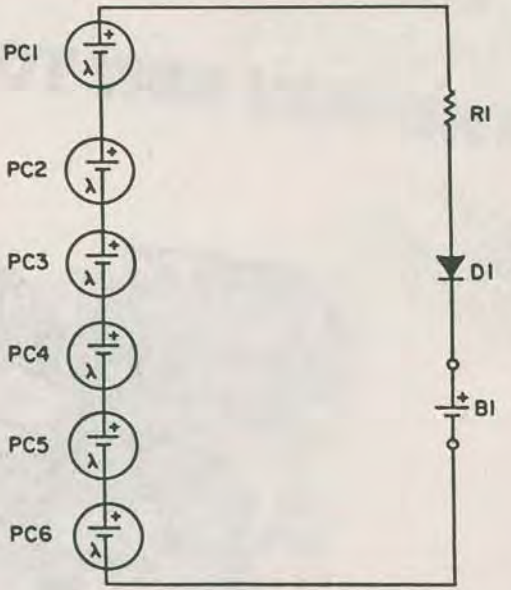
SOLAR BATTERY CHARGER

Tired of charging your NiCd cells? Then let Old Sol do the work for you free-of-charge. In this circuit, photovoltaic cells supply the charging current, which is limited to a safe level by R1. Diode D1 prevents the battery from discharging through the solar cells during periods of darkness.

NiCd cells of different sizes require different maximum charging currents for best results. Currents in excess of the recommended values result in rapid evolution of oxygen gas within the cell. When this happens, oxygen gas pressure is relieved through vents, and a significant portion of the cell's chemical contents may be lost in the process. The net effect is reduced cell life; therefore, resistor R1 should be selected to limit the charging current to a safe level.

To do this, break the circuit and insert a DC milliameter in series with B1. (Watch those polarities!) Expose the solar cells to the brightest sunshine they can expect to receive, and make note of the charging current. The recommended charging rates for various NiCd cells are: 50 mA for AA cells, and 100 mA for C or D cells. To obtain these currents, the suggested values of R1 are approximately 18 ohms (for AA cells) and 9.1 ohms (for C or D cells). With your milliameter, measure the actual charging current produced by your circuit with the resistor appropriate to your chosen cell size. If the current exceeds the safe level, replace R1 with a larger resistance. As a final note, be sure to select solar cells capable of supplying the desired charging current.



PARTS LIST FOR SOLAR BATTERY CHARGER

B1—1.25V rechargeable NiCd battery
D1—1N4001 rectifier diode
PC1 thru PC6—.5-volt silicon photovoltaic cell (see text)
R1—current-limiting resistor (see text)