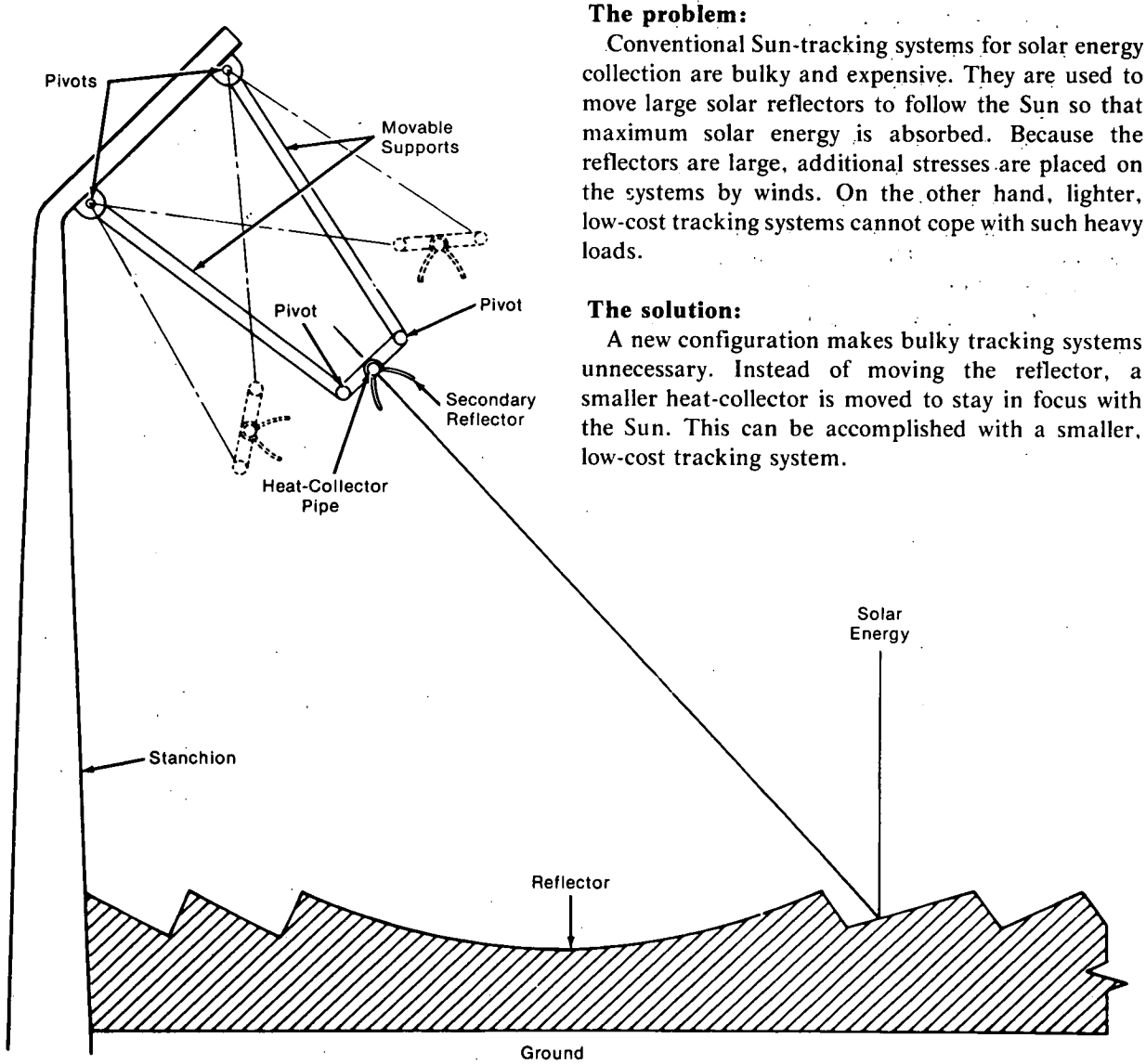
NASA TECH BRIEF

NASA Pasadena Office

Low-Cost Solar Tracking System



Low-Cost Sun-Tracking Arrangement

The problem:

Conventional Sun-tracking systems for solar energy collection are bulky and expensive. They are used to move large solar reflectors to follow the Sun so that maximum solar energy is absorbed. Because the reflectors are large, additional stresses are placed on the systems by winds. On the other hand, lighter, low-cost tracking systems cannot cope with such heavy loads.

The solution:

A new configuration makes bulky tracking systems unnecessary. Instead of moving the reflector, a smaller heat-collector is moved to stay in focus with the Sun. This can be accomplished with a smaller, low-cost tracking system.

(continued overleaf)

How its done:

The arrangement of the new tracking system is shown in the illustration. Basically, the reflector is laid on the ground, using conventional soil stabilization methods to keep it from shifting. The reflector body is made of concrete, and its surface is covered with smooth thin layers of aluminized polymeric film which reflect solar energy. The film can be replaced periodically as necessary to maintain a highly reflective surface.

The heat-collector pipe is supported by four bars above the reflector surface. One of these is a stanchion supporting the entire structure. Two bars on pivots are used to translate the pipe with respect to the reflector surface. These are pivoted to move as shown. The pipe is mounted between the two in a secondary reflector [see NASA Tech Brief B75-10210 (NPO-13580)].

Tracking can be controlled in one of two ways. First, a control may be provided by a programed source. Positions of the Sun are predicted according to seasons, and the resulting data are stored to be used for the control. The second approach is to apply conventional Sun-sensing devices to follow the movement of the Sun. Mechanical movement is provided by servos.

Note:

Requests for further information may be directed to:

Technology Utilization Officer
NASA Pasadena Office
4800 Oak Grove Drive
Pasadena, California 91103
Reference: TSP75-10209

Patent status:

This invention is owned by NASA, and a patent application has been filed. Inquiries concerning nonexclusive or exclusive license for its commercial development should be addressed to:

Patent Counsel
NASA Pasadena Office
4800 Oak Grove Drive
Pasadena, California 91103

Source: Charles G. Miller and
James B. Stephens of
Caltech/JPL
(NPO-13579)

Categories: 06 (Mechanics)
03 (Physical Sciences)
02 (Electronics Systems)