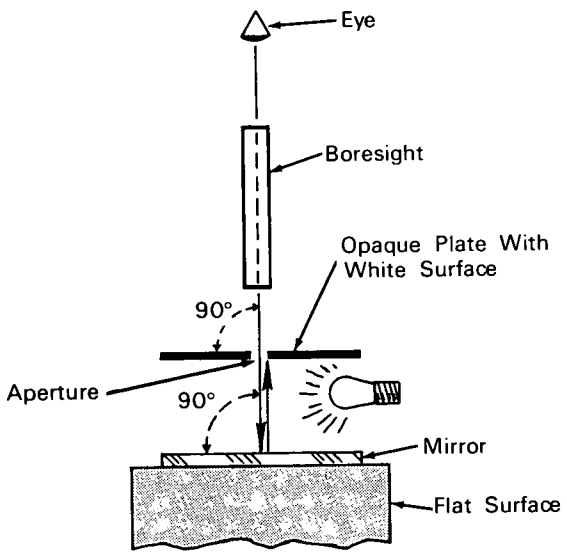
May 1964

Brief 63-10421

NASA TECH BRIEF

Mirror Device Aligns Machine Surface Perpendicular to Sight Lines



The problem: To align two machines so that an axis of the first machine is parallel to a flat surface on the second machine.

The solution: A relatively inexpensive and easily adaptable sight alignment device or fixture that depends on the reflection of a light beam from the surface to be aligned.

How it's done: A sighting device, such as a boresight, is mounted on one of the machines whose position is fixed. Normally, the device is positioned at right angles to a major axis of the machine. The second machine must then be aligned so that it is perpendicular to the line of sight from the first machine to the second.

An opaque plate having a narrow slit at its center is mounted in front of the boresight and approximately at right angles to it. The surface of the plate away from the boresight is white. The surface to be aligned is brought up close to the plate, but enough distance is left to place a light source (an ordinary light bulb) between the white side of the plate and the surface to be aligned. A mirror is placed flat against the surface of the second machine to complete the alignment device.

As one looks through the boresight, the slit will appear white because of the reflection of the white side of the plate in the mirror. The position of the second machine is adjusted so that a dark line, the image of the slit, is visible through the slit. When this is done the plane of the mirror, and thus the surface of the second machine, is perpendicular to the line of sight.

(continued overleaf)

Notes:

1. This optical device is simple and easily constructed. It is a simplified form of the Foucault knife-edge test, and is inexpensive compared with many of the optical alignment devices available.
2. The innovation can be used for orienting many kinds of work with respect to a reference plane, such as work on drill presses and milling machines.
3. If one of the machines to be aligned is equipped with lenses, as for example, a camera, its lens will serve as a boresight and no auxiliary sighting device is needed.
4. For further information about this innovation inquiries may be directed to:
   Technology Utilization Officer
   Western Operations Office
   150 Pico Boulevard
   Santa Monica, California 90406
   Reference: B63-10421

Patent status: NASA encourages commercial use of this innovation. No patent action is contemplated.

Source: Jet Propulsion Laboratory,
under contract to NASA Western Operations Office
(WOO-5)