Calibration of a Surface Plate with Laser
## Becomes Easier than an Electronic Level

I,   What is the problem?

Granite surface plates require periodic checking for flatness. This has been done by using electronic level, autocollimator or laser interferometer. Electronic level is most convenient to use. However, the resolution and accuracy is low. The laser interferometer or autocollimator provides higher resolution and accuracy. But, it is very difficult and time consuming to operate.

II,   How LDDM solves the problem.

Using conventional laser interferometer for surface flatness measurement, a laser head is mounted on a tripod near the surface plate. The laser beam is directed by a beam steering mirror and aligned to a remote interferometer and a dual-retroreflector. A straight edge is used to guide the dual-retroreflector and the distance moved is measured by an external scale. This same alignment and measurement procedure has to be repeated 8 times at 8 different segments of a union Jacket pattern.

Using a dual-beam LDDM for surface flatness is very simple and fast. This is because 1) the dual-beam LDDM can measure both linear distance and the pitch angel simultaneously. Hence angular data can be collected automatically without stop. 2) There is no remote interferometer, only the laser head and the dual-retroreflector need to be aligned. 3) The laser head is compact and lightweight, it can be mounted on a straight edge and pre-aligned, as shown in Fig.1. For the measurement on different segments, just move the straight edge to the location and collect data. The laser is always aligned. A typical 36"x48" surface plate will require about 15 minutes to collect and analyzed data. The speed of measurement and accuracy no longer have to be compromised.

DUAL
RETROREFLECTOR

STRAIGHT EDGE

DUAL BEAM
LASER HEAD

FIG. 1, Dual-beam laser head, straight edge,
And dual-retroreflector
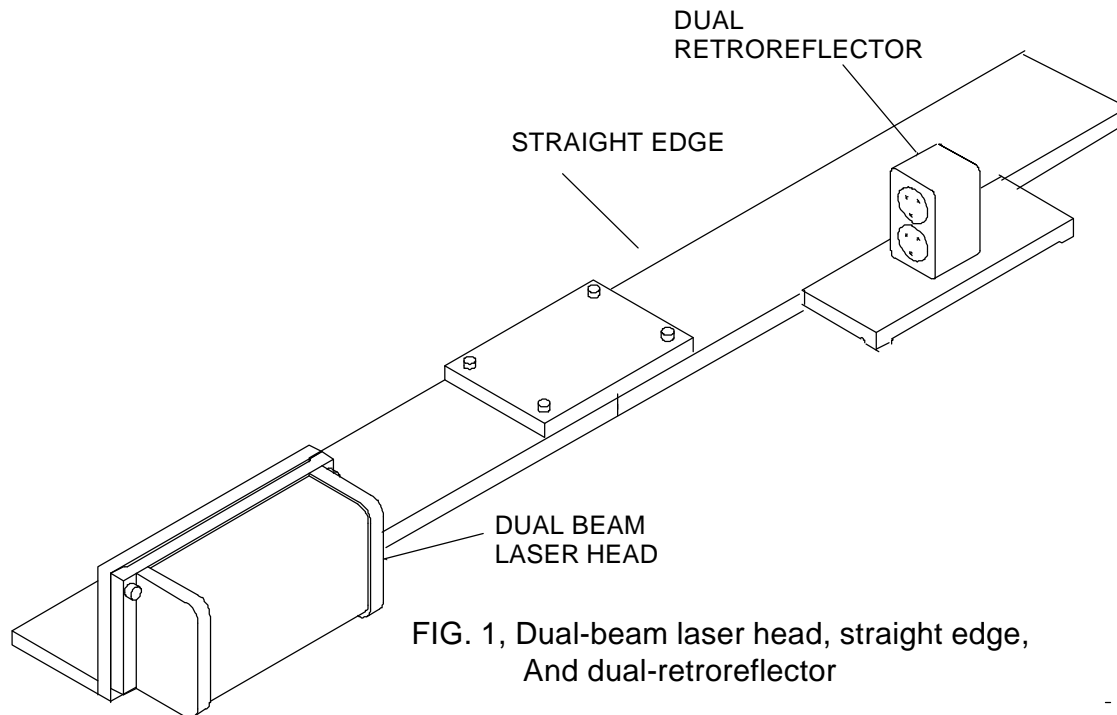
III,   How it works.

Fist mount the LDDM dual-beam laser head at one edge of the straight edge.
Adjust the two mounting screws to align the laser beam to be parallel to the dual-
retroreflector sliding along the straight edge. Set up the notebook PC and the
window software. Enter the measurement parameters and select automatic data
collection. Move the straight edge to the first segment and collect pitch angle
data on-the-fly. Slide the straight edge to the second segment and collect data
again. Repeat the same procedure until data on all 8 segments are collected. The
software will process the data, calculate the flatness and plot the numerical or
isometric plot of surface flatness.

IV,   Need more information.

Please call Optodyne at (310)-635-7481 or
Your Local Representative.