

Solar Cells 2005

New this year, the cells are single crystal. They are cut from a cylinder, which you can see from the shape of the corners. Past years cells were polycrystal, cut from a cast block. Both types of cells have similar characteristics. They are N on P, that is, the sun surface is negative. The new cells are slightly more efficient; however both types are compatible and can be combined if necessary. Note that with the layout of new cells quadrants 1 & 3 and also 2 & 4 are identical.

CAUTION – the cells are silicon which is basically glass. They are thin and somewhat fragile. Handle carefully!!!

Electrical connections are made using the tinned copper ribbon. This is held in contact with the cell contact using “magic” type tape, as this can be changed carefully if the tape position is not satisfactory the first time. Note that the layout of the new cells makes quadrants 1 & 3 and also 2 & 4 identical.

Make the connections with the cell on a firm flat surface. The contact area may be cleaned carefully with alcohol.

When completed, keep the array dry and it will last years.

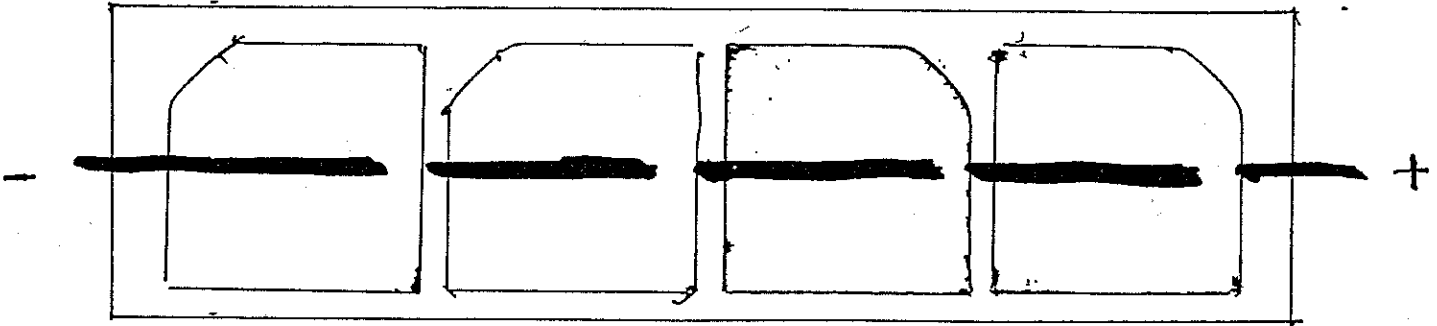
Do not attempt to solder the cell contacts. This requires factory equipment and control. Connecting wires, motor and switch may be soldered.

The cells are connected in series because our electric motors work best with the higher voltage. Our 4 cell arrays generate about 1.2+ watts of power, so the cars must be light and mechanical friction must be low.

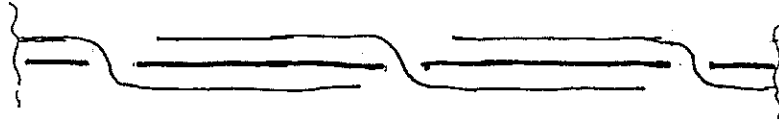
www.nrel.gov/education -- look for “Junior Solar Sprint”

This NREL website has excellent information.
Our Arizona differs in that we construct our own arrays.
This makes our program much more affordable.

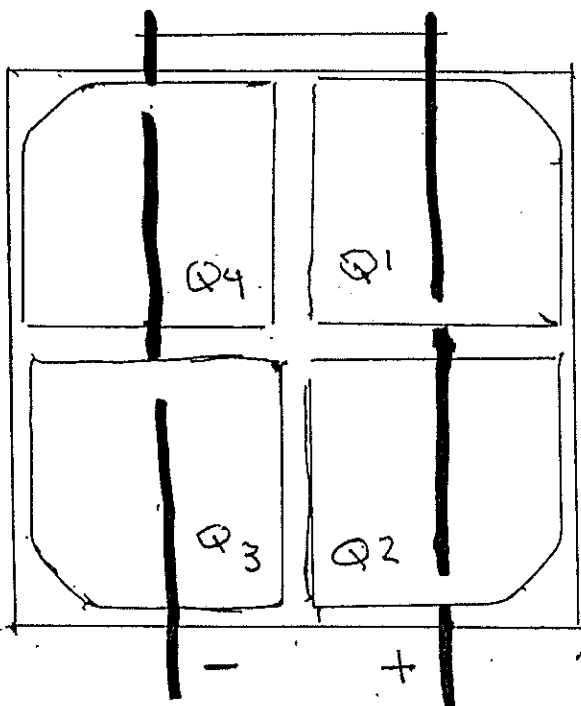
Solar Array Connections 2005



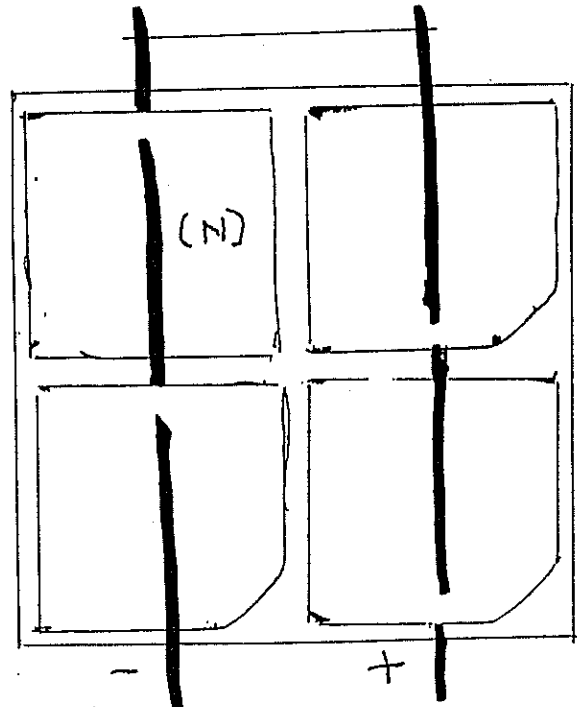
Cells on 9.5" x 2.5" foam board - typ.



Series connection - typ.

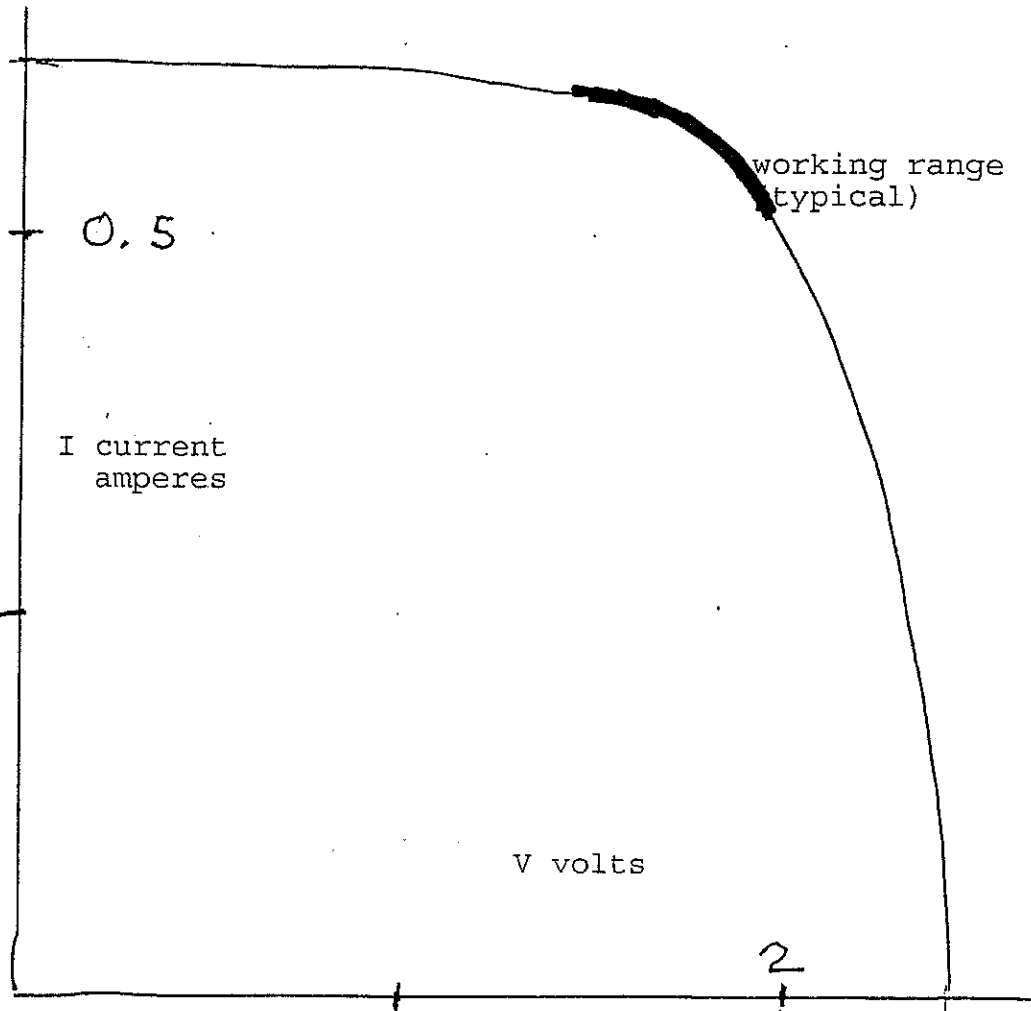


Cells on 4.5" x 4.5" foam board
(typical)



Mixed cell array
note old type
polycrystal cell

4 Cell Power Curve



Generalized I V (power) curve