTS AND TECHNIQUES

Aimed at secondary school students and higher, and assumes no previous knowledge of programming microprocessors. It progressively takes the reader through the use of microprocessors and the fundamental concepts of programming and techniques up to assembly level programming and debugging. Well presented, and contains questions at the end of each chapter.

By G A STREITMATTER, 1981, 356pp, Hardback.  
Stock No: 02-24375 Price: £14.20

## THE MINICOMPUTER IN ON-LINE SYSTEMS

Practical and complete, this informative handbook provides an overview of mini-computers and data communications — and how the two work together. While also discussing the functions of data transmission, the authors address the problems of systems design, development and implementation. Technical managers, designers, system programmers, and applications programmers in user companies, manufacturers and software houses will find it extremely helpful in their development of effective data communications based systems.

By M HEALEY et al. 1981, 252pp, Hardback.  
Stock No: 02-87626 Price: £17.20

## MOSTLY BASIC: APPLE II

This book contains 28 chapters divided into 6 sections, each of which cover a different topic such as 'Real Time Applications' and 'Business and Investment'. The 28 programs are well laid out and all are tested.

By H BERENBON, 1980, 158pp, Spiral bound  
Stock No: 02-21789 Price: £9.05

## MOSTLY BASIC: PET

Same as 'Mostly Basic: Apple II' but the author has adapted the programs for the PET.

By H BERENBON, 1980, 158pp, Spiral bound.  
Stock No: 02-21790 Price: £9.05

## MOSTLY BASIC: TRS80

The same as 'Mostly Basic' series for Apple and PET but adapted for the TRS80.

By H BERENDON, 1980, 158pp, Spiral bound  
Stock No: 02-21791 Price: £9.05

## PET BASIC: TRAINING YOUR PET COMPUTER

The material in each chapter of this book is written for people who are learning to use the PET. There are plenty of examples, do-it-yourself exercises, and fun-filled explorations. You are encouraged to experiment with your machine and try out the many features and capabilities. Each new piece of information is carefully presented and thoroughly explained. Computers are not meant to be mysterious, and this book helps you to discover that fact.

By R ZAMORA et al. 1981, 310pp, Paperback.  
Stock No: 02-55249 Price: £9.70

## PET GAMES AND RECREATIONS

This book covers simple games and complex games of reasoning, chance, word and number games etc.

By M OGELSBY, 1981, 256pp, Paperback  
Stock No: 02-55290 Price: £9.70

## PET INTERFACING

The user port, the memory expansion port, and I/O breadboard for the memory port and interfacing to the IEEE 48 port of the PET are explained.

By J M DOWNEY & S M ROGERS, 1981, 240pp, Paperback.  
Stock No: 02-21795 Price: £11.85

## PET PERSONAL COMPUTER FOR BEGINNERS

Written for beginners with no experience of computers, this thorough introduction shows how to make full use of this versatile machine, and is suitable for all versions of the PET, from the original 2001 to the 8032.

By S DUNN & V MORGAN, 1981, 240pp, Paperback.  
Stock No: 02-66182 Price: £4.95

## PRACTICAL HARDWARE DETAILS OF Z80, 8080, 8085 & 6800 MICROCOMPUTER SYSTEMS

The book details how each of the above families of microprocessors are orientated and how each system operates. It has many software and extensive hardware details for each microprocessor discussed.

By J W COFFRON, 1981, 330pp, Hardback.  
Stock No: 02-69108 Price: £17.20

## PRACTICAL TROUBLESHOOTING TECHNIQUES FOR MICROPROCESSOR SYSTEMS

Written for the engineer or technician who uses microprocessor systems, this book is a collection of different troubleshooting techniques. The text is hardware orientated to meet the needs of practical troubleshooters and others who will deal with microprocessors in a real world context. The author describes troubleshooting techniques for 8-bit microprocessors and covers circuits utilizing the 8080, 8085, Z80 and 6800.

By J COFFRON, 1981, 256pp, Hardback  
Stock No: 02-69427 Price: £15.70

## A PRIMER ON PASCAL

An introduction for students who have not programmed previously. It does not attempt to cover all of the Pascal language, but to introduce an elementary sub-set.

By R CONWAY et al. 1981, 430pp, Paperback.  
Stock No: 02-67150 Price: £9.70

## PROGRAMMING AND INTERFACING THE 6502, with experiments

Dr De Jong has compiled 14 interesting chapters of information and programs that will be useful to anyone interested in using 6502-based microcomputer systems.

Experiments and examples are written so that a KIM, AIM or SYM system may be used to reinforce the material presented in each chapter.

By M L DeJONG, 1980, 416pp, Paperback.  
Stock No: 02-21651 Price: £11.15

## THE S100 AND OTHER MICRO BUSES

This very useful book gives details on 24 common buses for all popular microcomputers as well as discussion on each bus. They range from the Apple II/III bus and ATARI BUS through IEEE 488 to the TI99/4 and LS1-11 buses. Also some information on how to interface from various buses to the S100 bus.

By E C POE et al. 1981, 208pp, Paperback.  
Stock No: 02-21810 Price: £6.95

## SMALL BUSINESS COMPUTER SYSTEMS

This book should suit courses in computer science, business administration and commerce, and provide programmers with commercial knowledge and business graduates with an appreciation of computerized business systems.

By P BEST, 1980, 296pp, Paperback  
Stock No: 02-11362 Price: £8.40

## SOFTWARE MAINTENANCE GUIDEBOOK

This book attempts to remove much of the mystery surrounding maintenance and forms a generalised guide for people involved in software maintenance.

By R L GLASS & R A NOISEAUX, 1981, 193pp, Hardback.  
Stock No: 02-21651 Price: £17.25

## SYSTEMS PROGRAMMERS PROBLEMS SOLVER

By W S Mosteller, 1981, Hardback.  
Stock No: 02-26830 Price: £14.20

## STRUCTURED COBOL, A PRAGMATIC APPROACH

A very practical and up to date approach to structured COBOL programming that bridges the gap between theory and commercial applications. Has extensive coverage on all aspects from data processing to maintenance of sequential and non-sequential files.

By R T GRAUER et al. 1981, Paperback  
Stock No: 02-85445 Price: £13.45

## TELEMATIC SOCIETY: A CHALLENGE FOR TOMORROW

James Martin, the world's foremost systems writer vividly demonstrates how developments in telecommunications will affect the way we work, spend our leisure, bank, shop, educate our children, and govern ourselves. Martin takes you on an exciting journey through a society changed by a revolution with words such as telemedicine, teleconferencing, telepresence etc.

By J MARTIN, 1981, 244pp, Hardback.  
Stock No: 02-90246 Price: £9.70

## THE 8080A BUGBOOK

The principles, concepts, and applications of an 8-bit microcomputer based on the 8080 microprocessor. The emphasis is on the computer as a controller. Cover the four fundamental tasks of computer interfacing:

- (1) generation of device select pulses;
- (2) latching of output data;
- (3) acquisition of input data;
- (4) servicing of interrupt signals. Intended to help develop the skills needed to use an 8080-based breadboard microcomputer system.

By P R RONY, 1977, 416pp, Paperback.  
Stock No: 02-21447 Price: £9.05

## 8085A COOKBOOK

From basic concepts to details on system control, memory, interfacing and 8085A family compatible chips, this book shows the reader how to design a microcomputer using the 8085A microprocessor chip.

By TITUS et al. 1980, 352pp, Paperback.  
Stock No: 02-21697 Price: £9.75

## TRS-80 ASSEMBLY LANGUAGE

This book shows how to program the TRS-80 at assembly language level, even for the newcomer to the subject. It gives many machine code Z-80 routines as well as details of sub-routines in the ROMS and DOS.

By H S HOWE, 1981, 186pp, Paperback  
Stock No: 02-93112 Price: £7.45

## TRS-80 INTERFACING Books 1 & 2

If you have a fairly good understanding of the commands in Level II BASIC, Book 1 will appeal to you. The book introduces you to the signal available within the TRS-80 computer and illustrates how they can be used to control external devices. You will have an opportunity to construct and test a number of interesting interface circuits that will be used in the experiments. Book 2 introduces you to more advanced interfacing techniques that allow you to do real things with your TRS-80 computer.

By TITUS et al. Each book - 1980, 256pp, Paperback  
Stock No: 02-21633 Price: Book 1 £7.65  
Stock No: 02-21739 Price: Book 2 £8.35

## USING THE UNIX SYSTEM

This comprehensive book presents the UNIX system which was designed for both program development and software applications. Among the topics examined are a hierarchical file system, asynchronous processing, over 100 subsystems and utilities, and languages such as FORTRAN 77, FORTRAN VI, Pascal, BASIC and C.

By R GAUTHIER, 1981, 298pp, Hardback  
Stock No: 02-81649 Price: £14.20



# BOOKS/CABLE

## VIDEO/COMPUTERS

By C J SIPPL & F DAHL. 1981.  
245pp. Paperback.  
Stock No: 02-94184

Price: £5.95

## YOUR OWN COMPUTER — 2nd Edition

Both software and hardware are explained in detail as well as the many uses of the computer.

By M WAITE & M PARDEE. 1981.  
80pp. Paperback.  
Stock No: 02-21860

Price: £5.55

## Z-80 MICROCOMPUTER DESIGN PROJECTS

Even a beginner in electronics will enjoy constructing and operating the EZ-80 microcomputer, a project that requires surprisingly little time and money. The book is a solid introduction to the Z-80 microcomputer and the remarkable chip, EZ-80. Several EZ-80 applications programs are included.

By W BARDEN Jnr. 1980. 208pp. Paperback.  
Stock No: 02-21682

Price: £9.75

## Z-80 MICROCOMPUTER HANDBOOK

This thorough handbook covers hardware, software and microcomputers built around the Z-80.

By W BARDEN. 1978. 304pp. Paperback.  
Stock No: 02-21500

Price: £8.35

## Z-80 MICROPROCESSOR PROGRAMMING & INTERFACING BOOKS 1 & 2

Two volumes of laboratory-orientated text. Book 1 explores Z-80 software and machine language programming. Book 2 addresses interfacing digital circuits with the Z-80 CPU, PIO, and CTC chips. Both books stress learning through experimentation.

By NICHOLS et al. 1979.  
304pp/496pp. Paperback.

Stock No: 02-21609 Price: Book 1 £9.05  
Stock No: 02-21610 Price: Book 2 £11.15

## 6502 SOFTWARE DESIGN

The 6502 integrated circuit is a very popular microprocessor that is currently being used in general-purpose microcomputers, video games, and personal computers. This material is presented to increase the reader's understanding of the 6502 integrated circuit. Fundamentals are first explained then more complex topics are gradually introduced in the nine information-packed chapters.

By L SCANLON. 1980. 272pp. Paperback.  
Stock No: 02-21656

Price: £9.05

## 6809 MICROCOMPUTER PROGRAMMING AND INTERFACING with experiments

Written to give you a sound understanding of how to program and interface the 6809 microprocessor. It has a set of questions (and answers) at the end of each chapter.

By A C STAUGAARD. 1981. 270pp.

Paperback.  
Stock No: 02-21798

Price: £10.45

## THE 68000: PRINCIPLES AND PROGRAMMING

A comprehensive introduction to one of the most powerful new 16-bit microprocessors the Motorola 68000, this book assumes a basic understanding of computer architecture and familiarity with some types of assembly language.

By L J SCANLON. 1981. 238pp. Paperback.  
Stock No: 02-21853

Price: £10.45

## 16-BIT MICROPROCESSORS

The authors have attempted to reduce the vast complicated documentation available on the many microprocessors into something manageable and at the same time provide a format in which the reader can easily compare the processors.

By TITUS et al. 1981. 350pp. Paperback.  
Stock No: 02-21805

Price: £10.45

## EQUIPMENT WIRE

### SOLID CORE

1/0.6mm copper conductor. Overall dia 1.6mm  
0.3mm sheath. Rated 1kv RMS 1.8A at 70°C

Colour.	Stock No.	Price (10m roll only)
Black	03-00010	36p
Red	03-00011	36p
Green	03-00012	36p
Orange	03-00013	36p
White	03-00014	36p
Blue	03-00015	36p

One roll each colour:

03-00020 £1.80

### MULTI-STRAND

7/0.2mm copper conductor. 0.3mm PVC sheath. 1.2mm overall dia. Rated 1kv RMS 1.4A at 70°C

Colour.	Stock No.	Price (10m roll only)
Black	03-00060	36p
Red	03-00061	36p
Green	03-00062	36p
Orange	03-00063	36p
White	03-00064	36p
Blue	03-00065	36p

One roll each colour

03-00070 £1.80

### MULTI-STRAND

16/0.2mm copper conductor. PVC overall dia 1.6mm 0.3mm sheath. Rated 1kv RMS 3A at 70°C

Colour.	Stock No.	Price (10m roll only)
Black	03-00030	50p
Red	03-00031	50p
Green	03-00032	50p
Orange	03-00033	50p
White	03-00034	50p
Blue	03-00035	50p

One roll each colour

03-00040 £2.60

## MULTI-STRAND

32/0.2mm copper conductor. PVC overall dia 2.5mm. 0.6mm sheath. Rated 1.5kv RMS 6A at 70°C

Colour.	Stock No.	Price per m.
Black	03-00080	11p
Red	03-00081	11p
Green	03-00082	11p
Orange	03-00083	11p
White	03-00084	11p
Blue	03-00085	11p

## EXTRA FLEXIBLE WIRE SUITABLE FOR TEST LEADS

55/0.1mm plain copper with pliable PVC insulation. Overall dia 2.8mm. Rated 500 VDC 2.5A at -40 to +70°C

Colour.	Stock No.	Price per m. (max 25m)
Black	03-00050	12p
Red	03-00051	12p

## FLEXIBLE MAINS

### 2 CORE 3A OVAL

Brown and blue PVC insulation 16/0.2mm copper molded into oval-shaped PVC sheath 3.5 x 5.4mm 3A rating 240v RMS

Colour.	Stock No.	Price per m. (max 100m)
Black	03-00100	20p
White	03-02100	20p

### 3 CORE 3A ROUND

Brown, blue, green/yellow PVC insulated 16/0.2mm plain copper in PVC sheath overall dia 5.8mm

Colour.	Stock No.	Price per m. (max 100m)
Black	03-00110	26p
White	03-02110	26p

# CABLE

## 3 CORE 6A ROUND



Brown, blue, green/yellow PVC insulated 24/0.2mm plain copper in PVC sheath overall dia 6.6mm

Colour.	Stock No.	Price per m. (max 50m)
Black	03-00111	45p
White	02-02111	45p

## 3 CORE 13A ROUND



Brown, blue, green/yellow PVC insulated 40/0.2mm plain copper in PVC sheath overall dia 6.6mm

Colour.	Stock No.	Price per m. (max 50m)
Black	03-00112	65p

## COILED MAINS CABLE



Extendable lead. Brown, blue, green/yellow PVC insulated 17/0.122 copper moulded in coiled Black PVC sheath. Overall dia 16mm. Extended length 1.5m nom current 1A.

Colour.	Stock No.	Price each
Black	03-00120	£2.25

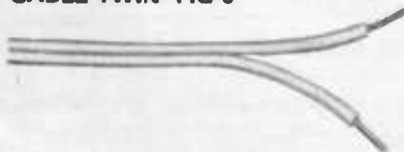
## CABLE TWIN 'FIG 8'



Plain copper 2 x 7/0.25mm laid side by side PVC insulated sheath 0.32mm wall-thickness. One sheath ribbed for identification. 60v RMS 1A

Colour.	Stock No.	Price per m. (max 100m)
White	03-00130	12p

## CABLE TWIN 'FIG 8'



Plain copper 2 x 13/0.2mm similar to above suitable for loudspeaker extension etc. 60v RMS 2A.

One side has an identification tracer

Colour.	Stock No.	Price per m. (max 100m)
Grey	03-00140	15p

## RF CABLES

### UNIRADIO '70'



7/0.19mm plain copper, plain copper braiding in Black PVC sheath overall dia 5.8mm. Impedance 75  $\Omega$ . Cap 67pF/m. Attn 100MHz 1.5dB, 1GHz 5.2dB (per 10m)

Colour.	Stock No.	Price per m. (max 100m)
Black	03-00210	35p

### UNIRADIO '76'



7/0.32 plain copper, plain copper braiding in black PVC sheath, overall dia 5.0mm. Impedance 50  $\Omega$ . Cap. 100pF/m. Attn 100 MHz 0.68dB, 1 GHz 5.2dB (per 10m)

Colour	Stock No	Price per m (max 100m)
Black	03-00212	31p

### UNIRADIO '67'



7/0.77mm plain copper, plain copper braiding in Black PVC sheath overall dia 10.3mm. Impedance 50  $\Omega$ . Cap 100pF/m. Attenuation at 100MHz: 0.68dB, 1GHz: 2.52dB (per 10m).

Colour.	Stock No.	Price per m. (max 100m)
Black	03-00220	88p

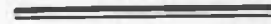
### RG174A/U



7/0.16mm plain copper clad steel, tinned copper braid, black PVC sheath overall dia 2.8mm. Impedance 50  $\Omega$ . Cap 100pF/m. Attn 10MHz 1.1dB, 200MHz 4.2dB.

Colour.	Stock No.	Price per m. (max 50m)
Black	03-00230	52p

## UR95



1/0.46 silver plated, copper-clad, steel solid conductor. Plain copper braid. Overall dia 2.3mm. Impedance 50  $\Omega$ . Cap 100pF/m. Attn at 10MHz 0.86dB, at 100MHz 2.7dB, at 600MHz 6.5dB (per 10m).

Colour.	Stock No.	Price per m. (max 50m)
Black	03-00295	34p

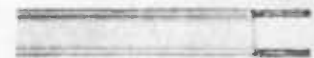
## TV AERIAL DOWNLEAD



1/1.0mm solid copper, 'air spaced' polythene insulation covered with a brown PVC sheath overall dia 7mm. Imp 75  $\Omega$ . Cap 56pF/m. Attn 100MHz 0.8dB, 90MHz 2.7dB (per 10m)

Colour.	Stock No.	Price per m. (max 100m)
Brown	03-00240	36p

## BALANCED TWIN FEEDER



300  $\Omega$  9.7mm x 1.8mm. Clear polythene insulation. Cores are 7/0.25mm plain copper.

Colour.	Stock No.	Price per m. (max 100m)
Clear	03-00250	12p

## AUDIO CABLES

### LOW NOISE



Braided screen. Core 7/0.2mm. Capacity 92pF/m. Overall dia 4.5mm.

Colour.	Stock No.	Price per m. (max 25m)
Black	03-00260	45p

### MINIATURE TWIN



Core 2 x 7/0.2mm PVC insulation. Braided screen. Overall dia 4.8mm. Cap 120pF/m core to core, 210pF core to screen.

Colour.	Stock No.	Price per m. (max 100m)
Grey	03-00270	55p

# CABLE

## 'FIGURE OF 8' INDIVIDUALLY SCREENED



Two individually screened plain 10/0.1 conductors, side by side in 'Figure of 8' PVC. Width 4.1mm. Core to screen capacity: 350pF/m.

Colour.	Stock No.	Price per m. (max 100m)
Grey	03-00280	24p

## AUDIO LAPPED

Single round. Dia 31mm. 7/0.2mm copper stranded in PVC sheath. Core to screen capacity: 322pF/m.



Colour.	Stock No.	Price per m. (max 100m)
Grey	03-00150	16p

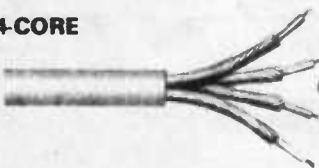
## TWIN OVAL



Dia 3.1 x 4.7mm. 7/0.2mm copper stranded in oval PVC sheath. Core to screen 272pF/m. Core to core 148pF/m.

Colour.	Stock No.	Price per m. (max 100m)
Grey	03-00160	22p

## 4-CORE



ew

Four individually screened 7/0.1mm plain copper conductors, yellow, blue, red and white polythene insulation. Overall PVC sheath, dia 5mm. Cap 96pF/m core to screen.

Colour.	Stock No.	Price per m. (max 50m)
Grey	03-00284	54p

## FLAT COPPER BRAID

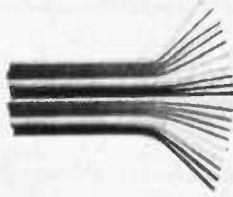


Flat tinned copper braid ideal for low impedance earthing straps etc. 30A version - nom size 6.4 x 0.9mm

Type.	Stock No.	Price per m. (max 25m)
30A	03-00091	40p

## RIBBON CABLE

New



Flat multi way ribbon cable. Tinned copper, 7 x 0.2mm cores. Coloured coded; Black, Brown, Red, Orange, Yellow, Green, Blue, Violet, Grey, White. Max current 1.4A max voltage 250VAC.

Dimensions:  
10 way 13 x 1.3mm  
20 way 26 x 1.3mm

No. Way	Stock No.	Price per m. (max 25m)
10	03-30210	94p
20	03-30220	1.70

## TINNED COPPER

new



2oz reels tinned copper in the following gauges 16, 18, 22, 26 swg.

Size	Stock No.	Price
16 swg	03-04016	54p
18 swg	03-04018	60p
22 swg	03-04022	64p
26 swg	03-04026	76p

## ENAMELLED COPPER WIRE

New

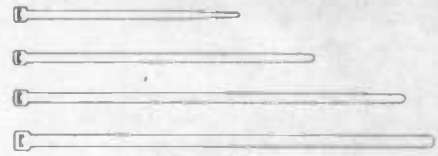


2oz reel, enamelled copper wire in the following gauges: 14, 16, 18, 20, 22, 24, 25, 26, 28, 30, 32, 34, 36, 38, 40 swg.

Size	Stock No.	Price
14 swg	03-03014	55p
16 swg	03-03016	56p
18 swg	03-03018	60p
20 swg	03-03020	64p
22 swg	03-03022	66p
24 swg	03-03024	70p
26 swg	03-03026	78p
28 swg	03-03028	79p
30 swg	03-03030	82p
32 swg	03-03032	84p
34 swg	03-03034	86p
36 swg	03-03036	92p
38 swg	03-03038	96p
40 swg	03-03040	1.06

## CABLE TIES

NEW



Nylon non-release lock action, for cable looms etc.

Max dia (mm)	L	W
14	75	2.2
20	100	2.5
28	130	2.9
30	140	3.6

Max dia	Stock No.	Price (pack 20)
14	03-40075	28p
20	03-40100	28p
28	03-40130	36p
30	03-40140	36p

## SLEEVING

### SILICONE RUBBER

Wall thickness 0.5mm. with 1mm bore.

Colour.	Stock No.	Price per 5 m
Black	03-00170	95p
Red	03-00171	95p

## PVC SLEEVING

Colour	Dia.mm	Stock No.	Price per m
Red	2	03-00180	7p
Black	2	03-00181	7p
Red	4	03-00182	12p
Black	4	03-00183	12p

## HEAT SHRINK

A heat shrinkable polyolefin tubing which will reduce to 50% of the original diameter when heated to 100°C-120°C. Max operating temperature 135°C. Breakdown voltage 8.6kV min. Colour - Yellow.

Size	Stock No.	Price per 1.2m
2.4mm	03-00190	1.20
4.8mm	03-00191	1.40

## DRIVE CORD

Nylon covered spun glass core. Dia 0.56mm.

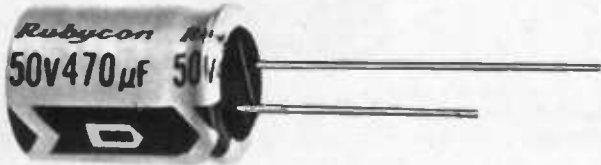
Colour.	Stock No.	Price per 3m
White	03-00200	15p



# CAPACITORS

## MINIATURE ALUMINIUM ELECTROLYTICS RADIAL PCB MOUNTING

A standard 'workhorse' capacitor for general circuit applications. The operating temperature range is -40°C to +85°C. Tolerance -10% to +75% or better.



## AXIAL LEAD ELECTROLYTICS

Specifications as for radial types



Value	Voltage	Case Size	Stock No.
0.47	50	1	05-47408
1u	50	1	05-10508
2u2	50	1	05-22508
3u3	50	1	05-33508
4u7	50	1	05-47508
10u	16	1	05-10606
10u	50	1	05-10608
22u	10	1	05-22605
22u	25	1	05-22607
33u	6.3	1	05-33605
33u	25	2	05-33607
47u	10	1	05-47605
47u	16	2	05-47606
47u	25	2	05-47607
47u	63	4	05-47608
100u	10	2	05-10705
100u	16	3	05-10706
100u	25	3	05-10707
100u	63	6	05-10708
220u	16	4	05-22706
220u	25	5	05-22707
330u	16	5	05-33706
330u	25	6	05-33707
470u	6.3	4	05-47705
470u	16	6	05-47706
470u	63	8	05-47708
1000u	16	7	05-10806
1000u	25	8	05-10807
1000u	63	9	05-10808
2200u	16	8	05-22806
4700u	16v	9	05-47806

### CASE SIZES (in mm)

Size	L	D	Pitch
1	11.2	5	2
2	11.2	6.3	2.5
3	11.2	8	3.5
4	12.5	10	5
5	16	10	5
6	20	10	5
7	25	12.5	5
8	25	16	7.5
9	40	18	7.5

### Prices

Case Size	1-24	25-99	100+
1	7p	8p	4p
2	8p	7p	5p
3	9p	8p	7p
4	10p	9p	8p
5	14p	12p	11p
6	18p	15p	12p
7	23p	17p	13p
8	28p	23p	18p
9	88p	55p	41p

Value	Voltage	Case Size	Stock No.
1u	50v	1	05-10511
2u2	50v	1	05-22511
3u3	50v	1	05-33511
4u7	35v	1	05-47511
10u	16v	1	05-10609
10u	35v	2	05-10611
22u	16v	2	05-22609
22u	35v	3	05-22611
33u	16v	2	05-33609
47u	25v	4	05-47610
100u	16v	4	05-10710
100u	35v	5	05-10711
220u	16v	5	05-22709
330u	16v	6	05-33709
470u	16v	7	05-47709
470u	25v	8	05-47710
1000u	25v	9	05-10810
1000u	35v	10	05-10811
2200u	16v	10	05-22809
2200u	25v	10	05-22810
4700u	16v	11	05-47809
4700u	35v	12	05-47811

### Approx case sizes (mm)

Size	L	D
1	12	5
2	12	6
3	16	6
4	16	8
5	20	10
6	25	10
7	29	10
8	31	13
9	31	16
10	40	18
11	50	22
12	52	22

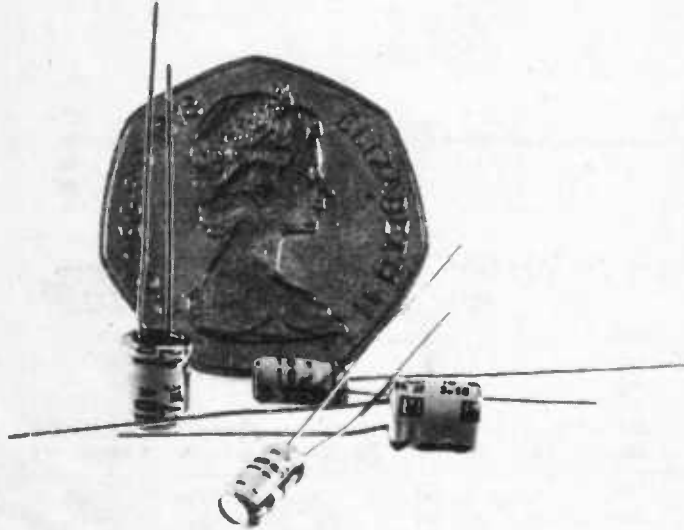
### Prices (Axial)

Case Size	1-24	25-99	100+
1	8p	7p	8p
2	9p	8p	7p
3	9p	8p	7p
4	10p	9p	8p
5	11p	10p	9p
6	18p	14p	12p
7	25p	22p	19p
8	29p	27p	25p
9	36p	33p	30p
10	45p	40p	38p
11	49p	48p	44p
12	92p	83p	75p

# CAPACITORS

## ULTRA MINIATURE ELECTROLYTICS

Ultra small electrolytic capacitors for use where space is at a premium. Op Temp Range  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ . Tolerance  $-10\%$  to  $+30\%$  or  $\pm 20\%$ . Leakage current I equals  $0.01\text{CV} + 3(\mu\text{A})$  max.



Size	L	D	Pitch
1	7.5	4	1.5
2	7.5	6.3	2.5

Value	Voltage	Case Size	Stock No.
1uF	50v	1	05-10514
2u2	50v	1	05-22514
4u7	35v	1	05-47514
10u	16v	1	05-10613
22u	6.3v	1	05-22612
22u	16v	2	05-22613
47u	10v	2	05-47612

Case Size	1-24	25-99	100+
1	9p	8p	7p
2	11p	10p	9p

## ULTRA LOW LEAKAGE ELECTROLYTICS

A low cost alternative to tantalum in the majority of applications where low leakage and high reliability is the prime concern. The leakage current is typically  $0.002\text{CV}$  or  $0.4\mu\text{A}$  - whichever is greater. Operating temperature range  $-40^{\circ}$  to  $+85^{\circ}$ . Tolerance 20%.



Value	Voltage	Stock No.	1-24	25-99	100+
0.1uF	50v	05-10210	8p	7p	6p
0.22uF	50v	05-10404	12p	10p	8p
0.47uF	50v	05-47404	12p	10p	8p
1uF	50v	05-10504	12p	10p	8p
2u2	50v	05-22504	12p	10p	8p
4u7	50v	05-47504	14p	12p	10p
10uF	25v	05-10604	12p	10p	8p
22uF	25v	05-22604	14p	12p	10p
33uF	16v	05-33604	14p	12p	10p
47uF	10v	05-47603	14p	12p	10p
47uF	16v	05-47604	16p	14p	12p
100uF	10v	05-10703	18p	15p	13p

Case Size (mm)	Dia	Length	Pitch
0.1, 0.22, 0.47, 1, 2u2	5.0	11.2	2.0
4u7, 10, 33, 47(10v)	6.3	11.2	2.5
22, 47(16v), 100	8.0	11.2	3.5

## HIGH RIPPLE CAPACITOR

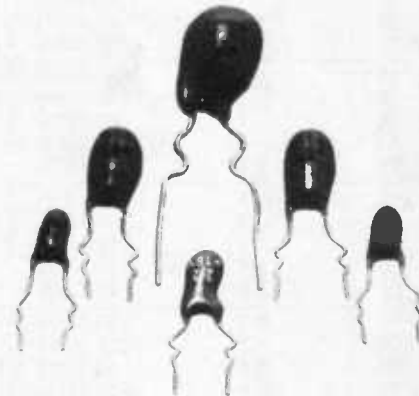
High ripple (7 amps) capacity electrolytic suitable for use in power amplifier smoothing applications. Op temperature  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ . Tolerance  $-10\%$  to  $+50\%$ . Maximum leakage current I is  $0.02\text{CV}$  (mA) or  $6\text{mA}$  whichever is greater. Size:  $72 \times 50\text{mm}$ . Includes mounting clip.



Value	Voltage	Stock No.	1-24	25-99	100+
10000uF	80v	05-10915	£4.75	£4.50	£4.10

## TANTALUM BEADS ELECTROLYTICS

Resin dip coated capacitors with extremely low leakage current combined with small physical size. Tolerance  $\pm 20\%$  or better. Lead spacing 5mm. Operating temperature range  $-55^{\circ}$  to  $+85^{\circ}\text{C}$ . Leakage current:  $0.008\text{CV}$  or  $0.05\mu\text{A}$  - whichever is greater.



Value	Voltage	Stock No.	1-24	25-99	100+
0.22uF	35v	05-22402	20p	16p	12p
0.33uF	35v	05-33402	20p	16p	12p
0.68uF	16v	05-68401	20p	16p	12p
1uF	35v	05-10501	20p	16p	12p
2u2	35v	05-22502	22p	19p	15p
4u7	16v	05-47501	22p	19p	15p
4u7	35v	05-47502	26p	23p	20p
10uF	16v	05-10601	28p	25p	21p
10uF	25v	05-10602	40p	38p	35p
22uF	6.3v	05-22601	45p	40p	36p
22uF	16v	05-22602	50p	45p	40p
22u	25v	05-22603	55p	50p	45p
47uF	6.3v	05-47601	45p	40p	36p
47u	16v	05-47602	44p	39p	35p
100uF	6.3v	05-10701	94p	85p	76p

## MONOLITHIC CAPACITORS

Resin dipped monolithic capacitors, giving high capacity combined with ultra miniature size. The low AC impedance makes this type of capacitor well suited for RF and logic decoupling applications. Max working 50v. Lead spacing 2.54mm.



Value	Stock No.	1-24	25-99	100+
1n	04-10204	18p	13p	11p
4n7	04-47204	18p	13p	11p
10n	04-10304	18p	13p	11p
47n	04-47304	18p	13p	11p
100n	04-10404	18p	13p	11p

# CAPACITORS

## SUB MINIATURE CERAMIC PLATE

Metallised ceramic plate caps with small size and close tolerance specification. All types Min 63v DC.

<b>Tolerance:</b>	<b>Temp Coeff:</b>
Up to 8.2pF +/-0.25pF	Up to 18pF: 'npo' - 0 (Black band)
10pF to 330pF +/-2%	22pF to 150pF: -150ppm (orange band)
	180pF to 330pF: -750ppm (violet band)

<b>Case Size:</b>	
Up to 18pF	3.5mm x 4.5mm (max)
22pF to 47pF	4.5mm x 5.5mm (max)
56pF to 68pF	5.5mm x 6.5mm (max)
82pF to 100pF, 180, 220pF	6.5mm x 7.5mm (max)
120pF to 330pF	7.5mm x 8.5mm (max)

Lead spacing all values is 2.5mm, length 15mm min. Max case thickness 2.5mm.

Due to supply fluctuations we reserve the right to supply alternative case styles.



Value	Stock No.	1-24	25-99	100+
2.2pF	04-22901	5p	4p	3p
2.7pF	04-27901	5p	4p	3p
3.3pF	04-33901	5p	4p	3p
3.9pF	04-39901	5p	4p	3p
4.7pF	04-47901	5p	4p	3p
5.6pF	04-56901	5p	4p	3p
6.8pF	04-68901	5p	4p	3p
8.2pF	04-82901	5p	4p	3p
10pF	04-10001	5p	4p	3p
12pF	04-12001	5p	4p	3p
15pF	04-15001	5p	4p	3p
18pF	04-18001	5p	4p	3p
22pF	04-22001	5p	4p	3p
27pF	04-27001	5p	4p	3p
33pF	04-33001	5p	4p	3p
39pF	04-39001	5p	4p	3p
47pF	04-47001	5p	4p	3p
56pF	04-56001	5p	4p	3p
68pF	04-68001	5p	4p	3p
82pF	04-82001	8p	5p	4p
100pF	04-10101	8p	5p	4p
120pF	04-12101	8p	5p	4p
150pF	04-15101	8p	5p	4p
180pF	04-18101	8p	5p	4p
220pF	04-22101	8p	5p	4p
270pF	04-27101	8p	5p	4p
330pF	04-33101	8p	5p	4p

## MEDIUM K CERAMIC PLATE

For use in coupling, decoupling and non critical resonant circuit applications where close tolerance is not required.

All types 63v DC min.

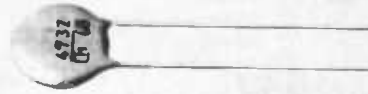
**Tolerance:** +/-10%

<b>Case Size:</b>	
Up to 820pF	3.5mm x 4.5mm (max)
1000pF to 1800pF	4.5mm x 5.5mm (max)
2200pF to 2700pF	5.5mm x 6.5mm (max)
3300pF to 4700pF	6.5mm x 7.5mm (max)

Value	Stock No.	1-24	25-99	100+
390pF	04-39102	8p	5p	4p
470pF	04-47102	8p	5p	4p
560pF	04-56102	8p	5p	4p
680pF	04-68102	8p	5p	4p
820pF	04-82102	8p	5p	4p
1000pF	04-10202	8p	5p	4p
1200pF	04-12202	8p	5p	4p
1500pF	04-15202	8p	5p	4p
1800pF	04-18202	8p	5p	4p
2200pF	04-20202	8p	5p	4p
2700pF	04-27202	8p	5p	4p
3300pF	04-33202	8p	5p	4p
4700pF	04-47202	8p	5p	4p

## LOW VOLTAGE DISC CERAMIC

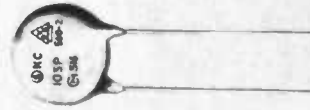
Small size, hi-k, decoupling capacitors. Tolerance -20% to +80%. 50v (min) working. Lead spacing 5mm (100n 7.5mm)



Value	Stock No.	1-24	25-99	100+
10n	04-10303	5p	4p	3p
22n	04-22303	8p	5p	4p
47n	04-47303	8p	5p	4p
100n	04-10403	9p	8p	7p

## HIGH VOLTAGE DISC CERAMIC

**NEW**



SEMKO approved high voltage disc ceramic. Voltage 400VAC, 1kVDC. Tol 1nF +/-10%, 10nF +100%. Lead spacing 1uF 6.4mm, 10uF 9.5mm.

Value	Stock No.	1-24	25-99	100+
1nF	04-10217	10p	8p	7p
10nF	04-10312	22p	18p	16p

## CERAMIC FEEDTHROUGH CAPACITORS

These are ideally suited to RF decoupling of supply and control lines in RFI sensitive environments. The relatively high impedance at audio also permits this type of feedthrough to be used at amplifier inputs which may be sensitive to RFI.

Rated at 50v DC, with an insulation resistance of 10,000M  
Tolerance +100%, -0%



Value	Stock No.	1-24	25-99	100+
1000pF	04-10210	8p	7p	5.5p

NB. Stock type may vary from type illustrated.

## MYLAR

Highly reliable capacitors completely protected against moisture with epoxy resin coating. Ideal for audio frequency use and most RF applications. Working voltage 100v DC. Tolerance 10%. Temperature -25°C to +85°C.

Lead spacing:

1n,2n2-2.5mm, 3n3,10n-3mm, 22n,33n-3.5mm,  
47n,68n-5mm, 100n-6.5mm, 150n-9mm,  
220n,330n-10.5mm, 470n-14mm.



Value	Stock No.	1-24	25-99	100+
1n	04-10206	5p	4p	3p
2n2	04-22206	5p	4p	3p
3n3	04-33206	5p	4p	3p
4n7	04-47206	5p	4p	3p
6n8	04-68206	5p	4p	3p
10n	04-10306	5p	4p	3p
22n	04-22306	8p	5p	4p
33n	04-33306	8p	5p	4p
47n	04-47306	8p	5p	4p
68n	04-68306	8p	5p	4p
100n	04-10406	8p	8p	5p
220n	04-22406	10p	8p	7p
330n	04-33406	11p	9p	8p
470n	04-47406	14p	12p	10p



# CAPACITORS

## POLYESTER (C280 or equiv)

Working voltage 250v DC or better. Miniature polyester film capacitors, wax treated, hard lacquer case. Tolerance Below 220n + 20%. Above 470n + 10%.

Lead spacing up to 100n 10mm  
150n and 200n 15mm  
330n to 680n 20mm  
1uF 27.9mm.



Value	Stock No.	1-24	25-99	100+
10n	04-10305	6p	5p	4p
15n	04-15305	6p	5p	4p
22n	04-22305	6p	5p	4p
33n	04-33305	6p	5p	4p
47n	04-47305	8p	7p	6p
68n	04-68305	8p	7p	6p
100n	04-10405	8p	7p	6p
150n	04-15405	10p	8p	7p
220n	04-22405	10p	8p	7p
330n	04-33405	17p	16p	14p
470n	04-47405	17p	16p	14p
680n	04-68405	17p	16p	14p
1uF	04-10505	24p	22p	18p

## POLYESTER (SIEMENS TYPE)

Metallized polyester layer with small size for high capacity. Working voltage 100VDC or better. Tolerance 10% (This type supersedes the Siemens polycarbonate type).

Lead spacing:  
Up to 1uF 10mm, 2.2uF 15mm



Value	Stock No.	1-24	25-99	100+
10n	04-10307	10p	8p	7p
22n	04-22307	10p	8p	7
33n	04-33307	11p	9p	8p
47n	04-47307	11p	9p	8p
68n	04-88307	12p	10p	8p
100n	04-10407	13p	11p	10p
150n	04-15407	18p	14p	11p
220n	04-22407	18p	15p	12p
330n	04-33407	22p	19p	16p
470n	04-47407	26p	22p	19p
1uF	04-10507	42p	36p	29p
2u2	04-22507	65p	55p	44p

## LEADLESS CERAMIC CAPACITORS

Ideally suited for VHF and UHF applications where low inductance coupling and decoupling capacitors are required.

Tolerance: + / - 10%  
Working voltage 50v DC



Value	Stock No.	1-24	25-99	100+
18pF	04-18011	6p	5p	4p
22pF	04-22011	6p	5p	4p
180pF	04-18111	6p	5p	4p

## POLYSTYRENE

Plain foil tubular capacitors with polystyrene dielectric. Tolerance 5% or better.

Working voltage 63v DC or better.



Value	Stock No.	1-24	25-99	100+
10pF	04-10009	8p	7p	6p
15pF	04-15009	8p	7p	6p
18pF	04-18009	8p	7p	6p
22pF	04-22009	8p	7p	6p
27pF	04-27009	8p	7p	6p
47pF	04-47009	8p	7p	6p
56pF	04-56009	8p	7p	6p
68pF	04-68009	8p	7p	6p
100pF	04-10109	9p	8p	7p
180pF	04-18109	9p	8p	7p
220pF	04-22109	9p	8p	7p
270pF	04-27109	9p	8p	7p
330pF	04-33109	9p	8p	7p
390pF	04-39109	9p	8p	7p
470pF	04-47109	10p	9p	8p
680pF	04-68109	10p	9p	8p
820pF	04-82109	10p	9p	8p
1nF	04-10209	11p	10p	9p
1n2	04-12209	11p	10p	9p
1n5	04-15209	11p	10p	9p
1n8	04-18209	11p	10p	9p
2n2	04-22209	12p	11p	10p
2n7	04-27209	12p	11p	10p
3n3	04-33209	12p	11p	10p
3n9	04-39209	12p	11p	10p
4n7	04-47209	13p	12p	11p
5n6	04-56209	13p	12p	11p
6n8	04-68209	13p	12p	11p
10nF	04-10309	13p	12p	11p

## SILVER MICA CAPACITORS

High stability, high quality capacitors available with close tolerances ideally suited to all RF and frequency determining circuits.

Tolerances: up to 50pF 0.5pF  
Over 50pF + 1%

working voltage 350v

Temperature coefficient  
up to 50pF + 75 ppm/°C  
above 50pF + 35 ppm/°C



Value	Stock No.	1-24	25-99	100+
2.2pF	04-22908	20p	18p	15p
4.7pF	04-47908	20p	18p	15p
10pF	04-10008	20p	18p	15p
22pF	04-22008	20p	18p	15p
33pF	04-33008	20p	18p	15p
47pF	04-47008	20p	18p	15p
56pF	04-56008	20p	18p	15p
68pF	04-68008	20p	18p	15p
100pF	04-10108	20p	18p	15p
120pF	04-12108	20p	18p	15p
150pF	04-15108	20p	18p	15p
220pF	04-22108	23p	18p	16p
330pF	04-33108	32p	29p	26p

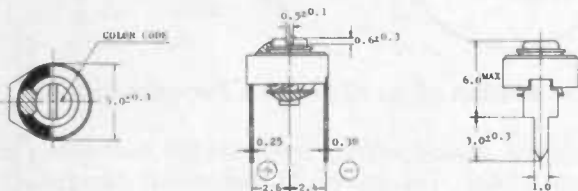
# CAPACITORS - VARIABLE

## CERAMIC TRIMMER CAPACITORS

Miniature ceramic 'disc' trimmers for general circuit applications in filters, tuned circuits etc. up to around 500MHz (depending on application). Maximum working voltage is 350v DC

### 5mm DIAMETER TYPES

Value	T.C.	Q. at 10MHz	Stock number
1.8 to 6pF	NPO	300	06-60903
2.8 to 12.5pF	-600	300	06-12003
3.5 to 20pF	-750	300	06-20003
5 to 30pF	-1500	200	06-30003
9 to 50pF	-1500	200	06-50003



Prices	1-24	25-99	100+
All 5mm types	15p	14p	12.5p

### 7.5mm DIAMETER TYPES

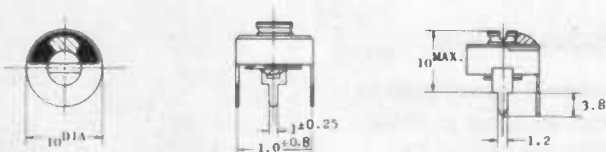
Value	Stock no.	1-24	25-99	100+
7-35pF	06-35004	24p	20p	18p
4.5-20pF	06-20004	19p	16p	14p



### 10mm dia. CERAMIC TYPES

Value	T.C.	Q. at 10MHz	Stock number
5 to 30pF	NPO +0/-1200	500	06-30005
8 to 50pF	NPO +0/-1200	300	06-50005
16 to 100pF	NPO +0/-1700	300	06-10005

Prices	1-24	25-99	100+
All 10mm types	23p	22p	20.5p



## TRIMMERS (FOIL)

Miniature trimmers designed to fit directly to 0.1in. pitch PC layouts. Polypropylene dielectric for high insulation and low temp coefficient.

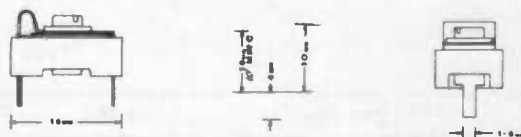


Capacity	Min. Dia	Stock No	1-24	25-99	100+
1.5 to 10pF	7.5	06-10001	18p	15p	14p
2 to 22pF	7.5	06-22001	20p	16p	14p
3 to 36pF	7.5	06-36001	27p	23p	19p
5 to 60pF	10	06-60001	26p	22p	18.5p
3 to 90pF	10	06-80001	29p	24p	22p

## COMPRESSION TRIMMERS

Ceramic base with mica dielectric. Screwdriver adjustment.

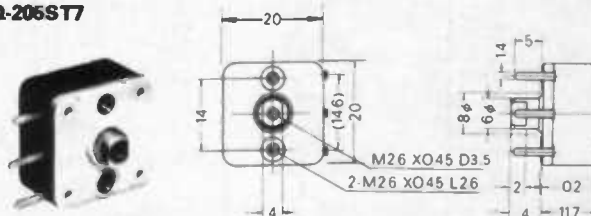
Cap Range	Colour	Stock No.	1-24	25-99	100+
10-80pF	Red	06-08006	24p	21p	18p
30-140pF	Blue	06-14006	24p	21p	18p
60-180pF	Yellow	06-18006	24p	21p	18p



## POLYVARICON VARIABLES

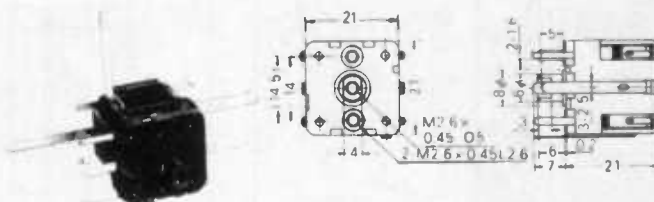
Compact variable capacitors ideal for use where space is restricted. These use plastic film/ brass vane construction providing low microphony characteristics. All types are supplied with integral trimmer caps. (20pF)

### 2Q-205ST7



Value	Stock No.	1-24	25-99	100+
2 x 266pF	06-26102	80p	70p	58p

### CY2-3217Z



Value	Stock No.	1-24	25-99	100+
2 x 335pF	06-33102	£1.85	£1.45	£1.25
3 x 20pF				

## DILECON CAPACITORS

Solid dielectric tested at 750V. 0.25" brass shaft.

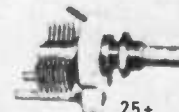
Max Cap	Stock No.	1-24	25+
300pF	06-30006	£3.12	£2.80
500pF	06-50006	£3.12	£2.80



## JACKSON C804 CAPACITORS

High quality air spaced capacitors for use with VFO's, ATU's, BFO's etc. Tested at 1,250V. 0.25" brass shaft.

Max Cap	Stock No.	1-24	25+
25pF	06-02506	3.55	2.00
50pF	06-05006	3.55	2.00
100pF	06-10006	4.01	3.57

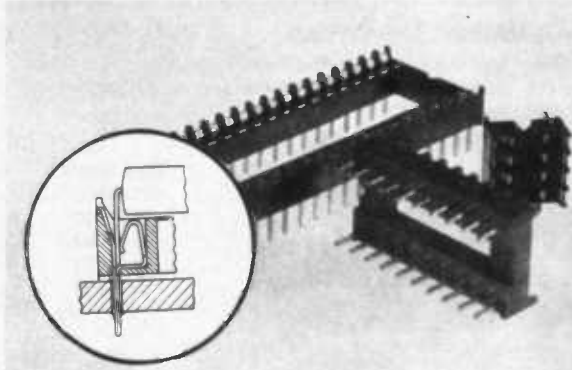


# CONNECTORS

## IC SOCKETS

A range of high quality, low cost, low profile DIL sockets ideally suited for both the OEM and hobbyist. All types feature double sided phosphor bronze contacts, tin-plated for low contact resistance.

<p><b>8 Pin</b></p>	<p><b>18 Pin</b></p>	<p><b>24 Pin</b></p>
<p><b>14 Pin</b></p>	<p><b>20 Pin</b></p>	<p><b>28 Pin</b></p>
<p><b>16 Pin</b></p>	<p><b>22 Pin</b></p>	<p><b>40 Pin</b></p>



**A cross section of an IC pin in a Zetronix socket,**

showing the double wiping action of the leaf spring in a Zetronix socket. The design of the socket also prevents 'wicking' - the process by which solder and flux creeps up the leg during soldering processes.

These low profile sockets are a great deal more versatile than other low cost, low profile types, with pins that do not easily fracture, even when bent through 90°

### Stock Types and Prices

No. Pins & pitch	Stock No.	1-24	25-99	100+
8 x 0.3"	28-00800	12p	9p	7p
14 x 0.3"	28-14000	13p	10p	8p
16 x 0.3"	28-16000	13p	10p	8p
18 x 0.3"	28-18000	18p	15p	14p
20 x 0.3"	28-20000	19p	16p	15p
*20 x 0.4"	28-20100	19p	16p	15p
*22 x 0.3"	28-22000	20p	17p	16p
*22 x 0.4"	28-22100	20p	17p	16p
24 x 0.6"	28-24200	22p	20p	18p
28 x 0.6"	28-28200	25p	23p	21p
40 x 0.6"	28-40200	35p	30p	27p
+ *42 x 0.6"	28-42202	38p	32p	30p

+Mitsumi Manufacture - a single side wipe construction.  
\*Not illustrated.

### SPECIFICATION

#### Electrical Specification

Contact resistance at 10mA	15mΩ
Contact resistance at 1A	15mΩ
Contact capacitance	0.5pF
Insulation resistance at 500V DC	10,000MΩ
Breakdown voltage between contacts	1kV
Dielectric constant at 1MHz	3.8

#### Mechanical Performance

Insertion force per contact	200gm (typ)
Withdrawal force per contact	300gm (typ)
Body material	Polyester
Contact material	Phosphor Bronze
Contact finish	2u Cu, 5u Tin
Contact style	Spring, double sided face wipe

#### Thermal Performance

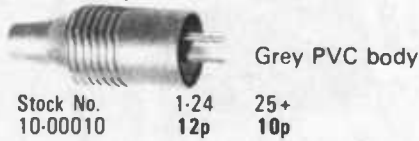
Temperature Range	-45 to +125°C
-------------------	---------------



# CONNECTORS

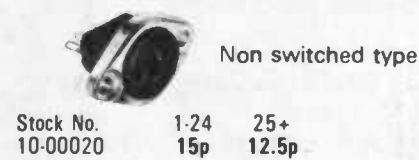
## SPEAKER PLUG

DIN standard 2 pin plug for power levels not exceeding 35W per channel.



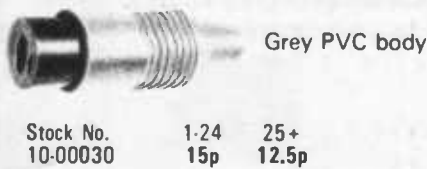
## SPEAKER SOCKET (CHASSIS MTG)

DIN standard 2 pin socket.



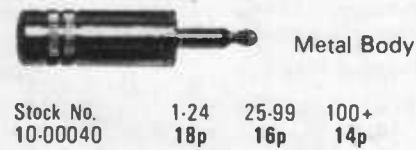
## SPEAKER LINE SOCKET

DIN standard 2 pin line socket.



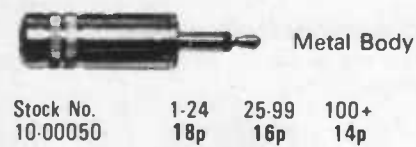
## 2.5mm JACK PLUGS (MONO)

A shielded 2.5mm 'sub' miniature jack plug.



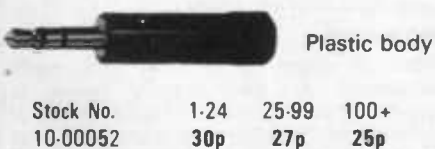
## 3.5mm JACK PLUGS (MONO)

A shielded miniature jack plug.



## 3.5mm JACK PLUGS (STEREO)

An insulated miniature stereo jack plug.

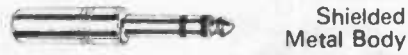


## 0.25" JACK PLUGS (MONO)

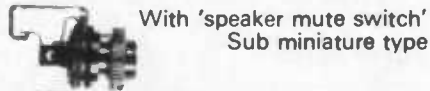
The standard type 'group' and 'disco' line jack connector.



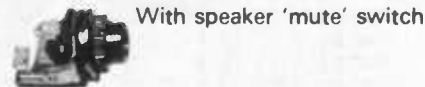
## 0.25" JACK PLUGS (STEREO)



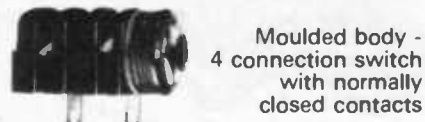
## 2.5mm MONO CHASSIS SKTS



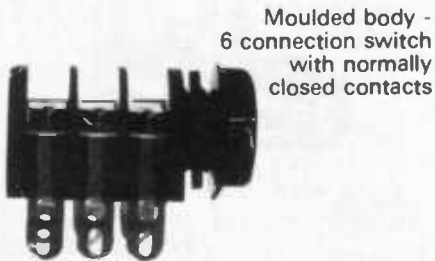
## 3.5mm MONO CHASSIS SKTS



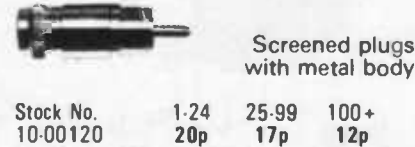
## 0.25" MONO CHASSIS SKTS



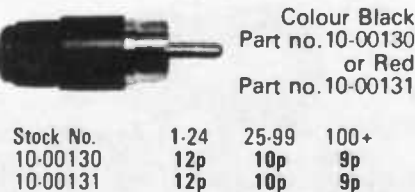
## 0.25" STEREO CHASSIS SKTS



## PHONO CONNECTORS - SCREENED PLUG

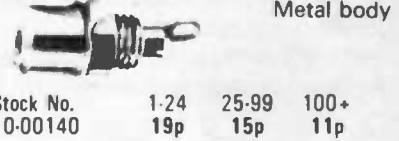


## PLASTIC INSULATED PHONO PLUG



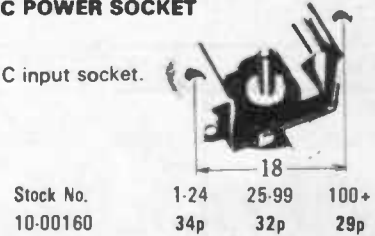
## PHONO SOCKETS

High quality screw fixing type.



## DC POWER SOCKET

DC input socket.



## DC POWER PLUG

DC plug, 2.1mm internal diameter to suit above.

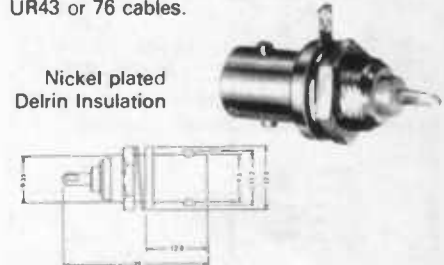


Stock No.	1-24	25-99	100+
10-00161	24p	21p	19p

## BNC SERIES

### BNC FEMALE CHASSIS CONNECTOR

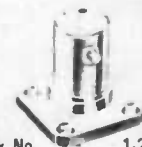
Constant impedance 50Ω connectors. Suit UR43 or 76 cables.



Stock No.	1-24	25-99	100+
10-01000	75p	67p	55p

### SQUARE BNC CHASSIS SOCKET

4 hole fixing chassis 50Ω socket. 17.5mm square base. Fixing centres 12.7mm.



Stock No.	1-24	25-99	100+
10-01002	90p	81p	75p

### BNC MALE CONNECTOR

Free cable connector.



# CONNECTORS

## STRAIGHT CABLE SOCKETS (RE-WIREABLE)

To be used from mains plug to equipment socket.



Stock No.	1-99	100+
10-02010	97p	86p

## REVERSED TYPES

Three pole shuttered chassis mounting mains outlet.



Stock No.	1-99	100+
10-02020	80p	75p



Stock No.	1-99	100+
10-02030	1.30	1.23

NB: Under no circumstance should the plug no. 10-02030 be mated with IEC free socket no. 10-02010.

## IEC CHASSIS PLUG WITH FILTER

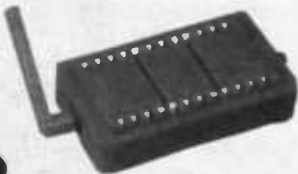
Designed to filter mains borne interference in radios, computers or other RFI sensitive apparatus. They also keep RFI from escaping down the mains. Provides approx 30dB attenuation over frequency range 600kHz to 100MHz.



Rating	Stock No.	1-24	25+
1A	10-02040	6.00	5.50
3A	10-02041	6.30	5.80

## ZERO INSERTION FORCE SOCKET IF-24

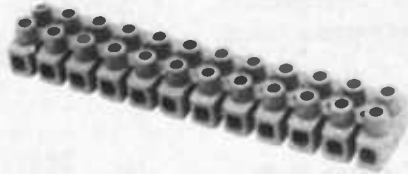
A 24 Pin zero insertion force socket for applications where and IC needs to be inserted and removed numerous times. Ideal for EPROM programming etc. Supplied complete with operating lever.



Type	Stock No.	1-9	10+
ZIF-24	10-24100	6.05	5.85

## TERMINAL BLOCKS

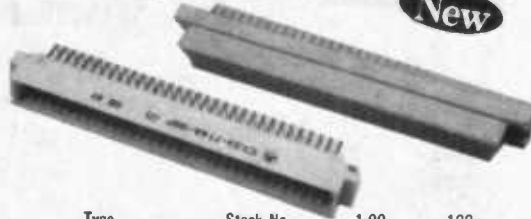
2A rating polythene max 60°C. 12-way.



Stock No.	1-24	25-99	100+
10-02050	35p	30p	24p

## INDIRECT PCB CONNECTOR C133/C143

High quality 64 way PC connectors. Both plug and sockets have two hole fixing provided 2 x 32 contacts using rows a + c. Plug has right angle leadouts for PC use.



**New**

Type	Stock No.	1-99	100+
Plug	10-03030	2p	1.5p
Socket	10-14300	3.95	3.55

## 'D' SERIES CONNECTOR

A 25 way plug/socket commonly encountered in computer terminals. Contacts are hard gold over nickel. Working voltage 300V RMS, working current 7.5A per contact (Max 50% of contacts fully loaded).



**new**

Type	Stock No.	1-99	100+
Plug	10-25100	1.72	1.46
Socket	10-25200	2.50	2.12

## MAINS CONNECTORS

Distribution Block. 4 way. 13A distribution block. Fitted with 13A fuse, which can be changed without dismantling board.



**new**

Colour	Stock No.	1-99	100+
Black	10-04000	6.90	6.20

Less 10% to callers

## PLUG

13A square pin plug, with unbreakable rubber cover and nylon base.

**NEW**



Colour	Stock No.	1-99	100+
Black	10-04001	98p	90p
White	10-04002	98p	92p

## INTER PCB CONNECTORS

A range of miniature 0.1" pitch PCB connectors for PCB to PCB - or PCB to extension wire leads.

Max Voltage 250v AC, 2.5A max per way (limited by PC track size). Typical contact resistance 7mΩ at 1A.

## CABLE SHELLS

For terminating 'flying lead' connectors. Use crimp terminals (10-03030) for each lead position occupied.



No. Ways	Stock No.	1-24	25-99	100+
2	10-03000	10p	8p	7p
4	10-03001	10p	8p	7p
10	10-03002	11p	9.5p	8p
12	10-03003	11p	9.5p	8p

## PCB PLUG - STRAIGHT

For right angle connections (usually with the cable shell connector)



No. Ways	Stock No.	1-24	25-99	100+
10	10-03010	24p	21p	19p
12	10-03012	25p	22p	20p

## PCB SOCKET

PCB mounting parallel - to - face connector



No. Ways	Stock No.	1-24	25-99	100+
6	10-03020	25p	23p	21p
10	10-03021	34p	30p	28p

## CRIMP TERMINAL

For use with cable shells (10-03000-3). Suits 0.07 to 0.5mm wire.



Stock No.	1-99	100+
10-03030	2p	1.5p

## CAGE JACKS

Precision made, gold plated individual sockets designed for component legs of different sizes. CG1 Int dia 1.0mm for HC25Uxtals CG2 Int dia 0.56mm for transistors etc. CG3 Int dia 0.8mm for DBMs Coils etc.

CG1 and CG3



CG2



Illustration (Actual Size)

**NEW**

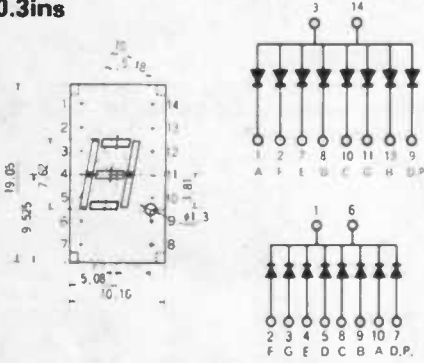
Type	Stock No.	1-24	25-99	100+
CG1	10-06001	16p	14p	12p
CG2	10-06002	18p	16p	14p
CG3	10-06003	18p	16p	14p

# DISPLAYS

## 7 SEGMENT LED DISPLAYS

A range of red LED displays in DIP pin arrangement suitable for socket mounting. High brightness using gallium arsenide phosphide displays.

### 0.3ins

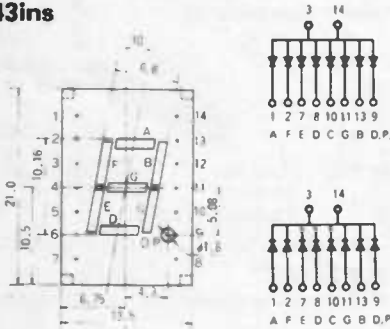


**GL-9R03**  
Common Anode

**GL-8R03**  
Common Cathode

Type	Stock No.	1-9	10-24	25+
GL9R03	15-90003	1.18	1.06	95p
GL8R03	15-80003	1.18	1.06	95p

### 0.43ins

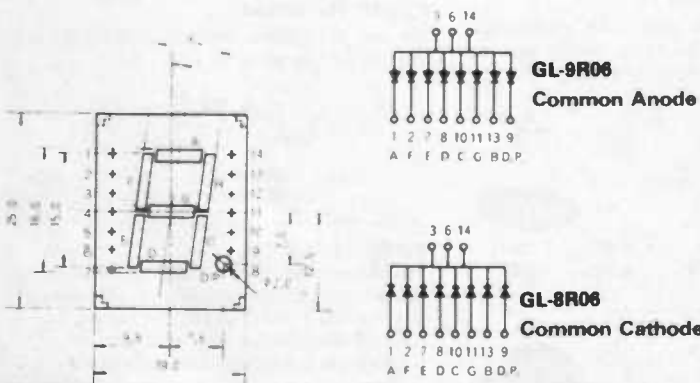


**GL-9R04**  
Common Anode

**GL-8R04**  
Common Cathode

Type	Stock No.	1-9	10-24	25+
GL9R04	15-90004	1.22	1.10	97p
GL8R04	15-80004	1.22	1.10	97p

### 0.6ins



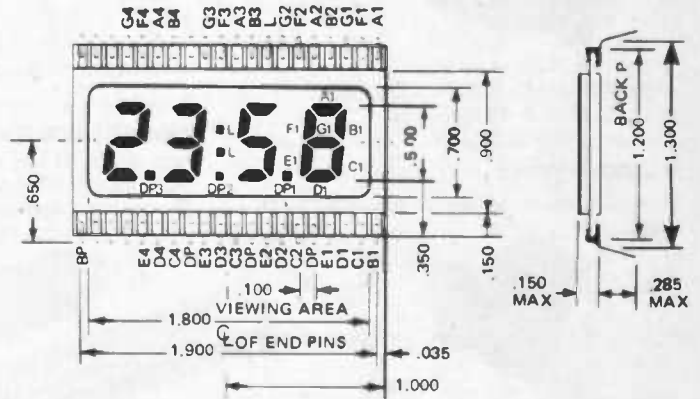
**GL-9R06**  
Common Anode

**GL-8R06**  
Common Cathode

Type	Stock No.	1-9	10-24	25+
GL9R06	15-90006	1.50	1.35	1.18
GL8R06	15-80006	1.50	1.35	1.18

## LIQUID CRYSTAL DISPLAY

4 digit LCD, .5" digits, operating temp -15-+55°C. Transflective background - can be backlit. Operating current 5v RMS 0.5uA.



Stock No.	1-24	25+
13-04001	£5.80	£5.22

## FLUORESCENT DISPLAYS

Vacuum fluorescent displays for use where the environmental conditions are unsuited to LCD. VF displays are generally brighter and more readable under a variety of viewing angles when compared to both LCD and LED types. The basic colour output is green, although the spectrum is sufficiently broad that a variety of filters ranging from blue to pink may be used.



Device	Stock No.	Description	1-24	25+
5LT03	13-50300	5 digit +/-	£7.35	£7.00
6LT06	13-60600	3.5 digit AM,FM,kHz,MHz	£7.35	£7.00
7LT02	13-70200	5 digit AM,FM,kHz,MHz	£8.85	£8.50

## AMBIT RETAIL COUNTER

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Brentwood, Essex CM14 4SG



# FERRITE & DUST IRON COMPONENTS

## MAGNETIC MATERIALS — DUST IRON

An expanding range of toroid and balun cores is offered here for applications ranging from broadband amplifiers to main interference filters. Please note the important differences between dust iron cores — which have an inherent 'air gap' and the vastly higher permeability ferrite products.

Dust iron cores derived from Hydrogen reduction are an ideal material for switching power supplies — both as the main storage core, and subsequent filters. A comprehensive information and applications package is now available for SMPS and EMI filter designers.

### Ferrite

The new ferrite materials offered here are primarily for use in balun and wide band transformers. The use of ferrites for antenna rods and choke/suppressor is already widely appreciated, and broadband aspects will be considered in some detail in the pages of 'Radio & Electronics World'.

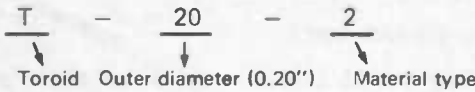
### Basic Formulae

To calculate the required number of turns on a toroid

$$\text{Turns} = 100 \sqrt{\frac{\text{required inductance (}\mu\text{H)}}{A_L (\mu\text{H}/100\text{t})}}$$

where  $A_L$  equals inductance of a single turn on a specified core.

### Dust Iron Nomenclature



## RF Dust Iron Toroids — Micrometals

Complete catalogue, characteristics etc. 02-55003 60p

### RF TOROIDS

A range of Iron Powder toroids offering good stability and High Q for RF applications from 10kHz to 200MHz.

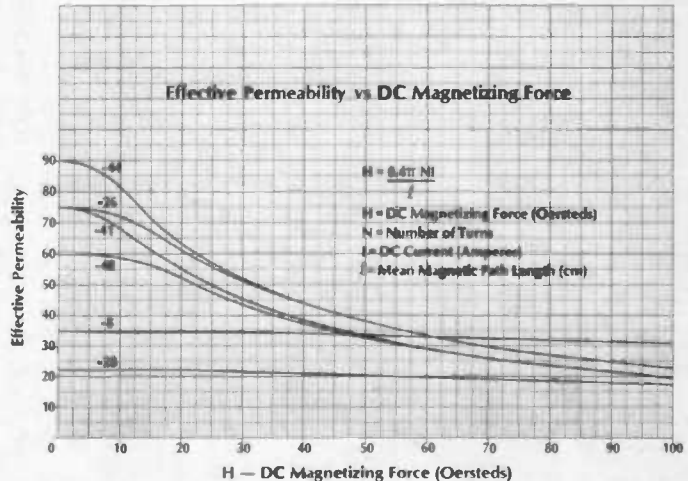
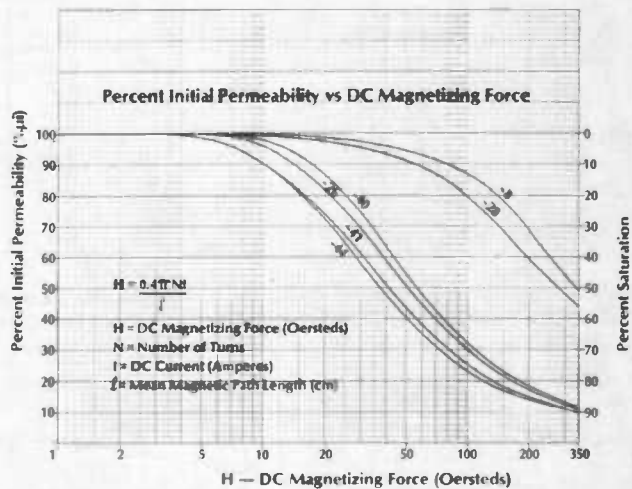
Type	Stock No.	OD(mm)	ID(mm)	Ht(mm)	Freq.
T20-2	55-00202	5.08	2.2	1.7	.1-10MHz
T50-2	55-00502	12.7	7.7	4.84	.1-10MHz
T68-2	55-00682	17.53	9.4	4.38	.1-10MHz
T157-2	55-01572	34.88	24.14	14.48	.1-10MHz
T200-2	55-02002	50.8	31.75	13.19	.1-10MHz
T20-6	55-00206	5.08	2.2	1.7	1-12MHz
T37-6	55-00376	9.53	5.21	3.25	1-12MHz
T50-6	55-00506	12.7	7.7	4.84	1-12MHz
T68-6	55-00686	17.53	9.4	4.38	1-12MHz
T50-10	55-05010	12.7	7.7	4.84	10-100MHz
T20-12	55-02012	5.08	2.2	1.7	20-120MHz
T37-12	55-03712	9.53	5.21	3.25	20-120MHz
T50-12	55-05012	12.7	7.7	4.84	20-120MHz

## EMI FILTER TOROIDS

A range of iron powder toroids suitable for use in EMI and power filters. Complete catalogue and notes on SMPS and filter design 02-55004 1.10

Type	Stock No.	OD(mm)	ID(mm)	Ht(mm)	Freq.
T80-26	55-08026	20.2	12.6	6.35	EMI
T106-26	55-10626	26.9	14.2	11.1	EMI
T68-40	55-06840	17.5	9.4	4.83	EMI
T94-40	55-09440	23.9	14.2	7.42	EMI

Stock No	1-24	25-99	100-999
55-08026	0.33	0.28	0.22
55-10626	0.50	0.42	0.33
55-06840	0.27	0.23	0.18
55-09440	0.32	0.27	0.21



## TOROID MOUNTS

A range of mounts/potting caps to enable PC mounting of toroid coils

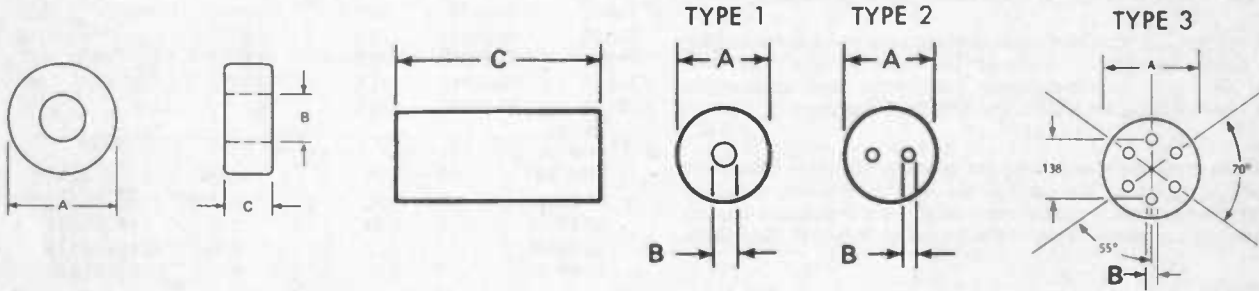
Type	Pins/dia	Stock No.	1-24	25-99	100+
TM200-4	4pin 5mm	55-12004	0.20	0.18	0.14
TM401-6	6pin 8.6mm	55-14016	0.20	0.18	0.14
TM421-3	3pin 8.6mm	55-14213	0.20	0.18	0.14
TM501-6	6pin 12mm	55-15016	0.25	0.21	0.18
PC401	cup 8.6mm	55-10401	0.09	0.08	0.07
PC501	cup 12mm	55-10501	0.12	0.10	0.08



# FERRITE & DUST IRON COMPONENTS

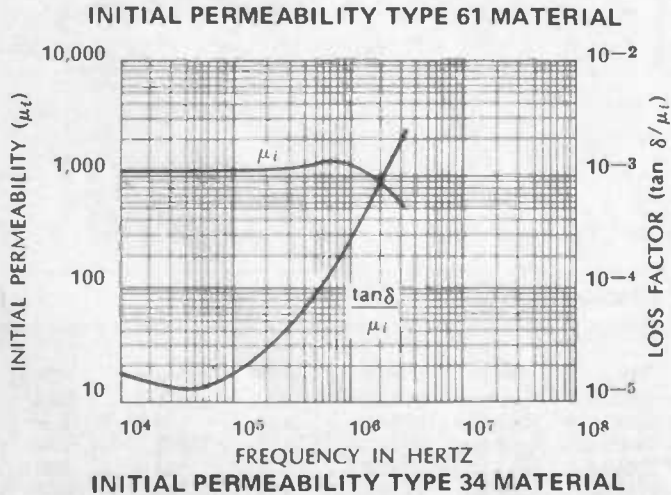
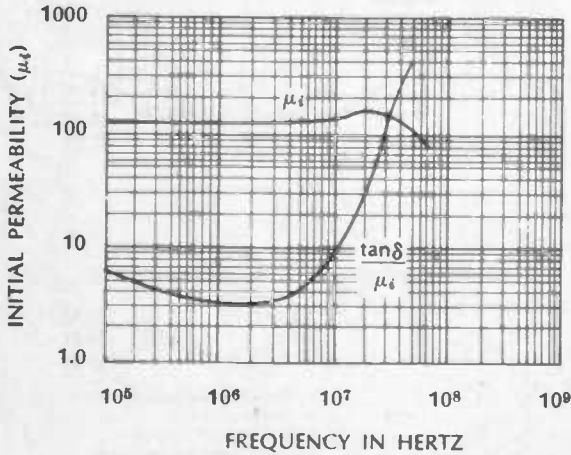
## FAIR-RITE FERRITE CORES

We start the WR&E stock range with a number of toroids and wideband transformer cores selected to suit most of the applications notes issued by Siliconix, Motorola and TRW for RF power amplifiers. Also included are some wideband transformer cores, theory and applications of which are the subject of forthcoming R&EW features on broadband design.



Fair-Rite Part No	Ambit Stock No	Physical (mm)			DIMENSIONS				Price 1-24	Price 25-99	Price 100+
		A	B	C	Ae	Magnetic Le	Ve	Mi			
59-61001101	55-011101	12.5	8.0	6.3	2.13	13.4	28.7	125	27p	26p	24p
59-61000401	55-00401	22.0	12.5	6.2	30.3	53.3	1610	125	32p	30p	28p
59-64001401	55-01401	25.0	15.0	8.0	40.3	62.7	2520	250	35p	33p	30p
(3) 26-64225111	55-25111	6.0	1.0	10				250	19p	17p	15p
(1) 26-43000101	55-00101	3.5	1.3	3.0				850	18p	16p	14p
(1) 26-43540001	55-40001	14.0	6.5	28.0				250	46p	42p	38p
(1) 26-43006301	55-06301	9.5	5.0	10.3				850	22p	20p	19p
(1) 26-64000101	55-40101	3.5	1.2	3.0				250	18p	16p	14p
28-43002402	55-02402	7.0	1.75	6.0	Balun			850	30p	28p	26p

**NB** This range is being increased during the currency of this catalogue — please check with us if the item you require is not shown here. COMPLETE FAIR-RITE CATALOGUE including applications and design information 02-59260 3.00



## FERRITE RODS AND COILS

Ferrite rod 3/8" diameter (9.5mm)  
 F14 material 150kHz to 2MHz:  
 FRA 5.5" (140mm)  
 F16 material 500kHz to 12MHz:  
 FRD 8.0" (200mm)  
 F14 material  
 FRE 3.0" (75mm)

MW antenna coil MWC2  
 Flush on FRC L equals 330uH  
 1cm down FRC 420uH  
 With separate coupling winding  
 Not suited to bipolar discrete inputs.

LW antenna coil LWC1  
 Use with 68pF parallel capacity  
 Flush on FRC L equals 3mH  
 1cm down FRC 4.45mH  
 Suitable for bipolar and IC circuitry

Coupling coil FRCC1  
 External antenna coupling coil for FR assemblies  
 Flush on FRC L equals 100uH  
 1cm down FRC 140uH

Prices:		1-24	25-99	100+
Stock No.	Type			
35-14147	FRA	39p	33p	29.5p
35-16007	FRD	69p	59p	45p
35-14757	FRE	28p	24p	22p
35-00268	MWC2	32p	28p	24p
35-00108	LWC1	32p	28p	24p
35-00118	FRCC	20p	16p	12p
35-00128	FRPC	5p	5p	4p

## FERRITE BEADS

Stock No	Type/Description	1-24	25-99	100+
55-11115	FX1115/5 x 4mm/2mm hole A1 material	4p	3p	2p
55-01242	FX1242/5.5 x 4mm/1.5mm hole B2 material	6p	5p	4p
55-02249	FX2249/Dual aperture WB core B2 material	55p	45p	
55-35000	FXH0/H core for FM input balun	12p	9p	
55-35004	FB4/2 x 2mm/1.6mm hole	4p	3p	

# FILTERS

## CERAMIC IF FILTERS AND RESONATORS

These ceramic filters cover most applications for communications and high quality broadcast reception. The range includes types from TDKO, Murata and NTK.

### CFM/LFC SERIES

A medium priced hermetically sealed ladder filter, suitable for most communications applications and high quality broadcast equipment.

Type	Stock No.	-6dB BW	-50dB BW	Max ripple	Stopband attenuation dB	Spurious Response (0.1-1 MHz)	Insertion Loss (dB)	In/Out Impedance (k ohm)	
CFM455H/LFC8	16-45520	8	18	3	45	40	7	1.5	Prices : all CFM/LFC series: 1-24: £8.25 25-99: £5.14 100+: £4.85
CFM455G/LFC8	16-45521	8	20	3	45	40	5	1.5	
CFM455F/LFC12	16-45522	12	24	3	45	40	8	1.5	
CFM455E/LFC15	16-45523	15	28	3	45	40	8	1.5	
CFM455D/LFC20	16-45523	20	38	3	50	40	5	1.5	

### CFG/SLF SERIES

A miniature high performance filter. Possibly the highest selectivity/size ratio available. Supplied in shield and hermetically sealed case.

Type No.	Stock No.	-6dB BW	-80dB BW	Max ripple	Stopband attenuation dB	Spurious Response (0.1-1 MHz)	Insertion Loss (dB)	In/Out Impedance (k ohm)	
CFG455I/SLFD4	16-45542	4	10	3	70	50	7	1k5	Prices : all CFG/SLF series: 1-24: £8.25 25-99: £5.14 100+: £4.85
CFG455H/SLFD6	16-45543	6	15	3	70	50	7	1k5	
CFG455G/SLFD8	16-45544	8	18	3	70	50	7	1k5	
CFG455F/SLFD12	16-45548	12	25	3	70	50	7	1k5	

### CFS/LFD SERIES

A very high attenuation filter, with very excellent shape factor. Suitable for the best communications applications.

Type No.	Stock No.	-6dB BW	-80dB BW	Max ripple	Stopband attenuation dB	Spurious Response (0.1-1 MHz)	Insertion Loss (dB)	In/Out Impedance (k ohm)	
CFS455J/LFD2	16-45550	3	9	8	75	75	8	2k0	Prices : CFS/LFD series: 1-24: £12.25 25-99: £9.95 100+: £7.85

### SSB FILTER CFM455JI

High performance filter as used in the Yaesu FRG7700. Ideal for all low cost SSB filter requirements.

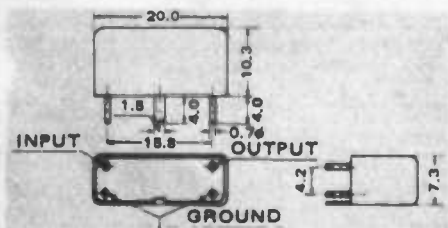
Type No.	Stock No.	-6dB BW	-80dB BW	Max ripple	Stopband attenuation dB	Spurious Response (0.1-1 MHz)	Insertion Loss (dB)	In/Out Impedance (k ohm)	
CFM455J1	16-45513	2.6kHz min	8kHz max	3dB max	75	30dB min	6dB	2k	Prices : 1-24: £11.00 25-99: £10.85 100+: £10.25

Dimensions as other CFM series.

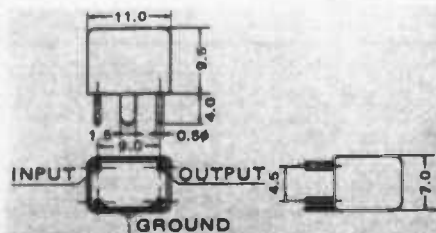
#### NB

Bandwidth quoted are total bandwidths.

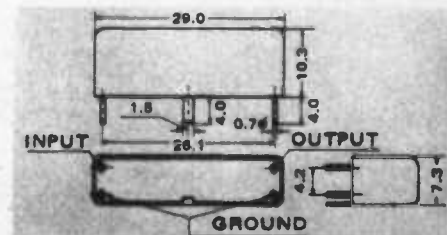
CFM/LFC



CFG/SLF



CFS/LFD



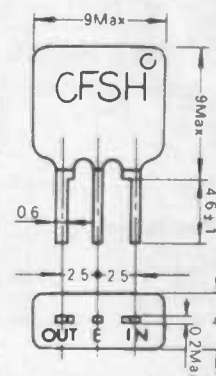
# FILTERS

## CERAMIC FILTERS FOR FM 5-30MHz

	Description	Ambit Pt No.	1-24	25-99	100+
SFE6.0MA	6.0MHz TV SIF filter (UK)	16-06055	80p	60p	45p
CFSE10.7	Replaced by CFSH10.7M1				
SFE10.7MA	10.7MHz/280kHzBW	16-10755	45p	38p	30p
CFSB10.7	10.7MHz/180kHz mono	16-10777	50p	43p	32p
SFE10.7MJ	10.7MHz/150kHz mono	16-10756	50p	43p	32p
SFA10.7MF*	10.7MHz/50kHz scan det.	16-10760	75p	65p	55p
SFE10.7ML	10.7MHz/280kHz linear phase	16-10757	70p	58p	41p
SFE10.7MX*	10.7MHz/250kHz linear phase	16-10758	95p	82p	65p
CFSH10.7M1	10.7MHz/280kHz lo tc	16-10765	50p	43p	30p
CFSH10.7M2	10.7MHz/240kHz lo tc	16-10766	50p	43p	30p
CFSH10.7M3	10.7MHz/180kHz lo tc	16-10767	50p	43p	30p
CDA10.7MA*	10.7MHz ceramic detector	16-10770	70p	58p	41p
SFE27MA	27MHz bandpass for RC	16-02755	94p	80p	68p
SAF10.7MC-Z	SAW for ultra linear phase	16-10715	3.75	3.15	2.25

\* 10.7MHz centre f only.

**NB** Specific frequency ranks can only be supplied by prior arrangement, and with a 20% surcharge. FM Ceramic Filter input/output impedance equals 330 ohms Insertion Loss approx 6dB.

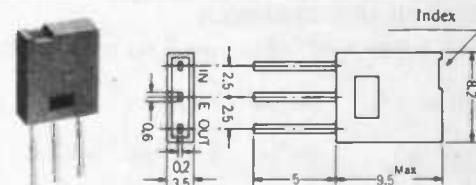


## MECHANICAL IF FILTERS

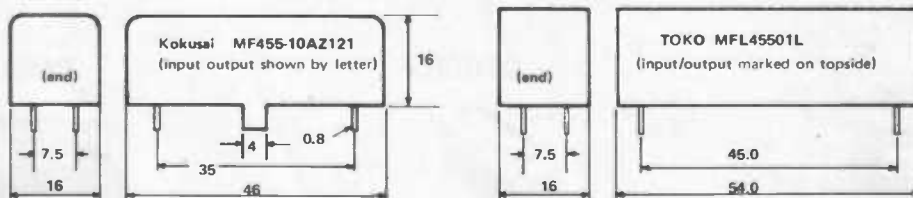
TOKO mechanical filters provide a low cost method of achieving high selectivity in a prealigned unit. The CFM2 series described here provide selectivity that roughly equates to that available from 3 separate single tuned 10 mm IFTs.

Parameter	455A	455B	455C	455D	468B
Centre frequency kHz	455	455	455	455	468
Min 6dB bandwidth	4 kHz	6 kHz	8 kHz	10 kHz	6 kHz
Passband ripple	2dB max			2dB max	
Insertion loss	6dB max			6dB max	
Attenuation within +/- 100 kHz	30dB min			30dB min	
Input/output impedance in ohms	1k/1k5	1k5/2k	2k/2k	2k/2k	1k5/2k

TOKO No.	Stock No.	Price 1-24	25-99	100+
CFM2455A	19-45530	0.65	0.52	0.45
CFM2455B	19-45531	0.65	0.52	0.45
CFM2455C	19-45532	0.65	0.52	0.45
CFM2455D	19-45533	0.65	0.52	0.45
CFM2468B	19-46831	0.65	0.52	0.45



## MECHANICAL FILTERS FOR SSB



Typical specifications

Filter type	Input Z	Output Z	Zin IFT	Zout IFT	Insertion loss	6dB BW	60dB BW	Centre F	Typ. ripple	Accuracy (Hz)
MF45510AZ121			1k0	1k0	10dB	2kHz	4.3kHz	455kHz	0.9dB	300
MFL45501L	500E	500E	5k0	1k0	10dB	2.1kHz	5.1kHz	453.5kHz	1dB	300

Type No.	Stock No.	Price 1-24	25-99	100+
MF45510AZ121	19-45008	18.55	16.95	15.05
MFL45501L	19-45517	11.95	10.25	8.95

# FILTERS

## CRYSTAL FILTERS

### 2 pole types

Model	Centre Freq (MHz)	Band Width (kHz)	Ripple (dB)	Loss (dB)	Stop Band (kHz)	Spurious (dB)	Term. Imp. (kR)	Case/Stock No.
10M15A	10.7	15(3dB)	0.5	2.0	+/-25.0(18dB)	-18	3.0	FS12/20-10152
21M15A	21.0	15(3dB)	0.5	2.0	+/-25.0(18dB)	-18	3.0	FS12/20-21152
45M15A	45.0	15(6dB)	1.0	3.0	+/-25.0(20dB)	-15	3.0	FS12/20-45152
75M25A	75.0	25(6dB)	1.0	3.0	+/-35.0(20dB)	-15	5.6	FS12/20-75252

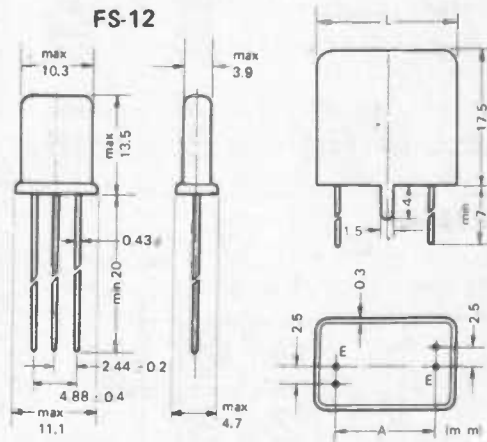
### 8 pole types

10M22D	10.7	2.2(6dB)	2.0	6.0	+/-2.4(60dB)	-80	0.5	FS23/20-10028
10M8D	10.7	8(6dB)	2.0	4.0	+/-11.0(80dB)	-90	3.0	FS22/20-10088
10M15D	10.7	15(6dB)	2.0	4.0	+/-20.0(80dB)	-80	3.0	FS22/20-10158



### Prices:

Stock No.	1-10	10-99	100+
20-10152	1.99	1.53	1.36
20-21152	3.45	2.98	2.50
20-45152	5.95	4.80	3.95
20-75252	6.90	5.95	4.80
20-10028	17.20	14.00	12.00
20-10088	15.50	11.55	7.35
20-10158	14.50	11.25	7.15

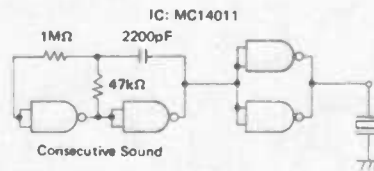


Case Code	L	A
FS-21	15.0	9.0
FS-22	18.5	13.4
FS-23	23.0	17.8
FS-24	28.0	22.2

FS 22/23

## PIEZOELECTRIC TRANSDUCERS

The PB2720 will produce in excess of 80dB SPL when driven with 3v p-p 1mA.

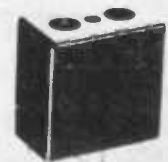
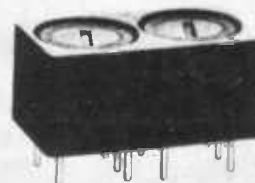


Type	Stock Code	Resonance kHz	Static Capacity	1-24	25-99	100+
PBN2720 (less case)	43-27200	4.6 +/- 0.5	20,000pF	34p	27p	24p
PB2720	43-27201	4.5 +/- 0.5	20,000pF	44p	34p	29p

## PILOT TONE FILTERS

Toko No.	Specifications	Stock No.	Attenuation relative to 0dB/400Hz				Impedance	
			15kHz	19kHz	38kHz	23kHz	In	Out
170BLR3107N		18-31071	1.2	26	50		4k7	4k7
BLR2011N		18-20111	1.0	30	30		1k1	4k7
190BLR3157N		18-31573	3.0	37	60		4k7	3k0
208BLR3152N		18-31524	1.2	30	52		4k7	4k7
208BLR3154N		18-31544	2.0	30	60		4k7	3k0
208BLR3157N		18-31574	3.0	37	60		4k7	3k0
208BLR3315N		18-33154	0.6		50	35	4k7	3k0
242BLRC3757		18-37571	1.5		48	32	4k7	4k7

Prices:		1-24	25-99	100+
	170BLR3107N	2.15	1.75	1.53
	BLR2011N	2.75	1.95	1.82
	190BLR series	1.22	98p	79p
	208BLR series	1.22	98p	79p
	242BLRC series	1.22	98p	79p

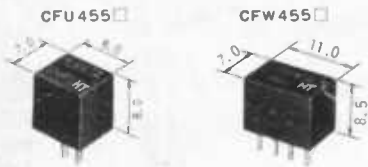




# FILTERS

## CFU/LFB CFW/LFH SERIES

Miniature 455kHz filters. I/P and O/P impedance 2k



Stock Types	NTK/Murata	-6dBW (Min)	-40dB (Max)
16-45511	LFB4	4kHz	15kHz
16-45512	LFB6/CFU455H	6kHz	18kHz
16-45513	LFB8	8kHz	21kHz
16-45514	LFB10	10kHz	23kHz
16-45515	LFB12/CFU455F	12kHz	26kHz
16-45525	LFH6S/CFW455HT	6kHz	14kHz
16-45526	LFH8S	8kHz	18kHz
16-45528	LFH12S/CFW455FT	12kHz	22kHz

**Prices:**

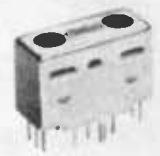
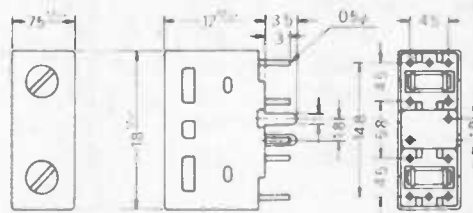
	1-24	25-99	100+
LFB Series	1.95	1.45	1.10
LFH Series	2.45	1.95	1.55

## FILTERS CERAMIC

### CFT (TOKO)

Input red, output blue

#### Dimensions



Stock Types:

Stock Types	Part No.	Frequency	Bandwidth
16-45501	CFT455B	455kHz	8kHz BW
16-45502	CFT455C	455kHz	6kHz BW
16-47002	CFT470C	470kHz	6kHz BW

CFT Prices:

	1-24	25-99	100+
	65p	50p	42p

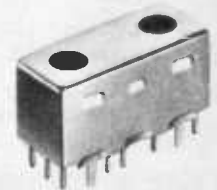
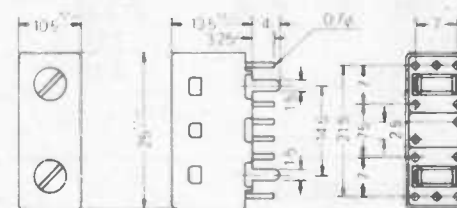
### CFU (TOKO)

Input red, output blue.

Bandwidth 6dB.

Select 10kHz, 24dB min.

#### Dimensions



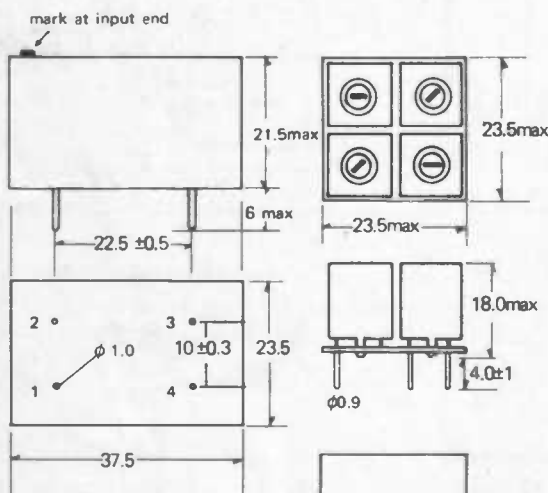
Stock Types:

Stock Types	Part No.	Frequency	Bandwidth
16-05006	CFU 050D	470kHz +/- 3.5	6kHz

CFU Prices:

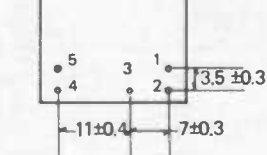
	1-24	25-99	100+
	65p	54p	45p

## LINEAR PHASE FILTERS



- 1 Ground
- 2 Input
- 3 ground
- 4 Output

NB A DC path exists between input and output

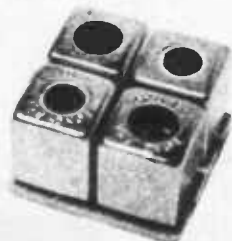


- 1 Signal in
- 2 Signal earth
- 3 Earth
- 4 Output earth
- 5 Output signal



**BBR3132**

**BBR3125**



Type	Stock No	1-24	25-99	100+
BBR3132	18-31322	2.45	2.05	1.75
BBR3125	18-31252	1.30	0.95	0.82

## LOW COST CERAMIC RESONATORS

These resonators provide an excellent alternative to costly LF quartz crystals, and are especially suited to use with MPUs, rate generators, remote control systems, dial tone and dial pulse clocks etc. There are two basic types as with crystals - series and parallel resonant types.

The majority of 'clock' applications will require the parallel resonant types (CRM), whereas 'bypass' and 'trap' circuits will usually call for the series (CFE) types.

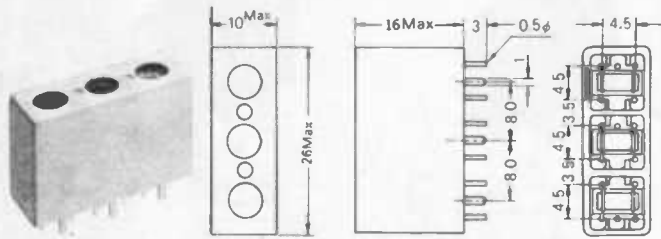


Type	Stock No.	Frequency	Mode
CRM455	16-45573	455 kHz	parallel
CRM460	16-46073	460 kHz	parallel
CRM500A	16-50073	500 kHz	parallel
CFE455	16-45575	455 kHz	series
CRM560	16-56074	560 kHz	parallel
Prices 1-24	25-99	100-999	1000+
<b>40p</b>	<b>35p</b>	<b>24p</b>	<b>21p</b>

# FILTERS

## LOW PASS BLOCK FILTERS

### 7VST



## TOKO 7V - SERIES FILTERS

The 7VST and 7VUT are prealigned filters from a larger family that have been evolved for use in video recorder/disc player applications.

The filters from these families can be designed to provide both LP and BP characteristics over the range 1-15MHz. Although these units may be duplicated by appropriate filter design using discrete coils and capacitors, the prealigned reliability of a block filter has many attractions. One of the less obvious though more useful applications of this type of filter is at the front end of sensitive LW/MW receivers - where the LPF effectively prevents HF image responses. In the 'front end' of a receiver using up conversion to 10.7MHz, an LPF can be used to provide the necessary broadband tuning - and with the advent of receivers such as the Trio R1000 using block selectivity - the move away from awkward gang tuned circuitry is gathering pace.

### Stock 7V series LPFs:

Type	Stock No.	-3dB	-40dB	-60dB	Z in/out
237LVS1109	18-11090	2.3MHz	3.2MHz	4.2MHz	1k0
237LVS1110	18-11100	4.5MHz	6.2MHz	7.5MHz	1k0
237LVS1070	18-10700	10.5MHz	12MHz	13.5MHz	1k0
Price	25.99	100+			
7V	1.20	87p			

## CBFI CB NOTCH FILTER

Designed to give high rejection of 27 MHz CB band signals. It will generally affect a complete cure for aerial borne CB interference on TV Hi-Fi or car radios. Available in two models.

**new**



Type	Fitting	Stock No	Price
CBF1/1	TV plug, socket	24-10001	5.80
CBF1/2	Car radio plug, socket	24-10002	5.80

## PACB2 FM BOOSTER AND CB NOTCH FILTER

Built-in car FM radio booster and CB notch filter for improving car FM sensitivity without incurring CB interference. Requires 12V supply.

**new**



Type	Fitting	Stock No	Price
PACB2	Car Radio plug, socket	24-10003	12.00

## HPFI HIGH PASS FILTER/BRAID BREAKER

Highly effective filter provides rejection of signals below 200 MHz. Suitable for UHF TV receivers above 400 MHz. Rejection up to 30 MHz >55dB (typ 60dB) and > 40dB (typ 50dB) up to at least 200 MHz. Fitted with TV type plug and socket.

**ne**



Type	Stock No	Price
HPFI	24-10004	5.50

## CBPAI CB SIGNAL BOOSTER

Highly effective CB receive signal booster. Amplification of greater than six times is available on receive, the unit is automatically switched out of circuit on transmit. Requires 8 to 18 volts at 100mA approx.

**new**

Type	Stock No	Price
CBPAI	24-10005	12.50

## PAI CAR RADIO FM BOOSTER

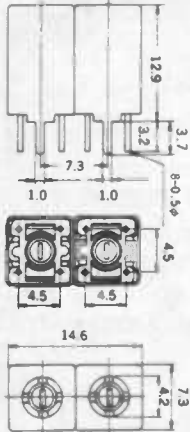
Fits between car radio and aerial with flying +12V lead. Useful in weak signal areas and towns and cities (negative earth only).

**new**

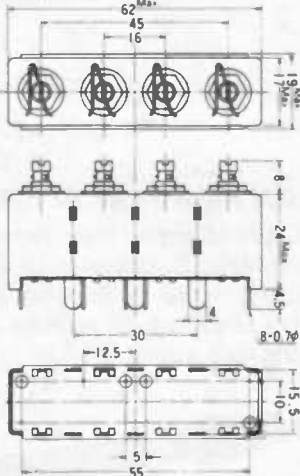
Model	Stock No	Price
PAI	24-10006	9.50

# FILTERS

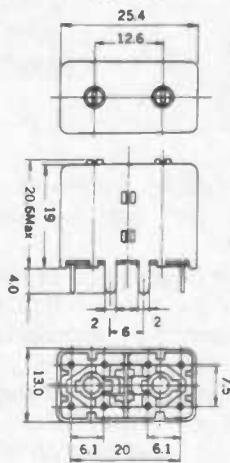
## HELICAL FILTERS



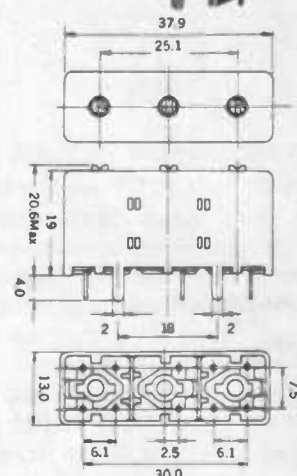
7HW type



HRQ type



CBW type



CBT type

### STOCK TYPES 7HW - 2 CHAMBER

Toko Part No. 7HW	Stock No	Freq.	Zin/out	1dB BW	Atten/MHz off centre	Ins Loss	Ripple	Power
252MT1001A	17-10011	435MHz	50	12MHz	23dB +30 29dB-30	1.5dB	0dB	500mW
252MT1090A	17-10901	470MHz	50	8MHz	23dB +30 27dB-30	2.0dB	0dB	500mW
252MT1127A	17-11271	463MHz	50	12MHz	15dB Min ±30MHz	2.0dB	0dB	500mW
252MN1111A	17-11111	432MHz	50	7MHz	18dB Min ±30MHz	2.0dB	0dB	500mW
Prices	1-24	25-99	100+					
7HW	1.85	1.56	1.39					

### STOCK TYPES HRQ - 4 CHAMBER

Toko Part No. HRQ	Stock No.	Freq.	Zin/out	3dB BW	Atten/MHz off centre	Ins Loss	Ripple	Power
232MT1001A	17-10010	435MHz	50	10MHz	28dB +15 31dB-15	1.8dB	0.7dB	5W
232MT1021A	17-10210	470MHz	50	6MHz	28dB +15 31dB-15	1.6dB	0.6dB	5W
Prices	1-24	25-99	100+					
HRQ	7.26	6.23	5.81					

### STOCK TYPES CBW - 2 CHAMBER

Toko Part No. CBW	Stock No.	Freq.	Zin/out	1dB BW	Atten/MHz off centre	Ins Loss	Ripple	Power
271MT1006A	17-10062	145MHz	500	3.0MHz	25dB Min ±15MHz	3dB	0dB	5W
271MT1007A	17-10072	170MHz	500	3.5MHz	20dB Min ±15MHz	3dB	0dB	5W
Prices	1-24	25-99	100+					
CBW	2.75	2.55	1.72					

### STOCK TYPES CBT - 3 CHAMBER

Toko Part No. CBT	Stock No.	Freq.	Zin/out	3dB BW	Atten/MHz off centre	Ins Loss	Ripple	Power
272MT1006A	17-10063	145MHz	500	2.8MHz	25dB Min ±6MHz	7dB	0dB	5W
272MT1007A	17-10073	170MHz	500	4.0MHz	30dB Min ±6MHz	4.5dB	0dB	5W
272MT1019	17-10193	160MHz	500	3.5MHz	20dB Min ±6MHz	6.0dB	0dB	5W
272MT1008	17-10083	145MHz	50	1.2MHz	30dB Min ±6MHz	4.5dB	0dB	5W
Prices	1-24	25-99	100+					
CBT	3.15	2.55	1.98					

N.B. All parts have a temperature coefficient of 23 ppm/°C except CBT-272MT1007A which has a temperature coefficient of 25 ppm/°C.

# HARDWARE

## FUSES

High quality SEMKO approved cartridge fuses, rated at 240v AC.

### Anti surge (20mm)



Value	Stock No.	1-99	100+
100mA	21-05000	18p	16p
200mA	21-05001	15p	13p
250mA	21-05002	15p	13p
500mA	21-05003	13p	11p
630mA	21-05004	13p	11p
800mA	21-05005	13p	11p
1.25A	21-05006	13p	11p
2A	21-05007	13p	11p
3.15A	21-05008	13p	11p
5A	21-05010	13p	11p

### Quick Acting (20mm)

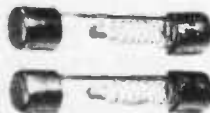


Value	Stock No.	1-99	100+
100mA	21-05020	13p	11p
200mA	21-05021	7p	5p
250mA	21-05022	7p	5p
500mA	21-05023	7p	5p
630mA	21-05024	7p	5p
800mA	21-05025	7p	5p
1A	21-05029	7p	5p
1.25A	21-05026	7p	5p
2A	21-05027	7p	5p
3.15A	21-05028	7p	5p
5A	21-05030	7p	5p

## 1/4" x 1 1/4" FUSES

UL Listed fuses, cartridge type. 250v AC

Anti Surge Types:



Value	Stock No.	1-99	100+
150mA	21-05040	36p	30p
250mA	21-05041	25p	20p
500mA	21-05042	25p	20p
1A	21-05043	25p	20p
2A	21-05044	25p	20p
5A	21-05045	37p	31p

### Quick Acting 1/4" x 1 1/4"



Value	Stock No.	1-99	100+
100mA	21-05060	9p	7p
250mA	21-05061	9p	7p
500mA	21-05062	9p	7p
1A	21-05063	7p	5.5p
2A	21-05064	7p	5.5p
5A	21-05064	7p	5.5p
10A	21-05066	7p	8p
15A	21-05067	9p	7p

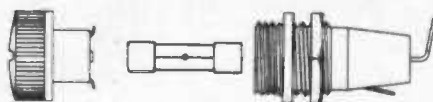
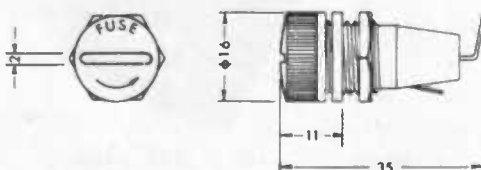
## 1in. MAINS FUSES



Value	Stock No.	1-99	100+
2A	21-05080	13p	10p
5A	21-05081	13p	10p
13A	21-05082	13p	10p

## FUSEHOLDERS

A panel mounting fuseholder for 20mm fuses. Finger release mounting hole 13mm diameter.



Stock No.	1-24	25-99	100+
21-05100	31p	27p	25p

## Fuse clips for 20mm fuses

Hard brass fuse clips for PC mounting of 20mm fuses.



Stock No.	1-24	24-99	100+
21-05110	6p	4p	3p

## SPACERS

Nickel plated brass clearance spacers



Overall Length	Clear	Stock No.	Pack 10
1/4"	4BA	21-07050	26p
1/4"	6BA	21-07051	26p
1/2"	6BA	21-07052	30p
1/2"	8BA	21-07053	22p

## THREADED SPACERS

Nickel plated brass hexagonal threaded spacers



Overall Length	Thread	Stock No.	Pack 10
1/2"	4BA	21-07060	50p
1/2"	6BA	21-07061	36p
1"	6BA	21-07062	72p

## SOLDER TAGS

Hot tinned brass tags



Clear size	Stock No.	Pack 10
4BA	21-07000	10p
6BA	21-07001	10p

## SCREW PACKS

Packs of bright zinc plated steel screws.

### 150 Metric

Pozidriv Pan Head



Thread size	Thread length	Stock No.	Pack 20
M3	6mm	21-07201	28p
M3	12mm	21-07401	30p
M3	20mm	21-07501	32p
M4	6mm	21-07202	34p
M4	12mm	21-07402	36p
M4	20mm	21-07502	40p
M6	25mm	21-07603	86p

## B.A.

Round Head Slotted

**New**



Thread size	Thread length	Stock No.	Pack 20
8BA	1/4"	21-07204	30p
8BA	1/2"	21-07405	30p
6BA	1/4"	21-07206	26p
6BA	3/8"	21-07306	28p
6BA	1/2"	21-07406	30p
6BA	3/4"	21-07506	32p
6BA	1"	21-07606	36p
4BA	1/4"	21-07207	34p
4BA	1/2"	21-07407	36p
4BA	3/4"	21-07507	39p
2BA	1/2"	21-07408	42p
2BA	3/4"	21-07508	46p

## B.A.

Slotted counter-sunk head

**NEW**



Thread size	Thread length	Stock No.	Pack 20
8BA	1/2"	21-07409	28p
6BA	1/4"	21-07210	25p
6BA	1/2"	21-07410	28p
6BA	3/4"	21-07510	30p
4BA	1/2"	21-07411	34p
2BA	3/4"	21-07512	40p



# HARDWARE

## NUT AND WASHER KITS

Packs contain; 20 plated steel full nuts, 10 plated plain washers and 10 self colour shakeproof washers.



### ISO Metric

Thread Size	Stock No.	Per pack
M3	21-07052	28p
M4	21-07053	30p
M6	21-07055	45p

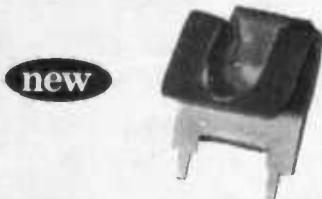
### B.A.

Thread Size	Stock No.	Per pack
8BA	21-07062	23p
6BA	21-07063	23p
4BA	21-07064	25p
2BA	21-07265	32p

## HEATSINKS

### TYPE 92F

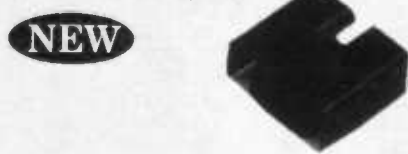
Fast fit board-mounted radiator for TO-92, E-line and similar. Heat is partly radiated and part conducted back into PCB via soldered-in lugs. Temp rise 0.05°C/mW.



Stock No	1-24	25-99	100+
21-08092	10p	9p	8p

### TYPE PF745

Spring loaded clips on heatsink for use with TO220 style package (voltage regulator etc). Temp rise 0.023°C/mW.



Stock No	1-24	25-99	100+
21-08745	18p	16p	14p

### TYPE 5F

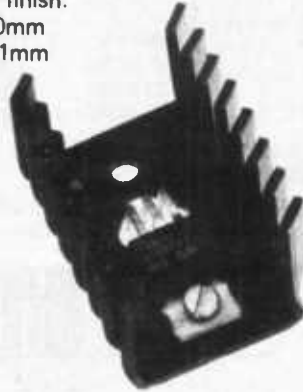
Push fit black anodised heatsink for TO5 package transistors. 16mm dia. 12.7mm high. Temp rise 0.05°C/mW.



Stock No.	1-24	25-99	100+
21-08000	13p	11p	9.5p

## TYPE TV21

Low profile finned heatsink for mounting TO-126 to TO220 packages. Black anodised finish. Height 30mm Length 31mm



Stock No.	1-24	25-99	100+
21-08010	37p	33p	30p

## TYPE PF083

Dual TO220 Heatsink featuring high performance with economy. Temp rise 4°C/W. Dimensions 45.2mm square x 31.75mm high.



Stock No	1-24	25-99	100+
21-08083	52p	47p	42p

## TYPE PF016

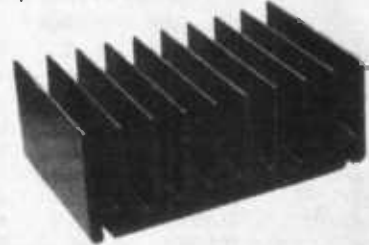
TO3 heatsink for use in tight spaced applications where max radiation is required. Temp rise 5.2°C/W. Dimensions 48L x 36W x 25Hmm.



Stock No	1-24	25-99	100+
21-08016	37p	35p	33p

## TYPE E1.58

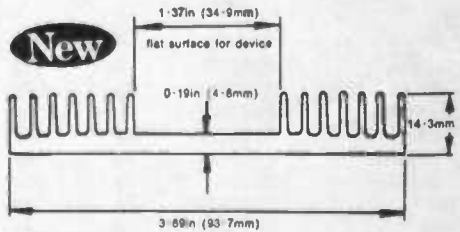
Black anodised aluminium h/s for use with power amp IC's 80 x 40 x 30mm. Temp rise 2.1°C/W.



Stock No.	1-24	25-99	100+
21-08020	2.00	1.79	1.63

## TYPE 4M-229

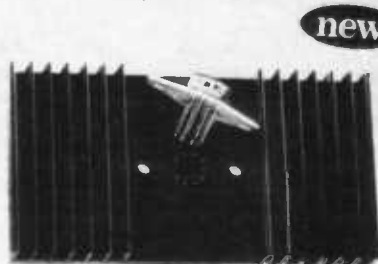
Flat anodised aluminium heatsink, pre-drilled for use with R&EW 2m PA, but suitable for other applications. Temp rise 2.8°C/W. Dimensions 101 x 94 x 14mm.



Stock No.	1-24	25-99	100+
21-08229	2.74	2.45	2.21

## TYPE 6M-16

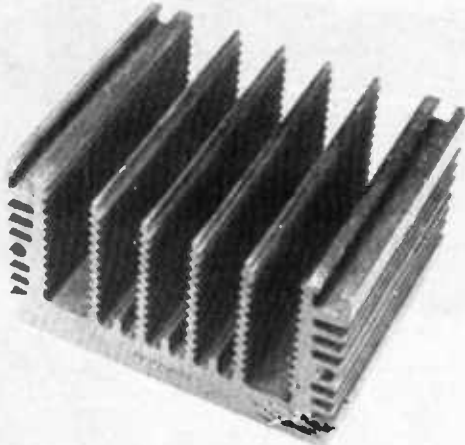
Flat anodised aluminium heatsink. Pre-drilled for 1 x TO3 type transistor. Dimensions 153 x 94 x 14mm. Temp rise 2.25°C/W.



Stock No	1-24	25-99	100+
21-08616	2.85	2.60	2.42

# HARDWARE

High efficiency black anodised heatsink for use with high power audio amps and other applications requiring high power dissipation.  
Length 89mm Width 76mm Height 51mm.  
Temp rise 1.5C/W.



Stock No.	1-24	25-99	100+
21-08030	4.50	4.05	3.65

Right angled bracket to suit heatsink stock No. 21-08030. Takes 2 x TO3 power devices 6.3mm thick aluminium. 51 x 51 x 76mm.

Stock No.	1-24	25-99	100+
21-08040	1.48	1.33	1.20

U-shaped bracket to suit 4 x TO3 power devices for heatsink Stock No. 21-08030. 51 x 51 x 41 x 76mm

Stock No.	1-24	25-99	100+
21-08050	2.18	1.96	1.79

## HEATSINK COMPOUND

High thermal conductivity compound for use with devices requiring good thermal contact with heatsinks etc. Improves thermal resistance by up to 40%. Supplied in polythene syringe capacity 5ml (approx 11gms).



Stock No	1-24	25-99	100+
21-08060	1.20	1.08	98p
21-08167	79p	72p	67p

## KNOBS

High quality collet knobs suitable for .25" shaft mounting. Made from nylon with matt finish. The collets, sleeves and nuts are manufactured from brass. A parts stable from -20 degrees C to +70 degrees C.

38mm dia



Stock No.	Colour	1-24	25+
21-10000	Black	95p	85p

21mm dia

21-10010	Black	56p	50p
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Attractive chrome knob for 6mm splined shafts



**NEW**

Stock No	1-24	25-99	100+
21-66331	25p	23p	20p

## Push-on Type

Black moulded knob with integral skirt for 0.25" spindles with standard flats. Knob caps available in a range of colours, all with built-in index line, knob moulded matt black. Overall height 20mm, dia 19mm.



Stock No.	Type	1-24	25+
21-10020	Push on knob	16p	14p

## GRUB SCREW FIXING

As above but for 6mm shaft, with grub screw fixing.



**New**

Stock No	Type	1-24	25-99	100+
21-86203	Grub Screw fix	24p	21p	19p

Caps to suit both above types — with white line.

Stock No	Colour	1-99	100+
21-10021	Black	5p	4p
21-10022	Red	5p	4p
21-10023	Yellow	5p	4p
21-10024	Green	5p	4p
21-10025	Blue	5p	4p
21-10026	White	5p	4p
21-10027	Grey	5p	4p

## 'STICK ON' FEET

Grey moulded, flexible feet with adhesive backing.



Stock No.	1-24	25-99	100+
21-06061	6p	5.5p	5p

## CABINET FEET

Screw fixing feet. Fixing hole 4BA clear.

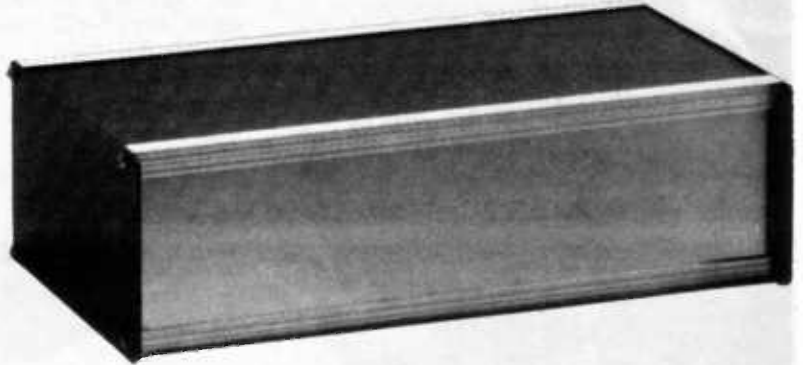
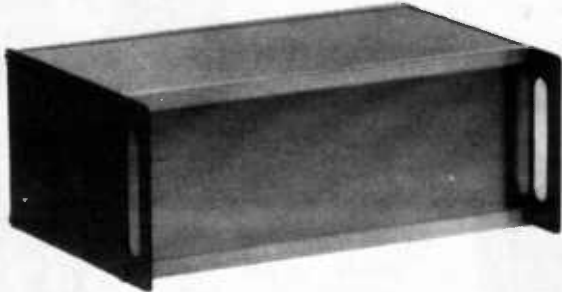


Stock No.	Colour	1-24	25-99	100+
21-06060	Black	6p	5.5p	5p

# HARDWARE

## Centurion EQUIPMENT CASES

A range of high quality cases with integral handles. These cases are finished in two tone green, with brushed aluminium front panels protected by PVC film.



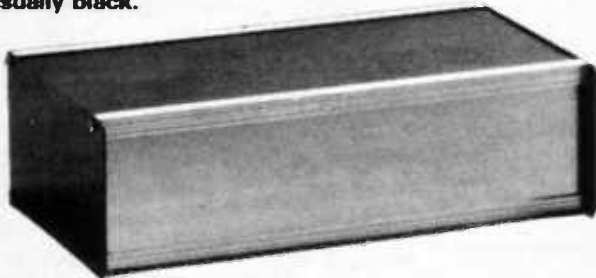
Overall Size (mm):

Type	Width	Depth	Height	Stock No.
EX1H	200	187	90	21-06000
EX2H	200	187	130	21-06001
EX3H	325	187	90	21-06002
EX4H	325	187	130	21-06003

Prices:

Stock No.	1-24	25-99	100+
21-06000	10.39	9.35	0A
21-06001	11.22	10.10	0A
21-06002	12.08	10.87	0A
21-06003	13.87	12.48	0A

Similar to the above, but without integral handles. Colour usually black.



Overall Size in mm:

Type	Width	Depth	Height	Stock No.
DX 1	150	100	60	21-06010
DX 2	150	100	90	21-06011
DX 3	150	100	130	21-06012
DX 4	300	150	60	21-06013
DX 5	300	150	90	21-06014
DX 6	300	150	130	21-06015

Prices:

Stock No.	1-24	25-99	100+
21-06010	5.87	5.28	0A
21-06011	6.48	5.83	0A
21-06012	7.27	6.54	0A
21-06013	7.74	6.97	0A
21-06014	8.29	7.46	0A
21-06015	9.46	8.52	0A

## LARGER VERSION OF DX RANGE

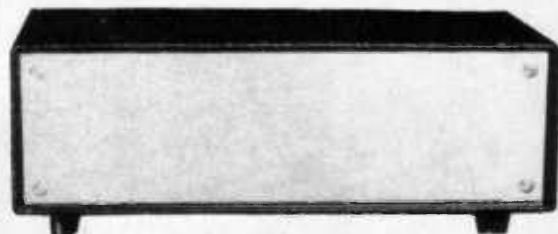
Type	Width	Depth	Height	Stock No.
WX 1	390	187	90	21-06061
WX 2	390	187	130	21-06062
WX 3	200	187	90	21-06063
WX 4	200	187	130	21-06064

Prices:

Stock No.	1-24	25-99	100+
21-06061	12.22	11.00	0A
21-06062	12.82	11.54	0A
21-06063	10.64	9.60	0A
21-06064	11.50	10.35	0A

## FBL SERIES

Outer sleeve fabricated from 22swg stelvitite with black plastic coating. Removeable front and back panels of 18 swg aluminium



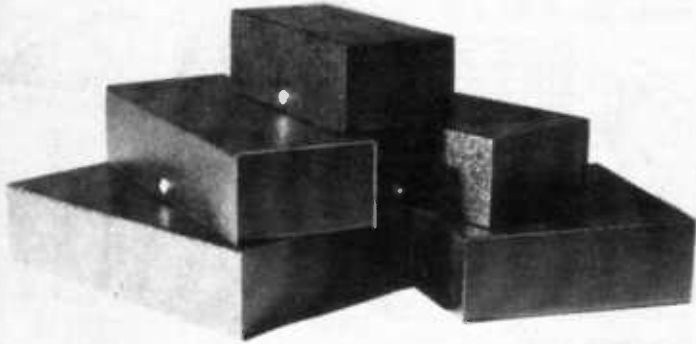
Stock No.	W	D	H	1-24	25+
21-06070	203	114	64	£4.50	£3.80
21-06071	279	165	76	£5.80	£5.15
21-06072	305	165	102	£7.05	£6.70

All models are supplied with black plastic feet

# HARDWARE

## PROJECT CASES

Constructed from 22swg PVC coated steel in two 'U' shape halves.



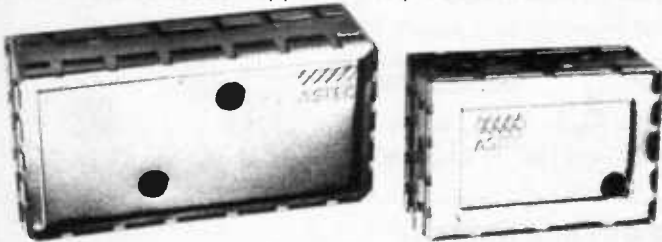
Min int clearance (mm)

Stock No.	W	D	H	1-24	25+
21-06100	75	40	35	£1.40	£1.36
21-06101	100	60	35	£1.65	£1.50
21-06102	100	100	35	£1.85	£1.65
21-06103	150	60	35	£2.05	£1.85

## SCREENED TINPLATE BOXES

Tinplate boxes suitable for making fully screened PCB modules. Pushfit lids.

Stock No: 21-06050 supplied c/w phono socket.



Stock No	L	W	H	1-24	25-99
21-06050	43	30	18	65p	58p
21-06051	71	37	20	85p	72p
21-06052	97	56	22	£1.25	£1.05

## ABS PLASTIC BOXES

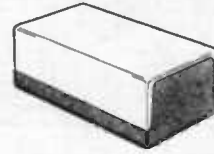
Low cost black ABS boxes. Lids and screws to fix are provided.



Stock No	External (mm)			1-24	25-99
	L	W	H		
21-06040	80	61	41	77p	67p
21-06041	100	76	41	83p	73p
21-06042	119	99	44	£1.02	89p
21-06043	215	130	85	£2.31	£2.05

## MOULDED CASES

Two tone dark and light grey cases in ABS. The two halves of the box are held together by four screws inserted from the base.



Stock No	Length	Width	Height	Price
21-06020	100	50	25	£2.14
21-06021	120	65	40	£3.36
21-06022	150	80	50	£3.36
21-06023	188	110	60	£4.31

## MOULDED CASES

Moulded case with metal front panel and integral battery compartment.

For battery type:

1xPP3: 21-06030

4xAA: 21-06031



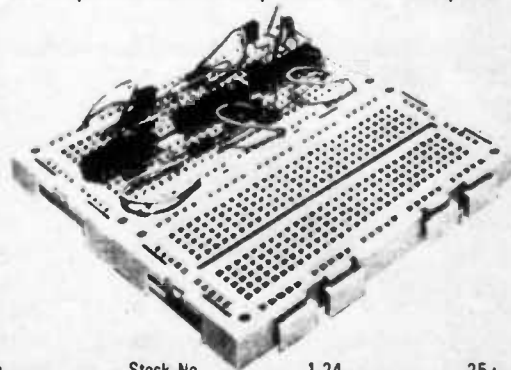
Stock No.	Depth	Width	Height	Price
21-06030	110	68	45	£4.36
21-06031	155	92	45	£5.78

Snap-in battery compartment (fits 59 x 24mm hole). For PP3 series batteries.

Stock No.	1-24	25+
21-06032	72p	60p

## VEROBLOC

Prototype breadboard system. 29 x 5 rows of contact sockets (0.1" pitch) with independent bus strips of X and Y axis.



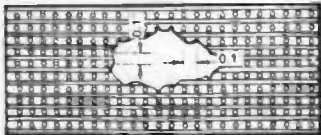
Vero No.	Stock No.	1-24	25+
200-21092G	21-09100	£3.92	£3.53



# HARDWARE

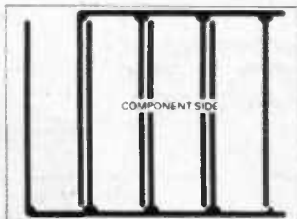
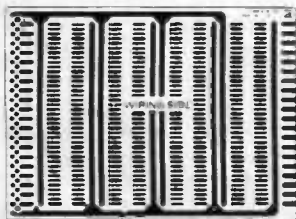
## VEROBOARD

Copper clad universal wiring board, pre-punched with a matrix of holes with parallel copper tracks. All 0.1" pitch.



Vero No.	Stock No.	No. Holes	Size (")	No.	
				1-24	25+
200-21070K	21-09000	24 x 37	2.50 x 3.75	73p	86p
200-21073A	21-09001	36 x 37	3.75 x 3.75	83p	75p
200-21069J	21-09002	24 x 50	5.00 x 2.50	83p	75p
200-21072D	21-09003	36 x 50	5.00 x 3.75	95p	86p
200-21074J	21-09004	36 x 170	3.75 x 17	£3.26	£2.94
200-21075E	21-09005	38 x 179	4.70 x 17	£4.26	£3.84
200-21071G	21-09006	24 x 170	2.50 x 17	£2.51	£2.26

DIL type veroboard that can accommodate up to 20 x 14 pin DIL IC's or 16 x 16 pin DIL IC's. Double sided size 4.5" x 6".



Vero No.	Stock No.	1-24	25+
200-21012E	21-09010	£3.57	£3.22

## VEROSTRIP

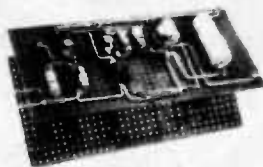
A variation on the VQ style board Pitch 0.1". Size 8.5" x 1.5".



Vero No.	Stock No.	1-24	25+
200-21086K	21-09030	£1.00	90p

## PERF BOARD

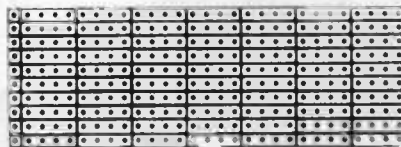
SRBP material similar to Veroboard but without copper tracks 0.1" pitch.



Vero No.	Stock No.	No. Holes	Size (")	No.	
				1-24	25+
200-210784	21-09041	36 x 50	5.00 x 3.75	80p	72p
200-21000E	21-09042	36 x 170	3.75 x 17	£2.11	£1.90

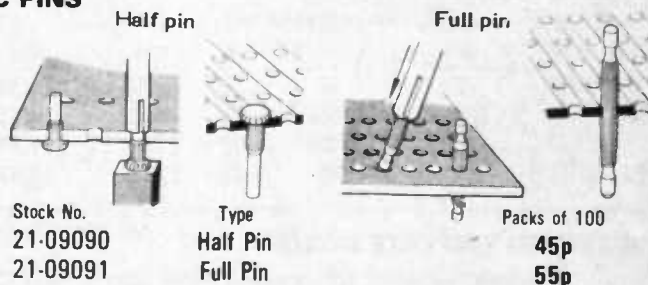
## DIL BOARD VQ

Accommodates all types of comps. Track cutting not required on this board. Plain side is marked by white lines denoting the vertical position of the breaks in the copper track. Size 5.75" x 3". Pitch 0.1"



Vero No.	Stock No.	1-24	25+
200-21084E	21-09020	£1.58	£1.42

## PC PINS



## INSERTION TOOL

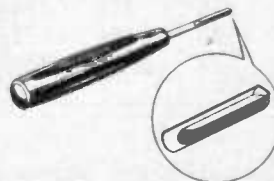
For inserting pins into 0.1" pitch boards.



Vero No.	Stock No.	1-24	25+
203-21015L	21-09050	£1.47	£1.32

## SPOT FACE CUTTER

For cutting the copper strips on Veroboard



Vero No.	Stock No.	1-24	25+
203-21013A	21-09060	£1.18	£1.07

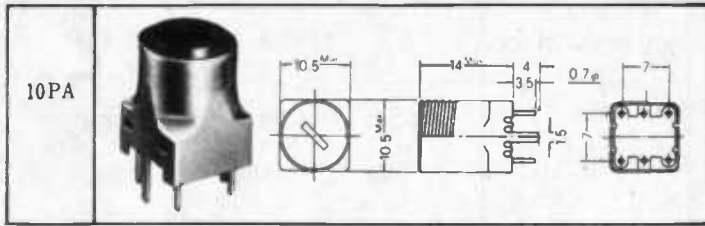
## ALL-PURPOSE CUTTER

High quality stainless steel cutters. Easily cuts 1.6mm fibre glass or SRBP board as well as wire, tin sheet, plastic, leather etc.



Vero No.	Stock No.	1-24	25+
203-22277D	21-09102	£3.60	£3.24

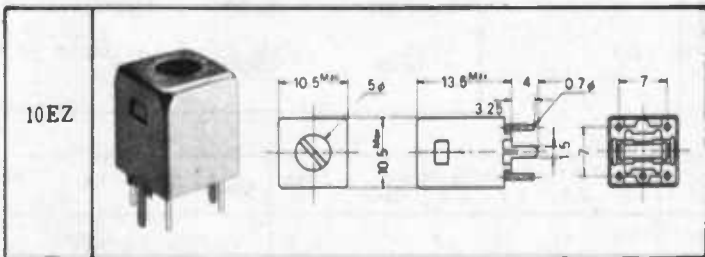
# INDUCTORS



## 10PA PRICES

1-24	25-99	100+
44p	35p	28p

Coil Style	Stock No.	Type No.	Use	Colour	Q	Int. C (or L)	Winding Details					Base No.	Comments
							1-2	2-3	1-3	4-6	Other		
10PA	35-18980	CAN1898HM	LF	orange	50	7mH			396			1	MPX tuning/filter coil
10PA	35-19800	CAN1980B X	LF	yellow	50	7mH	40		396		1/4:198%	5	MPX tuning/filter
10PA	35-19790	CAN1979A	LF	white	50	11.75mH	257	257	514	257		3	MPX tuning/filter
10PA	35-18960	CAN1896HM	LF	black	85	22mH	695					1	MPX tuning/AF filters
10PA	35-05680	CLNS30568Z	LF	black	70	23mH			640			1	MPX/AF filter (Dolby)
10PA	35-05690	CLNS30569Z	LF	black	100	36mH			780			1	MPX/AF filter (Dolby)
10PA	35-03500	CAN1A350EK	LW	red	100	3.5mH	27	234	261	27		6	LW RF/Antenna coil
10PA	35-08790	CAN1A879AO	LF	black	35	3.5mH			271	489		4	LF filter/osc
10PA	35-34050	CLNS3405											

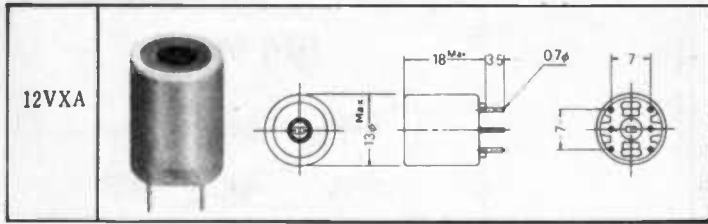


## 10E / 10EZ / 10EZC PRICES

1-24	25-99	100+
35p	28p	22p

Coil Style	Stock No.	Type No.	Use	Colour	Q	Int. C (or L)	Winding Details					Base No.	Comments
							1-2	2-3	1-3	4-6	Other		
10E 468kHz	35-10980	YRCS11098AC	AM IF	orange	90	180pF	140	25	165	4		6	1st IF, low Z coupling
10E 468kHz	35-23740	YRCS12374AC	AM IF	yellow	90	180pF	127	38	165	6		6	2nd IF
10E 468kHz	35-11000	YHCS11100AC	AM IF	black	140	180pF	104	36	140	20		6	3rd IF/detector
10E 468kHz	35-05890	YHCS1A589R	AM IF	blue	150	180pF	15	125	140	6		6	Hi Q 2nd IF
10E 468kHz	35-05900	YHCS1A590R	AM IF	white	150	180pF	80	60	140	15		6	Hi Q IF
10E 468kHz	35-07400	YMCS2A740A	AM IF	brown	90	180pF			158			7	Series tuned trap
10E 468kHz	35-71030	YHCS17103D	AM IF	white	140	180pF					2/6:149	8	Series tuned trap
10E 468kHz	35-71040	YMCS17104G	AM IF	yellow	110	180pF	98	87	165			2	Gen. IF/osc for BFO
10E 468kHz	35-08880	YLE4A888EK	AM IF	black	70	430pF	55	55	110	15		6	Balanced AM detectors
10E	35-85760	YRCS18576AQ	MW osc	green	120	100uH			59	36		4	For varicap tuning
10E	35-00460	YMRS80046N	MW osc	blue	70	158uH	2	79	81	9		6	300pF tuning
10E	35-67260	YMRS16726Z	MW osc	red	130	158uH					3/4:83	10	5/6:9.3 wdg type
10E	35-03560	YWOS6A356E	MW osc	blue	70	158uH	2	64	66	7		6	Low int C
10EZ	35-12080	RWR331208	MW osc	red	70	330uH	2	92	94	8		6	Also MW RF
10EZ	35-64080	RWO6A6408	MW osc	red	80	360uH	95	3	98	12		6	Also MW RF
10EZ	35-07750	RWO6A775EK	LW osc	green	80	630uH	9	114	123	13		6	LW/RDF band osc
10E	35-04500	YXNS3045OE	LF	blue	80	2mH				270		11	LPF/LF osc
10E	35-01390	YXNS6A139	LW	green	80	940uH					1/4:185	9	LW RF padder
10E	35-01400	YXNS6A140	LW	red	80	120uH			64			1	LW osc padder
10E	35-71510	RZES1A7151DC											
10E 10.7MHz	35-50760	RX056A5076	FM	white	67	180pF	6	1	7	2			
10E	35-03990	YLCS10399AC2											
10E 455kHz	35-08570	YXE10857		yellow									Filter Matching
10E 796kHz	35-70650	YXRS17065		red	80	180uH	3	77	80	12		6	
10EC 455kHz	35-71050	YMCS17105R2		black	140	200pF	68	68	136	68		6	
10EZC "	35-18570	RMC41857		yellow									Filter Matching
10EZC "	35-19970	RMC41997		blue	110	180pF		19	164	16			MFL Matching trans
10EZC "	35-19960	RMC41996		red	110	180pF		43	164	16			MFL Matching trans
10E	35-00330	YAN60033											
10EZ SW1	35-64380	154FN8A6438	RF	violet	100	45uH	10	30	40	8		6	SW1 RF Hi-Z
10EZ SW2	35-64390	154FN8A6439	RF	yellow	110	5.5uH	4	10	14	6		6	SW2 RF Hi-Z
10EZ SW1	35-64400	154AN7A6440E	Osc	white	90	38uH	10	31	41	9		6	SW1 osc Hi-Z
10EZ SW2	35-64410	154AN7A6441E	Osc	green	70	5uH	4	11	15	7		6	SW2 osc Hi-Z
10E 10.7	35-04650	94AES30465	FM IF	brown	75	120pF	6	3	9	1		6	FM IF
10E 10.7	35-04660	94AES30466	FM IF	pink	75	none	6	3	9	1		3	FM IF no int cap.
10E 10.7	35-05160	94ACS10516	FM rat.	pink	80	32pF				5		14	FM ratio detector ...
10E 10.7	35-10517	94FCS10517	FM rat.	blue	80	51pF	1				3/4-3/6:6%	17	...FM ratio detector
10EZ 9MHz	35-66020	154PC7A6602EK	IF	black	50	47pF	8	8	16	16		6	Det. coil AM/SSB
10EZ 9	35-66610	154AES7A6661EA	IF	green	60	150pF	4		10	1		18	IF
10EZ 9	35-66620	154AES7A6662EA	IF	yellow	60	150pF	5		10	1		18	IF
10EZ 9	35-66630	154PE7A6663AO	IF	white	50	150pF			10	1		4	IF

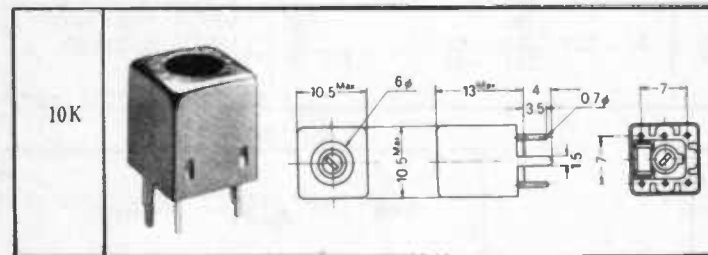
# INDUCTORS



## 12VXA PRICES

1-24	25-99	100+
56p	48p	38p

12VXA	35-80230	719VXA8032	LF	Black	45	80mH	2070	1	LF tuning/filter
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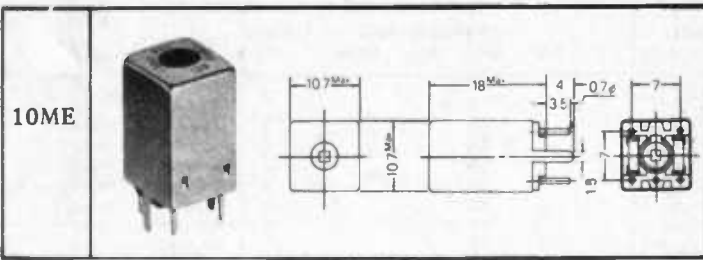


## 10k / 10kN / 10KC PRICES

1-24	25-99	100+
35p	28p	22p

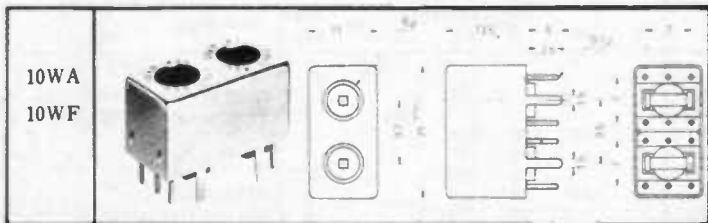
Coil Size	Stock No.	Type No.	Use	Colour	Q	Int. C (or L)	Winding Details					Base No.	Comments
							1-2	2-3	1-3	4-6	Other		
10k SW1	35-33330	KANK3333R	RF	Violet	60	45uH	14	41	55	4	6	SW1 RF/Antenna Coil	
10k SW2	35-33340	KANK3334R	RF	yellow	85	5.5uH	7	11	18	3	6	SW2 RF/Antenna	
10k SW3	35-33350	KANK3335R	RF	pink	85	1.2uH	4	4	8	2	6	SW3 RF/Antenna	
10k SW3	35-37670	KXNK3767EK	RF	pink	80	1.2uH	2	6	8	5	6	SW3 RF Hi-Z	
10k SW1	35-34260	KAN3426R	Osc	white	65	38uH	3	48	51	4	6	SW1 osc	
10k SW2	35-33370	KANK3337R	Osc	green	50	5uH	2	25	27	3	6	SW2 osc	
10k SW3	35-34280	KANK3428R	Osc	blue	60	1.1uH	2	10	12	3	6	SW3 osc	
10k SW3	35-37660	KXNK3766EK	Osc	blue	80	1.1uH	2	6	8	5	6	SW3 osc hi-Z	
10kN SW2	35-20270	K2027	RF/Osc	none	75	9uH	3	25	28	6	6	SW2 RF/Osc no can	
10k 10.7	35-45200	KALS4520A	FM IF	red	100	50pF	8	7	15	1	6	1st IF, low Z link	
10k 10.7	35-38920	KACSK3892A	FM IF	red	80	82pF	7	7	14	2	6	FM IF, filter match	
10k 10.7	35-38930	KACSK3893A	FM IF	red	80	82pF	7	7	14	3	6	FM IF	
10k 10.7	35-38940	KACSK3894A	FM IF	red	80	82pF	7	7	14	4	6	FM IF	
10k 10.7	35-15060	KAC1506A	FM IF	black	100	51pF	3	12	15	2	6	FM IF, Hi-Lo/Z in	
10k 10.7	35-61840	KAC6184A	FM IF	black	65	82pF	10	3	13	3	6	FM IF, Hi-Lo/Z in	
10k 10.7	35-05860	KACSK586HM	FM det	pink	100	82pF			12		1	FM quadrature coil	
10k 10.7	35-43420	TKACS3432	FM det	black	70	51pF			15	1	4	Double quad with....	
10k 10.7	35-43430	TKACS3433	FM det	black	70	51pF				3/4:15	13	double quad with above	
10k 10.7	35-84480	KAC8448PJQ	FM rat.	pink	65	68pF		14		11	14	Half ratio detector ....	
10k 10.7	35-84490	KAC8449SZ	FM rat.	blue	65	68pF	7	7	14	1	6	....2nd half ratio detect.	
10k 10.7	35-15080	KAN1508PAM	FM rat.	pink	100	ext.30p			13		3/4:7/8	16	FM ratio detector....
10k 10.7	35-15090	KAXS1509SZ	FM rat.	blue	80	91pF	6	6	12	1	6	....FM ratio detector	
10k 4.6MHz	35-41740	MKANK4174HM	Osc	black	100	4.8uH			17		1	VFO osc coil	
10k 9	35-41730	KXNK4173AO	Osc	brown	80	3uH			15	3	4	9MHz C10 coil	
10k 28MHz	35-46120	KXNSK4612BM	RF	white	45	1.7uH			11	3	4	RF/Antenna coil	
10k 28	35-46130	KXNSK4613BM	RF	white	45	1.7uH			11	1	4	RF/Antenna coil	
10k 28	35-41720	KXNSK4172EK	RF	black	65	1.4uH	1	8	9	3	6	RF/Antenna	
10k 28	35-22500	TKXNS22250N	RF	black	80	1.4uH	1	8	9	1	6	RF/Antenna	
10k 36MHz	35-47320	TKXCA34732CON	TV vif	white	85	27pF				9	19	TV video IF	
10k 36	35-33470	KXCAK3347AHC	TV	white	85	27pF				9	20	TV	
10k 41.4	35-33460	TKXCAK3346AHJ	TV	white	80	39pF			6	9	21	TV vif trap	
10k 31.9	35-47350	TKXCA34735EMD	TV	white	68	82pF				6	22	TV vif	
10k 31.9	35-33450	KXCAK3345AEU	TV	white	85	27pF			11		21	TV vif	
10k 40.4	35-33440	KXCAK3344AM2	TV	white	80	27pF			7		23	TV vif	
10k 33.5	35-24990	KXCAK2499ABZ	TV	white	75	12pF				1/6:16	24	TV vif	
10k 37	35-49090	TKCA34909EMH	TV	white	27pF		9			1/6:4	25	TV vif	
10k 6.0	35-17310	MKANSK3731HM	TV	black	75	ex.560p			8		26	TV sound detect	
10k 4.43	35-24950	KANFK2495ET	TV	none	35	ex1n2				10	3/4:5	27	Chroma
10k 5.5	35-33600	BKANK3360AGM	TV	pink	41	ex1n0			7		26	TV euro sound if	
10k 10.7	35-18930	KANSK1893HM	FM	black	50	.39uH				5			
10k 4.6MHz	35-24950	KANK2495	TV	black	35	1n1 ex			10	5	27		
10k 10.7	35-34050	KACS9340558	FM IF	white	65	68pF	7	7	14		2	FM IF	
10k C 10.7	35-93390	KACS9339REV	FM IF	green	65	68pF	8	7	15		2		
10k 10MHz	35-23540	TKANS12354BM	Aerial	grey	80	2.5mH			13	2%	4		
10k 10.7	35-13630	KACS11363	FM Disc	violet	78	68pF		14		6			
10k 2.4MHz	35-26960	TKANS2696A	SW1	white	50	23uH	3	45	48	6	6		
10k 7MHz	35-26980	TKANS32698	SW Aut	red	76	240pF					12 1/2:1 1/2		
10k 27.0	35-34640	MKXVXK3464B	RF	black	100	27pF			8	2	3	RF/Antenna coil	

# INDUCTORS



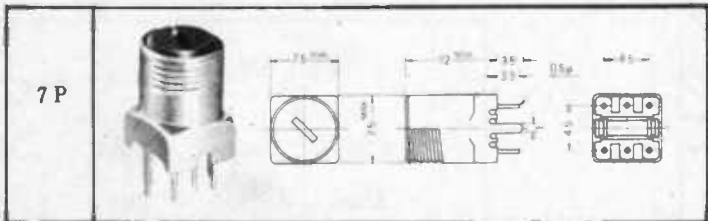
10ME PRICES		
1-24	25-99	100+
44p	35p	28p

Coil Size	Stock No.	Type No.	Use	Colour	Q	Int. C (or L)	Winding Details					Base No.	Comments
							1-2	2-3	1-3	4-6	Other		
10ME	35-01340	87BN134HM	LF	orange	55	7mH		349				1	See CAN1898HM
10ME	35-01350	87BN135BX	LF	yellow	55	7mH	35	314	349		1/4:174	5	See CAN1980BX
10ME	35-01330	87BN133AT	LF	white	55	11.8mH	226	226	452	226		3	See CAN1979A
10ME	35-01320	87BN132HM	LF	black	100	22mH			618			1	See CAN1896HM



10WA / 10WF PRICES		
1-24	25-99	100+
80p	64p	50p

Coil Size	Part No.	Type No.	Use	Colour	Q	Int. C (or L)	Winding Details					Base No.	Comments
							1-2	2-3	1-3	4-6	Other		
10WF 10.7	35-00355	125LCS30035	FM dt.	pink	75	82pF			12			15	{Double tuned IF...
10WF 10.7	35-00365	125LCS30036	FM dt.	blue	75	82pF				6/8:13		15	...other half of above
10WA	35-11155	WFDC1115P	AM IF	pink	80	180pF	107			3/4:45		12	AM Double tuned
	35-11155	WFDC1115S		blue	80	180pF	3		158	5/6:5		12	
10WA455kHz	35-51675	WRHC1A516/7	nbfm	pink/blu	100		see base diagram					28	455/470 ratio detct.



7PA / 7E / 7P / 7KC / 7KN PRICES		
1-24	25-99	100+
35p	28p	22p

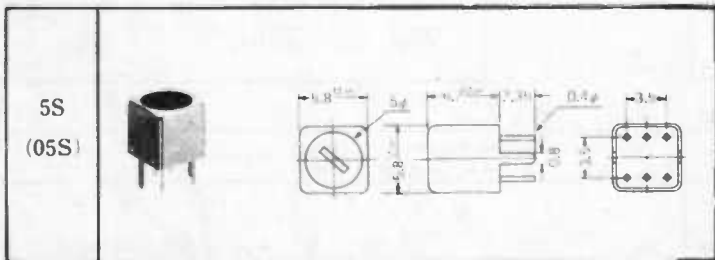
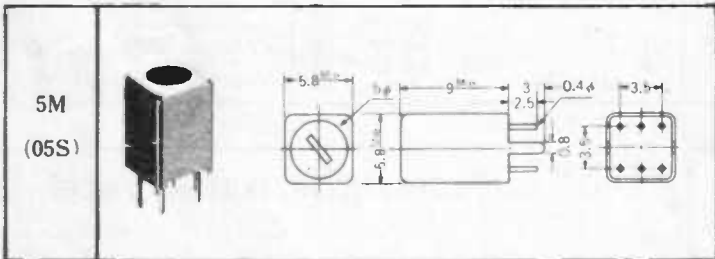
Coil Size	Stock No.	Type No.	Use	Colour	Q	Int. C (or L)	Winding Details					Base No.	Comments
							1-2	2-3	1-3	4-6	Other		
7PA	35-53051	126ANSA6305	LF	yellow	55	7mH	39	349		1/4:195	5	7mm version CAN19808X	
7PA	35-53061	126ANAS306	LF	orange	55	12mH	257	257	514	136		3	7mm version CAN1979A
7E 10.7	35-44021	85FC4402EJ	FM IF	blue	100	100pF	6	6	12	1		3	1 turn link IF
7P 10.7	35-00991	119LC30099N	FM IF	orange	90	82pF	8	2	10	4		6	Hi-Z secondary
7P468kHz	35-21971	7MCS2197R	AM IF	blue	110	180pF	15	125	140	6		6	7mm YHCS1 A589
7P467kHz	35-21981	7MCS2198R	AM IF	black	110	180pF	104	36	140	20		6	7mm YHCS11100AC
7P468kHz	35-21991	7MCS2199DC	AM IF	white	110	180pF	80	60	140	15		6	7mm YHCS1A590R
7P468kHz	35-21941	7MCS2194AA	AM IF	brown	110	180pF			140			7	7mm YMCS2A740A
7P455kHz	35-47181	7MCS4718N	AM IF	black	115	180pF	69	77	146	14		6	2k filter matching in
7P455kHz	35-48761	7MCS4876N	AM IF	black	115	180pF	130	16	146	14		6	2k filter matching out
7E455kHz	35-41001	LMC4100A	AM IF	yellow	105	150pF						6	1st IF for RC RXs
7E455kHz	35-41011	LMC4101A	AM IF	white	105	150pF						6	2nd IF for RC
7E455kHz	35-41021	LMC4102A	AM IF	black	105	150pF						6	3rd IF/detect for RC
7E455kHz	35-42001	LMC4200A	AM IF	yellow	60	150pF						6	1st IF for RC RXs
7E455kHz	35-42011	LMC4201A	AM IF	white	60	150pF	143	62	205	4		6	2nd IF
7E455kHz	35-42021	LMC4202A	AM IF	black	60	150pF	134	74	208	42		6	3rd IF/detect for RC
7E455kHz	35-02381	LLC238	AM IF	white	70	150pF	143	62	205	8		6	1st IF
7E455kHz	35-48271	LLC4827	AM IF	yellow	70	150pF	126	79	205	10		6	2nd IF
7E455kHz	35-48281	LLC4828	AM IF	black	70	150pF	163	52	205	26		6	3rd IF/detector



# INDUCTORS

Coil Style	Stock No.	Type No.	Use	Colour	Q	Int.C (or L)	Winding Details					Base No.	Comments
							1-2	2-3	1-3	4-6	Other		
7P	35-58651	7B0A5865HM		pink	80	470uH			113			1	Adjustable Choke
7P	35-58661	7B0A5866HM		red	80	220uH			78			1	Adjustable Choke
7P	35-58671	7B0A5867HM		blue	80	120uH			58			1	Adjustable Choke
7P	35-58681	7B0A5868HM		white	80	100uH			53			1	Adjustable Choke
7P	35-58691	7B0A5869HM		violet	60	68uH			53			1	Adjustable Choke
7P	35-58711	119ANA3871HM		yellow	80	47uH			48			1	Adjustable Choke
7P	35-58701	119ANA5870HM		orange	80	33uH			39			1	Adjustable Choke
7P	35-58721	119ANA5872HM		green	80	22uH			32			1	Adjustable Choke
7P	35-58731	119ANA5873HM		pink	80	15uH			25			1	Adjustable Choke
7P	35-58741	119ANA5874HM		red	80	8.2uH			19			1	Adjustable Choke
7kN	35-13691	113CNK1369HM		blue	50	5.6uH			22			1	Adjustable Choke
7kN	35-13701	113CNK1370HM		white	80	2.7uH			15			1	Adjustable Choke
7KC 27.0	35-01271	199CCA127EK	RF	black	70	47pF	4	4	8	1		6	RF/Antenna coil
7KN 27.0	35-01591	113CN2K159OZ	RF	black	90	ext 55p			8	2		4	RF/Antenna coil
7KN 27.0	35-02411	113KN2K241DC	RF	black	80	ext 27p	7	2	9	2		3	RF/Antenna coil
7KN 27.0	35-05091	113CN2K509ADZ	RF	black	90	ext 56p	1	1	2	8		3	RF/Antenna coil
7KN 28	35-10261	113KN2K1026HM	RF	black	45	1.7uH			14			1	RF/trap

Coil Size	Stock No.	Type No.	Use	Colour	Q	Int. C (or L)	Winding Details					Base No.	Comments
							1-2	2-3	1-3	4-6	Other		
7P 796kHz	35-21921	7BOS2192HM	AM	red	100	120uH				58		1	7mm version YXN56A140
7P 796kHz	35-21931	7BOS2193BA	AM	green	100	210uH					75%	9	7mm version YXNS6A139
7P 455kHz	35-40901	7XEA4090EK	AM IF	black	100	430pF	20	80	100	21		6	
7P 455kHz	35-40911	7XEA4091EK	AM IF	black	100	430pF	3	97	100	21		6	
7P 455kHz	35-40921	7XEA4092EK	AM IF	black	100	430pF	75	25	100	21		6	
7PA	35-60811	7MN6081Y	AM	black	105	400pFex	22	64	86			2	AM coil (carfax)
7PA	35-60801	7MN6080N	AM	black	90	580pF ex			73	73		6	AM coil (carfax)
7PA	35-60661	7MN6066N	AM	black	105	400pF ex	16	71	87	20		6	AM coil (carfax)
7PA	35-60651	7MN6065N	AM	black	105	400pF ex	2	85	87	20		6	AM coil (carfax)
7PA	35-61101	7MN6110X											



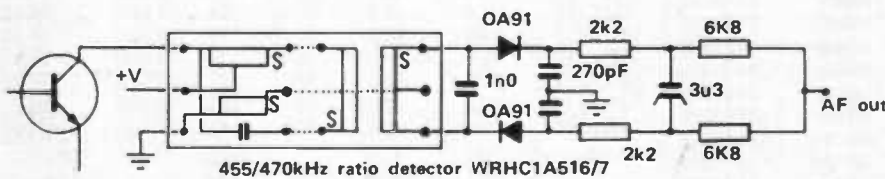
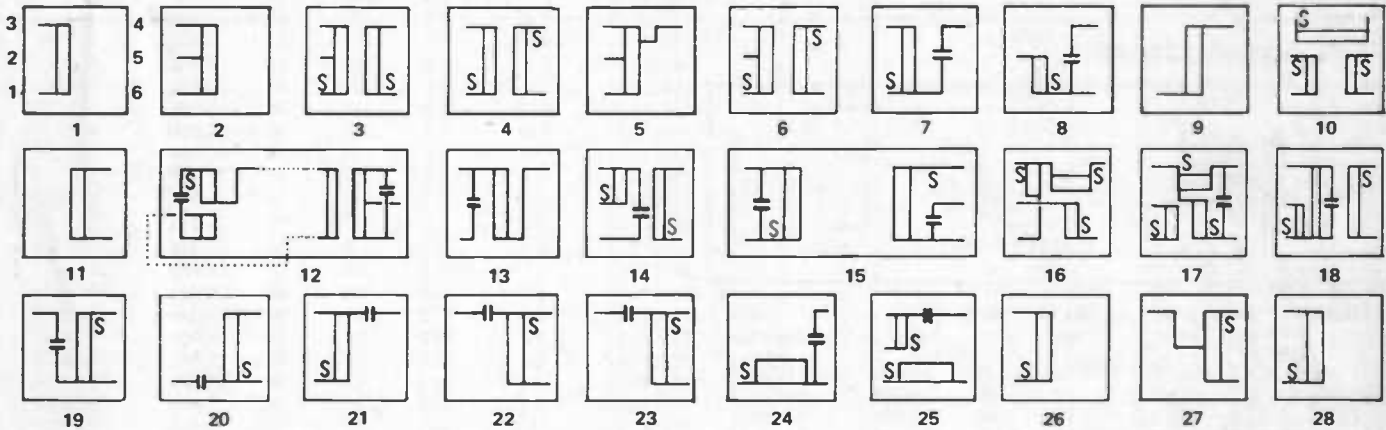
5S / 5M PRICES		
1-24	25-99	100+
55p	39p	30p

Coil Size	Stock No.	Type No.	Use	Colour	Q	Int. C (or L)	Winding Details					Base No.	Comments
							1-2	2-3	1-3	4-6	Other		
5M 455kHz	35-01242	5MMC0124N	AM IF	black	110	180pF	139	50	189	24		6	5M version LLC4828
5M 455kHz	35-02732	5MMC0273N	AM IF	black	125	180pF	114	75	189	9		6	5M version LLC4827
5M 455kHz	35-02722	5MMC0272N	AM IF	black	125	180pF	130	59	189	7		6	5M version LLC238
5S 455kHz	35-01842	5SLC0184R	AM IF	black	77	180pF	137	43	180	27		6	5S version YHCS11100
5S 455kHz	35-03332	5SLC0333R	AM IF	black	80	180pF	142	43	185	7		6	5S version YRCS12374
5S 455kHz	35-03312	5SLC0331R	AM IF	black	80	180pF	104	76	180	20		6	5S version YHCS1A590
5S 455kHz	35-01902	5SL0190N	AM IF	black	85	470pF	58	58	116	16		6	5S version YLE4A888
5S	35-01872	5SNR0187N	MW osc	blue	75	158uH	2	93	95	14		6	5S version YMRS80046
5S	35-03322	5SNR0332	AM IF	black	70	156uH	2	92	94	10		6	5S version of YW0S6A356
5M	35-02742	5MMC0274	AM IF	black	125	180pF	84	105	189	17		6	5M version 7MCS4785
5M	35-02752	5MMC0275	AM IF	black	120	180pF	172	17	189	17		6	5M version of 7MCS4786
5M	35-02752	5MMC0275	AM IF	black	120	180pF	172	17	189	17		6	5M version 7MCS4786
5S	35-01882	5SNR0188	1.4MHz	red	57	330uH	13	127	140	52		6	5S version RWR331208
5S	35-02102	5SPC0210Z	10.7	black	95	47pF			15			1	5S version KACSK586

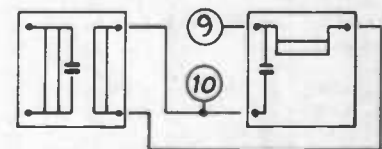
# INDUCTORS

## BASE CONNECTIONS:

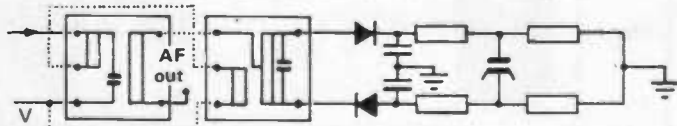
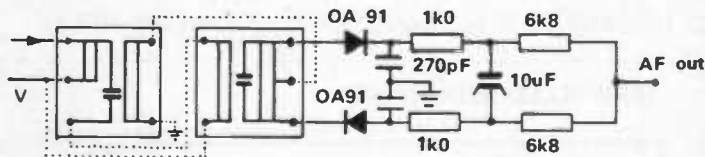
S = Start of Winding



## Double tuned quadrature assembly



TKACS34342/3 connections to 3089 family



The ratio detector is still a useful general purpose form of FM demodulator - particularly in applications where the signal level is rapidly fluctuating - such as mobile communications. The input to the ratio detector should be fully limited for best AM rejection - but unlike popular forms of quadrature, the performance below limiting is not particularly harsh and noisy.

The ratio detector can be driven from the IF output of ICs such as the CA3089/HA1137 families (MC3357 for 455/470kHz), which impart their excellent limiting characteristics although the audio level may be low, since the internal chip AF amplifiers are not being used.

The AF output point can be taken from either point shown - and the DC centre zero tuning indication may be taken from the same point as the AF (use a sufficiently high impedance to avoid affecting the audio). With the secondary winding referred to ground, the AFC will swing about 0v, which must be taken into account with any AFC connections.

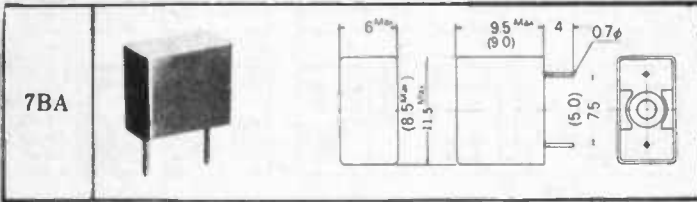
## TOKO COIL PIECE PARTS (All packed in fives)

Description	Stock Code	Packs 1-9	10+
10k Coil Cases	35-00106	50p	35p
10k Coil Formers	35-00116	55p	40p
10k Pot Cores 10-20MHz	35-00126	50p	35p
10k Pot Cores 10.7MHz	35-00136	50p	35p
10k Pot Cores 455 kHz	35-00146	50p	35p
10k Cores 10-20MHz	35-00156	45p	30p
10k Cores 10.7MHz	35-00166	45p	30p
10k Cores 455MHz	35-00176	45p	30p
7kN/kP Cases	35-00186	50p	35p
7mm Coil Formers	35-00196	55p	40p
7P Ferrite Cores 10-20MHz	35-00206	50p	35p
7P Ferrite Cores 10.7MHz	35-00216	50p	35p
7P Ferrite Cores 455kHz	35-00226	50p	35p
5A Cases	35-00236	50p	35p
5mm Formers	35-00246	60p	40p
5mm Ferrite cores	35-00256	50p	35p

# INDUCTORS

A wide range of miniature fixed inductance chokes, from 1uH to 1.5H. Manufactured by TOKO.

## 7BA FIXED INDUCTORS

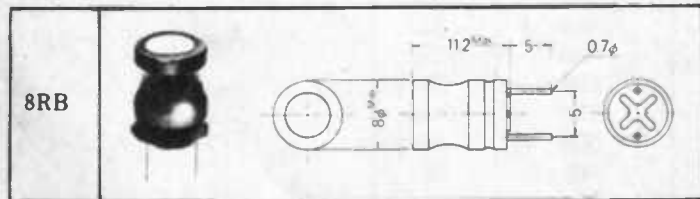


Toko Numbers	Ind. (uH)	DC Res.	Max DC (mA)	Min Q	Q Test Freq.	Ambit Stock No.
144LY-1R0	1.0	1.0	30	30	7.96MHz	34-10910
144LY-1R2	1.2	1.0	30	30	7.96MHz	34-12900
144LY-1R5	1.5	1.0	30	30	7.96MHz	34-15910
144LY-1R8	1.8	1.0	30	30	7.96MHz	34-18900
144LY-2R2	2.2	1.0	30	30	7.96MHz	34-22910
144LY-2R7	2.7	1.0	30	30	7.96MHz	34-27900
144LY-3R3	3.3	1.0	30	30	7.96MHz	34-33910
144LY-3R9	3.9	1.0	30	30	7.96MHz	34-39900
144LY-4R7	4.7	1.5	30	30	7.96MHz	34-47910
144LY-5R6	5.6	1.5	30	30	7.96MHz	34-56900
144LY-6R8	6.8	1.5	30	30	7.96MHz	34-68900
144LY-8R2	8.2	1.5	30	30	7.96MHz	34-82900
144LY-100	10.0	2.0	30	30	7.96MHz	34-10000
144LY-120	12.0	2.0	30	30	2.52MHz	34-12000
144LY-150	15.0	2.0	30	30	2.52MHz	34-15000
144LY-180	18.0	2.0	30	30	2.52MHz	34-18000
144LY-220	22.0	2.0	30	30	2.52MHz	34-22010
144LY-270	27.0	2.5	30	30	2.52MHz	34-27000
144LY-330	33.0	2.5	30	30	2.52MHz	34-33000
144LY-390	39.0	2.5	30	30	2.52MHz	34-39000
144HY-470	47.0	3.0	30	30	2.52MHz	34-47010
144HY-560	56.0	3.0	30	30	2.52MHz	34-56000
144HY-680	68.0	3.0	30	30	2.52MHz	34-68000
144HY-820	82.0	4.0	30	30	2.52MHz	34-82000
144HY-101	100.0	4.0	30	30	2.52MHz	34-10100
144HY-121	120.0	4.0	30	30	796kHz	34-12100
144HY-131	130.0	4.0	30	30	796kHz	34-13100
144HY-151	150.0	4.0	30	30	796kHz	34-15100
144HY-181	180.0	6.0	30	30	796kHz	34-18100
144HY-221	220.0	6.0	30	30	796kHz	34-22100
144HY-271	270.0	6.0	30	30	796kHz	34-27100
144HY-331	330.0	6.0	30	30	796kHz	34-33100
144HY-391	390.0	9.0	30	30	796kHz	34-39100
144HY-471	470.0	9.0	30	30	796kHz	34-47110
144HY-561	560.0	10.0	30	30	796kHz	34-56100
144HY-681	680.0	12.0	30	30	796kHz	34-68100
144HSY-751	750.0	12.0	30	30	796kHz	34-75100
144HSY-821	820.0	12.0	30	30	796kHz	34-82100
144HSY-102	1000.0	14.0	30	30	796kHz	34-10200

Tolerance 5%, but reserve the right to supply 10%. Pin spacing 5mm.

Price	1-24 <b>16p</b>	25-99 <b>10p</b>	100+ <b>8p</b>
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## 8RB FIXED INDUCTORS



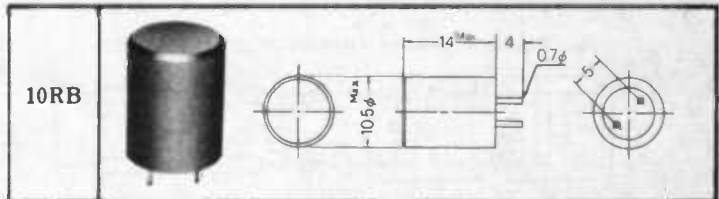
Toko Number	Ind. (mH)	DC Res.	Max DC (mA)	Min Q	Q Test Freq.	Ambit Stock No.
187LY-101	0.10	2.0	200	80	796kHz	34-10101
187LY-121	0.12	2.0	200	80	796kHz	34-12111
187LY-151	0.15	2.0	200	80	796kHz	34-15101

187LY-181	0.18	3.0	200	80	796kHz	34-18111
187LY-221	0.22	3.0	200	80	796kHz	34-22101
187LY-271	0.27	3.0	200	80	796kHz	34-27111
187LY-331	0.33	4.0	200	80	796kHz	34-33101
187LY-391	0.39	4.0	200	80	796kHz	34-39111
187LY-471	0.47	4.0	200	80	796kHz	34-47101
187LY-561	0.56	4.0	200	80	796kHz	34-56111
187LY-681	0.68	4.0	200	80	796kHz	34-68101
187LY-821	0.82	6.0	200	80	796kHz	34-82111
187LY-102	1.0	6.0	150	90	252kHz	34-10201
187LY-122	1.2	9.0	150	90	252kHz	34-12211
187LY-152	1.5	9.0	150	90	252kHz	34-15201
187LY-182	1.8	9.0	100	90	252kHz	34-18211
187LY-222	2.2	13.0	100	90	252kHz	34-22201
187LY-272	2.7	13.0	100	90	252kHz	34-27201
187LY-332	3.3	13.0	100	90	252kHz	34-33201
187LY-392	3.9	13.0	50	90	252kHz	34-39201
187LY-472	4.7	18.0	50	90	252kHz	34-47201
187LY-562	5.6	18.0	50	90	252kHz	34-56211
187LY-682	6.8	26.0	50	90	252kHz	34-68201
187LY-822	8.2	26.0	50	90	252kHz	34-82201
187LY-103	10.0	40.0	40	100	79.6kHz	34-10301
187LY-123	12.0	40.0	40	100	79.6kHz	34-12301
187LY-153	15.0	60.0	40	100	79.6kHz	34-15301
187LY-183	18.0	60.0	30	100	79.6kHz	34-18301
187LY-223	22.0	80.0	30	100	79.6kHz	34-22301
187LY-273	27.0	80.0	30	100	79.6kHz	34-27301
187LY-333	33.0	80.0	30	100	79.6kHz	34-33301

Price	1-24 <b>19p</b>	25-99 <b>13p</b>	100+ <b>11p</b>
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Tolerance 5% but reserve the right to supply 10%.

## 10RB FIXED INDUCTORS



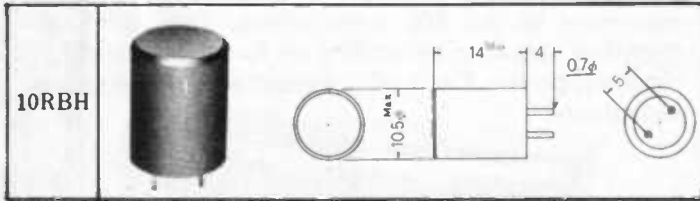
Toko Number	Ind. (mH)	DC Res.	Max DC (mA)	Min Q	Q Test Freq.	Ambit Stock No.
181LY-102	1.0	3.4	90	70	50kHz	34-10202
181LY-122	1.2	3.7	90	70	50kHz	34-12202
181LY-152	1.5	4.0	70	70	50kHz	34-15202
181LY-182	1.8	4.5	65	70	50kHz	34-18202
181LY-222	2.2	5.2	60	70	50kHz	34-22202
181LY-272	2.7	5.8	55	70	50kHz	34-27202
181LY-332	3.3	6.1	50	100	50kHz	34-33202
181LY-392	3.9	7.2	45	100	50kHz	34-39202
181LY-472	4.7	7.5	40	100	50kHz	34-47202
181LY-562	5.6	8.4	40	100	50kHz	34-56202
181LY-682	6.8	9.7	35	100	50kHz	34-68202
181LY-822	8.2	10.4	30	100	50kHz	34-82202
181LY-103	10.0	12.1	25	100	50kHz	34-10302
181LY-123	12.0	13.0	25	100	50kHz	34-12302
181LY-153	15.0	15.0	25	100	50kHz	34-15302
181LY-183	18.0	17.0	22	100	50kHz	34-18302
181LY-223	22.0	19.5	21	100	50kHz	34-22302
181LY-273	27.0	22.0	18	100	50kHz	34-27302
181LY-333	33.0	26.0	17	100	50kHz	34-33302
181LY-393	39.0	45.0	15	100	50kHz	34-39302
181LY-473	47.0	52.0	13	100	50kHz	34-47302
181LY-563	56.0	58.0	12	100	50kHz	34-56302
181LY-683	68.0	66.0	12	100	50kHz	34-68302
181LY-823	82.0	71.0	10	100	50kHz	34-82302
181LY-104	100.0	82.0	9	100	50kHz	34-10402
181LY-124	120.0	97.0	8	100	50kHz	34-12402

Price	1-24 <b>33p</b>	25-99 <b>28p</b>	100+ <b>22p</b>
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Tolerance 5%

# INDUCTORS

## 10RBH FIXED INDUCTORS



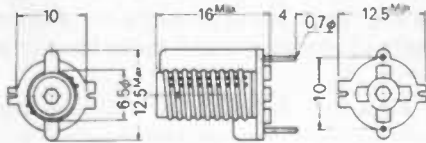
Toko Number	Ind. (mH)	DC Res. (mA)	Max DC (mA)	Min Q	Q Test Freq.	Ambit Stock No.
239LY-154	150	75	3.6	90	25.2kHz	34-15413
239LY-184	180	85	3.4	90	25.2kHz	34-15413
239LY-224	220	95	3.2	90	25.2kHz	34-22413
239LY-274	270	105	3.1	90	25.2kHz	34-27413
239LY-334	330	125	3.0	80	25.2kHz	34-33413
239LY-394	390	140	2.5	80	25.2kHz	34-39413
239LY-474	470	190	2.1	80	25.2kHz	34-47413
239LY-564	560	215	2.0	80	25.2kHz	34-56413
239LY-684	680	250	2.0	60	25.2kHz	34-68413
239LY-824	820	265	1.8	60	16.0kHz	34-82413
239LY-105	1000	295	1.7	60	16.0kHz	34-10513
239LY-125	1200	385	1.5	50	16.0kHz	34-12513
239LY-155	1500	435	1.2	50	16.0kHz	34-15513

Price	1-24	25-99	100+
	<b>43p</b>	<b>36p</b>	<b>30p</b>

Tolerance 10%

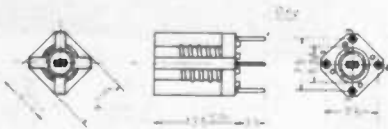
## MOULDED COILS FOR VHF APPLICATIONS

### COIL STYLE S18



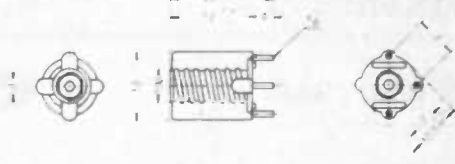
Stock Number	Coil Colour Code	Turns	Core Material	Centre Freq. (MHz)	Q (TYP)	L (uH)
35-00103	white	1.5	Aluminium	100	100	0.03
35-00203	red	2.5	Aluminium	100	100	0.05
35-00303	orange	3.5	Aluminium	100	85	0.064
35-00403	yellow	4.5	Aluminium	100	75	0.082
35-00503	green	5.5	Aluminium	100	95	0.098
35-00603	blue	6.5	Aluminium	100	90	0.12
35-00703	violet	7.5	Aluminium	100	90	0.141
35-00803	white	8.5	Aluminium	100	90	0.168
35-10103	white	1.5	Ferrite	100	150	0.04
35-10203	red	2.5	Ferrite	100	150	0.066
35-10303	orange	3.5	Ferrite	100	150	0.114
35-10403	yellow	4.5	Ferrite	100	170	0.18
35-10503	green	5.5	Ferrite	100	140	0.23
35-10603	blue	6.5	Ferrite	100	130	0.297
35-10703	violet	7.5	Ferrite	100	140	0.389
35-10703	white	6.5	Ferrite	100	170	0.45

### COIL STYLE MC111



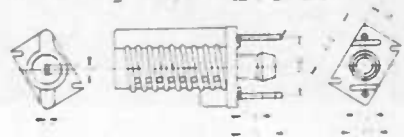
35-14204	4.25/2.25	Ferrite	100	115	0.12
35-14304	4.25/3.25	Ferrite	100	105	0.12
35-14204	4.25/1.25	Ferrite	100	137	0.12
35-15104	5.25/1.25	Ferrite	100	128	0.16

### COIL STYLE MC107



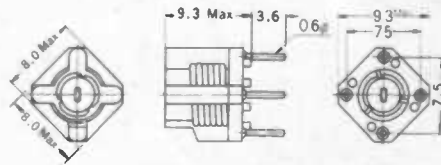
35-10714	white	1.5	Ferrite	100	110	0.03
35-10724	red	2.5	Ferrite	100	120	0.06
35-10734	orange	3.5	Ferrite	100	150	0.09
35-10744	yellow	4.5	Ferrite	100	160	0.15
35-10754	green	5.5	Ferrite	100	160	0.17
35-10764	blue	6.5	Ferrite	100	160	0.23

### COIL STYLE MC108



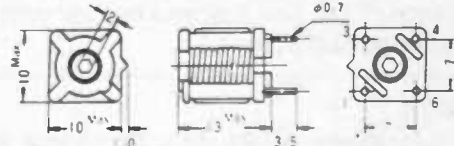
35-10814	brown	1.5	Ferrite	100	130	0.026
35-10824	red	2.5	Ferrite	100	150	0.038
35-10834	orange	3.5	Ferrite	100	170	0.056
35-10844	yellow	4.5	Ferrite	100	175	0.078
35-10854	green	5.5	Ferrite	100	180	0.105
35-10864	blue	6.5	Ferrite	100	185	0.135
35-10874	violet	7.5	Ferrite	100	190	0.170

### COIL STYLE MC119



35-11914	1.5	Ferrite	100	150	0.03
35-11924	2.5	Ferrite	100	120	0.05
35-11934	4.5	Ferrite	100	105	0.14

### COIL STYLE MC120



Stock Number	Toko Number	No. Turns	Core	Centre Freq.	Q	L (uH)
35-00714	100071	1.5	Ferrite	100	110	0.04
35-00724	100072	2.5	Ferrite	100	130	0.06
35-00734	100073	3.5	Ferrite	100	135	0.09
35-00744	100074	4.5	Ferrite	100	140	0.14
35-00754	100075	5.5	Ferrite	50	100	0.17
35-00764	100076	6.5	Ferrite	50	100	0.21
35-00774	100077	7.5	Ferrite	50	105	0.24
35-00784	100078	8.5	Ferrite	50	105	0.28
35-00794	100079	9.5	Ferrite	50	100	0.33
35-01104	100110	1.5	Ferrite	100	105	0.03
35-01114	100111	2.5	Ferrite	100	130	0.05
35-01124	100112	3.5	Ferrite	100	145	0.08
35-01134	100113	4.5	Ferrite	100	150	0.10
35-01144	100114	5.5	Ferrite	100	150	0.13

### Prices:

Coil Type	1-24	25-99	100 - 999
S18	<b>30p</b>	<b>24p</b>	<b>19p</b>
MC107	<b>35p</b>	<b>28p</b>	<b>20p</b>
MC108	<b>30p</b>	<b>24p</b>	<b>19p</b>
MC111	<b>35p</b>	<b>28p</b>	<b>20p</b>
MC119	<b>35p</b>	<b>28p</b>	<b>20p</b>
MC120	<b>35p</b>	<b>28p</b>	<b>21p</b>

Data and further information on non-stocked ranges of moulded coils by TOKO can be found in the TOKO MOULDED COIL CATALOGUE 02-00000 50p and the TOKO GENERAL CATALOGUE 02-00001 50p.



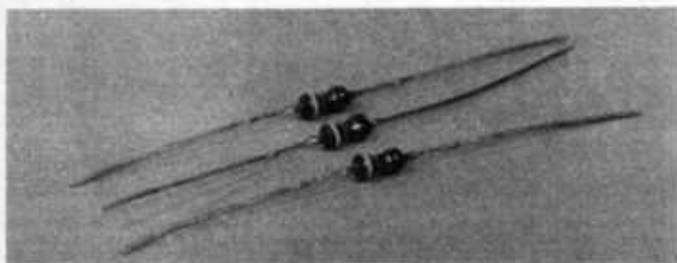
# INDUCTORS/METERS

## RF CHOKES B78108

Miniature high-quality axial RF chokes, ideal for applications where size is critical

9.5mm long.  
4mm Dia  
Total lead length, 85mm

**New**



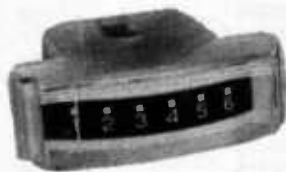
$\mu\text{H}$	Q at MHz	Max I (mA)	Stock No	1-9	10-99	100+
1	60 at 7.9	1250	38-71102	19p	15p	12p
4.7	80 at 7.9	850	35-71472	19p	15p	12p
10	80 at 2.5	750	35-71103	19p	15p	12p
47	50 at 2.5	500	35-71473	19p	15p	12p
100	70 at 0.79	350	35-71104	19p	15p	12p
470	70 at 0.79	180	35-71474	19p	15p	12p
1000	50 at 0.25	130	35-71105	19p	15p	12p
4700	40 at 0.25	55	35-71475	19p	15p	12p

## MOVING COIL METERS

A wide range of low cost indicator meters, with a selection of scales for most purposes.

### 900 SERIES

Miniature edgewise meters, 14 x 35mm face area. 200 $\mu\text{A}$  movement (which is not linear, but is nevertheless repeatable). 750 ohm DC coil resistance. Built in 12v bulb for back lighting translucent scales.



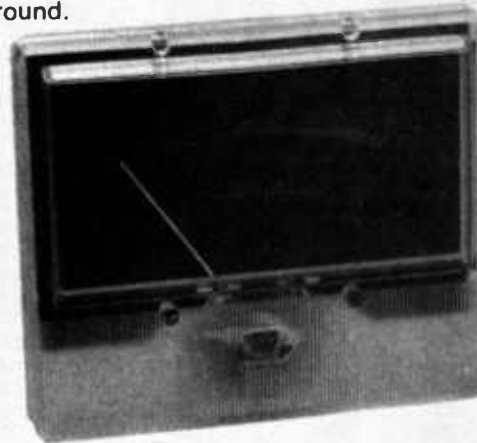
Stock No.	Scale No.	1-24	25-99	100+
37-09001	0-6 Horiz	2.50	1.75	1.50
37-09002	88-104 FM	2.50	1.75	1.50
37-09003	1-9 Horiz	2.50	1.75	1.50
37-09004	21-70 TV	2.50	1.75	1.50
37-09005	3-0.3 Horiz	2.50	1.75	1.50
37-09006	1-5 vert	2.50	1.75	1.50
37-09007	'S' units	2.50	1.75	1.50

In addition to the above, a 'meter made' kit is available that consists of 3 x 900 meters with 10 plastic scales (5 different types) and sufficient scale plastic to make your own customised scales.

Stock No: 37-09008 Price per kit: £6.50

### 920 SERIES

Flat faced meters, 28 x 50mm face area, with 200 $\mu\text{A}$  movement as per 900 series above. The stock types described here from a matching set for use with audio and tuner equipment. The scale is translucent green on a black background.



Stock No.	Scale	1-24	25-99	100+
37-09201	VU	2.75	1.85	1.60
37-09202	Centre zero	2.75	1.85	1.60
37-09203	Signal 0-5	2.75	1.85	1.60

A 'meter made' kit is available comprising 3 x 920 meters and blank scales for custom scale designs.

Stock No: 37-09204 Price per kit: £7.25

### RUB-DOWN SCALE TRANSFER SHEETS

Rub-down dry transfer sheets for use with 920 series metermade kits. Each sheet contains common symbols for a wide variety of electronic and radio functions.

Stock No.: 37-09205 Price per sheet: £1.00

### 930 SERIES

Flat faced meters 40 x 65 mm area, 200 $\mu\text{A}$  movement (which is not linear, but is nevertheless repeatable). 750 ohm DC coil resistance. Built in 12v bulb for back lighting translucent scales.



Stock No.	Scale No.	1-24	25-99	100+
37-09300	VU	3.75	2.95	2.35

In addition to the above, a 'meter made' kit is available that consists of 3 x 930 meters with 10 plastic scales and sufficient scale plastic to make your own customised scales.

Stock No: 37-09301 Price per kit: £10.25

# METERS

## RUB-DOWN TRANSFERS FOR 930 SERIES

Dry transfer sheets for the 930 series.

Stock No.: 37-09302 Price per sheet: £1.00

## 940 SERIES

Dual flat faced meters, 36 x 40mm face area, with 200uA movement as per 900 series above.



Stock No.	Scale	1-24	25-99	100+
37-09400	Blank	£3.50	2.75	2.15

A 'meter made' kit is available comprising 3 x 940 meters and blank scales for custom scale designs.

Stock No.: 37-09401 Price per kit: £9.50

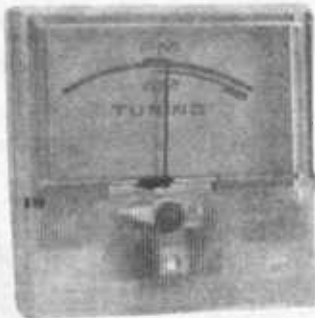
## RUB-DOWN TRANSFERS FOR 940 SERIES

Dry transfer sheets for the 940 series.

Stock No.: 37-09402 Price per sheet: £1.00

## 950 SERIES

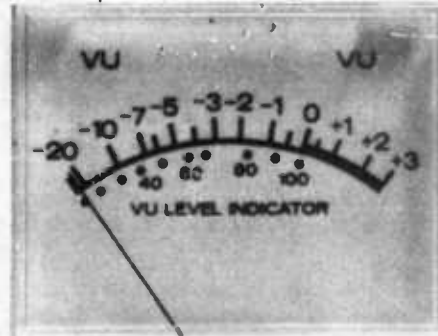
Compact flat faced meters 21 x 37 mm area, 200uA movement (which is not linear, but is nevertheless repeatable). 750 ohm DC coil resistance.



Stock No.	Scale.	1-24	25-99	100+
37-09500	AM/FM tune	2.20	1.85	1.40
37-09501	Power 0.25	2.00	1.25	1.15
37-09502	Power 0.50	2.00	1.25	1.15

## 960 SERIES

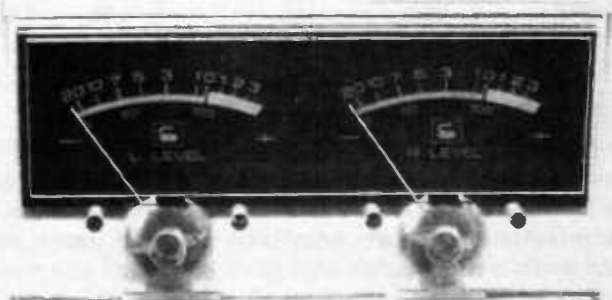
Large flat faced meters, 45 x 62mm face area, with 200uA movement as per 900 series.



Stock No.	Scale	1-24	25-99	100+
37-09600	VU	2.75	2.15	1.85

## 971 SERIES

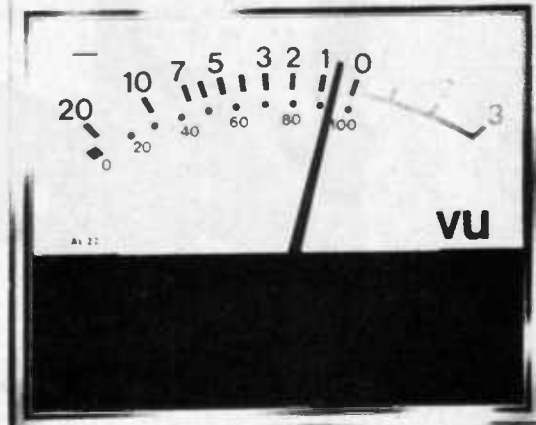
Elegant dual flat faced meters 98 x 30 mm area, each with a 200uA movement (which is not linear, as before). 750 ohm DC coil resistance.



Stock No.	Scale No.	1-24	25-99	100+
37-09710	VU	3.45	2.75	2.15

## SIFAM AUDIO LEVEL INDICATORS

Professional VU meter for non-ferrous panel mounting. Designed for use with 600Ω line, with one external 3k6 resistor. 0VU corresponds to a signal 4vu above 1mW in 600Ω (1.228v). Rise time to -3vu 0.21-0.26 secs.

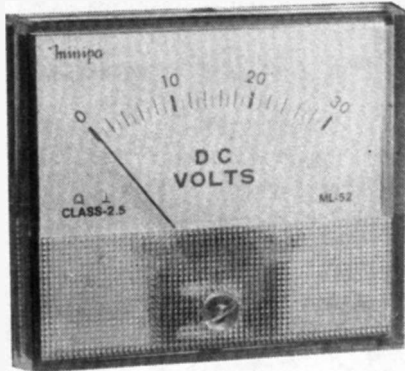


Type	Stock No.	1-4	5-24	25+
AL22	37-22000	9.95	7.60	0A
Bezel	37-22100	0.70	0.65	0A

# METERS/MODULES

## ML52 SERIES

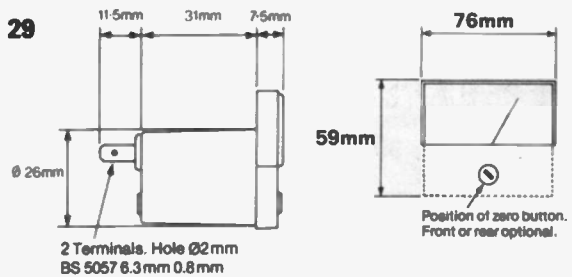
High quality linear meters, 35 x 70mm face area, with jewelled movement of 2% accuracy.



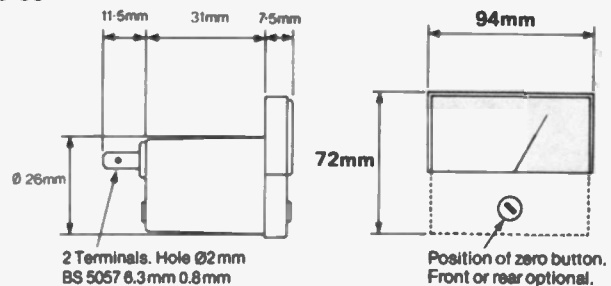
Stock No.	Range	Resistance	1-24	25-99
37-00520	0 - 100uA	3k5	5.35	4.15
37-00521	0 - 1mA	200 ohm	4.95	3.95
37-00522	0 - 1A	100 mohm	4.95	3.95
37-00523	0 - 3A	30 mohm	4.95	3.95
37-00524	0 - 10A	10 mohm	4.95	3.95
37-00525	0 - 15v	1k/v	4.95	3.95
37-00526	0 - 30v	1k/v	4.95	3.95
37-00527	0 - 100v	1k/v	4.95	3.95

## DIMENSIONS

### Type 29



### Type 39



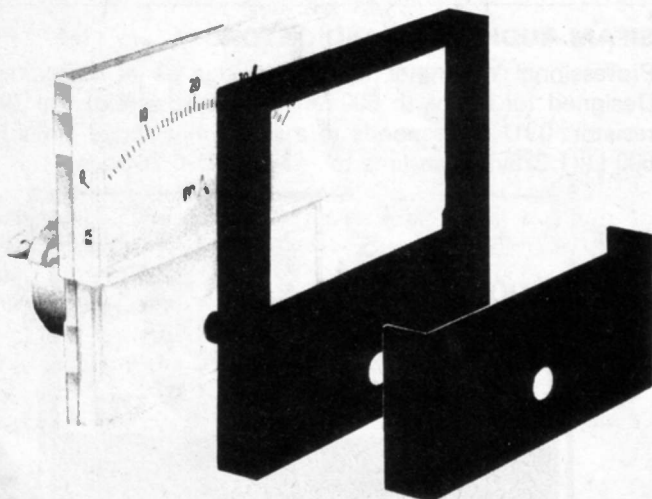
## SIFAM "PRESENTOR" RANGE

Tant-band movements, unaffected when mounted on steel panels. Accuracy 1.5% supplied in accordance with BS89: 1977, IEC51 and USA C39.1. Three forms of mounting are available: from back of panel, front panel with mask or front panel with bezel. Available in a choice of two FSD's and sizes.

Type	FSD	Scale	Mounting	Stock No.
29W	100uA	0-100	Back Panel	37-29041
29M	100uA	0-100	Front, Mask	37-29042
29B	100uA	0-100	Front, Bezel	37-29043
29W	1mA	0-1	Back Panel	37-29101
29M	1mA	0-1	Front, Mask	37-29102
29B	1mA	0-1	Front, Bezel	37-29103
39W	100uA	0-100	Back Panel	37-39041
39M	100uA	0-100	Front, Mask	37-39042
39B	100uA	0-100	Front, Bezel	37-39043
39W	1mA	0-1	Back Panel	37-39101
39M	1mA	0-1	Front, Mask	37-39102
39B	1mA	0-1	Front, Bezel	37-39103

### Prices:

Stock No.	1-4	5-24	25+
37-29041	16.30	11.30	0A
37-29042	16.50	11.50	0A
37-29043	16.60	11.60	0A
37-29101	15.30	10.30	0A
37-29102	15.50	10.50	0A
37-29103	15.60	10.60	0A
37-39041	17.10	12.10	0A
37-39042	17.30	12.30	0A
37-39043	17.40	12.40	0A
37-39101	16.10	11.10	0A
37-39102	16.30	11.30	0A
37-39103	16.40	11.40	0A



Meter

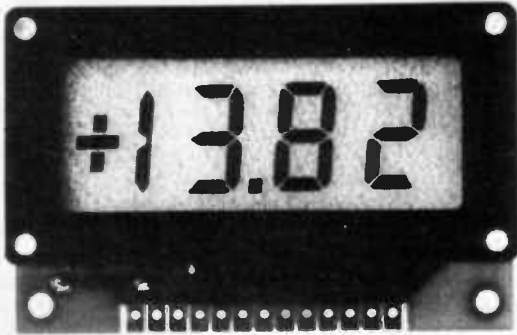
Bezel

Mask

# MODULES

## LCD MODULES

### DVM176 DIGITAL VOLTMETER



A highly attractive compact 3.5 digit LCD panel meter. The unit consumes typically less than 2mA at 9v, and measures 60 x 38 x 16 mm overall. The maximum FSD  $\pm 199.9$  mV. Typical accuracy  $\pm 0.15\%$ . Operating temperature 0° to +50°C.

The built in low battery voltage detector, shows 'BAT' on display when the supply voltage falls to typically 7.2v or less. All the decimal points are externally programmable.

Stock No.	type	1-4	5-24	25-99
38-01760	DVM176	£18.26	16.20	15.10

A panel mounting bezel is also available, see the 'Module' section (Stock No. 40-18012 price £1.00 1-49).

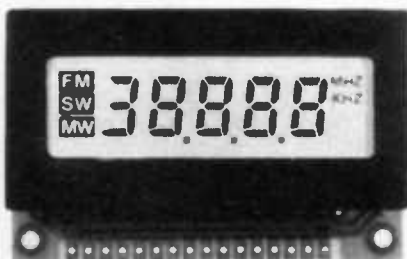
### FC177

A versatile frequency display module with 10.5 mm LCD with built in backlight. Up to 26 DC selectable IF offset programmes enable direct frequency display when used with superhet receivers with IFs in the range 455-470kHz, 10.6MHz to 10.8MHz. The basic module displays up to 3999.9 kHz with 100 Hz resolution. With an additional divide-by-ten prescaler it will display up to 39.999 MHz, with 1 kHz resolution, and with a divide -by-100 prescaler, it will display up to 399.99 MHz with 10 kHz resolution.

Built in annunciators display **MW**, **SW**, **FM**, **kHz** and **MHz**, along with automatic decimal point selection.

The FC177 can also be used as a direct frequency counter without offset.

The required supply voltage is 5 v at 5 mA typical.



L—60 mm  
H—38 mm  
D—10.5 mm

Stock No.	1-9	10-99	100+
39-17700	£20.00	18.00	15.75

### CM172

An LCD clock module with 0.5" digit height. The unit includes a 24 hour alarm with selectable output waveforms and a 10 minute snooze timer. A countdown timer is also available, settable in 1 minute increments from 1 hour to 1 minute. A built in incandescent backlight provides viewing at night.

The unit operates from 1.5 v DC, at typically 10uA. The alarm and snooze indicators are shown on the display.



L—60 mm  
H—30 mm  
D—8.5 mm

Stock No.	1-9	10-99	100+
40-80172	£10.10	8.30	7.55

### CM174/5

LCD clock module with 0.5" digits. Selectable 12/24 hour display format, with 24 hour alarm. The CM174 also features a 24 minute stopwatch (second increments) and a facility for displaying a second time. An additional timer is provided for switching equipment on for preset periods (16, 32, 64 or 128 minutes).

The supply voltage required is 1.5 v DC at 10 uA typically.



L—60 mm  
H—38 mm  
D—8.5 mm

Stock No.	1-9	10-99	100+
40-80174	£10.10	8.30	7.55

### CM161

A miniature LCD clock, ideal for use on equipment where space is limited. The module offers 12 or 24 hour display, 4 year calendar with alpha-numeric day/date - and 24 hour alarm facilities. The crystal controlled time base ensures typical accuracy of better than 2.5 minutes per year.

The module operates from 1.5v DC, at approx. 6 uA consumption. The display height is 6.4 mm, with backlight. The display includes an 'alarm on' indicator.



L—32 mm  
H—18.5 mm  
D—7.5 mm

Stock No.	1-9	10-99	100+
40-80161	£8.25	7.46	7.00



# MODULES

## DM180/181

A compact decoder/display module with a full display from multiplexed BCD inputs. The device is fully TTL/CMOS compatible.

10 mm digit height LCD.

The unit operates from 3.5v to 6v DC at only 20 uA typ. An incandescent backlight is built in for viewing when dark. The **DM180** has a 3.5 digit display, the **DM181** has a 4 digit display. Two decode options are available for either type: Hexadecimal or Code B.

Stock No.	Digits	Code	1-9	10-49	50+
40-18100	3.5	hex	19.95	14.75	13.75
40-18001	3.5	code b	19.95	14.75	13.75
40-18002	4	hex	19.95	14.75	13.75
40-18003	4	code b	19.95	14.75	13.75

## DM182/183

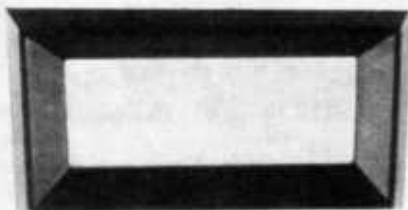
Similar to the DM180/181, but requiring a serial data input. Fully TTL, CMOS and NMOS compatible. Supply requirements 3 - 15v DC at 60 uA typ. Built in backlight, 10 mm high digits.



L: 60 mm  
H: 30 mm  
D: 7 mm

Stock No.	digits	1-9	10-49	50+
40-18010	3.5	14.00	12.65	10.75
40-18011	4	14.00	12.65	10.75

## MOUNTING BEZEL



This provides 'no - hole' fixing for modules type: DVM176, CM172, CM174/5, DM180 - 3.

Stock No.	1-49	50-99	100+
40-18012	1.00	0.95	0.85

## DOT MATRIX DISPLAY DM200

**NEW**



An alpha-numeric LCD dot matrix module with one line, 16 character, 5 x 7 matrix with row 8 as cursor. Bus orientated direct I/F to microprocessor. Max character height 5mm. ASCII format inputs display up to 64 characters. Powerful display instructions to achieve shift, rotate, blink, blank, fast load and power down. Fully controllable cursor. Powerful output instructions such as Get Character, Get Cursor location and Get Display Control Flags. Requires single +5V supply max 8mA. Full data available on request.

Type	Stock No	1-9	10-49	50-99	100+
DM200	40-20000	45.45	39.95	37.95	0A

## MODULES

All modules are sold as built and aligned, or as component kits. We will endeavour to repair/debug non-functioning kits brought from us, but it is necessary to charge for this service at commercial rates. Anyone doubting their constructional ability is advised to buy ready made modules. Tunerheads are available only as built items.

## BAND 2 TUNERHEADS

(Varicap tuning)

### EF5804

2 MOSFET of stages MOSFET mixer, JFET IF preamp, with internally amplified PIN diode AGC. Tuning voltage for 88-108MHz is 2-8v. Buffered LO output. AGC input. 145 x 70 x 24mm.

Stock No.	1-24	25+
40-05804	24.95	19.65

### EF5803

2 MOSFET rf stages, MOSFET mixer with buffered LO output. Tuning voltage for 88-108MHz is 2-11v. AGC input. 145 x 70 x 24mm.

Stock No.	1-24	25+
40-05803	19.75	15.55

### FD811UX

Alps tunerhead, five rf tuned circuits, 1 MOSFET rf stage, MOSFET mixer, buffered LO and IF outputs. 160 x 70 x 26mm.

Stock No.	1-24	25+
40-08110	18.35	14.65

### EF5600U

MOSFET rf stage, buffered IF output. Separate AFC input. Tuning voltage required for 88-108MHz is 3-22v. 90 x 60 x 26mm.

Stock No.	1-24	25+
40-05600	16.00	13.65

### UM1181

Astec produced, 4 tuned rf circuits. MOSFET rf stage, JFET mixer, buffered IF and LO outputs. Tuning volts for 88-108MHz are 2-8v. 97 x 56 x 24mm.

Stock No.	1-24	25+
40-01181	12.00	8.35

### EF5402

Balanced mixer using TDA1062 IC. FET rf amp. PIN diode AGC. Buffered LO output. 105 x 52 x 24mm.

Stock No.	1-24	25+
40-05402	10.75	8.05

# MODULES

## FD128U

MOSFET rf input. With AFC and buffered LO output. 60 x 37 x 20mm.

Stock No.	1-24	25+
40-01280	7.75	5.85

## EC3302

Toko FET rf budget tuner. 66 x 25 x 15mm.

Stock No.	1-24	25+
40-03302	7.50	5.95

## AT3302

Mechanical gang version of EC3302. 2 x 266pF AM gang capacitor with trimmers. 86 x 67 x 42mm.

Stock No.	1-24	25+
40-13302	9.50	7.45

## SPECIAL FREQUENCY TUNERHEADS

Available to special order on types EF5402 and EF5804. Any band in the range 30-200MHz may be covered. The tuning coverage is nominally 20% of the centre frequency.

EF5402 add 7.50 Stock No. 40-85402 + Freq

EF5804 add 12.35 Stock No. 40-85804 + Freq

Delivery usually 28 days.

## TV TUNERHEAD

### UE2-B31

UHF TV Tunerhead, 4 tuned circuits, varicap tuning (0.5-28V), good image rejection, 39.5MHz picture IF, 33.5MHz sound IF.

Stock No.	1-24	25+
40-20031	7.85	6.50

## TV VIDEO MODULATORS

### UM1233

High quality colour video modulator. Replaces earlier unstable types. Output frequency E36. Supply 5v at 6mA. 3dB bandwidth 8MHz. Size 43 x 30 x 13mm. Ideal for use in TV games, VDUs, test generators etc.

Stock No.	1-24	25+
40-01233	4.25	3.85

### UM1286

As UM1233 but with built in 8MHz intercarrier facility. Supply 5v at 9mA. Ideal for TV games requiring special sound effects.

Stock No.	1-24	25+
40-01286	9.55	8.08

## FM TUNERSETS (READY MADE)

High quality modules made by LARSHOLT of Denmark.

### 7252

MOSFET tunerhead with IF amplifier and detector. AF, AFC, AGC and signal outputs (Mono output).

Stock No.	1-24	25+
40-07252	27.50	21.75

### 7254

Complete FM tunerhead from RF input to stereo audio output. TDA1062 based frontend, HA1137 IF with AGC, AFC, centre tuning meter output signal strength output, KB4400 stereo decoder. Osc output for DFM etc. + 12v supply, module size 162 x 62 x 25mm.

Stock No.	1-24	25+
40-07254	27.50	21.75

## WIDE BAND FM IF AMPLIFIERS

### 7020

A low cost WBFM IF system with dual ceramic filter, IF preamps, KB4420 based, AGC, AFC. Centre tuning meter, deviation muting facility and signal strength meter outputs.

Stock No.	1-24	25+
40-97020	Kit	5.75
40-07020	Built	7.95
		7.12

### 7030

All features as 7020 but with linear phase filters and double tuned detector stage.

Stock No.	1-24	25+
40-97030	Kit	8.25
40-07030	Built	11.35
		9.85

### 7130

Dual linear phase filters and a low distortion double tuned detector stage.

Stock No.	1-24	25+
40-07130	Built	16.25
		14.05

### 7230

'Hyperfi' series. A comprehensive FM IF amplifier system with 3 ceramic filters. DC switched bandwidth, slope controlled AFC. Pre IF gain with dual gate AGC controlled MOSFET and cascode IC. The IF system provides all the usual facilities of mute, meter outputs for both centre zero and signal level meters, and ensures low distortion performance through the use of a double tuned low distortion detector.

Stock No.	1-24	25+
40-07230	Built	23.95
		18.50

### 911225A

The 911225A is the 7230 'edited' and shrunk into a screened metal case, 97 x 56 x 24mm. The 911225 is supplied without slope controlled AFC, although the standard version of AFC is available for tuning indication and fine tuning control. The unit is ideally suited to use with synthesised tuner systems.

Stock No.	1-24	25+
40-91225	Built	20.82
		16.25

### 911225B

A complete WBFM IF system, as the 7230, but with dual ceramic filter and single detector. Nevertheless, still a high performance unit at a low price.

Stock No.	1-24	25+
40-91228	Built	13.00
		11.00

## STEREO DECODERS

### 91196B

A high performance stereo decoder based on the HA1196 stereo decoder PLL IC. Complete with built in birdy filter, post - decoder preamp stage, pilot tone filter and 'phasing - type' separation control.

Stock No.	1-24	25+
40-91196	Kit	11.25
40-01196	Built	14.75
		12.95

### 911223

A surprisingly low cost high quality stereo decoder based on the HA11223 pilot cancel PLL decoder IC, with exceptional frequency response and low noise, THD, IMD etc. Pilot tone filtering is provided for 26/38 kHz, since the 19 kHz tone is removed by the phasing technique of the IC.

Stock No.	1-24	25+
40-91223	Kit	10.05
40-01223	Built	12.90
		11.65

### 944378

'Hyperfi' series stereo decoder module, with the TOKO KB4437 pilot cancel PLL IC, birdy filter, and the KB4438 muting stereo audio preamp with 26/38 kHz pilot tone filtering. Built only.

Stock No.	1-24	25+
40-04378		19.95
		18.05

### 944378-2

The complete 944378, squeezed into a screened metal case 97 x 56 x 24mm, but without the preset output level controls.

Stock No.	1-24	25+
40-14378		20.35
		17.85

# MODULES

## FM STEREO ACCESSORIES

### 8001

A linear phase 55 kHz 'birdy' filter for reducing interference from adjacent transmissions that lead to a 'warbling' effect on stereo reception (55kHz LPF)

Stock No.		1-24	25+
40-98001	Kit	2.25	1.95
40-08001	Built	3.50	3.00

### 94423

A stereo FM noise blanker, using the KB4423 impulse noise blanker IC, complete with 55 kHz low pass filter for reducing ignition interference. Suitable for use in auto radios, or at locations where noise from an adjacent road is a problem. Fit between the FM IF strip and stereo decoder.

Stock No.		1-24	25+
40-94423	Kit	5.15	4.55
40-04423	Built	6.75	5.45

## AM BROADCAST MODULES

### 7122

A compact one - band AM receiver based around the HA1197 IC, using 3 stage varicap tuning and a long wire antenna. Available in 4 bands — LW, MW, SW1(1.6-4MHz) and SW2(4-12MHz). One band per module, so please make certain you specify the right one.

Stock No.		1-24	25+
40-97122	MW Kit	9.00	7.95
40-07122	MW Blt	13.22	11.24
40-97123	LW Kit	9.00	7.95
40-07123	LW Blt	13.22	11.24
40-97124	SW1 Kit	9.00	7.95
40-07124	SW1 Blt	13.22	11.24
40-97125	SW2 Kit	9.00	7.95
40-07125	SW2 Blt	13.22	11.24

### 92242

A compact and comprehensive combined FM IF amp and complete AM receiver. Complete DC tuned and switched, with remote ferrite rod AM antenna, DC switching, MW and LW AM section. FM IF with deviation mute, AGC, centre zero meter. The module is built around the ULN2242 IC. Built only.

Stock No.		1-24	25+
40-02242	Built	27.55	23.35

## NARROW BAND FM MODULES

### 94420

Simultaneous AM/FM IF and detector module. Choice of IF: 6, 10.7 or 34.5MHz, AGC and AFC outputs. Built only.

Stock No.		1-24	25+
40-94420	6MHz	9.34	8.42
40-94421	10.7MHz	9.34	8.42
40-94422	34.5MHz	9.34	8.42

### 96640

9 channel DC switched crystal controlled monitor receiver with 100 mW audio output, mute, MOSFET RF and mixer stages, FET IF preamp, 8 pole crystal filter for either 12.5 kHz or 25 kHz channel spacing. The standard unit covers 140-160 MHz, but coils are available for the range 30-180 MHz in approx. 5 MHz bands. 0.3 uV for 10 dB S/N. No crystals are included. Kit only.

#### 1 Channel Version

Stock No.		1-24	25+
40-96640	12.5kHz ch	31.25	26.85
40-96641	25kHz ch	31.25	26.85

#### 9 Channel Version

Stock No.		1-24	25+
40-96642	12.5kHz ch	34.25	31.50
40-96643	25kHz ch	34.25	31.50

### 93357

A complete 10.7 Mhz input NBFM IF module with squelch - based on the MC3357P. CFW series ceramic IF filter, and AGC/AFC. Fixed (10.7MHz) or Tuneable (9-12MHz) IF. Built only.

Stock No.		1-24	25+
40-83357	Fixed	17.85	15.25
40-73357	Tuneable	17.85	15.25

## SSB AND AM COMMUNICATIONS MODULES

### 455F

A DC switched ceramic/mechanical filter unit for use with the FRG7 and similar types of equipment with a 455 kHz IF. A 2 kHz mechanical filter combined with a 4 kHz ceramic ladder filter (SLF/CFG series). In screened case.

Stock No.		1-24	25+
40-07455	Kit	30.55	26.30

### 91600

A sophisticated yet compact and easily made SSB transceiver module with an 8 pole 10.7MHz SSB 2.4kHz bandwidth crystal filter, upper and lower sideband crystals, SBL double balanced mixer for 1-500MHz RF range. SL1600 ICs for TX-RX processing. Simply add an LO and PA for the frequency range required, for full T/R operation over selected bands in the range 1MHz to 500MHz.

Stock No.		1-24	25+
40-91600	Kit	44.00	37.00

## RX80 HF RECEIVER SYSTEM

A complete double conversion superhet receiver as described in *Radio Communication* commencing with the January 1981 issue. The unit uses a 3-4 MHz tunable IF with individually optimized converters covering used-defined 1 MHz bands of the HF spectrum from 1 - 30MHz.

### Article reprints

Complete *RadCom* article from January to June 1981.

Stock No.		1-24	25+
02-00080		1.00	

### RX80IF

The 3-4 MHz tunable SSB IF, with track-tuned RF stage, KB4412 balanced mixer and IF amplifier, choice of 455 kHz SSB mechanical filters. A very stable VFO is provided with a buffered local oscillator output, together with signal level meter, audio derived AGC and 1W audio output. RX80 IF 'A' with CFM2455A filter, RX80 IF 'B' with MFL455L filter, RX80 IF 'C' with Kokusai filter.

Stock No.		1-24	25+
40-80245	RX80IFA	32.45	29.78
40-80455	RX80IFB	42.66	40.00
40-80544	RX80IFC	48.48	45.85

### CV80

The HF convertor for the RX80 system, including the crystal, low noise FET cascode RF stage, MOSFET mixer. Bands available include: 1, 7, 10, 14, 18, 21, 24, 27, 28 and 29 MHz. (The 1MHz convertor is used in conjunction with the 10 MHz band.)

Stock No.	Band	1-24	25+
40-01080	1MHz	9.10	8.19
40-07080	7MHz	9.10	8.19
40-10080	10MHz	9.10	8.19
40-14080	14MHz	9.10	8.19
40-18080	18MHz	9.10	8.19
40-21080	21MHz	9.10	8.19
40-24080	24MHz	9.10	8.19
40-27080	27MHz	9.10	8.19
40-28080	28MHz	9.10	8.19
40-29080	29MHz	9.10	8.19

### ST80

A 'huff and puff' VFO stabilizer. With meter and screened case.

Stock No.		1-24	25+
40-99980	Kit	9.60	8.64

# MODULES

## SW80

A 22 way switch bank for all band and mode switching.

Stock No.		1.24	25+
40-99885	Built	6.40	5.80

## AT80

A pin diode RF attenuator in a screened box with control transistor.

Stock No.		1.24	25+
40-99780	Kit	3.40	3.10

## PS80

A low RF noise 12v PSU specifically designed for the RX80 and other HF receivers. 200mA max.

Stock No.		1.24	25+
40-99680	Kit	7.45	6.71

## CV2

2 metre convertor. 144-146 MHz in, 28-30 MHz out with a MOSFET mixer and RF stage.

Stock No.		1.24	25+
40-80245	Kit	9.10	8.19

## DFM7B

LCD frequency meter for the RX80 system, reading up to 3,999.9 kHz with 1 kHz or 100 Hz resolution.

Stock No.		1.24	25+
40-17780	Built	23.75	21.38

## FM80

Narrow band FM, IF Amp and demodulator module. 455kHz.

Stock No.		1.24	25+
40-45580	Kit	9.95	8.96

## COMPLETE RX80 RECEIVER

The complete receiver kit contains; RX80IFB tunable IF, 6 CV80 convertors (freq. to your choice), DFM7B, Power Supply Unit, switch bank and case, offering a substantial saving over purchasing the individual units.

Stock No.		1.24	25+
40-00080	Kit	134.50	

## HARDWARE KIT

Complete hardware package. Front panel in 10swg aluminium, sprayed black with screen-printed legends. Also included, nuts, bolts, antenna sockets, knobs for pots and switches and bezels for DPM.

Stock No.		1.24	
40-00980	Kit	27.00	

## RADIO CONTROL SYSTEMS

### RCRX4

Developed from the original RCM&E FM receiver, with screened front end coils, 27MHz ceramic filter, FET front end. Including the 'SLM' series servo block and custom plastic case. Kit only.

Stock No.		1.24	25+
40-95071		14.00	12.75

### 94445

FM system transmitter based on TOKO KB4445 IC, with 4 proportional channels, 500mW output, as published in ET1 October 80. (Electronics only kit.)

Stock No.		1.24	25+
40-94445		7.45	6.96

### 94446

Companion FM radio control receiver for 94445, complete with case, and gold plated servo connector. Kit only.

Stock No.		1.24	25+
40-94446		12.40	11.10

## JOYSTICKS

Dual axis control joysticks to suite 94445. 220k pots.

Stock No.		1.24	25+
40-04445		6.10	5.80

## SDI

Servo driver electronics using the NE544 IC. Designed to fit inside standard servos for radio control. Kit only.

Stock No.		1.24	25+
40-90544		2.85	2.40

## SERVO BLOCKS

Gold plated SLM servo connector blocks. 7 way and 9 way (quad split entry).

Stock No.		1.24	25+
40-44460	7 way	1.60	1.44
40-44461	9 way	2.10	1.85

## SERVO PLUGS

'In-line' servo connector block.

Stock No.		1.24	25+
40-44462		0.30	0.24

Plug to suit 'in-line' block and PC types.

Stock No.		1.24	25+
40-44463		0.30	0.24

## 35MHz SYSTEM

Complete 4ch 35MHz Radio Control System. Based around Toko KB 4445/6. 4ch Transmitter, Receiver, 4 servos with mounting trays, cams etc. Sockets provided on TX and RX for recharging optional ni-cads without removing. Pluggable xtals, dual twin axis sticks. Superb value.

Stock No.		Price
40-35004		58.95

## FREQUENCY READOUT SYSTEMS

### DFM1

A complete receiver frequency display using the MSM5524, providing receiver readout for LW/MW/SW to 1kHz resolution and FM to 100kHz resolution. All local oscillator inputs are suitably buffered. All common IF offsets in the range 455kHz (AM/SW) and 10.7MHz (FM) are catered for. Plus a complete clock, stopwatch, timer and alarm functions. In a screened case with 5 x LED display.

Stock No.		1.24	25+
40-55230	Built	42.50	38.00

### DFM1A

As the DFM1, but without the SW functions. 4 x LED display. Clock, timer and stopwatch functions remain intact.

Stock No.		1.24	25+
40-55231	Built	36.50	30.00

### DFMS

A complete push-button switch bank with PCB and diodes to provide all functions used on the DFM1 or DFM1/A

Stock No.		1.24	25+
40-55232	Built	4.50	3.15

### DFM2

A low cost frequency readout with 4 digit liquid crystal display. Buffered input amplifiers etc., MW/LW display with 1kHz resolution. FM displayed with 100kHz resolution.

Stock No.		1.24	25+
40-55233	Kit	21.00	18.50
40-55234	Built	24.95	21.25

### DFM4

The same as DFM2 but with a green fluorescent display.

Stock No.		1.24	25+
40-55235	Kit	21.70	19.50
40-55236	Built	24.70	21.54

### DFM7

A very comprehensive display module using 5 digit LCD. MW/LW to 100Hz resolution, SW (up to 399.999MHz) in 1kHz steps and FM (up to approx. 250MHz with the prescaler used) with 10kHz resolution. All standard IF offsets, plus 2MHz and 10.7MHz for SW. May also be used as direct frequency display. Built only.

Stock No.		1.24	25+
40-17701	Built	29.50	26.80

## AUDIO MODULES

### 92002K

Pair of TDA2002 in stereo mode including heatsink. 8 watts into 2 ohms.

Stock No.		1.24	25+
40-92002	Kit	6.55	5.55



# MODULES

## 91388K

18 watt power amp module based on HA1388 including heatsink, single channel.

40-91388	Kit	6.65	5.65
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## 1370K

Stereo 20 watt module, +/-22v supply, very low THD, independent channels for maximum separation including heatsinks.

Stock No.	1-24	25+	
40-91370	11.35	9.85	

## 912017

Pair HA12017s with PCB and all resistors (2%) and capacitors for R1AA PU input pre-amplifier stage.

40-92017	Kit	8.65	7.25
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## PA101B

HMOS Power Amp module, up to 100w RMS output with meaty enough PSU. THD/IMD -65dB from DC-20kHz, at full power. S/N ratio 95dB +.

Stock No.	1-24	25+	
40-9010	Kit	14.00	12.50

## BARGRAPH METER

20 LED peak reading bar-graph with linear display, adjustable decay and sensitivity, using 2 x LM3914N as in Wireless World August 1980.

Stock No.	1-24	25+	
40-93914	Kit	16.70	15.05

## PA105

As PA101B but can be updated to PA205 with the addition of a pair of HMOS FETs.

Stock No.	1-24	25+	
40-90105	Kit	14.00	12.50

## PA205

As PA101B but with 4 output devices giving 140RMS output.

Stock No.	1-24	25+	
40-90205	Kit	19.00	17.20

## HEATSINK

Heatsink for 100w PA. See hardware section.

Stock No.	1-24	25+	
21-08030		4.50	3.45

## BRACKET-105

Right angle bracket 2 x HMOS FETs to heatsink. See hardware section.

Stock No.	1-24	25+	
21-08040		1.48	1.23

## BRACKET-205

U-Section bracket for 4 HMOS FETs to heatsink. See hardware section.

Stock No.	1-24	25+	
21-08050		2.18	1.98

## METAL DETECTOR - SANDBANKS

Developed from the PW Sandbanks, a pulse induction system with sturdily engineered hardware. Available in kit form only.

Stock No.	1-24	25+	
40-31400	Compl kit	44.00	37.00
40-31401	Hardware	29.00	26.50
40-31402	Electronics	15.00	13.75

## LARSHOLT KITS

Superbly presented kits recommended for all levels of construction experience.

### SIGNALMASTER MK8

Stylish FM tuner in wood cabinet using 7252 tuner with power supply and stereo decoder.

Stock No.	1-9	10+	
40-77252		59.00	42.00

### AUDIOMASTER MK2

Matching the style of the signalmaster MK8, 30w + 30w stereo amp with toroidal mains transformer.

Stock No.	1-24	25+	
40-73030		63.50	55.00

## PROJECT PACKS

### AUTO MODULATION METER

Scans 20-175MHz, locks on signal and gives deviation reading of NBFM signals. From Nov and Dec '81 R&EW. PCB and all components.

Stock No	1-24	25+	
40-20175	Kit	32.44	29.20

### CONVERTER PSU

Adjustable mains power supply. 220-250VAC input. 1.25-14VDC 500 mA (max) output. Regulation better than 1%. From March '82 R&EW.

PCB and all components:

Stock No	1-24	25+	
40-00140	Kit	7.46	6.72

PCB, all components, undrilled cased (93 x 45 x 110mm), connectors, switch etc.

40-00141	Kit	11.71	10.54
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### DFCM 500

Wide range digital frequency and capacitance meter. Frequency ranges; 0-1MHz, 1-50MHz and 80-500MHz. Capacitance ranges; 1pF-1uF and 1uF-1,000uF. 8 digit LED display, mains or Ni-Cad battery operation. Kits available for full 500 MHz version or 50 MHz version (omitting VHF prescalers). Kit includes all PCBs, components there-on, LED display, switches, plug, sockets, and punched and drilled case with painted and printed front panel. From Nov, Dec '81 and Jan '82 R&EW.

### DFCM500

Stock No	1-24	25+	
40-01500	Kit	95.95	86.50

### DFCM50

40-01050	Kit	79.95	70.60
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### FET DIP OSCILLATOR

An essential piece of test equipment for the RF constructor. GDO or WM function covering 1.6-215MHz in five ranges. Audio and meter indication. Kit includes; fibre glass PCB, all components, all hardware, punch, painted and screen printed case, wire etc. for coils and printed scale. From Nov '81 RadCom.

Stock No	1-24	25+	
40-16215	Kit	17.90	16.20

### LS1000

Loudspeaker protection system based around the HA12002. Kit includes PCB, all components, relay and switches. From Oct '81 R&EW.

Stock No	1-24	25+	
40-01020	Kit	12.99	11.70

### MASTHEAD TV PRE-AMP

Ingenuously designed UHF TV Masthead pre-amp. Power fed up centre core of co-ax from base PSU. Complete kit of parts included two case (PSU case punched) mains transformer etc. From January '82 R&EW.

Stock No	1-24	25+	
40-06200	Kit	9.10	8.50

### REWBICHRON — MSF CLOCK

The ultimate timepiece! 12 or 24 hour display, alphanumeric display, microprocessor based, continues running if MSF fails or is lost. From April '82 R&EW.

### Logic Display Board

PCB and all components including pre-built display module and pre-programmed EPROM.

Stock No	1-24	25+	
40-06000	Kit	63.63	56.27

### Receiver Board

PCB and all components.

Stock No	1-24	25+	
40-06002	Kit	8.76	7.89

# MODULES

## TV ANTENNA SELECTOR

DC switched antenna selector and masthead pre-amp. Remotely controlled antenna switch with power feed via co-ax. Jumper lead connection on masthead PCB giving 3 combinations of switch/pre-amp. From Jan '82 R&EW. PSU kit includes mains transformer, undrilled case, PCB and all components. Masthead switch (amp kit includes double-sided PCB, sockets and all components (no case).

Stock No		1-24	25+
40-06020	Kit	16.20	15.58

## TV PATTERN GENERATOR

Pattern Generator for testing and alignment of TV's, based around the ZNA234E, produces dots, crosshatch, vertical lines horizontal lines, lines and greyscale. Sound modulation from internal or external source. From Feb '82 R&EW.

PCB, all components, switches and modulator.

Stock No		1-24	25+
40-08001	Kit	28.50	26.10
As above undrilled case, all hardware and Ni-Cads plus (1.2A Hrs).			
40-08002	Kit	50.39	46.20
As above kit less Ni-Cads.			
40-08003	Kit	43.43	39.80

## UHF CONVERTER

432-434MHz to 28-30MHz converter. Incorporating low noise MOSFET and pre-aligned Helical Filter. Kit includes PCB all components, xtal, case (un-drilled) and sockets. From Nov '82 R&EW.

Stock No		1-24	25+
40-01433	Kit	14.91	13.42

## UHF TO VHF CONVERTER

Dual purpose converter for 70cms to 2m, and 70cms to UHF TV band. Complete kit of parts including xtals as listed below.

Stock No	Xtal Freq	1-24	25+
40-00170	96.0000/96.6667	23.50	21.15
40-00270	96.0000/97.3333	23.50	21.15
40-00370	96.0000/98.0000	23.50	21.15

## 2m MONITOR RX

Complete 2m/UOSAT receiver system. 6ch xtal controlled with AFC facility on 2ch for tracking the doppler shift of UOSAT signals. High performance front end with 3 chamber Helical filter. Sensitivity 0.15uV for 12dB SINAD. PSU, AF amp, IF and RF sections all on one PCB (160 x 100mm). Kit only. From May '82 R&EW.

Less PSU components:

Stock No	Filter	1-24	25+
40-14404	SLF-D12	28.80	26.40
40-14405	LFH12S	24.29	22.00

With Mains PSU:

Stock No	Filter	1-24	25+
40-14406	SLF-D12	32.23	29.90
40-14407	LFH12S	29.74	27.00

## 2m CONVERTER

Low noise 144/5 to 28/9MHz converter. Latest design with low noise MOSFET and 3 chamber helical filter. Complete kit of parts; PCB, all components, xtal, pre-drilled case and sockets. From Oct '81 R&EW.

Stock No		1-24	25+
40-01030	Kit	14.49	13.05

## 2m PRE-AMP

Very compact low-noise MOSFET 2m pre-amp. Gain, 22dB, Noise figure; less than 1.5dB, i/p and o/p impedance; 50Ω, size; 34 x 9 x 15mm. From April '82 R&EW.

Stock No		1-24	25+
40-14400	Kit	2.55	2.30

## 2m POWER AMP

20 watt 144MHz linear power amplifier. 10dB gain, 2W input — 20W output. Automatic switched relay. By-passes power amp in receiver mode. Developed from original class C version in Dec 81 R&EW. High power output relay. Pre-drilled heatsink, optional RX pre-amp. Kit only.

Stock No		1-24	25+
40-14421	Less Pre-Amp	38.50	25.65
40-14422	With Pre-Amp	30.40	27.36

## 4 WAY DISTRIBUTION AMP

4 way, wide band, 5-900MHz broad band distribution amplifier. Thick film amp-gain at 500MHz; 9dB min. 75Ω i/p and o/p impedance. Isolation between outputs; 15dB min. PCB and all components. From May '82 R&EW

Stock No		1-24	25
40-59004	Kit	20.39	18.36

## 27MHz DEVIATION METER

Will read deviation levels of FM transmission within the 27.6-28MHz band. Based around TDA4421. Kit includes PCB, all components and meter. From Oct '81 R&EW.

Stock No		1-24	25+
40-01040	Kit	7.49	6.84

## 70CM PRE-AMP

Compact low-noise pre-amp. Gain at 470MHz; 13dB. I/P and O/P impedance 50Ω. Size; 50 x 10 x 17mm. From March '82 R&EW.

Stock No		1-24	25+
40-07000	Kit	3.90	3.60

## 23CM CONVERTER

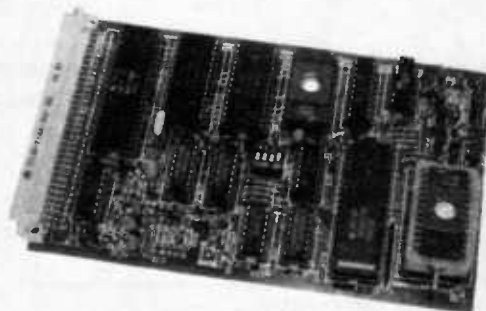
Low noise microwave (1240-1325MHz) converter. 2m or 10m output. Kit includes PCB, xtal and all components. From March '82 R&EW.

Stock No		1-24	25+
40-23144	(2m)	16.91	15.22
40-23028	(10m)	16.91	15.22

## Z-8 TBPDS

A versatile BASIC development system, based on the Z-8 basic/debug CPU. The Z8 TBPDS provides 8k x 8 RAM, 4k x 8 EPROM, containing utility software, and EPROM programming. The Z-8 TBPDS needs only to be connected to an RS232 terminal to provide complete program development/support.

Supported by regular features in Radio & Electronics World magazine.



Stock No		1-24	25+
40-00801	Kit	145.00	0A
40-00802	Built	160.00	0A

**Z-8 interconnect cable**, connects Z-8 to PSU cassette interface, and RS232 terminal.

Stock No		1-24	25+
40-00810		8.00	0A

**Z-8 Datapack**, complete documentation of Z-8 BASIC, and Z8671 CPU. Refundable against purchase of Z-8 kit, built.

Stock		1-24	25+
02-00800		10.00	0A

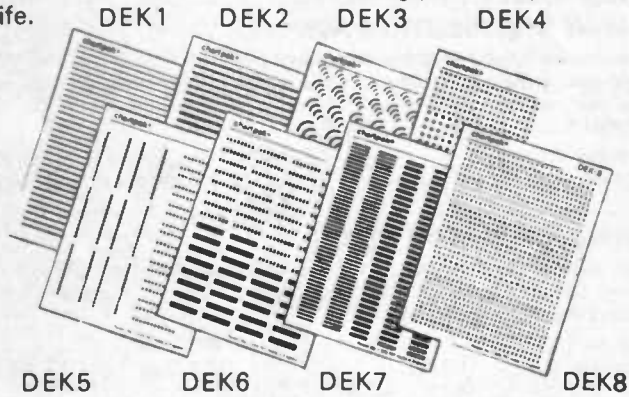
# PCB/DRAFTING AIDS

## PCB AIDS

This system of etch resist transfers is suitable for direct etching of 'one off' prototypes using any type of copper laminate PC board base.

### Starter Pack

A complete pack of 8 transfer sheets (as illustrated below), supplied with a 'rub-down' burnishing pen, and plastic art knife.



Stock No.	Contents.	Price per pack
42-70500	Starter pack	3.95
42-70501	DEK1, DEK2	65p
42-70502	DEK3, DEK4	65p
42-70503	DEK5, DEK6	65p
42-70504	DEK7, DEK8	65p

## PRECISION GRIDS

The basis of any accurate PCB artwork is a precision 'XY' grid with stable dimensions. The types listed here are based on non stretch polyester film, with a matt finish on both sides.

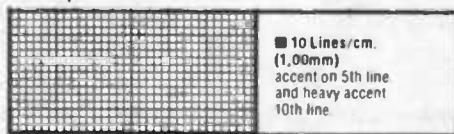
These grids can be used for direct placement of the circuit layout (use the opposite side to the printed grid) - or they can be used in conjunction with polyester based tracing materials. Ordinary acetate and tracing material is **not** suitable for this purpose, since it can warp and distort with temperature and pressure.

### NB

These grids should not be cleaned with ink removers or other spirit based solvents - except on the unprinted side.  
Imperial: 10 lines per inch



Metric: 10 lines per centimetre



Imperial	Metric	Size	Price
Stock No. 42-40800	Stock No. 42-40900	A1	10.60
42-40801	42-40901	A2	5.31
42-40802	42-40902	A3	2.66

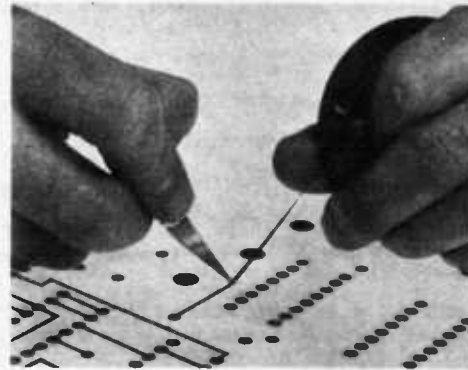
## Translucent film

A 7 thou (0.007") stable polyester film for producing master artworks in conjunction with the above grids. Supplied in A3 (420 x 240mm) sheets.

Stock No.	Price
42-50600	80p

## 'CHARTPAK'

The professional circuit drafting system of drawing tapes, and Die-Cut symbols for 2:1 and 1:1 master PCB artwork.

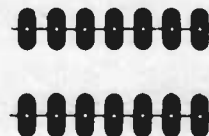


Stock No.	Chartpak No.	width (mm)	length (m)	Price
42-10009	CM005	0.5	16.46	93p
42-10007	CM007	0.7	16.46	93p
42-10010	CM010	1.0	16.46	93p
42-10012	CM012	1.2	16.46	93p
42-10014	CM014	1.4	16.46	93p
42-10015	CM015	1.5	16.46	93p
42-10020	CM020	2.0	16.46	1.06
42-10030	CM030	3.0	16.46	1.34
42-10040	CM040	4.0	16.46	1.86
42-10060	CM060	6.0	16.46	1.91

## Circles with centre hole

Stock No.	Chartpak No.	Ext. Dia.	Int. Dia.	Price £
42-20002	CS0002	1.27	0.38	5.79
42-20008	CS0008	2.03	0.91	5.79
42-20031	CS0031	3.00	0.99	5.79
42-20055	CS0055	3.51	0.99	5.79
42-20082	CS0082	4.06	1.14	5.79
42-20113	CS0113	5.08	1.27	5.79
42-20143	CS0143	6.10	1.02	7.64
42-20163	CS0163	7.11	1.52	7.64

## 16 Pin DIL Package Cluster



Stock No.	Chartpak No.	Size	Price £
42-33073	813073A	1:1	4.17
42-33074	813074A	2:1	5.44

# PCB/DRAFTING AIDS

Stock No.	Chartpak No.	Size	Price £
42-38003	818003A	1:1	4.17
42-38004	818004A	2:1	5.44



Stock No.	Chartpak No.	Size	Price £
42-38009	818009A	1:1	4.17
42-38010	818010A	2:1	5.44



## NOTE:

The above types of Chartpak are carried in quantity. All other Chartpak products available to special order (minimum order value £20 please).

## PCB Prototyping Kit

### General

Complete PCB prototyping kit containing all necessary items to enable fast PC and panel label prototypes to be produced with the minimum of effort.



### Photolab Kit Contents

UV exposure unit with 15 minute adjustable timer.  
 Backing grid for layouts, tracing film, rub-down transfers.  
 PCB developer, trays, etching crystals.  
 PCB material (presensitized)  
 12v hand drill with 3 collets and drill bits.  
 Photographic label making materials.  
 Label developer.  
 Full instructions.

Stock No.	Price
42-60100	£82.00

## FILM SERVICE

Ambit offers a PCB film service normally by return of post. Please mark finished size on artwork.

### Charges for film negatives and positives for PCB Artwork:

Up to A5 finished size negative	£2.00
Up to A5 finished size negative and positive	£3.00
Up to A4 finished size negative	£2.75
Up to A4 finished negative and positive	£4.50

### Maximum size of Artwork A3.

Please supply on translucent film.

VAT is chargeable on the above.

Handling charge per order in addition to p&p charges if ordering other goods 50p.

## COPPER CLAD PCB MATERIAL

Copper laminated board for production of printed circuit boards 1.6mm thick.

### SRBP (Single sided)

Stock No.	Size (mm)	Price:1-24	25+
42-07000	220 x 100	56p	51p
42-07001	234 x 160	87p	78p
42-07002	310 x 220	1.68	1.51

### Fibre Glass (Single sided)

Stock No.	Size (mm)	Price:1-24	25+
42-07010	220 x 100	81p	73p
42-07011	234 x 160	1.30	1.17
42-07012	310 x 220	2.18	1.96

### Fibre Glass (Double Sided)

Stock No.	Size (mm)	Price:1-24	25+
42-07020	234 x 160	1.68	1.51
42-07021	127 x 160	0.95	0.80

### Photo Resist Board

Copper clad fibre glass board with a positive photo resist surface protected by peel-off plastic film. For use with a UV exposure unit. (Such as that supplied with 42-60100). 1.6mm thick.

### Single sided

Stock No.	Size (mm)	Price:1-24	25+
42-07030	160 x 100	1.65	1.45
42-07031	220 x 100	2.05	1.85
42-07032	234 x 220	4.40	4.00

### Double sided

Stock No.	Size (mm)	Price:1-24	25+
42-07040	160 x 100	1.80	1.65
42-07041	220 x 100	2.30	2.05
42-07042	234 x 220	5.00	4.50



# PCB/DRAFTING AIDS

## FERRIC CHLORIDE SOLUTION

1 litre in plastic bottle.

Stock No.	Price: 1-24	25+
42-60110	£2.30	£2.00

## Tinplate solution

1 litre in plastic bottle.

Stock No.	1-24	25+
42-60120	£3.20	£3.00

## NOTE:

Available to callers only owing to PO restrictions on the nature of goods sent through the post.

## SENO ETCHING SYSTEM

A convenient easy to use etching method for easy — non mess results. Supplied with dry pack etchant which is activated using tap water (measure provided). No direct contact ever with etchant. When exhausted mix with supplied chemical and dispose in dustbin. Enough to etch approx 1600cm<sup>2</sup> (10 Eurocards).

**new**



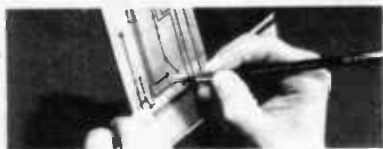
Stock No	Price
42-92000	5.30

## ETCH RESIST PEN (DALO)

Special etch resist ink pen for direct circuit layout onto PCB. Supplied with spare tip. Allow to dry for 15 minutes before etching.

**new**

Stock No	Price
42-92001	1.20



## PCB ERASER/CLEANER

Polyfix block for degreasing and cleaning copper clad board and other metallic surfaces. Size 40 x 30 x 20.

**new**

Stock No	Price
42-92002	1.10



## DRAWING PEN

High quality drawing pens for drawing template and general circuit diagram etc work. The pen tip is chrome-nickel steel with unique no-blob ink feed system. Full instructions supplied with pen.

**NEW**  
**marshmatic700**



with double seal

Type	Tip Size	Stock No	Price
700	0.25mm	51-20000	4.10
700	0.35mm	51-20001	4.00
700	0.5mm	51-20002	4.00

## SPORTS LCD QUARTZ STOPWATCH

Features : Stopwatch with 1/100ths of a second, normal time with seconds display and selectable 12/24 format, 24 hour alarm selectable hourly chime, selectable European/US date formats, pace maker 'bleeper' for joggers etc. Complete with neck cord.



Stock No.	Price
40-20001	£12.50

# QUARTZ CRYSTALS

## CRYSTALS

There are a large number of stock types listed here. Those below are for general applications in radio, microprocessor/ digital circuitry and frequency standards. All crystals are hermetically sealed metal can types and detailed by case style. All crystals below 40MHz are parallel resonance, while those above 40MHz are series resonance.

Frequency	Case Style	Load capacitance pF	Uses	Stock No.	1-9	Price £ 10-99	100-999
32.768kHz	Submin		miniature watch crystal	45-32900	2.70	1.95	
100.0	HC13U	32	Frequency standard	45-10900	3.85	3.25	
455.0	HC6U	32	B.F.O.	45-45900	5.00	4.25	
1.0000MHz	HC33U	32	Frequency standard	45-01000	3.50	3.15	2.65
1.8430	HC33U	13	MC14411 baud rate	45-00184	3.00	2.25	1.75
2.0000	HC33U	30	Frequency standard	45-00200	2.70	1.75	1.25
2.4576	HC33U	30	MPU	45-24576	2.70	1.75	1.25
2.5000	HC33U	50	MPU	45-00250	2.70	1.75	1.25
3.0000	HC18U	30	Frequency standard	45-00300	2.50	1.60	0.95
3.2768	HC18U	32	divided by 2 <sup>16</sup> gives 50MHz	45-03000	2.00	1.45	0.95
3.7000	HC18U	30	Clock rates, synthesisers etc.	45-04005	2.70	1.75	1.25
4.0000	HC18U	30	MPU, clocks etc.	45-04000	1.70	1.40	0.80
4.032	HC18U	30	TV pulse generator (US)	45-04001	1.70	1.40	0.80
4.0960	HC18U	30	divided by 2 <sup>12</sup> gives 1kHz	45-04002	1.70	1.40	0.80
4.194394	HC18U	30	divided by 2 <sup>22</sup> gives 1Hz	45-04003	1.95	1.70	0.95
4.433619	HC18U	30	TV colour sub carrier	45-04004	1.25	0.95	0.75
4.6080	HC18U	30	MPU	45-00460	2.00	1.55	1.05
4.9152	HC18U	30	MPU	45-00491	2.00	1.55	1.05
5.0000	HC18U	32	Clock frequency MPUS	45-05000	2.00	1.70	0.85
5.1200	HC18U	30	Clock frequencies	45-05001	2.00	1.70	0.85
5.9980	HC18U	30	MPUs, clock generators	45-05002	2.00	1.70	0.85
6.0000	HC18U	30	MPU	45-00600	2.00	1.55	1.05
6.1440	HC18U	30	MPU	45-00614	2.00	1.55	1.05
6.4000	HC18U	30	MPU	45-00640	2.00	1.55	1.05
6.5536	HC18U	32	divided by 2 <sup>17</sup> gives 50Hz, clocks etc.	45-06000	2.00	1.70	0.85
7.0000	HC18U	30	Frequency standard	45-07000	2.00	1.70	0.85
7.3728	HC18U	30	28 MPU	45-00737	2.25	1.95	1.25
7.6800	HC18U	30	Bit rate generators	45-07001	2.00	1.70	0.85
8.0000	HC18U	30	MPU	45-00800	2.00	1.55	1.05
8.9985	HC18U	30	SSB carrier	45-00899	2.00	1.55	1.05
9.0000	HC18U	30	BFO, converters	45-09000	2.00	1.70	0.85
9.0015	HC18U	30	SSB carrier	45-09001	2.00	1.70	0.85
10.000	HC18U	32	Frequency standard	45-10000	2.00	1.65	0.95
10.240	HC18U	30	CB synthesiser	45-10001	2.00	1.65	0.95
10.245	HC45U (min)	30	2nd LO	45-10002	3.40	2.90	2.55
10.245	HC18U	30	2nd LO	45-10003	2.00	1.55	1.05
10.6985	HC18U	30	USB carrier	45-10004	2.50	1.75	1.25
10.700	HC18U	30	IF/BFO standard	45-10005	2.00	1.55	1.05
10.7015	HC18U	30	LSB carrier	45-10006	2.00	1.55	1.05
11.000	HC18U	30	Converter (14 Mhz/3 MHz)	45-11000	2.00	1.55	1.05
11.115	HC18U	30	10.7/455 converter	45-11001	2.00	1.55	1.05
11.520	HC18U	30	Used in HSYNTH radio	45-11002	2.00	1.55	1.05
15.000	HC18U	30	MPU, 8080 (8224)	45-15000	2.70	1.75	1.25
16.2333	HC18U	30	Clocks etc.	45-16000	2.70	1.75	1.25
18.000	HC18U	30	MPUS 8080 (8224)	45-18000	2.70	1.75	1.25
19.9680	HC18U	series	MPU	45-01996	2.00	1.55	1.05
20.000	HC18U	30	MPU	45-02000	2.00	1.55	1.05
21.000	HC18U	30	3rd overtone for HF converter	45-21000	2.00	1.55	1.25
24.000	HC18U	30	3rd overtone for HF converter	45-24000	2.00	1.55	1.25
25.000	HC18U	30	3rd overtone for HF converter	45-25000	2.00	1.55	1.25
26.000	HC18U	30	3rd overtone for HF converter	45-26000	2.00	1.55	1.25
38.66667	HC18U	series	144/28MHz converter	45-03866	2.70	1.75	1.25
44.88889	HC18U	series	VHF converter injection osc	45-44000	2.70	1.75	1.25
48.000	HC18U	series	MPU	45-04800	2.00	1.55	1.05
58.000	HC18U	series	VHF converter injection osc	45-58000	2.70	1.75	1.25
96.000	HC18U	series	UHF/VHF converter	45-09600	4.60	3.90	3.20
96.66667	HC18U	series	Converter	45-09666	4.60	3.90	3.20
97.33333	HC18U	series	Converter	45-09733	4.60	3.90	3.20
98.0000	HC18U	series	Converter	45-09800	4.60	3.90	3.20
100.000	HC18U	series	Frequency standard	45-10100	3.00	2.45	2.00
105.6666	HC18U	series	Converter	45-10566	4.60	3.90	3.20
116.000	HC18U	series	144/28MHz converters	45-16100	3.00	2.45	2.00

# QUARTZ CRYSTALS

## RADIO CONTROL CRYSTALS

Below is a selection of plug-in crystals for 27/35MHz Radio Control systems. They are sold as single crystals for replacements, or as pairs at a slightly lower price (NO SPLITS). The crystals are metal can type of identical size to HC18/U but pin ended so that they can be plugged into crystal sockets or cage jacks.

Note: AM TX equals 3rd overtone, AM/FM RX equals 3rd overtone, FM TX equals Fundamental.



Frequency	Load capacitance pF	Colour/Channel Number	Stock No.	Price £			
				1-9	10-99	100-999	1k+
13.4975MHz	20	TX 27MHz FM, Brown	45-13000	1.85	1.60	1.20	0.95
13.5225MHz	20	TX 27MHz FM, Red	45-13001	1.85	1.60	1.20	0.95
13.5475MHz	20	TX 27MHz FM, Orange	45-13002	1.85	1.60	1.20	0.95
13.6275MHz	20	TX 27MHz FM, Blue	45-13004	1.85	1.60	1.20	0.95
13.5725MHz	20	TX 27MHz FM, Yellow	45-13005	1.85	1.60	1.20	0.95
13.5975MHz	20	TX 27MHz FM, Green	45-13006	1.85	1.60	1.20	0.95
26.540MHz	30	RX 27MHz (FM or AM), Brown	45-26000	1.65	1.25	0.85	0.72
26.590MHz	30	RX 27MHz (FM or AM), Red	45-26001	1.65	1.25	0.85	0.72
26.640MHz	30	RX 27MHz (FM or AM), Orange	45-26002	1.65	1.25	0.85	0.72
26.300MHz	30	RX 27MHz (FM or AM), Blue	45-26003	1.65	1.25	0.85	0.72
26.690MHz	30	RX 27MHz (FM or AM), Yellow	45-26004	1.65	1.25	0.85	0.72
26.740MHz	30	RX 27MHz (FM or AM), Green	45-26005	1.65	1.25	0.85	0.72
17.505MHz	20	TX 35MHz FM Channel 61	45-17000	1.85	1.60	1.20	0.95
17.515MHz	20	TX 35MHz FM Channel 63	45-17001	1.85	1.60	1.20	0.95
17.525MHz	20	TX 35MHz FM Channel 65	45-17002	1.85	1.60	1.20	0.95
17.535MHz	20	TX 35MHz FM Channel 67	45-17003	1.85	1.60	1.20	0.95
17.545MHz	20	TX 35MHz FM Channel 69	45-17004	1.85	1.60	1.20	0.95
17.555MHz	20	TX 35MHz FM Channel 71	45-17005	1.85	1.60	1.20	0.95
17.565MHz	20	TX 35MHz FM Channel 73	45-17006	1.85	1.60	1.20	0.95
17.575MHz	20	TX 35MHz FM Channel 75	45-17007	1.85	1.60	1.20	0.95
17.585MHz	20	TX 35MHz FM Channel 77	45-17008	1.85	1.60	1.20	0.95
17.595MHz	20	TX 35MHz FM Channel 79	45-17009	1.85	1.60	1.20	0.95
34.565MHz	30	RX 35MHz FM Channel 61	45-34000	1.65	1.25	0.85	0.72
34.575MHz	30	RX 35MHz FM Channel 63	45-34001	1.65	1.25	0.85	0.72
34.595MHz	30	RX 35MHz FM Channel 65	45-34002	1.65	1.25	0.85	0.72
34.615MHz	30	RX 35MHz FM Channel 67	45-34003	1.65	1.25	0.85	0.72
34.635MHz	30	RX 35MHz FM Channel 69	45-34004	1.65	1.25	0.85	0.72
34.655MHz	30	RX 35MHz FM Channel 71	45-34005	1.65	1.25	0.85	0.72
34.675MHz	30	RX 35MHz FM Channel 73	45-34006	1.65	1.25	0.85	0.72
34.695MHz	30	RX 35MHz FM Channel 75	45-34007	1.65	1.25	0.85	0.72
34.715MHz	30	RX 35MHz FM Channel 77	45-34008	1.65	1.25	0.85	0.72
34.735MHz	30	RX 35MHz FM Channel 79	45-34009	1.65	1.25	0.85	0.72
		FM Pairs		3.25			
		AM Pairs		3.10			

## Case Styles

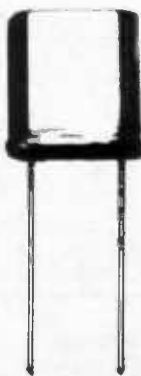
Shown approx actual size.



HC-13/U



HC-6/U



HC-33/U



HC-25/U



HC-18/U



HC-45/U

# RELAYS

## RELAYS

### KU1T-A SERIES

Miniature PC mounting relays, 16 x 21 x 18(H) mm. SPDT contact rated at 125 v AC, 60 v DC, at 1 amp maximum. All types operate at 80% of the rated voltage, and drop out at 10% of the rated voltage.



Coil voltage	Coil res	Stock No.	1-24	25-99	100+
6v	100 ohms	46-80000	44p	32p	30p
9v	225 ohms	46-80001	44p	32p	30p
12v	400 ohms	46-80002	44p	32p	30p

### KU1T-B SERIES

Miniature PCB mounting relay with silver contacts. SPDT contact rated at 125 v AC, 60 v DC at 3 amps maximum. All types operate at 80% of rated voltage, and dropout at 10% of rated voltage.



L-21 mm  
W-16 mm  
H-18 mm

Coil voltage	Coil resistance	Stock No.	1-24	25-99	100+
6v	100 ohms	46-80010	80p	64p	60p
9v	225 ohms	46-80011	80p	64p	60p
12v	400 ohms	46-80012	80p	64p	60p

### KS1-P SERIES

Ultra miniature PC mounting relays, with SPDT contacts rated at 125 v AC, 24 v DC at 1 amp.

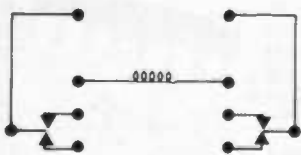


L-19 mm  
W-16 mm  
H-14 mm

Coil volt	Coil res	Stock No.	1-24	25-99	100+
12v	400 ohms	46-80020	44p	32p	30p

### OUB SERIES

Sub miniature PCB mounting relay with silver contacts. DPDT contacts are rated at 100 v AC, 24 v DC at 2 amps.



L-17.5 mm  
W-9.8 mm  
H-11 mm

Coil voltage	Coil res.	Stock No.	1-24	25-99	100+
12v	400 ohms	46-70030	£1.70	1.36	1.25

### OUC SERIES

Ultra-miniature PC mounting relay. SPDT contacts rated 1A at 230VAC, 2A 24VDC. Silver contact with gold plating.

**NEW**

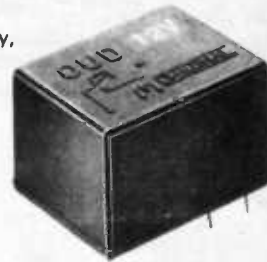


L-9.7 mm  
W-6.8 mm  
H-8.5 mm

Coil voltage	Coil resistance	Stock No.	1-24	25-99	100+
12v	320 ohms	46-70040	£1.05	88p	78p

### OOD SERIES

Miniature PC mounting relay, SPDT contact rated at 120 v AC, 30 v DC, at 10 amp maximum.



L-22 mm  
W-17 mm  
H-18 mm

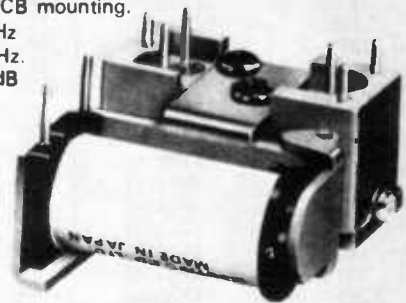
Coil voltage	Coil resistance	Stock No.	1-24	25-99	100+
12v	400 ohms	46-70050	£2.30	2.05	1.86

### COAXIAL RELAY CX-120P (Max 2.5GHz)

High quality RF relay for PCB mounting.

Max input 150W (at 500MHz PEP). Max frequency 2.5GHz. Insertion loss less than 0.2dB at 2.5GHz. Isolation more than 40dB at 500MHz.

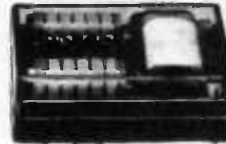
Impedance 50 ohms. Coil voltage 12VDC, size 35W x 35D x 18Hmm. Weight approx 70gms.



Type	Stock No.	1-9	10+
CX-120P	46-90120	10.95	8.65

### KW SERIES

Miniature low profile relay for PCB mounting. Contacts rated 220VAC 2A, 24VDC 3A.



L-32mm  
W-30mm  
H-11.5mm

Coil Voltage	Coil Resistance	Contacts	Stock No	1-24	25-99	100+
6V	125	DPDT	46-80021	1.85	1.65	1.55
6V	125	4PDT	46-80022	2.05	1.85	1.75
12V	500	DPDT	46-80023	1.85	1.65	1.55
12V	500	4PDT	46-80024	2.05	1.85	1.75

### KV SERIES

Ultra small, DIL relay. Contacts rated at 110V AC 0.5 amps. 24V DC 1 amp. DPDT only.



L-20.5mm  
W-10.5mm  
H-11.5mm

Coil Voltage	Coil Resistance	Stock No.	1-24	24-99	100+
6V	80	46-80025	1.50	1.32	1.20
12V	180	46-80026	1.50	1.32	1.20

### DIL REED RELAY

Encapsulated DIL reed relay with single pole contacts. Built in diode for back EMF protection. Contacts rated at 0.5A 100VDC. Coil voltage 5V (max 17V).

L - 20mm  
W - 6.4mm  
H - 6.4mm



**NEW**

Type	Resistance	Stock No	1-9	10+
E-1A-5V-D	500	46-61500	1.50	1.40



# RESISTORS

## RESISTORS

### CARBON FILM - 0.125W

Small, high stability resistors 5% tolerance. L 4.1mm Dia 1.1mm

Value	Stock No.
1	47-10941
1.5	47-15941
1.8	47-18941
2.2	47-22941
2.7	47-27941
3.3	47-33941
3.9	47-39941
4.7	47-47941
5.6	47-56941
6.8	47-68941
8.2	47-82941
10	47-10041
15	47-15041
22	47-22041
33	47-33041
47	47-47041
68	47-68041
100	47-10141
120	47-12141
150	47-15141
180	47-18141
220	47-22141
270	47-27141
330	47-33141
390	47-39141
470	47-47141
560	47-56141
680	47-68141
820	47-82141
1k	47-10241
1.2k	47-12241
1.5k	47-15241
1.8k	47-18241
2.2k	47-22241
2.7k	47-27241
3.3k	47-33241
3.9k	47-39241
4.7k	47-47241
5.6k	47-56241
6.8k	47-68241
8.2k	47-82241
10k	47-10341
12k	47-12341
15k	47-15341
18k	47-18341
22k	47-22341
27k	47-27341
33k	47-33341
39k	47-39341
47k	47-47341
56k	47-56341
68k	47-68341
82k	47-82341
100k	47-10441
120k	47-12441
150k	47-15441
180k	47-18441
220k	47-22441
270k	47-27441
330k	47-33441
390k	47-39441
470k	47-47441
560k	47-56441
680k	47-68491
820k	47-82441
1M	47-10541

0.125 watt carbon film  
(10 per pack). Price per pack

1.24	25+
30p	25p

### CARBON FILM 0.25W

Tolerance 5%  
L 7mm Dia 2.1mm

Value	Stock No.
1	47-10942
1.5	47-15942
1.8	47-18942
2.2	47-22942
2.7	47-27942
3.3	47-33942
3.9	47-39942
4.7	47-47942
5.6	47-56942
6.8	47-68942
8.2	47-82942
10	47-10042
12	47-12042
15	47-15042
18	47-18042
22	47-22042
27	47-27042
33	47-33042
39	47-39042
47	47-47042
56	47-56042
68	47-68042
82	47-82042
100	47-10142
120	47-12142
150	47-15142
180	47-18142
220	47-22142
270	47-27142
330	47-33142
390	47-39142
470	47-47142
560	47-56142
680	47-68142
820	47-82142
1k	47-10242
1.2k	47-12242
1.5k	47-15242
1.8k	47-18242
2.2k	47-22242
2.7k	47-27242
3.3k	47-33242
3.9k	47-39242
4.7k	47-47242
5.6k	47-56242
6.8k	47-68242
8.2k	47-82242
10k	47-10342
12k	47-12342
15k	47-15342
18k	47-18342
22k	47-22342
27k	47-27342
33k	47-33342
47k	47-47342
56k	47-56342
68k	47-68342
82k	47-82342
100k	47-10442
120k	47-12442
150k	47-15442
180k	47-18442
220k	47-22442
270k	47-27442
330k	47-33442
390k	47-39442
470k	47-47442
560k	47-56442
680k	47-68442
820k	47-82442
1.0M	47-10542
1.2M	47-12542
1.5M	47-15542
1.8M	47-18542

2.2M	47-22542
2.7M	47-27542
3.3M	47-33542
3.9M	47-39542
4.7M	47-47542
5.6M	47-56542
6.9M	47-68542
8.2M	47-82542
10M	47-10642

10 resistors per pack  
Price per pack

1.24	25+
15p	12p

### METAL FILM 0.25W

Tolerance 1%  
High stability  
L7mm Dia 2.1mm

Value	Stock No.
1.1	47-11972
1.2	47-12972
1.5	47-15972
1.8	47-18972
2.2	47-22972
2.7	47-27972
3.3	47-33972
3.9	47-39972
4.7	47-47972
5.6	47-56972
6.8	47-68972
8.2	47-82972
10	47-10072
12	47-12072
15	47-15072
18	47-18072
22	47-22072
27	47-27072
33	47-33072
39	47-39072
47	47-47072
56	47-56072
68	47-68072
82	47-82072
100	47-10172
120	47-12172
150	47-15172
180	47-18172

220	47-22172
270	47-27172
330	47-33172
390	47-39172
470	47-47172
560	47-56172
680	47-68172
820	47-82172
1k	47-10272
1.2k	47-12272
1.5k	47-15272
1.8k	47-18272
2.2k	47-22272
2.7k	47-27272
3.3k	47-33272
3.9k	47-39272
4.7k	47-47272
5.6k	47-56272
6.8k	47-68272
8.2k	47-82272
10k	47-10372
12k	47-12372
15k	47-15372
18k	47-18372
22k	47-22372
27k	47-27372
33k	47-33372
47k	47-47372
56k	47-56372
68k	47-68372
82k	47-82372
100k	47-10472
120k	47-12472
150k	47-15472
180k	47-18472
220k	47-22472
270k	47-27472
330k	47-33472
390k	47-39472
470k	47-47472
560k	47-56472
680k	47-68472
820k	47-82472
1M	47-10572

Price per pack of 10

1.24	25+
35p	30p

### SIL RESISTOR ARRAYS

5% resistor networks. 8 resistors with one common pin  
L-23mm H-5mm D-2.5mm

Value	Stock No.	1-9	10+
220	48-22000	30p	28p
330	48-33000	30p	28p
1k	48-10000	30p	28p
4k7	48-47000	30p	28p



### PRECISION METAL FILM

Precision resistors for use as meter and instrument shunts/multipliers for current and voltage measurements.

Tolerance 0.5%, temperature coefficient 100ppm/°C. Size up to 900k:  
9.5mm x 3.5mm, 900k and 9M: 15.5mm x 4.2mm.

Value	Stock No.	1-24	25+
10	48-10012	0.24	0.20
100	48-10112	0.16	0.14
1k0	48-10212	0.16	0.14
10k	48-10312	0.16	0.14
100k	48-10412	16p	14p
1M	48-10512	16p	14p
10M	48-10612	68p	58p
900	48-90112	18p	14p
9K	48-90212	16p	14p
90k	48-90312	0.16	0.14
900k	48-90413	0.16	0.14
9M	48-90513	0.68	0.58

# RESISTORS

## PRESET TRIMMER POTENTIOMETERS

### Low cost carbon 10 mm format

Miniature horizontal carbon film presets, suitable for PCB mounting. The exact style may vary slightly according to availability - tolerance 20%. Rated at 0.15 w at 40°C.

Value	Stock No.	1-24	25+
100	48-10101	10p	8p
470	48-47101	10p	8p
1k0	48-10201	10p	8p
1k5	48-15201	10p	8p
4k7	48-47201	10p	8p
10k	48-10301	10p	8p
22k	48-22301	10p	8p
47k	48-47301	10p	8p
100k	48-10401	10p	8p
470k	48-47401	10p	8p
1M0	48-10501	10p	8p
2M5	48-25501	10p	8p



10 mm  
5 mm  
PCB spacing  
all types



### Cermet preset on 10 mm format

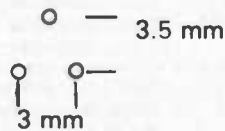
Miniature presets with enclosed metal film track, deposited on a high stability alumina substrate. tolerance: 20% rated at 0.33 w at 70°C.

Value	Stock No.	1-24	25+
1k0	48-10202	27p	20p
5k0	48-50202	27p	20p
10k	48-10302	27p	20p

### Sub-miniature 6 mm diameter presets

A totally enclosed track preset, with a rugged adjustment cap suitable for standard small screwdriver. Rated 0.05 w at 50°C, tolerance 25%.

Body height 7 mm



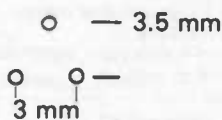
Value	Stock No.	1-24	25+
100	48-10103	20p	18p
470	48-47103	20p	18p
1k0	48-10203	20p	18p
4k7	48-47203	20p	18p
10k	48-10303	20p	18p
22k	48-22303	20p	18p
47k	48-47303	20p	18p
100k	48-10403	20p	18p
470k	48-47403	20p	18p

### Sub-miniature 6mm diameter cermet presets

A totally enclosed track preset, with a rugged adjustment cap suitable for standard small screwdriver. Rated 0.30 w at 70°C, tolerance 25%.

Type HO621A

Body height 7 mm



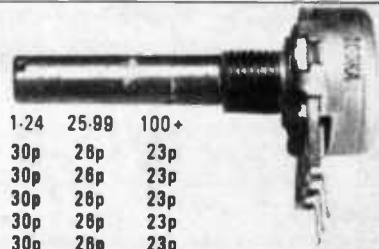
Value	Stock No.	1-24	25+
100	48-10104	31p	24p
1k0	48-10204	31p	24p
4k7	48-47204	31p	24p
10k	48-10304	31p	24p
22k	48-22304	31p	24p
100k	48-10404	31p	24p

## Variable Carbon Types

Supplied with PC/Wire on tags. Round shafts 6mm dia, with 7mm bush. M8 x 0.75 washer and fixing nut supplied.

### VM10R Style

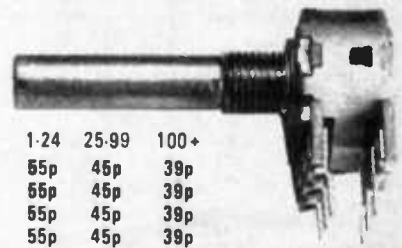
Value	Stock No.	1-24	25-99	100+
500R Lin	48-50113	30p	28p	23p
1k Lin	48-10213	30p	28p	23p
5k Lin	48-50213	30p	28p	23p
10k Lin	48-10313	30p	28p	23p
20k Lin	48-20313	30p	28p	23p
50k Lin	48-50313	30p	28p	23p
100k Lin	48-10413	30p	28p	23p
500k Lin	48-50413	30p	28p	23p
1M Lin	48-10513	30p	28p	23p
5k Log	48-50214	30p	28p	23p
10k Log	48-10314	30p	28p	23p
20k Log	48-20314	30p	28p	23p
50k Log	48-50314	30p	28p	23p
100k Log	48-10414	30p	28p	23p
500k Log	48-50414	30p	28p	23p
1M Log	48-10514	30p	28p	23p



### GM70R Style

Dual gang

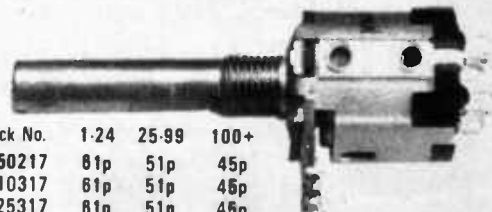
Value	Stock No.	1-24	25-99	100+
10k Lin	48-10315	55p	45p	39p
25k Lin	48-25315	55p	45p	39p
100k Lin	48-10415	55p	45p	39p
1M Lin	48-10515	55p	45p	39p
5k Log	48-50216	55p	45p	39p
10k Log	48-10316	55p	45p	39p
25k Log	48-25316	55p	45p	39p
100k Log	48-10416	55p	45p	39p
1M Log	48-10516	55p	45p	39p



### VM11R Style

Single gang with rotary switch. Switch rating 3A/30VDC.

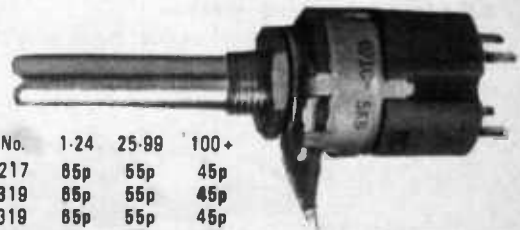
Value	Stock No.	1-24	25-99	100+
5k Lin	48-50217	81p	51p	45p
10k Lin	48-10317	81p	51p	45p
25k Lin	48-25317	81p	51p	45p
5k Log	48-50218	81p	51p	45p
10k Log	48-10318	81p	51p	45p
25k Log	48-25318	81p	51p	45p



### VM13R Style

Single gang, pull push on/off switch. Switch rating 3A/30VDC.

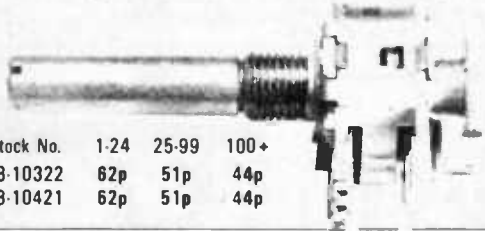
Value	Stock No.	1-24	25-99	100+
5k Lin	48-50217	85p	55p	45p
10k Lin	48-10319	85p	55p	45p
25k Lin	48-25319	85p	55p	45p
100k Lin	48-10419	85p	55p	45p
5k Log	48-50220	85p	55p	45p
10k Log	48-10320	85p	55p	45p
25k	48-25320	85p	55p	45p



# RESISTORS-VARIABLE

## GM80ER Style

41 click stop dual. Similar to GM70R but with 41 preset click-stop positions.



Value	Stock No.	1-24	25-99	100+
10k Log	48-10322	62p	51p	44p
100k Lin	48-10421	62p	51p	44p

## GM70ER Style

Dual gang and centre click. Similar to GM70R but with centre travel click.

Value	Stock No.	1-24	25-99	100+
50k Lin	48-50323	55p	47p	43p
100k Lin	48-10424	55p	47p	43p
100k Balance	48-10425	55p	47p	43p

## AB47

Miniature preset 100k diode low, 22 turn.

Knob	Stock No.	1-24	25-99	100+
20mm	48-10405	50p	40p	30p
10mm	48-10406	50p	40p	30p
20mm thumb	48-10407	50p	40p	30p

## Ten-turn wirewound

A high quality, high resolution multiturn potentiometer with precious metal wiper for long life and silent operation. 9mm diameter shaft. Tolerance 5%. Rated at 1.5 W at 40°C.

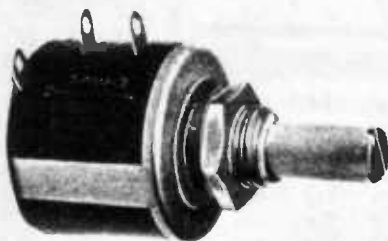


Body length: 46 mm  
Shaft length: 24 mm  
Diameter: 13 mm  
Mounting hole: 10 mm

Value	Stock No.	1-24	25+
50k	48-50309	£6.50	4.95

## 3W rated ten turn pot

A high quality ten turn 3W potentiometer, rated at 3 W/40°C. Tolerance 5%, 9 mm diameter shaft.



Body length: 19 mm  
Shaft length: 15 mm  
Diameter: 22 mm  
Mounting hole: 10 mm

Value	Stock No.	1-24	25+
10k	48-10310	£4.45	4.05

## Low cost carbon track multiturn

A low cost alternative multiturn pot. Based on a 300° pot with a 5:1 epicyclic reduction drive built into the shaft. tolerance: 20% rated at 0.33 W at 50°C.

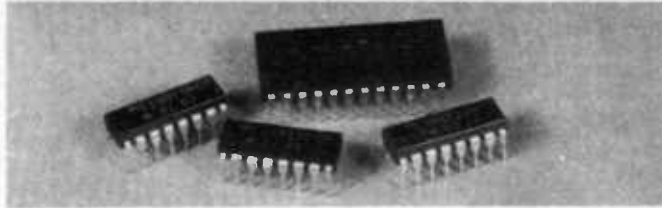


Value	Stock No.	1-24	25+
20k	48-22326	£0.95	80p

## 4000 series CMOS

The standard CMOS family for use where low power, high noise immunity, and wide operating voltages are required.

Note: All devices are buffered except where shown with a UB prefix.



Device	Description	Stock No	£
4000UB	Dual 3 input NOR Gate	22-04000	0.11
4001	Quad 2 input NOR Gate	23-04001	0.11
4002	Dual 4 input NOR Gate	23-04002	0.12
4007	Dual complementary pair plus inverter	23-04007	0.13
4008	4 bit full adder	23-04008	0.50
4009UB	Hex inverter/buffer	22-04009	0.25
4010	Hex buffer	23-04010	0.30
4011	Quad 2 input NAND Gate	23-04011	0.11
4011UB	Quad 2 input NAND Gate	22-04011	0.24
4012	Dual 4 input NAND Gate	23-04012	0.14
4013	Dual D flip-flop	23-04013	0.25
4015	Dual 4 bit static shift register	23-04015	0.50
4016	Quad analogue switch/quad multiplexer	23-04016	0.22
4017	Decade counter/divider	23-04017	0.40
4019	Quad AND/OR select gate	23-04019	0.38
4020	14 bit binary counter	23-04020	0.55
4021	8 bit static shift register asynchronous	23-04021	0.55
4022	Octal counter/divider	23-04022	0.55
4023	Triple 3 input NAND gate	23-04023	0.15
4024	7 stage ripple counter	23-04024	0.33
4025	Triple 3 input NOR gate	23-04025	0.15
4026	Decade counter/divider	23-04026	1.05
4027	Quad JK Flip flop	23-04027	0.26
4028	BCD to Decimal decoder	23-04028	0.50
4029	4 bit presettable up/down counter	23-04029	0.55
4030	Quad exclusive OR gate	23-04030	0.35
4035	4-Bit shift register	23-04035	0.67
4040	12 bit bB	56-18610	£99
4042	Quad latch	23-04042	0.50
4043	Quad NOR RS latch	23-04043	0.50
4044	Quad NAND RS latch	23-04043	0.60
4046	Phase locked loop	23-04046	0.60
4047	Monostable/Astable multivibrator	23-04047	0.68
4049UB	Hex Inverter/buffer	22-04049	0.24
4050	Hex buffer	23-04050	0.24
4051	8 channel analogue multiplexer	23-04051	0.55
4052	Dual 4 channel analogue multiplexer	23-04052	0.55
4053	Triple 2 channel analogue multiplier	23-04053	0.55
4060	14 stage binary counter/divider <sup>2</sup> osc	23-04060	0.75
4063	4 bit magnitude comparator	20-04063	1.15
4066	Quad analogue switch	23-04066	0.30
4067	Single 16 channel multiplexer/demultiplexer	23-04067	4.30
4068	8 input NAND gate	23-04068	0.16
4069UB	Hex inverter	23-04069	0.14
4070	Quad exclusive OR gate	23-04070	0.16
4071	Quad 2 input OR gate	23-04071	0.16

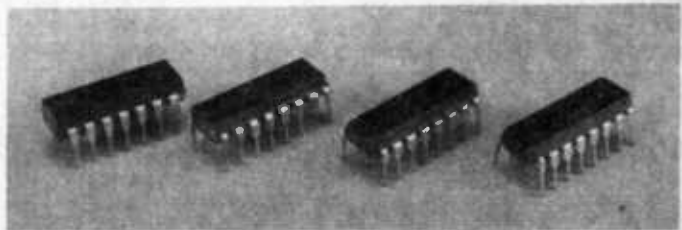
# SEMICONDUCTORS — CMOS

Device	Description	Stock No.	£
4072	Dual 4 input OR gate	23-04072	0.18
4073	Triple 3 input AND gate	23-04073	0.16
4075	Triple 3 input OR Gate	23-04075	0.16
4076	Quad D type register	23-04076	0.55
4077	Quad exclusive NOR gate	23-04077	0.18
4078	8 input NOR gate	23-04078	0.18
4081	Quad 2 input AND gate	23-04081	0.12
4082	Dual 4 input AND Gate	23-04082	0.18
4093	Quad 2 input NAND Schmitt trigger	23-04093	0.30
4099	8 bit addressable latch	23-04099	0.80
4175	Quad 0 flip-flop	23-04175	0.80
4502	Strobed hex inverter/buffer	23-04502	0.80
4503	Hex three state buffer	23-04503	0.50
4506	Dual expandable AOI gate	23-04506	0.70
4507	Quad exclusive OR gate	23-04507	0.37
4508	Dual 4 bit latch	23-04508	1.50
4510	BCD up/down counter	23-04510	0.55
4511	BCD to 7 segment latch/decoder/driver	23-04511	0.45
4512	8 channel data selector	23-04512	0.55
4514	4 bit latch/ 4 to 16 line decoder (high)	23-04514	1.25
4515	4 bit latch/ 4 to 16 line decoder (low)	23-04515	1.25
4516	Binary up/down counter	23-04516	0.80
4518	Dual BCD up counter	23-04518	0.35
4520	Dual binary up counter	23-04520	0.60
4521	24 stage frequency divider	23-04521	1.30
4522	Programmable 8CD divide by n counter	23-04522	0.89
4526	Programmable binary divide by n counter	23-04526	0.60
4527	8CD rate multiplier	23-04527	0.80
4528	Dual monostable multivibrator	23-04528	0.85
4529	Dual 4 channel analogue data selector	23-04529	0.70
4531	12 bit parity tree	23-04531	0.85
4532	8 bit priority encoder	23-04532	0.80
4534	Real time 5 decade counter	23-04534	4.00
4536	Programmable timer	23-04536	2.50
4538	Dual precision monostable multivibrator	23-04538	0.85
4539	Dual 4 channel data selector/multiplexer	23-04539	0.80
4543	BCD to 7 segment latch/decoder/driver	23-04543	0.80
4549	Successive approximation register	23-04549	3.50
4553	3 digit 8CD counter	23-04553	2.70
4554	2 x 2bit parallel binary multiplier	23-04554	1.20
4555	Dual binary 1 of 4 decoder	23-04555	0.35
4556	Dual binary 1 of 4 decoder (inverting)	23-04556	0.40
4557	1 to 64 bit variable length shift register	23-04557	2.30
4558	8CD to 7 segment decoder	23-04558	0.80
4559	Successive approximation register	23-04559	3.50
4560	N8CD adder	23-04560	2.50
4561	9's complementer	23-04561	1.00
4562	1 to 8 bit static shift register	23-04562	2.50
4566	Industrial time base generator	23-04566	1.20
4568	Phase comparator and programmable counter	23-04568	1.45
4589	Dual programmable binary counter	23-04589	1.70
4581	Quad 2 input AND gate	23-04081	0.18
4572UB	Hex gate	22-04572	0.22
4580	4 x 4 multiport register	23-04580	3.25
4581	4 bit arithmetic logic unit	23-04581	1.40
4582	Look ahead carry block	23-04582	0.70
4583	Dual schmitt trigger	23-04583	0.80
4584	Hex schmitt trigger	23-04584	0.27
4585	4 bit magnitude comparator	23-04585	0.45
4702	Programmable bit rate generator	23-04702	4.50
4703	16 x 4 FIFO	23-04703	4.48
4704	3 state data switch	23-04704	4.24
4705	3 state arithmetic logic register	23-04705	4.24
4706	3 state programme stack	23-04706	4.50
4720	3 state 256 bit RAM	23-04720	4.00

Device	Description	Stock No.	£
4723	Dual 4 bit address latches	23-04723	0.95
4724	8 bit address latch	23-04724	0.95
4725	16 x 4 RAM -3 state	23-04725	2.24
40014	Hex schmitt trigger inverter	23-40014	0.54
40085	4 bit magnitude comparator	23-40085	0.99
40098	3 state HEX inverter/buffer	23-40098	0.54
40106	Hex schmitt trigger inverter	23-40106	0.69
40160	Synchronous BCD decade counter	23-40160	1.05
40161	Synchronous 4 bit binary counter	23-40161	1.05
40162	Synchronous 4 bit binary counter	23-40162	1.05
40163	Synchronous 4 bit binary counter	23-40163	1.05
40174	HEX 0 type flip flop with clear	23-40174	1.05
40175	Quad D type flip flop with clear	23-40175	1.05
40192	Synchronous BCD up/down counter	23-40192	1.08
40193	Synchronous 4 bit binary up/down counter	23-40193	1.08
40195	8CD par in/par out shift register	23-40195	1.08

## 74LS SERIES TTL

A range of low power schottky TTL in plastic packages. Op temp 0° C to +70°. LS TTL offers a factor of five reduction in power consumption compared with standard TTL devices.



Device	Description	Stock No.	£
74LS00	Quad 2-Input NAND Gate	31-07400	0.10
74LS01	Quad 2-Input NAND Gate	31-07401	0.10
74LS02	Quad 2-Input NOR Gate	31-07402	0.11
74LS03	Quad 2-Input NAND Gate (Open Collector)	31-07403	0.11
74LS04	Hex Inverter	31-07404	0.12
74LS05	Hex Inverter (Open Collector)	31-07405	0.13
74LS08	Quad 2-Input AND Gate	31-07408	0.12
74LS09	Quad 2-Input AND Gate (Open Collector)	31-07409	0.12
74LS10	Triple 3-Input NAND Gate	31-07410	0.12
74LS11	Triple 3-Input AND Gate	31-07411	0.12
74LS12	Tripe 3-Input NAND Gate	31-07412	0.12
74LS13	Dual 4-Input Schmitt Trigger	31-07413	0.20
74LS14	Hex Schmitt Trigger	31-07414	0.30
74LS15	Triple 3-Input AND Gate (Open Collector)	31-07415	0.12
74LS20	Dual 4-Input NAND Gate	31-07420	0.12
74LS21	Dual 4-Input AND Gate	31-07421	0.12
74LS22	Dual 4-Input NAND Gate (Open Collector)	31-07422	0.12
74LS26	Quad 3-Input NAND (High Voltage)	31-07426	0.14
74LS27	Triple 3-Input NOR Gate	31-07427	0.12
74LS28	Quad 2-Input NOR Buffer	31-07428	0.15
74LS30	8-Input NAND Gate	31-07430	0.12
74LS32	Quad 2-Input OR Gate	31-07432	0.12
74LS33	Quad 2-Input NOR (Open Collector)	31-07433	0.15
74LS37	Quad 2-Input NAND Buffer	31-07437	0.15
74LS38	Quad 2-Input NAND Buffer (Open Collector)	31-07438	0.14
74LS40	Dual 4-Input NAND Buffer	31-07440	0.13
74LS42	1-of-10 Decoder	31-074 27	0.30
74LS47	BCD to 7-Segment Decoder/Driver (Open Collector)	31-07447	0.35
74LS48	BCD to 7-Segment Decoder/Driver	31-07448	0.45
74LS49	BCD to 7-Segment Decoder/Driver (Open Collector)	31-07449	0.55
74LS51	Dual AND-OR-Invert Gate	31-07451	0.13
74LS54	2-3-3-2-Input	31-07454	0.14
74LS55	2-Wide 4-Input	31-07455	0.14
74LS73	Dual JK Flip-Flop	31-07473	0.21
74LS74	Dual D Flip-Flop	31-07474	0.16



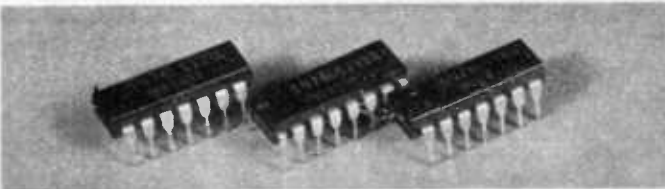
# SEMICONDUCTORS-TTL

Device	Description	Stock No.	£
74LS75	4-Bit Bi-Stable Latch	31-07475	0.22
74LS76	Dual JK Flip-Flop	31-07476	0.20
74LS78	Dual JK Flip-Flop	31-07478	0.19
74LS83	4-Bit Full Adder	31-07483	0.40
74LS85	4-Bit Magnitude Comparator	31-07485	0.60
74LS86	Quad Exclusive OR Gate	31-07486	0.14
74LS90	Decade Counter	31-07490	0.28
74LS92	Divide-by-12 Counter	31-07492	0.31
74LS93	4-Bit Binary Counter	31-07493	0.31
74LS95	4-Bit Shift Register	31-07495	0.40
74LS96	5-Bit Shift Register	31-07496	1.20
74LS107	Dual JK Flip-Flop	31-74107	0.25
74LS109	Dual JK Edge-Triggered Flip-Flop	31-74109	0.20
74LS112	Dual JK Edge-Triggered Flip-Flop	31-74112	0.20
74LS113	Dual JK Edge-Triggered Flip-Flop	31-74113	0.20
74LS114	Dual JK Edge-Triggered Flip-Flop	31-74114	0.19
74LS122	Retriggerable Monostable Multivibrators	31-74122	0.35
74LS123	Retriggerable Monostable Multivibrators	31-74123	0.35
74LS124	Dual Voltage-Controlled Oscillators	31-74124	1.80
74LS125	Quad 3-State Buffer (Low Enable)	31-74125	0.24
74LS126	Quad 3-State Buffer (High Enable)	31-74126	0.24
74LS132	Quad 2-Input Schmitt Trigger	31-74132	0.42
74LS133	13-Input NAND Gate	31-74133	0.24
74LS136	Quad Exclusive OR (Open Collector)	31-74136	0.20
74LS138	1-of-8 Decoder/Demultiplexer	31-74138	0.30
74LS139	Dual 1-of-4 Decoder/Demultiplexer	31-74139	0.30
74LS145	BCD-to-Decimal Decoder	31-74145	1.20
74LS151	8-Input Multiplexer	31-74151	0.30
74LS153	Dual 4-Input Multiplexer	31-74153	0.27
74LS154	4-to-16 line decoder	31-74154	0.99
74LS155	Dual 1-of-4 Decoder	31-74155	0.35
74LS156	Dual 1-of-4 Decoder (Open Collector)	31-74156	0.37
74LS157	Quad 2-Input Multiplexer (Non-inverting)	31-74157	0.30
74LS158	Quad 2-Input Multiplexer (Inverting)	31-74158	0.30
74LS160	BCD Decade Counter, Asynchronous Reset (9310 Type)	31-74160	0.37
74LS161	4-Bit Binary Counter, Asynchronous Reset (9316 Type)	31-74161	0.37
74LS162	BCD Decade Counter, Synchronous Reset	31-74162	0.37
74LS163	4-Bit Binary Counter, Synchronous Reset	31-74163	0.37
74LS164	8-Bit Shift Register (Serial-In Parallel-Out)	31-74164	0.40
74LS165	8-Bit Shift Register (Parallel-In Serial-Out)	31-74165	0.60
74LS168	Up/Down Decade Counter	31-74168	0.70
74LS169	Up/Down Binary Counter	31-74169	0.85
74LS170	4 x 4 Register File (Open Collector)	31-74170	0.90
74LS173	4-Bit D-Type Register (3-State)	31-74173	0.60
74LS174	Hex D-Type Flip-Flop with Clear	31-74174	0.40
74LS175	Quad D-Type Flip-Flop with Clear	31-74175	0.40
74LS181	4-Bit ALU	31-74181	1.05
74LS189	16 x 4 RAM	31-74189	1.28
74LS190	Up/Down Decade Counter	31-74190	0.60
74LS191	Up/Down Binary Counter	31-74191	0.60
74LS192	Up/Down Decade Counter	31-74192	0.45
74LS193	Up/Down Binary Counter	31-74193	0.42
74LS194	4-Bit Right/Left Shift Register	31-74194	0.35
74LS195	4-Bit Shift Register (9300 Type)	31-74195	0.35
74LS196	Decade Counter	31-74196	0.55
74LS197	4-Bit Binary Counter	31-74197	0.60
74LS200	Tri state 256 Bit Read/Write Memory	31-74200	3.40
74LS221	Dual Monostable Multivibrators	31-74221	0.50
74LS240	Octal Inverting Bus/Line Driver	31-74240	0.80
74LS241	Octal Bus Line Driver	31-74241	0.80
74LS242	Quad Bus Transceiver (Inverting)	31-74242	0.70
74LS243	Quad Bus Transceiver (Non-inverting)	31-74243	0.70
74LS244	Octal 3-State Driver (Non-inverting)	31-74244	0.60
74LS245	Octal Bus Transceiver (Non-inverting)	31-74245	0.80
74LS247	BCD to 7-Segment Decoder/Driver (Open Collector)	31-74247	1.35

Device	Description	Stock No.	£
74LS248	BCD to 7-Segment Decoder/Driver	31-74248	1.35
74LS249	BCD to 7-Segment Decoder/Driver (Open Collector)	31-74249	1.35
74LS251	8-Input Multiplexer (3-state)	31-74251	0.35
74LS253	Dual 4-Input Multiplexer (3-State)	31-74253	0.35
74LS257	Quad 2-Input Multiplexer (3-State)	31-74257	0.40
74LS258	Quad 2-Input Multiplexer (3-State)	31-74258	0.37
74LS259	8-Bit Addressable Latch (9334)	31-74259	0.60
74LS260	Dual 5-Input NOR Gate	31-74260	0.50
74LS266	Quad Exclusive NOR (Open Collector)	31-74266	0.22
74LS273	Octal D-Type Flip-Flop with Master Preset	31-74273	0.70
74LS279	Quad Set-Reset Latch	31-74279	0.35
74LS280	9-Bit Odd/Even Parity Generators/Checkers	31-74280	2.50
74LS283	4-Bit Full Adder (Rotated LS83)	31-74283	0.42
74LS290	Decade Counter	31-74290	0.50
74LS293	4-Binary Counter	31-74293	0.40
74LS295	4-Bit Shift Register (3-State)	31-74295	1.50
74LS298	Quad 2-Input Multiplexer with Output Latches	31-74298	0.76
74LS365	Hex Buffer with Common Enable (3-State)	31-74365	0.32
74LS366	Hex Inverter with Common Enable (3-State)	31-74366	0.34
74LS367	Hex Buffer, 4-Bit and 2-Bit (3-State)	31-74367	0.32
74LS368	Hex Inverter, 4-Bit and 2-Bit (3-State)	31-74368	0.35
74LS373	Octal Transparent Latch	31-74373	0.70
74LS374	Octal D-Type Flip-Flop	31-74374	0.70
74LS375	Quad Latch	31-74375	0.40
74LS377	Octal D-Type Flip-Flop with Enable	31-74377	0.85
74LS378	Hex D-Type Flip-Flop with Enable	31-74378	0.65
74LS379	4-Bit D-Type Flip-Flop with Enable	31-74379	0.60
74LS384	8-Bit By 1-Bit Complement Multiplier	31-74384	2.50
74LS385	Quadruple Serial Adders/Subtractors	31-74385	2.05

## 74 SERIES TTL

All devices are plastic package designed for 5V operation over the temperature range 0°C to +70°C.



Device	Description	Stock No.	£
7400N	Quad 2 input NAND	32-07400	0.10
7401N	Quad 2 input NAND open collector	32-07401	0.10
7402N	Quad 2 input NOR	32-07402	0.20
7403N	Quad 2 input NOR open collector	32-07403	0.11
7404N	Hex Inverter	32-07404	0.12
7405N	Hex Inverter open collector	32-07405	0.12
7406N	Hex Inverter 30v open collector	32-07406	0.22
7407N	Hex Driver 30v open collector	32-07407	0.22
7408N	Quad 2 input AND	32-07408	0.15
7409N	Quad 2 input AND open collector	32-07409	0.15
7410N	Triple 3 input NAND	32-07410	0.12
7411N	Triple 3 input AND	32-07411	0.18
7412N	Triple 3 input NAND open collector	32-07412	0.19
7413N	Dual 4 input Schmitt NAND	32-07413	0.27
7414N	Hex Schmitt Inverter	32-07414	0.51
7416N	Hex Inverter 15v open collector	32-07416	0.27
7417N	Hex drivers 15v open collector	32-07417	0.27
7420N	Dual 4 input NAND	32-07420	0.13
7421N	Dual 4 input AND	32-07421	0.28
7423N	Dual 4 input NOR with strobe	32-07423	0.22
7425N	Dual 4 input NOR with strobe	32-07425	0.22
7426N	Quad 2 input NAND 15v open collector	32-07426	0.22
7427N	Triple 3 input NOR	32-07427	0.22
7430N	8 input NAND	32-07430	0.13
7432N	Quad 2 input OR	32-07432	0.23

# SEMICONDUCTORS TTL

Device	Description	Stock No.	£	Device	Description	Stock No.	£
7437N	Quad 2 input NAND buffer	32-07437	0.22	74162N	Decade counter with synch clear	32-74162	0.55
7438N	Quad 2 input NAND buffer open collector	32-07438	0.22	74163N	Binary counter with synch clear	32-74163	0.55
7440N	Dual 4 input NAND buffer	32-07440	0.14	74164N	8 bit ser in/par out shift reg	32-74164	0.55
7441N	BCD to DEV decoder/driver	32-07441	0.54	74165N	8 bit ser/par in/ser out shift reg	32-74165	0.55
7442N	BCD to DEC decoder	32-07442	0.42	74166N	8 bit ser/par in/ser out shift reg	32-74166	0.70
7443N	Excess 3 t decimal decoder	32-07443	0.62	74167N	Synch BCD rate multiplier	32-74167	1.25
7444N	Excess 3 Gray to decimal decoder	32-07444	0.62	74170N	4 x 4 register file	32-74170	1.25
7445N	BCD to decimal 30v 80mA decoder/driver	32-07445	0.62	74173N	3 state 4 bit D-type register	32-74173	1.10
7446N	BCDS to 7 seg 30v 80mA decoder/driver	32-07446	0.62	74174N	Hex D type flip flop	32-74174	0.75
7447N	BCD to 7 seg 15v 80mA decoder/driver	32-07447	0.62	74175N	Quad type flip flop	32-74175	0.75
7448N	BCD to 7 seg decoder/driver	32-07448	0.56	74178N	Preset 35 MHz decade counter	32-74176	0.75
7450N	Exp dual 2 wide 2 input A.D.I.	32-07450	0.14	74177N	Preset 35 MHz binary counter	32-74177	0.75
7451N	Dual 2 wide, 2 input A.D.I.	32-07451	0.14	74178N	4 bit univ shift reg	32-74178	0.90
7453N	Exp 4 wide, 2 input A.D.I.	32-07453	0.14	74179N	4 bit univ shift reg	32-74179	1.35
7454N	4 wide, 2 input A.O.I.	32-07454	0.14	74180N	9 bit odd/even parity gen	32-74180	0.75
7460N	Dual 4 input expanders	32-07480	0.14	74181N	Arithmetic logic unit	32-74181	1.22
7470N	Pos edge JK flip flop	32-07470	0.28	74182N	Lock ahead carry gen	32-74182	0.70
7472N	Master slave JK FF	32-07472	0.27	74184N	BCD to binary code conv	32-74184	1.20
7473N	Dual JK master slave	32-07473	0.28	74185N	Binary to BCD code conv	32-74185	1.20
7474N	Dual D type pas edge trio g FF	32-07474	0.28	74188N	256 bit RDM	32-74188	3.00
7475N	Quad Bistable latch	32-07475	0.35	74190N	BCD up/down counter	32-74190	0.55
7476N	Dual JK master slave FF	32-07476	0.30	74191N	4 bit binary up/down counter	32-74191	0.55
7480N	Gated full adder	32-07480	0.26	74192N	BCD up/down clear	32-74192	0.55
7482N	2 bit binary full adder	32-07482	0.75	74193N	4 bit binary up/down counter	32-74193	0.55
7483N	4 bit binary full adder	32-07483	0.60	74194N	4 bit bi-direct univ S/R	32-74194	0.55
7485N	4 bit magnitude comp	32-07485	0.75	74195N	4 bit ser/par in par out S/R	32-74195	0.55
7486N	Quad 2 input Ex-OR	32-07486	0.24	74196N	Preset 50 MHz decade counter	32-74196	0.55
7489N	64 bit RAM	32-07489	1.05	74197N	Preset 50 MHz binary counter	32-74197	0.55
7490N	BCD decade counter	32-07490	0.30	74198N	8 bit bi-direct univ S/R	32-74198	0.85
7491N	8 bit ser in, ser out shift reg	32-07491	0.55	74199N	8 bit bi-direct univ S/R	32-74199	1.00
7492N	Divide 12 counter	32-07492	0.35	74221N	Dual mono multivibs	32-74221	1.00
7493N	4 bit binary counter	32-07493	0.35	74247N	BCD to 7 segment dec/driver	32-74247	1.51
7494N	4 bit par in/ser out shift reg	32-07494	0.70	74248N	BCD to 7 segment dec/driver	32-74248	1.89
7495N	4 bit ser/par in, par out shift reg	32-07495	0.60	74249N	BCD to 7 segment dec/driver	32-74249	1.89
7496N	5 bit ser/par in, par out shift reg	32-07496	0.45	74251N	1 of 8 data selector	32-74251	1.05
7497N	6 bit binary rate multiplier	32-07497	1.40	74273N	Octal D type FF	32-74273	2.67
74100	6 bit binary rate multiplier	32-74100	1.10	74279N	Quad SR latches	32-74279	0.89
74104	Gated JK master slave FF	32-74104	0.62	74283N	4 bit full adder	32-74283	1.30
74105	Gate JK master slave FF	32-74105	0.62	74298N	Quad 2 input mpx with store	32-74298	1.85
74107	Dual JK master slave FF	32-74107	0.26	74365N	3 state hex buffers	32-74365	0.85
74109	Dual JK edge trig FF	32-74109	0.35	74366N	3 state hex inv buffers	32-74366	0.85
74112N	Dual JK FF	32-74112	1.70	74367N	3 state hex bus drivers	32-74367	0.85
74120N	Dual pulse synch/driver	32-74120	0.95	74368N	3 state hex inv bus drivers	32-74368	0.85
74121N	Monostable multivib	32-74121	0.34	74390N	Dual decade counter	32-74390	1.85
74122N	Retrig mono multivib	32-74122	0.34	74393N	Dual 4 bit binary counter	32-74393	1.85
74123N	Dual retrig mono multivib	32-74123	0.40	74490N	Dual BCD decade counter	32-74490	1.85
74125N	Quad 3 state bus buffer	32-74125	0.40				
74126N	Quad 3 state bus buffer	32-74126	0.40				
74132N	Quad 2 input NAND Schmitt	32-74132	0.50				
74136N	Quad ex-OR open collector	32-74136	0.65				
74141N	BCD to decimal decoder driver	32-74141	0.45				
74145N	BCD to dec 15v decoder/driver	32-74145	0.75				
74147N	10 to 4 line priority encoder	32-74147	1.50				
74148N	8 to 3 lin priority encoder	32-74148	1.09				
74150N	1 to 16 data selector	32-74150	0.79				
74151N	1 to 8 data selector	32-74151	0.55				
74153N	Dual 1 of 4 data selector	32-74153	0.55				
74154N	4 to 16 line decoder	32-74154	0.55				
74155N	Dual 2 to 4 line dec/mpx	32-74155	0.55				
74156N	Dual 2 to 4 line dec/mpx OC	32-74156	0.55				
74157N	Quad 2 to 1 line dec/mpx	32-74157	0.55				
74160N	Decade counter with direct clear	32-74160	0.55				
74161N	Binary counter with direct clear	32-74161	0.55				

# SEMICONDUCTORS — TTL

## 74C SERIES TTL

A range of plastic devices pin for pin compatible with 74 series TTL devices but implemented using CMOS technology. Wide supply range of 3 to 15 v. High noise immunity. Operating temp range -40°C to +80°C.

Device	Description	Stock No	£
74C00	Quad 2 input NAND	29-07400	0.35
74C02	Quad 2 input NOR	20-07402	0.35
74C04	Hex Inverters	29-07404	0.35
74C08	Quad 2 input AND	29-07408	0.35
74C10	Triple 3 input NAND	29-07410	0.35
74C14	Hex Schmitt Inverters	29-07414	0.75
74C20	Dual 4 input NAND	29-07420	0.35
74C30	8 input NAND gate	29-07430	0.35
74C32	Quad 2 input OR	29-07432	0.35
74C42	BCD to Decimal decoder	29-07442	1.05
74C48	BCD to segment decoder	29-07448	1.50
74C73	Dual JK F/F	29-07473	0.75
74C74	Dual D type F/F	29-07474	0.75
74C78	Dual JK F/F	29-07476	0.60
74C83	4 bit binary full adder	29-07483	1.30
74C85	4 bit magnitude comparator	29-07485	1.30
74C86	Quad 2 input Ex-or	29-07486	0.40
74C89	16 x 4 RAM	29-07489	3.60
74C90	BCD decade counter	29-07490	1.05
74C93	4 bit binary counter	29-07493	1.05
74C95	4 bit ser/par in par out SR	29-07495	1.25
74C107	Dual JK F/F	29-74107	0.60
74C151	1 of 8 selector	29-74151	2.10
74C154	4 to 16 line decoder	29-74154	3.05
74C157	Quad 2 to 1 line decoder	29-74157	2.10

Device	Description	Stock No.	£
74C160	Decade counter with dir. clear	29-74160	1.05
74C161	Binary counter with dir. clear	29-74161	1.05
74C162	Decade counter with synch clear	29-74162	1.05
74C163	Binary counter with synch clear	29-74163	1.05
74C164	8 bit ser in, par out SR	29-74164	1.05
74C165	8 bit ser/par in, ser out SR	29-74165	1.10
74C173	3 state 4 bit D type register	29-74173	1.05
74C174	Hex D type	29-74174	1.05
74C175	Quad D type	29-74175	1.05
74C192	BCD decade up/down counter	29-74192	1.08
74C193	4 bit binary up/down counter	29-74193	1.08
74C195	4 bit ser/par in par out SR	29-74195	1.08
74C200	256 x 1 RAM	29-74200	6.50
74C221	Dual mono multivibrator	29-74221	1.55
74C901	Hex Inv TTL buffers	29-74901	0.55
74C902	Hex Non Inv TTL buffers	29-74902	0.55
74C903	Hex Inv PMOS buffers	29-74903	0.55
74C904	Hex Non Inv PMOS buffers	29-74904	0.55
74C905	12 bit successive approx register	29-74905	6.50
74C906	Hex open drain, N-Chan buffer	29-74906	0.55
74C907	Hex open drain, P-Chan buffer	29-74907	0.55
74C908	Dual CMOS 30 v drivers	29-74908	1.10
74C909	Quad comparators	29-74909	2.10
74C910	64 x 4 RAM	29-74910	5.00
74C914	Hex Schmitt inverters	29-74914	1.10
74C918	Dual CMOS 30 v drivers	29-74918	1.30
74C925	4 decade 7 SEG driver	29-74925	6.00
74C926	4 decade 7 SEG driver	29-74926	6.00
74C927	3.5 decade 7 SEG driver	29-74927	6.00

## LINEAR ICs

Device	Stock number	Description	Price 1-24	25-99	100+
LM10CN	61-00010	Ultra low current (270uA) Op Amp and voltage reference	3.88	3.60	3.12
TBA120S	61-00120	Basic FM IF strip plus quadrature detector	1.00	0.75	0.60
L149	61-00149	Darlington quasi-complementary output system	1.86	1.55	0.85
ZNA234	61-02340	TV Pattern Generator	8.50	7.60	
U237B	61-00237	Lin 5 LED bargraph driver	1.28	0.98	0.83
U247B	61-00247	Adds 5 more LEDs to U237B	1.28	0.98	0.83
U257B	61-00257	Log 5 LED bargraph driver	1.28	0.98	0.83
U267B	61-00267	Adds 5 more LEDs to U257B	1.28	0.98	0.83
LM301AH	61-03010	Improved op amp in 205	0.67	0.64	0.61
LM301AN	61-03011	DIL version	0.27	0.25	0.24
LM308H	61-03080	General purpose T05 op amp	0.96	0.91	0.87
LM308CN	61-03081	DIL version	0.65	0.62	0.59
LM324	61-03240	Low power quad op amp	0.45	0.43	0.41
LM339N	61-03390	Low power quad comparator	0.66	0.63	0.60
LF347	61-00347	Quad BiFET Op Amp	1.60	1.48	
LM348	61-03480	Quad 741 type op amp	0.90	0.80	0.75
LF351	61-03510	Bi-FET op amp	0.49	0.47	0.45
LF353	61-03530	Dual version of LF351	0.76	0.70	0.65
LM380N	61-00380	1W AF power amp	1.00	0.75	0.45
LM381	61-00381	Stereo preamp IC	1.81	1.22	
LM382	61-00382	Stereo preamp IC	1.81	1.22	
ZN419CE	61-00419	Ferranti servo driver IC	1.98	1.72	1.55
ZNA423	61-04230	Precision 1.26 voltage reference	1.00	0.95	0.90
ZN425E/8	61-04250	8 bit A/D or D/A incl clock	3.50	3.00	0A
ZN426E/8	61-04260	8 bit low power D/A	3.00	2.60	0A
ZN427E/8	61-04270	8 bit A/D micro MPU bus compatible	6.28	5.44	0A
ZN428E/8	61-04280	8 bit D/A micro MPU bus compatible	4.78	4.14	0A
ZN429E/8	61-04290	8 bit low cost D/A	2.10	1.80	0A
ZN432CJ10	61-04320	10 bit successive approx A/D	28.09	24.39	0A
ZN433CJ10	61-04330	10 bit tracking A/D	22.59	19.69	0A
ZN44DJ	61-04400	6 bit ultra fast A/D	56.63	44.25	0A
ZN450E	61-04500	3.5 digit DVM chip	7.81	6.08	0A
NE544	61-00544	14 pin DIL servo driver IC	1.80	1.40	1.12
NE555N	61-05550	Multi-purpose low cost timer	0.20	0.19	0.18
NE556N	61-05560	Dual version of the 555	0.50	0.48	0.45

# SEMICONDUCTORS LINEAR

Device	Stock number	Description	Price 1-24	25-99	100+
SL560C	61-05600	DIL VHF amp	1.98	1.79	
NE562	61-00562	HF PLL with separate access VCO/phase detector	4.05		
NE564	61-00564	HF PLL 5V operation - use in new designs	4.29	3.43	2.99
NE565	61-00565	LF PLL for tracking filters, RTTY, modems etc.	1.00	0.78	0.68
NE566	61-00566	LF VCO for PLL and AF generators	1.30	0.95	0.70
NE567	61-00567	Low frequency tone decoder PLL	1.30	1.05	0.90
NE570N	61-00570	Compounder for audio processing noise reduction etc	3.85	2.25	
SL624	61-00624	AM/FM/SSB multimode detector system	3.28	2.84	2.55
TBA651	61-00651	AM/Linear gain system with AGC	1.81	1.51	
uA709HC	61-07090	Op amp with external frequency comp. in T05 can	0.64	0.61	0.58
uA709PC	61-07091	DIL version of 709HC	0.36	0.34	0.32
uA710HC	61-07100	High speed comparator in T05	0.64	0.61	0.58
uA710PC	61-07101	DIL version of 710HC	0.59	0.56	0.50
uA711CN	61-07110	Dual comparator	0.85	0.80	0.75
uA733CN	61-07330	Differential video amp	0.89	0.85	0.81
uA741CH	61-07410	The original low cost op amp in T05 can	0.66	0.62	0.55
uA741CN	61-07411	DIL version of the 741CH	0.20	0.19	0.18
uA747CN	61-07470	Dual 741 op amp	0.70	0.67	0.63
uA748CN	61-04780	Similar to 741 with external frequency comp	0.30	0.28	0.27
uA753	61-00753	High gain limiting amp for 10.7MHz IF	1.95	0.75	
uA758	61-00758	As 1310 stereo decoder but buffered outputs	2.35		
TBA820M	61-00820	1W power amp 3-16V supply	0.78	0.65	0.45
TDA1028	61-01028	DC control signal source switch	2.11	1.62	1.52
TDA1029	61-01029	DC control signal source switch	2.11	1.62	1.52
ZNA1034	61-01034	Precision timer	2.10	1.95	1.75
LM1035	61-01035	DC tone/volume/balance control	4.50	4.05	3.60
TDA1054M	61-01054	AGC preamp for audio processor and VOGAD	1.45	1.12	0.86
TDA1062	61-01062	RF, oscillator and mixer system for 1-200MHz	1.95	1.65	1.45
TDA1072	61-01072	AM tuner IC with large overload margin	2.69		
TDA1074A	61-01074	Dual channel VCA for volume and tone control	5.04	4.22	3.35
TDA1083	61-01083	Portable radio AM/FM/audio in one IC	1.95	1.60	1.35
TDA1090	61-01090	Complete Hi-Fi AM/FM tuner with mute AFC etc	3.05	2.30	1.5
HA1137	61-12411	See HA12411			
HA1196	61-01196	PLL stereo decoder with audio preamp stage	2.00	1.70	1.25
HA1197	61-01197	Low noise and distortion AM tuner IC	1.00	0.92	0.84
TDA1220	61-01220	Basic AM/FM tuner IC low voltage working	1.40	1.22	0.90
LM1303	61-01303	Stereo preamp - mainly for replacement purposes	0.99		
LM1307	61-01307	An early type non PLL stereo decoder	1.55		
MC1310P	61-01310	The original motorola stereo decoder	1.90		
MC1330	61-01330	Synchronous demodulator for TV/AM systems	1.20	0.99	
MC1350	61-01350	AGC IF gain block up to 50MHz	1.20	0.99	
HA1370	61-11370	20W SIL audio power IC	1.90	1.65	1.45
HA1388	61-01388	18W PA from 14V	2.75	1.95	1.65
LM1458N	61-14580	Dual 8-pin DIL op amp	0.45	0.43	0.41
MC1496P	61-01496	Double balance mixer/modulator	1.25	0.90	
SL1610	61-01610	RF/IF amplifier	1.60	1.50	1.35
SL1611	61-01611	RF/IF amplifier	1.60	1.50	1.35
SL1612	61-01612	IF amplifier	1.60	1.50	1.35
SL1613	61-01613	FM limiting IF amplifier	2.06	1.85	1.67
SL1620	61-01620	VOGAD control system	2.17	1.82	1.63
SL1621	61-01621	Audio derived AGC system generator	2.17	1.82	1.63
SL1623	61-01623	AM/SSB AGC amplifier	2.44	2.35	2.20
SL1625	61-01625	AM agc system	2.17	1.82	1.63
SL1626		Replaced by SL6270			
SL1630	61-01630	Low power consumption audio amplifier	1.62	1.52	1.40
SL1640	61-01640	Double balanced mixer for modulators/receivers	1.89	1.65	1.56
SL1641	61-01641	Double balanced mixer for receivers	1.89	1.65	1.56
TDA2002	61-02002	8W into 2 ohms power amplifier	1.25	1.04	0.85
ULN2240	61-02240	Complete AM tuner, FM IF with deviation mute AFC etc.	3.25	2.52	2.12
ULN2242	61-01090	Complete Hi-Fi AM/FM tuner with mute AFC etc.	3.05	2.30	1.95
ULN2283	61-02283	1W max. 3-12V power amp	1.00	0.85	0.65
CA3080	61-03080	Operational transconductance amp in 741 config.	0.70	0.55	0.45
CA3089	61-03089	FM IF amp, detector, mute, AFC, AGC system	1.84	1.38	1.15
CA3123	61-03123	AM/linear AGC gain system	1.40	1.30	0.99
CA3130E	61-31300	BiMOS op amp	0.80	0.76	0.72



# SEMICONDUCTORS — LINEAR ICs

Device	Stock number	Description	Price 1-24	25-99	100+
CA3130T	61-31301	BiMOS op amp in TO5 can	0.90	0.86	0.81
CA3140E	61-31400	BiMOS version of 741	0.48	0.44	0.42
CA3189E	61-03189	Improved CA3089 with adjustable AGC threshold	2.20	1.80	1.50
CA3240E	61-32400	Dual version of the CA3140E	1.27	1.20	1.14
MC3357	61-03357	Versatile low power NBFM IF system end detector	2.85	1.95	1.35
MC3359		Equivalent to ULN3859			
ULN3859	61-03859	Low current dual conversion NBFM IF and detector	2.95	2.05	1.45
KM3701	61-03701	XY coordinate generator for NC, graphics displays etc.	85.53	72.20	0A
KM3702	61-03702	Boundary limit detector and monitor for KM3701	74.84	61.00	0A
LM3900	61-39000	Quad norton amp	0.80	0.57	0.54
LM3909N	61-39090	8 pin PIL LED flasher	0.88	0.85	0.82
LM3914N	61-03914	Linear 10 LED bargraph driver	2.80	2.40	1.90
LM3915N	61-03915	3dB log step version of the LM3194	2.80	2.40	1.90
KB4400	61-04400	MC1310, HA12003, HA1156, equivalent	0.80	0.75	0.60
KB4412	61-04412	Two balanced mixers IF amp with AGC for AM/SSB	1.95	1.55	1.24
KB4413	61-04413	AM/SSB detector, carrier squelch, ANL, AGC, meter	1.95	1.55	1.24
KB4417	61-04417	Mic preamplifier and limiter	1.80	1.55	1.24
KB4420B	61-04420	TOKO version of HA1137W	1.09	0.90	0.85
TDA4420	61-14420	Video IF demodulator with AFC and AGC	2.85	1.75	1.80
TDA4421	61-14421	Video IF demodulator with AFC and AGC	2.85	1.75	1.60
KB4423	61-04423	Audio noise blanker for MPX	2.30	1.95	1.45
KB4424	61-04424	Low voltage PLL stereo decoder	1.85	1.12	0.82
KB4430	61-04430	AM IF detector	2.30	1.98	1.54
KB4431	61-04431	Micro flat pack 1.8-3V complete AM tuner	1.95	1.55	1.22
KB4432	61-04432	Micro flat pack 2-3V working FM IF system	1.95	1.55	1.15
KB4433	61-04433	140mW - 4 ohms micro pack 3V amplifier	1.52	1.45	0.95
KB4436	61-04436	Audio noise blanker IC for MPX	2.53	2.05	1.55
KB4437	61-04437	Pilot cancel with VCO kill stereo decoder	1.75	1.55	1.30
KB4438	61-04438	Hi-Fi muting stereo preamplifier	2.22	1.82	1.10
KB4441	61-04441	Toko version of HA11225	1.35	1.25	1.10
KB4445	61-04445	Radio control 4 channel encoder and RF	1.29	1.08	0.86
KB4446	61-04446	Radio control 4 channel receiver decoder	2.75	2.34	1.85
KB4448	61-04448	Auto blend stereo decoder for car radio etc	1.85	1.22	0.95
NE5044	61-05044	Versatile 7 channel digi-prop encoder	2.28	1.85	1.36
MC5229	61-05229	Thick film broad band amp 30 to 900MHz 75ohm	9.60	8.84	
NE5532	61-55320	Low noise op amp from TDA1034 family	1.85	1.75	1.68
KM5624	61-05624	Synthesised 40 channel CB RX	4.35		
SD6000	61-06000	Dual DMOS RF/mixer MOSFET pair	3.75		
SL6270	61-06270	Gain control mic amplifier	2.03	1.74	1.65
SL6310	61-06310	Ultra low standby power consumption audio amp	2.03	1.74	1.65
SL6440	61-06440	High level mixer for HF receiver	3.38	2.95	2.75
SL6600	61-06600	PLL NBFM IF and detector system	3.75	3.22	2.90
SAS6610	61-06610	4 channel touch selector with reset	1.48	1.08	0.91
SL6640	61-06640	NBFM IF system with detector mute and AF amp	2.75	2.50	2.40
SL6690	61-06690	Very low power NBFM IF/detector	3.20	2.90	2.75
SL6700	61-06700	Versatile AM/SSB/CW IF and detector system	2.35	1.92	1.85
SAS6710	61-06710	Adds 4 extra channels to SAS6610	1.48	1.08	0.91
LS7225	61-07225	Security Lock	3.65	3.20	2.88
ICM7555	61-75550	Low power CMOS version of 555 timer	0.94	0.89	0.85
ICL8038CC	61-08038	Versatile AF sig. gen. with sine/square/triangle DPs	4.50	3.97	3.35
MSL9362	61-09362	4 channel radio control encoder	1.75	1.45	0.95
MSL9363	61-09363	4 channel with decoder to compliment MSL9362	1.75	1.45	0.95
TK10170	61-10170	5 channel version of KB4445	1.87	1.55	1.02
TK10321	61-10321	4 channel stereo analogue switching IC	2.75	2.30	1.94
HA11223	61-11223	Low noise pilot cancel stereo decoder	2.15	2.05	1.55
HA11225	61-11225	Low noise 13V version of HA12411	1.45	1.30	1.25
HA12002	61-12002	Protection monitor system for amps, PSUs, TXs etc	1.22	0.99	0.75
HA12017	61-12017	83dB S/N phono preamp 0.001% THD	0.80	0.88	0.54
HA12402	61-12402	Hitachi version of the TDA1083	1.96	1.80	1.35
HA12411	61-12411	Versatile supply volt. range version of 3089 with dev mute	1.20	1.00	0.95
HA12412	61-12412	Similar to HA11225 but no AGC but 88dB S/N ratio	1.55	1.40	1.25
LF13741	61-13741	BiFET version of 741	0.33	0.31	0.28
MK50366	61-50366	Clock/timer for direct LED/fluorescent drive	3.35	2.75	2.25
MK50375	61-50375	Clock dual on and off timer for direct LED/fluorescent drive	3.85	3.10	2.58
MM53200	61-53200	4,088 code transceiver system for Celcal etc.	3.80	3.51	3.12
SN76680N	61-76680	Basic FM IF strip plus quadrature detector	0.80	0.70	0.62

# SEMICONDUCTORS-ICS

## PRESCALERS, FREQUENCY DISPLAY AND SYNTHESISERS

Device	Stock No.	Description	1-24	25-99	100+
U264	61-02640	8 pin DIL divide by 64 1GHz prescaler	2.27	2.14	0A
U265	61-02650	8 pin DIL divide by 960/1024 1.3GHz prescaler	3.16	2.98	0A
U266	61-02660	8 pin DIL divide by 256 1GHz prescaler	2.43	2.29	0A
SAA1056	61-01056	(LN1031) A serially controlled dual modulus PLL synthesiser	3.75	2.98	
SAA1058	61-01058	32/33 prescaler for use with SAA1056 etc	3.35	2.88	
11C900C	61-01190	650MHz divide by 10/11ECL prescaler	12.95	11.00	
MSL2312R	61-02312	Lower power version of MSL2318	3.94	2.71	2.40
MSL2318	61-02318	LPS 45MHz /10, ECL 250MHz/100 with direct buffer/jamp	3.84	2.61	2.35
MSM5523	61-05523	Mpxd LED AM/SW/FM freq with clock	11.30	8.00	6.35
MSM5524	61-05524	As MSM5524 with fluorescent drive as well as LED	11.30	8.00	6.35
MSM5525	61-05525	Static fluor. display (6LT06) LW/MW/FM only	7.85	6.45	4.95
MSM5526	61-05526	As MSM5525 but for LCD systems	7.85	6.45	4.95
MSM55271	61-55271	As MSM5527, but for fluorescent displays (7LT02)	9.75	7.85	5.25
ICM7106CP	61-07106	LCD DVM	9.55		
ICM7107CP	61-07107	LED DVM	9.55		
LC7137	61-07137	UK spec 40 channel CB synthesiser	7.50	5.75	4.80
ICM7216B	61-72161	8 digit DFM	19.50		
ICM7216C	61-72162	8 digit DFM	19.95		
ICM7217A	61-07217	Programmable counter	9.50		
SP8629	61-08629	Low power /100 to 200MHz+	3.85	2.95	
SP8647	61-08647	Low power 250MHz version of 95H90	6.00	5.10	
95H90	61-09590	350MHz divide by 10/11 ECL prescaler	7.80	6.00	4.97
HD10551	61-10551	10/11, 20/22, 40/44 200MHz+ prescaler	2.45	1.95	1.20
HA12009	61-12009	Display driver for LED and fluorescent tubes (4 x 4 bit control)	6.00	4.55	3.25
HD44015	61-44015	4 x 4 bit parallel prog divider, PLL and reference divider	4.45	3.25	
HD44752	61-44752	1K CMDS 4 bit MPU controller for HA12009, HD44015	8.00	5.75	3.75
MC145151P	61-14151	Complete 50MHz CMOS parallel controlled synthesiser system	6.00	5.40	4.86
MC145152P	61-14152	Dual modulus prescaler control version of MC145151P	6.60	5.95	5.14
MC145156P	61-14156	As MC145152P, but with serial data control	4.60	4.14	3.72

## MICROPROCESSOR AND MEMORIES

Type No	Stock No.	Description	1-9
<b>Z80A 4 MHz devices</b>			
Z80A	26-18400	Popular and powerful 8 bit CPU	3.75
Z80A PIO	26-18420	2 port parallel input/output	3.50
Z80A CTC	26-18430	4 channel counter/timer	4.00
Z80A DMA	26-18410	Direct memory access controller	9.95
Z80A DART	26-18470	Dual channel async. serial I/O	7.50
Z80A SIO/1	26-18441	Dual channel serial I/O	11.00
Z80A SIO/2	26-18442	Dual channel serial I/O	11.00
Z80A SIO/9	26-18149	Single channel serial I/O	9.95

### NB

The Z80A family may be used as higher speed replacements for the standard speed Z80 (2.0MHz) devices.

<b>Z8001</b>			
<b>Z8001</b>	26-08001	16 bit 8 MByte processor	65.00

### 8080 1MHz series

8080 AP	26-08080	8 bit CPU (2MHz)	3.25
8212	26-08212	8 bit I/O port	1.65
8216	26-08216	4 bit directional parallel bus driver	1.65
8224	26-08224	System clock generator	1.95
8251	26-08251	Programmable communications interface	3.40
8255	26-08255	Programmable peripheral interface	2.58

### 6800 Series

6800P	26-06800	1MHz 8 bit CPU	2.90
6810P	26-06810	1MHz 1k (128 x 8) RAM	1.25
6820P	26-06820	1MHz peripheral interface adapter (PIA)	1.95
6821P	26-06821	1MHz peripheral TTL loading	1.25
6840P	26-06840	1MHz programmable timer	4.15
6850P	26-06850	1MHz ACIA	1.50
6852P	26-06852	1MHz Synchronous bidirectional ACIA	2.30
68488P	26-68488	1MHz IEEE 488 bus i/f	5.25
6809	26-06809	Arguably the best 8/16 bit MPU device	8.75
6802	26-06802	6800 with 128 byte RAM and clock	3.50

68A00P	26-16800	1.5MHz 8 bit CPU	4.25
68A21P	26-16821	1.5MHz peripheral interface adapter	2.10
68A40P	26-16840	1.5MHz programmable timer	4.55
68A52P	26-16852	1.5MHz synchronous serial data adapter	2.75
68B00P	26-26800	2MHz 8 bit CPU	4.65
68B21P	26-26821	2MHz version of 6820, but with TTL loading	2.25
68B40P	26-6840	2MHz programmable timer	4.65
68B50P	26-26850	2MHz ACIA	2.13
68B52P	26-26852	2MHz synchronous serial data adapter	2.95

## MEMORIES

Popular static and dynamic RAMs and EPROMs. All are first grade types from well known manufacturers - Hitachi, Texas etc. Please phone for quantity pricing.

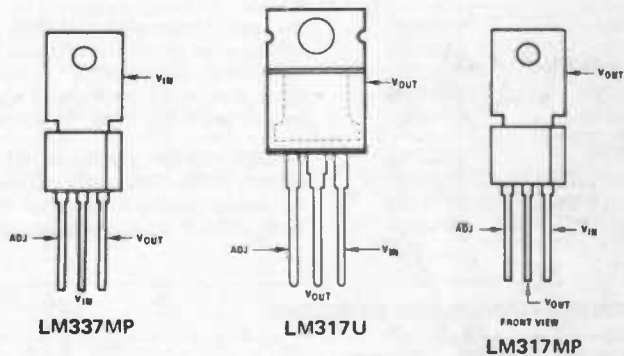
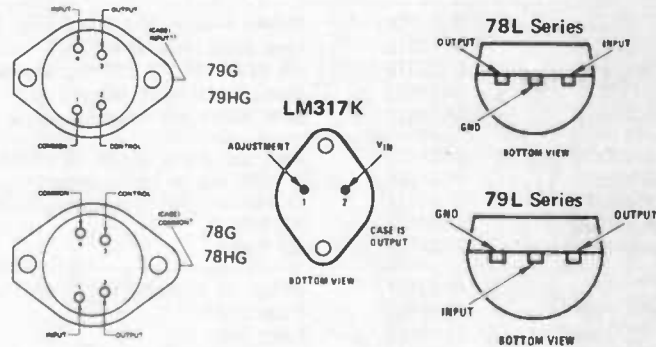
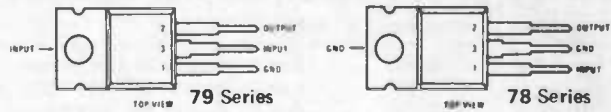
Device	Stock No.	Description	Speed	1-9
<b>static</b>				
6116-3	26-36116	16K (2k x 8) CMOS RAM	200nS	9.00
6116-4	26-46116	16K (2k x 8) CMOS RAM	250nS	11.25
2114-L2	26-02114	4k (1k x 4) Low power		1.49
2112	26-02112	1k (256 x 4) 18 pin		3.40
2111	26-02111	1k (256 x 4) 16 pin		3.40
2102	26-02102	1k (1k x 1)		1.70
<b>dynamic</b>				
8264	26-08264	64k (64k x 1)	150nS	12.50
4864-3	26-04864	64k (64k x 1)	200nS	12.50
4116-2	26-24116	16k (16k x 1)	150nS	1.59
4116-3	26-34116	16k (16k x 1)	200nS	1.49
4027	26-04027	4k (4k x 1)	350nS	5.78
<b>uv eproms</b>				
2732	26-02732	32k (4 x 8)	450nS	4.00
2532	26-02532	32k (4k x 8)	450nS	0A
2716	26-02716	16k (2k x 8) 5v	450nS	3.00
2708	26-02708	8k (1k x 8)	450nS	2.00

# SEMICONDUCTORS

## VOLTAGE REGULATORS

New low prices

Device	Voltage	Current	Style	Stock No	Price
7805	+5v	1A	T0220	27-78052	36p
7806	+6v	1A	T0220	27-78062	36p
7808	+8v	1A	T0220	27-78082	36p
7812	+12v	1A	T0220	27-78122	36p
7815	+15v	1A	T0220	27-78152	36p
7818	+18v	1A	T0220	27-78182	36p
7824	+24v	1A	T0220	27-78242	36p
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7905	-5v	1A	T0220	27-79052	45p
7906	-8v	1A	T0220	27-79062	45p
7908	-8v	1A	T0220	27-79082	45p
7912	-12v	1A	T0220	27-79122	45p
7915	-15v	1A	T0220	27-79152	45p
7918	-18v	1A	T0220	27-79182	45p
7924	-24v	1A	T0220	27-79242	45p
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78L05	+5v	100mA	T092	27-78050	40p
78L06	+6v	100mA	T092	27-78060	40p
78L08	+8v	100mA	T092	27-78080	40p
78L12	+12v	100mA	T092	27-78120	40p
78L15	+15v	100mA	T092	27-78150	40p
78L18	+18v	100mA	T092	27-78180	40p
78L24	+24v	100mA	T092	27-78240	40p
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79L05	-5v	100mA	T092	27-79050	55p
78GKC	+adj	1A	T03	27-78993	3.95
78GUIC	+adj	1A	T0220	27-78992	1.10
78H05	+5v	5A	T03	27-78054	4.25
78H12	+12v	5A	T03	27-78124	5.45
78HG	+adj.	5A	GT03	27-78994	7.45
79HG	-adj.	5A	GT03	27-79994	7.45
LM317	+adj.	0.5A	T0202	27-03175	1.30
LM337	-adj.	0.5A	T0202	27-03175	1.75
LM317K	+adj.	1.5A	T03	27-03173	2.35
LM317U	+adj.	1.5A	T0220	27-03172	2.15
78S40	+adj.	1.5A	OIL	27-78408	1.20
L200	+adj.	2A		27-02006	1.95
uA723	+adj.	200mA	OIL	27-07230	85p



## TRANSISTORS — SMALL SIGNAL — LOW FREQUENCY

Device	Stock Number	V <sub>ceo</sub> (max) V	I <sub>c</sub> (max) A	P <sub>tot</sub> (max) W	Type	hFE	Polarity	Base No.	Description	Price 1-24	Price 25-99	Price 100+
BC182	58-00182	50	200	300	125	at 2mA	NPN	1	General Purpose	10p	8p	7p
BC212	58-00212	-50	200	300	60	at 2mA	PNP	1	General Purpose	10p	8p	7p
BC237	58-00237	45	100	300	180	at 2mA	NPN	1	Plastic BC107	8p	6p	5p
BC238	58-00238	20	100	300	290	at 2mA	NPN	1	Plastic BC108	8p	6p	5p
BC239	58-00239	20	100	300	290	at 2mA	NPN	1	Plastic BC109	8p	6p	5p
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BC307	58-00307	45	100	300	180	at 2mA	PNP	1	Complement to BC237	8p	6p	5p
BC308	58-00308	25	100	300	290	at 2mA	PNP	1	Complement to BC238	8p	6p	5p
BC309	58-00309	20	100	300	290	at 2mA	PNP	1	Complement to BC239	8p	6p	5p
BC327	58-00327	45	800	500	180	at 100mA	PNP	1	Driver/Power Stage	13p	11p	9p
BC337	58-00337	45	800	500	180	at 100mA	NPN	1	Driver/Power Stage	13p	11p	9p
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BC413	58-00413	30	100	300	290	at 2mA	NPN	1	Low Noise BC239	10p	8p	7p
BC414	58-00414	40	100	300	290	at 2mA	NPN	1	Low Noise BC239	11p	9p	8p
BC415	58-00415	35	100	300	290	at 2mA	PNP	1	Complement to BC413	10p	8p	7p
BC416	58-00416	45	100	300	290	at 2mA	PNP	1	Complement to BC414	11p	9p	8p
BC546	58-00546	65	100	500	180	at 2mA	NPN	1	Pre/Driver Stage	12p	10p	8p
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BC550	58-00550	45	100	500	290	at 2mA	NPN	1	Low Noise Pre Stage	12p	10p	8p
BC556	58-00556	65	100	500	180	at 2mA	PNP	1	Complement to BC546	12p	10p	8p
BC560	58-00560	45	100	500	290	at 2mA	PNP	1	Complement to BC550	12p	10p	8p
BC639	58-00639	80	1000	1000	110	at 150mA	NPN	2	Driver Stage	22p	17p	16p
BC640	58-00640	80	1000	1000	110	at 150mA	PNP	2	Complement to BC639	22p	17p	16p
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MPSA13	58-04013	30	500		1 x 10 <sup>4</sup>	at 100mA	NPN	10	Darlington	30p	25p	20p
MPSA63	58-04063	-30	500		1 x 10 <sup>4</sup>	at 100mA	PNP	10	Complement to MPSA13	30p	25p	20p
ZTX108	58-01108	30	100	200	300	at 2mA	NPN	3	General Purpose E-line	10p	8p	7p
ZTX212	58-01212	50	200	300	300	at 2mA	PNP	3	General Purpose E-line	10p	8p	7p
ZTX653	58-01653	100	2000	1000	200	at 500mA	NPN	3	Driver/Power Stage	20p	18p	16p

# SEMICONDUCTORS

## TRANSISTORS — SMALL SIGNAL — LOW FREQUENCY

Device	Stock Number	V <sub>ceo</sub> (max) V	I <sub>c</sub> (max) A	P <sub>tot</sub> (max) mW	Type hFE	Polarity	Base No.	Description	Price 1-24	Price 25-99	Price 100+
ZTX753	58-01753	100	2000	1000	150 at 500mA	PNP	3	Complement to ZTX653	20p	18p	16p
2N2904	58-02904	40	600	600	80 at 150mA	PNP	4	Switching/Power Stage	25p	22p	20p
2N2905	58-02905	40	600	600	200 at 150mA	PNP	4	Switching/Power Stage	25p	22p	20p
2N3905	58-03905	40	200	500	100 at 10mA	PNP	3	General Purpose	10p	8p	7p
2SB646A	58-03646	-100	100	900	120 at 10mA	PNP	5	AF Driver Stage	30p	27p	23p
2SB648A	58-03648	-160	100	1000	120 at 10mA	PNP	6	AF Driver Stage	40p	35p	30p
2SD666A	58-03666	100	100	900	120 at 10mA	NPN	5	Complement to 2SB646A	30p	27p	23p
2S0668A	58-03668	160	100	1000	120 at 10mA	NPN	6	Complement to 2SB666A	40p	35p	30p
2SA872A	58-02872	-120	50	300	500 at 2mA	PNP	5	Pre Driver Stage	19p	18p	17p
2SA1084E	58-01084	-90	100	400	500 at 2mA	PNP	5	Ultra Low Noise	25p		
2SA1085E	58-01085	-120	100	400	500 at 2mA	PNP	5	Ultra Low Noise	25p	24p	23p
2SC1775A	58-01775	120	50	300	500 at 2mA	NPN	5	Complement to 2SA872A	19p	18p	17p
2SC2546E	58-01085	90	100	400	500 at 2mA	NPN	5	Complement to 2SA1084E	24p		
2SC2547E	58-02547	120	100	400	500 at 2mA	NPN	5	Complement to 2SA1085E	24p	23p	22p

## TRANSISTORS — AUDIO POWER

Device	Stock Number	V <sub>ceo</sub> (max) V	I <sub>c</sub> (max) A	P <sub>tot</sub> (max) W	Type hFE	Polarity	Base No.	Description	Price 1-24	Price 25-99	Price 100+
B0139	58-15139	80	1	8	100 at 150mA	NPN	6	General Purpose	29p	23p	19p
B0140	58-15140	-80	1	8	100 at 150mA	PNP	6	Complement to B0139	31p	24p	20p
B0165	58-15165	45	1.5	20		NPN	6	Output Stage	46p	42p	38p
B0166	58-15166	-45	1.5	20		PNP	6	Complement B0166	48p	44p	40p
B0179	58-15179	80	3	30	90 at 100mA	NPN	6	Output Stage	38p	29p	24p
B0180	58-15180	-80	3	30	90 at 10mA	PNP	6	Complement to B0179	41p	31p	26p
TIP31A	58-15031	60	3	40	25 at 3A	NPN	7	Output Stage	35p	32p	29p
TIP32A	58-15032	-60	3	40	25 at 3A	PNP	7	Complement to TIP31A	35p	32p	29p
MJ2955	58-12955	-60	15	115	45 at 4A	PNP	8	Complement to 2N3055	68p	61p	58p
2N3055	58-13099	60	15	115	45 at 4A	NPN	8	Output Stage	58p	52p	47p
2SB720	58-15720	-200	2	25	100 at 150mA	PNP	7	Complement to 2SB720	60p	54p	49p
2S0760	58-17600	200	2	25	100 at 150mA	NPN	7	High Voltage Output	60p	54p	49p
2SJ49	60-01049	-140	7	100		P-Ch	8	HMOS FET	3.10	3.00	1.75
2SJ50	60-01050	-160	7	100		P-Ch	8	HMOS FET	4.25	3.75	3.35
2SJ83	60-01083	-160	7	100		P-Ch	9	2SJ80 in Plastic Flatpack	3.55	3.40	2.88
2SK134	60-00134	140	7	100		N-Ch	8	Complement to 2SJ49	3.10	3.00	2.75
2SK135	60-00135	160	7	100		N-Ch	8	Complement to 2SJ50	4.25	3.75	3.35
2SK227	60-00227	-160	7	100		N-Ch	9	Complement to 2SJ83	3.55	3.40	2.80
2SD753	58-03753	200	15	150	100 at 1A	NPN	8	High Voltage Output	2.34	1.98	

## TRANSISTORS — SMALL SIGNAL RF DEVICES

Device	Stock Number	V <sub>ceo</sub> (max) V	I <sub>c</sub> (max) A	P <sub>tot</sub> (max) mW	Type hFE	Typ f <sub>T</sub> (MHz)	Polarity	Base No.	Description	Price 1-24	Price 25-99	Price 100+
BF195	58-06195								RF Amp/mixer	18p		
BF224	58-06224								RF Amp/driver	22p		
BF241	58-06241	40	25	300	90 at 1mA	430	NPN	11	RF/IF Amp	18p	14p	12p
BF273	58-06273								RF Amp	18p		
BF274	58-06274								RF Amp	20p		
BF362	58-06362	20	20	120	50 at 3mA	800	NPN	12	UHF/VHF RF Stage	49p	40p	32p
BF395	58-06395								RF Amp/mixer	18p		
BF440	58-06440	40	25	300	150 at 1mA	250	PNP	11	Controlled RF/IF Stage	21p	18p	16p
BF441	58-06441	40	25	300	90 at 1mA	250	PNP	11	RF/IF Stage	21p	18p	16p
BF479	58-06479	20	25	160	30 at 10mA	850	PNP	12	UHF/VHF RF/Mixer	66p	55p	44p
BF6795	58-06679	30	30	160	35 at 3mA	930	PNP	12	UHF/VHF RF Stage	55p	47p	33p
BFR91	58-07091	12	50	180	50 at 30mA	5000	NPN	13	UHF RF Stage	1.33	1.10	95p
BFT95	58-10095	15	25	200	60 at 10mA	5000	PNP	13	UHF RF Stage	99p	88p	77p
BFW92	58-08092	15	25	130	100 at 2mA	1000	NPN	13	UHF RF Stage	60p	51p	42p
BFY90	58-09090	15	25	200	100 at 2mA	1000	NPN	14	UHF/VHF RF Stage	90p	85p	70p
NE21936	58-21936	10	80	250mW	80 at 20mA	8000	NPN	13	UHF RF	£5.00	£4.30	£3.90
ZTX323	58-06232	15	500	175mW		600	NPN	3		60p	55p	45p
ZN2369A	58-02369	15	200	360mW	10 at 10mA	500	NPN	4		38p	34p	30p



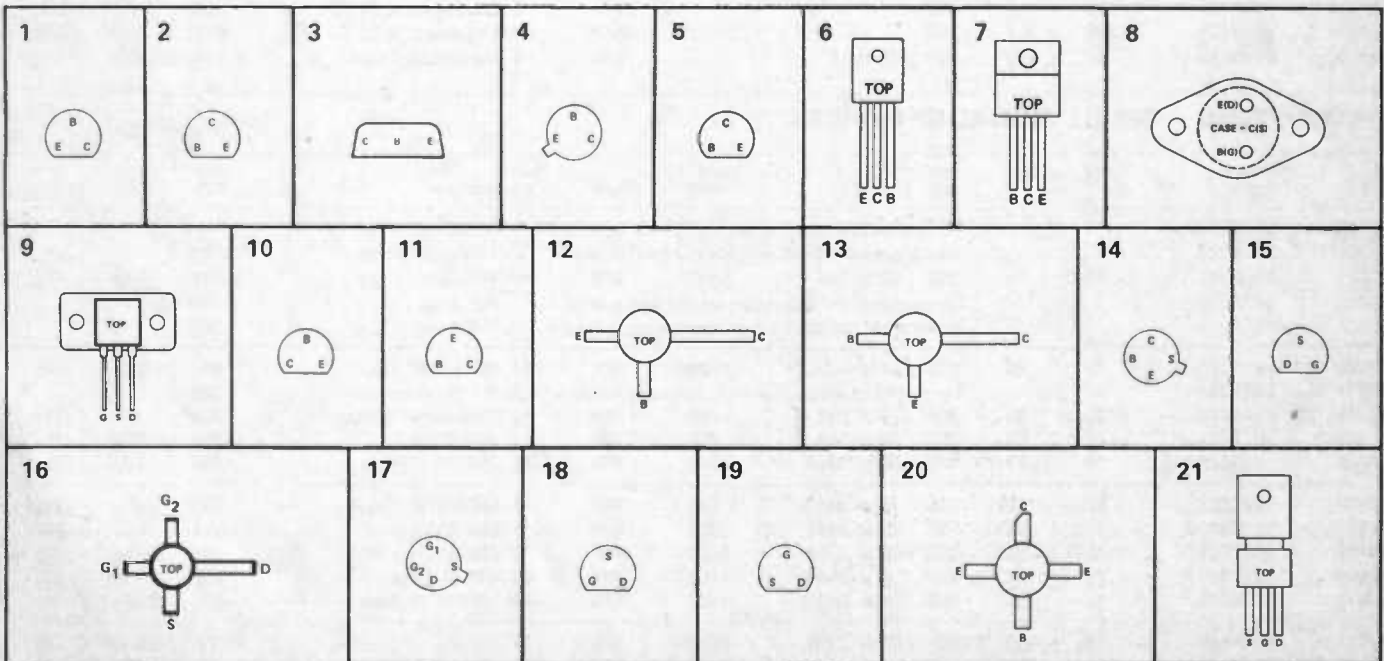
# SEMICONDUCTORS — TRANSISTORS

## TRANSISTORS — RF POWER DEVICES

Device	Stock Number	V <sub>ceo</sub> (max) V	I <sub>c</sub> (max) A	P <sub>tot</sub> (max) W	Typ hFE	Typ T (MHz)	Polarity	Base No. Description	Price 1-24	Price 25-99	Price 100+
BFW16A	58-08016	25	0.3	1.5	30 at 0.15	1200	NPN	4 UHF Med Power	85p		
MRF237	58-14237	18	0.64	8	6 at 0.25	225	NPN	4 VHF Med Power	3.20	2.80	2.45
MRF472	58-14472	30	1.0	10	20 at 0.5		NPN	7 CB PA Ect	1.25		
MRF475	58-14475	18	4	10	60 at 0.5	30	NPN	7 CB PA Ect	4.60	4.15	3.60
TP2320	58-12320	18	6	50	30 at 0.5	175	NPN	20 VHF PA Stage	10.24	9.26	7.82
VN66AF	60-02066	(60vDS)		15		200	N-Ch	21 VMOS Power FET	95p	87p	81p
ZTX3866	58-03866	30		0.7		400	NPN	3 E-line version 2N3866	45p	40p	33p
ZN3866	58-13866	30	0.5	1	4 at 0.05	400	NPN	4 VHF/UHF Output	1.20	98p	89p

## TRANSISTORS — SMALL SIGNAL RF FET/MOSFET

Device	Stock Number	V <sub>DS</sub> (max) V	V <sub>DG</sub> (max) V	I <sub>G</sub> (max) mA	P <sub>tot</sub> (max) mW	Y <sub>fs</sub> (Typ) mmhos	Polarity	Base No. Description	Price 1-24	Price 25-99	Price 100+
BF256	95-00256	30	30	10	360	4.5	N-Ch	15 JFET for HF/VHF	38p		
BF960	60-06960	20		0.1	200	11.5		16 Dual gate MOSFET to 900MHz	99p	85p	75p
BF961	60-06961	20		0.1	200	14		16 Dual gate MOSFET to 300MHz	70p	62p	54p
BF963	60-06963	20		0.1	333	25		16 Dual gate MOSFET to 300MHz	99p	85p	75p
J310	59-02310		25	10	350	12	N-Ch	18 JFET for HF-VHF	69p	60p	54p
J176	59-02176		30	50	350		P-Ch	19 JFET analogue switch	65p	52p	46p
MEM680	60-05680							17 Dual gate MOSFET for VHF	75p	67p	56p
2SK55	59-01055		-18	10	150	8	N-Ch	15 JFET VHF amp/mixer	32p	29p	26p
2SK168	59-01168		-30	10	200	10	N-Ch	15 JFET VHF amp/mixer/LO	37p	33p	28p
3SK45	60-04045	22		0.02	330	14		17 Dual gate MOSFET — VHF amp	49p	34p	26p
3SK51	60-04051	20		0.02	330	17		17 Dual gate MOSFET — VHF amp	54p	44p	34p
3SK60	60-04060	15		0.02	330	16		17 Dual gate MOSFET — VHF amp	58p	46p	35p
3SK88	60-04088	20		0.7	200	7		16 Dual gate MOSFET — Ultra low noise	99p	85p	79p
40673								Replaced by 3SK51			
40822								Replaced by 3SK45			
40823	60-03823	18			330	12		17 Dual gate MOSFET — VHF mixer	65p	49p	41p

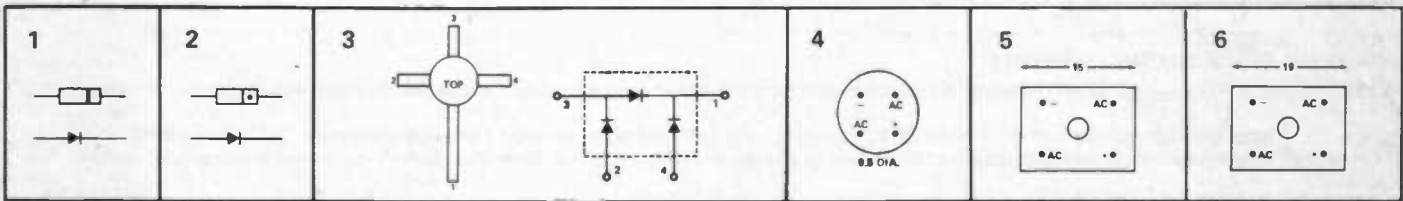


## TRANSISTOR BASE CONNECTIONS

# SEMICONDUCTORS — DIODES

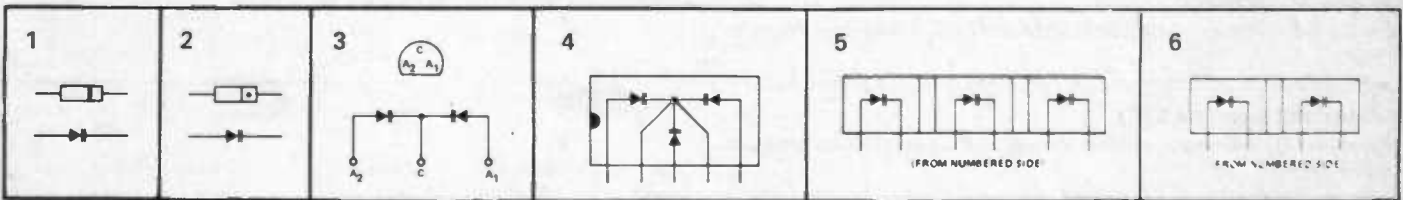
## DIODES — SIGNAL, RECTIFIER, ETC.

Device	Stock No.	PIV	IF max A	VF	Base No.	Description	Price	Price	Price
							1-24	25-99	100+
AA112	12-01126	20	0.03	950mV at 10mA	1	Gold Bonded Ger	25p	20p	
BA244	12-02447	20	0.1	1V at 100mA	1	Switching Diode	17p	12p	10p
BA379	12-03797	30	0.05	1V at 50mA	2	PIN Diode - Atten	35p	32p	30p
ND4981-7E	12-49817		0.01	340mV at 10mA	1	Schottky Diode	51p	44p	38
OA91	12-00916	115	0.05	2.1V at 30mA	1	Gen Purpose Silicon	7p	6p	5p
TOA1061	12-10617	30	0.05	1.2V at 50mA	3	3-Pin Diode Network	95p		
PW02	12-62006	200V	6	1.1V at 5A	4	Bridge Rectifier	75p	85p	59
SO4	12-24006	400V	2	1.1V at 1.5A	5	Bridge Rectifier	45p	40p	46
W005	12-10506	50V	1.5	1.1V at 1A	6	Bridge Rectifier	28p	25p	23p
IN4001	12-40016	50V	1	1.1V at 1A	1	Rectifier Diode	6p	5p	
IN4002	12-40026	100V	1	1.1V at 1A	1	Rectifier Diode	7p	6p	
IN4004	12-40046	400V	1	1.1V at 1A	1	Rectifier Diode	7p	6p	
IN4148	12-41486	100V	0.2	1V at 10mA	1	General Purpose Silicon	5p	4p	3p
IN5404	12-54046	400V	3	1.1V at 3A	1	Rectifier Diode	16p	13p	
IN6263	12-62637		0.015		1	Schottky Diode	62p	50p	41p



## DIODES — VARICAP

Device	Stock No.	C / VR 2V		C/VR (typ)		Cap Ratio	Description	Price	Price	Price
		(max)	(typ) pF	pF/V	Q (typ)			1-24	25-99	100+
BA102	12-01025	20	40	10/10		1.4	1 VHF AC	30p	27p	24p
BA121	12-01215	30	10	6.5/15	600	2.5	1 VCO/AFC etc.	30p	23p	21p
BB105B	12-01055	28	13	3/11	5	5	2 UHF tuning -- AFC	30p	23p	21p
BB109B	12-01095	28	35	5/11		6	2 VHF tuning/modulator	27p	24p	18
BB204B	12-02045	30	42	15/12		2.6	3 Dual VHF tuning	36p	30p	24p
BB212	12-02125						AM Tuning	1.95	1.68	1.22
ITT210	12-02105	20	17	8/12		4	4 VHF/UHF AFC	30p	23p	
MVAM115							Use KV1235			
MVAM125							Use KV1225			
KV1210	12-12105	20	400	30/9	200	15	4 Triple AM tuning	2.45		
KV1211							Use KV1236			
KV1225	12-12255	30	510	30/21	200	28	5 Triple AM tuning	2.75	2.25	1.80
KV1235	12-12355	20	450	30/8.5	200	20	5 Triple AM tuning	2.75	2.25	1.80
KV1236	12-12365	20	450	30/8.5	200	20	6 Dual AM tuning	2.55	2.04	1.30
KV1310	12-13105	18	22	9/8		2.6	3 Dual VHF tuning	40p	30p	26p
KV1310	12-13205	30	40	10/18		2.8	3 Dual VHF tuning	40p	30p	26p



## DIODES — ZENER

BZY88C type or equivalent. 400mW. 5%.

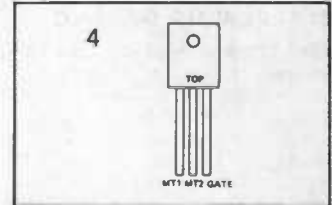
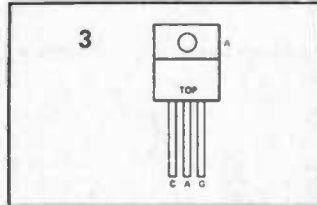
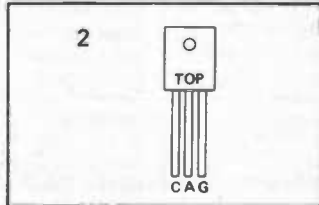
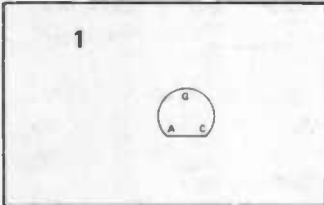
Voltage	Stock No	Typ. Temp Coeff. at 1ZT % per °C	Price	Price	Price	Voltage	Stock No	Typ. Temp Coeff. at 1ZT % per °C	Price	Price	Price
			1-24	25-99	100+				1-24	25-99	100+
2V7	12-00278	-0.09...-0.04	10p	8p	7p	10	12-01008	+0.05...+0.08	10p	8p	7p
3V3	12-00338	-0.08...-0.03	10p	8p	7p						
3V9	12-00398	-0.07...-0.03	10p	8p	7p	11	12-01108	+0.05...+0.09	10p	8p	7p
4V7	12-00478	-0.85...+0.02	10p	8p	7p	12	12-01208	+0.06...+0.09	10p	8p	7p
5V1	12-00518	-0.03...+0.04	10p	8p	7p	15	12-01508	+0.07...+0.09	10p	8p	7p
						18	12-01808	+0.08...+0.10	10p	8p	7p
5V6	12-00568	-0.02...-0.06	10p	8p	7p	22	12-02208	+0.08...+0.10	10p	8p	7p
6V8	12-00688	+0.02...+0.07	10p	8p	7p						
8V2	12-00828	+0.04...+0.07	10p	8p	7p	27	12-02708	+0.08...+0.10	10p	8p	7p
9V1	12-00918	+0.05...+0.08	10p	8p	7p	33	12-03308	+0.08...+0.10	10p	8p	7p

# SEMICONDUCTORS — DIODES

## SILICON CONTROLLED RECTIFIERS

**NEW**

Device	Stock Number	PIV (V)	IRMS (A)	IGT (mA)	VGT (V)	IH (mA)	Base No.	Description	Price 1-24	Price 25-99	Price 100+
BRY55-100	52-55100	100	0.8	0.2	0.8	5.0	1		39p	34p	34p
C106D1	52-00106	400	4.0	0.2	0.8	3.0	2		42p	38p	34p
C122D1	52-00122	400	8.0	25	1.5	30	3		1.14	1.02	91p
ZN6403	52-06403	400	16	30	1.5	40	3		2.22	2.00	1.80
<b>Triac</b>											
2N6073A	58-06073	400	4.0	5	2.4		4		78p	70p	62p



BASE CONNECTIONS

## SCHOTTKY DIODE BALANCED MIXERS

A comprehensive range of high quality hermetically sealed mixers for receiver and modulator applications. All devices are designed for PC mounting on 0.2" grid.

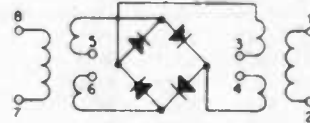
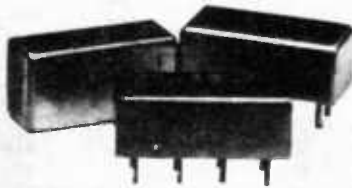
All the SB...series are supplied for operation from -20°C to +85°C. All SR devices are supplied for use in the range -55°C to +100°C.

All types are suitable for use in frequency mixing, pulse and amplitude modulation, phase detection, current controlled attenuators, and bi-phase modulation.

All versions are designed for 50 ohm terminations.

An informative booklet on double balanced mixers applications is available for 0.50p Stock No. 02-01234

Sizes:  
L—20 mm  
W—10mm  
H—7mm



Pin 2 is located under the letter 'M' of MCL.



BOTTOM VIEW

Device	Stock No	Description	L0 level	1-9	10-99
SBL1	12-00003	1-500MHz premium type	+7dBm	4.68	4.22
SBL1-8	12-00013	0.1-200MHz premium type	+7dBm	5.00	4.50
SBL1-X	12-00023	10-1000MHz	+7dBm	6.33	5.70
SRA1	12-00033	5-500MHz MIL-M-28837/1A HiRel	+7dBm	10.80	10.26
SRA1-1	12-00043	1-500MHz	+7dBm	12.77	12.14
SRA1H	12-00053	5-500MHz high level mixer	+17dBm	16.34	15.52
SRA3	12-00063	25kHz to 200MHz high spec receiver mixer	+7dBm	15.35	13.65

## OPTO ELECTRONICS

The top quality range of LED products from AEG -Telefunken. Made in Europe.

### MINIATURE 3mm DIA LEDs

Miniature LED indicators, suitable for use on PC boards or on crowded control panels.

Type	Stock No.	Colour	1-9	10-99	100+
CQX25	15-20250	Red clear	15p	13p	12p
V178P	15-01780	Red	15p	13p	12p
CQX26	15-20260	Green clr	16p	15p	14p
V179P	15-01790	Green	16p	15p	14p
CQX27	15-20270	Yellow clr	18p	17p	16p
V180P	15-01800	Yellow	18p	17p	16p
CQX41A	15-20410	Orange red	19p	18p	17p

### STANDARD 5mm DIA LEDs

Type	Stock No.	Colour	1-9	10-99	100+
CQY40L	15-10400	Red	12p	10p	9p
CQY72L	15-10720	Green	15p	14p	13p
CQY74L	15-10740	Yellow	15p	14p	13p
CQX38A	15-20380	Orange red	20p	18p	17p
CQX39B	15-20390	O/Red clr	29p	25p	23p

## STANDARD RECTANGULAR 2.5 x 5mm LEDs



Type	Stock No.	Colour	1-9	10-99	100
CQX10	15-20100	Red	17p	16p	15p
CQX11	15-20110	Green	20p	18p	17p
CQX12	15-20150	Yellow	20p	18p	17p
CQX40	15-20400	Orange red	24p	21p	19p

## INFRA-RED LEDs

Individual emitter and sensor devices for use in remote control, counting circuits etc.



Type	Stock No.	Mode	Price
CuY99	15-10990	Emitter	56p
BPW41	15-30410	Detector	1.51

# SEMICONDUCTORS — LED

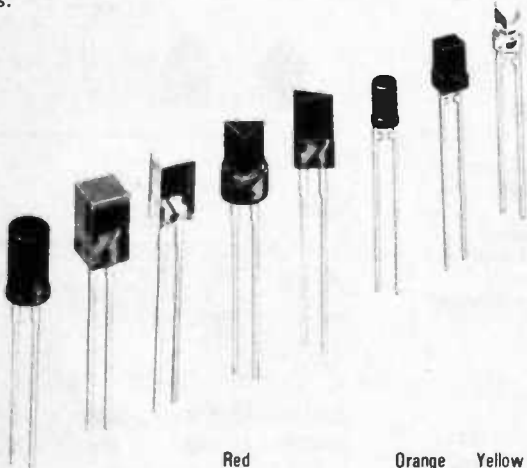
## INFRA-RED OPTOCOUPLER



Type	Stock No.	1-9	10-99	100+
CNY37	15-40370	1.44	1.26	99p

## FLAT SURFACE DIFFUSED

New range of flat face, diffused LED indicators in a range of different shapes.



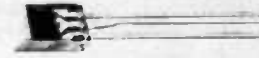
Shape	Size	Red	Orange	Yellow	Green
Square	3 x 3mm	V330	V331	V333	V332
Round	3mm	V320	V321	V323	V322
Triangular	3mm	V340	V341	V343	V342
Rect.	2.5 x 5mm	V510	V511	V513	V512
Round	5mm	V520	V521	V523	V522
Square	5 x 5mm	V530	V531	V533	V532
Triangular	5mm	V540	V541	V543	V542
Acute Triang	5mm	V550	V551	V553	V552

Type	Stock No.	1-9	10-99	100+
V320	15-03200	17p	16p	15p
V321	15-03210	26p	22p	20p
V322	15-03220	20p	18p	17p
V323	15-03230	20p	18p	17p
V330	15-03300	17p	16p	15p
V331	15-03310	26p	22p	20p
V332	15-03320	20p	18p	17p
V333	15-03330	20p	18p	17p
V340	15-03400	17p	16p	15p
V341	15-03410	26p	22p	20p
V342	15-03420	20p	18p	17p
V343	15-03430	20p	18p	17p
V510	15-05100	17p	16p	15p
V511	15-05110	26p	22p	20p
V512	15-05120	20p	18p	17p
V513	15-05130	20p	18p	17p
V520	15-05200	17p	16p	15p
V521	15-05210	26p	22p	20p
V522	15-05220	20p	18p	17p
V523	15-05230	20p	18p	17p
V530	15-05300	17p	16p	15p
V531	15-05310	26p	22p	20p
V532	15-05320	20p	18p	17p
V533	15-05330	20p	18p	17p
V540	15-05200	17p	16p	15p
V541	15-05410	26p	22p	20p
V542	15-05420	20p	18p	17p
V543	15-05430	20p	18p	17p
V550	15-05500	17p	16p	15p
V551	15-05510	26p	22p	20p
V552	15-05520	20p	18p	17p
V553	15-05530	20p	18p	17p

THE ANODE IS THE LONGEST LEAD ON ALL LEDS

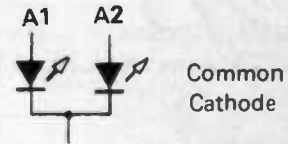
## TRI COLOUR LED (flat top)

This true three colour LED achieves total colour mixing by using a flat diffused face as a 'screen' for projection. The colours available depend on the wiring configuration: red, green and yellow.



Size: 10 x 5 x 2.5mm  
Leads: 15mm

A1-Orange/red  
A2-Green  
A1 A2 - yellow

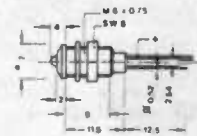


Type	Stock No	1-9	10-99	100+
V518	15-05180	60p	57p	53p

## LEDs WITH CHROME MOUNTING BEZEL

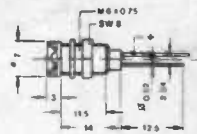
### Prominent type (3mm LED)

Contains a 3mm LED mounted in a chrome finish bezel.



Colour	Stock No.	1-9	10-99	100+
Red	15-60850	52p	46p	41p
Green	15-60860	53p	47p	42p
Yellow	15-60870	54p	48p	43p
Or/Red	15-60880	58p	52p	46p

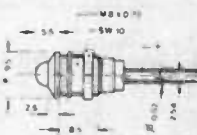
### Recessed type (3mm LED)



Colour	Stock No.	1-9	10-99	100+
Red	15-61850	52p	46p	41p
Green	15-61860	53p	47p	42p
Yellow	15-61870	54p	48p	43p
Or/Red	15-61880	58p	52p	46p

### Prominent type (5mm LED)

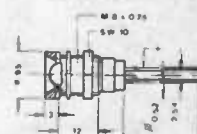
Contains a 5mm LED mounted in a chrome finish bezel.



Colour	Stock No	1-9	10-99	100+
Red	15-62850	62p	56p	51p
Green	15-62860	65p	59p	54p
Yellow	15-62870	66p	60p	56p
Or/Red	15-62880	68p	62p	58p

### Recessed type (5mm LED)

Contains a 5mm LED mounted in a chrome finish bezel.



Colour	Stock No	1-9	10-99	100+
Red	15-63850	62p	56p	51p
Green	15-63860	65p	59p	54p
Yellow	15-63870	68p	60p	56p
Or/Red	15-63880	68p	62p	58p



# SWITCHES

## KEYBOARD SWITCHES

A range of small, lightweight, PCB mounting keyboard switches for data entry and instrument switching. Two part caps are available for all switches, with a coloured base and clear top, for customised labeling.

## TACTILE SWITCHES

Uses such as time setting, instrument function selection, intercom switching etc.

### KHC 10901

Momentary contacts, push to make, 1 pole.

Spec

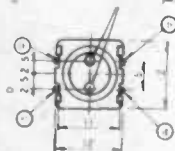
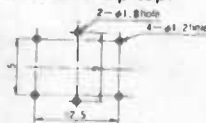
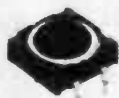
Contact: Mechanical  
 Operating Force: 130 +/- 50g  
 Stroke: 0.3 + 0.2mm  
           - 0.05mm  
 Contact resistance: 100m ohms max  
 Life: 500,000 cycles min  
 Max current: 50mA at 12VDC



Stock No.	1-24	25-99	100+
53-10901	18p	16p	15p

### KHC10902

As KHC10901 but with built in cap top.



Stock No.	1-24	25-99	100+
53-10902	18p	16p	15p

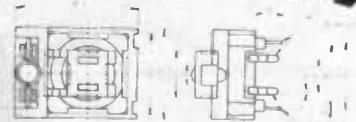
### KHC15001

Right angle version of KHC10901.

Stock No.	1-24	25-99	100+
53-15001	22p	18p	17p

### KHC11901

With red LED indicator.



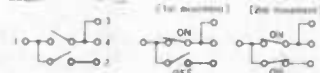
Stock No.	1-24	25-99	100+
53-11901	31p	28p	26p

### KHF10901

Double action tactile switch providing two movements in one unit. With initial push the first contact position is 'ON', with further pressure the second contact also switches 'ON'.



Switch action configuration



Specification:

Maximum current: 20mA at 12VDC  
 Operating force: 1st position 90 +/- 40gms  
                           2nd position 280 +/- 100gms  
 Stroke: 1st position 0.7 +/- 0.3mm overall  
           stroke 1 +/- 0.4mm  
 Contact resistance: Maximum 100mR  
 Operational life: 200,000 cycles minimum

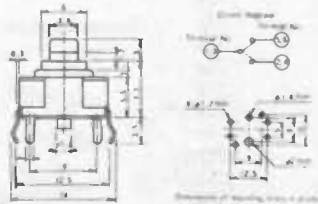
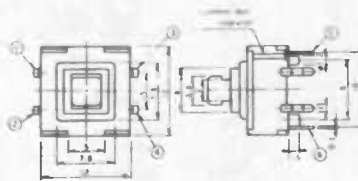
Stock No.	1-24	25-99	100+
53-30901	29p	26p	25p

### KHE10901

Small, PC mounting keyboard switch with changeover contacts.

Specification:

Maximum op current: 20mA at 12VDC  
 Operating force: 100 +/- 40gms  
 Stroke: 0.6m +/- 0.2mm  
 Contact resistance: 100m ohms maximum  
 Operating life: 100,000 cycles min



Stock No.	1-24	25-99	100+
53-60901	29p	27p	23p

### KEF10901 (Soft Touch)

Very small, single key switch. Uses unique conductive rubber contact and is suitable for use where pulse input to logic circuits are required.

Specification:

Maximum current: 20mA at 12VDC  
 Operating force: 80 +/- 40gms  
 Stroke: 1 +/- 0.3mm  
 Contact resistance: 1k ohms maximum  
 Operational life: 100,000 cycles minimum



Circuit diagram



Dimensions of mounting tabs on printed circuit board (alloy vapour from switch mounting face)

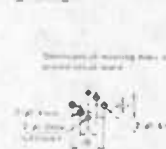
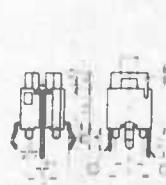


Stock No.	1-24	25-99	100+
53-40901	18p	16p	15p

### KEC11901

With integral red LED.

Small high performance switch using rubber contact.



Circuit diagram

Specification:

Operating force: 80 +/- 40gms  
 Stroke: 0.8 +/- 0.4mm  
           - 0.1mm  
 Contact resistance: 1k ohm maximum  
 Operational life: 100,000 cycles

Stock No.	1-24	25-99	100+
53-51901	31p	29p	27p

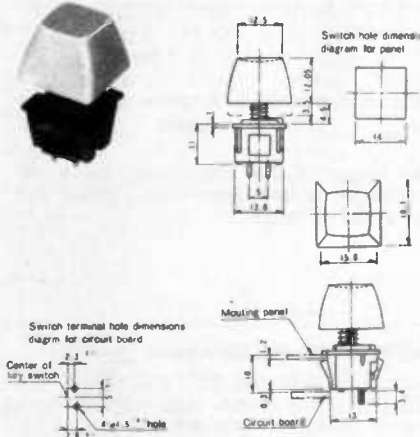
# SWITCHES

## KCC10002

Data entry keyboard with high reliability and minimum 10 million operations.

Specification:

Maximum current: 100mA at 12VDC  
 Operating force: 90 +/- 25gms  
 Key stroke: 3.5 +/- 0.5mm  
 Contact resistance: 5 ohms

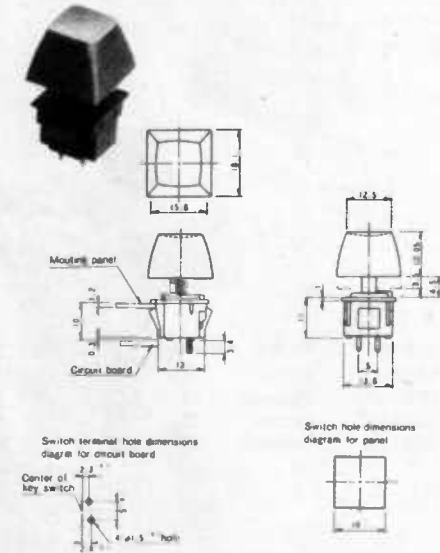


Price less keytop

Stock No.	1-24	25-99	100+
53-70002	24p	22p	20p

## KCC10902

As KCC10002 type but self locking.



Price (less key top)

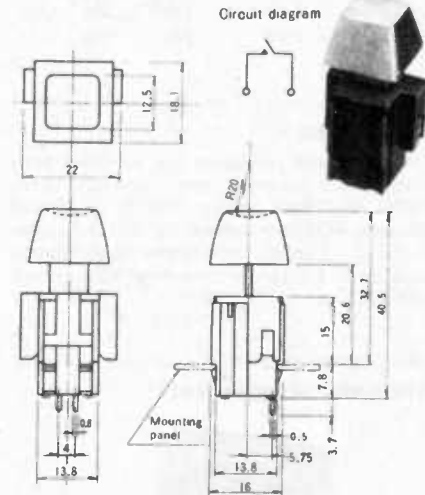
Stock No.	1-24	25-99	100+
53-70902	48p	42p	38p

## KGF10021

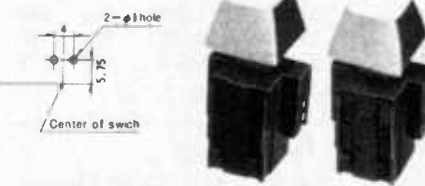
Data entry keyboard switch with reed switching element. Minimum 20 million operations.

Specification:

Current: 100mA at 12v  
 Operating force: 60 +/- 25gms  
 Key stroke: 4.3 +/- 0.5mm  
 Contact resistance: 200m ohms maximum



Switch terminal hole dimensions diagram for circuit board

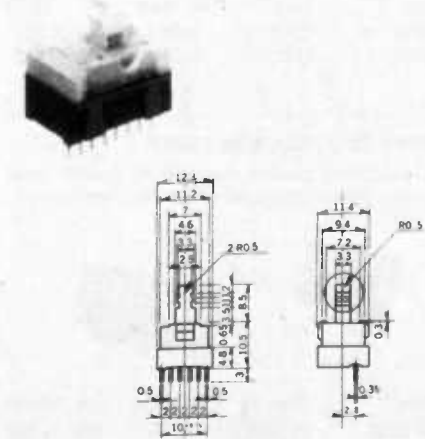


Price (less keytop)

Stock No.	1-24	25-99
53-80021	62p	55p

## SUT SERIES SWITCHES

Small PC mounting double pole changeover switch. Available in latching or momentary operation.



Type	Stock No.	1-24	25-99	100+
Latching	53-90010	32p	27p	23p
Momen.	53-90011	32p	27p	23p

## KEYSWITCH CAPS

### KT5 SERIES

Small square keytop to suit types KHC10901, KHF11901 and KHE10901. Two part moulding, blue base, with clear top to allow user legend to be inserted.



Stock No.	1-24	25-99	100+
53-90901	17p	14p	10p

### KT6 SERIES

'Piano Key' type top to suit KH11901. Colour black.



Stock No.	1-24	25-99	100+
53-90902	12p	9p	7p

### KT7

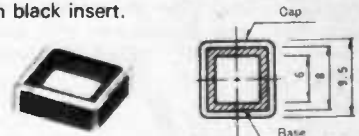
Small square keytop to suit type KEF10901. Two part moulding, clear top with ivory base to allow user legend to be inserted.



Stock No.	1-24	25-99	100+
53-90904	18p	15p	12p

### KT9

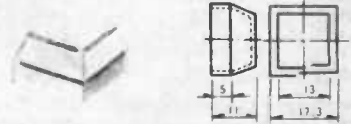
Small square keytop with centre cutout to suit type KEC11901. Two part moulding, clear top with black insert.



Stock No.	1-24	25-99	100+
53-90905	19p	16p	12p

### KT2-1

Two part cap for use with KCC10002, KCC10902, and KGF10021. Clear top with ivory base, to allow user legend to be inserted.



Stock No.	1-24	25-99	100+
53-90906	18p	15p	12p

### KT2-2

Double width version of KT1-1

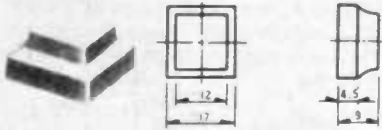


Stock No.	1-24	25-99	100+
53-90907	18p	16p	13p

# SWITCHES — KEYBOARDS

## KT3-1 (Numbered)

One piece keytop in ivory colour available with a range of letters and numbers.



Legend	Stock No.	Legend	Stock No.
0	53-90910	9	53-90919
1	53-90911	T	53-90920
2	53-90912	C	53-90921
3	53-90913	CE	53-90922
4	53-90914	P	53-90923
5	53-90915	+	53-90924
6	53-90916	-	53-90925
7	53-90917	^	53-90926
8	53-90918		
Prices	1-24	25-99	100+
	8p	8p	7p

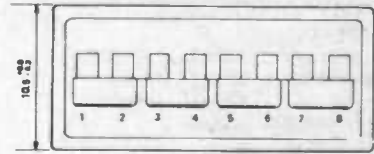
## MINIATURE PUSH

Sub-miniature push to make switch. Rated 1A at 240VAC.



Stock No.	Type	1-24	25-99	100+
53-00300	P-t-M	30p	26p	21p
53-00302	P-t-B	30p	26p	21p

## TYPE BX - SLIDE LEVER CHANGEOVER



Type	Stock No.	No. ways	1-9	10-99
B-8AX	53-84009	4xSPST	2.10	1.95

Other types of BX changeover types are available on special order only - please call sales office for details.

## LEVER SWITCHES

### SLR1

Miniature low profile switch with integral chrome finish knob. 2 pole changeover.



Stock No.	1-24	25-99	100+
53-00100	32p	28p	22p

## MINIATURE TOGGLE

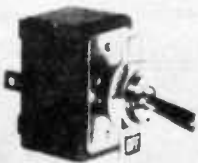
Sub-miniature switches available in single pole changeover, double pole changeover and 3 position single pole changeover with centre off. Contacts rated 3A at 125VAC. Mounting hole 6mm dia.



Stock No	Type	1-24	25-99	100+
53-00200	SPCO	85p	55p	49p
53-00201	OPCO	85p	76p	68p
53-00202	3p SPCO	85p	76p	88p

## MAINS TOGGLE

Panel mounting double pole changeover mains toggle switch with solid terminals. Contacts rated at 1.5A 250VAC. Mounting hole 12mm.



Stock No	Type	1-24	25+
53-00208	OPCO	95p	88p

## TYPE DNS - SLIDE LEVER



Type	Stock No.	No. ways	1-9	10-99
DNS04	53-04009	4xSPST	81p	69p
DNS06	53-06009	6xSPST	88p	76p
DNS08	53-08009	8xSPST	1.40	1.10

## TYPE DNT - PIANO LEVER

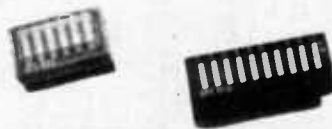
Switch is 'on' when lever is in lower position.



Type	Stock No.	No. ways	1-9	10-99
DNT4	53-40009	4xSPST	1.05	90p
DNT8	53-80009	8xSPST	1.45	1.20

## TYPE SPC - ROCKER LEVER

Transparent covers available to special order only - please call sales office for details.



Type	Stock No.	No. ways	1-9	10-99
SPC002	53-00209	2xSPST	88p	76p
SPC004	53-00409	4xSPST	1.40	1.10
SPC006	53-00609	6xSPST	1.45	1.20
SPC008	53-00809	8xSPST	1.70	1.60
SPC010	53-01009	10xSPST	2.00	1.85

## SRQ BCD/HEX PROGRAMME SWITCH

PCB mounting 10 way BCD and 16 way HEX BCD programme switch. Both types available in either vertical or horizontal mounting.

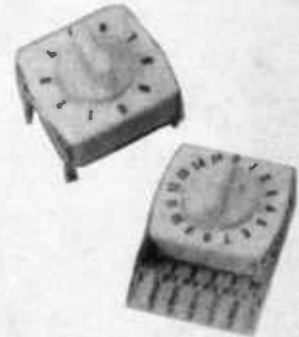
Spec:

Contacts: 6V at 100mA. Resistance less than 1ohm.  
Lifetime: Resistance less than 1ohm after 10,000 operations.

Operational

Temp: -30 to +70°C

Coding: Standard 4-bit

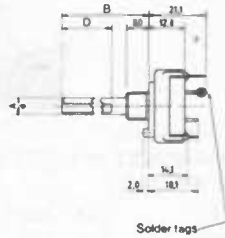
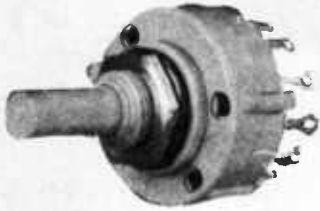


Stock No	Mounting	No. Ways	1-24	25-99
53-01102	Vertical	10	1.28	1.05
53-01103	Horizontal	10	1.28	1.05
53-01162	Vertical	16	1.38	1.24
53-01163	Horizontal	16	1.38	1.24

# SWITCHES

## ROTARY

Rotary wafer switches with adjustable limit stops. Suitable for 250VAC/DC at 150mA (non reactive). Spindle 0.25" dia, 30° indexing, make before break.



1 pole 12 way



2 pole 6 way



3 pole 4 way



4 pole 3 way

Type	Stock No.	Circuit	1-24	25-99	100+
CK1024	53-21024	1p 12 way	54p	50p	46p
CK1025	53-21025	2p 6 way	54p	50p	46p
CK1026	53-21026	3p 4 way	54p	50p	46p
CK1027	53-21027	4p 3 way	54p	50p	46p

## THUMBWHEEL SWITCH 4400

Front mounted, 10 position (0-9) BCD coded switch with complement outputs as well as straight BCD. Expected life over half million cycles. Character height 5mm. Snap together construction with push-in mounting cheeks.

H — 34mm  
W — 8mm  
D — 32mm



**New**

Type	Stock No.	1-24	25+
44010	53-44010	2.80	2.45
Mounting cheeks (pair)	53-44040	75p	60p

## THUMBWHEEL SWITCH J1009

Front mounted miniature 10 position (0-9) BCD coded switch. Expected life in excess of half million cycles. Snap together construction with push-in mounting cheeks. Character height 3mm

H — 15mm  
W — 6mm  
D — 16mm



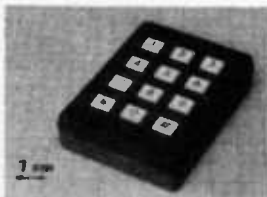
**NEW**

Type	Stock No.	1-24	25+
J1009	53-41009	2.65	2.45
Mounting cheeks (pair)	53-42009	55p	45p

## LOW PROFILE KEYBOARD KL0025

Low profile tactile keyboard. Front mounting with single pole x 12 configuration. Contact life 1 million operations at full rating (MTBF). Contact rating 50mA at 28VDC. Contact resistance 500 milliohms max at .2mA at 17VDC. 12 keys 0-9,

L — 69mm  
W — 50mm  
D — 5mm

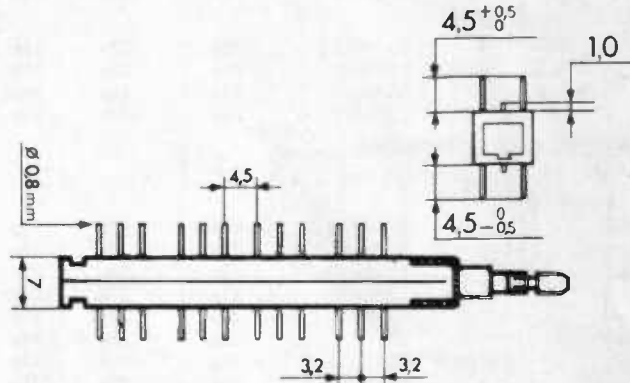


**new**

Type	Stock No.	1-24	25+
KL0025	53-60025	10.20	9.50

## DIALISTAT SWITCHES

(Not recommended for new designs)



## SWITCH BLOCKS

Switch Blocks	Stock No.	1-9	10+
2 pole C/O			
Latching	53-70060	31p	28p
Push/push	53-70061	32p	29p
4 pole C/O			
Latching	53-70062	41p	37p
Push/push	53-70063	43p	39p
6 pole C/O			
Latching	53-70064	51p	46p
Push/push	53-70065	52p	48p
8 pole C/O			
Latching	53-70066	63p	57p
Push/push	53-70067	64p	58p

Block prices include: block, spring, retaining clip, location cup, dust cap, (cam).

## BRACKETS AND LATCHBARS

May be cut to exact length by user. Holes on 5mm pitch. Brackets (Latchbars)

	Stock No.	1-9	10+
10 hole	53-70080	12p	9p
	53-70081	(9p)	(9p)
20 hole	53-70082	16p	14p
	53-70083	(12p)	(9p)
30 hole	53-70084	21p	18p
	53-70085	(14p)	(12p)
50 hole	53-70086	26p	23p
	53-70087	(16p)	(14p)

Use the bracket/latchbar with the number of holes 'rounded up' to a standard value.

## ILLUMINATED SYSTEM

This is simply a special button and LED holder used in connection with the standard switch. Remember to allow an extra switch pole to light the LED.

	Stock No.	1-9	10+
8			
LED holder	53-70090	9p	7p
Button	53-70091	20p	15p

See standard PL for details of various coloured LEDs.

## PIANO KEY CONVERSIONS & PUSH BUTTONS

A pivot bar for up to 10 button positions is supplied as standard, which must be cut to suit your exact requirement.

	Stock No.	1-9	10+
Pivot shaft	53-70070	45p	39p
Shaft holder	53-70071	10p	8p
Slider cap	53-70072	9p	8p
Piano key button	53-70073	22p	18p



# SWITCHES

## SUE SERIES SWITCHES SWITCH MODULES

	Stock No	1-24	25-99	100+
C/O modules inc spring				
2p	53-70000	26p	22p	17p
4p	53-70001	35p	30p	25p
6p	53-70002	43p	38p	33p
8p	53-70003	51p	46p	41p

## BRACKETS AND LATCHBARS

Brackets - 10, 15 or 20mm pitches.  
Please state 10, 15 or 20.

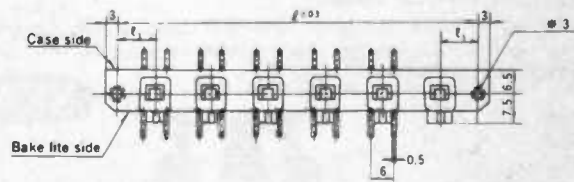
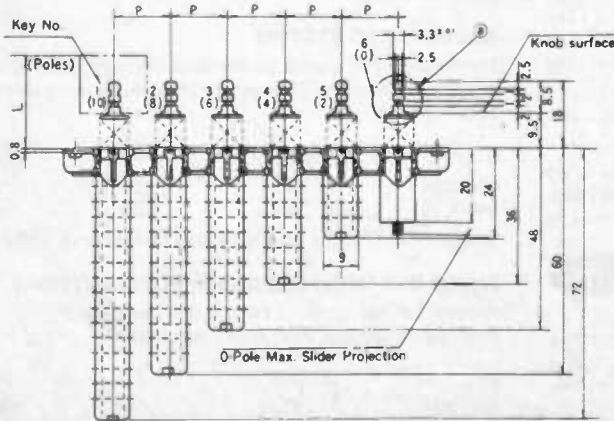
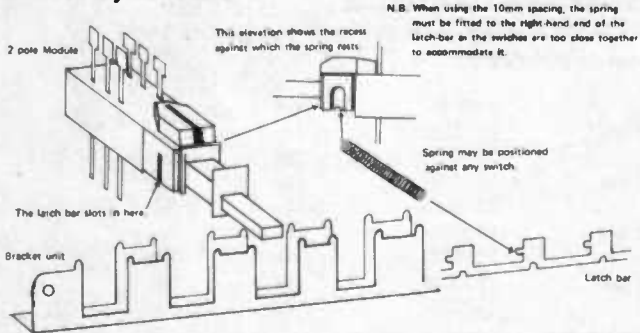
2 way	53-70010	20p	17p	15p
3 way	53-70011	25p	22p	19p
4 way	53-70012	29p	24p	21p
5 way	53-70013	31p	27p	23p
6 way	53-70014	34p	30p	27p
7 way	53-70015	36p	33p	29p
8 way	53-70016	38p	35p	31p
9 way	53-70017	40p	37p	33p
10 way	53-70018	42p	39p	35p

Latchbars - to interlock, 10, 15 or 20mm.

2 way	53-70020	10p	8p	6p
3 way	53-70021	10p	8p	6p
4 way	53-70022	12p	10p	8p
5 way	53-70023	12p	10p	8p
6 way	53-70024	14p	12p	10p
7 way	53-70025	16p	14p	12p
8 way	53-70026	18p	16p	14p
9 way	73-70027	18p	16p	14p
10 way	53-70028	18p	16p	14p

When ordering switches please state either interlocking push-push momentary action for each block. It is also very helpful to enclose a simple schematic of the switch bank you intend to build so we may endeavour to supply the correct parts regardless of possible errors in ordering.

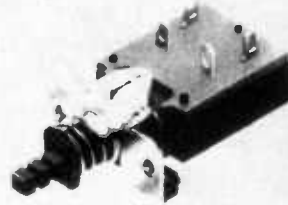
## Assembly Details



## MAINS SWITCHES

SDU Mains switch 7 amp 240V compatible with SUE bracket including 2 pole SUE switch.

Stock No.	1-24	25-99	100+
53-70040	95p	86p	75p



SDS Mains switch 5 amp 240v compatible with SUE bracket.

Stock No.	1-24	25-99	100+
53-70050	62p	52p	45p

## KNOBS FOR PUSH BUTTON SWITCHES

Code X fits Dialstat

Code Y fits Alps switches

	Code	Stock No	Description	1-24	25-99	100+
Round 'A'	XY	53-50010	7.5x11.5mm black	9p	7p	6p
Round 'A'	XY	53-50011	7.5x11.5mm red	9p	7p	6p
Round 'C'	XY	53-50012	11x15mm black	10p	9p	8p
Chrome 'B'	XY	53-50013	10x13mm chrome	13p	11p	10p
Taper 'A'	X	53-50014	9.5x5.5mm taper black	9p	7p	6p
Taper 'B'	X	53-50015	9.5x5.5mm taper red	9p	7p	6p
Rectang. 'B'	XY	53-50017	Rect. as MkIII tuner	14p	10p	9p

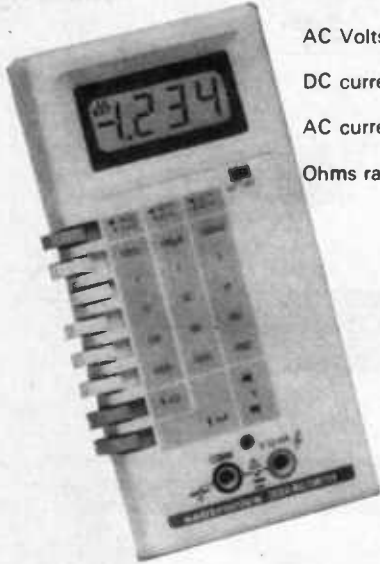
# TEST EQUIPMENT

## SABTRONICS HAND HELD DMM

Precision designed DMM's using laser trimmed divider networks and band gap references.

### MODEL 2035A

DC Volts	100uV to 1kV in 5 ranges +/-0.1% acc
AC Volts	100uV to 1kV in 5 ranges +/-0.3% acc
DC current	0.1uA to 2A in 5 ranges +/-0.3% acc
AC current	0.1uA to 2A in 5 ranges +/-0.5% acc
Ohms range	0.1Ω to 20MΩ in 6 ranges +/-0.25% acc



Uses 0.5" LCD display with low battery ind, power source 1 x PP3 battery or optional mains adaptor. Full overload protection. Size: 3.5"W x 6.6"L x 1.6"H. Weight 310g. Can be used with THP-20 touch and hold probe in difficult locations. Supplied complete with test leads.

Type	Stock No	Price
2035A	56-02035	£62.00

### MODEL 2037A

Similar to Model 2035A but has additional facility of two temp measurement ranges from -50 C to +150 C, +/-2.5. Supplied complete with test leads and temperature probe.

Type	Stock No	Price
2037A	56-02037	£67.00

### MODEL 2033A

Exciting new low cost DMM featuring the same high quality SABTRONICS features with new low prices.

DC Volts	100uV to 1kV in 5 ranges +/-0.5% acc
AC Volts	100uV to 1kV in 5 ranges +/-1% acc
DC current	10uA to 2A in 3 ranges +/-0.5 acc
AC current	10uA to 2A in 3 ranges +/-1% acc
Ohms	1Ω to 20MΩ in 5 ranges +/-1% acc



Uses 0.5" LCD display with low battery ind. Power required 1 x PP3 or optional mains adaptor. Full overload protection. Built in tilt stand provided. Size 3.5"W x 6.6"L x 1.6"H. Weight 310g. Supplied complete with test leads.

Type	Stock No	Price
2033A	56-02033	£36.75

## BENCH DMM MODEL 2015A

**New**



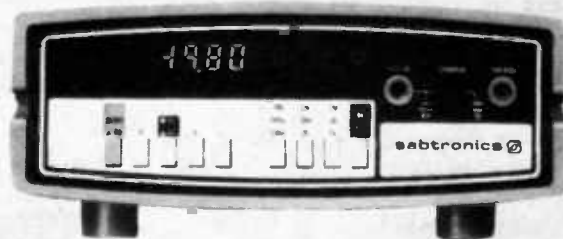
Bench/portable DMM using 0.5" LCD display with low battery indicator. Powered from 4 x 'C' cells or with optional mains adaptor. Weight 680g without batteries, size 8"W x 6.5"D x 3"H.

DC volts	5 ranges 100uV to 1kV +/-0.1% acc
AC volts	5 ranges 100uV to 1kV +/-0.5% acc
DC current	6 ranges 0.1uA to 10A +/-0.3% acc
AC Current	6 ranges 0.1uA to 10A +/-0.5% acc
Ohms	6 ranges 0.1Ω to 20MΩ +/-0.1% acc
Diode Test	3 ranges 0.1uA, 10uA, 1mA

Model	Stock No	Price
2015A	56-02015	£83

## SABTRONICS 2020 BENCH DMM WITH COMPUTER INTERFACE

**NEW**



Supplied with Microcomputer I/F to enable use with home computer to carry out extensive test programs, sampling etc. not possible with a DMM alone. Interfaces are available at the present for Apple, TRS-80 and Atari Computers, others will be available in the near future. The 2020 uses a 3.5 digit 0.4" high LED display and is powered from 4 x 'C' cells or optional mains adaptor. Full overload protection is provided along with facility for using the optional THP-20 touch and hold probe. The ranges are:

DC Volts	5 ranges 100uV to 1kV +/-0.1% acc
AC Volts	5 ranges 100uV to 1kV +/-0.5% acc
DC current	6 ranges 0.1uA to 10A +/-0.3% acc
AC current	6 ranges 0.1uA to 10A +/-0.5% acc
Ohms	6 ranges 0.1Ω to 20MΩ +/-0.1% acc
Diode test	3 ranges 0.1uA, 10uA, 1mA.

Provided with test leads and appropriate interface.

Type	Interface	Stock No	Price
2020	Apple	56-12020	£165
2020	TRS-80	56-22020	£165
2020	Atari	56-32020	£165

# TEST EQUIPMENT

## FUNCTION GENERATOR MODEL 5020A

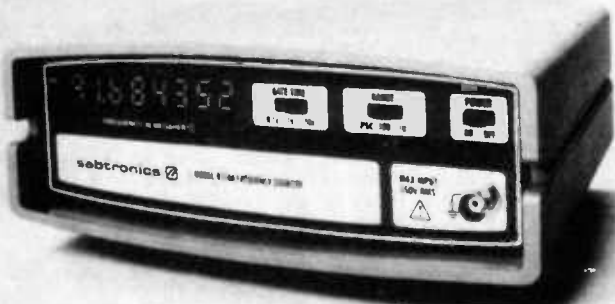
A versatile 1 Hz to 200 kHz generator with sine, square, triangle and TTL square wave outputs. Output continuously variable to 10V p-p. Distortion < 1% up to 100 kHz, < 3% above 100 kHz. Output impedance 600Ω Sweep input, range 100:1 Power required 12V from mains adaptor (supplied). Weight 740g, Size 8"W x 6.5"D x 3"H.

Type	Stock No	Price
5020A	56-05020	£79

## SABTRONICS FREQUENCY COUNTERS

### 8 DIGIT 100 MHz 8110A

**NEW**



Easy read 0.4" LED display with 8 digits resolution switch selected 0.1Hz with 10s gate time (10 MHz range) 1 Hz with 10s gate time (100 MHz range). 10 MHz xtal controlled timebase with leading zero suppression. Sensitivity typ < 30mV RMS. Time base stability +/- 1ppm from 0 to 40 C. Setability +/- 2ppm. Powered from 4 'C' cells or from optional mains adaptor. Size 8"W x 6.5"D x 3"H. Weight (less batts) 540 grammes. Optional accessories available include LFP-10 and RFA-10.

Type	Stock No	Price
8110A	56-08110	£67

### 8 DIGIT 600 MHz 8610A

Same specification as 8110A but with additional 600 MHz range with resolution of 10 Hz with 10s gate time. Typ sensitivity 150 mV at 600 MHz

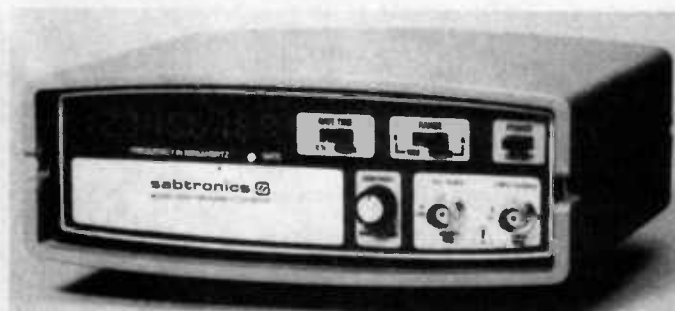
Type	Stock No	Price
8610A	56-08610	£82

### 9 DIGIT 600 MHz 8610B

**NEW**

9 digit 0.4" LED display for ease of reading. Resolution selectable to 0.1 Hz with 10s gate (10 MHz range), 1 Hz with 10s gate (100 MHz range) and 10 Hz with 10s gate time (600 MHz range). Sensitivity < 20 mV, 10 Hz to 100 MHz, < 30mV rms, 100-600 MHz. Timebase 10 MHz, temp stability +/- 1ppm over 0 to 40 C, setability +/- 2ppm. Powered from 4 'C' cells or optional mains adaptor. Size 8"W x 6.5"D x 3"H. Weight (less batteries) 590 grammes. A separate sensitivity is fitted for added versatility.

Type	Stock No	Price
8610B	56-18610	£99



### 9 DIGIT 1 GHz 8000B

Same specification as 8610B but with extended range up to 1000 MHz. Typical input sensitivity of < 35mV rms at 1000 MHz.

Type	Stock No	Price
8000B	56-08000	£155

### LOGIC PROBE LP-1

**new**



CMOS/DTL/TTL compatible logic probe with 100kΩ input impedance to reduce loading. Input protected to 50V. Feature memory latch switch for detecting single pulses, high speed operation, pulses as narrow as 50ns can be detected.

Type	Stock No	Price
LP1	56-69612	£24.95

### SABTRONICS KITS

Besides ready built versions, many of the Sabtronics range are available in kit form, allowing a substantial saving to be made. No special test gear is required to calibrate the kits, many are supplied with in-built calibration circuitry for ease of setting. All specifications are as the ready built model.

Kit Type	Stock No	Price
2035A	56-12035	£49
2037A	56-12037	£56
8110A	56-18110	£56
8610A	56-18610	£68
8610B	56-28610	£84
2015A	58-12015	£73

**new**

### MAINS ADAPTOR BS-01



For powering all SABTRONICS range from AC supply.

Type	Stock No	Price
BS-01	56-01200	£4.95

### THP-20 TOUCH AND HOLD PROBE



For use with Models 2015A, 2035A and 2037A. Permits reading to be held on display. Ideal for use in hazardous or hard to reach places where the probe tip required undivided attention.

Type	Stock No	Price
THP-20	56-02000	£13

### HVP-30 HIGH VOLTAGE PROBE



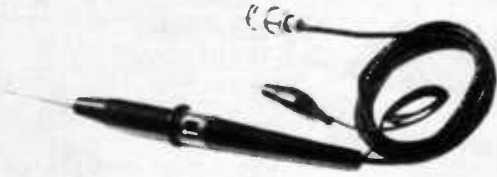
Extends DC range of any 10MΩ DVM to 30kV.

Type	Stock No	Price
HVP-30	56-03000	£22.50

# TEST EQUIPMENT

## LFP-10 AUDIO FREQUENCY PROBE

**NEW**

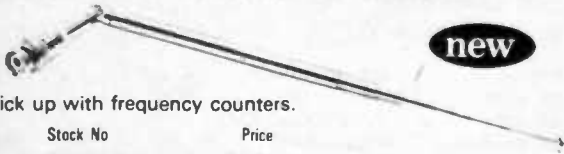


Effectively attenuates RF noise from LF signals. For use with all SABTRONICS frequency counters.

Type	Stock No	Price
LFP-10	56-12616	£18.50

## RFA-10 TELESCOPIC RF PICK UP ANTENNA

**new**

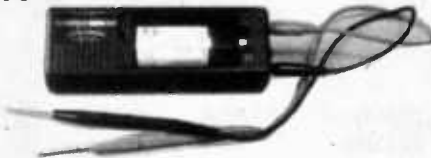


For off air pick up with frequency counters.

Type	Stock No	Price
RFA-10	56-21717	£6.50

## BATTERY TESTER X-8

**New**



Convenient easy to use tester for dry batteries and NiCads. Has expanded scale for best accuracy and built in load. Supplied with two test probes for non standard batteries. Can also be used as continuity checker. Checks up to 9V sizes.

Stock No	Price
56-05020	£5.00

## OSCILLOSCOPE PROBES

A range of passive probes manufactured to highest standards in West Germany

### AT-001 x 1 Probe

Bandwidth	DC to 25MHz
Input resistance	1MΩ (oscilloscope input)
Input Capacitance	47pF + oscilloscope C
Working Voltage	600 (DC and peak AC)
Cable length	1.5m

Supplied with spring loaded test hook, insulating tip, IC test tip, BNC adaptor.

Stock No.	Price
56-00001	£7.50

### AT-010 x 10 Probe

Bandwidth	DC to 150MHz
Risetime	Less than 2.5 nanoseconds
Input resistance	10MΩ when used with scopes with 1MΩ input. Probe resistance 9MΩ +/- 1%.

Input capacitance 11.5pF when used with scopes with 30pF input cap.

Compensation range	10 to 60pF
Working Voltage	600V (DC and AC peak)
Cable length	1.5m

Supplied with spring loaded test hook, insulating tip, IC test tip, BNC adaptor.

Stock No.	Price
56-00010	£8.50

### AT-110 x 1 x 10 Probe

x 1 position  
x 10 position  
Ref position

Specification as AT-001  
Specification as AT-010  
Probe tip grounded via 9MΩ resistor.  
Scope input grounded.

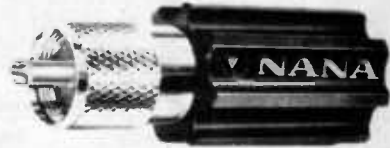
Cable length	1.5m
Supplied with accessories as	AT001/010
Stock No.	Price
56-01100	£11.00

### NC-589 DUMMY LOAD

Net Weight  
Impedance:  
Power capacity:  
Freq. range:  
VSWR:

65gr  
50 ohms  
15W continuous 30W peak  
DC-150MHz  
Less than 1.2:1

Stock No.	Price
56-00589	£5.95



### MINIATURE TEST CLIP PROBE

A high quality plunger action test probe, ideal for connection to IC pins and high density PCB layouts. Gold-flashed contact hook and solder connections. Made in W Germany to highest standards.

Stock No.	Colour	Price each
57-00111	Black	31p
57-00112	Red	31p
57-00113	Green	31p
57-00114	White	31p
57-00115	Blue	31p
57-00116	Yellow	31p



### EPROM ERASER

The model 'UV-1B' EPROM eraser is a low cost, highly reliable unit for 'wiping' programmed EPROMs. The removable anti-static filled tray holds up to 6 EPROMs. Exposure time for a 2708 is between 7 and 15 minutes.

Lamp life in excess of 2000 hours.

NB

the UV tubes used in PCB development are NOT suitable for EPROM erasure- which uses a different wavelength of UV.



Stock No.	Price	Post
26-99900	£42.17	£2.50



# TEST EQUIPMENT

## THANDAR ELECTRONICS — FREQUENCY METERS



### TF040 8-DIGIT LCD FREQUENCY METER

Frequency Range:	10Hz-40MHz (To 400MHz when used with TP600 prescaler)
Resolution:	Down to 1Hz
Sensitivity:	40mV rms
Functions:	Frequency, Totalize and Reset. 2 Gate times. Power take-off for optional TP600 prescaler.
Accuracy:	±(1 count + timebase accuracy). Timebase factory set within ±0.5ppm.
Battery life:	Typically 80 hours from 6 alkaline 'C' cells.
Size:	255 x 150 x 50mm
Weight:	1200gms with batteries

Stock No. 56-00040 Price £ 110.00



### TP600 600MHz ÷ 10 PRESCALER

Frequency Range:	40MHz to 600MHz
Sensitivity:	10mV rms
Output:	Typically 500mV peak-peak
Power Requirements:	6-9V from AC adaptor or power take-off from TF200, TF040.
Size:	105 x 52 x 28mm
Weight:	120gms.

Stock No. 56-60000 Price £ 37.50

### LCD HANDHELD

TM354	3.5 digit DMM
DC volts	1mV to 1kV
AC volts	1V to 500AC RMS
DC current	1uA to 2A
Resistance	1Ω to 2MΩ
Accuracy	+/-0.75% + 1digit
Battery Life	2000 hrs typ
Size	155 x 75 x 30mm
Weight	165gms excl. battery

Stock No. 56-03540 Price £ 39.95



### LCD HANDHELD DMM TM352

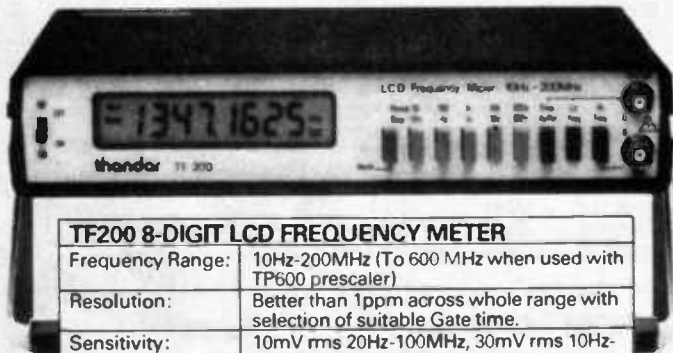


3.5 digit 0.5" LCD  
Battery life in excess of 150 hrs from PP3 battery  
Push button controls  
Weight 280gms including battery  
Audible continuity check  
Hfe measurement facility

Stock No. 56-03520 Price £ 49.95

### Ranges

DC volts	100uV to 1kV. Accuracy +/-0.5% + 1 digit
AC volts	100mV to 1kV. Accuracy +/-0.8% + 10 digits (1kV range +/-0.8%)
DC current	100nA to 10A. Accuracy +/-0.7% + digits (10A range +/-1%)
Resistance	1Ω to 2MΩ Accuracy +/-1% + 2 digits
Diode check	Test current 1mA, max test voltage 3.2V.
Cont check	Max test voltage 3.2V. Max test current 1.5mA. Buzzer sounds if resistance less than 130Ω +/-50Ω.
Hfe check	1 to 1000. Accuracy +/-10% + 5 digits. Test I-10uA

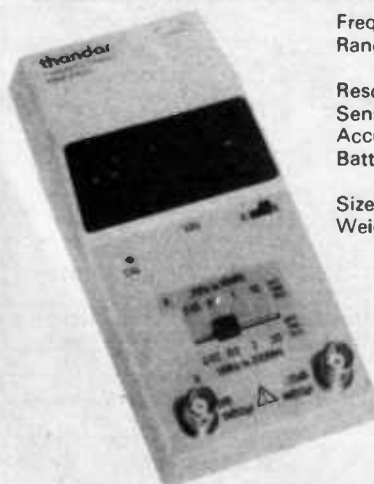


### TF200 8-DIGIT LCD FREQUENCY METER

Frequency Range:	10Hz-200MHz (To 600 MHz when used with TP600 prescaler)
Resolution:	Better than 1ppm across whole range with selection of suitable Gate time.
Sensitivity:	10mV rms 20Hz-100MHz, 30mV rms 10Hz-20Hz, 100MHz-200MHz
Functions:	Frequency, Time Average Period, Totalize and Reset. 2 ranges, 5 Gate times. External clock facility. Power take-off for optional TP600 prescaler.
Accuracy:	±(1 count + timebase accuracy). Timebase factory set within +0.3ppm.
Battery life:	Typically 200 hours from 6 alkaline 'C' cells.
Size:	255 x 150 x 50mm
Weight:	1200gms with batteries

Stock No. 56-20000 Price £ 145.00

### PFM200A 8 DIGIT LED POCKET FREQUENCY METER



Frequency Range:	10Hz-200MHz 600MHz with TP600
Resolution:	Down to 0.1Hz
Sensitivity:	Typ 10mV RMS
Accuracy	+/-2ppm
Battery Life	Type 10hrs from MN1604
Size	155 x 75 x 30mm
Weight	180 grms

Stock No. 56-00222 Price £ 58.69

# TEST EQUIPMENT

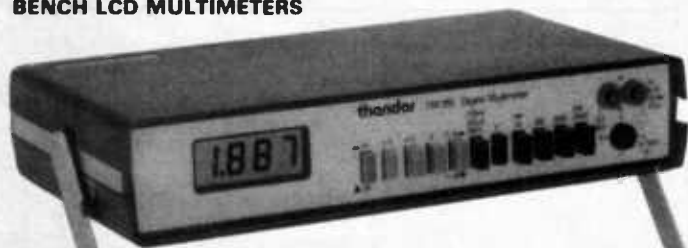
## TH301 HANDHELD THERMOMETER



Sensor: K type thermocouple  
 Accuracy: 0.01% of reading + 0.05°C/°C inc cold junction stability  
 Battery Life: 1000 hrs from MN1604  
 Resolution: 1°C  
 Size: 155 x 75 x 30mm  
 Weight: 200gms incl. battery

Stock No. 56-16301 Price £ 59.50

## BENCH LCD MULTIMETERS



### TM351 3½ DIGIT

Measurement Capability:  
 DC and AC volts : 100µV to 1000V (750V AC rms)  
 DC and AC current : 100nA to 10A (20A for 10 secs)  
 Resistance : 100mΩ to 20MΩ

Diode check

Accuracy: Basic accuracy: ±(0.1% of reading + 1 digit)  
 Battery life: Up to 4000 hours from 6 alkaline 'C' cells  
 Size: 255 x 150 x 50mm  
 Weight: 1200gms including batteries

Stock No. 56-16351 Price £ 99.00



### TM353 3½ DIGIT

Measurement Capability:  
 DC and AC volts : 100µV to 1000V (750V AC rms)  
 DC and AC current : 100nA to 2A  
 Resistance : 1Ω to 20MΩ

Diode check

Accuracy: Basic accuracy: ±(0.25% of reading + 1 digit)  
 Battery life: Typically 3000 hours from 6 alkaline 'C' cells  
 Size: 255 x 150 x 50mm  
 Weight: 1200gms including batteries

Stock No. 56-16353 Price £ 75.00

## OSCILLOSCOPE



### SC110 SINGLE TRACE LOW POWER 2" OSCILLOSCOPE

Bandwidth:	DC to 10MHz
Sensitivity:	10mV/division to 50V/division
Sweep Speeds:	0.1µsecs/division to 0.5 secs/division
Power Requirements:	4 to 10V DC from 4 'C' cells or AC adaptor
Size:	255 x 150 x 40mm
Weight:	800gms excluding batteries

Stock No. 56-16110 Price £ 139.00

## FUNCTION GENERATORS



### TG100 100kHz FUNCTION GENERATOR

Frequency Range:	1Hz to 100kHz
Functions:	Sine, Square, Triangle and DC from variable 600Ω output. External sweep input permits ≥300:1 linear sweep below range maximum, i.e. below 0.1Hz on 10Hz range.
Outputs:	1mV to 10V from variable 600Ω output; variable DC offset to ±5V. TTL output.
Power Requirements:	120V or 240V AC (nominal) 50/60Hz
Size & Weight:	255 x 150 x 50mm : 1200gms

Stock No. 56-18100 Price £ 79.00

### TG102 2MHz FUNCTION GENERATOR

Frequency:	< 0.2Hz to 2MHz
Functions:	Sine, Square, Triangle and DC from variable 50Ω output. External sweep: ≥1000:1 linear range.
Outputs:	60mV-20V from variable 50Ω output; variable DC offset to ±10V. TTL output.
Power Requirements:	120V or 240V AC (nominal) 50/60Hz
Size & Weight:	255 x 150 x 50mm : 1200gms

Stock No. 56-18102 Price £ 145.00

# TEST EQUIPMENT

## PULSE GENERATOR



### TG105 5MHz PULSE GENERATOR

Period:	200nsec to 200ms (5MHz to 5Hz)
Pulse Width:	100nsec to 100ms, independent of period.
Operating Modes:	Run, Triggered, Gated, One Shot, Square Wave and Complement
Outputs:	0.1V to 10V variable 50Ω output; Separate TTL output; Sync. output
Power Requirements:	120V or 240V AC (nominal) 50/60Hz
Size:	255 x 150 x 50mm
Weight:	1200gms

Stock No.	Price £
56-16105	85.00

SERVICE MANUALS	Model	Stock No.	Price £
	SC110	56-80110	3.00
	PFM200A	56-80222	3.00
	TF040A	56-80040	3.00
	TF200	56-80000	3.00
	TG100	56-80100	3.00
	TG102	56-80102	3.00
	TG105	56-80105	3.00
	TM351	56-80351	3.00
	TM352	56-80352	3.00
	TM353	56-80353	3.00
	TM354	56-80354	3.00
	TH301	56-80301	3.00

### NB

All manuals are zero VAT rated.

## THANDAR ACCESSORIES

### Carrying Case 130

Suitable for use with models TM351, 353, TG100, TG102, 105, TF040, 200.

Stock No.	Price £
56-12130	5.95

### Carrying Case 040

Suitable for use with models TM354, PFM200A, TH301.

Stock No.	Price £
56-12040	3.00

**Carrying Case 060** Suitable for use with SC110

Stock No.	Price £
56-12060	7.70

**Carrying Case 014** Suitable for use with TM35

Stock No.	Price £
56-12014	3.00

## AC ADAPTORS

Model	Stock No.	Price £
PFM200A	56-20200	4.95
TF040A	56-20510	4.95
TF200	56-20520	4.95
TP600	56-20530	4.95
SC110	56-20350	4.95

## SC110 ACCESSORIES

	Stock No.	Price £
Rechargeable Battery Pack	56-30100	7.50
x1 probe	56-30010	8.50
x10 probe	56-30200	10.00
Sprung hook/trimmer pack	56-30300	2.50

## 40kV DC PROBE

Suitable for use with all multimeters.

Stock No.	Price £
56-40200	29.95

## NAKED BEAD THERMOCOUPLE

For use with TH301 digital thermometer.

Stock No.	Price £
56-40080	4.75

## 5E2K MINERAL INSULATED PROBE 200 x 3mm

For use with TH301 digital thermometer

Stock No.	Price £
56-40030	19.50

## STANDARD ACCESSORIES (see price list for optional accessories)

### MULTIMETERS (all supplied with test leads)

TM351, TM353 supplied with batteries  
PDM35, TM354 supplied with protective wallet

### FREQUENCY METERS

TF040, TF200 supplied with batteries  
PFM200 supplied with protective wallet and test prods  
TP600 supplied with power take-off lead

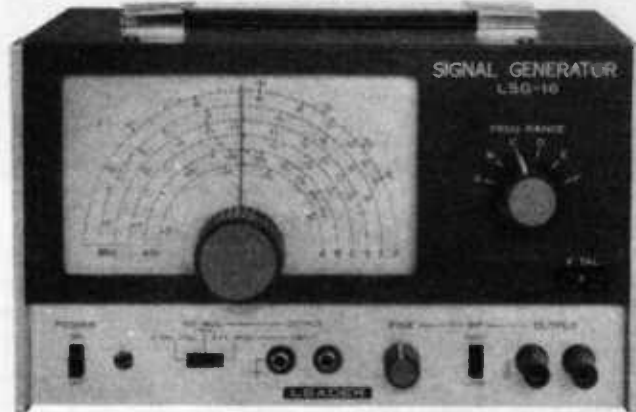
### SIGNAL SOURCES

TG100, TG102, TG105 supplied with mains lead (117V, 220V or 240V)

## SIGNAL GENERATOR LSG-16

### SPECIFICATIONS

Frequency Range	100kHz to 100MHz in five ranges. (up to 300MHz on harmonics) A 100kHz - 320kHz B 320kHz - 1100kHz C 1.00MHz - 3.3MHz D 3.2MHz - 11MHz E 10MHz - 35MHz F 30MHz - 100MHz (HARMONICS) 90MHz - 300MHz
Frequency Accuracy	±1.5%
Output Voltage Modulation	0.1Vrms, or higher, to 100MHz Internal 1kHz for amplitude modulation. External, 50Hz to 20kHz, at less than 1Vrms input.
Crystal Oscillator	For 1 - 15MHz crystal in FT-243 type holder
Power Supply	AC 100, 115 or 230V, 50/60Hz; 3VA approx.
Size and Weight	150(H) x 250(W) x 130(D)mm; 2.5kg approx.



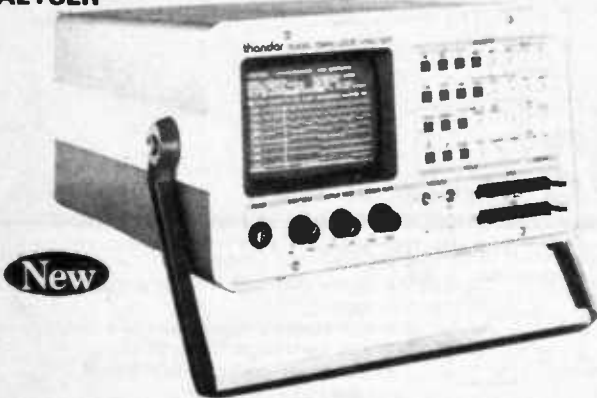
LSG-16 is a very versatile solid-state, wide-band signal generator designed for the radio experimenter, hobbyist, service technician and instructional purpose. An FET is used in a stable oscillator circuit to cover the frequency range from 100kHz to 100MHz on fundamental and up to 300MHz on harmonics.

Stock No.	Price £
56-90016	55.00



# TEST EQUIPMENT

## TA2080 20MHz 8-CHANNEL PORTABLE LOGIC ANALYSER



**New**

A portable 20 MHz, 8-channel logic analyser with comprehensive triggering, recording and display capabilities. The TA2080 is controlled by a Z80 microprocessor linked to an interactive keyboard. Recording memory depth is 252 bytes and a reference memory is also provided which can be loaded direct from the recording memory or from the keyboard. Data can be displayed either in timing diagram format, with cursor, window and expansion facilities or in state format which has cursor, reference memory compare, and word search features. All 24 inputs, grouped in 2 pods of 12, are via custom hybrid circuits which have wide input range, adjustable logic thresholds and high impedance to minimise circuit loading. Power required 90-135VAC, 180-270VAC, switch selectable, 45-450 Hz. Size 12 x 7 x 16.5 inches (excl handle). Weight 20lbs. Provided with two TA120P input pods, instruction manual, mains lead, 16, 28 and 40 way IC test clips and accessory carry case. Full specification available on request.

Type	Stock No	Price
2080	56-20800	£1950.00

## MULTIMETER 20,000 OPV HT-320

High quality, high specification meter at a reasonable price. In addition to the usual ranges facilities are provided for measuring transistor parameters such as  $I_{ceo}$  and  $H_{fe}$ .



**NEW**

Meter movement fully protected against overloads. 3-colour mirrored scale in robust case. Supplied complete with comprehensive instructions, test leads, transistor test leads and batteries (2 x HP-7, 1 x PP3).

DC volts	0.1V, 0.5V, 2.5V, 10V, 50V, 250V, 1kV (20k $\Omega$ /V)
AC volts	10V, 50V, 250V, 1kV (8k $\Omega$ /V)
DC current	50mA, 2.5mA, 25mA, 250mA
Resistance	2k, 20k, 2M, 20M ohms
AF Output	-10dB to +22dB for 10VAC (0dB/0.775V, 600 $\Omega$ )
Leakage ( $I_{ceo}$ )	150uA, 15mA, 150mA
$H_{fe}$	0-1000 (1c/1b)
Weight	410gms.

Stock No	Price
56-83201	£14.00

## MULTIMETER HT-735 (30,000 OPV)

High quality multimeter using diode and fuse protected taut band meter movement with three colour, mirror scale. Supplied complete with carrying case and carrying handle. Carrying handle also doubles as bench stand. Full instructions and test leads provided. Temp probe (TH-250) available as optional extra. Batteries (1 x HP7, 1 x PP3 provided). Unique AC current and temperature ranges make this an exceptional meter.

**new**



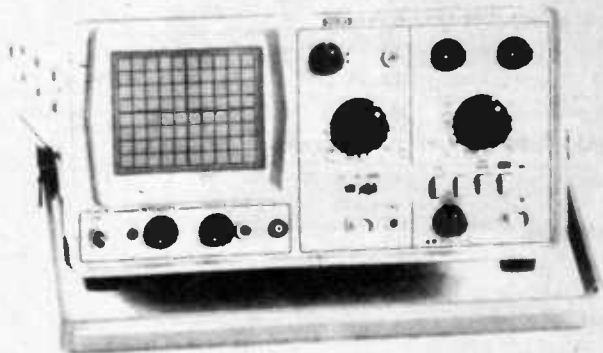
### Specification

DC volts	0.25v, 2.5v, 12.5v, 25v, 125v, 1.25kv (30k $\Omega$ /v)
AC volts	5v, 25v, 125v, 250v, 500v, 1.25kv (10k $\Omega$ /v)
DC current	50uA, 5mA, 50mA, 500mA, 10A
AC current	5mA, 50mA, 500mA, 10A
Resistance	30k, 300k, 3M, 30M
Temp Range	Ohms x 1 - 0° to 250°C Ohms x 100 - -50° to 100°C (requires optional TH-250 probe).

Type	Stock No	Price
HT735	56-70735	£31.95
TH250	56-70250	£11.95

## SINGLE TRACE OSCILLOSCOPE 3030

**new**



Premium priced oscilloscope ideal for the home constructor. Built in component test allows in or out of circuit testing of active or passive parts.

### Specification:

Vertical B/W	DC-15MHz (-3dB)
Def Range	5mV/div to 20V/div
Accuracy	3%
Horizontal sweep speeds	200nS/div to 0.25/div (max)
Accuracy	5%
Triggering	Automatic and level control internal or external
Sensitivity	0.5div to 1div from 10 Hz to 20 MHz
Display	95mm flat faced rectangular CRT with P31 phosphor

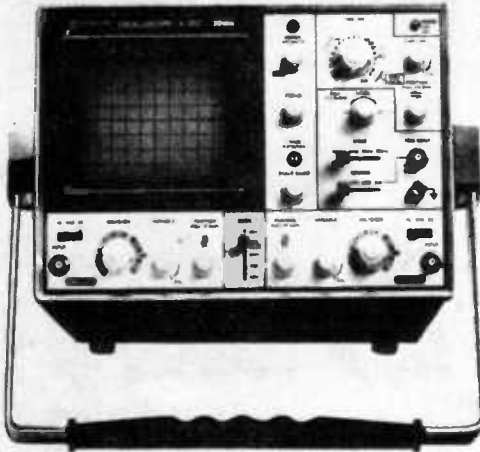
Supplied with instruction manual, test leads and power card.

Type	Stock No	Price
3030	56-13030	£155.00



# TEST EQUIPMENT

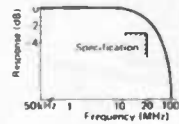
• A New Range of High Quality Oscilloscopes from World Famous HITACHI.



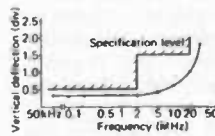
Stock No: 56-00202  
Price (incl Securicor del) £266.00

## Model V-202 20MHz, DUAL TRACE

Frequency response



Internal trigger sensitivity



Vertical drift



1mV/div range.  
Initial drift (from switch ON to 15 minutes thereafter) 0.5 div. Drift (from 15 minutes after switch ON to one hour thereafter) 0.45 div.

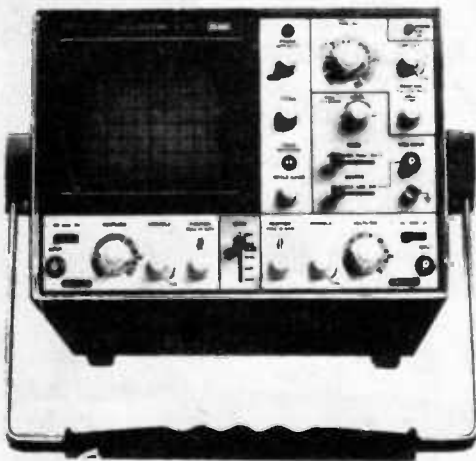
Typical data

### • Features

- Square CRT with internal graticule (illuminated scale)
- High-accuracy voltage axis and time axis set at  $\pm 3\%$  (certified at 10° to 35°C)
- High-sensitivity 1mV/div (7MHz)
- Low drift
- Dynamic range 8 div.
- TV sync-separator circuit
- X-Y operation
- Sweep-time magnifier (10 times)
- Trace rotation
- Fine-adjusting, click-positioning function

### • Standard accessories

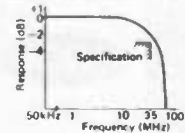
Probe AT-10AF1.5 (10:1/1:1) . . . . .	2
Power cable . . . . .	1
Operation manual . . . . .	1



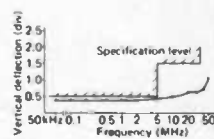
Stock No.: 56-00352  
Price (incl Securicor del) £416.00

## Model V-352 35MHz, DUAL TRACE

Frequency response



Internal trigger sensitivity



Vertical drift



1mV/div range.  
Initial drift (from switch ON to 15 minutes thereafter) 0.5 div. Drift (from 15 minutes after switch ON to one hour thereafter) 0.45 div.

Typical data

### • Features

- Square CRT with internal graticule (illuminated scale)
- High-accuracy voltage axis and time axis set at  $\pm 3\%$  (certified at 10° to 35°C)
- High-sensitivity 1mV/div (7MHz)
- Low drift
- Dynamic range 8 div.
- TV sync-separator circuit
- Signal delay line
- X-Y operation
- Sweep-time magnifier (10 times)
- Trace rotation
- Fine-adjusting, click-positioning function

### • Standard accessories

Probe AT-10AF1.5 (10:1/1:1) . . . . .	2
Power cable . . . . .	1
Operation manual . . . . .	1

Other models are also available. Below is a brief description of the range. Full colour brochures giving full descriptions available on receipt of a large SAE.

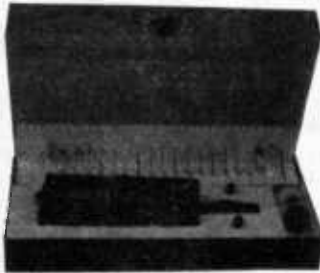
<b>V152B</b> 15MHz dual trace. Trace Rotation. Sens 1mV/div (5MHz). Sweep magnifier (x10). Z-axis input. Stock No: 56-00152 Price £239.00	<b>V302</b> 30MHz dual trace. Other features as mode V152B. Stock No: 56-00302 Price: £326.00	<b>V550B</b> 50MHz dual trace. Delayed sweep 5nS/dw sweep rate. Sens 1mV/div (10MHz) 3rd channel display. Dustproof cover. Stock No: 56-00550 Price: £731.00	<b>V1050</b> 100MHz quad trace. Delayed sweep 500uV/div (5MHz) 2nS/dw sweep rate. Accuracy +/-2% (+10 to +35°C). Dustproof cover. Stock No: 56-01050 Price: £1156.00
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All prices include securicor delivery (Please allow 10 days)

## EXPO DRILLS

Powerful miniature electric drills for PCB and general lobby applications for 12V DC operation.

**Titan Mini Drill Kit**  
(Drill body dimensions 114 x 44mm)



**New**

A powerful drill complete with 4 collets and 20 assorted grinding, shaping and drill bits — complete with presentation box.

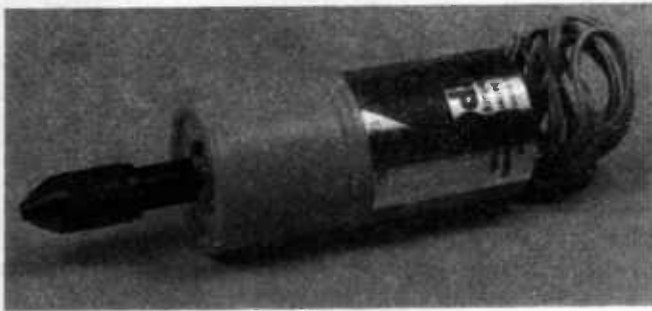
Stock No	Price
54-10255	£19.18 ea.

TITANDRILL ONLY — WITH 4 COLLETTES

54-10175	£10.28
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## RELIANT MINI DRILL KIT

(Drill body 75 x 34mm)



A compact drill, complete with 20 various accessories, 3 collets and presentation box.

Stock No	Price
54-10250	£15.56

RELIANT DRILL ONLY - WITH 3 COLLETTES

54-10150	£6.98
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## MULTI-PURPOSE DRILL STAND

An all-metal stand for the Titan — or Reliant using an adaptor collar. The unit can also be mounted horizontally for grinding/polishing etc.



Drill Stand:

Stock No	Price
54-10209	£12.00

Collar for Reliant:

54-10201	£0.60
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## DRILL POWER SUPPLIES

A transformer/rectifier unit for 240V AC mains. Output 12V DC at 30/40VA. Also available with speed control.

Drill PSU:

Stock No	Price
54-10220	£11.31

Drill PSU & Speed Controller:

54-00221	£14.94
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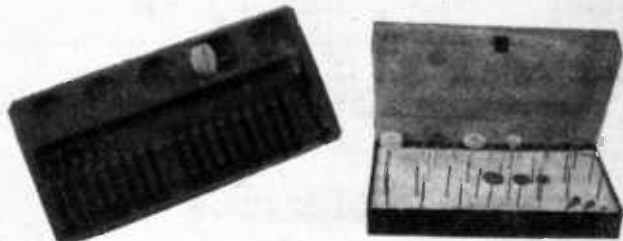
A complete PSU for the Reliant only with integral 13A mains plug, LED and thermal trip.

Reliant PSU:

54-10222	£8.44
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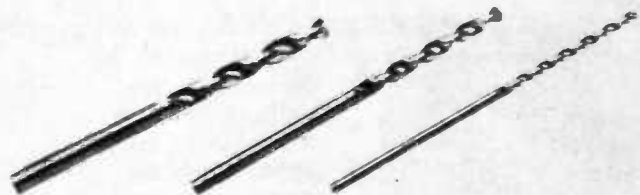
## DRILL TOOL SETS

Sets of grinders, routers, cutters, burrs, etc. As used in the "Boys from Brazil".



	Stock No	Price
40 Tool Selection	54-10367	£15.56
20 Tool Selection	54-10305	£7.78
10 Tool Selection	54-10306	£3.89
5 Tool Selection	54-10307	£2.00

## HSS STRAIGHT SHANK DRILL BITS



	Stock No	Price
0.6mm	54-17206	30p
0.7mm	54-17207	30p
0.8mm	54-17208	30p
0.9mm	54-17209	30p
1.0mm	54-17210	30p
1.2mm	54-17212	30p
1.4mm	54-17214	30p
1.6mm	54-17216	30p

## SPARE COLLETTES



### Nylon

Collett	Stock No	Price
Zero	54-11300	10p
1.5mm	54-11315	10p
2.25mm	54-11322	10p
3.0mm	54-11330	10p

### Steel

Zero	54-11800	42p
1.5mm	54-11815	42p
2.25mm	54-11822	42p
3.0mm	54-11830	42p

# TOOLS

## SOLDERING IRONS AND BITS

Iron coated bits

**NEW**



### ANTEX CX-230

17 watts with ceramic isolation for virtually zero leakage current, and 4kV breakdown.

	Stock No	Price
CX230 Iron	54-22300	£5.04
2.3mm bit	54-22302	65p
3mm bit	54-22303	65p
4.7mm bit	54-22304	65p
6mm bit	54-22306	65p
Spare Element	54-22309	£1.80

### SK3 CX iron with ST3 stand

	Stock No	Price
SK3 iron kit	54-22310	£6.80

### C15



### C240

One of the most popular 15W irons of all time — also available complete with case, solder, tweezers and two spare bits (SK1).

	Stock No	Price
C240 iron	54-22400	£4.73
2.3mm bit	54-22402	65p
3.0mm bit	54-22403	65p
Spare Element	54-22409	£1.90
SK1 Complete Kit	54-22410	£6.95

### X25



### X25/240

A 25W iron with high heatcapacity for fast assembly work — or complete with ST3 stand in the SK4 pack.

	Stock No	Price
X25/240 iron	54-22500	£5.04
3mm bit	54-22503	65p
4.7mm bit	54-22504	65p
Spare Element	54-22509	£1.90
SK4 Iron Kit	54-22510	£6.90

### ST3 STAND

A chromium plated steel spring stand with plastic base — suitable for all irons.

	Stock No	Price
ST3 stand	54-20003	£1.79

## SOLDER

Ersin Multicore solder suitable for all electronic work.

**PC115:** 6.4m of 0.7mm solder in a handy dispenser (22SWG)

PC115 Solder 54-30115 £1.22

**Size 5:** 2.3m of 1.2mm solder in a handy dispenser (18SWG)

Size 5 solder 54-30005 £1.04

**Solder Wick:** A valuable aid to desoldering without damaging the PCB.

AB10 solder wick 54-30010 £1.26

## AEROSOLS

A range of aerosol sprays for general cleaning, servicing and maintenance use.



**NEW**

### CONTACT CLEANER/LUBRICANT

High purity electrical cleaning and efficient mechanical lubrication with exceptional electrical and physical properties. Non-toxic, non-flammable, safe on paint, plastic and rubber. Supplied with safety cap and extension tube.

	Stock No	Price
6oz aerosol	51-10000	1.60

### FREEZER

Non toxic, non flammable, dry refrigerant spray that can quickly reduce component temperature to  $-50^{\circ}\text{C}$ . Supplied with extension tube.

	Stock No	Price
2oz aerosol	51-10001	1.75

### FOAMING CLEANER

Highly efficient foaming cleaner for fast effective cleaning of plastic, wood, metal, glass etc.

	Stock No	Price
6oz aerosol	51-10002	1.75

### 40+ PROTECTIVE LUBRICANT

Light, non greasy, non conductive lubricant to prevent the ingress of moisture, water etc. Protects against corrosion. Extension tube supplied.

	Stock No	Price
6oz aerosol	51-10003	2.05

### ELECTRONIC SAFETY SOLVENT

Powerful electronic cleaning solvent safe for use on delicate components, plastics, rubber and generally used insulation materials. Will also remove oil, grease and dirt and will not cause metal corrosion.

	Stock No	Price
6oz aerosol	51-10004	2.05

### PRINTED CIRCUIT LACQUER

For protecting PCB's and components against humidity and air pollution. Seals against moisture. Flexible dry film can be soldered through for spot repairs.

	Stock No	Price
6oz aerosol	51-10005	2.05

# TRANSFORMERS — MAINS

## TRANSFORMERS by DRAKE

A range of generously rated transformers from a manufacturer with an established reputation with the most discerning users in the country. The transformers use split bobbin construction, and are fully shrouded giving excellent isolation between windings for maximum safety. (Conforming to BS2214).

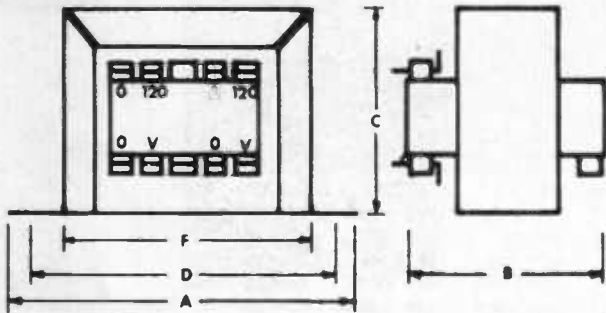
Each unit is flash tested to 2.5kV rms. The maximum temperature rise on full load is 60°C. All secondary voltages are quoted at full load.

Ambient temperature range -10°C to +40°C. Varnish coated finish. Please do not confuse the standards used to specify this range with those used by less conservative manufacturers.

## CHASSIS MOUNTING TYPES

### NB

Each transformer is supplied with dual primaries and secondaries for dual standard mains, the secondaries may be used independently as required.

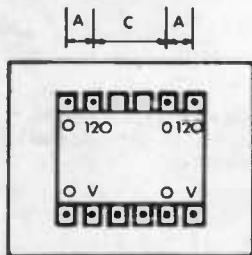
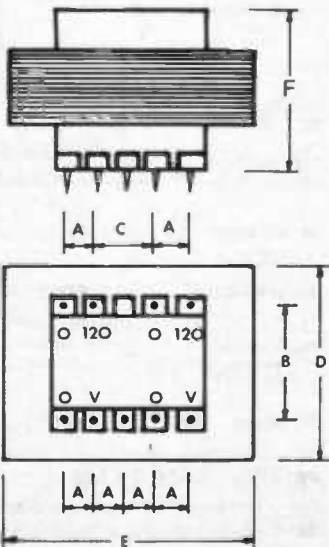


DIMENSIONS (mm)		3 VA	6 VA	12 VA	25 VA	50 VA
LENGTH	A	62	75	83	93	105
WIDTH	B	33	37	44	49	56
HEIGHT	C	38	41	51	59	67
FIXING CENTRES	D	53	60	70	79	92
LENGTH	F	45	50	59	69	78
WEIGHT (grms)		190	250	400	650	990

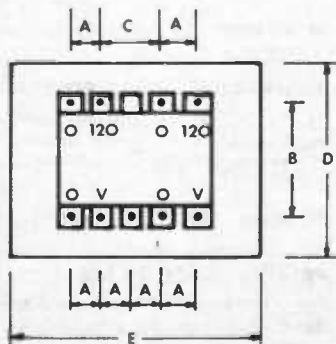
## PCB MOUNTING TYPES

Miniature stacked laminate transformers for direct PCB mounting. Each transformer is supplied with dual primaries and secondaries for dual standard mains, the secondaries may be used independently as required.

**Important Note:** For added mechanical strength when mounted all secondary pins are fitted. This gives a total of 5 secondary pins on 3VA and 12VA types and 6 pins on 6VA types. Only four are electrically connected.



6 VA Types  
Six secondary pins



3 & 12 VA Types  
Five secondary pins

VA	Sec V · I	Sec V · I	Stock No.
3 VA	6V 0.25A	6V 0.25A	57-10000
	9.5v 0.16A	9.5v 0.16A	57-10001
	12v 0.13A	12v 0.13A	57-10002
	15v 0.10A	15v 0.10A	57-10003
	17.5v 0.09A	17v 0.09A	57-10004
6 VA	6v 0.50A	6v 0.50A	57-10010
	9.5v 0.32A	9.5v 0.32A	57-10011
	12v 0.25A	12v 0.25A	57-10012
	15v 0.20A	15v 0.20A	57-10013
	17.5v 0.17A	17.5v 0.17A	57-10014
12 VA	6v 1.00A	6v 1.00A	57-10020
	9.5v 0.63A	9.5v 0.63A	57-10021
	12v 0.50A	12v 0.50A	57-10022
	15v 0.40A	15v 0.40A	57-10023
	17.5v 0.34A	17.5v 0.34A	57-10024
25 VA	6v 2.08A	6v 2.08A	57-10030
	9.5v 1.32A	9.5v 1.32A	57-10031
	12v 1.04A	12v 1.04A	57-10032
	15v 0.83A	15v 0.83A	57-10033
	17.5v 0.71A	17.5v 0.71A	57-10034
50VA	6v 4.16A	6v 4.16A	57-10040
	9.5v 2.63A	9.5v 2.63A	57-10041
	12v 2.08A	12v 2.08A	57-10042
	15v 1.66A	15v 1.66A	57-10043
	17.5v 1.42A	17.5v 1.42A	57-10044

## Chassis Mounting Prices

VA size	1-24	25+	Post surcharge per unit
3 VA	2.05	1.84	30p
6 VA	2.25	2.02	40p
12 VA	2.75	2.45	50p
25 VA	3.45	3.15	60p
50 VA	4.50	4.10	90p

VA	Sec V · I	Sec V · I	Stock No.
3 VA	6V 0.25A	6V 0.25A	57-10050
	9.5v 0.16A	9.5v 0.16A	57-10051
	12v 0.13A	12v 0.13A	57-10022
	15v 0.10A	15v 0.10A	57-10053
	17.5v 0.09A	17v 0.09A	57-10054
6 VA	6v 0.50A	6v 0.50A	57-10060
	9.5v 0.25A	9.5v 0.25A	57-10061
	12v 0.32A	12v 0.32A	57-10062
	15v 0.20A	15v 0.20A	57-10063
	17.5v 0.17A	17.5v 0.17A	57-10064
12 VA	6v 1.00A	6v 1.00A	57-10070
	9.5v 0.63A	9.5v 0.63A	57-10071
	12v 0.50A	12v 0.50A	57-10072
	15v 0.40A	15v 0.40A	57-10073
	17.5v 0.34A	17.5v 0.34A	57-10074

## PCB Mounting Prices

VA size	1-24	25+	Post surcharge per unit
3 VA	1.85	1.70	20p
6 VA	2.05	1.85	30p
12 VA	2.55	2.30	40p

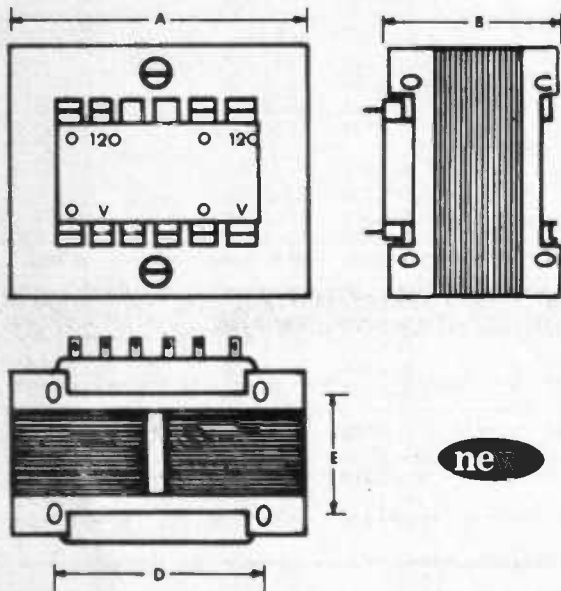
DIMENSIONS (mm)		3 VA	6 VA	12 VA
	A	5.08	5.08	7.62
	B	23.2	26.0	31.0
	C	10.2	15.2	15.2
WIDTH	D	37	40	50
LENGTH	E	43	48	57
HEIGHT	F	33	37	44
WEIGHT (grms)		170	230	370



# TRANSFORMERS — MAINS

## 100VA UNIVERSAL MOUNTING

Ideal for use in power supplies or any high current uses. Open frame construction provides ease of mounting in various positions. Supplied with dual primaries and secondaries.



Sec 1 V-I	Sec 2 V-I	Stock No	1-24	25+
6V, 8.33A	6V, 8.33A	57-11006	9.55	9.25
9.5V, 5.26A	9.5V, 5.26A	57-11009	9.55	9.25
12V, 4.16A	12V, 4.16A	57-11012	9.55	9.25
15V, 3.33A	15V, 3.33A	57-11015	9.55	9.25
17.5V, 2.86A	17.5V, 2.86A	57-11017	9.55	9.25
30V, 1.66A	30V, 1.66A	57-11030	9.55	9.25

For callers only — deduct £1 from above prices.

## TOROIDAL TRANSFORMERS

A range of toroidal transformers for requirements where small size and low magnetic fields are needed. All types have dual secondaries with 240VAC primaries. Supplied complete with mounting kit. All voltages quoted full load.

**new**

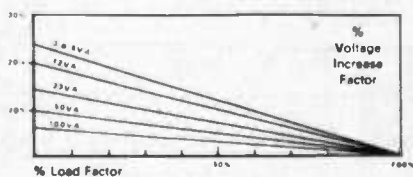


VA Size	Sec 1 V,I	Sec 2 V,I	Size (mm)	Stock No	1-24	25+
30	12V, 1.25A	12V, 1.25A	70 x 30	57-12012	6.35	6.05
30	15V, 1A	15V, 1A	70 x 30	57-12013	6.35	6.05
50	6V, 4.16A	6V, 4.16A	80 x 35	57-22010	7.23	6.95
50	12V, 2.08A	12V, 2.08A	80 x 35	57-22012	7.23	6.95
50	15V, 1.66A	15V, 1.66A	80 x 35	57-22013	7.23	6.95
80	12V, 3.33A	12V, 3.33A	90 x 30	57-32012	8.25	7.85
80	15V, 2.66A	15V, 2.66A	90 x 30	57-32013	8.23	7.85
80	30V, 1.33A	30V, 1.33A	90 x 30	57-32017	8.25	7.85
120	12V, 5A	12V, 5A	90 x 40	57-42012	10.25	9.95
120	15V, 4A	15V, 4A	90 x 40	57-42013	10.25	9.95
120	30V, 2A	30V, 2A	90 x 40	57-42017	10.25	9.95
120	35V, 1.71A	35V, 1.71A	90 x 40	57-42018	10.25	9.95

Callers only — deduct 15% from prices shown (10% for 120VA)

## Selection of Transformers—A Designers Guide

When selecting a transformer for a particular application, it is important to realise that any one transformer can be used in many different operating modes. The VA rating of a transformer is the product of the secondary r.m.s. voltage and secondary r.m.s. current at full load. Due to the regulation characteristic, the off-load voltage will be higher; the actual increase being dependent upon the particular transformer design and size. This means, for example, that although we rate type P0606 as 3VA, 6V, 500mA per secondary, it is also possible to use it as a transformer supplying 7V at 200mA per secondary. The graph shows how our standard types can be used in different applications and shows the designer exactly what r.m.s. secondary voltage to expect at a given load.



Whenever a transformer is used to supply any load other than a pure resistive one, it is necessary to derate its r.m.s. current rating to prevent overload. Many modern power supplies call for full wave bridge rectification followed by a capacitive smoothing element. The derating factor is given as follows: D.C. current = r.m.s. current x 0.82. The value of the smoothing capacitor effects the amount of d.c. current available. The larger the capacitor, the smaller the D.C. capability.

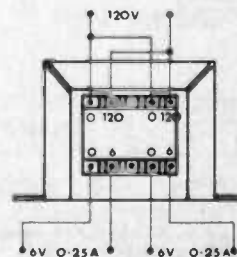
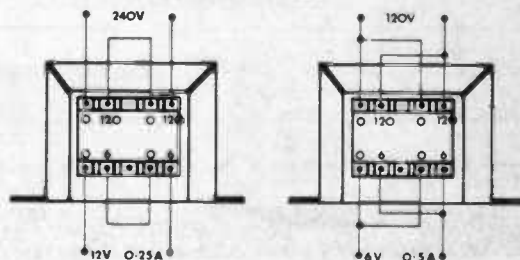
When using a semi-conductor as a series regulating element, consideration should be given to the off-load transformer output voltage. The capacitor will charge to the peak, not r.m.s. voltage. Taking this and the regulation factor into account, the off-load d.c. voltage presented to the regulation circuitry can be far higher than the full-load r.m.s. value. This can destroy the semi-conductor by exceeding its maximum voltage rating, or reduce the output current available as the regulator has a higher power to dissipate. However, the d.c. voltage presented to the regulator should be high enough to allow the regulator to operate correctly. Various factors such as mains voltage fluctuations, maximum excursions of ripple voltage have to be taken into account to ensure the absence of current limiting and other undesirable features. The table gives recommended secondary voltages (r.m.s.) for given regulated output voltages.

Desired Regulated Voltage (d.c.)	Recommended Secondary Voltage (r.m.s.)
5V	9.5V
6V	9.5V
9V	12V
12V	15V
15V	17.5V

These notes are intended as a general guide only and should not be taken as a performance guarantee in any particular application. All figures and specifications in this brochure are based on a sine-wave input of 240V a.c. 50Hz. However, the transformers may be used over the voltage range 100—125V or 200—250V r.m.s. 50—60Hz.

## Connection Details

By series or parallel connections various voltage combinations can be achieved. For example, by using a C0306 transformer inputs of 120 volts or 240 volts can be catered for and outputs of 6 V 0.5 A, 12 V 0.25 A, or 2 of 6 V 0.25 A, can be obtained.









## validity and prices

This catalogue is valid for dispatches from April 8th 1982 and supersedes all previous issues.

Prices quoted are 'NET' and exclude Value Added Tax. The rate of Value Added Tax, on any item, may change to reflect the position at the time of supply. Whilst every endeavour will be made to maintain the prices quoted in this catalogue we reserve the right to effect changes without prior notice.

A flat rate post and packing charge of 50p should be added to all C.W.O. and credit card orders.

A charge of £2.00 is added to all credit account orders to cover post and packing and administration. If specialist shipping arrangements are required e.g. Securicor or Red Star, these are normally charged at cost.

## ordering

Please use the order form provided. If you send in additional sheets, please write your name and address on each sheet.

Please give both the stock number and description when ordering.

We endeavour to ship all orders within 24 hours of receipt. We do not substitute items not available unless instructed to do so — or unless the product has been superseded.

Customers ordering by Credit Card will be debited accordingly, although orders prepaid by cash, cheque or postal order will be supplied with a credit note for those items not available from stock as above.

Customers paying by Access or Barclaycard may place orders by telephone between 8.00 am and 7.00 pm. Monday to Friday and 9.30 am to 5.30 pm on Saturdays.

## credit account customers:

We do not require confirmation of telephoned or telexed orders under £100 in value. An official order *must* be brought to our sales counter when collecting goods previously ordered by telephone. If you confirm verbal orders, kindly mark 'Confirmation Only' to avoid duplication.

To assist prompt dispatch please use the stock numbers shown, and give description or part no., and order the priced units indicated (per pack, each, per reel, etc.).

## product and availability information

Unless otherwise stated, electrical ratings represent safe working limits. Dimensions and other physical characteristics are subject to normal commercial tolerances.

The information contained in this catalogue was to the best of our knowledge, correct at the time of going to press. We do not, however, accept responsibility for damage, injury, loss or expense resulting from any

## TERMS OF BUSINESS

error or omission.

We reserve the right without prior notice to discontinue any product or to make design changes as part of our continuous programme of product improvement, or to assist product availability. Where possible, future design changes will be indicated against the description. Such changes may take place during the currency of this catalogue. We ask that you verify dimensions and other data published in this catalogue — together with future availability — before incorporating products into long-term production designs or for other critical purposes.

Our Technical Department will be pleased to advise you in these and other matters related to the use of our products.

## delivery

Orders supplied against credit account or credit card can only be delivered to the customer's permanent business address, or the address specified for the card.

## guarantee

We guarantee to replace faulty goods, or, at our option, to refund the purchase price thereof, subject to the claim being made in writing to us within 6 months after the sale. Other than as provided in this clause we shall not be under any liability, in contract, tort or otherwise, in respect of defects in goods delivered or for any injury, damage or loss resulting from such defects and in no event shall any failure of any kind on our part give rise to any liability for loss of revenue or any other consequential loss or damage arising from any reason whatsoever. Those products which are of a type ordinarily bought for private use, and are purchased for use other than in the course of business, our terms of business do not limit or exclude that person's legal rights in case the products are faulty.

Any goods which are the subject of a guarantee claim must be returned to us accompanied by the sender's advice note which should state the date of purchase of the goods in question and the nature of the claimed fault.

## payment terms:

1. Net Monthly terms are available to commercial, industrial, educational and 'trade' users (subject to satisfactory references). Payment is due by 20th of month following the month in which goods are dispatched.
2. Cash with Order:  
UK customers  
Please add 50p postage and VAT to the total purchase value at the rate applying at the date of ordering.  
Export customers  
Please add sufficient for postage by your preferred method (we strongly advise air post be used at all times). If possible, payment by Credit Card will

allow us to debit the exact cost of postage -otherwise any excess will be refunded. Underpayment of postage may result in part of the order being cancelled or delayed.

3. Cheques and Postal Orders should be made out to 'AMBIT INTERNATIONAL'. Please ensure these are crossed.
4. Payment may be made by ACCESS or BARCLAYCARD or the international variants thereof (Mastercharge and Visa).
5. Overseas customers paying by cheque please note that payments must be made out in Sterling and drawn on a UK bank.

NB Title in goods does not pass to purchaser until payment is received and credited to our account in full.

## country of origin

Unless otherwise confirmed, nothing herein is to be taken as a representation of the source of origin or production of the goods or any part thereof.

## transit delays

Queries regarding shortage or non-delivery of goods must be made in writing within 10 days of receipt and be accompanied by our Packing Note. *Please refuse parcels delivered to you in a damaged condition, and inform us in writing of so doing.*

## returns and handling charge

No returns, except when claiming for replacement under guarantee, are permitted without our prior consent. To be eligible for credit and a correct V.A.T. refund, goods must be returned to us in an *unused condition* within 30 days of invoice date stating relevant invoice number.

If unopened, a minimum handling charge of 10% will apply. A higher rate may be levied on goods opened but unused, since it may be necessary for us to retest them in accordance with the manufacturer's specifications.

## discounts and vouchers

Each issue of WR&E (and some issues of R&EW) contains discount vouchers for use as part payment for CWO purchases. The validity of these vouchers is imprinted thereon, and they may be used in conjunction with any purchase over £15 **excluding VAT and PP**. One voucher may be used for each complete £15 worth of order value up to a maximum of £60 per order, i.e. no more than 4 vouchers may be used per order. These vouchers are not transferrable or exchangeable for credit or cash. We reserve the right to refuse or cancel vouchers not submitted in accordance with these conditions.



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