

for a PV system, and would be very remarkable if it holds up in practice. SunPower is also working on a similar concept in partnership with the Polytechnical University of Madrid, except that they are using silicon cells [76].

11.5.9 Solar Research Corporation

Solar Research Corporation, Pty. Ltd., is developing reflective dish concentrators and water-cooled close-packed PV arrays for use at the focus [77]. A single close-packed silicon array produced more than 200 W with a reported efficiency (not independently confirmed) of 22% at 239 suns and a GaAs module produced 85 W with an efficiency of 18% at 381 suns. These systems will be deployed first in the Australian outback by an affiliated company, Solar Systems, Pty. The design has progressed to the point where full-sized prototype dishes have been tested and Solar Research Corporation is preparing for a larger system test. Figure 11.40 shows the Solar Systems dish in operation.

11.5.10 Spectrolab

Spectrolab, a major manufacturer of multijunction solar cells for space application, has initiated a concentrator cell and module development effort utilizing their high-efficiency cells. They recently announced a 34% conversion efficiency cell, a remarkable result, especially considering that the high efficiency was obtained at sufficiently high concentration for practical, low-cost module use.¹⁸

11.5.11 SunPower Corporation

SunPower Corporation manufactures a variety of high-efficiency silicon concentrator solar cells. These include cells designed for point-focus Fresnel lens applications as well as cells designed for closely spaced arrays for use with large dishes and central receivers. Design concentration ratios vary from 250X to 400X. Peak efficiency is around 27% at 100X, dropping to 26% at 250X. SunPower has built complete water-cooled dense

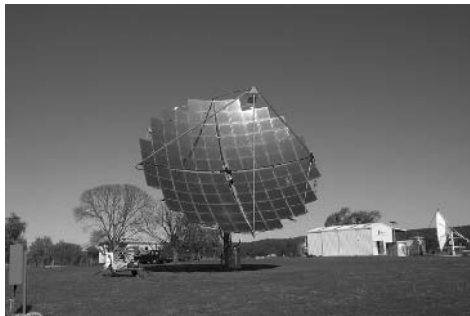


Figure 11.40 Solar Systems 24-kW dish concentrator-PV system in operation

¹⁸ Spectrolab press release.