SCHOOL ELECTRONIC SUPPLIES
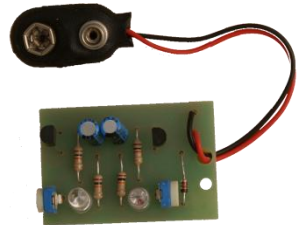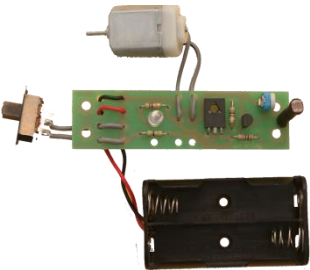
## ELECTROTECHNOLOGY CATALOGUE
March 2016

KITS

SES kits include an instruction sheet, a printed circuit board with solder mask and all necessary components. IC sockets are also supplied where applicable. Batteries, solder, power supplies and enclosure boxes are not included.

	1+	25+	50+
K1000 **DUAL VARIABLE FLASHING LEDs** (Requires a 9 volt battery)	$4.95	$4.70	$4.40

This is a great first soldering kit, but if it is assembled and tested on a breadboard first, it provides students with an ideal introduction to electronics. It is a multivibrator circuit featuring two high brightness LEDs with individual flash rate adjustment provided by two trimpots. It provides students the opportunity to learn about resistors, capacitors, diodes, transistors, variable resistors and LEDs.

	1+	25+	50+
K1006 **TWO TONE DOORBELL** (Requires a 9 volt battery)	$8.90	$8.40	$7.90

This kit is based on a 555 timer integrated circuit and features battery saving circuitry and a trimpot to enable adjustment of the second tone. The kit is designed so that the printed circuit board, speaker and push button switch can be fitted neatly into a UB3 utility box.

	1+	25+	50+
K1030 **SINGING CICADA** (Requires a 9 volt battery)	$9.90	$9.40	$8.80

Singing Cicada is a very annoying little insect who likes to make a lot of noise. He is very sensitive to light and you can exploit this weakness to train him to do as he is told. He is a very fast learner and in no time at all you will be able to teach him to communicate with real cicadas and crickets in your backyard. To help you train him, Cecil Cicada has four adjustable trimpots to vary tone, light sensitivity, modulation and repetition. Cecil Cicada eats 9 volt batteries and is a very low maintenance pet.

	1+	25+	50+
K1063 **LIGHT CONTROLLED MOTOR** (Requires two AA batteries)	$8.40	$7.90	$7.40

This kit uses a light dependent resistor and two transistors configured as a darlington pair to control the speed of a motor. A trimpot enables the LDR to have adjustable sensitivity and a high brightness LED indicates the speed of the motor. You should be able to control the LDR up to a metre away. You can also add a centre off DPDT switch as a H Bridge so that you could change the direction of the motor. The circuitry is designed to handle motors with a current rating of up to 1 Amp. There are lots of applications for this kit, EG. A light controlled Vibrabot. This kit is featured in an excellent Student Workbook entitled Design Creativity and Technology produced by L.A.P.tek Pty Ltd.   Check it out @ www.laptek.com.au

Basic Electronics Notebook

This notebook provides an ideal introduction to the essential concepts of electronics. The emphasis of this notebook is on understanding electronics. It features step by step instructions for a variety of projects that can be built on a NP4035 solder less breadboard. It has lots of pictures to make it easy to follow. It includes full descriptions of all the electronic components used with clear and simple explanations of how they work and what they do. When students have successfully completed the breadboard circuits they can then move on to soldering one of the projects on a NP5000 prototype board.
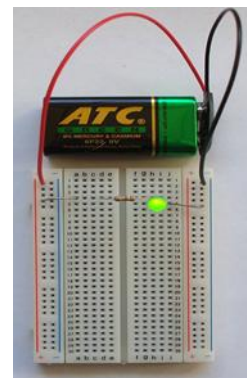
EC1099 BASIC ELECTRONICS COMPONENT PACK	1+	25+	50+
This pack contains the Basic electronics notebook, discrete components needed to build all of the breadboard circuits and one of the soldering projects K1000 dual flashing led kit from the Basic Electronics Notebook. Component pack **does not** include the breadboard, prototype board or the 9 volt battery	$9.95	$8.95	$8.50

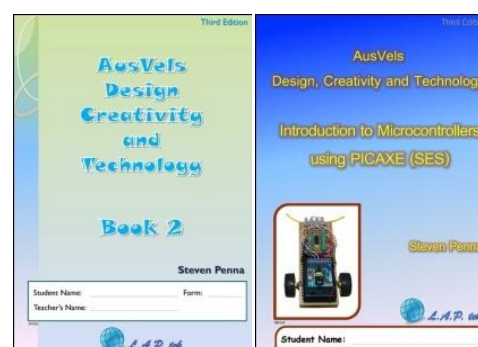| K1099 BASIC ELECTRONICS KIT	1+	25+	50+
This pack contains the Basic electronics notebook, discrete components, breadboard, prototype board and a 9 volt battery needed to build all of the breadboard circuits and two of the soldering projects K100 dual flashing led and K1094 nite lite project. from the Basic Electronics Notebook.	$24.30	$22.50	$19.80

LAPTEK Student Workbooks

LAPTEK Pty. Ltd. produces an extensive range of student workbooks that cover subjects including VET Automotive, VET Building and construction, Design creativity and technology which incorporates basic electrical/electronics up to programming the 14M2 chip.

A number of their workbook feature a comprehensive guide to building and using some of SES products including:
K1084 14M2 Starter Kit, **K1086** Student Experimenter Kit and the **K1063** Light Controlled Motor Kit.

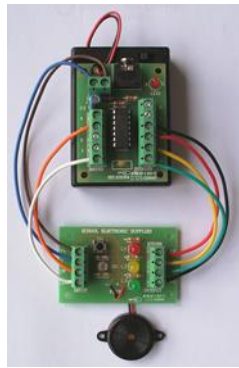For more information see their website **www.laptek.com.au**

PICAXE MICROCONTROLLER

	1+	20+	50+
ZM0014 PICAXE 14M2 Microcontroller IC	$5.25	$4.95	$4.75

This chip has 11 inputs/outputs and holds up to 1800 lines of program code. It is also backwards compatible for programs written for the previous M series.

K1084 14M2 PIC STARTER MODULE (batteries are not included)	$15.50	$14.50	$13.50

The PICAXE 14M2 microcontroller is a very versatile device and is designed primarily for educational use. This is by far the easiest PICAXE chip to use and will suit the needs of most high school and TAFE students. It supports 11 inputs/outputs and holds up to 1800 lines of programming code. Team it up with a K1086 Student Experimenter Kit and start experimenting. The kit contains a PICAXE 14M2 chip, IC socket, PCB, 3 x AA battery case with on/off switch, LED power on indicator, terminal block connections and all necessary components.
NB: To use this starter module you will need the PICAXE Programming Editor Software loaded on your computer and an AXE027 USB download cable. PICAXE software is FREE and can be downloaded from www.picaxe.co.uk

K1086 STUDENT EXPERIMENTER KIT	$8.50	$8.10	$7.70

This module is designed to team up with a PIC starter kit to enable students to learn how to program input and output devices in an easy to understand way. Features include a push button switch digital input, a LDR analogue input, three LED outputs and a piezo sounder output. Enough components to do lots of experiments. Terminal block connections make it very easy to use.

	1+	10+	20+
K1071 DUAL MOTOR DRIVER MODULE	$8.70	$8.30	$7.90

This module is designed to use with PIC Microcontrollers to control the speed and direction of one or two small DC motors. This makes it ideal for using in robotic projects as a dual H bridge driver when reversing and turning is required. The kit includes a L293D IC, PCB with integral heatsink, motor noise suppression capacitor and terminal block connections.

PICAXE ACCESSORIES

AXE027 USB DOWNLOAD CABLE	1+	5+	
Moulded Cable USB to 3.5mm Stereo Plug. The drivers for this cable can be downloaded from www.picaxe.co.uk	$27.50	$25.15	

TVR0108 UNIVERSAL INFRARED REMOTE CONTROLLERS	1+	10+	20+	
Picaxe compatible infrared tv remote fully programmable	$9.95	$8.95	$8.50	

PIC 14M2N   PICAXE BASICS NOTEBOOK $4.20 printed

This Notebook is designed to help Teachers and students to become familiar with the PICAXE system using the 14M2 microcontroller in an easy to follow format. It includes experiments using LEDs, piezo sounders, LDRs and switches.

PIC 14M2EXT   MORE PICAXE NOTEBOOK $4.20 printed

Now you learned the basics you can move on more challenging projects. Subjects include using infra red remote control, controlling motor speed and direction, transistors, relays and much more.

TEST EQUIPMENT

	1+	5+	
QM1130 MULTI METER DIGITAL AUTORANGING This feature packed DMM operates in auto ranging or manual modes. Manual override of auto ranging - Data hold function - Backlit display - Auto power off - Low battery indicator - AC Volts < 200mV - 600V - DC Volts < 200mV - 600V - AC/DC Amps < 200µA - 10A - Resistance < 200ohm - 2Mohm - Temperature measurement - Continuity & diode tester - Battery included	$31.50	$29.95	
QL0404 TEST PIN LEADS Right angle shrouded banana plugs to pin probes. Ideal replacement leads for most multimeters	$5.90	$5.65	
QL0405 BANNA TO ALIGATOR CLIP LEADS Pair of red and black. Useful for hands free testing**.**	$6.65	$6.15	
QL0415 JUMPER LEAD SET Mini alligator to mini alligator clip leads. Pack contains 10 300mm leads. 2 of red, white, black, green and yellow.	$6.80	$6.20	

BATTERIES AND HOLDERS

BATTERIES other sizes available on request		1+	20+	40+	
LR6AA	Maxell Alkaline AA battery Pack of 2, shrink wrap.	$1.20	$1.10	$1.00	
6LF22	Maxell 9v Alkaline battery	$3.00	$2.80	$2.50	

BATTERY HOLDER		1+	50+	100+	
BH5060	2 x AA Flat Battery Holder with 150mm leads	$0.90	$0.80	$0.70	

SWITCH BATTERY ENCLOSURE		1+	25+	50+	
BH5253	3 x AA with On/Off Switch and 150mm leads	$2.50	$2.20	$1.90	

BATTERY SNAP		1+	50+	100+	
BH0455	9V Battery Snap with 150mm leads	$0.40	$0.38	$0.35	

RETAINING CLIP		1+	50+	100+	
BH5050	Metal Retaining Clip suits 9V Battery	$0.55	$0.52	$0.50	

HARDWARE

BOXES		1+	25+	50+	
HB0103	Box Utility UB3 Black 130L x 68W x 41H mm	$3.30	$3.00	$2.70	
HB0105	Box Utility UB5 Black 83L x 54W x 28H mm	$2.10	$2.00	$1.90	

WIRE LIGHT DUTY TINNED		1+	
W0420	0.71mm Diameter (30 metre Roll)	$19.80	
WR0420	0.71mm diameter (100 meter roll)	$24.70	

FIGURE 8 CABLE		1+	
WS2095	Light duty cable 2 x 14/0.14mm (30 metre Roll)	$12.00	
WS2100	Light duty cable 2 x 14/0.14mm (100 meter roll)	$35.00	

TERMINAL BLOCKS		1+	50+	100+	
PT2032	Terminal block 2 way PCB mount 5mm pitch	$0.46	$0.39	$0.34	
PT2033	Terminal block 3 way PCB mount 5mm pitch	$0.70	$0.63	$0.52	
PT2036	Terminal block 36 way PCB mount 5mm pitch, cut to size.	$9.60	$9.30	$8.90	
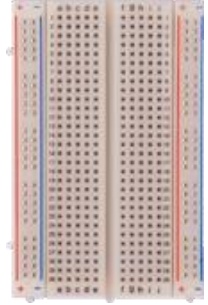
SWITCHES
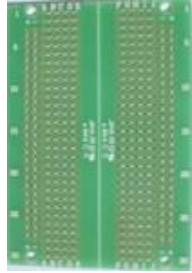
PUCH BUTTON SWITCH		1+	50+	100+	
SP1060	SPST Minature momentary push on (normally open) mounting hole 6mm	$1.20	$1.06	$0.90	
SP1122	Tactile momentary 6mm x 6mm PCB mount, push on (normally open)	$0.36	$0.32	$0.28	

SLIDE SWITCH		1+	50+	100+	
SP2010	Miniature DPDT slide	$0.85	$0.75	$0.60	
SS2030	DPDT Centre Off On-Off-On Ideal to use as a H bridge for switching the direction of DC motors.	$1.05	$0.92	$0.79	

TOGGLE		1+	50+	100+	
ST1040	Single pole single throw 2A on/off indicator	$2.00	$1.85	$1.70	

MICRO SWITCH		1+	50+	100+	
SM3265	SPDT 37mm Lever Actuated Miniature Micro Switch	$3.50	$3.65	$2.80	

SOLDERING

|		1+	5+	
TS1242	**SOLDER SUCKER** This high suction solder sucker quickly removes solder from PCBs. Reduces damage to components and copper track during desoldering.	$11.50	$10.50	
NS3020	**DESOLDERING BRAID (3mm)** A specially treated braid for removing solder from a PCB. Simply apply the braid to the joint and heat with a soldering iton.	$2.75	$2.50	
TS1100	**Solder** 0.8 mm 60/40 200g roll	$14.50	$12.80	
TS1078	**Solder** 0.8mm Lead free 250g roll	$26.70	$25.50	
TS1300	**Solder roll holder** up to 1KG roll capacity, wall or bench mountable	$15.85	$14.90	
TS1310	**Soldering roll holder** cast iron base, steel spring stand. Supplied with sponge	$14.50	$13.00	

PROTOTYPING

	1+	10+	20+
NP4035 BREADBOARD	$9.90	$9.25	$8.80

This Solderless Breadboard accepts most common ICs, transistors, LEDs, resistors, capacitors, diodes etc.

It has 300 connection holes plus two positive and negative buses. Single strand wire can be used for interconnections. E.G. WJ3032. Great tool to design circuits easily and quickly.

	1+	10+	20+
NP5000 PROTOTYPE BOARD (54mm x 80mm)	$3.50	$3.20	$2.90

It has 300 pre-drilled 0.9mm holes at 2.54mm spacing set out in an alphanumeric grid plus positive and negative buses.
It has a very similar layout to the NP4035 Breadboard which makes it very easy to transfer your prototype to a permanent board.
It can also be snapped in half and used for smaller circuits.
Ideal for building circuits without the need to etch PCBs.

COMPONENTS

RESISTORS Carbon 0.25 watt 5% tolerance	Pkt 100	Box 1K
(Supplied in packets of 100 or boxes of 1,000	$4.50	$13.95

Cat No	Value		Cat No	Value		Cat No	Value
RR0005	Zero		RR0040	330R		RR0054	4K7
RR0022	10R		RR0041	390R		RR0056	6K8
RR0024	15R		RR0042	470R		RR0058	10K
RR0030	47R		RR0043	560R		RR0062	22K
RR0031	56R		RR0044	680R		RR0064	33K
RR0034	100R		RR0046	1K		RR0066	47K
RR0035	120R		RR0047	1K2		RR0068	68K
RR0036	150R		RR0049	1K8		RR0070	100K
RR0038	220R		RR0050	2K2		RR0078	470K
RR0039	270R		RR0052	3K3		RR0082	1M
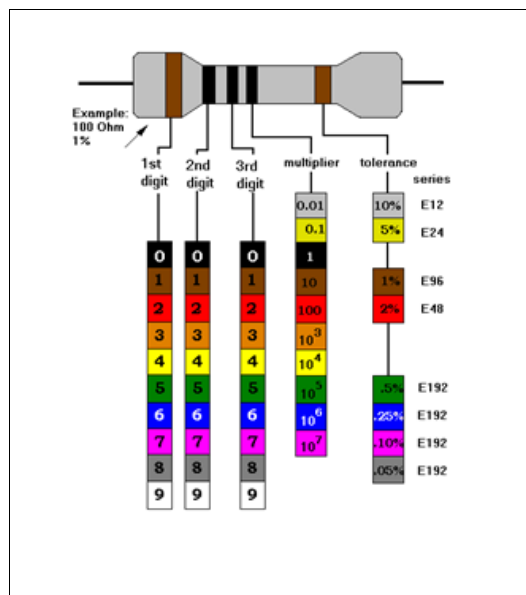
POTENTIOMETERS	1+	10+	20+
	$1.60	$1.45	$1.30
RP2225 16mm Single Gang Linear B – 10K			
RP2229 16mm Single Gang Linear B – 500K			

TRIMMING POTENTIOMETERS	1+	50+	100+
Trimpot Miniature Vertical 5mm	$0.79	$0.73	$0.62

Cat No	Value		Cat No	Value		Cat No	Value
RT1939	5K		RT1945	50K		RT1951	500K
RT1941	10K		RT1947	100K		RT1953	1M
RT1943	20K		RT1949	200K			

CAPACITORS

MONOLITHIC 50 volt DC 5mm Lead Spacing				1+	50+	100+
RM2910	10nf	0.01uf	103	$0.21	$0.19	$0.17
RM2930	100nf	0.1uf	104	$0.22	$0.20	$0.18
RM2935	220nf	0.22uf	224	$0.23	$0.21	$0.19

CAPACITORS (cont.)
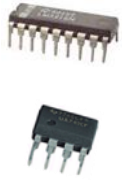
ELECTROLYTIC Single Ended Leads (RB)			1+	50+	100+
RE5018	1uf	63 volt	$0.17	$0.12	$0.10
RE5048	4.7uf	63 volt	$0.17	$0.12	$0.10
RE5068	10uf	63 volt	$0.17	$0.12	$0.10
RE5084	22uf	25 volt	$0.17	$0.12	$0.10
RE5104	47uf	25 volt	$0.25	$0.20	$0.16
RE5123	100uf	16 volt	$0.25	$0.20	$0.16
RE5143	220uf	16 volt	$0.19	$0.16	$0.13
RE5163	470uf	16 volt	$0.30	$0.27	$0.15
RE5182	1000uf	16 volt	$0.53	$0.50	$0.48

TRANSISTORS				1c Max	Package	1+	50+	100+
ZT1030	BC327	PNP	GP	800mA	TO92h	$0.34	$0.32	$0.29
ZT1035	BC337	NPN	GP	800mA	TO92h	$0.34	$0.32	$0.29
ZT1042	BC548	NPN	GP	100mA	TO92h	$0.21	$0.18	$0.15
ZT1057	BC558	PNP	GP	100mA	TO92h	$0.21	$0.18	$0.15
ZT1068	BD139	NPN	HV	1A	TO126	$0.80	$0.70	$0.60
ZT1069	BD140	PNP	HV	1A	TO126	$0.80	$0.70	$0.60
ZT1081	BD681	NPN	Darlington	4A	TO126	$1.40	$1.20	$1.08

INTEGRATED CIRCUITS (ICs)			1+	25+	50+
ZC2900	L293D Dual Motor Driver	16 pin	$4.25	$3.95	$3.70
ZC2556	LM386 Low Voltage Amplifier 1 Amp	8 pin	$1.85	$1.45	$1.30
ZC2755	NE555 Timer	8 pin	$1.20	$1.00	$0.90
ZC3000	ULN2003 Darlington Transistor Array	16 pin	$4.40	$3.40	$3.15

IC SOCKETS		Tube Qty	1+	30+	60+
PS0550	8 pin DIL Tinned Dual Contacts	60	$0.30	$0.26	$0.22
PS0560	14 pin DIL Tinned Dual Contacts	34	$0.30	$0.26	$0.22
PS0565	16 pin DIL Tinned Dual Contacts	30	$0.35	$0.30	$0.26

DIODES	1+	50+	100+
ZD0101 1N914 or 1N4148 100v 150ma Small Signal	$0.09	$0.06	$0.05
ZD0109 1N4004 400v 1Amp Rectifier	$0.13	$0.09	$0.07

THERMISTOR		1+	25+	50+	
RT4285 NTC Type 1K ohm -20C to +125C		**$1.20**	**$1.00**	**$0.89**	

VOLTAGE REGULATOR		1+	25+	50+	
ZR0505 7805 5 volt 1 Amp		**$1.65**	**$1.25**	**$1.15**	

LIGHT EMMITTING DIODES

STANDARD LEDs 5mm					1+	100+	500+	
RE5018	Red	2.2 volt	15ma	9mcd	**$0.20**	**$0.17**	**$0.11**	
RE5048	Green	2.2 volt	30ma	80mcd	**$0.22**	**$0.20**	**$0.17**	
RE5068	Yellow	2.2 volt	30ma	70mcd	**$0.22**	**$0.20**	**$0.17**	
RE5084	Orange	2.2 volt	30ma	80mcd	**$0.22**	**$0.20**	**$0.17**	

HIGH BRIGHTNESS LEDs 5mm					1+	100+	500+	
ZL0860	Red	2.2 volt	30ma	500mcd	**$0.40**	**$0.27**	**$0.24**	
ZL0862	Red	2.2 volt	30ma	6,500mcd	**$1.75**	**$1.55**	**$1.48**	
ZL0869	Blue	3.5 volt	25ma	1,000mcd	**$1.60**	**$1.50**	**$1.45**	
ZL0876	White	3.2 volt	25ma	25,000mcd	**$2.90**	**$2.75**	**$2.50**	Water Clear Lens

FLASHING LED		1+	25+	50+	
ZL0890 5mm Flashing Red 3 to 12 volt 40mcd		**$0.90**	**$0.90**	**$0.85**	

LED HOLDERS		1+	5+	10+	
ZH1554 5mm Clip Type Panel Hole 6mm Pkt 100		**$12.00**	**$10.95**	**$9.80**	

OPTOELECTRONICS

LIGHT DEPENDENT RESISTOR	1+	50+	100+	
ZP4801 5mm 100mw Resistance Light 2K Dark 10M	$1.75	$1.60	$1.40	

PHOTOTRANSISTOR	1+	25+	50+	
ZP1950 5mm Infra Red Photo receiver	$1.15	$1.00	$0.90	

INFRA RED TRANSMITTER	1+	25+	50+	
ZP1960 5mm Infra Red Emitting Diode 1.2 to 1.5v	$0.95	$0.90	$0.85	

INFRA RED RECEIVER	1+	10+	20+	
ZP1955 Infra Red Receiver Module	$5.10	$4.85	$4.60	

7 SEGMENT LED DISPLAY	1+	10+	20+	
ZD0190 17mm Red Common Cathode	$2.75	$2.55	$2.35	

Postage and handling

Melbourne metro $8.80 per box, up to 23kg

Country Vic/interstate- $23.50 per box, up to 23kg

Please allow a minimum 5 business days for delivery.

Prices effective: March 2016.

Prices subject to change without notice.

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