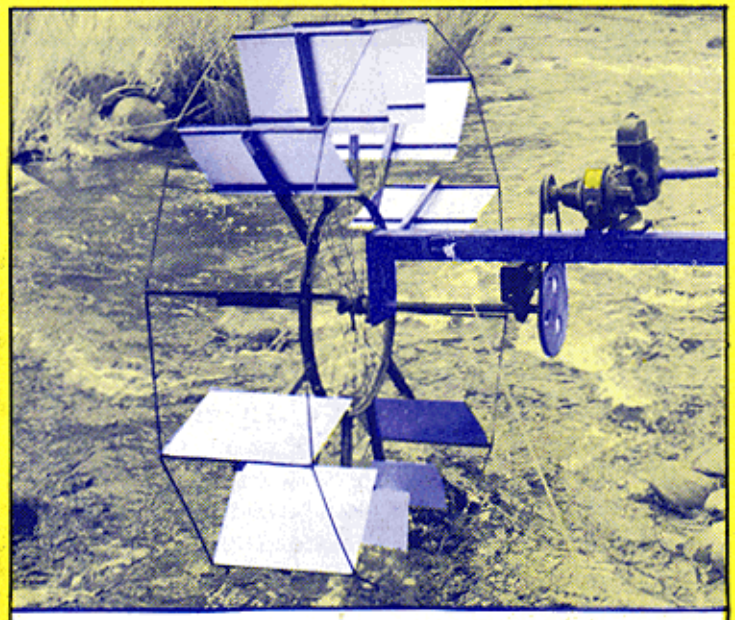
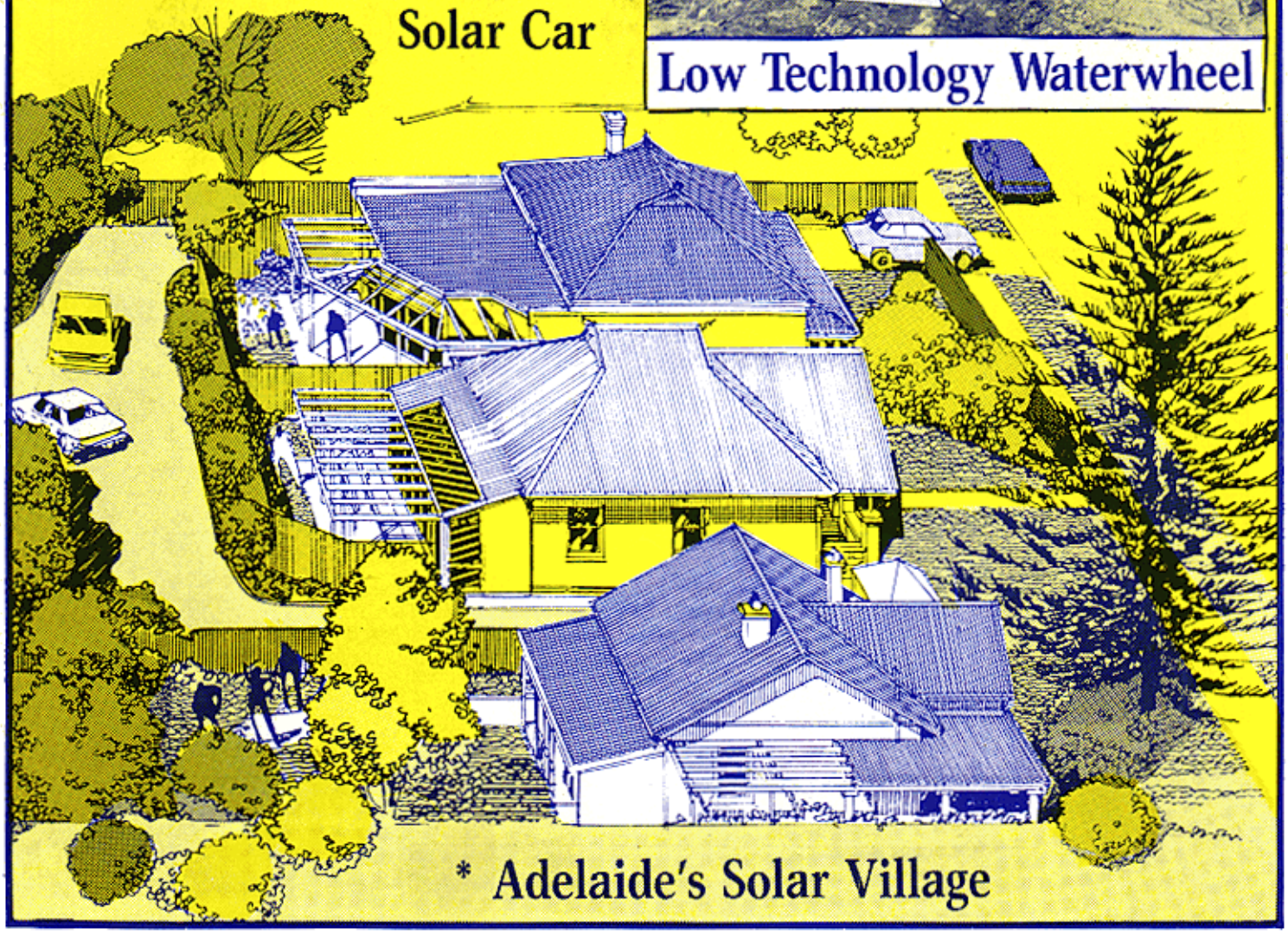
Soft Technology

Alternative Technology in Australia No. 21 Feb 1986 $2.00

* Cities for People
* Solar Water Pumping
* Solar Timer for Watering
* Across Australia with the Solar Car



Low Technology Waterwheel



* Adelaide's Solar Village

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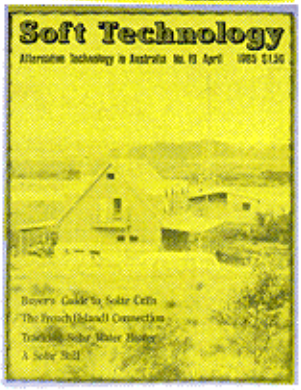

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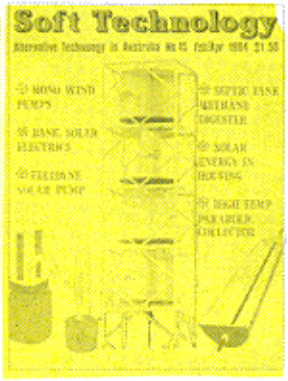

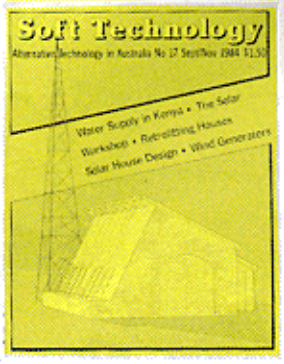

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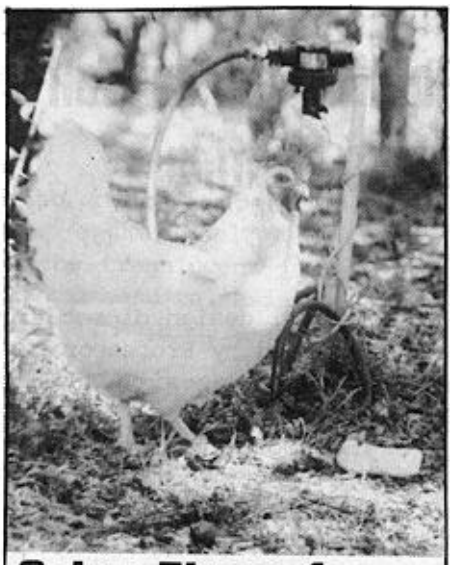

Solar Timer for Watering p18

This issue of Soft Technology was edited by Mick Harris with the help of Alan Hutchinson, Noel Jeffrey, David Anderson, Lester Prowse and Steve Ingerol.
If you are interested in being involved in the production of this magazine, please leave a message on 419-8700.
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Energy Flashes

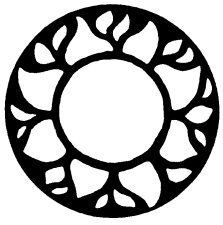
Rotating Solar Wall Helps Home Heating

A novel design of rotating wall has been developed by Professor David Fairman of the Desert Research Institute of Ben Gurion University.

The prototype has an array of four rotatable vertical columns 2.5m high made of triangular adobe bricks. Each weighs 920Kg.

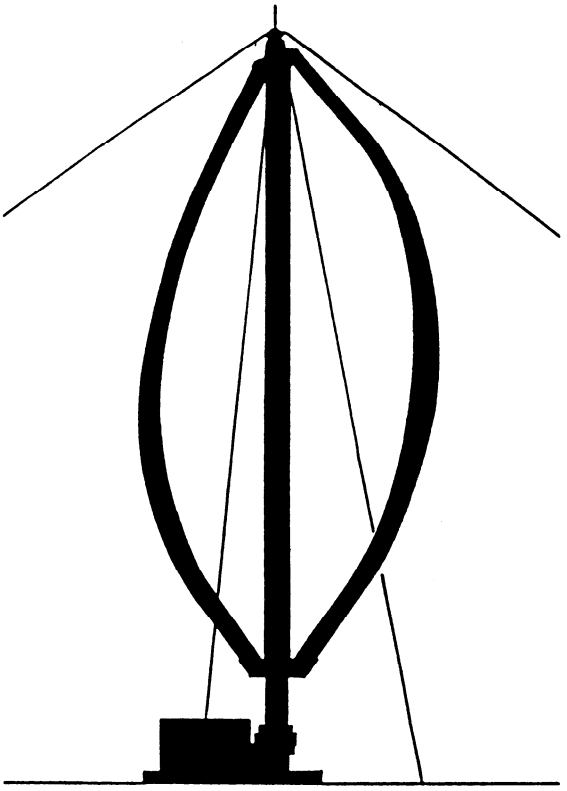
A dark brown face is presented to the sun from 7.30am to 4.30pm to collect and store heat. Then, a white face of thin ply over 5cm thick polystyrene is turned outward to prevent heat loss while the brown face heats the room. The third face matches the interior decor,

During winter the outside temperature averaged 10.5°C with a swing of 10°C in the room the temperature averaged 18°C with a swing of 2°C between morning and evening.



Wet Windmills

Canada's National Research Council, New York University and Plymouth Polytechnic are all looking at modified windmills (in moving water) for generating electricity.



Canadian Barry Davis has an adapted three blade, vertical axis Darrieus 'Eggbeater' windmill under a moored floating platform in the St. Laurance River. The blades rotate at 30 RPM putting 20KW into the grid.

Dean Corren has a 6m conventional type windmill upside down in the tidal East River. It develops 30KW and he has his eye on the Niagara River for the next project.

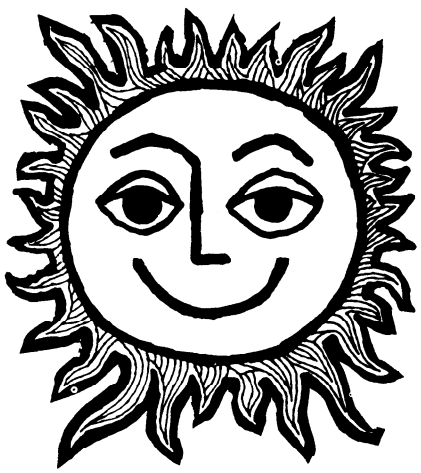
Peter Cave (Plymouth) is researching sea bed turbines using the out of phase tidal patterns of the Channel Islands for a continuous 100KW.

These turbines are less costly, faster to set up and have far less environmental impact than above ground windmills.

Imagine the power avalible at the Rip (Port Phillip Bay) each tide .....

Methane Fuel Cell

A 40 Kg fuel cell unit has been set up Los Angeles using methane gas from a landfill project. At present it supplies part of the power and hot water needs of a hotel complex. It can also supply enough power for approx 25 residential customers. Southern California Edison are also evaluating moving the fuel cell to a waste water digester site to use the methane gas produced as a by product of the digesters.



A Heat Battery

A British Company, Altec Adeco, has produced a battery which stores heat without electricity or combustion. Its working principle relies on heat absorbed or given out when substances change from solid to liquid and V.V.

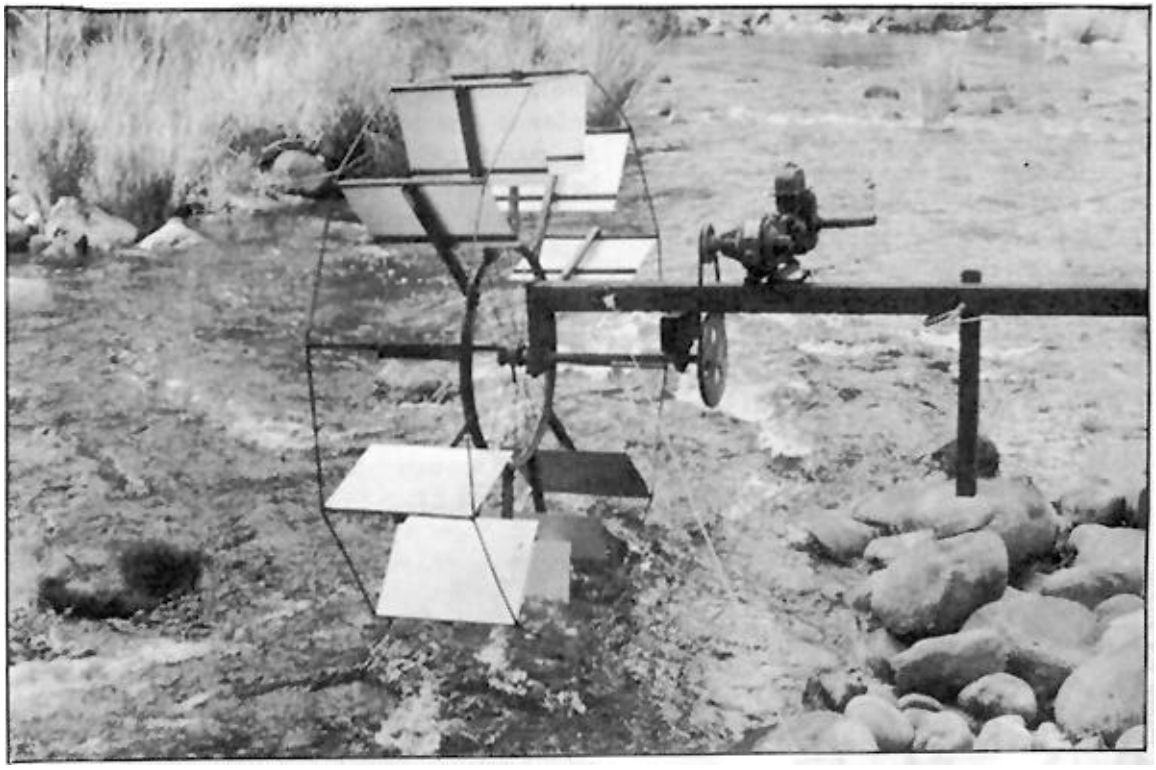
The patented active ingredient is called Thermogel a crystalline sodium acetate in a Xanthan gum, which controls the heat output; the 450 gm sachet is warmed at 65°C until the crystals dissolve then cooled to room temperature. To release the heat a small self sealing cap is punctured, the translucent pink jelly becomes opaque and hand releasing heat for up to six hours. The process can then be repeated.

NEW SCIENTIST

Solar Phones Outback

Above is one of the increasing numbers of solar powered telephone boxes being used by Telecom in remote locations. This phone box can be seen in the camping area of Wilpena Pound in the Flinders Ranges, South Australia. Telecom uses solar cells to power these phones because it is cheaper than running special cables and power wires. In some locations where no power is available it is the only way to provide a telephone.

LOW TECHNOLOGY WATERWHEEL



The waterwheel and pump in operation on the Mann River in Northern New South Wales. It is all done with old bicycle wheels and scrap metal.

Here is one approach to building a simple waterwheel from an old bicycle wheel. When Zeb King found he needed extra water for the garden of his house near the Mann River in Northern New South Wales, the river itself was the logical place to get it from. However, how was he to get the water from the river to his home about **500** metres away. Well the river also provided the solution.

So it was that this undershot waterwheel was built. The river provides the power to push the paddles and turns the wheel. This then turns a small pump which pumps the water up to his house.

It's simple, with little to go wrong and because of its small size has no adverse environmental impact on the river.

How it was built

The waterwheel is based on a bicycle wheel (the source of many good home made gadgets). Because the wheel was too small to get much usable power it was extended by the addition of extension shafts made of square section steel (3" x 3" R.H.S., rolled hollow section).

On the end of these extensions go the 12 paddles which are 10 inches square and made of 24 gauge galvanised iron. Smaller pieces of square section steel (1" x 1" R.H.S.) strengthen the paddles by running along the top and bottom of each paddle. These smaller pieces of steel are welded to the larger pieces which are in turn welded to the bicycle wheel.

The paddles themselves are pop-riveted to the steel. Two strips of steel run around the outside of the wheel adding strength and stability to it.
All put together this makes a wheel five and a half feet in diameter, but which is very light and quite strong. The bicycle wheel was a 28" with a heavy duty rim. It needed to be heavy duty to take the welding. The wheel sits on a 1" shaft which transfers power to the pulley. Two standard bearing blocks allow the shaft and wheel to turn freely.
From the wheel power of l/4 to l/3 horse-power, goes via a 10" pulley through a "V" belt to a 4-l/2" pulley at the pump. The pump is double acting piston pump with a l-1/2" bore and a l-1/2" stroke.

How about floods

Probably the worst enemy of waterwheels are floods. To get over this problem Zeb mounted his waterwheel on a hinged pole. With the use of an old winch fixed to a tree, Zeb can hoist his waterwheel out of the river until it is 3 metres above the normal water level.
The whole thing is fixed onto a steel pole which is concreted onto some very large river rocks sitting in the bed of the river.

The winch came from the tip, and Zeb believes any reasonably heavy winch could do the trick. He uses 6mm cable for the raising and lowering of the waterwheel. Two other cables (both 5mm) are secured to trees upstream and downstream from the wheel. When the wheel is lowered these cables (which are attached close to the end of the supporting arm), give added strength to the whole structure; an extra protection against flood or high water.

How Well it Works

The waterwheel which turns at a sedate 16 R.P.M. can pump 40 gallons an hour. Zeb uses this to top up his dam. It works well but after some thought a number of ways to improve the wheel have suggested themselves and now Zeb plans to build a bigger and better wheel. There is certainly enough water and stream flow' to build a larger undershot wheel and maybe even a breast wheel, where the water enters half way down the wheel rather than at the bottom.

This wheel certainly proves one thing. That is that you don't have to have a lot of fall to get a usable amount of water power.

MICK HARRIS

Hoisting the waterwheel out of the river to avoid flood damage.

SOLAR SEEKER

"We made it !"

The solar car crosses one of the cattle grids after boards have been carefully put in place to make the crossing easier.

Last issue we reported on the preparations of a group of school students planning to take a solar car across Australia from North to South. The trip has now been successfully completed and we report on how it went.

For much of 1985, students and staff of Warrigal Technical School in Eastern Victoria, spent their time building a lightweight solar car and preparing for an epic trans Australian journey.

The car left for the Gulf of Carpentaria by truck on September 27th. Some last minute hitches which included the

need to realign the wheels and add some extra supports to the roof covered with solar cell panels caused some delay. After the 3,500 km drive to the Gulf the real journey, solar powered this time, began.

Along the way the solar car struck a number of novel problems. The cattle grids on the remote stretches of road were a problem for the narrow wheels and planks had to be placed across them to allow the solar car to pass.

When the 18 month drought broke in Queensland the car had to be carried more than 300 km on a truck to escape rising floodwaters. Minor mechanical problems also occurred with regularity*

At one stage of the journey the car ran over a dead feral pig on the road and buckled a wheel. Another problem occurred when one of the solar panels came off and had to be replaced.

Roadtrains, expected to be a problem with their jetstreams and stones proved less of a worry and the drivers used their radios to warn other drivers of the cars progress.

The team averaged 180 km a day travelling at an average speed of 25 km and a top speed of 50 km an hour.

After six weeks of travel the group reached Melbourne on November 6th They drove into Melbourne despite the heavy rainfall which had been common occurrence on the trip.

Despite the problems which occurred along the way the staff and students were very pleased with the project.

We will be doing a feature in the next issue of Soft Technology showing how the Solar Seaker as the car was named was built.

School children at Boulin State School leave their classes to come out to inspect the solar car.

Energy Ideas Village

In the Adelaide suburb of Woodville, three old run down houses have been used to demonstrate ways of saving energy, and using solar energy, in existing homes. Now called the "energy ideas village," these houses use a variety of techniques to improve the energy efficiency of the houses.

The idea began with a firm of architects, John, Held and Russell, who approached the Department of Mines and Energy, with a proposal for a low energy retrofit display house. This was seen as important because of the large numbers of renovations taking place which were not taking into account energy saving techniques.

Because of the range of ideas and options which needed to be demonstrated it became clear that more than one display house was needed. Appropriate houses where located when the City of Woodville offered to lend three houses it owned to the project,

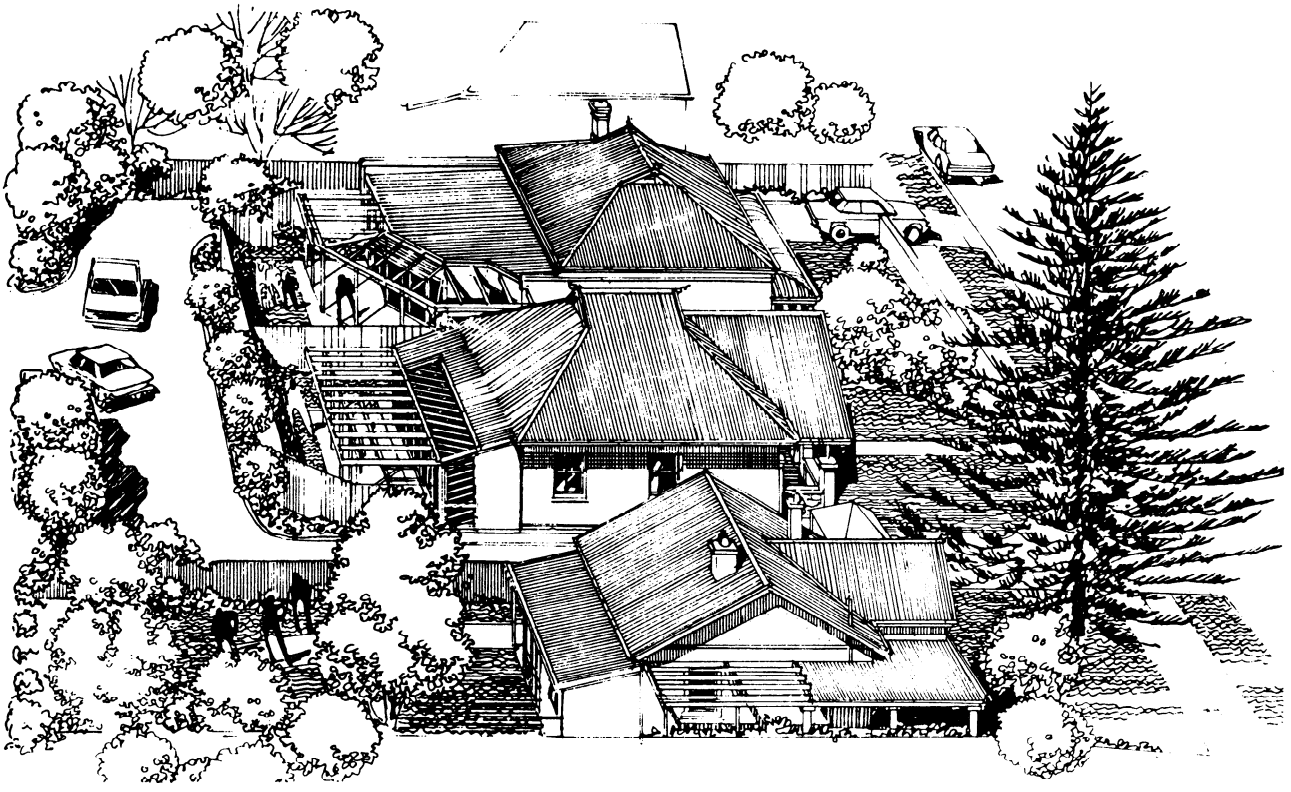
Funding was obtained through the Commonwealth Employment Program and the South Australian Energy Council. Large numbers of sponsors contributed various materials to make the display houses possible.

In the end it was decided to have a different theme for each of the houses. One would demonstrate a low budget approach, one would show experimental ideas and one would include major addition ideas.

HOUSE NO 23 DO-IT-YOURSELF

This house demonstrates a "low-budget" approach to house renovation. Most of the ideas presented are of the "do-it-yourself" variety and their installation could be undertaken by the average home handyman.

Minor upgrading was required to make the building presentable this included



House 23

painting internally and externally, new floor coverings and some basic redecoration of the kitchen and bathroom. The only construction work was a new laundry/sunporch and small verandah to the rear, and the opening up of this sunporch to the dining room by means off sliding glass doors. The previous sleepout was converted into a site office and entry to the display houses).

LOUNGE DINING

1A **Slow combustion heater**

This replaces the previous open fireplace, which has a low efficiency (around 10% and a high running cost. An airtight slow combustion heater, using dry wood, is about 60% efficient, and has one of the lowest running costs of all forms of space-heating. This inbuilt heater has a secondary burning chamber and an optional fan unit for extra capacity. Above it, is the inlet to the heat-shifter

1B **Ceiling fan**

In summer, a ceiling (or sweep fan provides economical and effective cooling by moving large quantities of air past the skin.

In winter, if operated on a low speed, the fan pushes the warmth (from the room-heater) down to where it is needed. This is particularly effective in rooms with high ceilings.

1C **Curtain and pelmets**

A significant amount of energy (from heated rooms is lost through windows. . Heavyweight curtains, either touching the ceiling or with sealed pelmets at the top to prevent air circulating past the window, reduce much of this heat loss. They need to be closed at sunset.

1D **Lighting**

Throughout the house are several new low-energy lights using low-wattage fluorescent tubes mounted into conventional fittings. They consume about 75% less electricity and last several times longer than incandescent bulbs. The dining room light has been fitted with a dimmer switch, to reduce electricity consumption, and to extend the life of the globes.

BEDROOM

2A **Ceiling insulation**

The roof-ceiling area is usually the major source of heat gain and loss. In this house, the ceiling below the pitched-roof area has been insulated with R2.5 fibreglass batts ("R" is the measurement of the insulation's resistance to heat transfer.

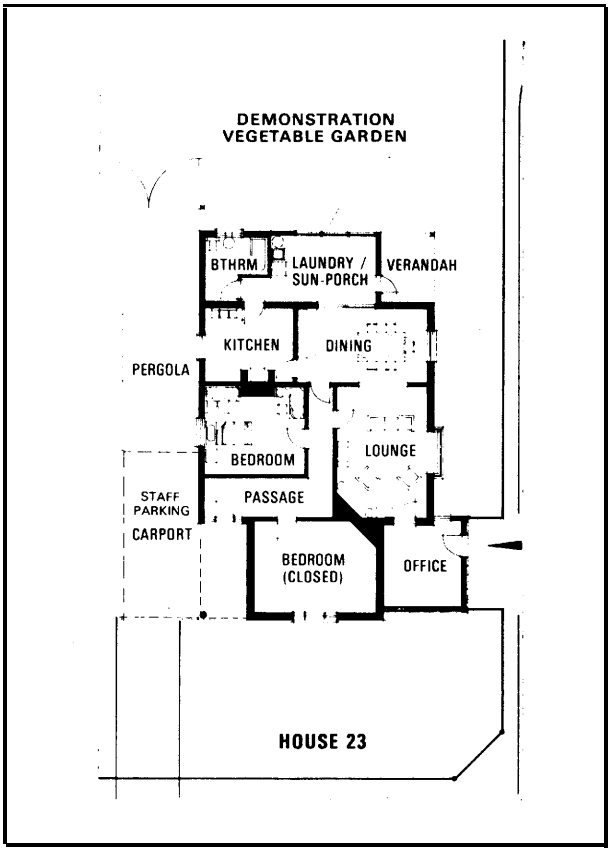
2B **Heat shifter (exit)**

This transfers warm air near the ceiling of the heated lounge to the unheated bedroom, using a standard ceiling exhaust fan and commercially available ducting. Room temperatures can be raised from a cold l5°C to a comfortable 21°C within minutes. Although the system is only 3 metres long in this house, it has been tested satisfactorily with duct lengths of up to 12 metres.

2C **Window weather-stripped and shaded**

In winter, cold air flows through the tiniest openings, adding to heating bills. In summer, unwanted heat enters and helps to raise the indoor temperature. In all houses, external doors and windows have been sealed using commercially available products. As this windows faces north-west, the addition of shade-cloth to the existing pergola provides shade from the

summer sun. This shadecloth can be removed to allow the winter sun to penetrate.



PASSAGE

3A **Carpet**

The carpet and thick underlay laid over the existing timber floors provides a reasonably good insulation, equivalent to about 15 mm of fibreglass.

LAUNDRY/SUNPORCH

4A **Floor and insulation**

A concrete floor, covered with a hard surface such as quarry tiles, provides "thermal mass" to receive and store the sun's heat in winter and stabilise indoor temperatures in summer. Note that the walls and roof of this (new) laundry/sunporch were insulated during construction.

OUTSIDE

5A **Pergola with adjustable louvres**

Since this window faces north-east, a pergola with adjustable louvres will protect it from the summer sun but allow the winter sun to penetrate. External shading of windows and walls is far more effective at preventing 'the entry of unwanted heat than internal shading devices, such as blinds and curtains.

5B **Garden**

This shows both traditional back yard features (such as service areas) as well as some of the concepts of the Community Gardening Team (food production maximised, nutrients recycled, organic soil improvement, water conservation). Displays in the laundry/sunporch provide further information.

HOUSE NO 25 EXPERIMENTAL IDEAS

This house demonstrates less conventional ideas, some of which may be hard to justify on economic terms. Nevertheless, they are presented to provide additional interest, to demonstrate a wider range of techniques, and to attract more publicity.

Structural changes included demolition of the "lean-to" kitchen, rear porch, separate laundry and W.C. and the relocation of the kitchen, dining room and laundry. A sunspace was added to the back of the house, with a small porch. Other techniques include earth-cooled tubes, a solar heating skylight, and a ceiling-mounted radiant heating system.

OUTSIDE

lA **Verandah and exterior light**

The old-fashioned" Australian verandah, particularly with vertical shading (e.g. canvas blind on the outer face, is a very effective means of shading east and west facing walls and windows.

BEDROOM 2

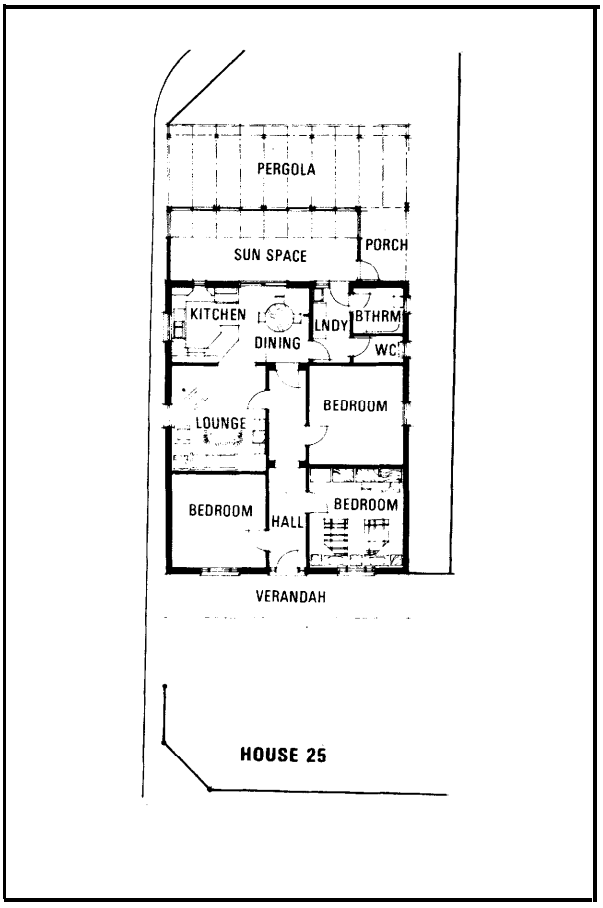
2A **Vents sealed**

Top-of-wall vents are sealed off to minimise unnecessary heat gain or loss, summer and winter.

BEDROOM 3

3A **Solar heating skylight**

This new product provides natural lighting all year round and, in winter, some solar space heating by means of a reflector hatch raised towards the northern sun. Installed on the north-east sloping roof face, the raised reflector hatch allows light (and thus heat into the house both directly and by reflection from the underside of the reflector hatch. During summer, the hatch is lowered (using a removable winder allowing only a small amount of light in for illumination.



LOUNGE-DINING-KITCHEN

4A **Insulated shutters**

These outside aluminium shutters, with a polyurethane foam core, are controlled from indoors. In summer, they keep about 80% of the heat out; in winter they help to keep heat in. They can be locked automatically in any position.

4B **Radiant heating system**

In this "all electric" house, a relatively new (to Australia) system of heating is installed in the ceiling. It consists of thermostatically controlled flexible heating elements sealed in a plastic waterproof laminate. The thin strips are stapled to the ceiling under the fibreglass batts, and connected to mains power. They radiate heat from the ceiling directly to the floor and furniture, heating about 4.5 square metres for less than 1 cent per hour.

4C **Sliding glass door with curtains**

This door is the main link between the living area of the house and the sunspace. On sunny winter days, the door needs to be left open to transfer excess warmth from the sunspace to the main house. On winter nights or during very hot weather, the door needs to be closed and the curtains drawn to isolate the sunspace from the house. Further

Continued on page 30....

A Tribute To Tony

The death of Tony Stevenson in September 1985 was a severe blow to the Alternative Technology movement in Australia. Tony played a key role for many years in encouraging and working for the development of alternative, renewable energy technologies.

Tony went back a long way in the A.T. Field. It was over ten years ago in the mid 70s when his interest in Alternative first developed. His desire to help society move away from the polluting and limited fossil fuels, to the safer and sustainable renewable energy sources such as sun, wind and water led to him taking a key role in 1976 in a new group, the Alternative Technology Co-op.

Tony quickly became the key contact in this group with Tony's own home becoming the contact point for the A.T. Co-op. In those days the limitations of Alternative Technology were not as apparent as they are today and with the taste of the energy crisis still in their mouths, people saw all sorts of possibilities.

One newsletter in 1977 mentioned the group as being involved in "public meetings, alternative books, community workshop, alternative fairs, alternative energy and technology centre, community discussion groups, community research, alternative radio (3CR), and a solar energy shop." It seemed the sky was the limit.

Going Solar as it used to be

To help supplement its income, (to get on the mailing list cost only $2.00) the group sold books at the meetings that were held. This eventually led to Tony feeling the need for a shop where information, books and equipment could be available. In February 1978 Tony wrote "Some Co-op members are considering leaving their dull jobs to set up an A.T. shop. It would be near the city centre, and would stock a wide range of books and magazines as well as AT. hardware (like bicycle trailers and parts of windmills, etc, that cannot be made in a home workshop.)" Another newsletter said "We hope to house a library on the site, and provide coffee and folk music, at least on Fridays (from lunchtime)".

Anyhow the shop finally came together as "Going Solar". Tony established a workshop and started to develop more comprehensive skills in areas of solar energy, wind power and other areas of AT. However while working on a range of A.T. equipment Tony's key love continued to be windpower.

In those early days you could buy Grass Roots for $1.40, spinning wheel kits for $74, Dunlite Wind Generators for $3,025 and Alpinite Sea Grass Insulation for $8.00 per bag.

The shop grew and developed with Tony taking on the technical role of designing and installing systems and Steven Ingrouille (another key A.T. Co-op member) looking after much of the organisation of the shop. The shop moved

to opposite the Victoria Market and in Mid 1981 Tony and Steve broke up their partnership.

After a rest, Tony started a new business Survival Technology. With the help of Lyn he quickly established himself, and with the knowledge he had already accumulated, became the leading practical authority on small scale windpower in S.E. Australia. Tony continued at Survival Technology until his death.

Perhaps Tony's greatest flaw was he gave so much. So much of his time, his energy, his ideas and his enthusiasm. When the A.T. Co-op finally faded away he was still ready to put in his time and energy when the new group - the Alternative Technology Association started. Without his enthusiasm, both Going Solar and Survival Technology would never have started. The Solar Workshop would never have been built. Soft Technology would never have happened.

Tony's quiet confidence and energetic enthusiasm inspired many more people than he realised. His knowledge and work in solar and wind power made Alternative Technology a reality in hundreds of peoples lives.

Tony was a pioneer in the A.T. field. His work resulted in a renewal of interest in small scale windpower which would have been impossible without him. He took a key role in opening Australia's first A.T. shop. His loss has left a hole that cannot be filled.

COMING SOON

* **The latest developments in Photovoltaics and what it could mean to you.**
* **The story of how the Solar Seeker was constructed.**
* **Simple solar projects: the sunbottle solar water heater made from recycled plastic bottles.**
* **windpower in the Future: current trends in wind turbine construction and where they are leading us.**
* **How to build an electric go cart from readily available materials.**

A.T.A. REPORT

After two years of hard work we finally have a finished workshop, (well almost except for some rough edges.) Since the last magazine we have installed the massive doors in the bluestone arch, placed the wind generator on top of the tower, finished the windows and other doors, installed the wiring and fitted the battery bank.

We now have a locked and functional building which is already being used. The massive effort we put into the workshop at the end of last year was one of the reasons for the lateness of this issue of Soft Technology. With a finished workshop we will be able to get Soft Technology back to its usual regularity.

The workshop, almost finished in November 1985, complete with windgenerator and it's own independent power system.

The interior of the workshop before and after. In a matter of weeks the empty interior of the workshop was transformed with the construction of the office and library (upstairs).

The opening meeting at the Workshop in November was an enjoyable time for all with food, fireworks and the film of the workshops construction. It was also a chance for the many people who helped with the workshops construction to relax with the knowledge that at least on that day they did not have to work.

In January we had our first activity with people working on a variety of projects, including a 60ft high Savonius Rotor and a 7ft high solar barbecue. A variety of other equipment was prepared for a series of displays in which the group will be participating. These

include one at the Down-to-Earth Confest, one at the Moora-Moora co-operative and one which we could be involved with at the Exhibition buildings in Melbourne.

At the next meeting on February 4th, speakers will talk about solar home design and renovation and the workshop's windgenerator system. In future, meetings will be held every moth on the first Tuesday evening and activity days will be held on the 3rd Sunday of each month.

The wind generator was erected in early November. Despite some last minute problems such as "where does this wire go" and "this doesn't fit", we finally got the wind generator up. Because it was such a stinking hot day it wasn't long before the day degenerated into a relaxed chat in the shade of the workshop, while the wind generator whizzed around high above our heads.

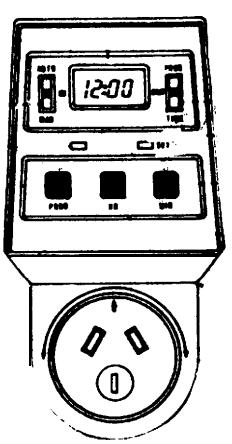
Use For 12V Timer

I recently found myself faced with the problem of providing fresh water to my ducks while I was away on holidays for a month. The solar powered duck watering system I came up with could be used to irrigate or water plants, provide fresh water regularly for animals, or even complement a domestic water supply which needs a regular injection of a measured amount of water. The system was also pleasing because it was so cheap and simple to put together.

The system basically consists of a solar electric panel, an old car battery, an electronic time clock (converted to 12 volts) and a 12 volt solenoid valve. Not counting the solar cell panel it cost less than $50.00.

The size of the solar panels you use on the system depend on how long you will be operating the solenoid valve and allowing water to flow. Because the electronic timer actually operates off two small photographic batteries, power is only used when the water flow is "on".

I found I could get away with quite a small solar cell panel because I was only operating the valve for about half an hour a day.



A chook examines the solenoid valve which regularly supplies her with fresh water.

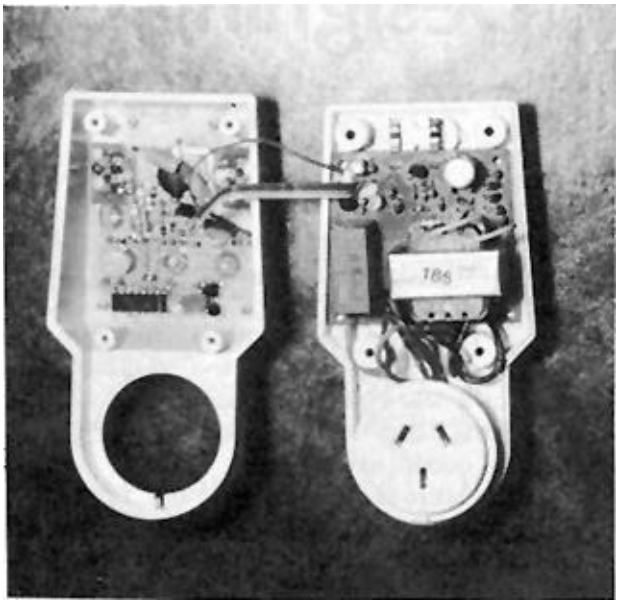
The solar cell panel charges the battery. I found because of the relatively small power requirements of the system I could get away with an old car battery. If you have more power going into the battery from a relatively large panel you may be advised to have a regulator between the panel and battery. However regulators are designed to protect batteries and if you are using an old battery which is practically valueless you may choose not to worry about protecting the battery.

Next comes the timer. The timer is a Kambrook electronic timer. You can often pick these up for around $20.00 these days. Peter pedals had an article in Earth Garden on how to convert the timer to 12 volts and I decided to have a go at doing one myself. The basics of the conversion are as follows. Open the timer by removing the four screws at the back which hold it together. You will now see two printed circuit boards, one in each half of the plastic case (which is now in two pieces. Unscrew the circuit board with the transformer on it. Now unsolder the two black wires on one side of the transformer and two yellow wires on the other side of the transformer. Also disconnect the brown capacitor next to the transformer.

In Peter Pedals' articles in Earth Garden he suggested removing both the transformer and capacitor. I suggest leave them in, in case you want to convert back to 240 volts.

You could even put in a switch so you can have either; even though the danger is you might forget to have the switch the right way and "BANG".
Anyhow, once you have disconnected the transformer wires use a small piece of wire to connect the place on the circuit board where a black wire was and a yellow wire. Get another wire and connect the other place where there was a yellow wire and a black wire. Now you have bypassed the transformer.
That is all there is to it. Put it all back together and try it out. It's a good idea to put a big label on the timer saying "12 Volts Only" just in case you forget.
Now comes the last part of the system. I bought a 12 volt solenoid valve from Plastic Plumbing Supplies in Carlton, Melbourne. This with its associated fittings cost about $28. I used some old wire and a plug to connect the timer to the solenoid valve. Then screwed the solenoid valve onto the standard tap and that was all there was to it.
If you are in a situation where you have no reticulated water under pressure and nave to pump water, then you could replace the solenoid valve with an appropriate electric pump. But make sure you have the capacity from the solar panel and attached battery to run it for the required time.
Once you have wired it all together, read the instructions on how to set the timer and see how it goes. You should be able to turn the water on and off up to our times a day for as long as you like.

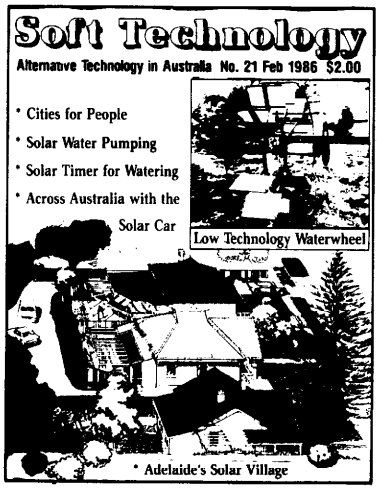
MICK HARRIS



The inside of the electronic timer. Note, the transformer and black wires on the bottom right hand side.

Six Months Late .....

Soft Technology is your magazine. It is produced by a small group of unpaid volunteers who need all the help they can get. Because of the heavy workload of other A.T.A projects, this issue took six months to produce instead of three months. We hope to catch up over the next year however we badly need help. If you live in Melbourne, contact us and give us a few hours help. Otherwise write us an article and remember to send photos or diagrams. Thankyou for your support.



Designing Cities FOR People

Most of Australia's people are urban. We live in cities which make little use of natural energy sources and do little to create a feeling that we live in a community of people. In the village and small town we all knew and cared about each other, used less energy and didn't waste the goods around us.

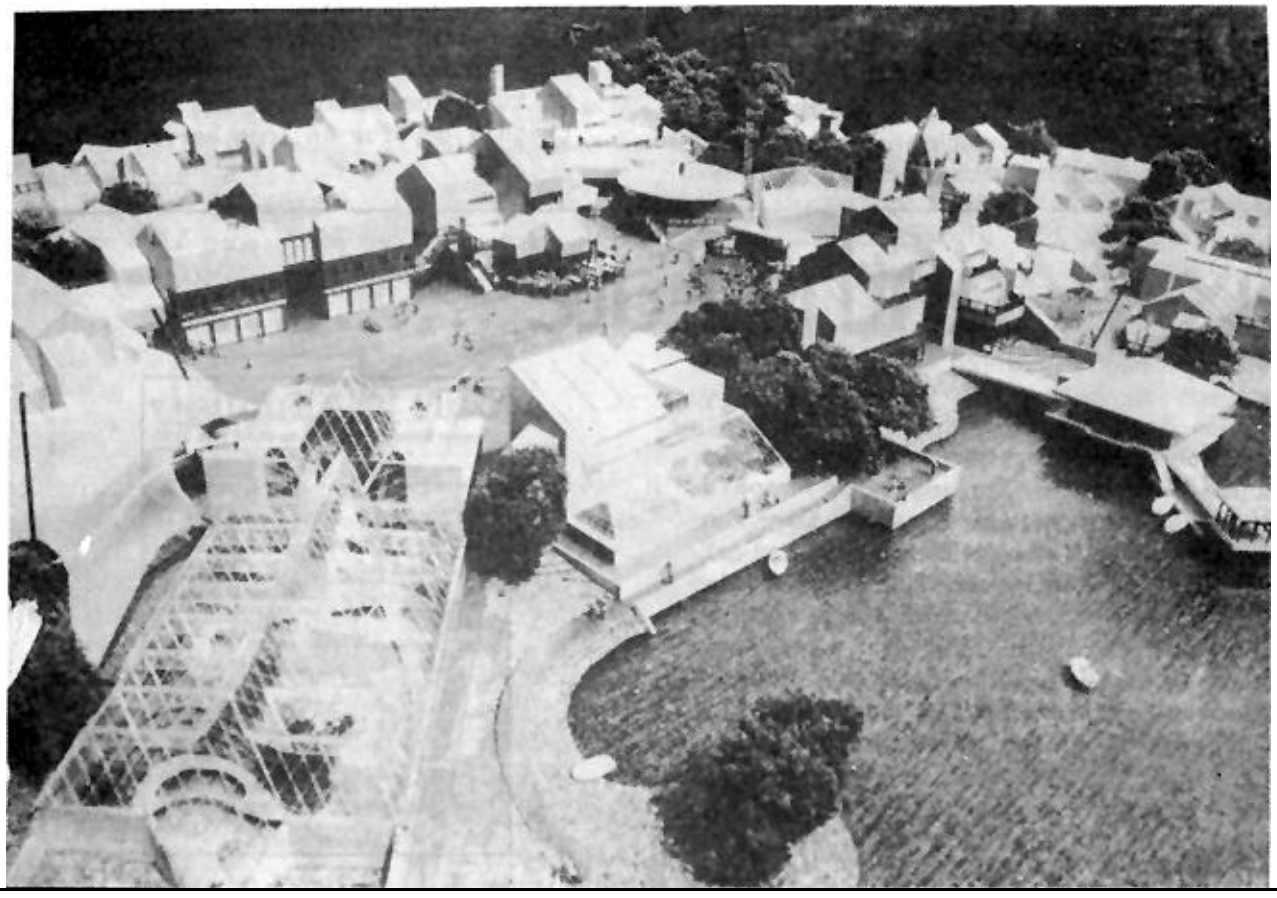
In Australia, getting away from the the city and it's high energy demands means running away, but in Britain, the Dartington Hall Trust thought that running away from the town and the city helped nobody. So why not try to create the answers to the traumas within the town/city area?

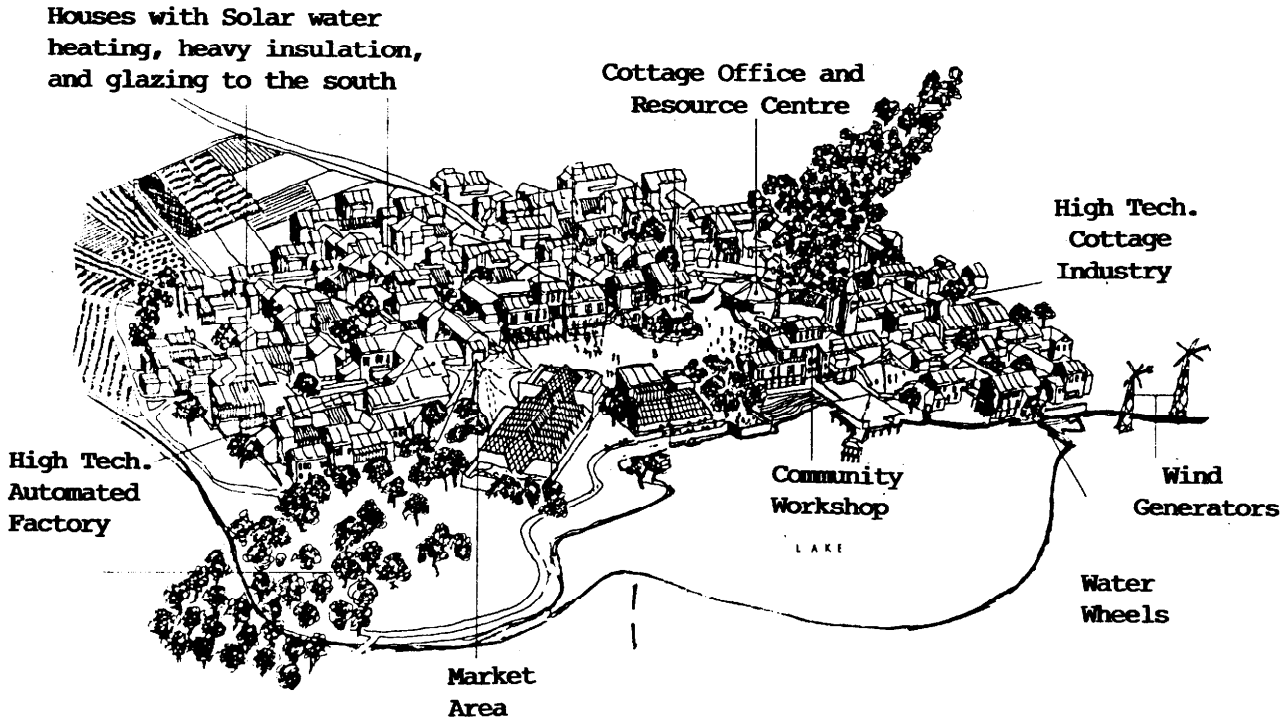
The result was that in 1980, a model for a town which concerned itself with people and energy was unveiled.

Andrew Page, the designer of the model, took a long look at the towns and cities of England and saw a separation of peoples, the cutting of towns into little squares hemmed in by a moat of asphalt inhabited by motorised piranha.

He said that the intention is to project a positive future, doing more with less, fostering a full life, and responding creatively to the challenges posed by rising energy costs, the withdrawal of public services, the introduction of microprocessor based technologies and unemployment.

The unifying theme is 'community': the assumption being that for a full life in the future we will need to cooperate with each other on a far greater scale - locally, nationally and internationally.





The objective of the model is to portray a community in which life may be lived in accordance with the values generally associated with village life - a life of cooperation with neighbours, of small scale business and industry, of respect for and closeness to the land; a life in which we can experience a strong sense of belonging to the community as a whole and to the place in which it exists.

Although self-sufficiency is advocated, the community depicted in the model is not designed for isolation from the rest of the world, nor from advances in modern technology. A balance is called for, Much thought and discussion is required as to which kinds of work it may be appropriate for machines to do; which issues may be best determined locally, which regionally, nationally or internationally.

Tofler, Schumacher and Lovins have wrung their hands and cried with horror at the way in which we live, but few have looked not at the farm as an ideal, but at the city/town level. If this area was rethought and the town was built not as a number of discrete pieces of land but as a total intergrated whole, then 'community' could start to mean something.

The projected population for the community would be about 2000. Large enough to allow a full and creative life and to justify extensive community facilities, but small enough to be experienced as a cohesive unit by the inhabitants.

There are several communal facilities and services in the model - the Village Hall, Cottage Office and Resource Centre, educational facilities, the Spa, the Aquaculture Centre etc. In order to support these, there would be a community levy paid by each individual in either cash or labor. Thus a number of community services might be run on a volunteer rosta basis, by people choosing this means of contributing rather than paying their levy in cash. A number of facilities such as the Learning Exchange, might be run on a non cash mutual aid basis. The greater the degree of voluntary cooperation within the community, the more the magic of 'synergy' is released - that extra energy that emerges when people act together in harmony.

As you can see in the photo, the Dartington project is very English with high density 4 story dwellings interspersed with service retail and

garden areas, a central admin, market and industrial area.

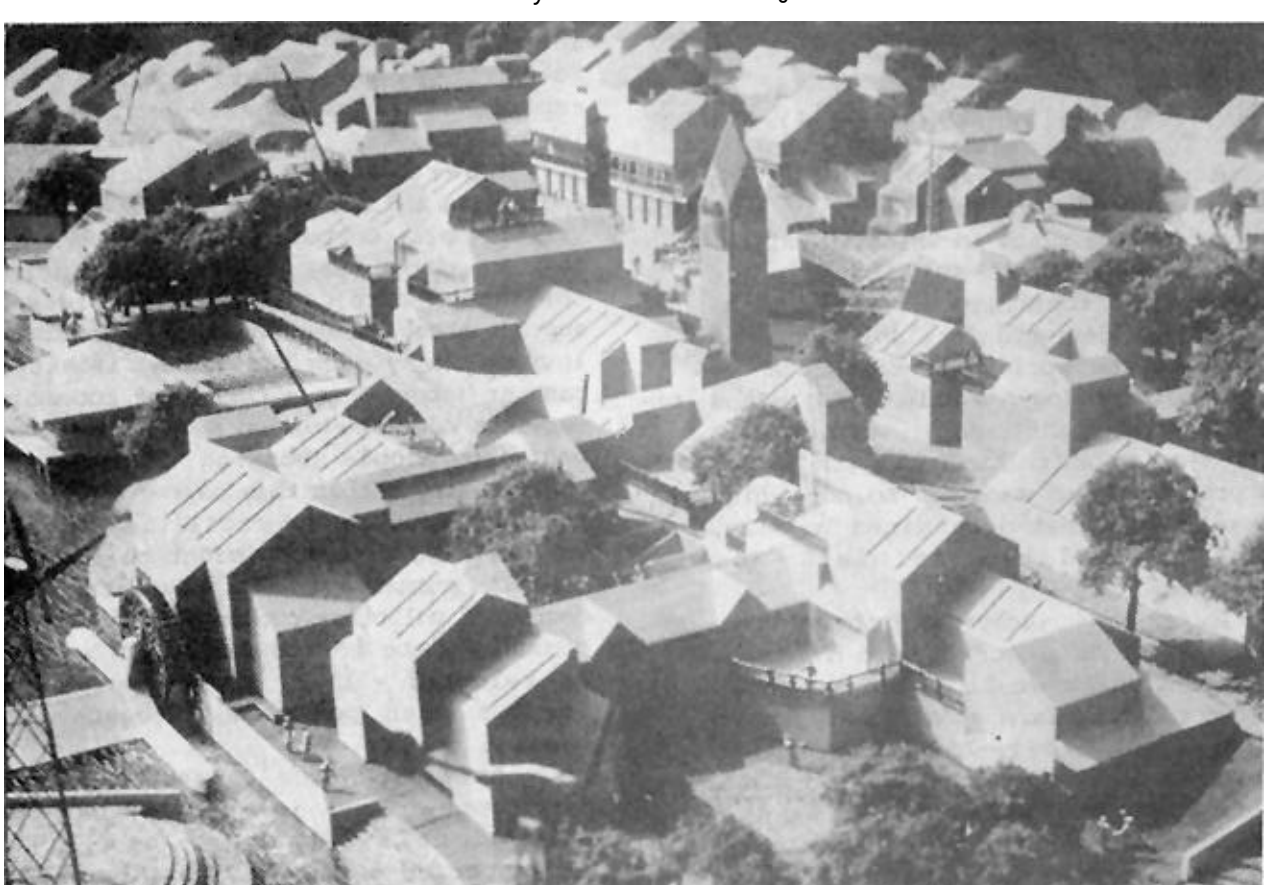
The concept leans heavily on an interweaving of high and low tech. industry each serving it's appropriate field, The 'microchip' revolution is seen by page as opening the door to the post-industrial age removing the need to commute great distances or work within a time framework of 35-40 hours per week worked in 8 hour blocks.

In our present system a clear line is drawn between 'work' and 'leisure' for most people. Only the self and unemployed really have the freedom of their own days, to organise as they see fit. As soon as the yoke of the compulsory 40 hours at one job is lifted, work and leisure can become intermixed, both bringing equal self respect and satisfaction. Some people might choose to spend most of their hours at money making ventures; others might prefer to contribute to the community's various collective needs, instead of paying for these with money that they have earned.

This assumes a highly automated production and distribution network which I doubt that even small England could create, but with a bulk transport system and towns consisting primarily of service industry personel, it may well work, but not completely within the framework envisaged by Andrew Page.

The model approaches energy with a strong emphasis on energy conservation and appropriate use of renewable energy sources. It turns to a total integrated energy package with wind generators and sewerage fuel methane digesters.

The houses are designed to make use of the sun as a passive source of heating. They use insulation, double glazing and weatherstripping to reduce energy needs. Water is heated by the use of solar water heating.



It looks at transport a little as though South West England were a warm temperate climate by his comments:

'The community would be car-free. People would be able to walk in their own streets without danger; there need be no reason to fear for the children. The car cuts though our lives, destroying connections and fragmenting all possibilities of community. Transport within the community would be limited to walking, bicycling and carts. here is a Community Transport Depot for the co-ordination of deliveries and as a base for travel outside the community.'

This may be allowing more than the current human can bear, but it is not without a sensible base. Weatherproof man or animal powered transport is now a proposition and intergrated within a village framework could service the requirements.

The most immediate effect of this change would be massive unemployment as industry automated. Ex-employees, unskilled at not working for a boss, unskilled at tasks to provide themselves with food, clothing, energy and entertainment by their own labor and not by money earned, are roaming the towns and cities existing on the dole.

Children and adults died by the thousands as the Industrial Age opened. If the Post Industrial is not to follow this pattern, education **NOW** in skills and self support not state support must commence to buffer the change and prevent this breakdown occurring.

This design would not be suitable for Australia as conceived, but could be utilised as a base for a new development in Australia and next issue we will examine the needs, technology and effects of transporting this concept to Australia.

Ian Gray

Mono/Suntron Solar Water Pumping System

Solar water pumping systems consist of a solar array and an electric motor driven pump. They can offer a reliable low maintenance, low running cost method of water pumping in remote areas. Solar water pumps are an alternative to using either a diesel driven pump or a windmill for supplying water from a dam, creek, river or bore.

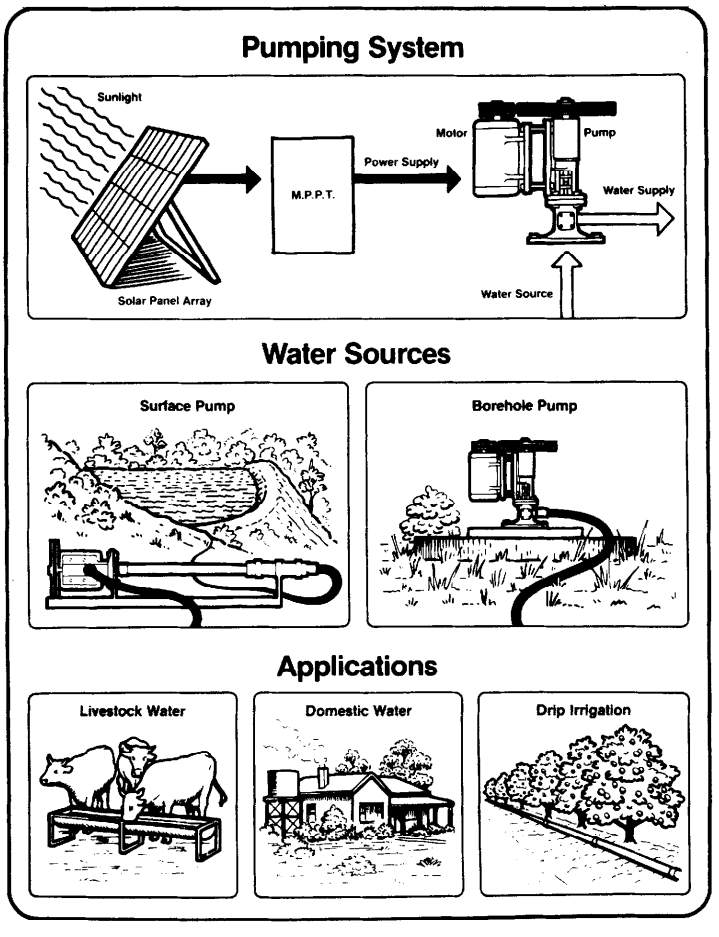
Over recent years two companies Mono Pumps Australian and Suntron Energy have been working on a high efficiency Solar Pumping System. The system combines photovoltaic cells as a source of power with Mono's positive displacement pump via a high efficiency electronic controller. The pump is the same as the one used by Mono in their Savonius rotor wind pump (Refer Soft Technology No.15). However it is the controller which is the key to system efficiency. It ensures that almost all the energy collected by the photo-voltaics is transfered to the pump to move the maximum possible amount of water.

Mono Pumps and the Managing Director of Suntron first installed two test solar water pumping systems in early 1982, one which operated with batteries and the other by direct connection to a permanent magnet DC motor.

The test installation operated fairly satisfactorily but troubles were experienced with the controller in the battery system and the supply of DC motors.

During the period from 1982-1983, the World Bank conducted a series of tests of overseas manufactured solar water pumping systems and published a comprehensive report in June 1983. The best system performance was achieved with a system comprising solar modules and an inverter to drive the AC motor which in turn drives the pump. The best average daily efficiency achieved was 3.8%.

By February 1984, Suntron Energy Company in conjunction with Mono Pumps, had analysed in detail, the results of the World Bank tests and evaluated the two alternative methods of configuring solar water pumping systems. That is, having the solar modules drive either a DC or AC motor.



MONO/SUNTRON SOLAR WATER PUMPING SYSTEM

This is a diagram of the elements and applications of the 5 module Mono/Suntron Solar Water Pumping system.

In Northern latitudes, the 8 module version (MS8) has a maximum flow of 25,000 L/day and a maximum useful head of 70m.

The first prototype 2kw system was installed at Werribee in September 1984 and the system was continuously monitored until April 1985.

From December 1984, Suntron and Mono Pumps installed smaller systems for test purposes at the Mono factory in Mordialloc.

The pumping systems under test have achieved average daily system efficiencies exceeding 4.8%, with peak efficiencies of up to 5.5%. This is well above the figure of 3.8% found by the world bank.

For more information on the Mono/Suntron pumping system, contact, Mono Pumps Pty. Ltd at 338-348 Lower Dandenong Road, Mordialloc, Victoria 3195, Telephone (03) 580-5211.

The Mono/Suntron Solar Water Pumping system supplying stock water on a cattle property in the North of Western Australia.

The System - in its 8 module configuration (likely to be the most popular) comprises solar panels, the Maximum Power Point Tracker which optimises efficiencies of all elements and the new highly efficient Mono P301 borehole pump - a unit admirably suited to the needs of solar water pumping because of its high efficiencies across a range of speeds and head, low operating speeds and low torque. It can handle silt laden and sandy water.

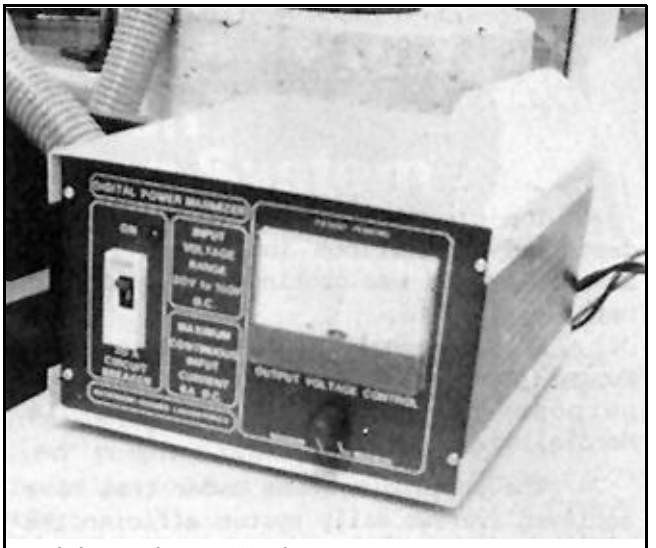
THE MAXIMIZER

If you are using photovoltaics to pump Water you could be wasting more than half of the expensive power from your solar panel. This comes about because the power coming from your solar panel may not be in the form that your pump needs to operate at top efficiency. The same applies with using PV's to charge batteries. A substantial amount of power may be getting wasted.

Well, now an organisation in Queensland has come up with a "black box" which matches the solar panel with the load to give the best efficiency. It's called a Digital Power Maximizer and the people who developed it claim it can increase average daily output of a photovoltaic pumping system by 50% and by 20% where the power is being fed into batteries. When we spoke to the inventor of the maximizer he told us that the maximizer was performing much better than these figures, especially when it came to water pumping.

How It Works:

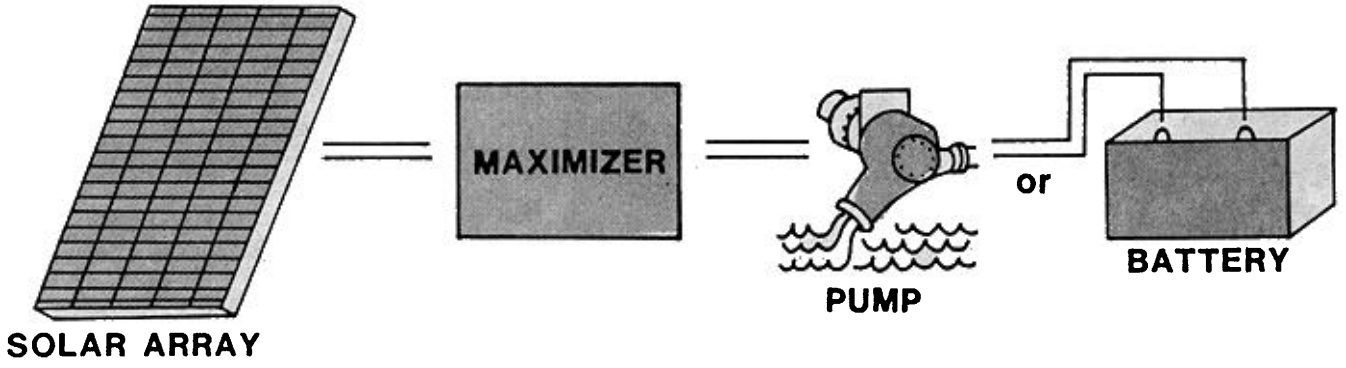
Maximizing power transfer from a renewable energy source to a fixed or variable load has been difficult to achieve in the past. This difficulty is due to the varying impedence mismatch between the generating source and the load throughout the day. This mismatch wastes energy and typically reduces the power transfer by 50% in even the best designed systems and more in poorly designed systems.



Maximizer HP (up to 1600 W)
Input Voltage Range: 20 VDC to 150 VDC
Maximum Input Current: 12 A
Regulated Output Voltage: Zero up to the transformed max. power point voltage
Regulated Maximum Output Current: 20 A
Recommended Operating System Size: 800 to 1600 Watts

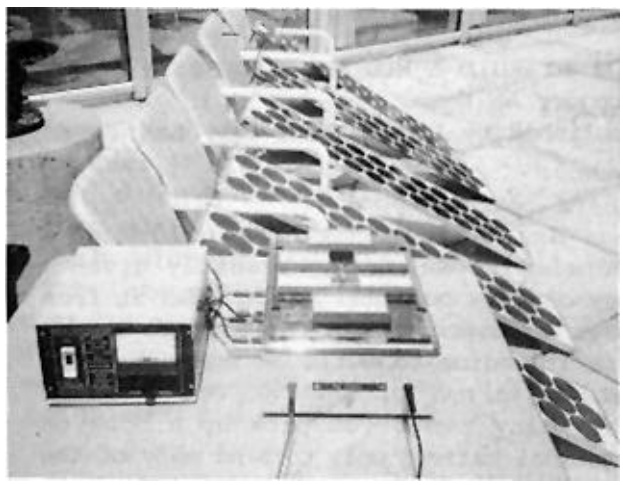
The **MAXIMIZER** uses state-of-the-art digital power electronics to continually **match** the impedence of the load to that of the generating source, ensuring maximum power transfer under all conditions. For example, even in carefully designed photovoltaic pumping systems, the variability of solar radiation can cause the motor load to be poorly matched to the power coming from the solar array. The MAXIMIZER will always extract **maximum power** from the array and deliver it to the pump's motor."

Another benefit of the Maximizer is it can be used as a battery charger charging any voltage up to 150 VDC depending on your input voltage.



Because the Maximizer increases the output from your solar panels you could be able to substantially reduce the size of your solar array or alternatively greatly increase the output from the same array. And either way this leads to saving money.

If you want more information on the maximizer you can contact
Stewart Watkenson
8 Deborah St.
Red Cliff, Qld.



Reviews

HOW TO BUILD A MUDBRICK HOUSE
Gregory Ah Ket
Published by Lloyd O'Neil Pty. Ltd. 1985.

In anticipation of building a Mudbrick house, I was recently given a copy of this book and having read it from cover to cover, I can only say to anyone else intending to build in mud brick, go and buy it.

Many times you pick up a book on practical matters only to find many of the terms and descriptions too technical to follow.

In this case that is certainly not a problem as everything is clear and precise with terms, names, etc. being easy to follow. Of course working with mud brick is basically a simple way to build, which is one of the beauties of it. Good photos and diagrams add to the ease of understanding added to this is **a** bibliography to enable you to chase up further information.

The book includes descriptions of different ways to handle problems such as flooring, plumbing and so on and even discusses different sizes for bricks, which makes one ponder the possibility of using smaller bricks.

I certainly think this book is well worth putting on the bookshelf, particularly if involved in the art of mud brick making.

D a v i d -

SELF SUFFICIENCY SUPPLIES CATALOGUE

Self sufficiency supplies has just brought out their 1986 catalogue and because of the vast range of products they stock and the volume of information the catalogue contains it deserves some comment.

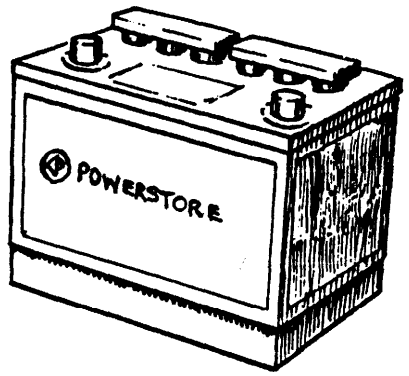
Self sufficiency supplies is one of the major Alternative Technology Retailers in Australia . Their catalogue includes batteries, chargers, inverters, control boards, low voltage appliances, solar cell panels, wind generators, hydro systems, solar and wind pumping, hydraulic rams, wood fired water heaters, mudbrick equipment, refrigeration, weather instruments, kero appliances, beekeeping, dairy equipment, cornposting toilets, natural pest control, compost makers, water purifiers, mills and grinders and kitchen accessories. As you can see it is quite a comprehensive list,

There are some lines which are new to us and may be of interest. These are as follows:

Powerstore Batteries

"POWERSTORE" Batteries have been specially designed for solar applications.

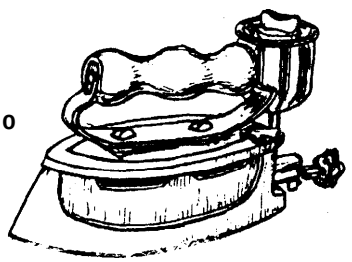
They incorporate the latest in battery technology with low antimony in the positive plate and some calcium in the negative. The lead oxide used is a special type rather than that used for cheaper automotive batteries. The positive plates are sealed in an envelope of microporous polyethylene which prevents many of the short life problems found in other batteries with breakdown of the positive plate.



"HAND!" PUMPLESS IRON

Yes, they are still available! In production since 1932 and run on Shellite or similar. You can iron for 1.5 to 2 hours on a single fill. Because the fuel is gravity-fed, no pump is required. It is finished in high quality polished nickel. A full range of spares are available.

Ironing with kero



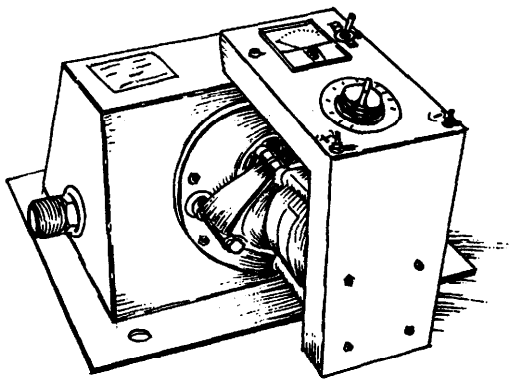
Southern Cross 'Sola Flow' Floating pump units and Base Mounted pump units:

Sola-Flo units are supplied in package form including pump and float assembly, solar panels, 10 metres of electrical cable, 5 metres of delivery hose with floats and suction strainer ready for installation.

For tank filling transfer from one tank to another and general pumping from river or dam these units provide a simple low cost answer. Because the pumps used are positive displacement type, self-priming up to 1.5 metres is possible. Housed in a sturdy fibreglass case with carrying handle and fitted with 5 metres of powercable, these units are suitable for either permanent installation or are convenient for use as portable pumping units.

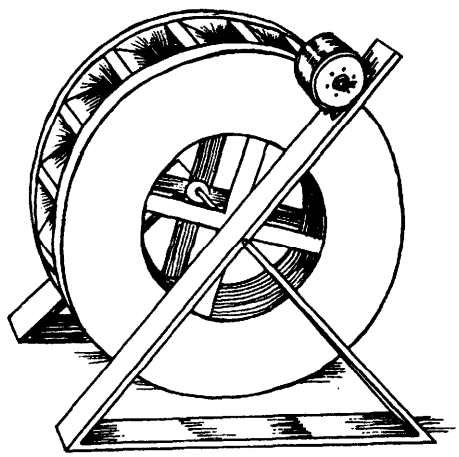
Hydro-Electric Systems

For high heads a "TAMAR' Pelton single jet turbine (100mm diam.) with integrally cast bronze runner, bronze shaft mounted on heavy galvanised steel case, with bronze mounting flange and direct driving a heavy duty 24V alternator with integral rectification and battery charging regulation. It is complete with a variable field resistor so that adjustments can be made for various heads and flows.

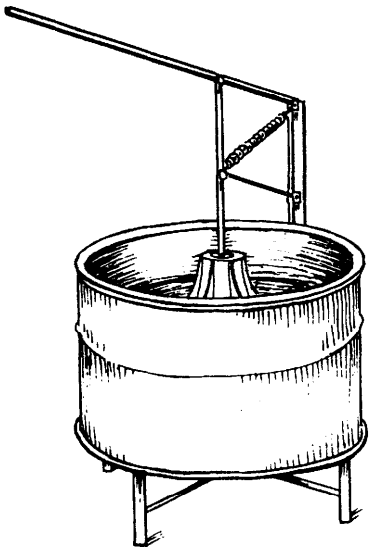


For low heads a "Firefly" Overshot Water Wheel Generator by Windpower Australia.

This wheel consists of 16 buckets on a 1200mm rim with a 35mm shaft and bearings (greasable and sealed). Wheel width is 46mm and the capacity of the buckets is 23L. The minimum water flow required is 2.5L/sec and maximum is 15L/sec. Mechanical power developed is 1/2H.P.



Hand Operated Washing Machines (As featured in Soft Technology No 10).
These come from Alice Springs of all places. They were being built to provide washing facilities for large items such as blankets on the outstation in the outback. Whilst an automatic washing machine would be preferred, if you are currently doing your washing by hand then this has to to be a 100% improvement. Construction is solid with the washing action coming from a spring loaded plunger made from a normal washing machine agitator, up and down in the bowl. It would have been better (and more expensive) if the bowl had been galvanised, but his could be done after the paint wears off later if you wish.



If you want to get hold of a copy of Self Sufficiency Supplies Catalogue write to them at Shop 3 Cnr. Clyde and Fourth Streets, Kempsey. N.S.W. 2440. Enclose $3.00 which includes postage.

CLIVUS MINIMUS

Leigh Davison has sent us a report on the functioning of cornposting toilets in the Lismore area, some additional notes on their construction, notes on the Clivus Multrum, operating hints and a trouble shooting sheet for operating problems.

The construction notes are quite detailed giving the dimensions of the footings, block. arrangement, the placing of air ducts, seating arrangements, the priming of the compost and drainage to ensure aerobic decomposition.

Included are notes on the Clivus Multrum (commercially available in Melbourne) which disposes of both toilet and kitchen waste using no water, no energy and and no chemicals. Because the decomposition depends on a plentiful supply of air, what little odour there is, is carried out the high vent. It is installed indoors. A saving of some 20,OOOL of water per person is made and only dish, laundry and bath water have to be disposed of. After 2-3 years approximately 30L of humus are produced and this is the only time the Clivus is opened.

The construction of the Clivus is easier than for a septic tank. Water has to be kept out, and a sloping site is preferable because the bottom of the chamber is approx 2m below the floor and a good air flow is essential.

Leigh will send the 14 pages of notes for $3 to cover the cost of printing and postage and answer any questions.

Leigh Davison, Dharmananda
The Channon 248,
Phone 66 886307

Other addresses
Clivus Multrum Australia P.O. Box 15 Oakleigh Vic. 3166. (03) 569 0851

Ecos Soltran: Environment Equipment Pty. Ltd. 12 Wellington Pde. East Melbourne. Vic. 3002. (03) 417 1162 (a larger 50 person/day unit using solar energy to dispose of excess liquid)

Continued from page 13.

insulation is provided by the two panes of glass in this sealed unit.

SUNSPACE

5A **Earth-cooled tube (exit)**

Earth-cooled tubes are relatively experimental, at least in Australia. The basic principle is that of moving air at a controlled rate through tubes buried beneath the ground surface, and delivering this earth-tempered air to the house,
In this system, plastic spiral-wound tube is used, 0.4 metres in diameter buried for 30 metres at 2.0 metres below the ground. A variable speed axial-flow fan, mounted at the house end pulls the air along the

tube into either the kitchen or sunspace. This flow of air is variable, from 500 to 1000 cubic metres per hour.
Under some conditions, temperature reductions in excess of l5°C could be experienced. The system's performance is being monitored.

5B **Sun space with diagonal louvres**

The sunspace, with its partial-glass roof and glass walls facing north-east and north-west, is designed to collect enough solar energy in winter-time to heat itself and contribute excess warmth to the house. During summer, the glass needs to be shaded to prevent overheating. This is achieved by specially-designed louvres, angled across the glass roof and the north-west wall. The differential performance (summer vs winter) is due to the unique geometry of the blades and their tilt angle across the face of the window.

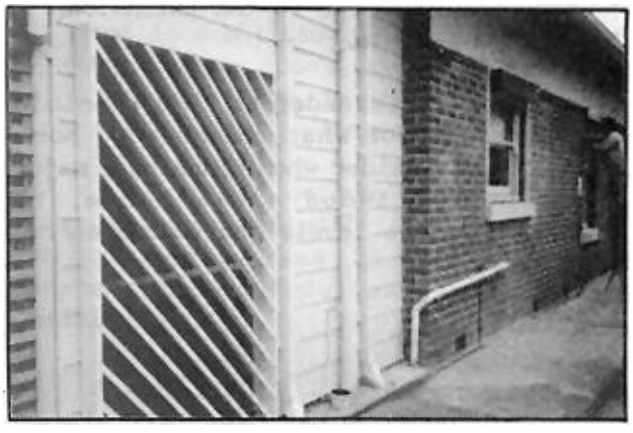
OUTSIDE

6A **Pergola with fully adjustable louvres**

This "Vergola" consists of linked, pre-painted steel louvres and can be operated either manually or electrically. The blades can be set in the closed position, giving full weather protection, through 15 degrees of adjustment for ventilation, shade or up to 86% of available sunlight. It provides both protection to the north-eastern wall of the sunspace and a flexible outdoor living area.

6B **Solar hot water system**

Conventional water heating systems use around 30% of the total energy consumed in a typical South Australian home, costing about $200 year. To reduce this running cost, solar hot water systems have been installed in two of the houses. In this house, the system is boosted by electricity to ensure an adequate supply of hot water during the cooler months or on overcast days. Water is circulated between the north-east facing collector panels on the roof) and the storage tank (in the porch) by means of a small, electric pump.



HOUSE NO. 27 MAJOR ADDITIONS

A major target audience for energy-saving techniques are those who are planning major additions and alterations to their existing house. The addition of a family room, new kitchen, laundry, bathroom and toilet to an existing house is relatively common, and the presence of new construction allows the display of a larger range of passive solar design techniques. The north-eastern aspect of the rear of all the houses required careful design to prevent overheating of the area in summer.

House 27 prior to renovation.

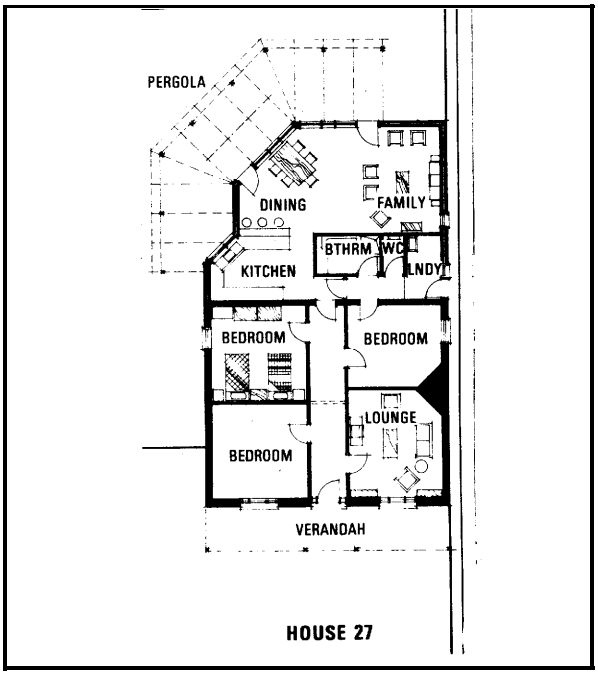
'Techniques which are demonstrated include all of the items mentioned for house 23, with the addition of:-

* Direct gain heating;
* Energy efficient appliances and heating;
* Wall insulation;
* Gas heater and evaporative cooling;
* Concrete floor slab to the extension;
* Use of skylights.

This house is intended to be a sensible demonstration of what the average home owner could consider when planning a major addition, or indeed a new house, to increase comfort levels and reduce energy consumption.

BEDROOM 1

2A **Unchanged room**
This bedroom has been left almost



unchanged, so that "before" and "after" comparisons can be made. There is no ceiling insulation or new floor coverings; the top-of-wall vents have not been sealed off nor the window sealed against draughts.

LOUNGE

2A **Slow combustion heater**
This free-standing, small slow combustion heater, with rear-flue in the existing chimney, is an ideal method of heating small living-spaces. Note the slate hearth over a fire-resistant, insulating membrane.

BEDROOM 3.

3A Unused chimney
This chimney, which is no longer used, has been blocked off to reduce unnecessary heat loss.

BEDROOM 2

4A **Adjustable awning**
This window, facing north-west, has been fitted with an adjustable canvas awning. In general, movable shading devices are preferred, since they can be

adjusted to allow the entry of sunlight on cooler days.

KITCHEN-DINING-FAMILY ROOM

5A **North facing glass**

The windows to the kitchen and dining area of this major extension face true north, enabling easier sun-control. On the kitchen window, an insulating shutter of aluminium with a polyurethane core, provides insulation, noise reduction and security. This window, and all the full-height windows are double-glazed, with two panes of glass separated by an aluminium spacer and hermetically sealed. The trapped air space reduces heat loss in winter and heat gain in summer. Vertical blinds provide further light and sun control.

5B **Quarry-tiled floor**

A concrete slab floor with a hard surface, provides "thermal mass" to receive and store the sun's heat in winter and stablise indoor temperatures in summer. No additional under-floor insulation is required, unless the slab itself is being used for heating.

5C **Wall insulation**

The cavity walls to the major extension are insulated with 30 mm thick rigid boards of extruded, expanded polystyrene ("R" value of 1.0) which are easily installed during construction.

5D **Evaporative cooling**

With the additional insulation, careful sunshading and introduction of "thermal mass" (concrete or brick floors, internal brick walls into the houses, the need for mechanical air conditioning is reduced or eliminated. However, some methods of low-cost cooling are demonstrated due to the expected high number of visitors during warm or hot weather.

In this family-dining-kitchen area, a wall-mounted evaporative system is installed. At a running cost of 6 cents an hour, it is ideally suited to Adelaide's hot dry summers.

OUTSIDE

6A **Pergola with appropriately angled slats**

The battens on this pergola are designed to provide shade in summer, but allow the lower-angled winter sun to penetrate.

6B **Landscaping**

Landscaping is an important and integral part of the low-energy concept. There are many ways in which landscaping can provide thermal benefits, while improving the visual quality of any home.

For example:-

* Trees and shrubs can lower air and ground temperatures, reduce glare and reflected heat in summer;
* Windbreak planting can assist wind and dust control as well as reducing heat loss in a building in winter;
* Deciduous trees and creepers can provide shade in summer and will allow warming winter sun to enter the house.

The private outdoor space (patio or courtyard combined with its well-designed pergola to houses 25 and 27 is an inexpensive and useful extension to the dwelling.

BATHROOM, W.C. LAUNDRY

7A **Rooflight**

This provides natural light and ventilation for the internal bathroom and W.C.

7B **Flow-control rose**

By limiting the flow of water through this specially-designed shower head, the average 5 minute shower will use up to 70% less water without sacrificing the quality of the shower. This easily-installed device is a proven energy and water saver.

7C **Dual flush cistern**

These cisterns conserve water and (at the sewerage treatment works) energy.

Where a single energy saving feature is used in more than one house we have only mentioned it once in one house (to avoid a repetitious list of features). For example insulation, ceiling fans, efficient lighting, northerly glazing and concrete or brick floors are used in all three houses, however they have generally only been mentioned in one.

The Energy Ideas Village is an interesting look at energy efficient home renovation.

It is open on Saturdays, Sundays and Wednesdays from 1.30 pm to 5.30 pm until June 29 1986. The village is at 23-27 Norman Street, Woodville, South Australia.

PHOTOVOLTAIC FEEDBACK

Late last year the A.T.A. decided to go ahead with a bulk buy of solar cell panels made up of orders from members. It was quite successful with an order of about 30 panels being made and reasonable savings passed onto members.

However we did receive some negative feedback from some retailers and one of the manufacturers. In essence the comments were as follows.

Most of the select group of retailers who specialise almost exclusively in A.T. equipment are in it because they believe in it philosophically. Because they have significant overheads and relatively low profit margins they have to work long hours in poor working conditions. Also because the market in photovoltaics is very competitive they are often forced to discount already small margins to make a sale. Retailers also have to give a considerable amount of time assisting their customers in designing and setting up their systems.

We were criticised that by looking around for a good price we were further encouraging discounting in an already tight market. We were also taking customers away from the existing retailers who would still be likely to have to give their time advising people who had already bought cheap panels from us.

These comments are reasonable in many respects hence we felt it worthwhile letting our readers know about them. At this point it might be worth saying a little more about our motivation in the bulk buy and what we found.

When we first thought about the group buy the feeling was it would be a great service to give our members. People in all sorts of circumstances often get together to get a better deal and so what we did was certainly not new.

On the basis of some initial offers, we published some prices which were somewhat lower than those generally available. This information was not truly representative of the market as a whole. We apologise to the retailers if we created the impression that you could walk into a shop and buy a panel for that price.

Another minor, though significant reason for the group buy was that we as consumers were wondering just what was the real price of photovoltaics. For years the consumer has been told that rock bottom

prices for solar cells were coming. We have been waiting and although the news reports of price breakthroughs have kept coming, the dramatic drop in price has not. This has led to suspicion of "who is holding out".

On this point a letter from one of the manufacturers helps cast some light on what may be going on.

'The Solar Electricity Industry is an infant industry but growing fast and the pioneers who are taking the brunt of the battle are the retailers in the marketplace. One point is very pertinent, that the retailers operate off low margins. The history behind this requires explanation.

One of the original manufacturers decided to buy the Australian market i.e. absolutely rock bottom prices to retailers /distributors. Pressure from the buyers and Alternative Energy "Groups" kept the retail price down to a minimum. The ultimate result was that the manufacturer has nowhere to move on price except up. The retailers fighting for sales in a small but growing market started to discount cutting into their own margins. We currently have a situation where the manufacturers are losing huge amounts, the retailer is struggling with low margins and the buyer is under the illusion that prices will come tumbling down.

Even with current technology raising the efficiencies of P.V. cells, the price of the cells, glass, frames, other components, labour and overheads is constantly rising.

Production techniques and machinery will defray some of this increase but this is offset by the millions of dollars required to implement the technology and purchase new plant. So if anything, in the short term, the retail panel price will rise not fall."

These comments on pricing from the manufacturer are supported by the fact that while one of our members was recently in the U.S.A. he noted that the recommended retail price of Solarex panels was several hundred dollars (Australian) higher than the same panel in Australia.

However we would like to point out in our own defence that the suggestion that "Alternative Energy Groups" were significant in keeping retail prices down is not true. As one of the major groups we have had no involvement in photovoltaic pricing in the past and if any other group group had we feel certain we would know about it.

So it appears from all we have been able to find out that the prices of photovoltaics in Australia are not excessive. If anything, the prices are low relative to other countries. The retailers are not making a lot out of photovoltaics and are working in a very competitive market. We do not know about the profit margins of the manufacturers, but it is quite possible that they are ploughing a lot back into research and development. (The Japanese and their thin film cells are coming...)

Now back to our group buy and the criticisms of it. As a community organisation we are bound to represent the interests of our members. And as our members are Alternative Technology equipment buyers it is the consumers view we are bound to represent. However it will not do anyone any good if the businesses who specialise in A.T. equipment while maintaining a moral conscience are driven to the wall. We have no wish to compete with established retailers and do not see retailing as a role of the Alternative Technology Association.

Hence in the future if we do any bulk buys we intend to be more cautious and consult with retailers.

We would like to see our role as promoting the kind of technology which works in harmony with the environment and providing information to the community which makes it possible for people to use this technology in their own lives. We hope that as well as being a good service to members bulk buys will encourage people to go ahead and invest in photovoltaics thus stimulating demand for more panels and other accessories from retailers. Hence they would help everyone.

We would welcome any feedback from either members, retailers or manufacturers on the matters raised.

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The Alternative Technology Association is a group of people interested and involved in alternative technology. Our activities include meetings, film nights, workshops and field trips.

MEMBERSHIP

Members receive Soft Technology, our newsletter and have access to the Solar Workshop.

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