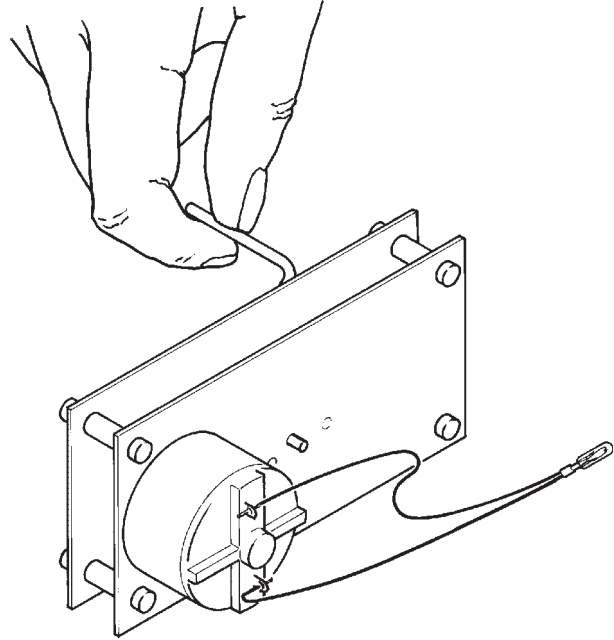


STUDY FILE 2 - USES FOR TEP GENERATOR

Possible Uses For the Mini-DC Generator

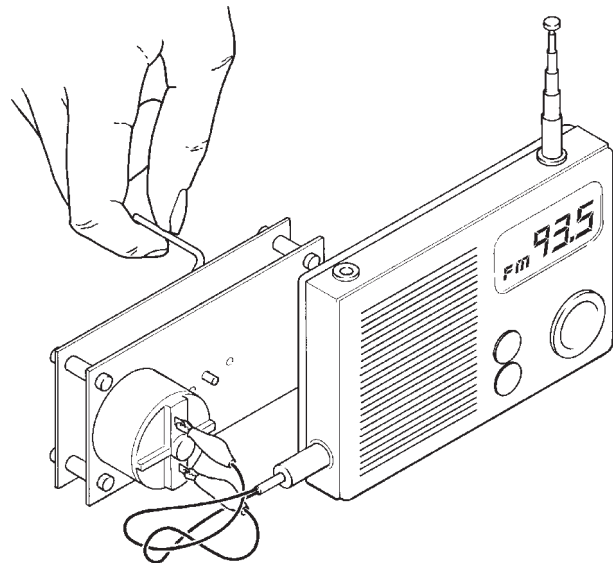
• Emergency generator for lighting

Many people keep a torch in the home or other places where an emergency light might be needed in the event of a power failure. Sometimes, the torch is used rarely and, when it is needed, the batteries are found to have gone past their shelf life. Inexpensive batteries will probably last for only two to three years if unused because of the internal chemical changes that take place.



• Battery alternative

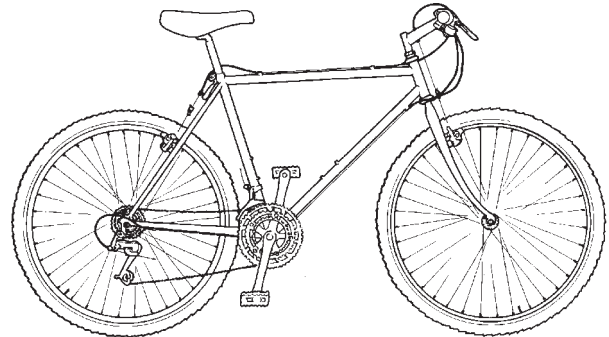
In many developing countries, it is possible to obtain small radios but not a reliable supply of batteries - which can be both expensive and environmentally damaging. The mini-DC generator could be used as an alternative by continuous turning of a handle or preferably by storing and slowly releasing energy. Probably the easiest way of doing this is to “wind up” or raise a mass and then let it fall so that it rotates a shaft. A relatively small mass suitably raised and matched to the generator with a gearbox can give several minutes operating time for a transistor radio.



• Cell charger

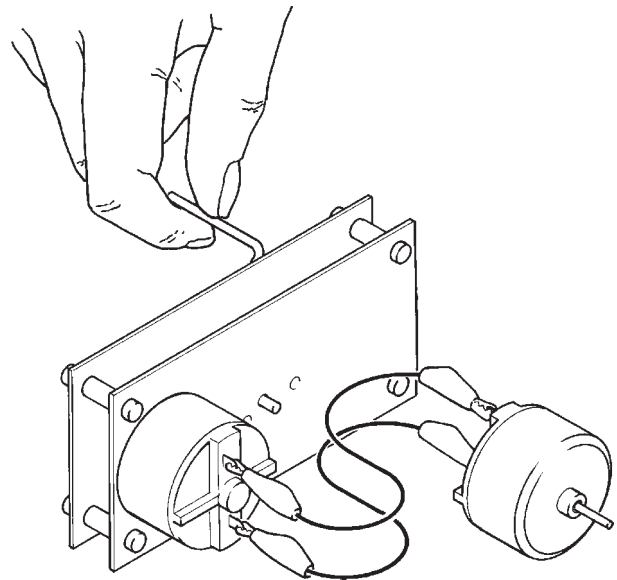
The generator can be used for charging rechargeable batteries - for example those used in a cycle lamp. A generator driven by the chain or tyre of the cycle will produce current whenever the cycle is used. However, depending upon what batteries are used, the generator's output will almost certainly require (a) a circuit to ensure a smooth charging output at the correct voltage and (b) a means to ensure that the batteries do not discharge into the generator.

You should take advice from your teacher before embarking on a project involving rechargeable batteries.



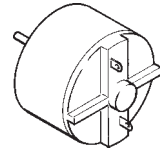
• Power transmission

The TEP generator is a *reversible* device. This means that one generator can be used to drive another and vice versa. There is some loss of energy in such a system, but two generators connected together can be used to replace mechanical linkages and drives in some applications. The illustration shows a simple toy. Experimenting with pairs of generator/motor units connected together convinced pioneer electrical engineers that power could be transmitted over distances by means of electrical current.



Using the TEP Generator as a Motor

The TEP generator can be used with or without its gearbox as an electric motor. It has the following specification:



NOMINAL Constant Volts	NO LOAD		AT MAXIMUM EFFICIENCY					Stall Torque g-cm
	Speed rpm	Current A	Speed rpm	Current A	Torque g-cm	Output W	Efficiency %	
3.0	1800	0.022	1430	0.085	8.4	0.123	48.3	41
6.0	3700	0.028	3060	0.134	14.5	0.455	56.4	84

The motor can be driven by a battery, power supply unit (PSU), or by a second TEP generator. Its current consumption increases in proportion to the amount of work it does. If you try to make a motor do too much work, it slows down and eventually *stalls* or stops. Because current continues to flow, the armature windings heat up and may eventually burn out. The small motor in a cordless drill is only about two to three times larger than the TEP generator/motor and will burn out very quickly if the drill is stalled. A fuse, which melts when a certain current is exceeded, offers some protection.

