Prototyping & PCBs

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PCB Prototyping

K&H Manufacturing

Protobloc AD Series Advanced Solderless Breadboard

A range of **solderless breadboards** that are ideal for prototyping and testing electronic circuits.

As a prototyping system, **Protobloc** offers a fast and economical method of circuit construction and development. Components are plugged into the board and are retained by double leaf spring contacts, with positions clearly defined on an alphanumeric grid. Sockets are on a 2.54mm matrix, allowing all dual-in-line integrated circuits, plus many other components to simply be plugged into the board. Units can be clipped together to accommodate larger circuit designs and the solderless concept allows components to be used time and time again, making these boards an ideal system for the teaching of electronic systems and circuit design.

- Available in several types
- Provides ideal placement for all components
- Easy insertion and wiring
- Very flexible for digital and analog circuits
- Easy combination and expansion
- More tie points for MSI, LSI, and all DIL-size chips
- ABS Body

Technical specification

Order code	Part number	Tie points	Dimensions (L x W x H)
34-0668	AD-10	10	81 x 30 x 19mm
34-0672	AD-4D	48	81 x 12 x 9mm
34-0666	AD-100	360	81 x 42 x 9mm
34-0674	AD-101	408	81 x 52 x 9mm
34-0676	AD-102	456	81 x 62 x 9mm
34-0678	AD-01	948	83 x 118 x 9mm
34-0662	AD-11	958	83 x 147 x 19mm
34-0664	AD-13	2854	266 x 168 x 24mm

Tie points	Order code	1+	10+	50+
10	**34-0668**	6.19	5.59	4.79
48	**34-0672**	1.19	1.09	0.99
360	**34-0666**	2.49	2.29	2.09
408	**34-0674**	3.29	2.99	2.89
456	**34-0676**	3.79	3.69	3.59
948	**34-0678**	8.99	8.79	8.49
958	**34-0662**	10.44	9.90	9.36
2854	**34-0664**	23.42	22.08	21.39

526259

Rapid Prototyping Board (Protobloc 1)

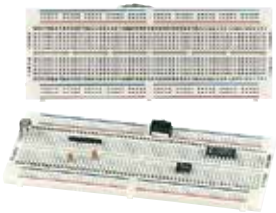
This prototyping board (protobloc 1 breadboard) is a prototyping system offering a fast and economical method of circuit construction and development. Solderless in concept allowing components to be used time and time again, while components are plugged into the board and are retained by double leaf spring contacts. Incorporating the following features: protobloc prototyping board, 2 (29 x 5) grid size, 390 number of holes, 2.54mm hole pitch, 0.3 to 0.8mm wire size acceptability, 3A contact current, abs polymer body material, silver alloy/nickel alloy contact material, fast and economical method of circuit construction and development, double leaf spring contacts, allowing all dual-in-line integrated circuits, ideal system for the teaching of electronic systems and circuit design, ideal introduction to solderless circuit development systems.

- Sockets are on a 2.54mm matrix, allowing all dual-in-line integrated circuits, plus many other components to simply be plugged into the board
- An ideal system for the teaching of electronic systems and circuit design
- Total of 390 tie points
- Two sets of 29 rows of 5 interconnected contact sockets
- 4 rows of 25 interconnected sockets suitable for use as power supply rails
- ABS polymer board mounted on an adhesive foam base
- Can accommodate up to three 16-pin devices
- An ideal introduction to solderless circuit development systems

Type	Order code	1+	10+	50+	100+
Protobloc 1	**34-0650**	3.57	3.21	2.92	2.71

029458

RVFM Protobloc 2 Prototyping Breadboard



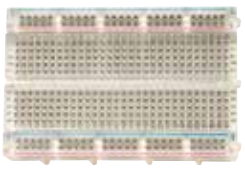
This **prototyping board** (protobloc 2 breadboard) is a prototyping system offering a total of 840 tie points, consisting of two sets of 64 rows of 5 inter-connected sockets. Incorporating the following features: protobloc 2, 2 (64 x 5) grid size, 840 number of holes, 0.3 to 0.8mm wire size acceptability, 3A contact current, ABS polymer body material, silver nickel contact material, 4 rows of 50 interconnected sockets suitable for use as power supply rails, all contact positions are clearly defined on an alphanumeric grid.

- 4 rows of 50 interconnected sockets suitable for use as power supply rails
- All contact positions are clearly defined on an alphanumeric grid
- ABS polymer board mounted on a non-removable self-adhesive foam base
- Can accommodate up to seven 16-pin devices
- White colour

Type	Order code	1+	10+	50+	100+
Protobloc 2	**34-0655**	6.14	5.38	4.97	4.70

029459

Rapid Transparent 400 point Solderless Breadboard



Solderless Breadboard allows components to be easily connected together into circuits and used time and time again for experiments and prototyping. This transparent topped version allows visibility of the contacts and how they are connected together, making it ideal for use in training and education.

- Transparent Solderless Breadboard
- Solderless concept allows components to be used again and again
- Ideal system for teaching electronic systems and circuit design
- Components are plugged into the board and are retained by double-leaf phosphor bronze nickel-plated spring contacts
- Sockets are on a 2.54mm matrix, allowing dual-in-line integrated circuits, plus many other components to simply be plugged into the board
- Two sets of 30 rows of 5 interconnected contact sockets
- Allows up to 4 connections to each pin of ICs placed accross the central gap
- 2 rows of 50 contacts for power supply distribution
- Total of 400 tie points
- All contact positions are clearly defined on an coloured alphanumeric grid
- ABS polymer board mounted on an adhesive foam base
- Accepts components with wire sizes from 0.288 to 0.841mm (29 to 20 AWG)
- Dimensions: 83.5 x 54.5 x 8.5mm

These boards can be slotted together for larger circuits but do not physically fit with Protoblocs.

Type	Order code	1+	10+	50+	100+
Transparent breadbord	**34-0671**	3.66	3.58	3.38	3.08

518906

Rapid Breadboard Jumper Wires Bundle Of 75

A bundle of 75 assorted reuseable Jumper Links for use with Protobloc prototyping boards and other breadboards.

- Made from insulated 22AWG solid copper wire
- Fitted with plugs that fit the connectors in the breadboard without damage
- 4 lengths
- Assorted colours for easy identification
- Supplied in **packs of 75**

Technical specification

Length	Quantity
100mm	55
140mm	10
180mm	5
230mm	5

Type	Order code	1+
Breadboard jumpers	**34-0673**	3.66

518907

Rapid Jumper Wire 40 Way Ribbon Cable

These high quality **jumper wires** come in a strip of 40 with four pieces of each of **ten colours**. They have 0.1in sockets on either end and fit cleanly next to each other on a standard pitch (2.54mm) header. You can always pull the ribbon wires off to make individual jumpers, or keep them together to make neatly organised wire harnesses.

- Available in male-female, male-male and female-female versions
- Length 200mm
- 40 ways

Type	Order code	1+	10+	100+
F to F	**34-0684**	4.25	3.71	3.38
M to F	**34-0686**	4.25	3.71	3.38
M to M	**34-0688**	4.25	3.71	3.38

564327

RVFM Jumper Wire Kit

This **jumper wire kit** has been designed for use with protobloc prototyping boards

has a variety of colours for easy identification and comes in a wide range of sizes.

- Convenient hinged plastic storage case
- Variety of colours for easy identification
- Pre-cut and pre-formed jumper wires with ¼in stripped end bent 90°
- Box dimensions: 270 x 124 x 30mm

Set includes 25 each of the following lengths:
0.1in (no insulation), 0.2in, 0.3in, 0.4in, 0.5in, 0.6in, 0.7in, 0.8in, 0.9in, 1in, 2in, 3in, 4in and 5in.

Type	Order code	1+	10+
Jumper wire kit	**34-0495**	10.98	10.30

029452

Rapid

Copper Track Cutter for Stripboard and Prototype Boards

This simple tool is ideal for easy copper track cutting on stripboards and prototyping boards. Simply insert the tool in a hole at the point where the break is required and twist clockwise.

- Swivel top handle for easy turning
- Bit size 3.5mm
- Overall length 115mm

Type	Order code	1+	10+	50+
Stripboard cutter	**34-0608**	3.28	3.02	2.59

550885

Rapid

Stripboard

These **stripboards** provide a simple form of printed circuit, ideal for prototype and development work. Featuring holes with a 2.54mm pitch, while manufactured with copper clad paper and phenolic laminate body material.

- Can be readily cut to size
- Provides a simple form of printed circuit
- Copper strips form the interconnections and can easily be cut where required
- Made from copper-clad laminated board
- All boards are punched on a 0.1in pitch

Technical specification

Board Size	Tracks No.	Holes
25 x 64	9	25
64 x 95	24	37
95 x 127	36	50
95 x 432	36	170
119 x 455	46	179

		MOQ 5			
Board Size (mm)	Order code	5+	10+	50+	100+
25 x 64	**34-0500**	0.306	0.283	0.248	0.189
		Price each			
Board Size (mm)	Order code	1+	10+	50+	100+
64 x 95	**34-0505**	0.872	0.837	0.742	0.613
95 x 127	**34-0515**	1.60	1.46	1.39	1.17
95 x 432	**34-0535**	5.81	5.12	4.73	4.04
119 x 455	**34-0540**	7.03	6.64	6.43	5.85

029453

RVFM

Plain Copper-Clad Fibreglass Circuit Board

High quality 305g/m copper clad boards in epoxy glass material.

- Grade: FR4
- Plain fibreglass board
- **Single** or **double sided paper** available
- 35 Micron copper thickness
- Suitable etchant: ferric chloride solution
- Thickness: 1.6mm

Type	Order code	1+	20+	50+
Eurocard size - single sided				
100x160	**34-0800**	1.08	0.864	0.76
233.4x160	**34-0805**	2.30	2.06	1.87
100x220	**34-0810**	1.46	1.27	1.09
233.4x220	**34-0815**	3.57	3.23	
Double sided				
100x160	**34-0820**	1.17	0.936	0.812
233.4x160	**34-0825**	2.39	2.18	
100x220	**34-0830**	1.31	1.17	1.08
233.4x220	**34-0835**	3.41	3.10	
Other sizes - single sided				
203x95	**34-0360**	1.24	1.10	
203x305	**34-0365**	3.63	3.26	2.99
Double sided				
203x305	**34-0845**	4.40	4.15	3.61

029478

RVFM

Low Cost Copper-Clad SRBP Circuit Board

Single-sided copper-clad printed circuit board made from SRBP: a paper-based material.

- Excellent for low-cost printed circuit boards
- Easier to drill than epoxy glass fibre
- Results in longer life for drills and cutting tools
- Suitable etchant ferric chloride solution

Type	Order code	1+	10+	50+	100+
100 x 160	**34-0860**	0.60	0.54	0.52	0.48
100 x 220	**34-0862**	0.90	0.85	0.80	0.75
233 x 160	**34-0864**	1.32	0.988	0.853	
233 x 220	**34-0866**	1.84	1.55	1.45	1.29
203 x 305	**34-0868**	2.19	1.64	1.42	1.31

032634

MEGA

Microtrak FR4 Positive Photoresist Copper Clad Printed Circuit Board PCB

Single-sided and double-sided **copper-clad fibreglass PCB laminate** photo etch boards coated with a **high resolution photo-resist**.

Microtrak laminates consist of **FR4 epoxy-glass laminate** sheets, dip-coated with a **positive working photo-resist**. The photo-resist contains a dye that provides a **good contrast** against the copper and allows boards to be easily inspected at the developing stage. Boards are protected by a specially designed **light-proof blue film** which allows them to be guillotined without the risk of fracturing the photo-resist.

- FR4 fibreglass laminate
- Thickness 1.5mm
- Copper thickness 35 micron
- High resolution positive photo-resist
- Supplied covered with blue light-proof film
- Single or double sided
- Wide range of sizes

Mega Microtrack FR4 boards require a developer strength of 10 to 1. (Not 20 to 1 as with other products it replaces.) Exposure time is typically 2.5 to 3.5 minutes.

Technical specification

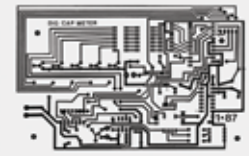
Thickness	1.6mm
Copper thickness	35µm
Dissipation factor	35
Dielectric constant	5.4
Solder bath resistance @ 260°C	20s
Resist thickness	5µm
Spectral response	350 to 450nm
UV light energy required	Approx. 50mJ/cm
Shelf life	1 year @ 15 to 20°C
Developer	CPD5
Etchant	Ferric chloride/fine etch crystals

Size	Order code	1+	5+	10+
Single sided				
160 x 100mm	**34-1500**	3.55	3.48	3.25
203 x 114mm	**34-1502**	5.00	4.68	4.45
220 x 100mm	**34-1504**	4.70	4.37	3.82
233.4 x 160mm	**34-1508**	7.64	7.09	6.55
233.4 x 220mm	**34-1506**	8.18	7.57	6.66
450 x 300mm	**34-1510**	24.39	22.79	20.66
Double sided				
160 x 100mm	**34-1512**	4.59	4.24	3.78
203 x 114mm	**34-1514**	6.24	5.98	
220 x 100mm	**34-1516**	5.67	5.35	
233.4 x 160mm	**34-1520**	8.37	7.27	
233.4 x 220mm	**34-1518**	8.56	8.02	
450 x 300mm	**34-1522**	28.92	26.77	24.63

560428

MEGA

Laser Printer PCB Artwork Film Packs of A4 Sheets



A specially formulated translucent film for the production of high-resolution PCB artwork directly from any laser printer.

- Supplied in **packs of 10** or **100** A4 sheets of film

Type	Order code	1+
10 pack A4 Laser film	**39-0774**	6.88
100 pack A4 Laser film	**39-0776**	62.87

029485

STAEDTLER

Etch Resist Pens

This **etch resist pen** from **Staedtler** is ideal for using on plain copper boards. Producing a blue ink for preparation and artwork.

- Simply press the tip to promote ink flow
- Apply slow, even pressure in use

Colour	Order code	1+
Blue	**34-0300**	1.25
Black	**34-2951**	1.25

029444

MEGA

Seno Polifix PCB Cleaning and Polishing Block

Specially formulated, ultra-fine non-metallic polishing compound carried in an elastic bonding material.

- Cleans, degreases and polishes in one simple action.
- Simply polish back and forth in straight lines, then wipe with a cloth to remove traces of the abrasive.
- Size 30 x 40 x 20mm

Type	Order code	1+
Polifix block	**34-0295**	3.01

029443

PCB Shears and Blades

Powerful, cost effective shears which have the ability to accurately cut PCB laminates, plastics up to 2mm thick and aluminium up to 1.5mm.

- Access to the cutting area is prevented by heavy Perspex shielding extending along both sides of the blade
- A safety latch is fitted to the pivot to prevent accidental operation
- For positional accuracy the cutting bed is fitted with a metric rule which is recessed to assist in securing the PCB or sheeting whilst cutting
- The 200mm unit has a cutting capacity of 203mm (8in.) for normal 1.6mm PCB laminate and is extremely compact with an overall height of only 575mm and a base of 275 x 140mm
- The 300mm shear will cut 1.6mm PCB laminates up to 305mm (12in.) wide and has a height of 670mm and a base of 430 x 135mm
- The 457mm shear will cut 2mm PCB laminates up to 457mm (18in.) wide and has a height of 700mm and a base of 570 x 360mm

Type	Order code	1+
300mm PCB shear	**34-0955**	322.40
457mm PCB shear	**34-0965**	489.95
Blade set 200mm	**34-0951**	66.20

032578

Fine Etch Clear PCB Etchant

An alternative etchant, with superior performace compared to standard ferric chloride.

- Di-Sodium Peroxodisulphate Hexahydrate
- Completely odourless
- Remains clear
- Does not crystallise out
- Achieves satisfactory etching in 6 to 8 min. at 45 to 50°C
- Supplied in **packs of approx. 400g or 1.1kg** in powder form to produce approx. 2 or 5 litres respectively of working solution
- **400g pack** is supplied as **4x 100g sachets**
- **1.1kg pack** is a **single large sachet**

Suitable for use with etch tanks **34-0760**, **34-0764** *and* **34-0765**.

Type	Order code	1+	10+
400g etchant (2 litres)	**34-0392**	12.31	11.24
Type	**Order code**	**1+**	**3+**
1.1kg etchant (5 litres)	**34-0394**	27.53	25.95

029448

Seno PC145 Ferric Chloride Etchant 5L

A special formulation of ferric chloride for etching metals and all types of copper circuit boards.

- Supplied as full strength (45 Baume), suitable for metals such as stainless steel, nickel, brass, etc.
- Dilute by an additional 30% with water for use with copper
- Supplied in **5 litre containers,** weight 7.5kg

Type	Order code	1+	3+
5 litre Ferric chloride	**34-0758**	14.99	13.99

061309

Seno Photoresist PCB Developer

Mega Electronics PCB Developer is suitable for use with all alkaline developed, positive photo resists and fully aqueous dry film photo resists.

- Safe to use: contains no sodium hydroxide
- Suitable for use in our tanks **34-0764** and **34-0765**
- Developer gives a long tank life and fast developing time
- Available either in dry crystalline form in **packs of approx. 25g**, sufficient to produce 500ml solution (1 litre when used with Fotoboard 2), or as **1 litre of concentrate**, to make 10 litres of working solution (20 litres when used with Fotoboard 2)

The shelf life of the solution is considerably greater than that of the crystalline form and should be kept in undiluted form in an airtight container.

Type	Order code	1+	10+
25g crystals	**34-0395**	1.02	0.916
1 litre conc. liquid	**34-0790**	17.34	

029449

Ferric Chloride Stain Remover

This **ferric chloride stain remover** from **Mega Electronics** can be used for the removal of ferric chloride stains from clothing, PCB tanks, benches and other affected areas.

- Concentration required will depend upon nature of stain requiring removal
- Typical concentration in solution is between 100g/200ml and 100g/1000ml of water
- May be used directly on badly affected areas
- Supplied in **packs of 1kg**
- Manufacturer's part **600-039**

Type	Order code	1+
1kg stain remover	**34-0430**	24.95

029450

PCB Bubble Etch Tank

A **single free-standing tank** from **Mega Electronics** designed for the rapid production of PCBs from photo-resist coated, or conventional copper clad boards.

The tank is moulded as a single piece eliminating the risk of leaks or splits from any welds. The inside tank has a built-in heater and thermostat. A pump forces air through two bubble bars to provide agitation for efficient and even etching.

Supplied complete with syphon, 2 metres of mains lead, 13A mains plug fused at 5A and comprehensive instructions. The use of an RCD safety cut-out is recommended with this equipment.

- Accepts boards up to 320 x 260mm
- Rigid outer moulded protective case
- Splash-proof lid
- Mesh board holder
- Etchant capacity: 5 litres
- Splash-proof switches control mains power and the pump
- A neon light indicates when the heater is operating
- Temperature is set by adjusting the thermostat control
- **Mega type PA104**

Type	Order code	1+
Bubble etch tank	**34-0760**	260.08
Replacement heater	**34-0761**	42.84
Bubble bar assembly	**34-0767**	10.71
Tank thermostat	**34-0769**	16.06
Replacement lid/basket	**34-0762**	8.56

029472

Tri-Tank Bubble Etch Unit

A completely self-contained three-tank system for the production of printed circuit boards up to 320 x 260mm (12.6 x 10.2in).

- Heated developing tank, 20°C to 25°C
- Wash tank
- Heated bubble etch tank, 40°C to 45°C
- Enables the user to produce boards in a small convenient area without the need to transfer wet materials over wide areas
- The control switches, neons and variable thermostat controls are mounted on a recessed front panel in the moulded outer case
- Connections are provided at the rear for drain and cold water requirements
- Supplied complete with 2 syphons, 2 metres of mains cable with IEC socket, 13A mains plug fused at 5A and comprehensive instructions
- When using this tank, we recommend the use of an RCD safety cut-out
- **Mega type PA310**

Type	Order code	1+
Tri-tank system	**34-0765**	567.73
Replacement heater	**34-0761**	42.84
Bubble bar assembly	**34-0767**	10.71
Tank thermostat	**34-0769**	16.06
Replacement lid/basket	**34-0762**	8.56

029474

Tin Plating Crystals 1 litre/5 litre

These **tins of Seno immerse tin crystals** from **Mega Electronics** are sufficient to cover either **0.6m²** or **2.7m² of boards.** The powder is mixed with warm 50°C water, allowed to cool and used at room temperature - no heated tanks are required.

The low operating temperature allows very small tin molecules to be deposited, giving a very smooth and hard surface. The longer the board is left immersed, the thicker the deposit (1.5 to 2.0 microns in 30 minutes and 4.5 microns in up to 2 hours).

- Solution lasts up to six months
- Unmixed powder has unlimited shelf life
- Low operating temperature allows very small tin molecules to be deposited
- Ideal for depositing resistant tin surfaces
- Available in **90g (1 litre)** or **450g (5 litres)** packs
- Sufficient to **cover 0.6m²** or **2.7m² of boards**

Type	Order code	1+
90g tin crystals (1 litre)	**34-0775**	22.93
450g tin crystals (5 litres)	**34-0776**	56.10

029475

MEGA Electronics

ROTA-SPRAY

ROTA-SPRAY ETCH/DEVELOPER SYSTEM

This spray processing tank has many advanced features making it an ideal upgrade from a bubble etch tank.

- 3 to 4 times faster than a standard bubble etch tank
- Splash hopper helps to contain chemicals to aid clean processing
- Integral spray tank washes the entire board holder to keep whole etching process clean
- Adjustable spray bars
- Takes multiple small boards
- Low profile design means less etchant or developer collects on board holder keeping processing cleaner
- Panels can be examined after processing without removing (for better results use translucent Fotoboard 2)
- Set and control temperatures and processing times accurately with the digital controllers
- As the board is not immersed in liquid, there is no over-processing after completion
- As well as etching, the unit can be used to develop photoresists
- No syphoning is necessary
- The top of the processing tank is at an efficient working height of 110cm when using in conjunction with the optional base unit
- Optional base unit dimensions: 440 x 360 x 450mm (W x D x H)
- Note: Only Ferric Chloride etchants are suitable for use with Rota-Spray
- Spray processing
- Etches PCBs in less than 90 seconds
- Splash hopper included
- Board holder takes small boards
- Integral spray wash tank
- Transparent case design
- Digital temperature control
- Developer or etcher
- Bottom drain with secure fastening
- 254 x 305mm (10 x 12in.) board capacity
- Safety cut-out on lid
- Digital timer controls processing time
- **Mega type 500-702**

ORDER CODE 34-0752

£1,114.95

ROTA-SPRAY PLUS PROMOTIONAL KIT

A spray processor with many advanced features making it an ideal upgrade from a bubble etch tank. The Rota-Spray Plus is a spray processor with an in-built spray wash tank and is normally used for etch/spray wash. It also features a static unheated developing tank enabling the unit to be used as a develop/spray wash/spray etch combination.

- Digital temperature control
- Transparent case design for excellent visibility
- Integral spray wash tank
- Adjustable spray bars
- Etches PCBs in less than 90 seconds!
- Static developing tank, unheated with bottom drain
- Bottom drain with secure fastening - no syphoning necessary
- Splash hopper included
- Safety cut-out on lid
- Board holder takes multiple small boards
- Digital timer controls processing time
- 254 x 305mm (10in. x 12in.) board capacity
- Dimensions : H 650, W 540, D 500mm
- Base unit dimensions: 440 x 360 x 450mm (W x D x H)

ORDER CODE 34-0751

£1,285.43

Prototyping PCBs

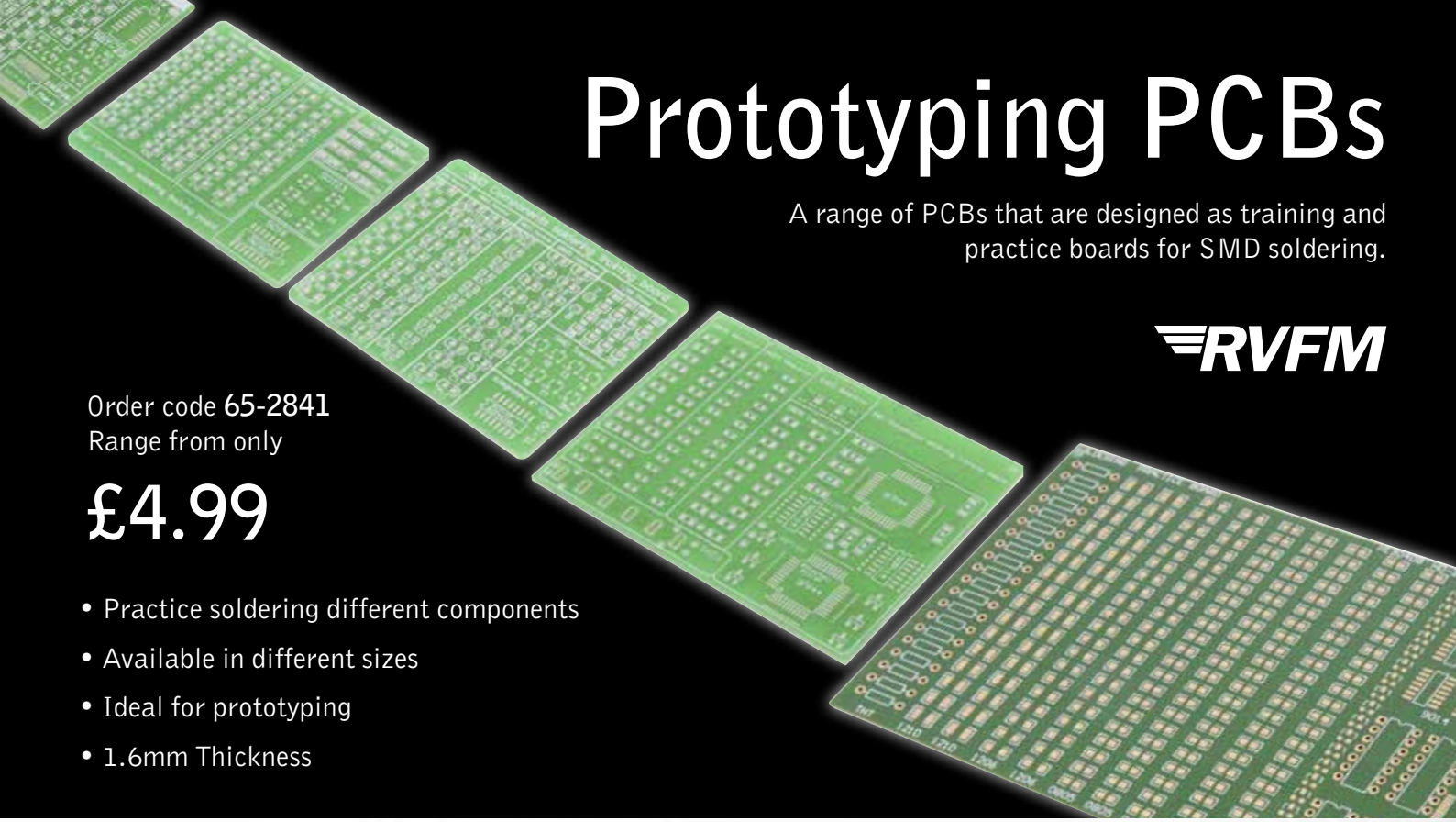
A range of PCBs that are designed as training and practice boards for SMD soldering.

RVFM

Order code **65-2841**
Range from only

£4.99

- Practice soldering different components
- Available in different sizes
- Ideal for prototyping
- 1.6mm Thickness



MEGA Electronics

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