

SOLAR ENGINES

At the heart of most solar-powered robots is a circuit called the **solar engine** (variously called Solar Engines, solar engines, SEs; a. k. a, relaxation oscillators). The purpose of a solar engine is to act like a power "savings account" - a small trickle of incoming energy is saved up until a useable amount is stored. This stored energy is then released in a burst, in order to drive some useful (if only sporadic and incremental) work.

The solar engine has a number of advantages:

- A solar-powered robot can be made to work, even in relatively-low light levels.
- Solar cell size is minimized
 - Saves money
 - Saves weight
 - Allows room for the solar cell to be ruggedized.

There are four types of solar engines to date:

- **Type 1** - voltage controlled trigger. This is by far the predominant form of solar engine, since they are "efficient enough" for most uses, and pretty simple to build.
- **Type 2** - time controlled trigger. These aren't terribly efficient, but are handy for 'bots that need activity at specific times.
- **Type 3** - charge curve differentiated (i.e., it triggers when the charge rate of the capacitors slow down). These are theoretically the most efficient, though type 3 designs are still in their infancy.
- **Nocturnal** -- These solar engines charge up when it's light, and discharge (i.e., power a load) when it's dark.

Source: <http://www.solarbotics.net/library/circuits/se.html>