

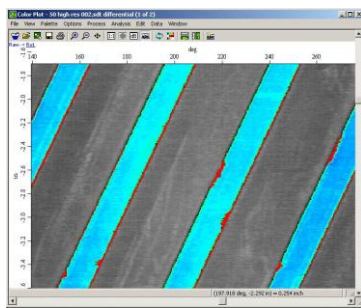
Laser-based Mapping of Gun Bores



Leading-edge laser technology

Laser Techniques Company, LLC (LTC) specializes in the development of automated, high-resolution laser-based sensors and systems that can be applied to a wide variety of NDT and Quality Control applications. Often these sensors are used to detect and measure difficult-to-inspect features such as erosion, corrosion or deformation in tubes and bores.

The *Laser MicroMap*TM system is a high-performance laser-based inspection system capable of rapidly, accurately and *quantitatively* mapping component surfaces. This family of products helps to eliminate operator subjectivity and human error by scanning up to 100% of the surface, providing quantitative results that can be used to confirm, document and monitor the integrity of a wide variety of parts.



Automated laser mapping of gun bores

LTC has adapted its laser-based inspection technology for the application of gun tube erosion and pit mapping. The *Laser MicroMap*TM system is capable of rapidly and accurately generating high resolution maps and visual images of both rifled and smooth-bore surfaces. Systems have been developed for mapping gun bores ranging from .30 caliber to 155 mm.

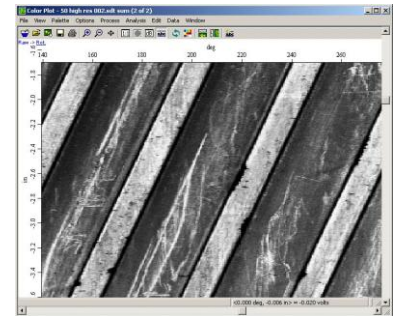
The *Laser MicroMap*TM sensor operates like a non-contacting “laser caliper”, rapidly scanning a tiny laser beam over the part surface. It is capable of detecting and mapping flaws or dimensional variations such as pits, corrosion, and erosion with typical accuracies of better than ± 0.001 inch (0.025 mm). Test results can be viewed in several user-friendly computer-graphic or tabular summary formats.

LaserVideoTM image eliminates the need for borescopes

A unique feature provided by the system is the

*LaserVideo*TM image display.

This feature allows the operator to view a high-



resolution, laser-generated image of the part surface. The *LaserVideo*TM image resembles a conventional CCD camera image of the ID surface of the test part — but without the distortion that results from using a right-angle mirror.

Features such as cracks, surface scratches, heat checking, and manufacturing blemishes — too small to be detected by a profiling sensor — can be detected, displayed and analyzed using this unique tool.

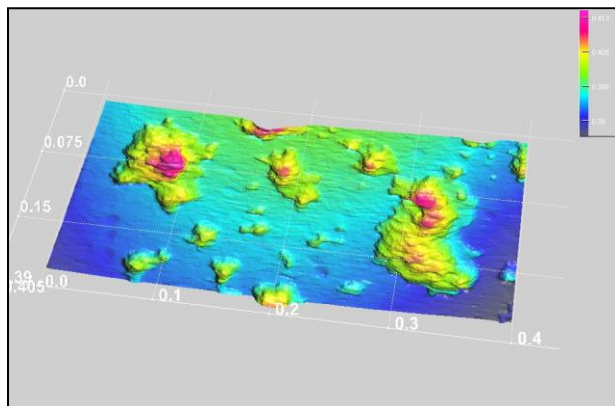
Modular / Flexible / Expandable

The *Laser MicroMap*TM system employs a modular design, which facilitates ease of expandability. The *LP-4000*TM data acquisition unit can be interfaced with virtually any commercial or custom probe delivery system. We also provide turn-key systems that can be used for the inspection of a wide range of gun tube sizes.

The *Laser MicroMap*[™] system architecture allows the system to be integrated with complimentary NDT technologies such as eddy-current and ultrasonics. Numerous integrated sensors have been developed with both bobbin and single-point rotating eddy current sensors for both probe location and complimentary flaw detection.

User-friendly Control and Analysis Software

The *Laser MicroMap*[™] is supported by our proprietary *LaserViewer*[™] software. This robust and incredibly flexible software provides a wide array of options for acquisition, display and analysis of data. Its modular architecture also allows easy addition of custom data processing or calibration algorithms. All measurement data can be exported as ASCII or other format files for further analysis and display.



LTC offers 3D viewing and analysis software.



LP-4000[™] data acquisition unit

Operators can view inspection results in contour, axial (side view) and polar (cross-section) plots. Two cross-sectional images can be superimposed and quantitatively compared to each other — a very useful feature for measuring flaw growth.

In addition, data can be post-processed with our optional custom analysis modules. Results are provided in tabular summary form, which can be graphically plotted or analyzed with our *LaserViewer 3D*[™] visualization and analysis software.

This advancement in NDT technology provides NDT professionals a new and powerful tool with modular flexibility for easy integration with existing NDT systems and expansion into new applications.

For more information contact:

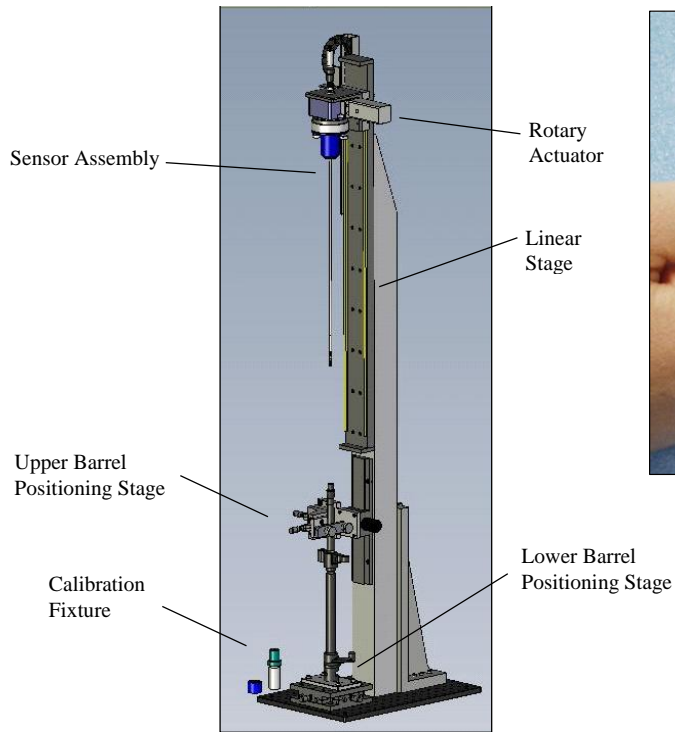
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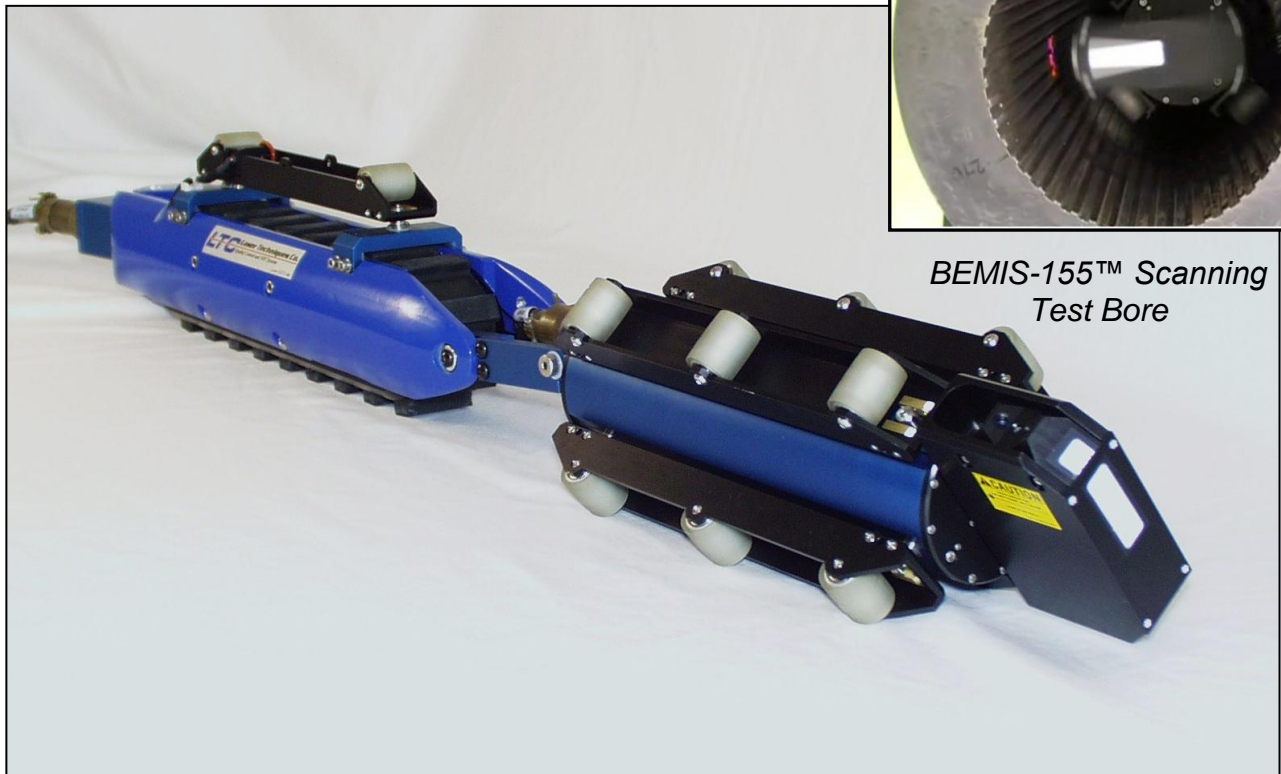
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Small caliber scanning station

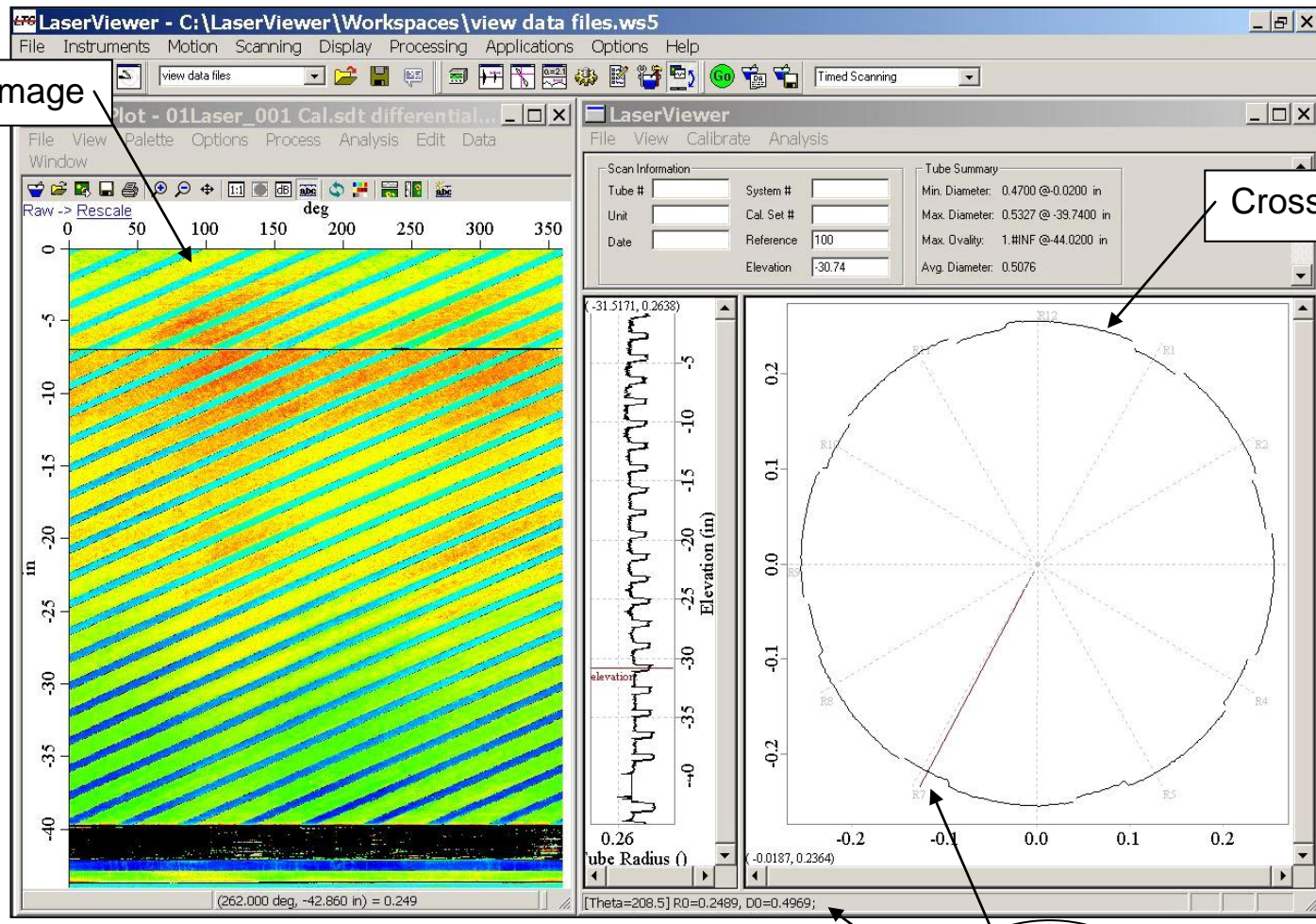


LTC Weapon Systems Group specializes in laser-based Bore Erosion Measurement and Inspection Systems from 5.56mm (.223 cal) to 155mm



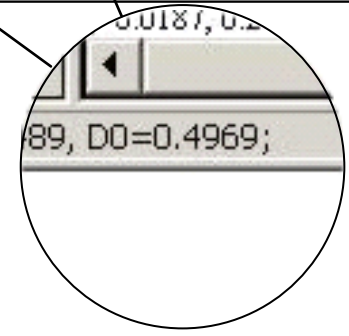
Laser MicroMap™ scanning assembly for 155 mm cannon bores

Color Plot image



Cross Sectional image

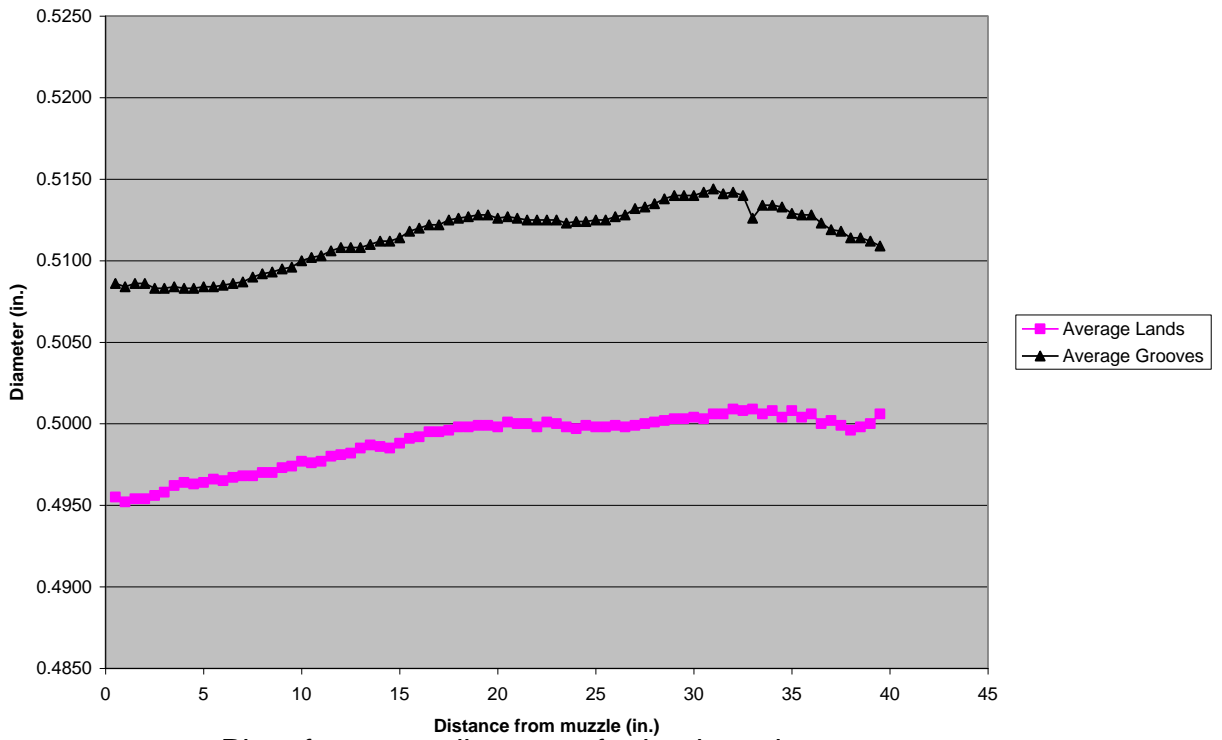
Color Plot image of full gun tube length "sliced" and laid open. False-color map shows slight changes in land and groove diameters over the length of the bore.



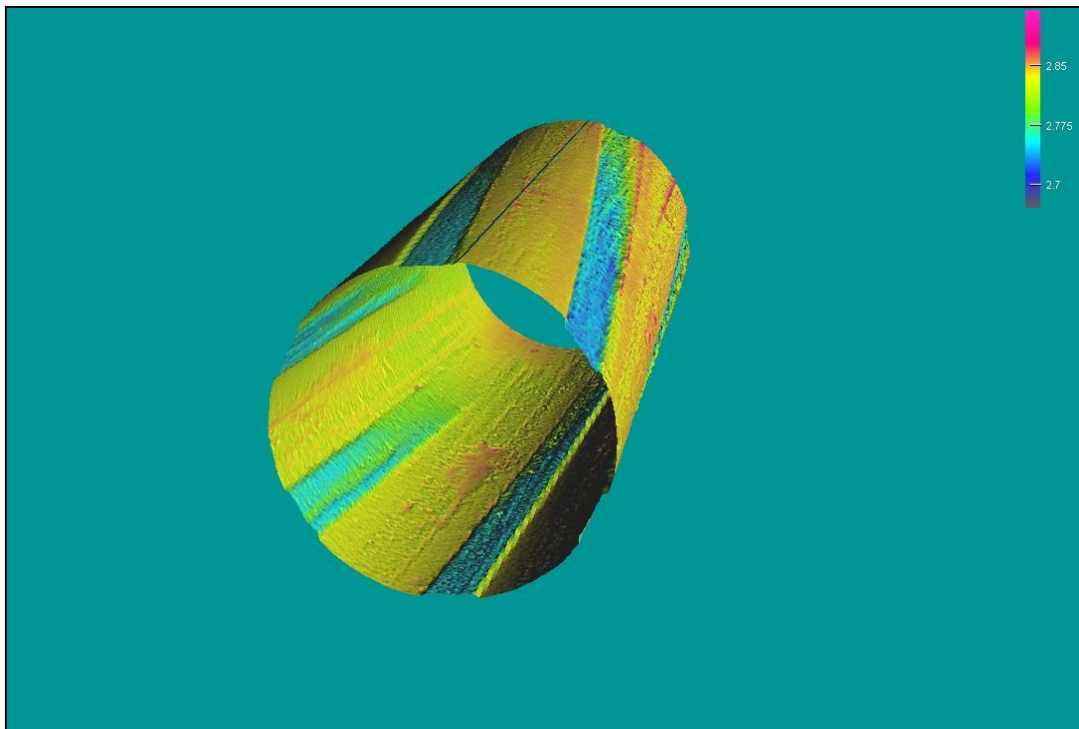
Local diameter reading - in this case the cursor is placed on a land.

Typical gun tube scan display

SCAN DATA FILENAME: D:\50 Cal\Test Scan\.sdt



Plot of average diameters for lands and grooves.



LaserViewer 3D™ image of internal surface of small caliber weapon.