



Bridge Gusset Plate Ultrasonic Inspection

Introduction

MISTRAS Group's Products & Systems division, Physical Acoustic Corp. and NDT Automation, presents the Pocket UT™ an innovative, handheld Ultrasonic System used for thickness mapping of gusset plates on steel bridges. This system can provide measurements and inspection data faster for future trending comparisons.

Current Condition

Steel Bridges of the “Baby Boomer Era” are becoming a major factor with DOT's as they approach the age of deterioration. Current inspection methods on steel bridges for corrosion use conventional ultrasonic thickness gages which take spot readings at single locations over a large area. Inspectors then take the readings and make an assessment of the thickness loss and rate the bridge accordingly. This process is very time consuming and the minimal number of thickness readings makes the inspector's job very difficult.

Our Pocket UT™ Ultrasonic System uses an encoded scanner to gather continuous thickness measurements versus distance *and* present a color picture of the inspection results. This increases the amount of data being recorded and completes the inspection much faster.



Application Solution: Pocket UT™

The Pocket UT™, is a hand held, battery powered, C-scan system, which can inspect gusset plates with confidence. Using the accompanying handheld scanner, the R-scan, with its unique dry coupled sensor, the system can gather thickness data quickly, displaying a graphical image showing areas of corrosion. The system runs on Windows CE and Pocket UT Win for data acquisition, analysis, and archiving. It also has the capability to perform A, B, and C-scans, placing the unit in a class by itself.

The heart of the 2 pound Pocket UT™ is a 20MHz bandwidth, 1kHz pulse rate pulser receiver board that is powered by a rechargeable 7.2V NiMH battery giving the instrument 4 hours of continuous use. Thickness, amplitude and waveform data is stored on a 1GHz compact flash card that can be transferred to a laptop computer using the USB port.

The Pocket UT™ can interface with 2 axis of motion. The open architecture allows the instrument to interface with any 2 axis encoded manual scanner or stepper motor scanners. Resolution is limited only by the scanner, with typical scans taken at .050”.

Case Study: Inspection of Gusset Plates

Inspections on steel bridges are carried out with limited access. Bucket Trucks, Snooper Trucks, and Rope Access are the only methods to get inspectors to the areas of interest. The Pocket UT™ allows inspectors to carry out their inspection quickly gathering more data than ever. Before the introduction of the Pocket UT™, inspectors would use conventional thickness gages, apply couplant, take readings every 3-4 inches, and then document the readings by hand.



Current inspection techniques on a single plate can take over 30 minutes. However, the Pocket UT™ System and R-scan can inspect the same area in less than 5 minutes, taking readings every .050", and saving all the data to produce a graphic image of the area with no couplant required.

A recent inspection with Ohio DOT inspectors was performed confirming the data collected was 75% faster and immediately displayed the recorded results. When asked about the Pocket UT, Michael Loeffler, an inspector for the Ohio DOT said *"It is a huge time savings. Not only will The Pocket UT™ limit the amount of time we have to shut down lanes of traffic and inconvenience the public, but we receive more and better data. Also the less time our inspectors have to spend on a bridge is a safety factor that cannot be measured. It's a win-win."*

The Pocket UT™ can not only complete the inspections of gusset plates in a fraction of the time, but also display the data for real time evaluation.



Pocket UT™ comes complete with hand-held unit, transducer, cables, battery charger & couplant



Physical Acoustics Corp. and NDT Automation, members of MISTRAS Products & Systems division, are a team of skilled researchers, engineers, technicians and manufacturing personnel dedicated to the development on practical and cost saving solutions to your challenging inspection needs.

For assistance or additional information, please contact our Princeton Junction headquarters.

195 Clarksville Road, Princeton Junction, NJ 08550 USA
Phone: (609) 716-4000 • Fax: (609) 716-0706
Email: sales.systems@mistrasgroup.com • www.mistrasgroup.com