Note

Title & Document Type:	**10562A Single Beam Interferometer for the 5526A Option 001**
Manual Part Number:	**10562-90001**
Serial Prefixes:	**none**
Revision Date:	**Jan 1980**

HP References in this Manual

This manual may contain references to HP or Hewlett-Packard. Please note that Hewlett-Packard's former test and measurement, semiconductor products and chemical analysis businesses are now part of Agilent Technologies.

Changes to this Manual

No changes have been made to this manual. All pages are scanned at 300 DPI or greater.

About this Manual

This manual is reproduced from scans of an original document and images OCR'd with Adobe Acrobat. OCR errors may exist and as such the user of this document should take care and use common sense when referencing this documentation.

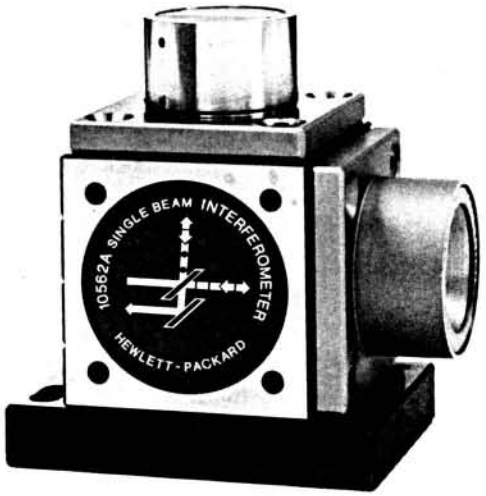
Copyright Notice

HEWLETT PACKARD

10562A
10562A OPTION 001
SERIES 1948A
SINGLE BEAM INTERFEROMETER

JANUARY 1980

OPERATING NOTE



DESCRIPTION

The HP Model 10562A Single Beam Interferometer is intended for use where the mass or size of a cube-corner retroreflector precludes the use of the 10565B Remote Interferometer. Since the Single Beam Interferometer can determine displacement information from a light beam reflected back on itself, it can measure the displacement of any plane reflective surface with suitable flatness, surface finish, and reflectivity properties.

HP Model 10562A Option 001 is a Non-Contact Conversion Kit consisting of three lenses with focal lengths of 127 mm, 254 mm, and 762 mm. This option eases the constraints imposed on the surface whose displacement is being measured by focusing the beam down to a small spot. Displacement within a short range on either side of the focal length of the particular lens used can then be measured for surfaces which are not necessarily flat.

SPECIFICATIONS FOR 10562A

Accuracy and Resolution are the same as the linear interferometer.

REFLECTOR REQUIREMENTS (without focusing optics):

FLATNESS:
Must not deviate from a best-fit plane by more than 10 microinches over the 0.3 inch (7 mm) diameters area being used.

SURFACE FINISH:
Metal 0.1-0.3 microinch arithmetic average.

OPTICAL 80-40

MAXIMUM MISALIGNMENT TO BEAM AXIS:
+5 arc-seconds in each of two orthogonally related axes.

DIMENSIONS:
Same as 10565B Remote Interferometer weight. 10562A 2.7 lb. (1,1 Kg)

MANUAL PART NO. 10562-90001
MICROFICHE PART NO. 10562-90002

PRINTED IN U.S.A.

SPECIFICATIONS FOR OPTION 001 NON-CONTACT CONVERSION KIT

Focal Length	5 in. (127 mm)	10 in. (254 mm)	30 in. (762 mm)
Spot Diameter	0.0004 in. (0,01 mm)	0.008 in. (0,02 mm)	0.024 in. (0,06 mm)
Displacement Range	0.040 in. (1,0 mm)	0.200 in. (4,0 mm)	1.500 in. (38,0 mm)

DIMENSIONS: Same as for 10581A Plane Mirror Converter.
WEIGHT: 0.5 lb (0,22 Kg) per lens.

10562A SET-UP

Alignment instructions of the 10565B Remote Interferometer apply with the reflective surface replacing the 10550B Retroreflector.

10562A OPTION 001 NON-CONTACT CONVERSION KIT SET-UP AND OPERATION

SET-UP

Clean all items according to maintenance instructions. Place the lens mount on a flat surface with flange up. Drop in the lens and then the O-ring. Screw on the lens retainer until the lens is held tightly in place. Now attach the assembly to the exit face of the 10562A Single Beam Interferometer using the four 8-32 screws. No adjustments are necessary.

OPERATION

Alignment instructions of the 10565B Remote Interferometer apply with the reflective surface replacing the 10550B Retroreflector. The 10562A Option 001 measures displacement of a reflective surface located at the focal point of the lens and oriented normal to the laser beam direction. The attached graph indicates the range of measurement as a function of lens focal length. Requirements of the surface are:

1. **Perpendicularity.** The surface must be approximately perpendicular to the laser beam. This alignment may be easily determined by observing the alignment meter of the 5505A Display and tilting either the 5500C laser head or the reflective surface to achieve a maximum reading.

2. **Flatness.** A #22 surface finish is recommended (RMS 2 microinch - or 0.05 m - deviation from a plane). Dull lapsed surfaces or ground surfaces may not reflect enough beam, and scratches will interrupt the beam during measurement.

FOCAL LENGTHS 10562A OPTION 001

Figures 1 and 2 show the focal length of lens in inches and millimeters.

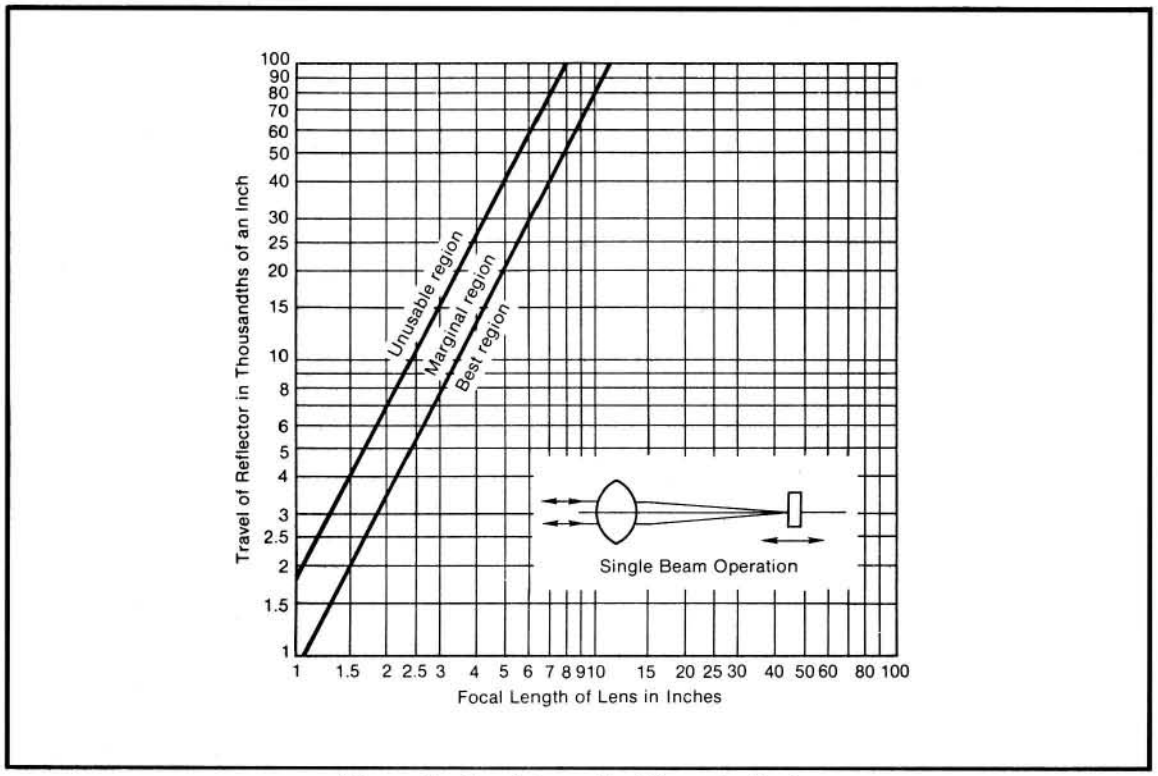


Figure 1. Focal Length of Lens in Inches

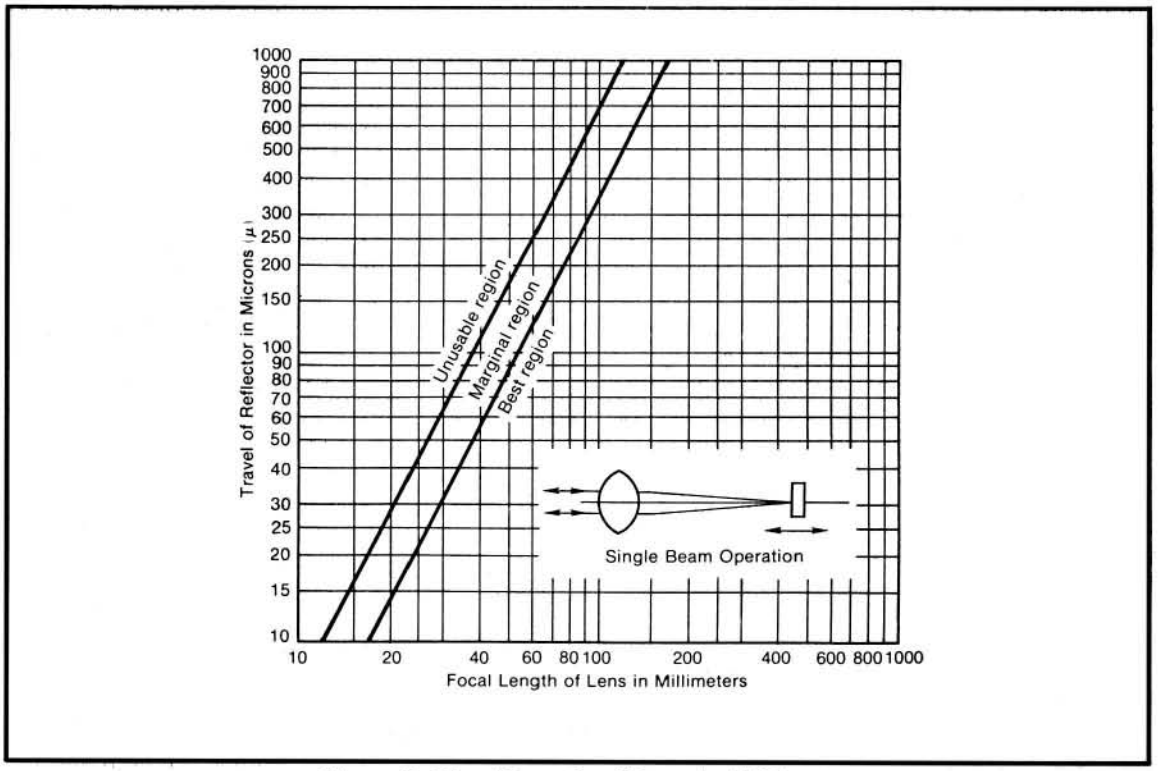


Figure 2. Focal Length of Lens in Millimeters

Option 001 Parts

(1)	Lens, 5" focal length (127 mm) 1000-0293
(1)	Lens, 10" focal length (254 mm) 1000-0291
(1)	Lens, 30" focal length (762 mm) 1000-0292
(3)	Lens mount
(3)	Lens retainer
(3)	O-ring
(12)	8-32 screws (flathead, hex drive), 0.437 in. long HP Part No. 3030-0426

HEWLETT PACKARD

MANUAL PART NO. 10562-90001

PRINTED IN U.S.A.