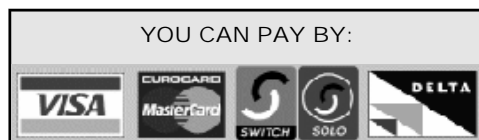


Sales and Ordering

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You can order by post, fax phone or via our secure online ordering system. **You get reduced price UK Postage & Packing if you order online!**



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If you feel that you will have difficulty building any Kit-Form product purchased from us (and you cannot get assistance) you can return it for a refund provided a Returns Number is first obtained from our Sales Department by email or telephone. All items must be returned to us (insured against loss or damage in transit) at your expense and received by us in original condition (with all packaging and documentation) within 10 days of original invoice date. The returns number must be clearly stated on the parcel.

Where a product is supplied in Kit-Form and assembly or construction has commenced or the inner component packages have been opened we are unable to offer any form of refund, replacement, exchange or free repair. This is because we cannot guarantee the labour you provide and components can be damaged during assembly. It is recommended that if a kit builder does not have enough knowledge to diagnose faults, that the project should not be started unless assistance can be obtained (unfortunately,

one small faulty solder joint or wiring mistake can take many hours to locate and at normal service rates, the service charge could well be more than the total cost of the kit). We do offer a [Get You Going](#) service if you find that you cannot get your project kit up and running without professional help. There is a charge for this service. Please ask our Sales Team for details.

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Or visit our web site where you will find photographs of built-up kits together with FREE software, documentation downloads and online ordering. It is also the best place to find out about new kits that are constantly being added to the range and our latest special offers.

<http://www.QuasarElectronics.com>

We look forward to being of service to you soon.

Accessories

Power Supplies

The PSU range of plug-in mains adaptor power supplies below are designed for use with 240Vac mains and standard British 3-pin style mains sockets. **They are NOT suitable for use in North America.** It is advisable to obtain a power supply locally if you live outside the UK.



3-12V, 300mA DC Plug-In Mains Adaptor

3-12Vdc *unregulated* 300mA plug-in mains adaptor with 6 output voltages. Includes polarity switch, 4-way spider plug & 1.3mm DC Walkman plug. See Page 54 when ordering this item.

- Input voltage: 220-240Vac, 50Hz
- Output Voltages: 3, 4.5, 6, 7.5, 9, 12Vdc
- Output current: 300mA max.
- Stability: 40%

PSU020 £5.95

3-12V, 600mA DC Plug-In Mains Adaptor

High quality 3-12Vdc *regulated* 600mA plug-in mains adaptor with 6 output voltages. Includes polarity switch, 6 plug sizes, LED indicator & automatic thermal cut-off and overload cut-off protection. Suitable for powering many of the kits that we sell.

- Input voltage: 220-240Vac, 50Hz
- Output: 3-4.5-6-7.5-9-12Vdc
- Short circuit protection
- Automatic thermal cut-off and overload cut-off
- Output current: 600mA max
- Stability: 2%

PSU345 £9.95

Please remember to add £3.95 P&P for UK orders

12Vac, 500mA Plug-In Mains Adaptor (230Vac)

High quality regulated 12Vac, 500mA max. output plug-in 220-240Vac mains adaptor. Integral 1.8m lead with a 2.5mm jack type plug. Suitable for kits 3096, 3101, 3117, 3119 and 3144.

PSU235 £11.95

Regulated Fixed Voltage Power Supply Range

Range of high quality fixed voltage regulated 500mA plug-in mains adaptor with 2.1mm plug.

- Input voltage: 230Vac, 50Hz mains
- Output Voltage: as ordered
- Output current: 500mA max.
- Ripple: <10mV
- Stability: >2%
- Adaptor Plug: 2.1mm
- Lead Length: 1.8m approx.

6Vdc output: PSU441 £8.95

9Vdc output: PSU443 £8.95

12Vdc output: PSU445 £8.95

9-18Vdc Universal Switch-Mode Power Supply

Compact, light, energy efficient switch-mode power supply. Regulated 9—18V dc output. Output current 800mA (9/12V), 1200mA (15/18V). 7 different adaptor plugs for various appliances. 100 - 240Vac 50/60Hz input voltage. 3 interchangeable plugs for UK, USA and European (Shuko) operation. Suitable for many of the kits we sell.

- Input voltage: 100 - 240Vac, 50Hz
- Output: 9 / 12 / 15 / 18Vdc
- Output Current: 800mA (9/12V), 1200mA (15/18V)
- Adaptor plugs: 2.5 / 3.5 / 5.0 x 2.1 / 5.5 x 2.5 / 3.5 x 1.35 / 4.1 x 1.7 / 2.35 x 0.75mm
- Short circuit protection
- Small ripple
- Automatic thermal cut-off and overload cut-off

PSU010 £19.95
Computer Leads

Parallel Lead 25-Pin D M-F

2 metre straight through parallel port lead. 25-pin male D Plug to 25-pin female D Socket.

LDC136 £4.95

Serial Lead 9-Pin D M-F

2 metre straight through serial port lead. 9-pin male D Plug to 9-pin female D Socket.

LDC441 £4.95

Centronics Parallel Lead

2 metre straight through 25-pin male D Plug to 36-way Centronics plug parallel port lead.

LDC750 £4.95

USB Lead Plug A-B

2.0 metre USB lead.

Plug A-B: **LDC644 £2.95**

ZIF Sockets

40 Pin Wide ZIF Socket

High quality universal ZIF (Zero Insertion Force) socket for use with our PIC / ATMEL programmer kits. Ensures quick and easy insertion of devices like PIC chips for programming without any possibility of leg damage.

Simply flick the integral lever to clamp the pins for programming and lift again to release the device. The socket has wide entry holes to accommodate devices with 0.3" to 0.6" pitch pins allowing the vast majority of devices to be inserted.



ZIF40W £15.00

As above but 20 Pin 0.3" ZIF Socket **ZIF20 £8.00**

See website for our full range of power supplies, leads, components, accessories and much more!

ABC Boards

ABC is an acronym for AVR Basic Controller. These ready assembled boards are available in two versions Mini and Maxi. Both contain a microcontroller based on ATME1s AVR 8535 RISC technology. Most instructions are single cycle giving up to 8 million instructions per second on the ABC boards. You can purchase just the boards or a 'Starter Pack' containing one pre-assembled ABC Board (Mini or Maxi), both parallel and serial leads for connection to your PC, and Windows software featuring an Assembler, True BASIC compiler and in-system programmer with on-screen results.



ABC Starter Pack based on

ABC Mini

The heart of the ABC Mini (or 'Hotchip') Board is an Atmel AVR AT90S8535. Silicon Chip magazine had a feature and write-up of our new ABC Boards (see website for copy).

Technical Specifications

- Microcontroller - Atmel AVR AT90S8535
- Clock Speed - 8 MHz

Memory

- 8Kb of In-System Programmable Flash (1000 write/erase cycles)
- 512 bytes of internal SRAM
- 512 bytes of EEPROM

Peripherals

- Two 8 bit Timer/Counters with 32768 Crystal for Real Time Clock
- One 16 bit Timer/Counter
- Programmable Serial UART
- 8 Channel, 10 Bit Analogue to Digital Converter (ADC)
- 32 Programmable I/O Lines

Special Features

- External/Internal Interrupt Sources
- Real Time Clock (RTC)
- Power Saving Modes
- Operating System - No built-in operating system or monitor, all resources are available to the user
- Supply Voltage - 9-12Vdc / 35mA

Connectors and Functions

- Power Connector to supply power to ABC Mini (9-12V / 100mA DC)
- Serial (RS232) Connector to PC. Standard 9 way straight through cable is used. Only pins 2,3 and 5 are used. On board TTL/RS232 level converter. Plug the other end into serial port of PC.
- Programming Connector for In-System Programming. Plug other end into programming adapter connected to parallel port of PC.
- 40 pin DIL connector. All signals are available directly connected to pins of AT90S8535. Schematic of pin assignments provided.

Physical Dimensions

- ABC Mini comes in a form of 40 pins DIL package and can be plugged into your circuit or function as standalone. Size 70x20x10mm.

ABC Mini Starter Pack: £59.95

ABC Mini Board Only: £34.95

ABC Maxi

If you need more power and speed, look no further than the ABC Maxi Board. The Maxi has open architecture design based around an Atmel AVR AT90S8535. All circuits are embedded within the package.

Technical Specifications

- Microcontroller - Atmel AVR AT90S8535
- Clock Speed - 8 MHz

Memory

- 8 Kb of In-System Programmable Flash (1000 write/erase cycles)
- 512 bytes internal SRAM
- 512 bytes EEPROM

Peripherals

- Two 8 bit Timer/Counters with 32768 Crystal for Real Time Clock
- One 16 bit Timer/Counter
- Programmable serial UART
- 8 channel, 10 bit Audio to Digital Converter (ADC)
- 32 programmable I/O lines
- Special Features
- External/Internal interrupt modes
- Real Time Clock
- Power saving modes

Operating System

- No built-in operating system or monitor. All resources available

Connectors and Functions

- Supply Voltage - 9-12Vdc / 100mA
- For pin assignments on connectors

see schematic within software.

- Power Connectors
- Serial (RS232) Connector to PC. 9 way straight through cable. On board TTL/RS232 level converter. Plug other end into PC serial port. RTS/CTS also available.
- Programming Connector for in-system programming. Plug the other end in programming adapter connected to PC parallel port.
- RS485 connector. 4 pin screw terminal for connection to RS485 network. On board RS485 circuit.
- 8 pins I/O connector. This is a screw terminal connector for analogue inputs (channels 0,1,2,3 and one I/O pin, which is selectable).
- Analogue input range 0-5V
- 12 pins I/O connector. Screw terminal connector for I/O pins.
- MOSFET outputs active low to GND capable of driving 8A current.
- I/Os are bi-directional with internal pull-up resistors. Output buffers can sink 20mA current (direct LED drive)
- LCD Connector. 14 pin DIL connector for 2-16 LCD display. If not used for LCD can be used as I/O.
- 3.5mm Phone Jack for connection to an external speaker for tone generation and speech synthesis through the onboard amplifier.
- Atmel 1/2Mb to 2Mb Data Flash onboard option.
- LCD 16 x 2 option as well
- On board 4 x 12A open drain MOSFETs and 4 Opto-isolated Inputs.

Physical dimensions

- ABC Maxi comes in a form of stand alone board and fits into standard rail mounted 72 mm wide enclosure approx. size 120 x 72 x 20 mm.

ABC Maxi Starter Pack: £99.95

ABC Maxi Board Only: £79.95

ABC Add-On Boards

The ABC Mini Add-On Boards are available now. They can be purchased as separate boards or as a complete kit called the 'ABC AVR Educational Workshop'. See our website for full details of all these products.

ABC Support Group

Check out the new ABC support group at www.egroups.com/group/abcbboardshotchip

a simple way to turn the telephone in a home into a listening device to pick up room sounds! It wasn't easy to get these ideas! Written by the tap expert 'Tricky Dick' himself! **R022 - £4.95**

EMERGENCY CAR DOOR OPENER TOOL!

Never be locked out of a car again! This simple device will open most cars with horizontal locking and vertical locking mechanisms! Many cars made since 1982 have this type of lock! This tool is easily constructed out of a piece of scrap metal usually found in rubbish bins around cardboard boxes! These types of tools have usually been sold only to police departments up until now. We show you how to make your own for FREE! Detailed instructions. Easy to make and USE! **R023 - £1.95**



ETHER BOX CALL INTERCEPTOR!

This publication shows you how to build a simple, inexpensive device that can tap someone's phone line merely by being aimed near the phone lines outside of their home! No wiring or connecting to their wiring is needed! This device is deadly in that you can simply drive near a home and situate the 'ether box' near the phone line and pick up all conversations on that line! This device snatches phone calls out of thin air, hence the name 'ether box'! Easy to build & extremely small and portable. Powered by 9V battery. **R025 - £2.95**



CALL-FORWARDING BOX!

A Call-Forwarding Box is a device whereby one places a long distance or local call through an intermediate phone! A salesman can use them so that those 'after hour' calls can be transferred to another phone of their choice. CF boxes can also be used by

phreakers to place long distance calls! This is an interesting device and up until now, little was known about the CF box! Complete schematics are included for constructing this simple, yet useful device. **R026 - £1.50**

POOR MAN'S VOICE CHANGER REPORT!

Why pay up to £200 for an electronic voice changer? We show you how to obtain your own completely assembled Electronic Voice Changer that is MUCH BETTER than models costing over £200!! This one we show you costs only £20!! This model allows you to change the sex of your voice! Can be used for answering the phone with our complete plans! This device is commonly available & is relatively unknown as far as the high quality voice changing capabilities! We were amazed by the results of the £20 device! Unbelievable! **R027 - £1.50**

CASH CREATOR BUSINESS REPORTS

Need some ideas on how to make hard cash? Well this is just what you need! You get 40 high quality business plans stretching to some 800 pages supplied on 3 1/2" floppy disk. Subjects covered include Mail Order Secrets, Profit From Auctions, Car Trading for Profit, How to Win Competitions, Import/Export Business, Locksmithing, Big Money From Your PC, Travel Writing and many more! Each disk also contains a valuable certificate that gives you full authorisation rights to reproduce, duplicate and sell the manuals as much as you like. Why wait until tomorrow to make your dreams of success and riches come true when you can start making money right now! **R030 - £4.95**

THE GOLD BOX PLANS!

The GOLD BOX is a device that uses a handful of parts from Tandy & when connected to phone lines, allows user to call the number the device is hooked to from HIS OWN home, the GOLD BOX is activated & answers the call & gives the user a DIAL TONE.

This is the dial tone of the REMOTE PHONE - NOT the users phone! The phreak can now phone to anywhere he wishes & not be charged! This is a relatively new device in a phone phreak's arsenal. Does NOT have to be connected inside home! **R034 - £1.95**

THE UNDERGROUND HACKERS GUIDE TO ANSWER MACHINES

Tells how anyone can control YOUR answering machine & make free long distance calls from your phone in THEIR home! Many methods on changing messages on other's machines, hacking answer machines, how to access codes, MORE! Did a business rip-you off?? Call THEIR answering machine after hours & change their message to cuss out future callers!! **R035 - £1.95**

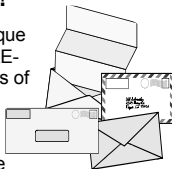
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Neither Quasar Electronics nor its owners or employees will be held accountable for the use or misuse of the information contained in these publications.

THE MAIL & MONEY EXTRACTOR!

Here at last! A unique and easy way to REMOVE the contents of practically any sealed envelope WITHOUT break-

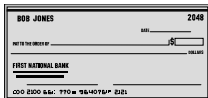


ing or steaming the seal! We show you how to construct a simple device for a total cost of a few pence from household materials that will remove the contents or REPLACE the contents after being read! Yes, you can now read someone's mail and replace the contents in the envelope with this device and leave NO signs of tampering! Money, cheques, letters etc. can easily be removed from sealed envelopes! Works on all sizes of envelope and does NOT break the seal. You won't believe this device!

R009 - £0.95

X-RAY LETTER SPRAY!

Have you ever wanted to read the contents of an envelope



without opening it? The government & other organisations use what is known as 'X-ray Letter Spray' to do this! An envelope is sprayed with this 'secret' chemical & it becomes translucent for a short period of time, allowing the contents to be read without opening it! After about 60 seconds the envelope is dry & NO trace whatsoever is left that it was ever tampered with! Does not harm contents of envelope or the printing on the envelope. Police supply houses sell small cans of this spray for up to £30 a can! Our publication shows you how this spray really is & what it's actually being sold under as a commercial product. The spray is a commonly available item found in grocery stores & sells for about £2 a can! No modification is needed, as it is ready to use as X-ray Letter Spray.

R013 - £0.95

DEFEATING SCAN-TRON!!

Here at last! Destined to be a best seller! This revealing report describes in detail how MANY students easily defeat scan-tron test readers to pass a

test, even though they do NOT know the answers! A very simple method is used to fool the scan-reader into thinking the questions have been correctly answered! The teacher never detects cheating with this TESTED & PROVEN system!! You won't believe how simple this method is!

R015 - £0.95

RADIO AND TV JOKER!!

Construct a simple device that will jam ALL nearby radio & TV broadcasts! The easy-to-build, inexpensive device will also JAM many other broadcasts! You can have fun with your friend's TV set just before they sit down for the cliff-hanger episode of their favourite show! One schematic will fog-out ALL radio receivers for about 400 metres! The devices are small, portable, easily concealed & inexpensive to build. Fun & Unique. Detailed drawings & schematics given for 3 different circuits.

R017 - £3.50

THE AMAZING CHEESE BOX PLANS!!

The 'cheese box' is simply a conference line or loop-around. They are very popular with bookies who place bets by phone because their clients call one number, the bookie calls another number and the police can't trace the bookie to the location of either of the two numbers! Last, but certainly not least, the cheese-box is FREE! We show you complete easy-to-build plans for constructing cheese boxes. Cheese boxes can be extended to many lines, thereby creating conferences! Schematics for several models are included in this unique publication. As seen on TV's 'Miami Vice' series! **R018 - £0.95**

INFINITY TRANSMITTER



Complete plans for building your own INFINITY TRANSMITTER bug for phones. When installed, it allows the user to call the target phone, which will NOT ring. Instead it allows the caller to hear the activities

Complete plans for building your own INFINITY TRANSMITTER bug for phones. When installed, it allows the user to call the target

in the home via a microphone hidden anywhere on the premises. Only YOU can activate the infinity transmitter! The microphone is turned off whenever you hang up. Monitor your office from home or call your home while away to check all is well!

R019 - £3.50

PHONE SWITCH CIRCUIT PLANS!!

Many detailed & fun circuits you can build for your telephone! SNOOP LIGHT - lights up if someone picks up an extension. ANSWEROO - answer the phone BEFORE it rings (this is useful for lovers who live with parents and are barred from using phone late at night!) LINE RELAY - an interesting device that will do practically anything you wish for it to do - turn on TV, answer the phone, turn on a lamp etc. The possibilities are endless with this unique collection of phone circuits. Detailed drawings & schematics. Easy to build and very inexpensive circuits. Unique designs & applications.

R020 - £1.50

'SNOOPER' EXTENSION DEVICE PLANS!

This simple, easy-to-build electronic circuit allows one to pick up an extension phone without user hearing the familiar 'CLICK!!' The 'click' has always been a dead give-away that someone was listening in on an extension - now you can cure the click!!

R021 - £0.95

WATERGATE SURVEILLANCE PACKAGE!



This publication is PACKED FULL of simple devices & modifications that can be used to covertly monitor and bug rooms, offices and homes. You won't believe how easy it is to eaves-

drop on others with this top-secret set of publications. How to build your own £1 phone monitor for example shows

Please remember to add
£3.95 P&P for UK orders

CMOS Cameras

This family of video camera modules is based on advanced CMOS (not CCD) mixed signal technology, an integrated image array, signal processing, timing & control circuitry - all on a single chip - enabling all aspects of video camera applications. They are specially designed for cost sensitive consumer electronics applications. The resolution is not as high as CCD, but for many purposes like security systems, videophones, industrial machine monitoring & toys and models, a high resolution is not necessary. They are PCB-mounted modules that require a case and some connections to be made, maybe a voltage regulator input circuit etc. Ideal for designers, experimenters & hobbyists.

You must use a REGULATED power supply like our order code PSU345. All cameras are tested before shipment.

CCIR, EIA, PAL or NTSC??

CCIR and PAL models are the 50Hz versions used in the UK and most other countries. EIA and NTSC models are the 60Hz version for north America only.

Monochrome Models

Miniature Monochrome Cube Camera Module

The C-CAM2A is a VERY small (just 16x16x15mm), low cost, extremely light (2g), low power consumption camera with a consistent image quality. It uses a high quality sensor and can be connected directly to a standard video monitor/TV.

Features

- Small size DIL package (0.3in)
- Low power consumption (<10mA)
- Direct connect to standard video monitor
- Auto exposure control
- Backlight compensation
- Gamma correction - 0.45/1.0
- Auto gain control - 18dB

- Auto black level calibration

Specifications

- Imager: 1/4" CMOS image sensor
- Scanning: 2:1 interlace
- Shutter: 1/50 to 1/6,000 sec
- Output: 1Vp-p composite video (75Ω)
- Picture Element: CCIR - 352 x 288 (101K pixel), EIA 320 x 240 (76K)
- Effective image area: 3.2 x 2.5 mm
- S/N Ratio: >46 dB (AGC on)
- Min. Illumination: 0.5 Lux at F1.4
- Supply Voltage: 5± 0.5 Vdc
- Lens: f4.9mm, F2.8 FOV 36° x 47°

Versions: C-CAM2A-CCIR (50Hz) or C-CAM2A-EIA (60Hz). Both supplied with an f4.9, F2.8 lens.

Prices: C-CAM2A-CCIR or C-CAM2A-EIA with f4.9 lens **£24.95**

1/3" Monochrome Camera

Slightly larger than C-CAM2, this 1/3" monochrome module has much higher resolution.

Features

- Small size 29 x 29mm
- Low power consumption (<200mW)
- Connects direct to standard video monitor/TV
- On-chip auto exposure control
- Backlight compensation
- Gamma correction - 0.45/1.0
- Auto gain control - 18dB
- Auto black level calibration

Specifications

- Imager: 1/3" OV7410 CMOS sensor
- Scanning: 2:1 interlace
- Shutter: 1/60 to 1/10,000 sec
- Output: 1V p-p composite video (75Ω)
- Picture element: CCIR - 628x582 (365K pixel), EIA 510x492 (251K)
- Effective image area: 5.8 x 4.2 mm (PAL), 4.7 x 3.5 mm (EIA)
- S/N ratio: >48dB (AGC on)
- Min illumination: 0.2 Lux at F1.2
- Supply Voltage: 9-15Vdc
- Lens: f3.7mm, F2.0 FOV 65° x 50° (wide angle)
- Connectors: PWR, GND, Video Out

Versions: M3185A-3720 (CCIR 50Hz) or M3186A-3720 (EIA 60Hz).

Both supplied with an f3.7, F2.0 lens

Prices: M3185-3720 or M3186-3720 with f3.8 lens **£39.95**

Colour Models

1/3" Miniature Colour Camera Module

C-CAM8 is the colour version of C-CAM2A camera above. It has low power consumption, low cost, small size together with consistent image quality. Can be connected directly to a standard video monitor/TV.



Features

- Small size (22x22x28mm)
- Low power consumption
- Direct connect to standard video monitor/TV
- Auto exposure control
- Backlight compensation
- Gamma correction - 0.45/1.0
- Auto gain control - 18dB
- Auto black level calibration
- Auto White Balance

Specifications

- Imager: 1/3" CMOS colour sensor
- Effective image area: 5.8 x 4.2mm
- Scanning: 2:1 interlace
- Shutter: 1/60 to 1/15,000 sec
- Output: 1Vp-p composite video (75Ω)
- Picture Element: PAL - 628x582 (365K pixel), NTSC 510 x 492 (250K)
- S/N Ratio: >48dB
- Fixed Pattern Noise: <0.03% Vp-p
- Dark current: <0.2nA/cm sq
- Lens: f6.0mm F1.6, FOV 43° x 33°
- Supply Voltage: 5± 0.5 Vdc
- Connectors: PWR, GND, Video Out

Versions: C-CAM8-PAL (50Hz). C-CAM8-NTSC (60Hz). Both supplied with an f6.0, F1.6 lens.

Prices: C-CAM8-CCIR or C-CAM8-EIA with f4.9 lens **£49.95**

Prices include
17.5% VAT

1/3" Colour Camera

This is the colour version of the M3185/86 camera above.

Features: same as M3185

Specifications

- Imager: OV7910 CMOS sensor
- Lens: f6.0mm F1.6, FOV 43.6° x 33.4°
- Other specifications as M3185

Versions: C3185A-6016 (50Hz PAL) or C3186A-6016 (60Hz NTSC). Both supplied with an f6.0 F1.6 lens.

Prices: C3185A-6016 or C3186A-6016 with f6.0 lens **£49.95**

Digital Output Models**1/3" Monochrome Camera Output with Digital**

The M3188A is a 1/3" monochrome camera module with digital output. The digital video port supplies a continuous 8 bit-wide image data stream. All camera



functions, such as exposure, gamma, gain, windowing, are programmable through I²C interface. Picture shows camera board and sensor with lens mount removed.

Features

- 326,688 pixel, VGA / CIF format
- Small size : 40 x 28 mm
- Read out - progressive / interlace
- Data format - 8 bit video data
- I²C interface
- Electronic exposure / Gain / Control
- Image enhancement - brightness, contrast, gamma, sharpness, window, etc
- Internal/external synchronization scheme
- Frame exposure/line exposure option
- Low power consumption (<300mW)
- Monochrome video output (60Hz only)

Specifications

- Imager: OV7120 CMOS sensor
- Array Size: 664 x 492 pixels
- Pixel size: 7.6 x 7.6 mm
- Scanning: Progressive / interlace

- Effective image area: 4.86 x 3.64mm
- Electronic Exposure: 500:1
- Gamma Correction: 128 Curve settings
- S/N Ratio: >48dB
- Min Illumination: <0.5 lux @F1.4
- Operation Voltage: 5± 0.5 Vdc
- Operation Current: 200mW Active, 10mW Standby
- Lens: f=3.7mm F2.0

Price: M3188A-3720 with f3.7 lens **£59.95**

1/3" Colour Camera with Digital Output

The C3188A is the colour version of the M3185/86 camera above. The digital video port supplies a continuous 8/16 bit-wide image data stream. It



provides the parallel interface for PC control. It also provides analogue monochrome signal output for monitoring purpose. Driver programs are supplied for both monochrome and colour camera models. Picture shows evaluation board with camera (not supplied).

Features

- 8/16 bit video data: CCIR601, CCIR656, ZV port
- Data format - YCrCb 4:2:2, GRB 4:2:2, RGB
- Built in 10bit 2-ch A/D converter
- Electronic exposure / Gain / White balance control
- Wide dynamic range, anti blooming, zero smearing
- Low power consumption (<120mW)
- Other features as M3188A
- Monochrome video output (60Hz only)

Specifications

- Imager: OV7620 CMOS sensor
- Min Illumination: 2.5lux @F1.4
- Operation Current: 120mW Active, 10mW Standby
- Lens: f6.0mm F1.6
- Other specifications as M3188A

Applications

Still Image, Machine Vision, Process control, Finger print recognition, Bar code scanner, Video Conferencing, PC Multimedia, Video Phone, Video Mail

Price: C3188A-6018 with f6.0 lens **£64.95**

Evaluation Boards for Digital Cameras**EV38 Evaluation Board**

EV38 is an evaluation board for the M3188 & C3188A digital camera modules detailed above. It provides the parallel interface for PC control. It also provides analogue monochrome signal output for monitoring purpose. Driver programs are supplied for both monochrome and colour camera models. Picture shows evaluation board with camera (not supplied).

**Features**

- CIF format of RGB raw data or YUV 4:2:2 8 bit format for colour camera
- Image display on PC monitor
- Window setting (max pixel 128K)
- Progressive scanning
- Mirror function
- Gain, contrast, sharpness, brightness, colour saturation control
- Internal register control of image sensor
- Still picture capture (1 frame)
- Offline for image capture

Specifications

- Camera Modules Supported: C3188 (colour) or M3188 (monochrome)
- Voltage: 9Vdc or 6V Battery
- Current Consumption: <200mA
- Video Output: Composite video monochrome (60Hz only)
- PC Interface: Pentium, W95/98 only, ECP parallel port

EV38 Contents

- EV38 evaluation board
- EV38 software and Operation Manual (supplied on floppy disk)

Other Items Required

The following items (sold separately) are also required:

- M3188 or C3188 camera module

Rare and Unusual Information**Plans & Reports by**

The experts in rare and unusual information that others dare not publish!! Insider information reports, circuit plans and much more!!

TELEPHONE 'BUG' DETECTION !!

This invaluable report will provide you with the knowledge needed to detect phone bugs. Thousands of people use the equipment we sell for wire tapping every day! Even the police use them! Learn how you can easily detect PARALLEL & SERIES phone taps plus DROP-OUT RELAY recording devices by using a simple Volt/Ohm meter. Even shows how to detect the INFINITY TRANSMITTER bug. If your business dealings are clandestine you should be reading this report. Why pay for expensive detection equipment when it's easy & CHEAPER to do it yourself. Is your phone line bugged now? Find out for sure with our report. **R001 - £1.95**

SUPER-EAR LISTENING DEVICE!!!

Complete plans to build a number of different super-human listening devices. Hear voices and other sounds up to 500 metres away!

You can even use one to listen through walls! Uses commonly available parts and are easy to build!! **R002 - £3.50**

**MICRO ROCKETS**

This publication shows you how to build simple micro-rockets from common straws! They use very inexpensive materials and dozens can be made in an afternoon. The rockets can be fired from an easily made launcher or tube and can even be fired from radio controlled model lanes and boasts. A small battery can also ignite the fuses. 'Warheads' can be attached to them using firecrackers to cause them to explode in the air! Multistage firing rockets can even be built also for pennies! N.B. Black powder required to make rockets is difficult to obtain without a gun licence. **R003 - £1.95**

**CLASSIFIED ADS EXPOSED!!**

Ever wondered what those money-making classified ads REALLY are? How about those 'home businesses'? Now, for the first time we reveal exactly how all these gimmicks and rip-offs really work! Discover the truth about envelope stuffing, home businesses, money-in-mailbox plus many, many more! Stop wasting your hard-earned money on these rip-offs. Learn what they are AND how you can place ads yourself to receive money. All the gimmicks are explained in detail in this fact-filled report! Don't be ripped off again! Get all the facts before you spend another pound on another get-rich-quick scheme! **R004 - £3.95**

**MICRO-BEETLE PHONE BUG!**

Complete plans for building a micro FM phone bug that is about the size of a twenty pence coin or beetle. Bug transmits both sides of telephone conversations to an FM radio over two blocks away (up to 1/2 mile is possible using a good FM receiver). Uses low cost, readily avail-



able parts from Tandy or similar. This easy-to-build James Bond-like device is extremely small & simply attaches to phone line or can be hidden inside phone. **R006 - £2.50**

THE ELECTRIC TOILET!

A unique and unusual practical joke! We show you how to electrify a commode to safely shock the victim when he uses it! The device is a commonly available part that will hold an electrical charge for hours! Requires no batteries or external power source. You can electrify practically ANYTHING with this device for a total cost of about £4. The plans show you in detail how to do it quickly and easily. Have fun at school with this unique shocking device! Does not use household current for shocking. SAFE! Sold for informational purposes only. A highly charged and shocking report!! **R007 - £1.50**

LOCK PICKS & LOCK PICKING!

Why buy expensive lock picks and pay for rip-off mail-order locksmith courses? We show you how to make your own PROFESSIONAL lock picks from ordinary spring-steel or car spark plug feeler tools! We give you exact dimensions to make your own! Exact detailed drawings and construction techniques. PLUS - we show you how to use them! This is perhaps the most comprehensive & easiest to understand course ever published on this hush-hush subject! You won't believe how easy it is to make and USE these tools. We also show you how a basic lock works and how to pick warded locks, warded padlocks, lever tumbler locks, disk tumbler locks and pin tumbler locks. We reveal all - picks, feeler tools and we even show you how to file keys down to make 'master' keys to open locks. This info packed publication has many detailed drawings and illustrations. **R008 - £3.50**



Tools

30W Soldering Iron (240V)

Low cost soldering iron suitable for hobbyist and for many small domestic or electrical soldering tasks. Also suitable for light industrial use. Input Voltage: 220/240Vac mains. Lead Length: 1.3m. Iron Length: 210mm **SOL744 £5.95**

**60/40 Fluxed Solder**

High quality 60/40 tin/lead alloy single core resin solder. It high purity and performance makes it suitable for general and precision electronic work. Diameter: 1.0mm. Flux: 2.2%. Supplied in 100g reels. **SOL412 £1.95**

Soldering Iron Stand

Almost as essential as the soldering iron itself! A soldering iron stand will help save burning holes in fabrics and yourself! Suitable for various soldering irons. Cleaning sponge included. **SOL775 £4.95**

**Desoldering Pump**

A general purpose desoldering pump with a slim profile and smooth action. This is an indispensable tool for the hobbyist and professional alike. Ensures quick and easy removal of components from boards thus greatly minimising the chance of component and board damage. **SOL988 £2.95**

**Standard 5" Cutters**

The last essential item in the soldering tool bag is a pair of cutters for trimming component leads. These high quality, 5" precision standard flush cutters are made from high quality carbon steel for years of trouble free service. **HTS183 £3.95**

**Illuminated Magnifying Glass**

Hand-held magnifying glass with high optical clarity 4 1/2" diameter glass lens and integral bulb for illumination. Useful for those fine soldering jobs, component identification, map, chart and fine print reading. Requires 2 x 1.5V "C" batteries (not included). **HTM040 £4.95**

**Electronics Screwdriver Set**

6-piece precision screwdriver set with rotating heads. Hardened steel shafts. Contains 4 flat blade and 2 cross-pointed screwdrivers. Supplied in an attractive plastic case. **HTS003 £3.95**

**3.5 Digit Multimeter**

Low cost, general purpose multimeter ideal for most hobbyists requirements. 7 functions including DC and AC Voltages, DC Current, Resistance (built-in conti-



nity buzzer), Transistor HFE and Diode Checker. Supplied with shock-proof rubber holster with stand and probe holder.

Specifications

- DC Voltage: 200m, 2/ 20/ 200/ 1000V +/-0.5%
 - AC Voltage: 200/750V/+/-1.2%
 - DC Current: 200µ/2m/20mA/+/-1.2%, 10A/+/-3%
 - Resistance: 200/ 2K/ 20K/ 2000K Ohm/+/-0.8%, 2MOhm/+/-1%
 - HFE: 1~1000 (NPN or PNP)
 - Diode Test: 0.8mA @ 3V
 - Test Signal: 50Hz square wave
 - Power Source: 9V PP3 battery x 1
 - LCD Display: 15 x 46mm
 - Dimensions: 70 x 126 x 24mm
- MM006 £7.95**

Stacks more Tools & Equipment online!!

Transformers

A range of clamp mounting 240Vac mains input transformers designed primarily for use with our power supply projects but also suitable for other applications as appropriate. ⚡

Order Code	Output Rating	Price each
MT12V/0.5A	12V/0.5A	£7.95
MT12V/2A	12V/2A	£13.95
MT18V/0.5A	18V/0.5A	£7.95
MT18V/3A	18V/3A	£22.95
MT24V/3A	24V/3A	£27.95
MT24V/5A	24V/5A	£36.95
MT24V/8A	24V/8A	£54.95
MT2x10V/20A	2x10V/20A	£52.95



Please refer to the warning on page 2 before purchasing mains powered projects

- Parallel port cable (Order Code [LDC136](#))
- 2-pin connector for battery
- RCA to RCA cable
- Regulated power supply (Order Code [PSU443](#)) or 6V battery

Price: **EV38 £79.95**

specifications and the latest camera models. Ask for prices on bulk camera quantities.

USB Camera Modules

USB VGA Camera Module

This VGA version utilise an advanced Omnivision [OV7620](#) CMOS image sensor with a sophisticated [OV511+](#) USB controller chip to provide excellent picture quality. Designed for maximum throughput of video image data enabling host systems to acquire larger volumes of video information in a more real-time manner. An on-chip proprietary high-performance compression engine capable of 8:1 compression ratio ensures fast image transfers from image sensor to the PC. It supports 8 isochronous interface alternates of up to 7.5Mbps USB transfer rate. Plug and play software driver is provided (Windows 98/Me only). Camera is supplied as standard with an f6.0mm F1.6 lens.

Features

- Still picture 640x480 pixel
- VGA Video resolution (640x480), 10-15fps
- Nominal FOV 45x36 deg approx. (user can program the image size)
- USB full speed signalling bit rate
- USB compliant power consumption
- No external power supply
- Auto gain, white balance control
- Powerful compression software
- Twain interface
- Hardware snap shot

Price: **UC5172 £39.95**

USB SVGA Camera

Same as [UC5172](#) above but SVGA version using an Omnivision [OV8610](#) CMOS image sensor with 800x600 pixel still picture resolution.

Price: **UC5181 £44.95**

See website for full technical

SAVE MONEY BY ORDERING ONLINE!
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YOU CAN PAY BY:



Please remember to add £3.95 P&P for UK orders

Audio Amplifiers

25W+25W Stereo Car Booster Amplifier

Well designed amp designed for boosting the output power of an existing car stereo. Connects directly to the output of the existing equipment. Can be used with kits [1044](#) and [3089](#). Heatsinks provided. Supply: 12-15Vdc. Max. current: 3.5A. (quiescent 50mA). Input sensitivity: 200mV. Output load: 4Ω. Dimensions: 65x75x105mm. **1046KT £29.95 / AS1046 £34.95**



18W+18W Stereo Amplifier

Hi-Fi quality stereo power amp with good input sensitivity, low distortion and good stability. Full overload and output short-circuit protection. Use as a booster amplifier for existing small systems or to drive a second pair of speakers. Input sensitivity: 250mV. Input impedance: 500KΩ. Output Load: 4-8Ω. Distortion: 0.5%. SN ratio: 80dB. Frequency response: 20Hz-20KHz. Requires a symmetrical power supply of ±18Vdc/3A. **1113KT £18.95 / AS1113 £21.95**

200W Hi-Fi Amplifier (Mono or Stereo Output)



Based on a tried, tested and reliable design using

2N3055 transistors and having relay soft start delay circuitry, current limiting for loudspeaker protection and quiescent current

adjustment with the help of two LEDs. This module is really two separate class AB amplifiers that can provide either a stereo output of up to 2 x 75W/RMS @ 4 Ohm (2x45W/RMS @ 8 Ohms) or by simply adding a single jumper you can turn it into a mono output of 200W/RMS @ 8 Ohms. The kit needs a symmetrical power supply of ±36Vdc/8A (see kit [1209](#)). PCB: 140x165mm. Large heatsink supplied. Solder posts for all connections. **1199KT £74.95**

LM386 Mono Amplifier

Variable gain audio amp module using an LM386 IC as used in radio/TV sound amplifiers, intercoms, line drivers, ultrasonic & servo drivers, voltage converters. Volume control. Supply voltage 4-12Vdc. Low quiescent current drain. Gain: 20/200. PCB 30x30mm. **3017KT £6.95 / AS3017 £10.95**



1W Mono Amplifier Module

1W BTL Mono amplifier module using a TDA7052 IC. Designed for battery-fed portable audio applications (low power consumption). Volume control. Good stability. No heat sink required. Short-circuit protection. Supply: 3-15Vdc. Output Impedance: 8Ω. Output Power: 1.2W @ 6V (10% THD). Typ. Gain: 39dB. PCB: 28x22mm. **3027KT £5.95 / AS3027 £7.95**

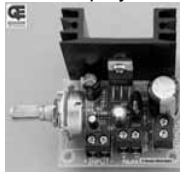
Please remember to add
£3.95 P&P for UK orders

YOU CAN PAY BY:



8W Mono Amplifier

Ideal building block for projects where a general (Class AB) amplifier is required. Uses the proven TDA2003. Features zero turn-on transients, wide 5 - 20Vdc supply range, current limiting and thermal protection. Power output is dependent on the supply voltage/load resistance. Over 10 watts is typical for a 2Ω speaker with 16V supply; 9V with 8Ω will give about 1W. Heatsink, 8Ω speaker and volume pot supplied. Screw terminal blocks for all connections. PCB 50 x 38mm. **3047KT £10.95 / AS3047 £14.95**



25W Mono Hi-Fi Amplifier

Uses an LM1875 hi-fi amplifier IC. Delivers 25W RMS into 8Ω @ 1% THD. S/N ratio >100dB. Short circuit and thermal protection plus onboard protection fuses. Requires dual ± 25V supply (see kit [3114](#)). Heatsink, transformer and speaker not provided. PCB: 51x53mm. **3050KT £8.95 / AS3050 £12.95**

1W+1W Stereo Amplifier

Stereo amplifier module using a Samsung KA2209 8-pin IC (equivalent to the TDA2822) in the standard data book circuit for this chip. Supply: 1.8V to 9V.DC. Output speakers (not supplied): 4 to 8Ω/1W min. No heat sink required. PCB: 35x50mm. **3087KT £6.95 / AS3087 £9.95**

10W+10W Stereo Amplifier

Uses a TDA2009A monolithic hi-fi quality audio power amplifier IC with dual class AB outputs, designed for high quality stereo

BASCOM Software

We supply the BASCOM range of BASIC COMPILER software programmes. All programs feature these common key benefits:

- Structured **BASIC** with labels.
- Structured programming with IF-THEN-ELSE-END IF, DO-LOOP, WHILE-WEND, SELECT-CASE
- Fast machine code instead of interpreted code
- Variables and labels can be as long as 32 characters
- Bit, Byte, Integer, Word, Long, Single and String variables
- Integrated terminal emulator with download option
- Integrated simulator for testing
- Editor with statement highlighting
- Context sensitive help

Three program versions are available:

BASCOM AVR Software

Windows BASIC COMPILER for the AVR microprocessor family. It is designed to run on W95/98/NT.

AVR Key Benefits

- Compiled programs work with all AVR microprocessors that have internal memory.
- Statements are highly compatible with Microsoft's VB/QB.
- Special commands for LCD-displays, I2C chips and 1WIRE chips, PC keyboard, matrix keyboard, RC5 reception, software UART, SPI.
- Local variables, user functions, library support.
- Integrated ISP programmer (application note AVR910.ASM).
- Integrated STK200 programmer and STK300 programmer. Also programs directly into our kit 3122 AVR programmer

- Perfectly matches the DT006 SimmStick
- DEMO version compiles 2KB of code. Well suited for the AT2313

Order Code BSCAVR - £54.95

BASCOM 8051 Software

Windows BASIC COMPILER for the 8051 family. It is designed to run on W95/98/NT and has all the features of BASCOM LT. In addition it has full support for arrays and the single floating point type.

8051 Key Benefits

- Compiled programs work with any 8051 uP such as AT89C1051, AT89C2051, 8031, 8032, 8051, 8052, 80552, 80535 and 80537 m Processors.
- Statements are highly compatible with Microsoft's VB/QB.
- Special commands for LCD-displays, I2C chips and 1WIRE chips.
- Integrated flash programmer and support for SPI, PG2051, PG302, SE512, SE514, TAFE. (hardware can be purchased separately)
- For compatibility with BASCOM LT, there is also a 32-bit version of the BASCOM LT compiler.

Order Code BSC8051 - £54.95

Order our BASCOM AVR and 8051 combo package and save! Order Code BASC51AVR £94.95

BASCOM LT Software

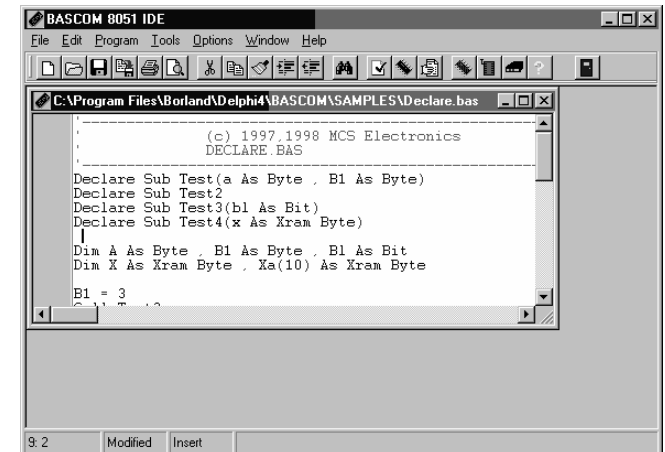
Windows 3.1 BASIC COMPILER for the AT89C2051 uP. BASCOM LT compiles BASIC programs into a binary and/or hexadecimal file. These files can be programmed into the chip's unique Flash ROM. BASCOM LT is designed for Atmel's unique 89C2051 microprocessor. Programs will also run on other 8051 family members.

LT Key Benefits

- Compiled programs work with any 8051 uP such as AT89C1051, AT89C2051, 8031, 8032, 8051, 8052, 80552, 80535 and 80537 m Processors
- Statements are highly compatible with Microsoft's VB/QB
- Special commands for LCD-displays, I2C chips and 1WIRE chips

Order Code BSCLT - £49.95

See website for full details of these software packages and free demo downloads



New Version 6 VisualSpice Schematic Editor and Mixed Mode Simulation Software Suite

VISUALSPICE

Low cost, powerful, and easy to use.

Perfect for Engineers, Hobbyists, Students, and Technicians.

Free Lifetime Tech Support. Windows W9x, NT, 2000, ME and XP compatible.

VisualSpice is a completely integrated 32-bit analogue, digital, mixed signal schematic design and circuit simulation program, sporting the **SAME** or **more advanced features** at a **fraction** of the cost of other simulators. **VisualSpice** allows you to quickly and easily capture your **schematic designs**, perform the simulation and analyze the results using our powerful signal processor and waveform viewer. You can customize almost everything in the design environment and easily search for, find, select, and categorize, from thousands of components. The popular **Control Panel** allows you to quickly enter component parameters with a **single click** and to **design waveforms using our graphical signal generator waveform editor**, before spending time doing a simulation.

VisualSpice comes in two main types - **VisualSpice** and **VisualEDA**. See our website to find the full details on the different types and versions. Download your **FREE** demo version today.

VisualSpice

VisualSpice is available in four versions - **Personal** at £64.95, **Standard** at £99.95, **Professional** at £129.95 and **Advanced** at £159.95. Please see website for comparison table.

Product Features

- 25,000 models
- 50,000 parts in EDA
- CMOS + TTL Parts
- 21 different analysis
- Monte Carlo
- Worst Case
- Temperature Sweep
- Parameter Sweep
- Parameter Passing
- Virtual Instruments
- 64-channel scope
- Multimeter
- Complex Power
- Complex Voltage
- Complex Current
- Complex Impedance
- Interactive Simulation
- Programmable Signal Generator
- Waveform Preview
- Set Breakpoints
- Analogue Breakpoints
- Break on Voltage Level
- Break on Edge
- Pulse + Single Step
- Timing Diagram
- Pure Digital Simulation
- Animated Schematics
- Change component values during simulation
- Model Editor
- Live Currents On Schematic
- Live Voltages On Schematic
- Live Power On Schematic
- Shows current direction animation
- Math Post Processor
- Project Browser
- BSM3V3 + BSM4
- EKV Model
- Workspaces
- Split and Join Graphs
- Dual Measurement Cursors
- Mouse Activated Interactive Devices
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- Named wires, connectors and busses
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- Built-in **Virtual Instruments including real-time Spectrum Analyzer and Frequency Counter**
- **Import Model Wizard**

VisualSpice Is Loaded With Features

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| <ul style="list-style-type: none"> • 21 Powerful Simulations (including Monte Carlo, Worst Case, 3D Parameter and Temperature sweep) • Interactive simulation in all modes • Additional XSpice devices • 21 Powerful Simulations (including Monte Carlo, Worst Case, 3D Parameter and Temperature sweep) • Pure Digital Simulation • Math and expression Signal Processor/Waveform Viewer | <ul style="list-style-type: none"> • Library Symbol Editor • Graphics annotation lets you draw directly on the simulation • Graphical cursor measurement functions • Netlist capability • Advanced BSM3V3 (Deep Submicron), BSIM4, SOI (includes FD, PD, and DD types), and EKV model support • Animated Schematics Graphical Device browser Library Editor • Plug-in Capability • Model Editor/Model Creator | <ul style="list-style-type: none"> • Named wires, connectors and busses • Sub circuit parameter passing using variable names and formulas • Export to PCB for design layout • Smith Chart / Grid and Polar Plots • Built-in Virtual Instruments including real-time Spectrum Analyzer and Frequency Counter • Import Model Wizard |
|---|--|--|

VisualEDA

VisualEDA version includes VisualSpice, VisualPCB, AutoRouter and Viewer. Available in three versions - **Standard** at £2954.95, **Professional** at £494.95 and **Advanced** at £539.95. See website for full details.

VisualEDA Includes VisualEDA, VisualPCB, AutoRouter & Viewer

- | | |
|--|---|
| <ul style="list-style-type: none"> • Supports up to 255 layers • Auto Placement, Auto Routing • Accuracy of 0.001 inches • Surface Mount and Thru hole | <ul style="list-style-type: none"> • Device Editor and Viewer • Large boards of up to 32"x32" are supported • 12000 Parts!!! |
|--|---|

applications. We use the standard data book application circuit giving a gain of 36dB. It delivers 10 Watts per channel into 4Ω speakers (not supplied) with a 24Vdc supply. Supply: 8 to 24Vdc. Screw terminal block connections. Heatsink provided. PCB: 45x80mm.

3088KT £11.95 / AS3088 £17.95

3W+3W Stereo Amplifier

A good general purpose stereo audio amplifier using a BA5406 monolithic audio power amplifier IC. 5 watts per channel with 3Ω speakers. THD=0.3% @ 0.5W. Supply: 5 - 15Vdc. Heatsink and speakers not supplied. PCB: 67x38mm.

3090KT £8.95 / AS3090 £12.95

or as above but supplied WITH heatsink: **3090HKT £9.95 / AS3090H £13.95**

2W Mono Amplifier LM380

Simple amplifier module with volume control using an LM380. Delivers 2W with an 8Ω speaker (not supplied). IC solders directly to the PCB and no heat sink is required. Supply: 10-20Vdc. All components including volume pot supplied. PCB: 43x68mm.

3097KT £8.95 / AS3097 £12.95

18W BTL Mono Amplifier

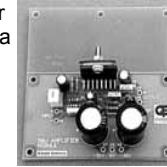
Low voltage, high power mono 18W Bridge Tied Load (BTL) amplifier module using HA13118 IC. Delivers 14W at 1% THD into 4Ω speaker (not supplied) with 13.2V supply. Thermal overload and surge protection. Supply: 8 - 18Vdc. 3°C/W heat sink provided. PCB: 26x57mm.

3105KT £9.95 / AS3105 £13.95

**KT = Kit Price
AS = Assembled Price**

50W Mono Hi-Fi Amplifier

High power, hi-fi quality class AB audio amplifier module using a TDA7294 IC. Mute and Standby are brought out to connection pads on PCB. IC has internal thermal protection. Space provided on the PCB for mounting a 1.4°C/W heatsink (not provided).



Specifications

- Supply: ±30V
- Input Sensitivity: 1.3V (50W/8Ω)
- Input Impedance: 10kΩ
- Freq. Response: 16Hz - 100kHz
- Slew Rate: 10V/μs
- Output Power: 50W/8Ω (0.1% THD), 82W/4Ω (0.1% THD)
- S/N Ratio: 105dBa (1W/8Ω)
- THD (40W into 8Ω): 0.002% (1kHz) <0.04% (20Hz - 20kHz)

3106KT £21.95 / AS3106 £29.95

1W+1W Stereo Amplifier

Stereo version of kit **3027** using a TDA7053 IC in the standard data book circuit. Good stability. Volume control. Ideal for battery operation. No heat sink required. Short-circuit protection. Supply: 3-15Vdc. Output Impedance: 8Ω. Output Power: 1.2W. THD: 0.2% Typ. @ 6V. Gain: 39dB Typ. PCB: 33x36mm.

3107KT £5.95 / AS3107 £6.95

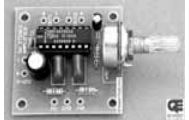
1W+1W Stereo Amplifier

Stereo version of kit **3017** using two LM386N-1 power amplifier IC's. Ideal for battery powered projects. Volume control pot for each input. Onboard jumper selects gain of 20 or 200. LED 'ON' indicator. ON/OFF switch. Supply: 4 - 12Vdc. Speakers (not supplied) must be rated 3W min. PCB: 62 x 35mm.

3115KT £7.95 / AS3115 £12.95

1W+1W Stereo Amplifier with DC Volume Control

Uses a TDA7053A stereo audio power amplifier IC with DC volume control. Volume is controlled by a DC voltage applied to the IC so the audio signal itself does not pass through a noise-prone pot.



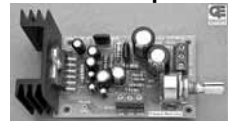
Technical Specifications

- 4.5 - 18V supply voltage
- 1.5A max non-repetitive peak output current
- 1.25A max repetitive peak output current
- 1.1W output power using 6V supply into 8Ω load (THD = 10%)
- 20kΩ internal input impedance
- 210μV noise output voltage
- 20Hz to 300kHz bandwidth (typical) at -1 dB
- PCB: 43 x 40mm.

3139KT £5.95 / AS3139 £8.95

10W+10W Stereo Amplifier

Class AB stereo audio power amplifier



using a hi-fi quality TDA2005 to provide excellent sound at a very reasonable price. Output current and thermal overload protection. Extremely low THD <0.1% @ 1W, 4Ω. Supply: 8 - 18Vdc at 1 - 2A. Power output: >8W RMS/channel, 2Ω load, 16Vdc supply; >6W RMS/ch., 4Ω load, 16Vdc supply; >4W RMS/ch, 4Ω load 12Vdc supply. Output Impedance: 2 - 4Ω. S/N ratio: >80 dBA. Frequency response: ~15Hz to 50kHz, -3 dB. Gain: ~30 dB maximum. Input level: ~150 mV for full output. PCB: 45x75mm. Heat sink supplied.

3143KT £11.95 / AS3143 £18.95

See Educational section for more amplifier kits

Audio / Video

Spring Reverberation

High quality reverberation circuit for use with a spring line (not supplied). Creates a sense of depth in hi-fi or microphone applications. Connect to an existing system between preamp and final amplifier. Adjustable reverberation level. Also has bass and treble tone controls that affect the reverberating signal, but have no effect when the unit is turned off. Supply: 12Vdc. Max. current: 100 mA. PCB: 42x86mm. **1012KT £13.95**

Loudspeaker Protection Unit

Protects your expensive hi-fi speakers from unpleasant and expensive surprises! Activated by peak signals, excessive output power and DC voltages produced when there is a fault in the output stage of the amplifier. Completely eliminates the possibility of loud speaker burnout due to overloading. Can be used with any amplifier with an output of 1 to 100 Watts max. Supply: 9-15 Vdc. Max. current: 50mA. Quiescent current: 2mA. **1016KT £10.95**

Guitar Tremolo

A tremolo is used to create fantastic effects with any electric guitar. Variable tremolo frequency (1-12 Hz) and adjustable modulation level (0 to 90%), making it very versatile and suitable for even professional guitarists. Very low power consumption for economical battery operation. Supply: 9Vdc. Max. current: 20mA. Input sensitivity: 200mV. PCB: 51x100mm. **1018KT £20.95 / AS1018 £30.95**

Stereo Loudness Unit

Active stereo loudness unit that will add a new dimension to your listening pleasure especially at the lower output levels. Suitable for use with any of our amplifiers and preamplifier kits. Very low distortion and noise. Supply: 9-28 Vdc (PSU445 or kits 1061 or 1068). Max. current: 50mA. **1043KT £10.95**

Graphic Equaliser

Five band audio graphic equaliser. A must for those who wish to listen to real hi-fi sound and want the best frequency response with minimum distortion. Ideal for the car. Frequency Bands: 60, 250, 1000, 4000, and 16000Hz. Supply: 12 Vdc (car battery or kit 1061). Max. current: 100mA. Output level: 1Vpp. **1044KT £22.95**



Electronic Metronome

Keep your music at the right tempo with this easy to build, yet accurate kit. Produces an audible click on the speaker provided. Uses a potentiometer to adjust tempo. Very low power consumption makes it suitable for battery operation. Supply: 9Vdc. Max. current: 30 mA. Output power: 0.5W. **1053KT £9.95**

Video Signal Amplifier

This project solves the problem of home video users who want to drive more than one TV set from the same VCR or those who want to make a duplicate recording of a tape on another VCR. One 75Ω input and three 75Ω outputs. Supply: 12Vdc.

Max. current: 100mA. Suitable box: 2083. PCB: 35x120mm. **1083KT £8.95 / AS1083 £10.95**

Stereo Loudspeaker Protection Unit with Delay

Similar to kit 1016 above. Protects both channels simultaneously from peak signals, excessive output power and DC voltages. It has a built-in delay that connects the speakers a short time after the amplifier is powered up. Protects the speakers and your ears from the THUMP that is heard (and which can sometimes destroy your expensive speakers). Supply: 12Vdc. Current: 100 mA. PCB: 52 x 68mm. **1112KT £11.95**

Fibre Optic Audio Link

Fibre optic cable is immune to interference from electrically noisy environments so this kit is great for applications where interference-free voice communication is required. Circuit uses a matched transmitter/receiver pair. Transmitter board has a built-in microphone, modulation circuitry and transmitter LED. Receiver board converts the light signal back to audio and drives the speaker provided. 4.25 metre fibre optic cable supplied but boards will drive over 150m of cable if required. Supply: 9Vdc. Rx PCB: 50 x 38mm; Tx PCB: 45 x 28mm. **3026KT £24.95**

See also *Light & Laser, Sound Generator and Surveillance kits*

**KT = Kit Price
AS = Assembled Price**

**Prices include
17.5% VAT**

Components

Cables

Single Core Audio Cable

A single core screened audio cable for general audio connections. 7/0.1mm stranded copper core with a lap copper screen covered by a PVC sheath. Diameter: 3.0mm. Colour: Black. **CB1002 £0.25 per metre**

Twin Core Audio Cable

A twin core audio cable. Each core is individually screened. 16/0.1mm stranded copper cores with lap copper screens covered by a PVC sheath laid in a figure of 8 configuration. Overall Size: 5.0 x 2.5mm. Colour: Black. **CB8008 £0.50 per metre**

4-Core Signal Cable

Aluminium screened signal cable with 4-core 7/0.2mm inner conductors. Manufacture red to meet BS4737:Section 3.30. Outer PVC insulation to BS6746. Suitable for use with most of the cameras above. Diameter: 4.0mm. Colour: White. **4014 £0.40 per metre**

50 Ohm Coax Cable

RG58 50 Ohm coax cable with 7/0.3mm centre conductor, 64 strand braided screen and a solid polyethylene insulator. Suitable for use with most of the transmitters above. Diameter: 5.0mm. Colour: Black. **RG58 £0.50 per metre**

Figure 8 Speaker Cable

PVC insulated, plain annealed 13/0.2mm copper cable, laid side by side in a flat figure 8 construc-

tion with markings to indicate polarity. Max current 2.5 Amp. Overall Size: 4.0 x 2.0mm. Colour: Black/Grey. **CB8044 £0.25 per metre**

Connectors

A range of connectors for making power and audio connections to our range of electronic kits.

3.5mm Chassis Jack Sockets



Chassis mounting unswitched jack sockets to suit standard jack plugs. Will accept a wide range of 3.5mm plugs.

**7-1001 (Mono) £0.50
7-1002 (Stereo) £0.50**

6.35mm Chassis Jack Sockets



Chassis mounting unswitched jack sockets to suit standard jack plugs. Will accept a wide range of 6.35mm (0.25") plugs.

**7-1003 (Mono) £0.50
7-1004 (Stereo) £0.50**

Metal Phono Plugs



High quality chrome metal body phono plug with coloured ID bands and cable protector. For cables up to 4mm diameter.

**7-1005 (Black) £0.50
7-1006 (Red) £0.50**

Chassis Phono Sockets



Single chassis mounting phono sockets for use with the above plugs. Socket is all metal with single hole fixing of 6mm. Colour coded

insulators for easy identification. **7-1008 (Black) £0.50
7-1009 (Red) £0.50**

Inline Phono Sockets



Single inline phono sockets with chrome metal body, coloured ID bands and cable protectors. For cables up to 4mm diameter. **7-1010 (Black) £0.50
7-1011 (Red) £0.50**

DC Power Sockets



Panel mounting DC power sockets with 2.5mm central pins for use with our range of plug-in mains adapters (page 3). An integral single pole switch operates when a power plug is inserted or removed. Supplied with washer and nut. Current rating based on 12Vdc operation. **7-1012 (1 Amp) £1.00
7-1013 (5 Amp) £3.95**

ATMEL & PIC Chips

Order Code	Price, ea
PIC12C508A-04/P	£1.95
PIC16F84A-04/P	£3.95
PIC16F628-20/P	£3.95
AT89C2051-24PI	£3.95
AT90S1200-12PC	£3.95

RF Transistors

Order Code	Price, ea
2N2219A	£1.95
BFS22A	£3.95
BLY88C	£14.95

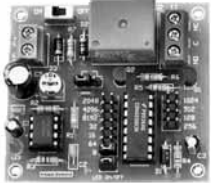
only change is the software the we program into the AT89C2051 microcontroller. All you have to do is remove one firmware and replace it with another. You can purchase the pre-programmed add-on firmware individually or as 5-piece pack containing all the other firmware chips listed below:

- 3148T1 - Simple Photographic Timer
- 3148T2 - Stopwatch with Pause
- 3148T3 - 40KHz Auto Ranging Frequency Meter
- 3148T4 - Programmable Down Timer from a maximum of 10,000 minutes
- 3148T5 - Programmable Down Timer from a maximum of 10,000 hours

Output to transistor (NPN, 100mA @ 30V). DC IN, RESET, OUTPUT, STOP and START are brought out to a 10-way header strip for easy connection. START and STOP buttons are provided on the board for easy setting-up. **3148KT £13.95 / AS3148 £24.95** Add-on Firmware £8.95 each or Pack of all 5 (3148F) £39.95

Multi-Timer II

This board uses a 555 timer and counter IC to switch an onboard mains rated SPDT relay after a preset delay period. This is set using a series of onboard jumpers and a trimpot. The count-down starts when power is applied to the board (there is also a small onboard ON/OFF switch) and will stop after the preset delay time is reached or the power supply removed. The relay can be set to either switch from 'On-to-Off' or 'Off-to-On' using an onboard jumper. The



number of "counts" made is set via a series of nine jumpers (8, 16, 32, 64, 128, to 8192). A trimpot allows you to set the time period for each "count", giving a maximum of two hours on the 8192 setting. Up to 22.7 hours is possible using different components for the RC network (not provided). Supply: 12Vdc (Order Code [PSU445](#)). Current Consumption: 15mA standby, <40mA active. PCB 54x58mm. **3152KT £9.95 / AS3152 £17.95**

New Products

We are always adding new products to our range. For the latest information please see the following page and also visit our website.

KT or AS?

You will find two part numbers and two prices listed for many of our electronic projects: This items can be purchased in either kit form or pre-assembled as detailed below.

KT Suffix

Part numbers ending KT are supplied in kit form. These kits needs to be soldered. They are supplied with all the components, PCB(s) and assembly instructions needed to make the kit as described. Kits are non-returnable and non-refundable once construction has commenced or the inner bags opened.

AS Prefix

Part numbers beginning AS are supplied pre-assembled and

tested by us. All you need to do is make the necessary power and any input/output connections. Most of the pictures on our website show products in the pre-assembled format.

Power Supply Advice

Which power supply should I use?

The [PSU020](#) power supply is suitable for use with our ATME1 and PIC programmers because it is *unregulated*. With 12Vdc selected, the power supply actually provides about 17Vdc. This is because the programmer presents little load to the power supply and a higher voltage is supplied. If you don't like the idea of this you can buy the more expensive [PSU010](#) which gives a regulated 9-18Vdc output.

We do not recommend you use [PSU020](#) unless you are certain that the piece of equipment being powered can tolerate an unregulated supply.

So, if unspecified, or in doubt, please use a REGULATED power supply like our Order Codes [PSU010](#), [PSU035](#), [PSU345](#), [PSU441](#), [PSU443](#) or [PSU445](#) as you can be certain that they will not do any damage.

Always choose a power supply with a current rating GREATER than the item it is going to power otherwise it will overheat and burn out!

The power supplies we sell are designed for operation in the United Kingdom only.

Car and Motorbike

Motorbike Alarm

Protect your motorbike from thieves and vandals. Uses a simple vibration sensitive contact that detects the slightest movement of the motorbike (sensitivity is adjustable) and triggers the alarm. When the alarm is triggered the output relay closes. This can be used to trigger a siren (e.g. kit [1003](#) or [3015](#)), the motorbike's horn, indicators and any other warning devices. The circuit has a pre-set alarm time. When that elapses it resets automatically. This kit is available in both 6Vdc and 12Vdc versions. PCB 57x64mm. **1011-6VKT £12.95** **1011-12VKT £12.95** **Metal Box: 2011BX - £7.95**

Car Alarm System

Effectively protect your car from theft with this simple yet reliable car alarm. Can be triggered by a vibration sensor (not supplied), a door or the boot opening (by sensing the voltage drop as the courtesy light is turned on) or through any number of switches wired to ground e.g. a bonnet or boot switch (not supplied). It has entry and exit delays, auto-reset, and the alarm duration is adjustable. Supply: 6 or 12 Vdc. PCB 47x55mm. **1019KT £11.95** **Metal Box: 2019BX - £7.95**



Car Battery Checker

A very simple, easy to build and inexpensive circuit that once installed will monitor constantly

the state of charge of your car battery. It warn you when the battery is not charged saving you from unpleasant "surprises". Very small size (PCB 36x47mm) so easily fitted in dashboard. Supply: 12Vdc. Current: 40mA. **1034KT £5.95**

Electronic Car Ignition

Electronic ignition can help improve your cars performance, efficiency and reliability by boosting spark performance. Electronic ignition systems reduce distributor contact wear and prolong spark-plug life thus reducing maintenance costs. Not to mention improved fuel economy, lower pollution and easier starting on cold days. Kit is simple to build and install. Ideal for vintage cars. NB Unit does NOT replace the original points. Supply: 12Vdc. PCB 67x135mm. **1058KT £32.95 / AS1058 £37.95** **Metal Box: 2058BX - £11.95**

Car Music to Light Effect

Add interest to your vehicle with this fascinating light effect. The circuit has three different channels, each with 6 LEDs that will respond to different music frequencies to create a mesmerising light display. Input: 0.5W RMS minimum (direct from amplifier speaker output). Operating voltage: 12Vdc. Max. current: 0.2A. NOT suitable for use with bridge (BTL) amplifier audio systems. PCB: 68x74mm. **1086KT £11.95**

"KITT" Scanner

Make your car look like "KITT" the computerised car in the 'Knight Rider' TV series. The kit comes complete with a special red mask for the lights just to make the effect look more like

the real thing. Flashing speed of lights is adjustable. Supply: 12Vdc. **1088KT £27.95**

In-Car Ioniser

Improve the quality and karma of the atmosphere in your car with this neat little kit. Breath in the uplifting negative ion enriched air and improve your mental state of mind during those tedious long journeys and frustrating traffic jams. Supply: 12Vdc. PCB: 49 x 100mm. **1092KT £37.95**

Windscreen Wiper Speed Controller

Adjust the speed of your vehicle wipers to suit the heaviness of the rain thus eliminating that annoying chattering noise that can drive the calmest driver round the bend! Easily fitted to any car. Onboard relay. Supply: 12Vdc. PCB 33x86mm. **1093KT £9.95 / AS1093 £12.95**

Car RF Interference Suppressor

Ready assembled unit designed to eliminate RF interference generated by the cars ignition system, wipers, indicators, air conditioning etc. These signals are particularly noticeable when listening to radio broadcasts. Simple to install and small enough to fit behind a dashboard. PCB: 58x70mm. **AS1097 £12.95**

Courtesy Light Delay

Stop fumbling in the dark! Fitted on luxury cars as standard, the courtesy light delay is simple to install on any vehicle. When you enter or leave the car and the doors are closed, it keeps the interior lights on for a few seconds to give you time to put the

key in the lock. Delay period is adjustable. Small enough to hide almost anywhere. Supply: 12Vdc. PCB: 46x58mm. **1115KT £6.95 / AS1115 £8.95**

NEW LED RPM Indicator



This RPM indicator (or rev counter) is the electronic version of the most essential car

dashboard instrument. It provides a reading within the range of 0 to 7000 rpm. The visually attractive display takes the form of a circular light bar made up of green, yellow and red rectangular LEDs and provides a reading in increments of 250 revolutions per LED. It is reliable and simple to construct. The small size makes the installation possible almost anywhere within a vehicle. Supply Voltage: 12-15Vdc from vehicle. Max. current: 130mA. PCB: 54x54mm. Solder posts for all connections. **1120KT £59.95**

NEW Digital RPM Indicator



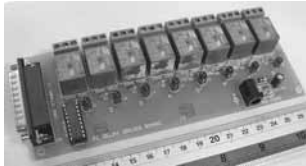
Electronic RPM indicator gives a reliable, highly

accurate and easy to read version of that most essential of dashboard instruments. The engine revolutions are counted and the result is displayed on a 13mm high four digit red LED display. It provides a reading within the range of 0 to 7000 rpm. The module is easy to assemble and can be installed in almost any car due to its small size. Supply Voltage: 12-15Vdc from vehicle. Current Consump-

tion: 180mA. Solder posts for all connections. PCB Dimensions: 29x81mm (display board) and 82x82 mm (main board). **1143KT £37.95**

Computer Projects

PC Controlled Relay Board



PC relay board providing independently programmable real-time control for each of the eight onboard 5 Amp mains rated relays. Relays can be used to automatically turn On/Off lights, motors & other devices around the home, office, laboratory or factory. The Windows (3.1 to XP) software interface allows you to program and save an infinite number of On/Off sequences. Turn your PC into a dedicated controller for turning on and off lights, motors & other devices around the home or workplace. Each relay has an LED to indicate it's status. Can be used with any PC parallel port on a 286 upward (remember those?). Software for DOS, UNIX and Windows available. DOS version enables you to write your own batch files. Relay connections are made using PCB mounted screw terminal blocks. PCB: 70x200mm. Supply: 12Vdc/0.5A (Order Code [PSU445](#)). Requires a Parallel Port Lead (Order Code [LDC136](#)). For a pre-assembled, boxed version of this project see Order Code [3165](#) below. **3074KT £24.95 / AS3074 £29.95**

PC Data Acquisition & Control Unit



This sophisticated unit allows you to use a PC to monitor and log a mixture of both analogue and digital inputs and control external devices via the analogue and digital outputs. With the appropriate sensors (not supplied) the unit can monitor physical variables such as pressure, temperature, light intensity, weight, switch state, movement, relays, etc. This data can then be processed and the results used to control devices such as motors, sirens, relays, servo motors (up to 11) and stepper motors (up to 2).

Features

- 8 digital Outputs - Open collector, 500mA, 33V max
- 16 Digital Inputs - 20V max. Protection 1K in series, 5.1V Zener
- 11 Analogue Inputs - 0-5V, 10 bit (5mV/step)
- 1 Analogue Output - 0-2.5V or 0-10V. 8 bit (20mV/step)
- Inputs and Output connections made via IDC box header sockets (cables not supplied)
- Custom box (140x110x35mm) with screen-printed front & rear panels
- Windows Software utilities (3.1 to XP) and programming examples available for free download
- 7 pages of documentation

Additional Items Required

Supply: Regulated 12Vdc (Order Code [PSU445](#)). Parallel Port Lead (Order Code [LDC136](#))

3093KT £64.95 AS3093 £94.95

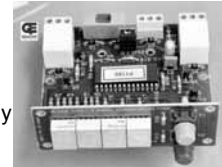


Please refer to the warning on page 2 before purchasing mains powered projects

plied). Relay Rating: 250Vac/2A. PCBs: 40 x 93mm (display), 80 x 93mm (control). **1173KT £43.95 / AS1173 £52.95**

24 Hour Dual Output Time Switch

Real-time 24 Hour clock and time switch with two independently settable timers with relay outputs. PIC based circuit ensures accuracy and reliability. Each output is independent and can be set (hh:mm) to any on/off time within a 24 hour time period. Simply use two push buttons to program the clock and timer on/off times. Data backup battery facility. Power Supply: 12 Vdc. Battery Backup: 9V PP3 (not supplied). Relay Rating: 250Vac/2A (each). PCBs: 38 x 93mm (Display), 80 x 93mm (control). **1180KT £41.95 / AS1180 £49.95**



555 Monostable Timer

Traditional 555 timer circuit that provides the maximum possible time period. Onboard relay (rated 240Vac/5A max) is activated when the START button is pressed and turned off either after time-out or pressing RESET. Timing period is adjusted via the onboard trimmer. Two different capacitors are provided to give a wide choice of timing periods from a second up to 20 minutes.

**KT = Kit Price
AS = Assembled Price**

LED status indicator. Supply: 12Vdc. PCB 45x60mm. **3085_2KT £8.95 AS3085_2 £14.95**

Delay Timer (12Vdc Out)

This board provides a 12Vdc output that drops to 0V immediately the 'START' button is pressed and returns to 12V at the end of the timing period. It can be used to turn off a device for a specific time period. Employs a simple capacitor discharge circuit. Timing period is adjusted via the onboard trimpot from approx. 2 to 400 seconds. Timing period can be altered by substituting different component values (not supplied). LED status indicator. Use with kit 3084 to switch mains voltages. Supply: 12Vdc. PCB 45x50mm. **3085_3KT £8.95 AS3085_3 £13.95**



3-in-1 Timer Circuits

This is our 3 kits 3085_2, 3085_3 and 3152 in one pack. You get all the same parts as if you bought each kit separately but just at a lower price! A useful kit and good introduction to timer circuits. **3085KT £20.95 / AS3085 £44.95**

Multi-Mode Timer



Highly versatile Multi-Mode Timer that features seven differ-

ent timing modes:
1. Instant On, Delayed Off, Level Triggered
2. Instant On, Delayed Off, Edge Triggered
3. Delayed On
4. Instant On and Hold, Delayed Off
5. Toggling (cycling On/Off)
6. Instant On, Delayed Off with Pause
7. Delayed On with Pause

Microcontroller based for accuracy and reliability and cost efficiency. Four crystal controlled timing periods are provided (1-255 seconds, 10-2550 seconds, 1-255 minutes or 10-2550 minutes). Trigger inputs are opto-isolated. Triggering options range from simple push button to electrically isolated voltage switching sources, to taking the output from our counter and timer kits [3129](#) and [3154](#). Outputs to a high quality mains rated relay. Timing modes and delay ranges set using on-board DIP switches. Screw terminal blocks for connections. Supply: 12Vdc. PCB: 48 x 96mm. **3141KT £14.95 AS3141 £20.95**

4-Digit Timer Board (6 optional functions)

This 4-digit LED timer comprises a Motherboard and one pre-programmed firmware chip, the [3148T0 Programmable Down Timer](#) (1 to 10,000 seconds). The Motherboard can also be used with 5 other pre-programmed firmware chips, 3148T1 to 3148T5 as described below. These enable it to perform different timing functions and are available for purchase as optional extras. The motherboard does NOT require any modification to accept any of the alternative firmware chips. The



amp to generate square, triangle & pseudo sine waveforms in the audio frequency range (6Hz to 7000Hz). Supply: 9V PP3 battery. 47x40mm. **3023KT £6.95**

Logic Probe

A vital piece of equipment for testing & measuring digital equipment. Usually used in fault finding & testing but can also assist in design work & to find out how digital equipment works. Three LED's give visual indication & a piezo buzzer provides audio indication. Switch between TTL and CMOS logic testing. Includes detection circuit for very fast pulses. Runs from 5-15Vdc supplied from equipment under test. Detects pulses >50nS. **3024KT £7.95**

20MHz Function Generator



This popular 20 MHz Function Generator project uses a MAX038 IC. It is supplied complete with a high quality custom designed box with printed front & rear panel pieces to give the project a professional finish when assembled. Pictures shows finished project with lid removed.

IC Features

- Operating Frequency Range: 10Hz to 20MHz
- Waveforms: Triangle, Sawtooth, Sine, Square, and Pulse
- Independent Frequency and Duty-

- Cycle Adjustments
- Frequency Sweep Range: 350 to 1
- Variable Duty Cycle: 15% - 85%
- 0.1Ω Low-Impedance Output Buffer
- Low-Distortion Sine Wave: 0.75%
- Low 200ppm/°C Temperature Drift
- Coarse and Fine tuning
- TTL and 2V p-p output
- Full assembly and operating instructions provided
- Dimensions (mm): 140W x 110D x 35H
- Power Supply: 7-12Vac (Order Code [PSU235](#)).

3101KT £69.95 / AS3101 £84.95

Continuity Tester

Two range tester will buzz up to 3Ω LO range, and 285Ω HI range. You can set your own ranges by changing resistor values connected to the LM324 quad op-amp. Full circuit description. PCB: 45x52mm **3110KT £5.95**

Square Wave Oscillator

Easy to build kit to generate 6 square waves. 1Hz, 10Hz, 100Hz, 1KHz, 10KHz & 100KHz are output using jumper selectors. Input Voltage: 5-18V. Finished Dimensions (mm): 55Wx85Lx30H. Supplied complete with box. **3111BKKT £7.95**

Timers

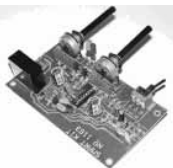
0-5 Minute Time Switch

A simple time switch continuously adjustable between 0 and 5 minutes. Suitable for alarms, photographic laboratories etc. Uses a 555 timer IC. Onboard relay rated to 250V/2 A. Kit can replace commercial time switches at a fraction of the cost. Supply: 12Vdc ([PSU445](#) or kit [1061](#)). Max. current: 50mA. De-

lay time: 0 - 5 minutes. PCB: 39x50mm. **1020KT £11.95**

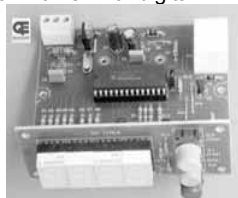
ON/OFF Cyclical Time Switch

This time switch activates the onboard relay for a pre-set time. Once this time period has elapsed, the relay with turn off for a pre-set time. This process will then be repeated with the relay turning on and off for the same time periods. The module has two independent circuits that are used to set the ON and OFF periods. ON/OFF times can be independently set between 30 seconds and 5 minutes. The operation can be ON-OFF or ON-OFF-ON etc. Ideal for use in automation circuits, flashing or traffic lights, models, etc. Operating voltage: 12Vdc. **1163KT £31.95**



Digital Countdown Timer

Countdown timer with digital display and a relay output. PIC based for accuracy and reliability. Easily programmable for any time between zero and either 99 minutes 59 Seconds (counting in seconds) or 999.9 Seconds (counting in tenths). Relay goes active during countdown. Countdown can be paused and resumed as desired. Data backup battery facility. Two PCBs, one for the control unit and second for LED display. Power Supply: 12 Vdc, 220mA max. Backup: 9V PP3 (not sup-



Serial Port Isolated I/O Controller



Computer controlled relay board providing eight 5A mains rated relay outputs and 4 optically isolated digital inputs. Designed for use in a variety of control and sensing applications including load switching, external switch input sensing, contact closure and external voltage sensing. It is programmed via the serial port which has several advantages over the parallel port:

- Can be used with ANY computer and operating system.
- Serial cables can be much longer (up to 35 metres) allowing 'remote' control
- Fewer wires are required (3 instead of 9)

A new simple to use but powerful Windows (3.1 to XP) software package makes the unit easy for even a novice to use to it's full potential. It allows you to set the inputs and outputs in real time with ease. Alternatively, you can write batch file programs. NO special software is required other than a terminal emulator program (built into Windows 3.1 onwards as Terminal or HyperTerminal). All components provided including plastic case with pre-punched and silk screened front and rear panels to give a professional and attractive finish. Dimensions (mm): 140Wx110Dx35H. Supply: 12Vdc/0.5A (Order Code [PSU445](#)). Requires a Serial Port Lead (Order Code [LDC441](#)). **3108KT £49.95 / AS3108 £59.95**

Dual 3108 Upgrade Kit

Simple upgrade kit for our 3108 Serial Port Isolated Input/Output Relay Controller (detailed above) that enables you to link two of these units together to provide a total of 6 external Inputs and 16 Relay Outputs. The Upgrade Kit consists of two new (identical) firmware ICs, two new front and rear box-panel sets and 30cm wire. The Master unit is whichever unit the serial cable is connected to. IC7 in both kits has to be jumpered (a very simple job) to provide the connection between the kits.

Software

The free software interface is similar to that described for the 3108 above but specially written for dual operation.

Additional Items Required

Two off 3108 Serial Port Isolated Input/Output Relay Controllers. Two off power supplies: 12Vdc, 500mA min. (Order Code [PSU445](#)). M-F Serial Port Lead (Order Code [LDC441](#)) **3108U £9.95**

Pocket Sampler/ Data Logger - MK II



This compact 8-bit PC driven data logger monitors voltage changes over periods rang-

ing from milliseconds to months. It uses the ADC0804 8-bit A/D converter IC. It can be used as a simple low frequency digital 'scope' to examine audio and other signals up to about 5KHz. Switch selectable 2V or 20V ranges. No batteries are required as it is powered from the computer's parallel port. This new Mark II version is

designed for compatibility with the new PC parallel port standards.

The complete sampler is built on a double sided PTH PCB. This fits neatly inside the extended D-shell case provided. A printed front panel is used to identify the Input socket and Voltage Range selector switch.

Technical Specifications

- A/D Converter: 8-bit
- Input Ranges: 0 - 2V and 0 - 20V
- Resolution: 2V Range: 10mV 20V Range: 100mV
- Sampling Rate: Once per hour to 100uS (10KHz)
- Input Connection: 2.5mm Jack socket
- Finished Dimensions (mm): 55Wx65Lx15H
- Supply: Powered directly from the PC

Software

Windows software (W9x to XP) displays plot, and data is saved as text files to allow import to spread sheets. Software allows timed sampling from milliseconds to months. Available for free downloading from our website. Requires a Parallel Port Lead (Order Code [LDC136](#)).

3112KT £20.95 / AS3112 £29.95

Data Acquisition Unit



Powerful, high precision 12-bit PC Data Acquisition System. It allows

quick, easy and economical data acquisition and control to be carried out using a PC. It uses a Maxim MAX186 IC that combines an 8-channel multiplexer and high-bandwidth track/hold together with high conversion speed and ultra-low power consumption.

Hardware Features

- 8 single ended analogue inputs

- reading 0 to 4 volts.
- Inputs can withstand up to $\pm 20V$
 - 12-bit ADC with conversion time of less than 10usecs (Note, using windows software reduces this speed)
 - 4 digital inputs to monitor the status of switches and valves. TTL and CMOS compatible
 - 4 digital outputs capable of sourcing and sinking 6mA. TTL and CMOS compatible. Used to control relays and solenoids
 - Unit fits inside an extended D shell case provided which plugs into the PC parallel port (Lead Order Code LDC136).
 - All components supplied including double sided PTH PCB. This fits neatly inside the extended D-shell case provided.

Software Features

- View the analogue inputs. They can be viewed as raw readings 0 to 4000 or in engineering units
- View the status of the digital inputs
- Control the status of the digital outputs
- Display the analogue inputs on graphs or trends
- View the maximum and minimum values for each of the analogue inputs
- Log analogue inputs and digital inputs and variables to disk
- Can display alarms
- Has a control language consisting of 50 If-Then statements allowing calculations and control to be done
- The program configuration can be saved to disk
- See website for full details and free software downloads

3118KT £49.95 / AS3118 £59.95

Temperature Data Logger

PC serial port controlled 4 channel temperature meter ($^{\circ}C$ or $^{\circ}F$). Uses a pre-programmed microcontroller and can be used with up to four DS18S20 sensors. Each DS18S20 may be located in excess of 200 meters



away from the motherboard/PC using simple 3-core cable. Ideal use for old 386/486 computers; continuous temperature data logging. You can tailor the input data stream to suit your purpose - dump it into an Excel spreadsheet, or you can write BASIC programs using the INPUT command to grab the readings. Download application software free from our website or ask for disk. The kit is very easy to build and the PCB is just 38x46mm. Connections via simple 3 pin headers (4 cables supplied). One DS18S20 is supplied with kit. You can add up to 3 extra sensors, available at £3.95 each. No external power supply required. Requires a Serial Port Lead (Order Code LDC441). **3145KT £16.95 / AS3145 £23.95 DS18S20 £3.95 each**

PC Controlled Relay Board with Box

Fully assembled and boxed version of our 8-channel relay board project (Order Code 3074) described above. Relay outputs have detachable screw terminal block connectors. See 3074 description for technical specifications and software details. Finished Dimensions (mm): 140W x 110D x 35H. Supply: 12Vdc/0.5A (Order Code PSU445). Requires a Parallel Port Lead (Order Code LDC136). **AS3165 £41.95**



Controllers & Automation

Sound Activated Latching Relay Switch



Sound activated latching switch for turning apparatus ON and OFF from a distance. Each time it receives a trigger signal it will switch state (either OFF or ON) and will stay in this state until it receives another sound i.e. latching. Can be adjusted to respond to voice, hand clapping or almost any sound and is very sensitive. Output relay has NO and NC connection options and is rated to switch up to 240Vac/2A maximum. Suitable for use in alarm systems, control systems for disabled, etc. Supply: 9-12Vdc i.e. Order Code PSU445 (with connector 7-1012). PCB: 47x74mm. Solder posts for all connections. **1047KT £12.95 Box 2047BX £5.95**

Electronic Thermostat

This reliable and useful circuit can be used to maintain a temperature level in a variety of applications. Uses a very sensitive thermistor sensor to activate the onboard relay (rated 250Vac/2A) when a pre-set temperature is reached. Trigger temperature is adjustable in the range 20 to 70 $^{\circ}C$. Supply: 12-15Vdc (PSU445 or kit 1061). Current: 50 mA. PCB: 29x63mm. **1048KT £9.95 / AS1048 £12.95**

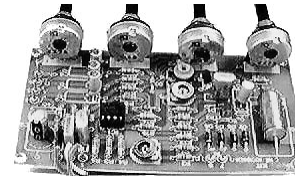
YOU CAN PAY BY:



Please refer to the warning on page 2 before purchasing mains powered projects

Test Equipment

AF Function Generator



An audio frequency generator based around a TL082 dual op-amp IC with 3 bands (25-250Hz, 250Hz-2.5KHz, 2.5KHz-25KHz). Outputs: 10Vpp Sine & Triangular waves, 16Vpp Square waves. Separate level controls for each. Can be easily set to give the same signal level for each waveform at the same time. It has sufficient output to drive any amplifier. Distortion level (0.5% max.) is low enough to make it useful for high precision testing. PCB: 63x120mm. Supply: 24Vac. **1008KT £19.95**

Transistor Tester

This little circuit will help you to test and identify transistors as either PNP or NPN types. It can also test some types of diodes. A handy and useful little circuit that can also be used in schools and colleges as a teaching project. PCB: 35x43mm. Supply: 9 Vdc. **1036KT £6.95**

AF Signal Generator (250Hz-16kHz)

An economical signal generator that produces a square wave of up to 15 Volts amplitude. A very good solution for the hobbyists lab. The frequency can be varied between 250Hz and 16KHz. Building the kit is very simple and the setting up is very easy.

Supply Voltage: 5-15Vdc i.e. PP3 battery (Order Code GPUPP3), mains adapter (Order Code PSU443 with connector 7-1012) or kit 1061. Max. current: 50mA. PCB: 35x44mm. Solder posts for all connections. **1042KT £6.95**

Thyristor & TRIAC Tester

A simple but most useful additions to your test gear. It will accurately test THYRISTORS and TRIACs, by opening and closing their gates and at the same time checking for open and short circuits. A handy and useful little circuit that can also be used in schools and colleges as a teaching project. PCB: 43x54mm. Supply: 9 Vdc. Max. current: 10mA. Solder posts for all connections. **1087KT £8.95**



Oscilloscope Component Tester



This board extends the testing capabilities of your oscilloscope with features only normally found on the most expensive models. It will allow you to test many electronic components including Diodes, Zeners, Transistors, Capacitors, Coils etc. The size of the board is small enough to fit easily in the case of any oscilloscope. The kit comes complete with a mains transformer. Supply voltage: 220-240Vac. PCB: 40x44mm. Solder posts for all connections. **1110KT £14.95**

TV Pattern Generator

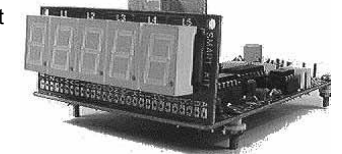
Low cost CCIR standard bar generator for correct alignment of TV timing circuits. Produces horizontal and vertical bars on the TV screen that are used to align the vertical and horizontal scanning synchronisation circuits of the receiver.

Specifications

- Supply: 9 Vdc / 2mA
- Operating Frequency: 170-250MHz
- Scan Frequency: Horizontal - 16525 Hz, Vertical - 50 Hz
- Output impedance: 75 Ω

1117KT £12.95 / AS1117 £17.95

Frequency Meter (10Hz - 1MHz)



A reliable digital frequency meter for the laboratory. It counts with great accuracy from 1Hz to 1MHz, covering the frequency areas of all the trade generators. It provides a 5 digit LED readout and also feeding voltage reverse. The input circuit does not create a load and subsequent frequency alteration to the circuit being measured. Supply Voltage: 12Vdc / 160mA (our order code PSU445 with connector 7-1012 is suitable). PCB: a:70x121mm b:33x77mm. Solder posts for all connections. **1152KT £64.95**

Opamp AF Function Generator

Function generators are used as a faultfinding tool on audio amplifiers etc. by feeding them a waveform of known shape, amplitude & frequency. This simple, low cost kit uses an LM348 quad op-

DTMF Telephone Relay Switcher

This device connects to your telephone line and has 4 relay outputs capable of switching 5 amps max. You can then call your number using a DTMF (tone dialling) telephone from anywhere in the world and remotely turn on/off any of the relays as desired. It is possible to connect a wide variety of devices to the relays including security lights, heating and pump controllers, computers, etc. The user can set a 4-digit security Password, Tamper facility, number of Rings to Answer, Auto Hang-up time and Lockout facility. The unit is supplied with a custom made plastic box and has detachable screw terminal blocks for the relay connections. Phone socket is RJ11 style. Dimensions (mm): 130W x 110D x 30H

Additional Items Required

Power Supply: 12Vdc/500mA (Order Code [PSU445](#)). BT plug to RJ11 3 metre phone cord (Order Code [LDT933](#) - £2.95 each)

3140KT £39.95 / AS3140 £59.95

Audio DTMF Decoder & Display

Detects DTMF tones via an onboard electret microphone or direct from the phone line through the onboard audio transformer. The numbers are displayed on a 16 character, single line display as they are received. Up to 32



numbers can be displayed by scrolling the display left and right. There is also a serial output for sending the detected tones to a PC serial port. Circuit is microcontroller based. The unit will not detect numbers dialled using pulse dialling. Supply: 12Vdc (Order Code [PSU445](#)). Serial port connection lead: Order Code [LDC441](#), **3153KT £17.95 / AS3153 £29.95**

Telephone Call Logger



Stores over 2,500 x 11 digit DTMF numbers. It records both incoming and outgoing calls, all buttons pressed during call plus date and time information. And if you don't tell your spouse the logger is connected you can monitor who they are calling and for how long. All components provided* including a plastic case with pre-punched and silk screened front and rear panels to give the kit a professional and attractive finish as shown. Phone sockets are RJ11 style. Dimensions (mm): 140W x 110D x 35H. This kit requires a 9-12Vdc Power Supply (Order Code [PSU443](#)), M-F Serial Port Lead (Order Code [LDC441](#)) and BT plug to RJ11 3 metre phone cord (Order Code [LDT933](#) - £2.95 each).

*Kit supplied with one AT24C128 memory chip, sufficient for most users. You can add up to 3 extra chips, available at £2.95 each. **3164KT £44.95**
AT24C128 £1.95 each

Please remember to add £3.95 P&P for UK orders

TCR' Telephone Conversation Recorder

The 'TCR' Telephone Conversation Recorder has many applications, such as, legal and contract work, monitoring telephone manner, review and training or any business, commercial or personal dealings where it matters what you say. TCR is fully assembled and ready to use and has full approval for the UK. Simply plug into any phone line and it will then automatically record both sides of any phone conversation. As soon as the handset is lifted it automatically begins recording. As soon as the handset is replaced it automatically stops. It will still pick up conversations from telephones plugged in elsewhere on the same circuit. It uses standard cassettes and has a two speed option, so a 90 minute tape will record 180 minutes of conversation. It can be battery or mains operated. 4 x AA batteries, a mains adapter, 90 minute tape, telephone cord and two-way adaptor are all included. The TCR is not compatible with PABX exchange systems. TCR is ideal for light to medium use (a few hours a day). **TRE076 £69.95**



See website for lots more Telephone Equipment!!



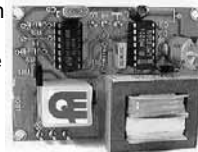
KT = Kit Price
AS Assembled Price

Automatic Mains Light Switch

Simple automatic switch that switches on a mains light bulb (rated up to 150W) when the ambient light level falls below a certain level. The bulb is switched off again when the ambient light level is restored. Unit has three selectable sensitivity levels. 21x33mm PCB is small enough to fit inside most light switch housings. **1072KT £8.95**

Mains Powered Thermostat Switch

Highly accurate thermostatic switch with relay output for use in control applications. Adjustable activation range from -10°C to +125°C. Relay activation hysteresis range adjustable from 1°C to 7°C. Accuracy: ±0.5%. Operating voltage: 240Vac (onboard mains transformer supplied). Relay load: 250V/2A. PCB: 67x88mm. **1076KT £32.95**



Liquid Level Sensor/ Rain Alarm

Can be used to indicate the level of fluid in a container or simply the presence of fluid depending on the way the circuit is used. Relay output can be used to control a pump or alarm. It can also act as a rain detector alarm (very useful in the UK!) when used with a suitable sensor that you can easily make. Supply: 12Vdc ([PSU445](#) or kit [1061](#)). Current: 60 mA. Relay: 250V/2A. PCB: 31x57mm. **1080KT £6.95 / AS1080 £9.95**

Mains Powered Fluid Level Detector

A simple and reliable circuit designed for the continuous maintenance of a fluid level using the onboard relay to operate a pump. Will detect the absence, the presence and the level of water and other polar liquids. Use in automated fluid distributors, washing machines, irrigation systems, water and fuel tanks, burner systems, heating installations, etc. Supply: 240Vac (onboard mains transformer supplied). Relay load: 250V/2A. PCB: 55x75mm. **1081KT £25.95 / AS1081 £34.95**

230Vac Automatic Light Dimmer

Automatically adjusts lighting of a room according to the ambient light level detected by the sensitive onboard photo-resistor. The darker the ambient light becomes the more the room lighting is raised and vice versa. Useful in a variety of applications including poultry-farming, design studios, security and safety lighting and children's bedrooms. Supply: 240Vac mains (onboard mains transformer supplied). Power Consumption: 3VA. Max Ohmic load: 2KW. PCB 80x115mm. **1134KT £42.95**

Emergency Lighting Controller

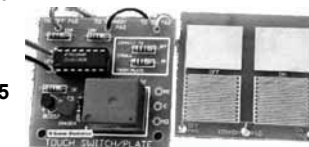


for use with a lead acid battery

This easy-to-build emergency lighting controller board is designed

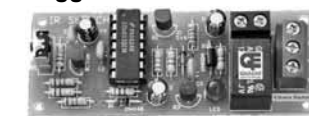
(not included) and has a built-in 12V/6Ah battery trickle charger circuit. It provides automatic control for emergency 12V lights in case of black out and has a maximum power capability of 50W. Supply Voltage: 15Vac/1A Lamp power: 50 Watts max. PCB: 55x66mm Solder posts for all connections **1184KT £15.95**

Touch/Contact Switch



Comprises two boards. One has both a Touch Plate (with a single contact plate) and a Contact Switch (that uses two contact plates). The second board carries the switching circuitry and a mains rated relay. Simply touch the appropriate pad to turn lights and other items ON/OFF. Useful for disabled people. The switching PCB can be positioned away from the contact plate PCB for remote control applications. The Contact Switch only needs a battery to power it but the Touch Plate requires a mains power supply like kit [3004](#) or [PSU445](#). Ideal for education (demonstrates IC's in flip/flop switching applications). Supply: 12Vdc. Two x PCB's: 50x50mm. **3010KT £5.95**

IR Remote Control Toggle Switch



Turn On and Off a variety of electrical devices using any house-

hold infrared remote control unit (e.g. TV, video, satellite, hi-fi, etc). Push any button on the remote control and the onboard relay (rated to 240Vac/5A) will turn on. Push any button a few seconds or even hours later and the relay will turn off. Supply: 8 - 15Vdc. PCB: 28x74mm. **3058KT £10.95**

3-in-1 LDR Light Switches

Three complete Light/ Dark LDR circuits each with an onboard relay output, all in the one kit. Each circuit is a simple well-tryed design. One uses two transistors in a super-Darlington set-up. The second uses the LM741 op-amp, and the third uses a Schmidt trigger design. Each board has a PCB-mounted switch to convert the circuit from light activated to dark activated switching and vice versa. **3079KT £17.95**

2-Channel UHF Relay Board



UHF remote control relay board comprising one ready built RF transmitter and one receiver board. The pocket size, car-alarm-style, two button key fob unit is used to toggle On/Off the corresponding receiver board relay (each rated 240Vac/5A) from a distance of up to 30 metres. LED's to indicate relay status. Full circuit explanation provided. Kit includes components to make one complete receiver board as pictured. One ready built 2-button key fob transmitter is also supplied. Extra transmitter units can be purchased separately (Order Code **30A15-Tx** - £7.95 each). Re-

ceiver PCB: 48x124mm. Supply: 12Vdc (Order Code **PSU445**). **3082KT £25.95 AS3082 £30.95**

Remote Control & Decoder IC Set

Comprises three sets of components:

- One 14-button Infra Red Remote Control unit. Requires 2 x AAA batteries (not supplied).
- One 3-pin Infrared Receiver Module that IR signal into data pulses.
- One pre-programmed micro-controller decoder IC plus 12MHz crystal, resistor, capacitor and diode for the power-on reset circuit, two 10K pull-up resistors plus a resistor and LED for testing purposes.



Each button on the remote produces a corresponding active low signal on one of 14 output pins of the decoder IC (normal state is high). You can build these components into your own circuit where remote control is required. No PCB is supplied (user can breadboard their circuit and make their own PCB). A sample application/test circuit is provided. **3092KT £14.95**

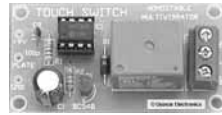
Sound Activated Relay Switch

This non-latching mini voice/sound activated relay switch can be used as a hands-free voice activation switch to operate tape recorders, lights, and a variety of other devices. Alternatively, it can be used as a simple



security device to sound an alarm or activate monitoring equipment. Adjustable trigger sensitivity to suit different environments. LED status indicator. Electret microphone provided. Output to a 1A rated relay. DC jack socket and screw terminal blocks for connections. Supply: 12Vdc i.e. Order Code **PSU445**. PCB: 44 x 48mm **3126KT £8.95 / AS3126 £14.95**

Touch Activated Relay Switch



Turn on any electrical device rated up to 240Vac/5A by just touching a wire or touch plate. It can also be triggered by shorting the PLATE contact to ground. Relay automatically turns off after a short delay (components for 1 sec and 5 sec delay are provided). Can be used to form a simple touch activated alarm or buzzer system. Can also be used as a simple short-duration timer circuit. Supply Voltage: 12Vdc (Order Code **PSU445** with connector **7-1012**). PCB 30x58mm. Solder pads for inputs. Screw terminal block for relay connections. **3137KT £5.95 / AS3137 £8.95**

12-Channel IR Relay Board



12-channel infrared relay board comprising a fully assembled commercial hand held IR remote

BUG DETECTION

Telephone Bug Detector

This inexpensive detector can help you to check your phone system for the presence of telephone bugs and taps. It uses two LEDs to indicate if the line is clear or not. It is powered by the phone line itself and therefore requires no batteries and can be connected permanently without fear of it interfering with the normal use of the phone. Power Supply: Phone line. Dimensions 30x40mm. Solder posts for all connections. **1130KT £8.95**

Transmitter Bug Detector

This simple bug detector could save you a small fortune! It will locate a wide range of bugging devices without the need to employ expensive private detective agency. This circuit will allow you to sweep a building for the presence of transmitter bugs. It also incorporates a bug location facility that enables you to pin point the exact position of any devices found. By using this kit you can ensure the privacy of your personal life or business interests at a fraction of the cost of commercially available units. Solder posts for all connections.



Specifications

- Supply: 9Vdc
 - Dissipation current: 30mA (max)
 - Detection range: 1 - 1000 MHz (99% of devices fall in this range)
 - Acoustic indication
 - Sensitivity adjustment
- 1154KT £21.95**

Please remember to add £3.95 P&P for UK orders

Telephone Equipment

Telephone Call Relay

- Noisy environment?
- Unable to hear your phone ring?
- Missing important calls?

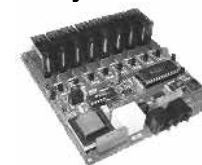
This simple to build and easy to install device is the answer. Once installed, it will close the onboard relay in synchronisation with the telephones ringing. The relay is completely isolated from the telephone line and can be used to operate a siren, bell, lamp or any other device. Normal telephone operation is not affected so the unit can be left permanently connected. Unit is powered from the phone line. Relay rating: 220Vac/2A. PCB: 64x64mm. **1122KT £12.95**
Box: 2122 - £5.95

Telephone Lines Priority Switch

This automatic switching box allows you to have a single fax, modem, answering machine or other device connected to TWO phone lines at the same time. The unit automatically detects which line is ringing and connects the fax or other device to that line. Supply: 12Vdc. Current: 40mA. PCB: 52x80mm. **1167KT £18.95**

8-Channel Telephone Activated Relay Board

You can use this DTMF Decoder board to control 8 electrical devices simply by calling your phone from any location in the world and making a few key



presses. Each channel has a relay output that can be independently controlled and an LED indicating the relays status. You can use the relays to control any devices you have in your house, office or factory. 4-digit user settable access code for security. The circuit is PIC based for accuracy and reliability. Kit includes matching transformer and plugs for connecting to the phone line. Relays for 4 positions only supplied. Supply: 12Vdc, 0.5A. PCB 126x134 mm **1186KT £79.95 / AS1186 £89.95**

TRI - Telephone Recording Interface

TRI is used to automatically record all conversations that take place on the target phone line to a tape recorder (not supplied). It only operates the tape machine while the phone is in use so no tape is wasted or left blank. TRI is connected to the phone line and the tape recorder's REMOTE and MIC sockets. Will operate recorders with 1.5-12V battery systems. 50x33x15mm **3033KT £8.95 / AS3033 £17.95**

TPA - Telephone Pickup Amplifier

Attach suction cup to a phone ear piece & let others in the room hear both sides of the conversation. Cup picks up the magnetic field produced in the ear piece which is then amplified & fed to the speaker provided. Has a built-in volume control. Instructions also include details of how the kit can be used to trace mains wiring behind walls. **3055KT £11.95 / AS3055 £19.95**



MRTX – Miniature 9V Room Transmitter

New greatly improved design.

More powerful than MTX but still simple to build.

Tank oscillator coil built onto the PCB. Easily tuneable. Choice of output powers. Can be connected to a Line Level Input with small modification. 9V battery operation. Maximum Range: ~1000m.

45x22x12mm.
3018KT £7.95 / AS3018 £13.95



VTX – Voice Activated Room Transmitter

VTX combines a sound activated switch & powerful FM TX. Adjustable trigger sensitivity. 2-

stage transmitter section gives crystal clear reception over 1km range. 'Peaking' circuit provided enables you to tune for maximum RF output. Supply: 6Vdc (4 cell "AA" battery holder supplied). 63x38x15mm.

3028KT £11.95 / AS3028 £19.95

HPTX – High Power Room Transmitter



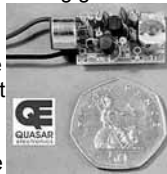
HPTX is our most powerful bug to date. This beefed-up 2 stage FM transmitter has an RF transistor in its output stage and gives a clear signal at over

1000m. 9V battery powered. On/off switch. 70 x 15 x 12mm.
3032KT £9.95 / AS3032 £17.95

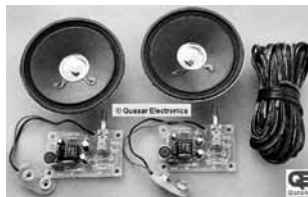
MMTX – Micro Miniature 9V Room Transmitter

This is the ultimate bug given its size and performance. The micro-miniature room bug is just 25 x 15mm but still turns in a very impressive performance. It is the smallest possible size using normal passive components. Further size reduction would require surface mount components and a double-sided PCB making DIY assembly very difficult. Transmits up to 500m with 9V PP3 battery and no aerial. Frequency range 105-120MHz approx. (i.e. top of FM and airband for greater privacy)

3051KT £8.95 / AS3051 £14.95



Hard-Wired Bug / Two Station Intercom



Kit contains all the parts needed to build a two-station intercom using a two-wire connection system. Each unit comprises a PCB that has its own amplifier, microphone and speaker (as pictured). Can easily be turned into a hard-wired 'bug' or room monitor by using half of the 2-core cable to send power from the receiving unit to the remote 'bug' unit. All

**KT = Kit Price
AS Assembled Price**

components including PCB's, speakers, microphones and 10 metres of 2-core cable supplied. 9V PP3 battery powered.
3021KT £15.95

TRVS – Tape Recorder Voice Switch

TRVS is used to automatically operate a standard tape recorder (not supplied) whenever it detects sound in the target area so that all conversations are recorded. Plugs into the tape recorders REMOTE socket. Adjustable sensitivity and turn-off delay. Needs a 6Vdc mains adapter for best performance (Order Code [PSU441](#)). PCB: 115 x 19 x 12mm.

3013KT £9.95 / AS3013 £21.95



PHONE BUGS

MTTX – Miniature Telephone Transmitter

Attach the MTTX anywhere on a phone line. Starts transmitting as

soon as the handset is lifted! 500 metre range - further if receiver is near phone line. Tune with ceramic trim cap. Uses phone line as aerial & power source. 20x45x8mm.

3016KT £7.95 / AS3016 £13.95

NB please note that transmitting distances quoted for any transmitter kit depends very much on the sensitivity of the receiver used and what buildings/obstructions are between the transmitter and receiver. Transmitter kits are not licensable in the UK and there use is against UK law.

control unit (range 20 metres indoors) and a receiver board containing 12 independently controllable relays. The receiver board has two banks of 6 relays. Each bank can be set to either toggle or momentary action. The relays are mains rated and each can carry 5 Amps max. and have screw terminal block connectors for the C/NO/NC connections. Receiver unit is built on a high quality gold plated DSPH PCB. Receiver board requires a 12Vdc power supply (Order Code [PSU445](#)). Transmitter requires 2 x AAA batteries (not supplied). Rx PCB: 112x122mm.

3142KT £39.95 / AS3142 £49.95

2-Channel Rolling Code UHF Remote Control

This is one very clever modern UHF remote controlled relay board that uses the latest state of the art technology. With rolling code, it's close-to-impossible to electronically "crack". With two channel relay outputs, both either latching or momentary operation, it's extremely versatile. With a sensitive pre-built receiver module, it's long 40 metre range (line of sight). Using the optional [MTXB434](#) booster module below can increase range up to 1.8Km! With up-to-15 keyfob-size transmitters per receiver, it's go-anywhere. And the kit even includes one keyfob! Whether you want to control a garage door or gate, a car and/or home alarm, or perhaps remotely turn lights or anything else on or off, this high-security system is just what you're looking for! The kit is supplied with all the components to build one 2-channel relay board

(as pictured). Relays are rated to switch up to 240Vac/5A. One ready built 2-button keyfob transmitter is also supplied but up to 15 transmitter units can be learnt by one Rx unit. Extra transmitter units can be purchased separately (Order Code [30A17-Tx](#) - see below). Relay Board PCB: 61 x 85mm. Supply: 12Vdc (Order Code [PSU445](#)).

3157KT £34.95 / AS3157 £39.95
The transmitter / receiver modules used in this kit can also be bought separately (Order Code 30A17).

4-Channel Rolling Code, UHF Remote Control

Same state of the art rolling code technology as kit 3157 above and 3181 below. This is the 4 channel version with 5 amp mains rated relay outputs (toggle or momentary). Transmitter range is 40 metres (line of sight). Using the optional [MTXB434](#) booster module below can increase range up to 1.8Km! Up to 15 Tx units can be learnt by one Rx unit. Kit includes components to make one complete receiver board as pictured. One ready built 4-button keyfob transmitter is also supplied. Extra transmitter units can be purchased separately (Order Code [30A16-Tx](#) - see below). Receiver PCB: 77 x 85mm. Supply: 12Vdc (Order Code [PSU445](#)).

3180KT £39.95 / AS3180 £47.95
The transmitter / receiver modules used in this kit can also be bought separately (Order Code 30A16).

**Prices include
17.5% VAT**

10-Ch Rolling Code UHF Remote Control



Same state of the art rolling code technology as kits [3157](#) and [3180](#) above. This is the 10 channel version with 1 amp mains rated relay outputs. You can switch between toggle or momentary action by holding the button or keypress combination depressed for more than 2 seconds. A PIC does ALL the work (source code is provided). Transmitter range is 40 metres (line of sight). Using the optional [MTXB434](#) booster module below can increase range up to 1.8Km! Up to 15 Tx units can be learnt by one Rx unit. Kit includes components to make one complete receiver board. One ready built 4-button keyfob transmitter is also supplied (a combination or single and two button combinations are used to activate each relay individually). Extra transmitter units can be purchased separately (Order Code [30A16-Tx](#) - see below). Receiver PCB: 113 x 85mm. Supply: 12Vdc (Order Code [PSU445](#)).

3181KT £54.95 / AS3181 £74.95
The transmitter / receiver modules used in this kit can also be bought separately (Order Code 30A16)

4-Channel 434MHz Tx / Rx Modules

4-Channel 434MHz Transmitter / Receiver modules with rolling code making it close-to-



impossible to electronically "crack". Used in our kits 3180 and 3181 but available here as just the Tx / Rx units for you to incorporate into your own circuits. Picture shows the pre-built, aligned and tested keychain transmitter (left) and receiver module (right).

Whether you want to control a garage door or gate, a car and/or home alarm, or perhaps remotely turn lights or anything else on or off, this high-security system is just what you're looking for! Using the optional [MTXB434](#) booster module below can increase range up to 1.8Km! Available as a kit comprising one keychain Tx and one Rx module ([30A16](#)) or individually.

30A16-Rx £14.95
30A16-Tx £17.95

2-Button 434MHz Tx / Rx Modules

2-Button 434MHz Transmitter / Receiver



modules with rolling code making it close-to-impossible to electronically "crack". Used in our kit [3157](#) but available here as just the Tx / Rx units for you to incorporate into your own circuits. Picture shows the pre-built, aligned and tested keychain transmitter (left) and receiver module (right).

Whether you want to control a garage door or gate, a car and/or home alarm, or perhaps remotely turn lights or anything else on or off, this high-security system is just what you're looking for! 40 metre range (line of sight). Using the optional [MTXB434](#) booster module below can increase range up to 1.8Km! The Tx and Rx modules sold individually.

30A17-Rx £14.95
30A17-Tx £16.95

434MHz Mini Transmitter Booster Module

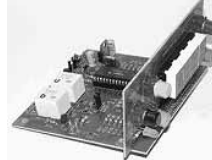
This tiny booster module fits inside our [30A16-Tx](#) and [30A17-Tx](#) key fob transmitters (used in kits [3157](#), [3180](#) and [3181](#)) to boost the range up to a massive 1.8Km. The booster is a pre-built superhetrodyne surface mount transmitter module with a saw resonator locked at 433.92MHz. It has a data rate of 1200pbs (maximum) and a frequency tolerance of ± 75 KHz. It operates from 3 ~ 12Vdc supply and has 7 external connections (of which only four are needed by the [30A16-Tx](#)). When use in conjunction with [30A16-Tx](#) or [30A17-Tx](#), the pair can give a range of up to 1.8km when the transmitter is powered by 12Vdc. Dimensions: 20mm (L) x 8mm (W). [MTXB434 £7.95](#)

Counters (Event)

Up-Down Counter (with Dual Relay Output)

General purpose up / down event counter that uses a pre-programmed microcontroller for maximum accuracy.

The four digit red LED display and control buttons are mounted on a separate board from the main control board. The unit has two independent relay outputs, each rated to switch up to 250Vac/2A. Power Supply: 12Vdc. Current Consumption: 45mA no relays active (each relay consumes approx 25mA when active). Battery Backup: 9V @ <10mA i.e. PP3 battery



(Order Code [GPUPP3](#)). Individual Relay Rating: Up to 250Vac/2A. PCBs: 1 x 51 x 122mm (Display), 1 x 103 x 104mm (control). Solder posts for all connections (hole spacing accepts screw terminal blocks) **1172KT £45.95 / AS1172 £54.95**

3 Digit LED Counter

Basic low cost 3 digit counter for use in a variety of counting applications. It uses a 14553 and 14551 IC. A separate Counter Module PCB is supplied that uses a push button counting. Has COUNT & RESET switches with debounce circuit built in to eliminate problems from noisy switches. Digital inputs used (with some modification to the debounce circuit if the input frequency is higher than 100 to 150 Hz). Two or more kits can be connected together with the socket/harness provided. 9V operation. Box provided. **3001KT £12.95**

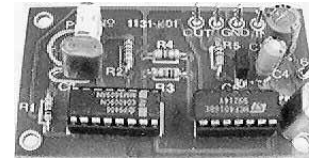
Up/Down Event Counter

Low cost 4 digit LED up/down counter with 0000 to 9999 range. Accepts input pulses from any 'make' contact so it can be used to count pulses from switches, relays, open collectors outputs or simply push buttons. For example, a turnstile micro switch or relay output from an infrared security beam (kit [3130](#)) counting cars, people or items on a conveyer belt. An overflow output signal (for connection to a second counter) is triggered when the counter wraps around to zero. Maximum count rate is 35 per



to sirens. The sound combinations that are produced are practically infinite! Output to speaker supplied. Supply: 9 Vdc (PP3 battery). Max. current: 200mA. Output power: 0.05 Watt. **1045KT £10.95 Box 2045 £5.95**

Robot Voice



This interesting inline effect will distort your voice similar to a DARLEK or robot. Good fun for children's parties, Discos, radio stations. Input: Microphone with preamplifier (e.g. Order Codes [4060](#) and [1024](#)). Output: Line Level Signal (to a mixing console or amplifier). Supply: 9Vdc. **1131KT £9.95**

SOUND RECORDERS

120 Second Voice Recorder (with Loop Option)

This voice recorder module uses a high quality 120 second non-volatile ISD2500 Chip-Corder series audio recording IC by [Winbond](#). The IC has several modes of operation and we use it here as a multi-message re-



Prices include
17.5% VAT

YOU CAN PAY BY:



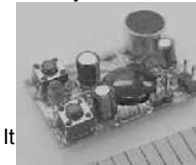
corder. You can record as many messages as you want up to 120 seconds total. You can then play them back on command. Recording and playback operations are controlled using the RE-CORD/PLAYBACK mode switch and the START/PAUSE and STOP/RESET buttons. A switch is used to select Loop or Normal playback. Unit has a built-in microphone and LEDs to indicate recording and playback. Supply: 6Vdc (Order Code [PSU441](#)). Output: 8-16Ω speaker. PCB: 50x67mm. **3064KT £20.95 / AS3064 £29.95**

40 Second Voice Recorder (with Loop Option)

As product code 3064 above but supplied with the lower cost 40 second ISD2540 ChipCorder IC. Supply: 6Vdc (Order Code [PSU441](#)). Output: 8-16Ω speaker. PCB 50x67mm. **3146KT £14.95 / AS3146 £23.95**

20 Second Sound Recorder

This low cost, ready assembled voice/message recorder is based around a COB PCB. It uses non volatile flash memory technology so no battery back up is needed to keep the message. It is user friendly with only 2 keys to operate - Record and Playback. It has a built-in microphone & an LED to indicate recording. 20 seconds of audio can be recorded at the factory set sampling rate of 6.4KHz. 5Vdc operation. PCB just 34x23mm. **30A63 - £6.95**



MELODY IC's

Melody IC Package

You get two TO-92 package melody transistors in this kit. The transistors contain a CMOS LSI IC. Easy to assemble - simply add a small Mylar speaker (not supplied). Plays a 128-note tune that repeats as long as power is supplied. 2 x 2 "AA" battery holders supplied. **SG06 - £2.95**

Surveillance

Our range of high quality electronic surveillance kits keeps getting bigger and better all the time.

These kits work on the 88 - 108 MHz waveband so can be received on any standard FM radio. Most of these kits can be altered to transmit above or below the commercial FM band by changing a few minor component values. (useful if you want to maintain a greater degree of security). All room transmitter kits are supplied with a sensitive electret microphone & battery holder/connectors.

Available in kit form (KT) or pre-assembled (AS)

ROOM BUGS

MTX - Miniature 3V Room Transmitter

Powerful 2 transistor 3V bug with clear, stable performance. MTX is guaranteed to transmit to 500 metres in the open. Easily tuneable in FM band. Operates on 3-9Vdc. Holder for 2 "AA" supplied. 20 x 45 x 12mm. **3007KT £6.95 / AS3007 £11.95**



Please remember to add
£3.95 P&P for UK orders

Sirens & Machine Gun Sounds

The classic noises every boy loves to make! Three sirens - ambulance, police & fire engine - plus a machine gun, all with two flashing LED's. Everything you need for your very own Dick Tracey movie! **SG04M: £5.95**
SG04COB: £1.95

'Ding Dong' Door Chime

Classic 'Ding-Dong' door chime. Component values in the RC networks can be changed to adjust the tone & duration of the sound. Extra capacitors are supplied with the kit so that you can experiment with the duration of the Ding and Dong's. Low stand-by current. **SG05M: £5.95**
SG05COB: £1.95

Animal Sounds

Produces sounds of a cat, dog, chicken and cow. Use this electronic version of 'Old Macdonald's Farm' to add fun to children's farmyard toys! Ideal project for schools. Components & 2 "AA" battery holder supplied for 6V operation. **SG10M: £5.95**
SG10COB: £1.95

Siren Driver

18mm x 15mm COB PCB containing a siren driver as found in piezo horn sirens & in toys. Drive circuit will tolerate a wide range of component values. 2V to 5V. 3 PCB's per kit. **SG11 £2.95**

Gun, Bomb & Siren Sounds

Produces sounds that simulate gunfire, bombs falling and sirens going off. Turn your bedroom into a battleground! Build it into your toy guns or model boats, tanks,

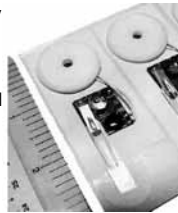
planes, etc and bring them to life. **SG12M: £5.95** **SG12COB: £1.95**

Music Box Engine

The electronic equivalent of a mechanical music box. Plays eight Christmas songs and five other tunes including Yesterday and Love Story. Activated by light falling on the LDR sensor. Place it anywhere you want a tune to play when light falls on it - make music box cupboard or fit it into children's toys or use it in promotional products. LDR can be replaced with a conventional switch if preferred. All component including speaker provided. PCB: 35 x 45mm. **3104KT £8.95**

MELODY CARDS

These kits really are great fun for both adults and children. They make giving and receiving cards and presents more enjoyable. They also make excellent 'attention grabbers' in promotional products.



Each kit contains two complete ready to use units. Each unit comprises a COB PCB, switch, battery and piezo speaker mounted on a self-adhesive backing for attaching to the inside of cards, books and cases etc, so that it plays the tune when opened. Ideal for personalising birthday cards and presents. Dimensions (each): 35 x 80mm.

Valentines

This melody package plays the 'Valentines' tune and makes an ideal addition to those romantic moments! **SG07 - £2.95**

Happy Birthday

This melody package plays the 'Happy Birthday' tune. **SG13 - £2.95**

Christmas Carols

This melody package plays 'Jingle Bells', Santa Clause is coming tonight' and 'We wish you a merry Christmas' Attached to any card of your own choice to add that personalised touch. They also provide excellent projects for primary school children when making Christmas cards for their friends and parents. **SG14 - £2.95**

SOUND EFFECTS

4-Sound Electronic Siren

An electronic siren with many applications. One of the output sounds is a single tone while the others are polyphonic resembling the sounds of FBI, POLICE, or AMBULANCE sirens. In the output can be connected a loudspeaker or a "horn" speaker of 8-25U impedance. Ideal for alarm systems in every situation. Suitable power supply is the kit 1063. Supply: 9-15 Vdc / 1A. Output power: 8W. **1029KT £9.95 / AS1029 £16.95**

Sci-Fi Sound Effects

Produces a range of mysterious electronic sounds similar to those used in old sci-fi movies and arcade games using on-board trim pot. Output can be connected to any audio power amplifier. Great for school discos, parties, etc. Demonstrates the use of oscillator circuits and frequency modulation. Supply: 12 Vdc (PSU445 or kit 1061). Maximum current: 40m A. Output: 2 Vpp. **1035KT £6.95**

Sound Effects Generator

An easy to built project that will create many interesting sound effects. It can produce many different sounds from bird chirps

second. Inputs for RESET, UP, DOWN, DISABLE and OVERFLOW. Supply: 9-15Vdc. PCB 50x65mm. **3129KT £13.95 / AS3129 £23.95**

4 Digit Pre-Settable LED Down Counter

Low cost 4 Digit Pre-settable Down Counter. Uses a micro-controller to do all the work. Count input can be used for both low (30cps) and high (4100cps) speed applications. Accepts inputs from any 'make' contact so can be used with pulses from switches, relays, open collectors outputs or simply push buttons. Four user-selectable output modes for when the count reaches zero. Inputs for Rate, Count and Reset. Output to transistor, NPN, 100mA @30V. The Input, Output and Power In are brought out to a 10-way header strip for easy connection. Power: 9-12Vdc. PCB: 64x51mm. **3154KT £13.95 / AS3154 £22.95**

100x38x 15mm. **3009KT £5.95**

Introduction to Power Audio Amplifiers

Using power amplifier ICs like the LM386, TDA2004, etc. is modern, quick and easy but they teach you nothing about how power amplification actually works. Here we use discrete parts to construct a Class AB power amplifier, still one of the most common types used today, even in modern audio amplifier IC's. Gives hands-on learning and detailed explanations about cross-over distortion, bootstrapping, complementary pairs, & push-pull outputs. Delivers several watts of power to the 8Ω speaker supplied. Power: 2 x 9V PP3 batteries. Screw terminal block connections. PCB: 48x41mm. **3048KT £7.95**



One-Chip AM Radio

Building your first radio receiver is a great experience for those starting to explore electronics. This is a complete AM radio on a PCB. Tuned Radio Frequency (TRF) front-end, single RF amplifier/detector IC and two stages of audio amplification. All components including speaker and pre-wound coil are supplied. Excellent for beginners and schools. **3063KT £11.95**



Thermoelectric Cooler

- Freeze or boil water
- Cool or heat equipment
- Generate power from heat

Thermoelectric coolers (TEC) or Peltier effect heat pumps can be used where controlled heating or cooling is needed in very small spaces. There is no refrigerant, fumes, mechanical vibration or noise. This 40x40mm-module contains 127 p-n junctions connected electrically in series but thermally in parallel. When powered up it will cool on one side and heat up on the other. Maximum temperature difference is 59°C (13.5V @ 4.4A). Heatsink required (not supplied). **3066KT £18.95**



PIC Trainer (5 Functions)

Measure and display temperature and humidity, build a timer and counter, or do analogue to digital conversion with this 5 in 1 PIC trainer. Ideal for those who wish to learn about PIC micro-processor and LCD technology - a new challenge for electronics enthusiasts. The kit includes a motherboard that carries a pre-programmed PIC16C711 chip

Educational

Introduction To Oscillators



This educational kit will teach you how to build, understand and experiment with various types of oscillators - astable, monostable and bistable (flip-flop) multivibrators. One PCB is used to build all three circuits simultaneously. Six LED's allow you to see & understand exactly how each oscillator is working. Component values can be altered to see the effect. 9V PP3 battery powered. PCB

Negative/Positive Ion Generator

Ion generator using the standard Cockroft-Walton multiplier circuit. This ladder of diodes and capacitors is used to pump the output voltage up to the level needed for ionisation to occur. Powered directly from 110-240Vac mains supply with a PCB mounted protection fuse built and a neon power indicator. Uses ordinary needlework pins for the ion emitters. Reversing the diodes makes it a positive ion generator. **3057KT £10.95**



containing all the code needed and alphanumeric LCD display. Three plug-in modules are supplied for the motherboard:

1. Temperature and Humidity Sensor Module. Display both temperature (either °C & °F) and humidity simultaneously. Uses a Dallas DS1620 sensor.
2. Counter and Timer Module. Switch between Counter Mode (Up, Down and Clear functions) and Timer Mode (Start, Stop and Clear functions).
3. Analogue to Digital Module. Illustrates analogue to digital conversion techniques using four potentiometers.

Excellent practical project as well as a learning tool. All components supplied including 5 PCBs, alphanumeric LCD display, temp/humidity sensors and the pre-programmed PIC. The complete, fully commented, software code used is also available for you to study and learn from. This kit makes an excellent introduction to using and programming micro controllers. Motherboard PCB: 40 x 90mm. Temp/Humidity PCB: 30 x 60mm. Counter/Timer PCB: 30 x 60mm. A/D PCB: 35 x 40mm. Kit powered from 9Vdc battery (Order Code [GPUPP3](#)). **3075KT £35.95**

Introduction to LCD'S and More!

This project will show you how to understand and use LCD's and much more! Learn how to connect a 2x16 LCD to a PC parallel port and then how to write keystrokes from the PC keyboard to display on the LCD. It will show you how to process this data (rotate the string left and right.) All the code is provided. Second, there is an on-board DS1620 to measure temperature. The temperature is displayed in F or C. Just press a button. With the

DS1620 you may set breakpoints to turn a thermostat on/off. We provide all the code to do this. Once the DS1620 is programmed it may be removed and placed in another device for temperature control. Many web references are provided. PCB: 70x85mm. **3134KT £27.95**

Two LED Flasher

Designed for teaching the concepts of astable multivibrator circuits. A 555 timer IC is wired as a square wave oscillator with a double ended output connection to two LED which flash on and off in turn. Ideal low cost project for schools and colleges. Documentation provides links to a website showing an animated explanation of how the circuit works. Introduces a variety of components and basic electronic principles. Power supply: 5-15Vdc. PCB 27x32mm. **3138KT £5.95**



Electronic Project Labs

- Ideal gift for the budding electronics enthusiast age 10 and over
- Excellent introduction to electronics
- Easy to use and understand
- No soldering. No tools required
- Each product is a complete, self-contained learning centre
- High quality and excellent value for money

YOU CAN PAY BY:



Please remember to add £3.95 P&P for UK orders

These Electronic Project Labs offer a great introduction to the world of electronics and make an ideal present for the budding electronics expert! Require no soldering, tools or previous knowledge of electronics. Circuits are built and unassembled using special clips and flying leads provided. Excellent practical and cost effective teaching aid for long-term repeated use in schools and colleges. All use low voltage battery power making it safe for use even for children aged 10 years and over. These robust project labs are made and presented to a very high quality standard. Each comes with a comprehensive printed manual with circuit explanations, schematics and assembly diagrams. All assume no previous knowledge.

Short Wave Electronic Radio Kit

Learn and build your own Short Wave radio. Explore the world of short wave radio. Receives band from 6-8 MHz (SW1) & 12-18 MHz (SW2). Learn how radios work. Earphone included. Illustrated instruction manual. Requires no soldering. Suitable for age 8. Requires 1 x 9V PP3 battery (not provided). Dimensions: 125x175x20mm. **ERKSW £8.95**



AM/FM Electronic Radio Kit

Learn and build your own AM/FM radio. Tunes into your favourite AM/FM radio stations. Receives band from 520-1650 KHz (AM) & 88-108 MHz (FM). Learn how radios work. Earphone included. Illustrated instruction manual. Requires no soldering. Suitable from age 8.



SX 8x8 Display Board

Learn how to write your own moving message displays in any language. Define your own character set so you can write in any language. Full instructions and commented programs provided. Write your own maze game. Copy and add to our maze game supplied. Details on how to do this are also enclosed. There is a random pattern kaleidoscope program built into the SX-I Monitor for testing. Up to three 8x8 Display Boards can be attached to the CN1 Input/Output Expansion Connector of the SX-I or SX-II. This teaches the general method for connecting tens of 8x8 display modules to the CN3 Expansion Socket in your own massive display board. PCB: 60 x 119mm. **SC04KT £20.95**

DS1213B or C Dallas SMART Socket

Ten year RAM battery backup when the power to the SX-I is removed. Do not lose your programs when you turn off the power. Plugs into RAM socket between RAM chip and socket. Easy installation (minor hardware modification necessary). Either the DS1213B or DS1213C can be used. Data sheet provided. **SC07 £21.95**

DS1216C Dallas SMART Watch

Ten year RAM backup for SX-I plus it keeps track of the year, month, day, date and time to 1/100th of a second. Use this data to add real-time day/date capability (both DD/MM/YY and MM/DD/YY formats) to your

programs. Plugs into RAM socket between RAM chip and socket. Easy installation (minor hardware modification necessary). Data sheet provided. **SC08 £39.95**

SX Relay Board Upgrade

This kit contains the remaining seven relays and component to enable you to complete all 8 relay positions for [SC03KT](#) above. **SC13 £12.95**

Sound Generators

COB KITS

These interesting sound generator projects are easy to build and are ideal for school and fun projects. COB (Chip-on-Board) means that the die form of the IC is bonded directly onto the PCB and the copper tracks come out from it. A blob of black epoxy covers & protects the IC. COB technology is used in toys, dolls, door chimes & voice recorders. Each kit contains a COB PCB and all of the other components required including speaker, switches & battery holder. Supply: 2.5-5Vdc. Kits with an 'M' suffix part number are supplied with a motherboard that carry the COB & external components and make soldering easier. Please call for quantity prices.



Typical kit contents. Actual components vary depending on kit ordered

COB PCB ONLY: We can also supply the COB PCB on its own. You supply all the other parts required.

SOUND GENERATORS

Train Sounds

Why watch your trains go round in silence when any model railway enthusiast can use this kit to bring life to their railway set. The 16x30mm COB PCB is small enough to fit inside many model trains. The sound can be triggered using the usual reed switch and magnet method. Produces four selectable train sounds including whistle blowing (repeats 4 times), chugging sounds, a level crossing bell and the clickety-clack noise of a train crossing a bridge. Two boards can be cascaded to produce a sequence of sounds from a single switch. **SG01MKT: £6.95**
SG01COB: £1.95

Mobile Phone Sounds

Imitates the ringing, dialling and engaged tones found in real cellular phone. Build it into toy phones or turn an old telephone into a child's toy. **SG02M: £6.95** **SG02COB: £1.95**

16-Tune Door Chimes

Bored of listening to your 'Ding Dong' doorbell? Then put the Ding back into your Dong with this kit. It plays 16 different door chime melodies that are cycled through with each press of the doorbell switch. The circuit also drives an LED that flashes with the rhythm of the song. Designed for use in high quality melody products. **SG03M: £5.95**
SG03COB: £1.95

Order online and get reduced price UK Postage & Packing

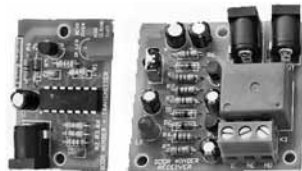
4-12Vdc. You only need to make three connections - +V, Ground and Output. The output is an active high going pulse, of 0.5 seconds minimum duration that remains active as long as motion is detected. **3076R £10.95**

12V PIR Detector Module

Similar to the 3076 PIR detector module above but with the following differences:

- 3133 has 3 pins directly off the PCB; 3076 has a 50mm cable
 - 3133 output is active low, [open collector](#); 3076 is active high output, [open collector](#)
 - 3133 is 27mm x 27mm; 3076 is 25mm x 35mm
 - 3133 needs a 10-14Vdc supply; 3076 operates on 4-12Vdc
- Supplied fully assembled with Fresnel lens and ready to use. **3133 £11.95**

Infrared Security Beam

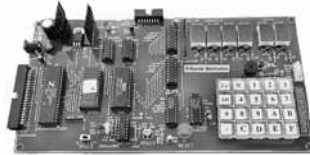


This kit can be used to set-up an invisible security system using infrared (IR) beams. When the beam is broken a relay is tripped that can be used to sound a bell or alarm. It could be used for detecting customers entering a shop or vehicles coming up a driveway, etc, etc. The kit consists of two separate PCBs - a transmitter board and a receiver board. The beam is very powerful and distances over 15 metres can be monitored with this kit. Supply: 12Vdc (Order Code PUS201). Relay rated at 5A/240Vac max.

3130KT £13.95 / AS3130 £24.95

Single Board Computers

SX-1 - Z80 Single Board Computer



The SX-I Single Board Computer System has been designed to teach students modern code development techniques. The system is not a copy of early single board computers. It is a modern update of what a single board computer system should be. You can move straight into programming to gain confidence and grows with the student It connects to a PC to aid and demonstrate modern methods of code development. All software code including the Monitor is supplied with comments.

Features

- 40 pin IDC expansion socket with all uP lines
- 16 pin IDC expansion socket with 4 I/O ports
- large single sided PCB for easy learning and use
- 6 LED displays for Address/Data output
- 10 year RAM backup with optional DS1213B Smart Socket
- Single stepping in both hardware and software available to debug your programs
- Connects to the Serial port of a PC. Teaches you how to write your programs on a PC, assemble it then download it to the Southern Cross Serial interface PCB, components and Z80 assembler included
- Many fully commented program examples available for free downloading from our website
- Real time, day and date capability with the optional DALLAS DS1216 - Smart Watch IC. Includes RAM backup

- Bit I/O Port with 2 input and 2 output bits available for add-on support kits and other projects
- all CMOS ICs, 8K RAM, 8K EPROM
- 9-15V, AC or DC input
- 20 key hex keypad plus Reset
- 2 hardware speed controls
- DSPTH PCB: 130x250mm

Documentation

- Full construction details included. All schematics.
- Monitor listing published with comments. We do not treat the Monitor as 'secret'. We show you how to use it in your own programs by system calls.
- Alphabetic and Numeric Instruction Set listing.
- Nine pages of program examples.

SC01KT (kit form) £74.95

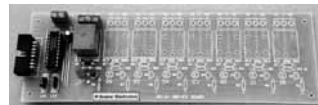
Hardware Manual for SX-I

Hardware technical manual for SX-I comprising:

- Reprint of pages from the Z80 Technical Manual and Data Book
- Data Sheets for all SX-I IC's

SC09 £5.95

SX Relay Board Kit



Can be used with either SX-I or SX-II. Allows them to communicate with the real world. Turn on lights, switches and solenoids from your program. If you use the optional DS1216B Smart Watch on the motherboard, then programs in real time can be written. All components for one of the eight relay positions is provided in this kit. The additional seven relays can be completed with [SC13](#) below. PCB: 207 x 67mm. **SC03KT £9.95**

Please remember to add £3.95 P&P for UK orders

Requires 1 x 9V PP3 battery (not provided). Dimensions: 125x175x20mm.

ERKAF £8.95

Robot Sensor 20 Electronic Projects Lab

The Robot Sensor 20 Electronic Projects Lab contains all the parts and instructions to build 20



educational and fun experiments and circuits. Explore how a robots sensors work to connect them to the outside world. The projects cover a good introduction to electronics and robot sensing in particular and include:

- Electronics components
- Basic / fun electronic circuits
- Electronic sensors and more!

The fully illustrated owners manual gives detailed step-by-step project instructions. Requires 1 x PP3 battery (not provided). Box Size: 330x240x80mm.

EPLR20 £14.95

30-in-ONE Electronic Projects Lab

Build 30 projects ranging from a radio, burglar alarm, water detector, Morse code practice circuit, simple computer circuits, and much more! 68 page manual.

EPL030 £14.95

130-in-ONE Electronic Projects Lab

The 130-in-ONE electronic projects lab will start you on the road to a great hobby or career in elec-



tronics. It contains all the parts and instructions to assemble 130 educational and fun experiments and circuits. Build a radio, AM broadcast station, electronic organ, kitchen timer, logic circuits and more. Comes with built-in speaker, 7-segment LED display, two fully integrated circuits and rotary controls.

The projects cover 11 categories of electronics and include:

- Electronics components
- Basic / fun electronic circuits
- Semiconductors
- Display Circuits
- Transistors
- Digital technology
- Oscillators
- Operational amplifiers
- Radio communications
- Test and measurement circuits

160 page A4 size fully illustrated owners manual gives detailed step-by-step project instructions. Requires 6 x AA batteries (not provided). **EPL130 £37.95**

300-in-ONE Electronic Projects Lab



The 300-in-ONE electronic projects lab contains all the parts and instructions to assemble 300 educational and fun experiments and circuits. Build a transistor radio, IC organ, burglar alarm, battery checker, delayed timer, electronic game, voltage controlled amplifier, multiplier, multiple counter, digital light dimmer, tone burst generator, audio signal tracer, electronic candle, voice level meter, metal detector,

rain detector, voltage drop alarm, logic checker, function generator and many more.

Built-in speaker, 7-segment LED display, breadboard area, seven integrated circuits, rotary controls and lots of other components. Projects cover 11 categories of electronics including:

- Electronics components
- Basic / fun electronic circuits
- Electronic 'Building Blocks'
- Radio circuits
- Sonic zoo and sound factory
- Operational amplifiers
- Power Amplifiers
- Digital technology
- Electronic counter circuits
- Introduction to computer circuits
- Analogue and digital circuits
- Test and measurement circuits

195 page A5 size fully illustrated owners manual gives detailed step-by-step project instructions and is a course in electronics in itself! Requires 6 x AA batteries (not provided). **EPL300 £59.95**

500-in-ONE Electronic Projects Lab Kit



The 500-in-ONE Electronic Projects Lab Kit is the top of the range and contains all the parts and instructions to assemble 500 educational and fun experiments and circuits. The main difference between this project lab and the 300-in-ONE lab is the addition of a more Advanced Hardware Course and a microcomputer

based Software Programming Course.

The Hardware

Includes a built-in speaker, microphone, LED digital display, integrated circuits, rotary controls transistors, transformers, diodes, resistors, capacitors, LEDs, phototransistors, CdS and lots of other components. A built-in breadboard allows easy wiring and connection of components. The microcomputer section features a 4-bit Microprocessor with 4 inputs, 8 outputs, 5 registers and 64 RAM storage. A 32 button keyboard is used for entering commands to the microcomputer and an 8-digit LCD Display indicates information entered and output while the experiments process. The command set comprises 26 instructions.

The Projects

Build your own knowledge by exploring amplifiers, analogue and digital circuits plus learn how to read schematic diagrams. Build a special lighting effects, radio transmitter and receivers, amazing electronic sound effects, cool games and MORE! The 500 projects cover 27 categories of electronics and include:

- Electronics components
- Basic / fun electronic circuits
- Electronic 'Building Blocks'
- Radio circuits
- Sonic zoo and sound factory
- Operational amplifiers
- Power Amplifiers
- Digital technology
- Electronic counter circuits
- Introduction to computer circuits
- Analogue and digital circuits
- Test and measurement circuits
- Microcomputer software programming projects and many others

The Documentation

Supplied with a fully illustrated 368 page Owners Manual in three separate books (38x25cm):

HARDWARE, Entry Course (Project No's 1-254)

HARDWARE Advanced Course (Project No's 255-400)

SOFTWARE Programming Course (Project No's 401-500)

These three books gives detailed step-by-step project instructions and are a course in electronics in themselves! They take you from basic component theory, through analogue and digital hardware circuits and right through to learning software programming.

Ideal for Education

The solderless components are fitted to a mounted breadboard and can be used over and over again. The kit is low voltage battery powered making it safe for use even for children. An ideal kit for schools and many other educational departments. It is also perfect for any inquisitive mind aged 12 years and over. Requires 6 x AA batteries (not provided). Approx Dimensions (mm): 240W x 140D x 55H (max). Weight: 5125g approx (excluding batteries). **EPL500 £149.95**

FM Transmitters

All transmit on the 88-108MHz FM waveband and can be received on a standard FM radio.

1 Watt FM Transmitter

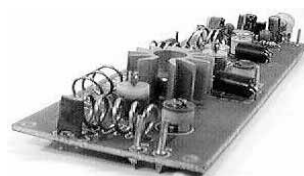
Easy to construct yet powerful 1 Watt FM transmitter that delivers a crisp, clear signal with a range of about 1 mile. Two stage circuit design comprising an audio pre-amplifier and the RF output stage. It can be used with the electret microphone supplied or any line level audio source e.g. a CD or tape OUT, mixing deck, computer sound card or audio mixer like kit [1052](#). Audio input sensitivity is adjustable. Can be used with the simple open dipole

wire aerial supplied or a ground plane can be used. Supply: 9-30Vdc 400mA. PCB: 42x45mm. **1009KT £10.95 / AS1009 £15.95**
Box - 2009BX £2.95

15 Watt FM Transmitter

Fully assembled FM transmitter with four transistor based stages and a Philips BLY88 (or equivalent) in the final stage. Delivers 15 Watts of RF power to the antenna. Supplied fully assembled and tested - just connect the aerial, power and audio input and you are on the air! Accepts any line level audio source e.g. a CD or tape OUT, mixing deck, computer sound card or audio mixer like our kit [1052](#). Audio input sensitivity is adjustable. Antenna can be an open dipole, ground plane, 5/8, J, or YAGI configuration. The board is pre-aligned for the factory-set transmitting frequency and no further adjustments are necessary. Operating frequency can be altered by the user (an SWR meter is required). Supply: 12-14 Vdc, 3.5A. PCB: 70x220mm. **AS1021 £124.95**

3 Watt FM Transmitter



Small but powerful FM transmitter consisting of an audio pre-amplifier stage and three RF stages with a 3 Watt RF power transistor in the final stage. It can be used with the electret microphone supplied or any line level audio source e.g. a CD or tape OUT, mixing deck, computer sound card or audio mixer like kit

220/240Vac mains. Operating voltage: 9Vdc (via onboard mains transformer supplied). PCB: 51 x 75mm. Solder posts for all connections. **1221KT £44.95**

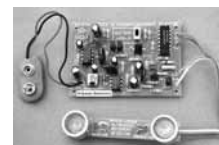
Light Alarm

Protect your valuables with this practical, clever little circuit. The built in piezo alarm sounds loudly the moment even the smallest amount of light falls on the highly sensitive phototransistor. Alarm output can be redesigned to activate a relay or triac. 9Vdc operation. PCB: 48 x 22mm. **3008KT £6.95**

Piezo Screamer

This painful alarm siren gives out a massive 110dB of ear piercing noise. Supplied complete with plastic box containing two 35mm diameter piezo electric elements already built into their own resonant cavity. All you have to do is build the PCB that fits neatly into the same box to form a single compact unit. Can be used as part of an alarm circuit or just for the hell of it!!! 6-9V operation. **3015KT £10.95**

Ultrasonic Movement Detector I



Matched 40 kHz transmitter/receiver pair of transducers detects movement at over 7 metres. Transmitter is crystal locked at 40kHz for maximum efficiency. Separate PCB for mounting the active units. Latch/reset PCB-mounted switch on board. Sensitivity control. Supply: 9Vdc. **3020KT £17.95 / AS3020 £31.95**

Combination Lock



Get a practical introduction to

'programmable' electronic locks with this fully working project. One PCB contains all of the circuitry comprising of the decoding IC's, a matrix to set the four number security code, and a 120V/10A relay for switching an external load e.g. a door lock solenoid. This is connected to a separate touch pad PCB with 9 pads. If an incorrect digit is pressed the lock is automatically reset. Robust, versatile design. 9Vdc operation. **3029KT £7.95**

PIR Movement Detector

A do-it-yourself passive infra red (PIR) movement detector, as used in burglar alarms and access control systems. Designed around a PIR sensing element, a purpose designed movement IC and a light dependent resistor (LDR), to provide an optimised circuit that will detect motion up to 6 metres away. The PIR sensor and Fresnel lens are fitted onto the solder side of the PCB. This enables the board to be mounted inside a case with the detecting lens protruding outwards, whilst still allowing easy access to the controls. Supply: 9-12Vdc. **3030KT £15.95 / AS3030 £24.95**

9V Siren

A surprising loud siren for such a simple circuit. It uses a voltage

controlled oscillator to drive the 0.5W loudspeaker provided. Makes an ideal internal siren for use in fire alarm, burglar alarm and other warning systems. 9Vdc operation. **3031KT £6.95**

Ultrasonic Movement Detector II

This sensitive ultrasonic motion detector circuit uses a quartz crystal to lock the detector frequency for maximum stability and reliability. All components, including the two ultrasonic transducers, are mounted on a single board so very little external wiring is required. Detects motion from 4-7m away. Sensitivity is adjustable LED 'ON' indicator. Output can drive an external relay or circuit. 9V operation. 75x40mm. **3049KT £14.95 / AS3049 £27.95**



PIR Detector Components

This kit contains all the hard-to-get parts for a PIR motion detector. Includes the IR sensor, detector IC and a PCB mounted plastic Fresnel lens. Includes data on IC & Sensor. **3062KT £11.95**

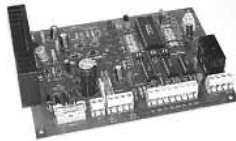
PIR Detector Module

This assembled and tested unit is a complete passive infra-red (PIR) movement detector measuring just 34x24x16mm as used in commercially made burglar alarms. Range is up to 8 metres. The module comprises a PCB mounted fresnel lens, PIR sensor, surface mount and movement detector IC. Operates from



Power Flasher (12Vdc)

A power flasher board suitable for connecting to the output of alarms, warning devices, car HAZARD lights, signalling devices, etc. It uses a power transistor to drive the lamp (not supplied) and solid state circuitry to provide the necessary pulses to flash it on and off. Supply Voltage: 12Vdc (Order Code [PSU445](#) with connector [7-1012](#) is suitable) Lamp power: 20 Watts max. PCB: 46x100mm. Solder posts for all connections **1128KT £8.95**

5 Zone Alarm System

This is a state-of-the-art security system. An

integrated security system that consists of 5 independent zones. One Delay Zone, three Direct Zones and one for 24 hours protection zone. The entry and exit time are adjustable from 15 to 60 seconds and you also have the ability to adjust the alarm time from 30 seconds to 2 minutes. All the zones are terminated in a 4K7 resistor for short-cut protection. The system can also accept a 12V/7Ah lead acid backup battery to maintain protection in the event of a power cut. Supply Voltage: 17Vac/2A. PCB: 120x165mm. Screw terminal blocks for connections. **1140KT £47.95**

See inside front cover for international shipping

YOU CAN PAY BY:

**Programmable Electronic Lock**

Simple and easy programmable electronic lock with one million different

combinations and memory backup. 1 amp rated relay output (C/NO/NC) can be used to indirectly switch solenoids, etc. Uses a PIC16C54 microprocessor for accuracy and reliability. Easy programming by the user. One Master access code allows the setting of six individual low level User codes (that are then used to operate the relay). Master and Users codes can be reset as desired (e.g. to provide a new employee with a new User code, making the old User code unusable). The board has an output that can be used to activate an alarm system (not included) after 3 consecutive combinations are entered. 3 coloured LEDs indicate the locks current status. The control board fits neatly into the keypad case supplied giving a very neat and professional finished product. Screw terminal blocks supplied for inputs and outputs. Supply: 12-14Vdc (Order Code [PSU445](#) with connector [7-1012](#)). Box: 95 x 60 x 25mm. **1177KT £52.95**

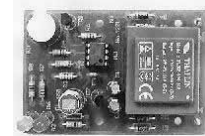
2 Zone Alarm System

Simple to install, low cost yet effective security system for a range of

properties. This security system consists of 2 independent zones. One delay and one direct zone. The entry and exit time as well as the alarm time are standard. Both zones have shortcut protection. The system can also support a 12V/3Ah lead acid backup battery to maintain protection in the event of a power cut. Supply Voltage: 17Vac/1A. PCB: 80x95mm. Solder posts for all connections. **1197KT £22.95**

4 Channel Selector for Camera Monitoring

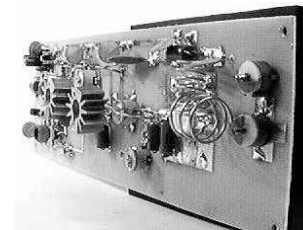
This board enables you to connect the output signals of 4 independent cameras so they can be viewed on a single display monitor. The outputs can be controlled manually with two pushbuttons switches or automatically with another button which can control all inputs in sequence every 5 seconds. The device can also be used in audio sources, alarm systems or in other applications where there is a need for combined monitoring. Four relay input switching system with LED indicators. Built in 5V regulator. Operation voltage: 9 - 12Vdc. Power consumption: 50 mA. PCB: 75 x 88mm. **1220KT £23.95**

Gas Leakage Sensor (230Vac Mains)

This 230Vac mains powered gas leakage sensor will detect propane, butane (LPG) and natural gas. An onboard buzzer and LED warn when gas is present. It uses a PIC microcontroller and high quality FIGARO TGS2610 sensor. Supply voltage:

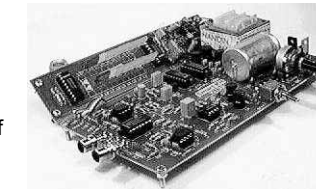
[1052](#). Audio input sensitivity is adjustable. Delivers up to 3 Watts RF power to the aerial which can be an open dipole or ground plane. Ideal project for the beginner who wants to get started in the fascinating world of FM broadcasting and wants a simple but robust circuit to experiment with. Supply: 12-15Vdc, 0.5A (Order Code [PUS010](#)). PCB: 45x145mm.

1028KT £24.95 / AS1028 £31.95

25 Watt FM Transmitter

Fully assembled FM transmitter having four transistor based stages with a Philips BLY89 (or equivalent) in the final stage. Delivers a mighty 25 Watts of RF power to the antenna. Supplied fully assembled and tested - just connect the aerial, power and audio input and you are on the air! Accepts any line level audio source e.g. a CD or tape OUT, mixing deck, computer sound card or audio mixer like our kit [1052](#). Audio input sensitivity is adjustable. Antenna can be an open dipole, ground plane, 5/8, J, or YAGI configuration. The board is pre-aligned for the factory-set transmitting frequency and no further adjustments are necessary. Operating frequency can be altered by the user (an SWR meter is required). Supply: 12-14Vdc, 5A. PCB: 70x220mm. **AS1031 £134.95**

KT = Kit Price
AS = Assembled Price

FM Stereo Encoder

Convert any FM transmitter to broadcast in high quality professional STEREO. Simply connects to the audio input stage of your existing FM transmitter via it's audio input stage, saving the expense of costly conversions. The encoder allows you to transmit a properly modulated signal which will be detectable by a simple mono radio receiver or a Hi-Fi stereo receiver. Two PCB's: 35x156mm and 87x186mm. Supplied complete with a mains transformer and printed sticker for fascia panel. Supply voltage 24Vac/110mA. **1079KT £104.95**

30W Linear FM Amplifier

Fully assembled linear FM amplifier (88-108MHz) ideal for building a small-area radio station without spending a lot of money. It is directly driven using our PLL FM synthesiser set-up (e.g. kit [1144](#) with [1187](#)) or an equivalent PLL that gives an output of 0.6-0.7 Watts. The two-stage circuit uses Philips BLY87 and BLY89 high frequency transistors and toroidal transformer to provide an output power of 30 Watts in the antenna. The unit is easily tuned, is supplied ready assembled with heatsink and requires only 7 connections. Voltage: 12.5-13.8V / 4A (e.g. kit [1056](#)). Dimensions inc. heatsink: 180x90x50mm. **AS1141 £164.95**

PLL FM Synthesizer

Upgrade your FM transmitter with this FM PLL synthesizer to ensure accurate tuning without the slightest declination. The circuit employs a Motorola MC145151 and crystal to give excellent signal stability. The transmitting frequency is selected by using a combination of dip switches that cover the 88-108MHz bandwidth in 50KHz steps. Can be used with kit [1187](#) below to give you a complete PLL transmitter. This set-up can be used to drive a linear amplifier (kits [1141](#) & [1179](#)) for even more power output. Voltage: 24-30Vdc. PCB 65x120mm. **1144KT £52.95 / AS1144 £62.95**

15W Linear FM Amplifier

This linear FM amplifier (88-108MHz) is ideal for building a small-area radio station without spending a lot of money. It is directly driven using our PLL FM synthesiser set-up (kits [1144](#) and [1187](#)) or an equivalent PLL that gives an output of 0.6-0.7 Watts. The circuit uses a Philips BLY88C high frequency transistor and toroidal transformer to provide an output power of 15 Watts in the antenna. The unit is easily tuned, is supplied ready assembled with heatsink and requires only 6 connections. Voltage: 12.5-13.8V / 2A (e.g. kit [1171](#)). Dimensions inc. heatsink: 120 x 70 x 50mm. **AS1179 £119.95**

3W VCO FM 88-108 MHz

This linear FM Voltage Controlled Oscillator (VCO) amplifier kit provides the ideal way to extend the range and capabilities of any FM transmitter operating in the 88-108MHz bandwidth without spending a lot of money. The circuit is based on high fre-

quency transistors that lead to a BFS22A and provides an output power of 3 Watts in the antenna. You can use this amplifier with our PLL FM synthesiser kit [1144](#) to give yourself a complete high-quality PLL transmitter set-up. This set-up can be used to drive a linear amplifier (kit [1141](#) or [1179](#)) for even greater power output. Mixer kit [1052](#) can be used for the audio input. Voltage: 15-18Vdc. PCB 65x160mm. **1187KT £49.95 / AS1187 £59.95**

NEW 250mW Mono FM Transmitter



This 250mW Mono FM Transmitter is

really our [3018 FM transmitter](#) and [3171 250mW FM Power Amplifier](#) combined onto a single printed circuit board.

The result is a high quality, stable, mono FM transmitter which can be tuned over the full commercial FM band (88MHz - 108MHz) with a true line-of-sight range of 1 kilometre. It requires no tuning or alignment procedures. Supply: 12Vdc/500mA. Dimensions (mm): 50W x 87L x 15H. Screw terminal blocks for connections.

3167KT £14.95 / AS3167 £29.95

NEW 250mW FM Power Amplifier

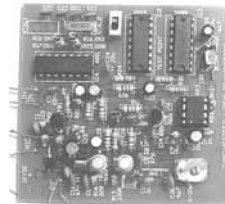


Easy-to-build 2-transistor VHF power amplifier,

with about 16dB gain. Requires no tuning or alignment procedures. Circuit design uses

wideband techniques and is equipped with a "low-pass" filter to ensure good output spectral purity. The circuit is specifically designed to amplify the output of 7mW to 10mW Wide Band Frequency Modulated (WBFM) transmitters like our Order Codes [3018](#) and [3172](#) to a final level of 250-300mW (enough for a low power home broadcast station). Supply: 12Vdc/500mA. Dimensions (mm): 45W x 70L x 15H. Screw terminal blocks for all connections. **3171KT £11.95 / AS3171 £19.95**

NEW Wide Band Synthesised FM Transmitter



This complete crystal-controlled Wide Band Fre-

quency Modulated (WBFM) transmitter delivers a high quality, stable power output of 10 milli-watts and is based upon the Phase-Locked Loop (PLL) principle. The transmitter has both 1v peak-to-peak 'LINE' input and 10mV 'MIC' audio inputs. These will accept audio input sources from external equipment, such as hi-fi, CD, audio mixer (like kit [1052](#)) and computer equipment. The spurious output signal level is better than -40dBc (0.0001 times the power of the wanted signal level), which makes the project suitable for driving an external power amplifier. It delivers up to 10milliwatts of RF power to the antenna which can be a simple single wire, open dipole or ground plane. Output power can be boosted to 250mW when used with our FM Power Amplifier above (Order Code

[3171](#)).

Technical Specifications

Modulation type : Crystal-controlled Wide Band Frequency Modulated (WBFM)
Frequency : 88-108 MHz
Output power : 10 milli-watts (+10dBm)
Working voltage : 12Vdc (tolerance 9-16Vdc)
Max. current : 100mA
Dimensions : 68x72mm

Good project for the experienced or beginners wanting to get started in the fascinating world of FM broadcasting. Solder pads for connections.

3172KT £14.95 / AS3172 £32.95

3171KT £11.95 / AS3171 £19.95

Games

Stress Meter Game

This circuit can form the basis for a game which apart from giving you hours of fun will also show you how nervous the player is. As a game it requires nerves of steel dexterity and patience.

Great fun for family gatherings, parties, fetes etc. The circuit can also be used as a BUZZER in alarms and warning systems. Operating voltage: 9Vdc. Output: 50mW. Max. current: 60mA. 42 x 61mm. **1090KT £9.95**

Deluxe Electronic Roulette Wheel

The simplest and most entertaining way to play roulette and have fun with your friends. This Deluxe Electronic Roulette Wheel will introduce you to the magic world of electronics and it will provide hours of entertainment from the many games that can be played.



where poor reception is experienced. It can also be used for FM Radio receivers. It has very low power consumption and battery powered.

Technical Specifications

- Frequency range : 40-860 MHz
- Frequency range : 40-860 MHz
- Signal gain : 15-22 dB
- Input/output impedance: 75 Ohm
- Working voltage : 9-18Vdc
- Power Supply : 9V PP3 battery or [PSU443](#)
- PCB : 41x55mm

1084KT £6.95 / AS1084 £8.95

Multiband Radio Receiver

High sensitivity multiband radio receiver covering the Air, Police, Marine, TV1, FM and CB bands. Suitable for receiving all of our FM surveillance devices.



Frequencies

CB:	1-80 Channels
TV1:	58-87MHz
FM:	88-108MHz
AIR:	108-136MHz
Police/Marine:	145-176MHz

Stubby rod antenna. Earphone jack. DC adapter jack. Supply: 6Vdc (4 x AA batteries not supplied). Carrying strap. This product is assembled and ready to use. **4051 £24.95**

Relay Boards

1168, 3043 and 3045

These handy little relay boards offer a neat and tidy solution to making a relay output. These modules use a PCB to carry the relay. A suppresser diode is also included to eliminate relay contact arcing. We have standardised on two 12V relay types.

Logic / LED Activated Relay Board

Similar to our discontinued kit 3044, this useful transistor switched relay board allows you to control external equipment from a simple 5V logic or LED signal. The relay is triggered when a signal of over +1.4Vdc is applied to the input and turns off when the voltage falls to zero. It has a relay output capable of handling 250Vac/1A but we recommend you use kit [3084](#) to directly switching main voltages. It can be used in automation applications, control rooms, VOX circuits etc. Supply: 6-12Vdc. PCB 37x45mm. **1168KT £5.95 / AS1168 £7.95**



5A Relay Board

Large SPDT relay rated to switch 5A @ 240Vac max. Supply: 12Vdc. PCB: 38 x 30mm. **3043KT £5.95 / AS3043 £7.95**

Twin 1A Miniature Relay Board

Two miniature relays rated to switch 240Vac / 1A max. Supply: 12Vdc. PCB: 52x28x19mm. **3045KT £7.95 / AS3045 £9.95**

Dual Hi/Lo Switched Relay Board



Useful TTL compatible switched dual relay board that allows you to control external equipment from a simple 5V logic or LED signal. Each relay has an independent trigger inputs for either LO (0 - 0.8V) or HI (2.4 - 12V) signals. The relays are mains

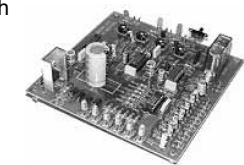
rated to 5A. Screw terminal blocks provided for all connections. Supply: 12Vdc. Dimensions (mm): 45Wx70Lx20H. **3156KT £7.95 / AS3156 £11.95**

Security

5W Electronic Siren

A powerful 5 watt electronic siren suitable for alarm systems, cars, motorbikes, etc. Consists of a two-transistor multivibrator and two-stage amplifier section. Suitable power supply: KIT 1063. Operating voltage: 6-12 Vdc. Max. Current: 1A. Frequency tone: 1.2 KHz. **1003KT £7.95**

Home/Shop Alarm System



A very good alarm system for houses and

shops with professional specifications. It has adjustable entry and exit times and variable alarm duration. It has four different branches (2 delayed and 2 with immediate alarm) with open or closed loop. It also has a battery backup circuit which uses Lead-Acid batteries (not supplied) and charges them automatically. Supply Voltage: 10Vac AC. Current: 2 Amps max. PCB: 140x140mm. Solder posts for all connections. **1094KT £32.95**

YOU CAN PAY BY:



16F627 16F627A 16F628 16F628A
16F648A 16F73 16F74 16F76 16F77
16F83 16F84 16F84A 16F630 16F676
16F870 16F871 16F872 16F873 16F873A
16F874 16F874A 16F876 16F876A 16F877
16F877A 18F242 18F248 18F252 18F258
18F442 18F448 18F452 18F458 18F2220
18F2320 18F4220 18F4320 - see website
for updated listing.

Additional Items Required

Power Supply: 18Vdc (Order Code [PSU010](#)), Lead: USB Plug A-B (Order Code [LDC644](#)) and/or M-F Serial Port Lead (Order Code [LDC441](#)). For maximum ease of use an optional 40-pin Wide ZIF socket can be used in place of the standard DIL socket supplied (Order Code [ZIF40W](#)).

3149KT £34.95 / AS3149 £49.95

USB Port ICSP PIC Programmer

Professional quality PIC Programmer. Quick and convenient USB port connection makes it ideal for use with modern and laptop computers. There is a 6-pin header cable for ICSP (GND, VCC, CLK, DAT, LOW, VPP1) and Auto Program feature for fast no-key-press bulk programming. The board is supplied completely assembled. You will need the ZIF socket to program the 0.3" wide DIL devices listed. Windows Software interface is a free download. It has a USB 'B' connector and sits on 4 rubber feet.

Software

As described for 3128 above.

Devices Supported

Same as 3149 - see website for latest device listing.

Additional Items Required

Power Supply: 18Vdc (Order Code [PSU010](#)), Lead: USB Plug A-B (Order Code [LDC644](#)).

AS3150 £39.95

AS3150ZIF £54.95

USB Flash ICSP PIC Programmer

This is a fully assembled version of our [3128](#) USB Flash Microchip PIC programmer (detailed above) but without the programming socket. It just has a 5-pin ICSP header (GND, VCC, CLK, DAT, VPP). No external power supply is needed. It provides reliable, high speed programming and uses our FREE MicroPro Windows software interface (as described for kit 3128 above). A bi-coloured LED indicates the programmers status. Please note that LVP programming is not supported. It is supplied in fully assembled format only as most of the components are surface mount. The board is only 48 x 30mm. There are 4 nylon feet to protect the underside and a short header cable is provided. USB 'B' female connector.

Software

As described for kit 3128 above.

Devices Supported

As listed under kit 3128 above.

Additional Items Required

USB Lead (Order Code [LDC644](#)).

AS3182 £37.95

Radio Receivers

AM/FM Aerial Amplifier

Small aerial amplifier with good gain factor and a bandwidth broad enough to cover all the broadcasting frequencies from 1MHz to 160 MHz. Ideal for use with vehicle radios or any receiver in difficult reception areas. Simple to build even for the most

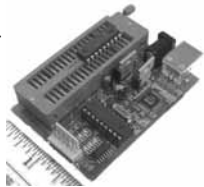
inexperienced beginner. Gain: 6dB. Power: 9-12Vdc / 10mA (max). PCB: 30x35mm.
1038KT £6.95 / AS1038 £9.95

FM Radio Receiver

This kit is a great way to explore the wonders of modern FM radio. The finished project gives a very decent performance indeed with surprising good sensitivity and sound quality even when used with just the simple wire antenna and small speaker provided. The circuit uses a [TDA7000](#) which provides a complete FM receiver in a single IC package. Varicap tuning provides high stability and a powerful 5 Watt TDA2003 audio amplifier section gives a good quality sound output. No setting up or special test equipment are required. The coils are already wound and the only things you have to do is to tune into a station adjust the volume and enjoy the music. Excellent intermediate level project for schools and colleges. Introduces a good selection of components. Tunes to the standard FM broadcast frequencies (88-108MHz). Operating voltage: 9-12Vdc. Supply Current: 500mA minimum. Sensitivity: 1.5V. S/N Ratio: 60dB. Distortion: 0.7%. All components including speaker, heatsink and pre-wound coil are supplied. PCB: 80 x 50mm. .
1055KT £22.95 / AS1055 £27.95

TV Aerial Amplifier

High gain, broadband aerial amplifier (signal booster) suitable for improving picture quality of Digital TV (DVB/DTV/Freeview), TV1, VHF, UHF broadcasts



The electronic roulette wheel simulates the ball spinning and has sound too. It using a micro-controller for guaranteed reliability and transparency. Great fun! Supply: 9 Vdc. PCB: 123 x 126mm **1192KT £46.95**

LED Dice with Slowdown

The classic beginners electronic project that never loses it's appeal. Combines a great game with an easy introduction to electronics and simple circuit analysis. Seven LED's are used to simulate a real dice face. Push the 'Start' button and watch the dice roll, slow down and stop on a number at random. Uses a clock and counter circuit based around a 555 timer and 4017 decade counter IC. Box supplied. 9V operation.
3003BKT £8.95



Stairway to Heaven

This game of skill will test your hand-eye co-ordination. Practice at home, then thrash the pants off your mates! You must press the switch each time the green part of the bi-polar LED lights. If you are successful the stairway of 6 red LED's light up in sequence - but miss and you start again! This kit is a good introduction to several basic electronic circuits and also gives you a surprisingly addictive game to play. Box included. Operates on a 9V PP3 battery. 78 x 50mm. **3005BKT £8.95**
LED Roulette Wheel
A great introduction to gamblingerr, electronics!! Ten



LED's arranged in a circular pattern simulate the ball rotating around the "wheel". Press the "Roll" button & the 'ball' runs at maximum rate. Release button and an adjustable voltage controlled oscillator (VCO) circuit causes the 'ball' to slow down and stop on a number. Teaches you about decade counters and VCO operational amplifier circuits. PP3 9V battery operation. 88 x 88mm. **3006KT £8.95**

PIC Single LED Dice

One of the most popular electronic kits devised is LED Dice.



This version uses a PIC16C54 microcontroller to bring it right up to date, replacing the old logic and display drivers with a single uC. A neat example of how microcontrollers are used in modern electronic designs to simplify assembly and reduce costs. After pressing the 'start' button, a number between 1 and 6 is displayed on a 7-segment LED display. The PIC is supplied pre-programmed and the complete, fully commented, software code used (plus the public domain assembler program from Microchip) is also available for you to study and learn from, making this kit an excellent introduction to using and programming micro controllers. Ideal teaching project. 35 x 65mm. **3069KT £8.95**

Prices include
17.5% VAT

Order online and get
reduced price UK
Postage & Packing

Light Effects & Lasers

⚠ **WARNING!** Many projects in this section require direct connection to 240Vac mains supply. Read note on page 2 before ordering.

Mono Music to Light Effect

Add rhythm to any party or disco with this simple but effective low cost light modulator. Success and satisfaction guaranteed. Very safe operation since it uses an optoisolator as a coupling device between the audio and the mains controlling stages of the circuit. Small plastic case supplied. Operating voltage: 220 Vac. Power handling: 800 Watt max. Input sensitivity: 2-60 Watts. ⚠ **1006KT £10.95**
Box 2006 £5.95

3-Channel Wireless Music to Light Effect

This wireless music to light modulator can be used in any situation and with any sound source. It has three channels (high, medium, low frequency), each capable of driving 400 Watts and with independent sensitivity adjustment. Sound waves are picked up using a sensitive electret microphone supplied. No direct connection between the unit and the amplifier needed thus eliminating any danger of damaging your valuable sound equipment. Supply: 220Vac. Output power: 3X400 Watts. PCB 54x112mm.
1014KT £17.95 /
Box 2014 £8.95

Running Lights

An exciting 12 LED rotating light effect with variable rotation speed and direction. Ideal for

parties, discos, shop-windows and eye-catching signs. The printed circuit board is designed so that it is possible, to use 220V mains bulbs instead of LEDs by simply adding three BT136 - 500 or equivalent TRIACs (not supplied), making the kit suitable for professional applications. Operating voltage: 9-15 Vdc. Consumption: 100 mA. Output power: 3x800 Watts (with TRIACs). PCB: 54x112mm.

1026KT £12.95
Box 2026 £8.95

Disco Strobe Light

The best of all light effects, previously available only as professional equipment for Discos, now available to amateur constructors at a very reasonable price. A very bright strobe that will give the illusion of interrupted motion. The rhythm is variable and you can add a second XENON tube to increase the light output. Supply: 220 Vac. Strobe frequency: 1-60 Hz. ☼

1037KT £20.95

Box 2037 £11.95

LED Sweet Heart

A unique heart shaped light effect. The heart is made up of 20 LEDs that are turned on and off periodically. May be used to decorate a room, inside a car, to attract attention in a shop window, or even given as a token of some special affection! No adjustments are required. Supply: 9Vdc (our PSU443 is suitable). Current: 100mA. PCB: 60x63mm. **1104KT £10.95**

Please remember to add
£3.95 P&P for UK orders

Super 3-Channel Music to Light Effect

Provides impressive light effects thanks to very good channel separation



between the low, medium and high frequency signals. Each channel is able to drive up to 1KW load. Easily connects to any audio amplifier with 1 to 100 Watts output power or other audio source. Input sensitivity is adjustable. Uses three optocouplers to completely isolate the modulator from the audio source. Output power per channel: 1KW peak. Input voltage: 2.5-28V AF. Input impedance: 500KΩ. Filter frequency responses: 10-160Hz; 350Hz-850Hz; HIGH: 1.8-12KHz. Supply: 220Vac. Current dissipation 4VA. PCB: 102 x 112mm. ☼
1132KT £39.95

Stereo Music to Light Effect

Stereo music to light modulator that can be used to make one or more lamps follow the rhythm of the music. Two optocouplers are used to link the modulator to the sound source isolating at the same time the two circuits completely. Supply: 220Vac. Maximum current 4A per channel. Maximum output power: 800W per channel. Input sensitivity: 2-60 Watts ☼
1133KT £13.95
Box 2133 £8.95



Please refer to the warning on page 2 before purchasing mains powered projects

Special Light Effects

Ideal for driving various light signs for shops. The signs may contain letters formed by the LEDs, in order to create messages like MERRY CHRISTMAS, SALE, SPECIAL OFFER, etc. It is also possible to create decorative signs like stars and hearts! Supply: 9-14Vdc (Order Code PSU445). Current: 100mA. PCBs: 62x83mm and 70x86mm. **1157KT £29.95**



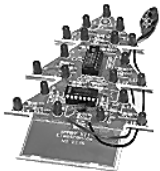
Double Heart Flasher

This double LED heart flasher has more than twice the impact of a single heart. The two hearts formed by the 40 red LEDs simulate an electronic optical heart beating. Can be used to decorate a room, inside a car, to attract attention in a shop window, or even given as a token of some special affection! Supply: 9-15Vdc (PSU445 or kit 1061). Current: 50mA. PCB: 62x68mm. **1162KT £11.95**



Flashing LED Christmas Tree

Add some colour and fun to your Christmas with this light effects unit. This electronic Christmas tree has 19 red LEDs which turn on/off successively. Can be used to decorate a room, inside a car, to attract attention in a shop window, a gift to your friends and relatives or send it as a Christmas card. Supply: 9Vdc



W9x (it will **NOT** run on later Windows). Available free from our website.

PCB 55 x 60mm. Supply: 9-12Vdc (Order Code PSU445). Connects to PC parallel port (Lead Order Code LDC136).

3151KT £9.95 / AS3151 £14.95

PIC Programmers

P16PRO40 Serial PIC Programmer (8 to 40 Pin)

Super value programmer designed for use with the P16PRO DOS or PICALLW Windows software (freeware version available for download from our website). It will program virtually all 8 to 40 pin DIP serial programmed PIC's in the 12C5xx, 16Cxxx, 16Fxxx and 18Fxxx series—see website for full list. *Parallel* programmed PIC's (16C5x) are not supported—use our 3149 or 3150 USB programmers detailed below. The software works under DOS and all versions of Windows **except XP/NT**. Connects to PC parallel port (Lead Order Code LDC136). Can be used with an optional 40-pin ZIF socket (Order Code ZIF40W). Power: 17-30Vdc (PSU020) or 12Vac (PSU235). **3096KT £14.95 / AS3096 £19.95**



leased. Supplied with fully functional pre-registered DOS and PICALLW Windows software packages, all components and high quality DSPTH PCB. Free software updates are available from our website. Connects to PC parallel port (Lead Order Code LDC136). Supplied with a 40 DIL IC socket as standard but for maximum ease of use and to allow 8 & 18 pin devices to be programmed you will need to use the 40-pin Wide ZIF socket (Order Code ZIF40W). Power: 17-30Vdc (PSU010) or 12Vac (PSU235). Available in assembled format only. **AS3117 £24.95**

USB 'All-Flash' PIC Programmer

Professional quality USB port 'All-Flash' PIC Programmer. No external power supply needed making this a truly portable programmer. Ideal for field and general use. There is a header cable for ICSP (GND, VCC, CLK, DAT, VPP). The board is completely assembled. Only the bi-coloured LED, programming socket and ICSP header are visible; the other components are protected inside the box. Supplied complete with a box PLUS free Windows Software interface. Remember, you will need the ZIF socket to program the 0.3" wide DIL devices listed below.



Software

Price includes our own fully functional 9x / NT / 2000 / ME / XP software interface which is available for free downloading from our website. Software accepts HEX files and



has Program, Verify, Read, Blank Check, OSCAL and Fuse functions.

Devices Supported

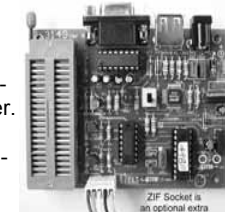
12F629 12F675 16F627 16F627A 16F628 16F628A 16F648A 16F73 16F74 16F76 16F77 16F83 16F84 16F84A 16F630 16F676 16F870 16F871 16F872 16F873 16F873A 16F874 16F874A 16F876 16F876A 16F877 16F877A 18F242 18F248 18F252 18F258 18F442 18F448 18F452 18F458 18F2220 18F2320 18F4220 18F4320 - see website for latest PIC list.

Additional Items Required

USB Lead (Order Code LDC644). **AS3128 £39.95**
AS3128ZIF £54.95

USB & Serial Port ICSP PIC Programmer

Professional quality PIC Programmer. Quick and convenient USB or Serial port connection makes it ideal for use with modern and laptop computers. The board has a header cable for ICSP (GND, VCC, CLK, DAT, LOW, VPP1). Uses an FT232BM surface mount IC pre-soldered to the board and has on-board firmware. All components (excluding ZIF Socket) supplied including a top quality gold plated DSPTH PCB (102 x 78mm) and free Windows Software interface.



Software

As described for kit 3128 above.

Devices Supported

12C508 12C508A 12C509 12C509A 12C671 12C672 12CE673 12CE674 12F629 12F675 16C505 16C554 16C558 16C61 16C62 16C62A 16C62B 16C63 16C63A 16C64 16C64A 16C65 16C65A 16C65B 16C66 16C66A 16C67 16C71 16C71A 16C72 16C72A 16C73 16C73A 16C74 16C74A 16C74B 16C76 16C77 16C710 16C711 16C712 16C716 16C745 16C765 16C773 16C774 16C83 16C84

suited for control applications. See also the **BASCOM** compiler software on page 57.

ATMEL AVR Programmer

Simple-to-use, low cost yet powerful parallel mode programmer for the AVR (AT90Sxxxx) family of microcontrollers. Apart from programming the Flash, EPROM and Lock Bits, this programmer will enable you to program the 'Fuse' bits which are not accessible in serial programming mode. You could for example program one of the fuse bits RCEN to enable the internal oscillator (not possible with serial programming). Also, there is a fuse bit to disable serial programming. If this fuse bit is programmed then the chip is not accessible at all using ISP. It would then only be programmable using a parallel-mode programmer like this one.

This programmer has intelligent onboard firmware and connects to the serial port. It can be used with ANY type of computer and requires no special software. All that is needed is a terminal/communications program which all computers have. 2 LED's are used to indicate programmer status. This programmer is supported by the **BASCOM-AVR** Basic Compiler software (see page 57 for details).

Devices Supported

- 20-pin DIP: AT90S1200, AT90S2313
- 40-pin DIP: AT90S4414, AT90S8515, AT90S4434, AT90S8535 plus
- 90S4434 and 90S8535 using optional adaptor board (Order Code **3122ADT**—£4.95)
- It will not program the 8-pin AVR devices 90S2323 & 90S2343

Additional Items Required

- For maximum ease of use optional 20-pin ZIF socket (Order Code **ZIF20**) and 40-pin Wide ZIF socket

(Order Code **ZIF40W**) can be used in place of the standard DIL sockets supplied

- Supply: 16Vdc (Order Code **PSU010**)
- Serial port lead (Order Code **LDC441**)

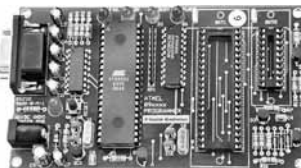
3122KT £19.95

AT90S4434 / AT90S8535 Adaptor Board for Kit 3122

Simple adaptor board to enable programming of AT90S4434 and AT90S8535 devices with our AVR programmer **3122**. It comprises a small PCB with connection plugs and a 40 pin DIL socket. Can be fitted with an optional 40 pin ZIF socket (Order Code **ZIF40W**) if preferred.

3122ADT £4.95

ATMEL 89xxxx Programmer



Simple-to-use, low cost yet powerful programmer for the 8051 family of microcontrollers. It will Program, Read and Verify Code Data, Write Lock Bits, Erase and Blank Check. **All fuse and lock bits are programmable.**

This programmer has intelligent onboard firmware and connects to the serial port. It can be used with ANY type of computer and requires no special software. All that is needed is a terminal/communications program which all computers have. 5 LED's are used to indicate pro-

See Page 3 for connection leads, power supplies and ZIF Sockets

grammer status.

Devices Supported

- 89C1051, 89C2051 and 89C4051
- 89C51, 89LV51
- 89C52, 89LV52
- 89C55, 89LV55
- 89S8252, 89LS8252
- 89S53, 89LS53
- 87F51, 87F52 (otp)
- Unless specifically listed above device is not supported e.g. 89C55WD is NOT supported

Additional Items Required

- For maximum ease of use optional 20-pin ZIF socket (Order Code **ZIF20**) and 40-pin Wide ZIF socket (Order Code **ZIF40W**) can be used in place of the standard DIL sockets supplied
- Supply: 16Vdc (Order Code **PSU010**)
- Serial port lead (Order Code **LDC441**)

3123KT £24.95

EEPROM Programmer

EEPROM Programmer

Programs 24xxx, I²C bus and SPI 93xxx serial 8-bit EEPROM's. You can use a 16 pin ZIF socket (not supplied) for volume programming. The top 8 pins are for the 24xxx; the bottom 8 are for the 93xxx SPI EEPROM's. The software supplied allows the user to read, program and verify EEPROM's, save EEPROM contents to disk and view EEPROM contents.

Devices Supported

- 2401, 2402, 2404, 2408, 2416
- 2432, 2464, 24128, 24256
- 9346, 9356, 9366, 9376, 9386

Software

The programmer is controlled by special driver software 'eeprog' that will run under DOS, W3.1,

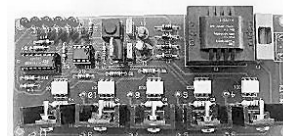
PP3 battery (not supplied). PCB: 87x130mm. **1175KT £14.95**

Musical LED Jingle Bells

Not only do you get two Christmas jingle bells with 24 flashing red LEDs, it also plays your favourite Christmas songs too! Use to decorate a room, inside a car, to attract attention in a shop window, a gift to your friends and relatives or send it as a Christmas card. Supply: 9Vdc PP3 battery (not supplied). PCB: 85x120mm. **1176KT £17.95**



5 Channel PIC Chaser (with TRIAC Outputs)



An impressive PIC controlled light chaser with five TRIAC outputs rated at 500W each. Ideal for parties, discos, shop-windows and eye-catching signs. The pre-programmed PIC can create 8 different lighting combinations including sequential ON/OFF, front-back, one by one, etc, by simply pressing the program button. The board has five TRIAC outputs with corresponding LED monitors. The board is powered from 230Vac mains and is supplied complete with an onboard power supply step-down mains transformer and fuse. All components including TRIACs and heatsinks supplied

Specifications

Output power: 500 Watts per channel (total 2500 Watts). Working voltage: 230Vac mains

(onboard transformer included). Power consumption: 50mA (excluding lamps). PCB: 67x153mm. Solder posts for all connections. **1223KT £36.95**

Mono Music to Light Effect

Make your own simple disco light that pulsates to the music's beat. The circuit uses an audio input to modulate the intensity of one or more lights. This kit uses a safe, modern opto-coupler triac based design that completely isolates the mains voltage lighting circuit from the low voltage amplifier section. Any music signal from 1.2-1.5V and 15-60mA will drive the circuit. Triac rated 4A @ 250V. Terminal strips for load & AC, 3.5mm jack socket for audio input. PCB 54x45x25mm. **3012KT £8.95**

Mains Powered Strobe Light (240Vac)

Build your own high power flashing strobe. Kit uses an extremely high light output Xenon Flash tube as found on aircraft, camera flash units, signal beacons and disco lights. Adjust to flash from one every three seconds to three flashes per second. 240Vac. **3014KT £15.95**

Multi-Sequence LED Flasher

5 ultra-bright LED's flash in 7 patterns. Cycle through the patterns using one switch. On finding the pattern you want you push the other switch to keep it flashing so long as power is connected. Small COB PCB with motherboard supplied for ease of construction. 3V supply. **3037MKT £5.95**

**KT = Kit Price
AS = Assembled Price**

Super LED Star

10 attention-grabbing and absorbing patterns are produced by this high-tech microcontroller driven LED Star. It is far more impressive than any other LED flasher we have seen. You could use it in shop windows to attract customers (it really is impossible to miss!) or just for fun. It uses 30 super-bright red LEDs and a pre-programmed ATMEL micro-processor. It would be quite easy to cover the PCB with a decorative mask. All source code is provided. Power Supply: 9-12Vdc (Order Code **PSU445**). PCB: 97x102mm. **3046KT £17.95**

5 LED Random / Sequence Flasher

5 ultra-bright red LED flasher. Ideal for electronic toy, model railway and warning light applications. You can switch between random or sequential mode. Tape up two 1.5V button cells with the PCB. Good introduction to electronics in today's toys & games. COB PCB with motherboard supplied for ease of construction. 3V supply. **3052MKT £5.95**



Hi-Tech Multi-Coloured Flashing Christmas Tree

Not any old Christmas Tree Flasher but an ultra sophisticated multi-colour, multi-pattern LED flasher that has a microcontroller at it's heart. The LEDs run over 20 minutes of



different red, green and orange coloured pattern sequences that keep any watcher mesmerised. Put it on the top of your tree or use it to attract attention to shop windows. It is a guaranteed attention grabber. All documentation, source code and instructions are provided. Power Supply: 6-10Vdc (Order Code **PSU443**). PCB: 130x100mm. **3103KT £18.95**

Super LED Flashing Heart

A simple rearrangement of the LED Star kit **3046KT** into two heart shapes. Electrically the hardware stays exactly the same. All that has changed is the software lookup table. Kit demonstrates the power of using an ATMEL microcontroller over normal IC's. All documentation, source code and instructions are provided. Power Supply: 6-10Vdc (Order Code **PSU443**). PCB 102 x 102mm. **3136KT £16.95**



6Vdc Xenon Flasher



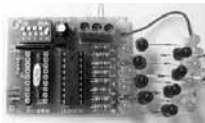
Uses a simple 6Vdc input (from a power supply or batteries not supplied) to trigger a high voltage onboard xenon U-flashtube. The flash rate is fixed but we explain how you can vary it by changing resistor and/or capacitor values. Onboard fuse protection. Pre-wound transformer. Power Supply: 6Vdc. Current: 150mA approx. PCB: 45x90mm. **3162KT £13.95 / AS3162 £19.95**

12Vdc Xenon Flasher

Similar to **3162**, this version requires a 12Vdc input to trigger a high voltage onboard xenon U-flashtube. Two capacitors are supplied to give different flash rates. A potentiometer is used to vary the flash rate from about 1-2 flashes per second and 3-6 flashes per second (depending on the capacitor fitted). Onboard fuse protection. Pre-wound transformer. Power Supply: 12Vdc. Current: 200mA. PCB 45x90mm. **3163KT £13.95 / AS3163 £19.95**

Versatile PIC Controlled LED Flasher

Versatile PIC based LED or filament bulb flasher. Can be used to flash from 1 to 160 LEDs. The user arranges the LEDs in any pattern they wish. The kit comes with 8 super bright red LEDs and 8 green LEDs. Based on the EPE Versatile PIC Flasher article (Dec 2002). See website for full details. Board Supply: 9-12Vdc. LED supply: 9-45Vdc (depending on number of LED used). PCB: 43x54mm. **3169P1KT £11.95**



Laser Pointers

Applications

- Conference, seminars, presentation
- Training and educational classes
- Construction projects
- Museums and art galleries
- Jewellery or other retail store

Key Chain Laser Pointer



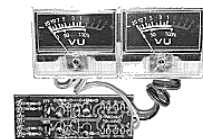
High quality key chain red laser pointer incorporating advanced laser optics and microelectronics. Supplied with

batteries, hard plastic case and an attractive cardboard presentation box. Wavelength: 630~650nm. Power: <1mW. Range: 400~500m. CE Approved. **4002 £7.95**

LASER SAFETY PRECAUTIONS!
Avoid direct eye contact to laser beam. Keep out of reach of children. We accept no responsibility for misuse of these products.

Meters

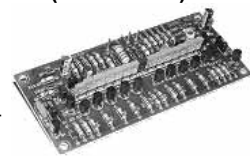
Analogue Stereo VU Meter



This analogue VU meter enables you to easily and accurately monitor the output of your amplifier. It is a must for every amplifier, especially if the hi-fi system is also used for tape recordings. The board is small enough to fit in most existing amplifier cases and is an ideal add-on module for any of our amplifier kits, or existing equipment. Suitable for any amplifier from 0.1 to 100 Watts RMS. The kit includes two analogue meters as pictured. Supply: 12Vdc i.e. Order Code **PSU445** (with connector **7-1012**) or kit **1061**. PCB: 33 x 87mm. Solder posts for all connections. **1039KT £23.95**

Symmetrical Stereo VU Meter (2 x 15 LED)

This stereo VU meter is easily fitted to any amplifier or preamplifier in the car or at home. It uses 15



uses two 7805 regulators to provide both a fixed output of +5V for TTL work and a variable output from +5V to 33V max (or 2V under the input voltage). Accepts an input voltage of 7-30Vdc or 7-20Vac from a transformer or mains power adapter (not included). PCB: 78 x 50mm. Box provided. **3004BKT £9.95**

Regulated Power Supply

Universal PCB for easy and neat mounting of any 78xx series 3 terminal regulator. Comes with heatsink, 1A bridge, 2 smoothing caps., LED plus PCB mounted ON/OFF switch, terminal blocks and input jack. The user supplies any 78xx series regulator from 5 to 24V i.e. 7605, 7806, 7808, 7809, 7812, 7815, 7818, 7820, & 7824. Accepts an unregulated AC or DC input. PCB 64x38x35mm. **3060KT £5.95**



Variable Voltage Power Supply Module

Fully adjustable 1.5 to 30Vdc / 1.5A power supply using an LM317T voltage regulator. Takes an unregulated AC or DC input (33V max.) via screw terminal block or power jack. Output voltage is 3V under input voltage. Onboard On/Off switch, diode protection. All components supplied including heatsink, pot and LM317T. PCB: 40x50mm. **3068KT £7.95**

Universal Power Supply



The kit provides a universal

PCB for mounting any pair of **78xx** (positive) and **79xx** (negative) series 3 terminal regulators to give a regulated, dual polarity DC power supply to a project in the range ± 5 to ± 18 Vdc/1A. Supplied with 2 small heatsinks. Requires centre-tapped AC voltage source. Put in your own matched 78xx and 79xx 3-pin regulator pairs up to give outputs up to ± 15 V. PCB 130x45mm. **3083KT £9.95**

Dual Unregulated Power Supply

Turn the AC output of a centre-tapped transformer (you supply one suitable for your needs) into a smoothed unregulated dual DC power supply suitable for powering many audio amplifiers. Four 100V/3A diodes and 200uF/50V electrolytics are PCB mounted to avoid the usual spaghetti-wired mess. **3114KT £10.95**

Positive Adjustable Power Supply Module

This compact positive variable power supply module is easy to build and use. It is ideal for powering any application requiring a DC supply of up to 1.5A.



Features

- Output reverse polarity and back-voltage protection
- LED power on indication
- On board heatsink for IC regulator
- Variable output voltage
- AC or DC input voltage (1.2 - 37V)
- Low noise (uses linear regulator)
- Screw terminals for inputs & outputs
- Compact dimensions (84 x 37 mm)

This kit can be combined with kit **3125** to create a dual-rail supply. **3124KT £10.95**

Negative Adjustable Power Supply Module

As kit **3124** but negative polarity. **3125KT £11.95**

Step-Up Converter (12Vdc to 16.5Vdc)

Converts a 9-12Vdc input to a 16.5Vdc/200mA output. Useful for powering our range of Atmel and PIC programmers from a regulated 12V plug-pack. PCB: 40 x 50mm. **3135KT £5.95**

± 45 Vdc Amplifier Supply



This is a DC power supply board designed for our **3106** audio power amplifier. It is

also suitable for any power amplifier module or circuit requiring a positive and negative rail voltage of up to 45 Volts per side. The output voltage and current will depend on the transformer chosen (this is not supplied with the kit and must not exceed 35V-0-35V). Maximum current: 5 Amps. Solder pins for all connections. PCB: 60 x 80mm approx. **3186KT £10.95 / AS3186 £13.95**

PIC and ATMEL Programmers

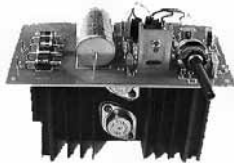
Our ATMEL, EEPROM and PIC programmers are suitable for both hobby and professional use.

ATMEL Programmers

With relatively few input/output lines, a limited instruction set and almost no peripherals ATMEL microcontrollers are well

Lead Acid Battery Charger

Trickle charger mainly intended for continuous use in the maintenance of lead-acid batteries in alarm systems and emergency lights. It incorporates a rectifier, voltage regulator and an automatic electronic switch that selects fast or slow charge rate according to the battery's condition. A visual indicator shows which charge rate is being used. Input voltage: 12Vac/2A (transformer [Order Code M/T12V/2A](#)). Output Voltage: 12Vdc. Output current: 1A max. PCB: 50x72mm. **1095KT £12.95**

Stabilised Power Supply 2-30Vdc/5A

Easy-to-build, powerful, stabilized

power supply with variable output voltage from 2 to 30 volts and a maximum power rating of 5A. It covers almost all of the voltage needs in the electronic laboratory. It uses the well known LM317 voltage regulator. The kit comes complete with a large heat sink for the power transistors. You just need to add a 24Vac/5A mains transformer ([Order Code M/T24V/5A](#)). PCB 77x150mm. **1096KT £32.95**

Stabilised Power Supply 0-30Vdc/3A

High quality power supply with a continuously variable stabilized output adjustable at any value between 0 and 30Vdc. It also incorporates an electronic output current limiter that effectively controls the output current from a few milliamps (2 mA) to the

maximum output of 3 Amps. This feature makes this power supply indispensable in the experimenter's laboratory as it is possible to limit the current to the typical maximum that a circuit under test may require. Untested circuits can be powered up without any fear that it may be damaged if something are any problems. There is also a visual indication that the current limiter is in operation so that you can see at a glance that your circuit is exceeding or not its preset limits.

Features

- Reduced dimensions, easy construction, simple operation
- Output voltage easily adjustable
- Output current limiting with visual indication
- Complete protection of the supplied device against over loads and malfunction

Technical Specifications

Input Voltage: 24 Vac
Input Current: 3 A (max)
Output Voltage: 0-30 V adjustable
Output Current: 2 mA-3 A adjustable
Output Voltage Ripple: 0.01 % maximum
PCB: 85x123mm

Uses three op-amps and four transistors and comes complete with a large heat sink for the power transistors. You just need to add a 24Vac/3A transformer ([Order Code M/T24V/3A](#)).

1138KT £30.95

Power Supply 3-4.5-6-9-12V/1.5A

Universal stabilized power supply with 5 fixed voltage DC outputs. Depending on the transformer used for the input, it gives the related DC output of 3-4.5-6-9-12V at power rating of up to 1.5A. Can be used to power many electronic devices such as radios, tape recorders, portable TV's, etc. You need to add a

12Vac/1.5A transformer ([Order Code M/T12V/2A](#)). PCB 85x123mm. **1169KT £16.95**

RF Power Supply 12-14Vdc/3A

RF transmitters and receivers demand special power supplies to avoid many serious problems like noise, overheating, standing waves, etc. This power supply blocks these unwanted high frequencies and delivers a crisp, clean voltage of 12-14Vdc with 3A maximum current. It has electronic stabilisation and full thermal and short circuit protection. You simply need to add a 18Vac/3A transformer ([Order Code M/T18V/3A](#)). PCB 72x82mm. **1171KT £27.95**

±40V/8A Power Supply

This dual polarity power supply is ideal for audio power amplifiers like out kit [1199](#) because it has four large 4700uF/63V capacitors for smoothing. If the amplifier is used alone for a MONO system, a 2 x 28V/4A transformer is sufficient. If you plan to use a STEREO amplifier setup then the transformer should have an 8A rating. Output Voltage: +/-40Vdc maximum. Current: 8A maximum per rail. Onboard fuse protection is also provided. Solder posts for all connections. PCB: 120 x 75mm. **1209KT £27.95**

Dual Output Power Supply

Batteries soon become an expensive way to power your projects and some form of power supply is an essential piece of equipment. This basic power supply module



LEDs placed in a single straight line - 7 for each channel with the centre LED used as an ON indicator. The display is symmetrical on either side of the central LED which is always on. It works with any amplifier or preamplifier from a few mW to 100 Watts. Suitable for almost all of our amplifier projects like the [1046](#), [1113](#), etc. Supply Voltage: 12-18Vdc (Order Code [PSU445](#) with connector [7-1012](#) or kit [1061](#) are suitable). PCB: 45x117mm. Solder posts for all connections. **1102KT £16.95**

NEW Loudspeaker LED Power Meter

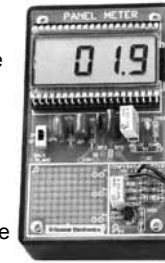
LED power meter for connection to your speakers to monitor the active power output of your amplifier.

Display uses five rectangular LEDs (four green and one red) to give an attractive visual display of the amplifiers power output. No external power supply is required as the circuit draws its power from the amplifier output. A must for any Hi-Fi enthusiast as it is inexpensive, accurate and visually pleasing! Suitable for any home or car amplifier having a power output of up to 100 Watts per channel. One unit is required per channel. Power: from speaker wires. PCB: 31x45mm. Solder posts for all connections. **1103KT £5.95**

LCD Digital Temperature Meter and More!

Build an LCD digital temperature meter with a 3½ digit display suitable for measuring temperatures from -30 to +125°C. Circuit uses the popular 7106 A/D Converter IC. We also show you how to use the breadboard area of the PCB to extend the circuit to build a digital voltage, current, resistance or extended-range temperature meter. Excellent for schools. Teaches you how multimeter's really work. 9V battery operation. Box provided. 100x57x30mm. **3002BKT £15.95**

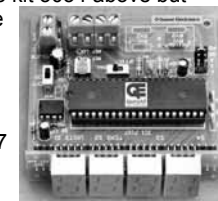
verter IC. We also show you how to use the breadboard area of the PCB to extend the circuit to build a digital voltage, current, resistance or extended-range temperature meter. Excellent for schools. Teaches you how multimeter's really work. 9V battery operation. Box provided. 100x57x30mm. **3002BKT £15.95**

**3½ Digit LCD General Purpose Panel Meter**

Suitable for measuring either voltage, current or with some slight modification resistance. Based around a 7106 A/D Converter IC. Can be customized to measure output from a transducer (not supplied) to measure temperature, weight, movement, pressure, etc. Display can be cut off and located remotely. 3 position decimal point selector and On/Off switch. Screw terminal blocks for Inputs & Power. Space on PCB for scaling & current shunt resistors. Comprehensive documentation. Supply: 9Vdc. PCB 95x57x19mm. **3034KT £14.95 / AS3034 £23.95**

3½ Digit LED General Purpose Panel Meter

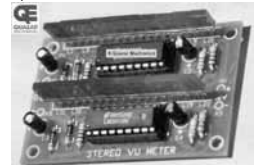
Similar to kit 3034 above but using the sister 7107 IC and LED display. The 7107 has two advantages. First, it can accept inputs from -4V to +4V. Second, a reading of zero can be displayed



when Vin is NOT equal to zero, allowing temperature and weight readings to be displayed with a variable tear. Meter can directly input this offset voltage for use as a weighbridge, use non-standard voltage inputs, measure current and high voltages. Display PCB is mount at right angles to the main board allowing low-profile viewing. Comprehensive documentation, schematics and sample input circuits are provided. Main PCB 65 x 75mm; Display: 25x75mm. **3061KT £13.95**

Stereo VU Meter

A simple, low cost stereo VU meter using LED's, which are more robust than traditional needle meters. LM3915 display driver IC's are used to drive 2 rows of 10 LED's (7 green and 3 red) in a moving bar display. Each row of LED's spans a power range of 0-30 dB in ten 3dB steps. When used with audio amplifiers, this VU meter indicates "peak music power". Ideal add-on module for any of our amplifier kits, or existing equipment. PCB: 65x42mm. **3089KT £11.95**

**3½ Digit LCD Panel Meter**

Versatile 3½ digit LCD panel meter based around a 7106 A/D Converter IC. Suitable for measuring either voltage, current or with some slight modification resistance. Can be customized to measure the output from a transducer (not supplied) to measure temperature, weight, movement, pressure, etc. 3 position decimal point selector. 9Vdc

operation. PCB 53x56mm.
3127KT £15.95 / AS3127 £21.95

50MHz 8-Digit Frequency Meter



Stand-alone frequency meter capable of measuring

repetitive signals up to 50MHz. It has two ranges (15 and 50MHz) and two sampling rates (0.1 and 1 second). Output is to an 8-digit LCD display. Nominal input impedance is 1M Ohm. Supplied complete with a high quality custom designed box with printed front panel pieces to give the project a professional finish when assembled. Finished Dimensions (mm): 130L x 65W x 40H. Power Supply: 9-12Vdc (Order Code PSU443).
3095KT £54.95

EPE Ultrasonic Wind Speed Meter



This solid-state design wind speed

meter (anemometer) uses ultrasonic techniques and has no moving parts and does not need calibrating. It is intended for sports-type activities, such as track events, sailing, hang-gliding, kites and model aircraft flying, to name but a few. It can even be used to monitor conditions in your garden. The probe is pointed in the direction from which the wind is blowing and the speed is displayed

See Page 2 for International Shipping rates

on an LCD display.

Specifications

- Units of display: metres per second, feet per second, kilometres per hour and miles per hour
- Resolution: Nearest tenth of a metre
- Range: Zero to 50mph approx.

It is based on a project published in Everyday Practical Electronics, Jan 2003. We have made a few minor design changes (see documentation for full details). Power: 9Vdc (PP3 battery or Order Code PSU443). Main PCB: 50x83mm.
3168KT £34.95

Miscellaneous

Electronic Mosquito Repeller

A modern and clean way to keep mosquitoes away during summer nights. It is a multivibrator with an output of 5 KHz. This frequency makes mosquitoes go away. The circuit has very low power consumption and the battery will last for about a month of continuous use. Supply: 1.5 Vdc. Max. current: 0.001A. Output frequency: 5 KHz. **1015KT £7.95**

Morse Code Generator

A simple and useful circuit for those who wish to learn the Morse code. The output frequency can be adjusted anywhere between 250Hz and 16KHz. It is a very easy project suitable even for beginners. It only requires a Morse Keyer and a miniature speaker. Operating voltage: 9Vdc. Maximum current: 15mA. Output power: 100mW.
1123KT £6.95

12/24 Hour Giant Clock



This 12/24 hour digital clock uses four giant 70mm high x 48mm wide LED display segments for the hours and minutes (the actual figures displayed are 58mm x 40mm). It can operate in either 12 or 24-hour mode. The microcontroller program (including a time adjustment mode) can keep the clock to within a few seconds accuracy a year. Fully commented software for the uC available from our website. All components supplied. Supply: 12Vdc.
3073KT £52.95

Mixers & Preamps

5-Input Mono Mixer

5-input mixer with professional specifications. Suitable for discos, hi-fi systems, FM transmitters etc. It uses professional sliding potentiometers to control the input levels. It has 2 Pick-up inputs, 2 CD, Tape or Tuner inputs and a Microphone input and also features a Monitor output. Freq. response: 20Hz-15KHz (-3dB). Distortion: 0.05%. Output: 1V/47KU. Sensitivity: MIC 2mV, P.U. 3mV, Tape/Tuner 150 mV. PCB: 165 x 220mm. **1010KT £51.95**

YOU CAN PAY BY:



Power Supplies



Please refer to the warning on page 2 before purchasing mains powered projects. See page 58 for suitable mains transformers.

RF filters incorporated to protect the circuit from interference that could affect stability

The kit comes complete with complete with large heatsinks for the power transistors. You just need to add a 24Vac/8A mains transformer (Order Code M/T24V/8A). PCB 67x155mm.
1056KT £36.95

Power Supply 3-30V / 2.5A

Good quality and reliable variable voltage, stabilised power supply that is ideal for the hobbyist or professional laboratory. Uses the tried and tested LM723 voltage regulator IC. The kit features short circuit protection, variable DC voltages from 3-30V and a rated output of 2.5 Amps which is sufficient for most applications (if you require a higher output see kit 1096 which is rated at 5A). Supplied complete with a large heat sink. You just need to add a 24Vac/3A transformer (Order Code MT24V/3A). PCB 55x112mm.
1007KT £21.95

Stabilised RF Power Supply 8-20Vdc / 8A

Heavy duty power supply delivering a pure, clean, stable DC output from 8 - 20Vdc with 150 Watts maximum power. Special RF protection filters make it particularly suitable for powering FM transmitters, CB radios and linear amplifiers, e.g. kits 1017, 1021, 1031 and 1141.

Features

- Stabilised output voltage even at maximum current
- Shorted output current limited and adjustable from 3 to 5 A.
- Fully protected against overloading and short circuits

Stabilised Power Supply 12Vdc / 0.5A

One of the most popular power supplies in our range. Ideal for powering projects or any other application that requires a stabilised 12Vdc supply. Maximum current: 500mA. Uses a 7812 voltage regulator IC. You just need to add a 12Vac/0.5A transformer (Order Code M/T12V/0.5A). PCB 36x75mm.
1061KT £7.95 / AS1061 £9.95

12Vdc / 2A Power Supply

General purpose stabilized power supply capable of delivery 2 amps at 12Vdc. Ideal for many projects including kits 1003, 1029, 1046 and 1048. You just need to add a 12V/2A transformer (Order Code M/T12V/2A). PCB: 50x50mm. **1063KT £6.95**

Voltage Inverter

12Vdc - 220Vac 50 Hz

Ideal for camping/caravanning enthusiasts who want to operate main voltage devices. It will supply 100 Watts of 220Vac, 50Hz mains power from a 12Vdc supply. Kit includes heat sinks for the power transistors. PCB 48x72mm. Kit requires a transformer rated 2x10V/10A : 230Vac (Order Code M/T2x10V/10A) and a DPDT

switch (not provided).
1065KT £34.95

18Vdc/0.5A Power Supply

A general purpose stabilised power supply with an output of 18V, 0.5A. It uses the 7818 Voltage regulator IC. Suitable for kits 1023, 1024, 1028, 1038 and 1052. Kit requires an 18V/0.5A transformer (Order Code M/T18V/0.5A). PCB: 36x75mm.
1068KT £7.95

12Vdc Fluorescent Light Driver

Enables you to directly drive an 8W to 40W (TLD36W/54) fluorescent tube from any 12V vehicle battery without the need for any choke or starter circuitry. Ideal for camping, caravanning and boating applications. Fluorescent lamps are ideal for this type of application because their superior energy efficiency compared to conventional light bulbs means more battery life. Special circuit design ensures flicker-free operation. Supply voltage: 12-14Vdc. Current consumption: 1.3A (max). Operating frequency: 58KHz. Step-up transformer provided. PCB: 46x162mm. **1069KT £24.95**

Voltage Converter 12Vdc/DC TO 6/7.5/9Vdc

This simple project will let you power devices that require different supply voltages from a 12V vehicle battery or 12V/1A transformer. Ideal for powering small radios, tape recorders, Walkmans, Game Boys, etc. whilst on the move. Supply voltage: 12 V (AC or DC) or a 12V/1A transformer (Order Code M/T12V/2A). Output current: 800mA. Output voltages: 6, 7.5 and 9Vdc. PCB: 40x85mm. **1085KT £9.95**

Unipolar Stepper Motor Driver

Drive any 5, 6 or 8-lead unipolar stepper motor rated up to 35V/1.25A.

Uses a UCN5804

stepper motor driver IC. It provides direction control and three step modes (one phase, two phase and half step) via SPDT PCB-mounted switches. Speed is controlled via a pot. Motor can be rough positioned at a fast or slow rate then switched to single step mode for final positioning using a tactile switch. 4 LED's give visual display of motor step pattern and rate. On/Off switch. Full operational details provided. PCB 65x50mm.

3109KT £16.95 / AS3109 £24.95

PC Based Two Stepper Motor Driver

Independently control two unipolar stepper motors (each rated up to 3 amp max.) using

a PC parallel port and the free software provided. Four digital inputs allow monitoring of external switches or other inputs. A DOS based software program (also runs under Windows 3.11 & 9x) written specifically to drive stepper motors complete with C source code is available for download from our website (or on disk if requested). Software provides three run modes and will half, single or manual step

See Page 2 for International Shipping rates

Prices include 17.5% VAT

motors. Unit is neatly housed extended D-shell case provided. All components (except stepper motors) including case provided. Dimensions (mm): 55x70x15mm. **3113KT £15.95 / AS3113 £24.95**

Bi-Polar Stepper Motor Driver

Drive 4, 6 or 8 wire bipolar stepper motors. Control is via externally supplied 5V levels for STEP and DIRECTION inputs. Both these inputs are opto-isolated making it ideal for use with a PC running suitable software (available free on the internet). Uses [IRFZ44](#) and [MTP2955](#) MOSFETs to drive motors rated up to 5 Amps max per phase. Screw terminal blocks and solder pins for connections. Supply: 8-30Vdc. PCB: 75x85mm. **3158KT £12.95 / AS3158 £27.95**

Bidirectional DC Motor Speed Controller



and reverse direction, from fully OFF to fully ON in either direction, using a single potentiometer. This system eliminates the danger of damage to both the control board and motor that is associated with sudden voltage reversals possible in boards that have just a simple DPDT polarity switch. With our controller, turning the pot in one direction causes the motor to start spinning. Turning the pot in the other direction causes the motor to

Controls the speed of a DC motor in both the forward

spin in the opposite direction.

Specifications

Voltage: The kit and motor use the same power supply. Since the maximum operating voltage of the LM324 is 32Vdc then this is also the maximum voltage available to run the motor.

Current Rating: The MOSFETs can handle 49 Amps but the PCB tracks that run from the MOSFET pins to the screw terminal block can only handle around 5 Amps. This can be increased by soldering wire links along the PCB tracks. PCB: 42Wx92Lx28H. **3166KT £14.95 / AS3166 £23.95**

PC/Standalone Unipolar Stepper Motor Driver

Drive any 5, 6 or 8-lead unipolar stepper motor rated up to 6A (5 - 35Vdc). Provides motor speed and direction control. Can be operated in free-standing (internal oscillator) or PC-controlled mode (direction, step) running suitable software available free on the internet. Uses [IRFZ44](#) power MOSFETs to drive the motors. These MOSFETs have a low on resistance and can carry 6A each without a heatsink. Uses discrete logic ICs: 4013, 4030, 4093. Separate supply voltage for kit and motors if required. Up to six 3179 driver boards (for controlling 6 motors) can be connected to a single PC parallel port. Screw terminal blocks and solder pins for connections. Supply: 9Vdc. Maximum Output Current: 6A. Motor Voltage: 5-35Vdc. PCB: 80x50mm. **3179KT £10.95 / AS3179 £18.95**



Stereo RIAA Dynamic Head Preamp

Stereo preamp for turntable pickup heads. Incorporates RIAA equalisation. Can be combined with kit [1032](#) (Stereo tone controls) to form the basis of a hi-fi system. Input Sensitivity: 2-5 mV. Input impedance: 47KΩ. Frequency response: 20 Hz-20 kHz. Output voltage: 150mV.

Supply: 18-25Vdc (power supply [1068](#) or [PSU010](#)). PCB: 60x60mm.

1023KT £7.95 / AS1023 £9.95
Box 2023 £8.95

Microphone Preamplifier

Small preamplifier for dynamic, electrostatic and electret (condenser) microphones. Very useful for FM transmitters, Discos, P.A. systems, etc. Also works well with the kit [1052](#) (3 Input Mixer). Supply: 9-20 Vdc ([PSU020](#) or kit [1061](#)). Input sensitivity: 1-2 mV. Output: AUX OUT (150-300mV). Frequency response: 50 Hz-15kHz. Distortion: 0.5%. PCB: 40x45mm **1024KT £6.95 / AS1024 £8.95**

Stereo Tone Controls

Low distortion active stereo tone control stage. Classic BAXANDALL circuit and simple single stage pre-amplifier. Can be used with any amplifier and head pre-amplifier from and despite its apparent simplicity its performance will impress. Can be used with the kits [1023](#) and [1024](#) to make a complete low cost stereo hi-fi amplifier.

Technical Specifications

- Supply: 18 - 30Vdc (Kit [1068](#))
- BASS/TREBLE adjustment: ±12 dB
- Input sensitivity: 150mV - 1.0V
- Output level: 0.5V - 3.5V
- Frequency response: 10Hz-25KHz
- Distortion: 0.02 % (maximum)

1032KT £16.95 / AS1032 £28.95

3-Input Hi-Fi Preamplifier

Complete hi-fi quality stereo pre-amplifier with twin Tone Controls, Balance, Volume, Mono/Stereo

switch and a switch for the inbuilt Scratch Filter. Input selectors for Dynamic head stage with RIAA correction (3mV sensitivity), AUX input (200 mV) and TAPE IN (200 mV). TAPE OUT (150mV). All the selector and function switches are PCB mounted to minimize external connections. Can be used with any power amplifier and offers excellent value for money. Frequency response: 15Hz -30KHz. Output voltage: 1.5 V. Supply: 24 Vdc. Current: 100 mA. PCB: 77 x 275mm. **1050KT £46.95**

3-Input Mono Mixer

3-input mono mixer with independent level control for each input plus separate bass and treble controls. Can be used with kit [1023](#) & [1024](#) above to make it's inputs sensitive enough for microphones and turntables. Input sensitivity: 150-300mV. Output Level: 2.5V. Supply: 18Vdc (kit [1068](#)). Max. current: 100mA. PCB: 60x185mm. **1052KT £20.95 / AS1052 £24.95**

4-Input Instrument Mixer

Allows you to use four musical instruments at the same time with the same amplifier input. It may not have separate tone controls or settings for each instrument but it is small, efficient and has very good sound quality. Supply: 9Vdc PP3 bat-

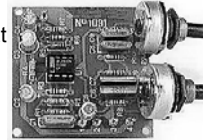
tery (not supplied). Current: 20 mA. PCB: 30x61mm. **1054KT £7.95 / AS1054 £14.95**

Stereo Cassette Head Preamplifier

Stereo pre-amplifier for raising the low output of cassette head to a level that will drive the TAPE-IN input of a stereo amplifier or any stereo pre-amplifier. Uses a Philips TDA1522 IC that gives the unit very low distortion (0.05%), high amplification factor, excellent frequency response (20Hz-40kHz) and includes compensation circuits for the proper equalization of the signal. Distortion THD: 0.05%. Channel separation: 45 dB minimum. Input sensitivity: 1.6 uV (20 Hz - 20 KHz). Supply: 7-23Vdc stabilized ([PSU445](#) or kit [1061](#)). Current drawn: 5 mA. Typical Output voltage: 760 mV. PCB: 43x50mm. **1057KT £10.95 / AS1057 £15.95**

Guitar Preamp with Tone Controls

Guitar preamplifier with very good specifications that will satisfy even the most demanding user. Takes the guitar pickup output up to line level so that it can be connected to any power amplifier, mixer, tape deck, etc. Separate Bass and Treble controls with a 12dB/octave adjustment range. Uses a high sensitivity and low distortion TL082 IC. Small enough to be placed inside many guitars. Supply: 9-12Vdc. Power consumption: 50mA max. Power supply: PP3 battery. PCB: 53x53mm. **1091KT £10.95 / AS1091 £15.95**
Box 2091 £5.95



3 Microphone Inputs Preamplifier

3 microphone inputs preamplifier suitable for use with any dynamic microphone. Provides separate master BASS and TREBLE controls and two OUTPUTS. Each OUTPUT has an individual VOLUME control and is sufficiently high to drive a power amplifier, a monitor circuit or both. Frequency response: 20Hz-15kHz. Input impedance: 500Ω. Input sensitivity: 1 - 300mV. Output impedance: 10KΩ. Output level: 100mV pp. Distortion (THD): 0.1% max. Bass/Treble adj.: +/-12 dB. Current: 50mA max. Supply: 30Vdc. PCB: 46x100mm.

1126KT £13.95 / AS1126 £21.95

Master Tone Controls

This is the Master Tone Controls unit that can be used in combination with one or more kit [1126](#) to form a complete MICROPHONE MIXER CONSOLE with individual and master controls (MASTER BASS, TREBLE and VOLUME). It can also be used with any preamplifier, cassette deck, etc. The output is sufficiently high to drive a power amplifier or a monitor circuit. Frequency response: 20Hz-20kHz. Input sensitivity: 50 mV. Output level: 20V max. Distortion (THD): 0.1% max. Bass/Treble adj.: +/-12 dB. S/N ratio: 50 dB min. Supply: 30Vdc. Current: 100 mA max.. PCB: 46x100mm.

1127KT £14.95 / AS1127 £28.95

SAVE MONEY BY ORDERING ONLINE!
(reduced price UK Postage & Packing)

Super Stereo RIAA Preamplifier



With the spread of CD players, many amplifiers and mini sound systems no

longer have a phono input for a record deck. As a result, your expensive record collection has become unusable. This problem can be solved by using this hi-fi quality stereo RIAA preamp. The circuit is based on the special and supplemented [LM833](#) IC that ensures low noise, very high sound quality and reliability. Power Supply: 2x15 Vac. Current Consumption: 70mA. Input Impedance: 47K Ohm. Output Impedance: 47K Ohm. Frequency Response: 20 - 20,000 Hz (-3dB). Filter Slope: 6dB/octave. THD: 0.001% @ 1KHz - 0.005% @ 10KHz (for 0.3 - 1V RMS input). SN Ratio: 86dB relative to 5mV input. PCB: 83x91mm. Stereo RCA sockets for audio input and output. Solder posts for power connections. **1166KT £27.95**

Super Microphone Preamplifier

Amplify the signal from a wide range of microphones to line level. Can be used with dynamic and condenser microphone with an internal supply and 3-pole condenser microphones. There are two inputs with different sensitivities. Uses an [LM833](#) IC that ensures low noise, low distortion, high sound quality and reliability. The gain can be adjusted by a trimmer to avoid overloading and distortion. Supply: 9-12Vdc. Current: 10mA. PCB: 44x70mm.

1193KT £14.95 / AS1193 £17.95

Preamplifier Module

Preamp module designed to raise a small input signal up to a suitable level to drive an audio amplifier. Use with our [3017](#) to produce full power output or our 3-Input Mono Mixer kit [1052](#). Delivering a minimum gain of 40dB, this is normally more than enough for most applications but it can be increased by simply changing a single resistor value. It can also take its input from an electret microphone by simply adding a resistor, both of which are included with the kit. Maximum input: ~100 mV RMS (gain = 27dB). Maximum output: ~2.5V RMS with 12V supply. Frequency resp.: ~70 Hz to 45 kHz -3dB (Standard setup). THD at 1V 1kHz: < 0.1%. S/N ratio: >75dB. Supply: 6-12Vdc. Current: 3mA max. PCB: 30x43mm. **3098KT £5.95 / AS3098 £9.95**

Stereo Preamplifier with Tone Controls

Stereo preamplifier with tone controls. A useful addition to any of our power amplifier kits. Easily constructed thanks to the Philips TDA1524A used. This clever IC contains all the circuitry to provide up to 20 dB of voltage gain, ±15 dB of bass and treble control, channel balance, and switchable loudness contour. IC uses DC voltage control so low cost linear pots can be used with no crackles and reduced tracking errors. It also enables control by switches or microprocessor if desired.

Features

- Simple construction
- Few external components.
- Low noise and distortion.



- Switchable loudness.
- Will drive most power amps.

Specifications

- Power: 12 - 15Vdc, 50mA min.
- Maximum output: > 3V RMS
- Maximum input: > 300mV, G=20dB > 3V RMS, G=0dB
- Input Z: > 10KΩ
- Output Z: < 300Ω
- Frequency response: <10Hz to >50kHz ± 1dB
- THD at 1kHz: < 0.1% at 1V output
- S/N ratio: > 80dB, G=0dB
- Bass boost/cut ~ 15dB at 50Hz
- Treble boost/cut ~ 15dB at 15kHz
- PCB Dimensions: 66 x 103mm

3100KT £14.95 / AS3100 £25.95

Stereo Tone Controls

This is a stereo tone control unit which will make a useful addition to many of our power amplifier kits. It provides +/- 12 dB of bass and treble boost/cut, and channel balance control and is based around the MC4558 IC.



Specifications

- D. C. Input: 6V - 15Vdc.
- Current Drain: ~ 10 mA
- Maximum output: > 3 V RMS (12Vdc supply)
- Maximum input: > 3 V RMS
- Gain (loss): -2 dB.
- Input Z: ~ 50 k ohm
- Frequency resp.: < 20 Hz to > 50 kHz - 3 dB
- THD at 1kHz: < 0.1 % at 1V output
- S/N ratio: > 85 dB re. 1V RMS
- Bass boost/cut: ~ 12 dB at 50 Hz
- Treble boost/cut: ~ 12 dB at 15 kHz
- PCB Dimensions: 48 x 120mm

3155KT £11.95 / AS3155 £24.95

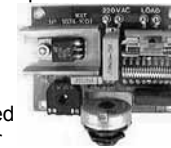


YOU CAN PAY BY:

Motor Controllers

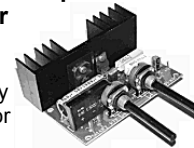
AC Drill Speed Controller

Reliable and simple to install project that allows you adjust the speed of any mains powered electric drill or single phase 240Vac motor rated up to 700 Watts. Simply turn the potentiometer to adjust the motors RPM. Working voltage: 220/240Vac. Maximum Output Power: 700 Watts (3 Amps @ 230Vac). PCB: 48x65mm. **1074KT £12.95**
Box: 2074BX - £5.95



DC Mini-Drill Speed Controller

Stabilised power supply specially designed for controlling DC hand-held mini drills. Enables you to adjust the drill speed to suit the job at hand. Speed is not affected by the hardness of the material being drilled. Output voltage and sensitivity are adjusted using two potentiometers. Circuit uses the well known L200 regulator IC. Output voltage: 4-26Vdc. Output current: 3-5A. Input Voltage: 20Vac (a 20Vac/3A transformer is suitable). PCB 50x100mm. Solder posts for all connections. **1139KT £28.95**



DC Motor Speed Controller

Control the speed of almost any common DC motor rated up to 100V/7.5A. Circuit uses an



NE556 IC with adjustable speed control to pulse-width modulate an IRF530 Mosfet. This set-up gives maximum motor torque at all speeds. Board Supply: 9-18Vdc. Box supplied. PCB: 60x100mm.

3067KT £12.95 / AS3067 £19.95

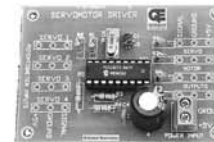
Digital Rotary Unipolar Stepper Motor Controller

Control the step rate and direction of a unipolar stepper motor by simply turning the bi-directional rotary switch. Will single or half step any 5, 6 or 8 lead unipolar stepper motor rated up to 35V/1.25A. Each 90 degree turn of the switch moves the motor one step. Circuit uses a PIC 16C54 plus UCN5804 stepper driver IC. PCB: 45 x 55mm. **3094KT £18.95 / AS3094 £24.95**



Servo Motor Driver

Microcontroller based circuit allows you to simultaneously drive up to four servo motors using potentiometers as positioning controllers. Circuit uses a PIC to do all the work. Power Supply: 5Vdc, 1A. All components (except potentiometers and servo motors) provided including pre-programmed PIC and source code. PCB: 75 x 50mm. **3102KT £15.95 / AS3102 £19.95**



KT = Kit Price
AS = Assembled Price