

NEW PRODUCTS UPDATE

In this issue of News and Views, we can announce a record number of new high-technology materials and components – all with tremendous potential for designing and making.

Ferocious Magnets

Rare earth magnets made from exotic materials such as samarium, boron and neodymium are the most powerful ever made. They have quietly revolutionised product design by giving us new types of electric motor, loudspeakers, micro-stereo headphones, magnetic drive systems – and many more. Electric toys such as aircraft and helicopters only exist because of the high power to weight ratio achieved in motors using these magnets.

TEP has now added even more powerful and larger magnets to the range already on offer. These are described in commercial circles as 'ferocious' because of their fantastic pulling and repulsion characteristics. Potential uses in design and technology range from the design of small magnetic products such as fasteners to the design and actual making of loudspeakers – previously beyond the reach of pupils and students.

Tim Hunkin, the well known automatist and TV presenter, demonstrated a DIY loudspeaker by taping a flat coil of copper wire on a bag and placing a magnet in the centre. When energised, the coil moved about the magnet and produced a weak sound. If the ordinary magnet is replaced by a rare earth type, the volume goes up by an order of magnitude, and practically any flat surface from a cornflakes box to a table top can be turned into a surprisingly good quality loudspeaker.

To make such a loudspeaker, you simply need to wind a coil of copper wire around a 'C' size battery (or equivalent) and then glue or tape this to the surface. Bring the magnet close to the centre of the coil and, as if by magic, the sound begins! In a more permanent set-up, the magnet can be placed on a small foam pad in the centre of the coil.

A new TEP starter pack provides magnets, copper wire and a small booklet describing different ways of making flat loudspeakers (and the factors governing performance). Most young people use sound systems of some kind, and this provides added motivation for project work ranging from graphics to engineering in metals. All of the magnets now available can be used in loudspeaker design work, but, generally speaking, the larger the magnet, the greater the volume.

The new range of ferocious magnets includes a number of miniature sizes that professional jewellers are now incorporating in their work as a substitute for traditional fastenings on brooches and garments.

Robo-tyres and Rover tracks

TR has now invested in an injection moulding tool to produce soft durable tracks with a transverse tread. At the same time, we have taken the opportunity to create two pneumatic-style rubber tyres of the type used on expensive radio controlled cars. The new TEP tyres are of the same quality, but a fraction of the cost. The aggressive-looking spikes are popular for their looks but also functional because the turning/rolling resistance is virtually zero. The spikes enable the tyres to climb easily over obstacles.

Both tyres allow the creation of flanged wheel centres or two-part wheels. Because the tyres have a deep recess on each side, the latter is easily achieved by making a 'wheel' from two separate disks – one for each side. These can be cut out using a lathe, CNC milling machine – or even laser cutter. Alternatively, the inserts can be made manually. A disk of material such as mirror styrene or the new TEP chameleon card for the outer surface completes a very attractive wheel.

Solar Panels

The new solar panel, announced in the main catalogue, is a major new addition to TEP resources because it is similar to those used in aerospace applications and more efficient than common ones made from an assembly of fragments. Because of direct purchasing, it is now also at a lower cost! Unlike other solar panels, it is so efficient it can be usefully energised from a high-intensity torch.

Apart from direct drive applications under sunlight or concentrated artificial light, the panel can also be used to charge ni-cad batteries or super capacitors – e.g., trickle charging over minutes to delivery useful energy for solar motors or an LED lamp or torch.

A new solar power starter pack, designed for both science and design and technology specialists, provides a range of sample components and a booklet containing information, investigations and practical applications.

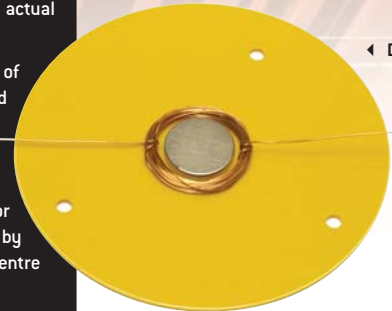
Super Capacitors

Super capacitors with a value of 10 Farads - an unbelievable figure just five years ago – were first developed for computer back-up applications. They now have a wider currency in products such as instantly rechargeable toys (e.g. electric aircraft, micro-cars). To avoid the normal high cost, they are now made to order for TEP - empowering pupils and students to design and make their own instantly rechargeable products – torches, buggies etc. The capacitors can be charged from a conventional 3-volt battery in just seconds and then deliver useful and sustained bursts of energy to motors etc. They can be connected in parallel for high storage capacity.

Rare earth Magnets



DIY Loudspeaker using a rare earth magnet



Tyres and Tracks

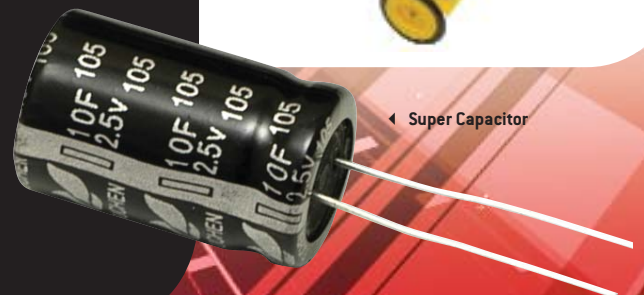


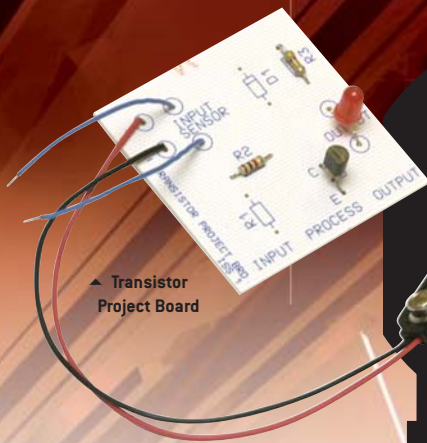
Manually make wheel inserts by using a compass cutter

Solar panel used to power a motor driven buggy



Super Capacitor





▲ Transistor Project Board

Transistor project board

In response to the many enquiries about 'one-component' electronics, TEP has created a single transistor project board that enables pupils to learn about transistor switching and apply the cheapest available transistor to a wide range of practical uses. The board is supplied unpopulated and needs just a transistor and a choice of other components – two or three – depending on application. It is available as a single-board starter pack with explanatory booklet or in class sets. A free introduction pack (with a page from the booklet) is available for those able to visit TEP at the NEC.

More low-cost equipment, accessories and products

The tightening of budgets prompted many colleagues to ask us if we could supply power tools etc. at supermarket prices, the answer was 'yes' – and sales have been brisk enough to support the purchase of more items. These include a replacement for the original hot air gun (useful for thermo-forming plastics), a low-cost laminator, ideal for glazing graphic product work and plasticizing card design work to give that professional finishing touch.

On the adhesives front, we have introduced a (normally) trade-only spray contact/impact adhesive used commercially for coachwork, upholstery, display systems etc. It sticks a wide range of materials including stone to metal! It is an excellent substitute for contact adhesives that are often messy to apply and then difficult to store without evaporation and loss. (Note: good ventilation during use remains essential.)

Also now available is a stick adhesive at what we believe is the lowest price in the UK. Apart from low cost, it has the advantage of being PVC based (as opposed to PVE) and is ultra-clean as well as offering high bond strength. It can be used on wood as well as card and paper.



A4 Laminator ▲

Phone PIC and Chip Machine

Two major innovations will be demonstrated on the TEP stand at the NEC in November. Both offer entirely new and easy ways of programming chips. Although TEP's award-winning Chip Factory continues to provide our 'industry standard' programming facility, the two new systems, offer even cheaper and simpler programming for beginners. Neither requires a computer: the Chip Machine just needs a PC keyboard and the Phone PIC simply uses a mobile phone!

Phone PIC

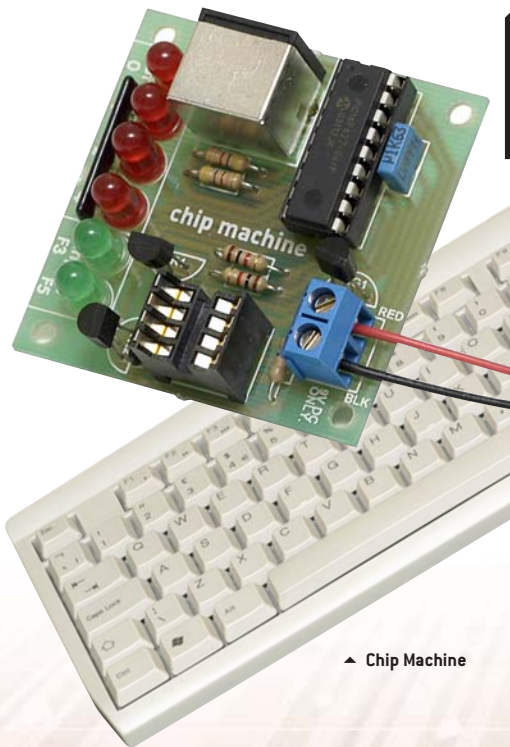
This pioneering system uses any mobile phone for programming. It consists of a small circuit board with a microphone. You simply hold your mobile near the microphone and enter a programme using the dial-up keypad. The Phone PIC responds to the acoustic tones (DTMF tones) generated by each key and translates these into program instructions. In newer mobiles, the numbers pressed appear on the LCD screen, thus visually recording the start of any program entered. It is even possible to program a PIC at any distance by phoning a third party who then holds the Phone PIC near their own mobile! [See Page 9 of this issue!]

The Phone PIC will accommodate existing 18 pin PICs such as 16F84 and 16F627 which are supplied partly programmed AT NO EXTRA COST. Because the Phone PIC firmware is in the actual PICs used, the system is future proofed against any possible upgrades an important consideration when buying any PIC programmer. The Phone PIC is supplied ready to run and features a ZIF (zero insertion force) socket making it very easy to move PICs in and out without damage.

Chip Machine

Of all the TEP PIC programming systems, this one probably offers the easiest route to programming a chip. The programmer is a tiny board that accommodates the newer and cheaper 8 pin PIC (12F629). You simply plug the programmer into a PC keyboard (supplied in the basic starter pack) and use a limited number of the keys to input the instructions. Up to three separate short programmes can be entered. When the programmed PIC is running, the two inputs are used to select (and change between) programs. This effectively provides 'IF' functionality.

The Chip Machine, complete with keyboard, is less than £20. It is fully portable and uses the lowest cost PIC – thus making it very attractive for foundation work at Key Stage 3.



▲ Chip Machine

teaching
resources



Do take a look at the accompanying update leaflet with this issue and our 2003/2004 catalogue for more information on the full range of new items. If you have not yet received a catalogue or for further details please contact:

Middlesex University Teaching Resources, Unit 10,
10 Centre, Lea Road, Waltham Cross Herts EN9 1AS
Tel: 01992 716052 Fax: 01992 719474
Web: www.mutr.co.uk

534.58