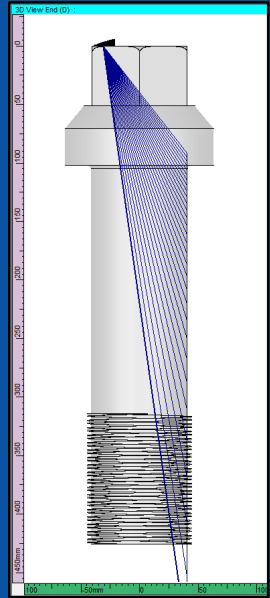


Riser Bolt Inspection

Application Solution



Overview



- Inspection Challenge
- Recommended Phased Array Ultrasonic (PA UT) Solution
- Results
- Benefits of Zetec Solution

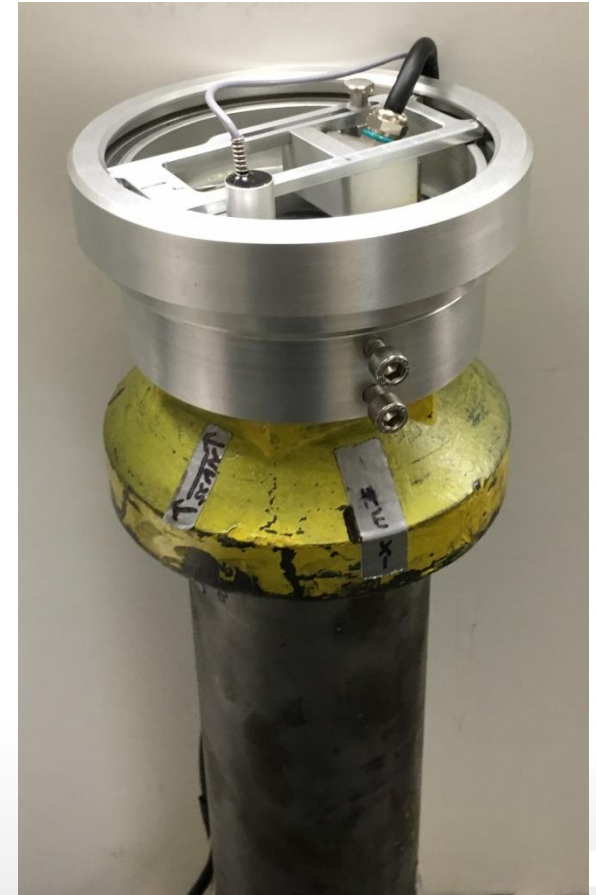
Inspection Challenge

- Riser bolts require regular in-service inspections for crack detection
- Removing bolts is time consuming, so owners look for reliably “in-situ” inspection
- Manual inspection techniques (conventional Ultrasound (UT) or PA UT) are not sufficiently effective :
 - Signal interpretation can prove difficult in the presence of multiple geometrical echoes (e.g. threads) and reflections
 - No permanent data recording or position information



- Encoded phased array UT will improve efficiency and reliability of the inspection :
 - Increased detection capability
 - Improved characterization and sizing of indications, through adequate visualization of inspection data
 - Provides permanent records
- Solution dealing with variety of bolt types :
 - Simple, encoded manually driven scanning tool
 - Standard phased array UT probe driven by a portable phased array unit
 - On-board software tools allowing for efficient and reliable interpretation of inspection data

Dedicated Manual Scanner



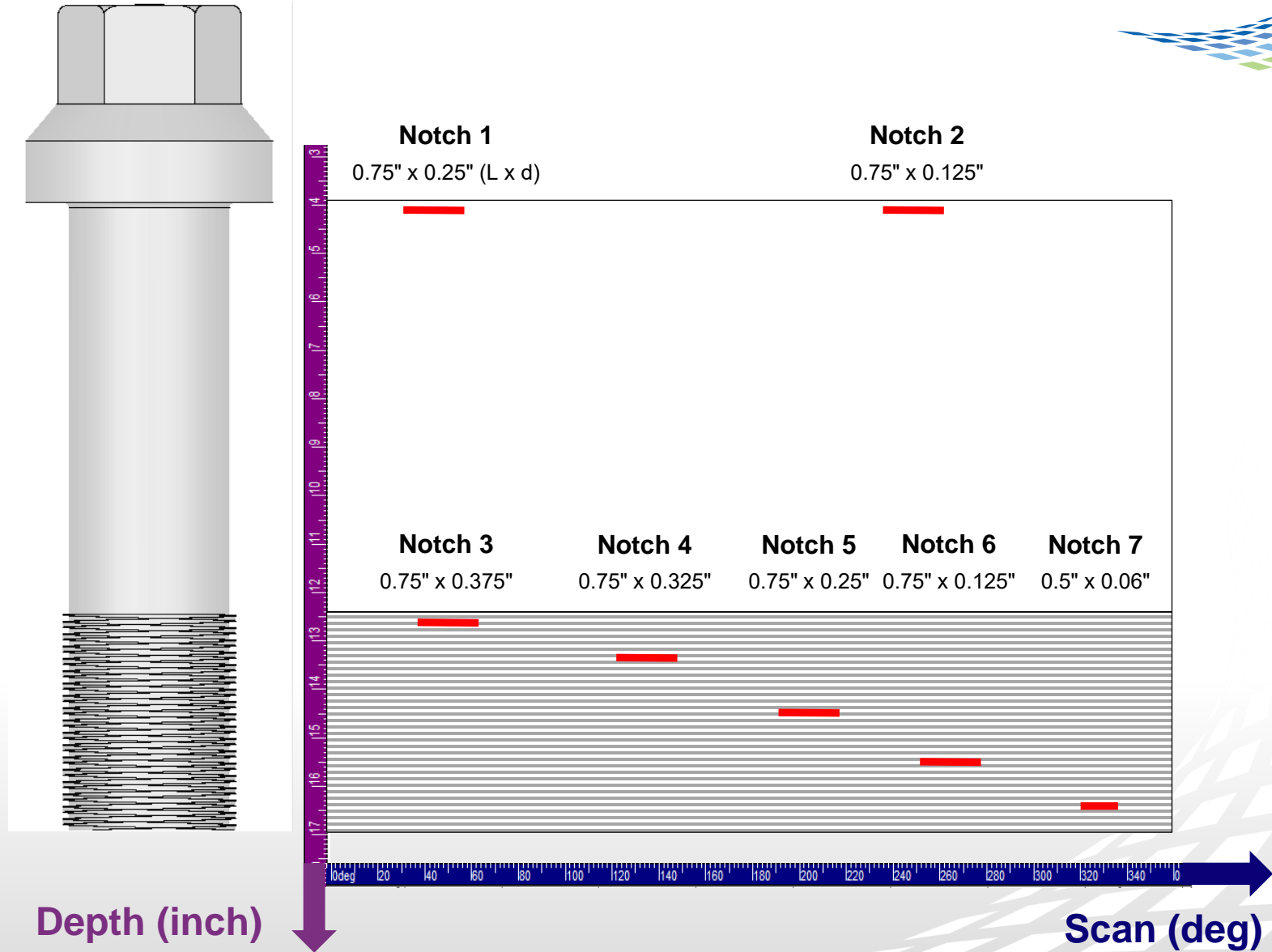
- Encoded rotation, manually driven
- Adjustable radial probe position
- Spring-loaded probe for adequate coupling
- Fits onto a range of hex nuts



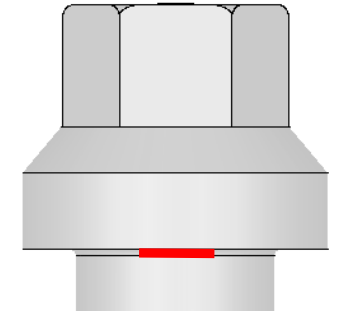
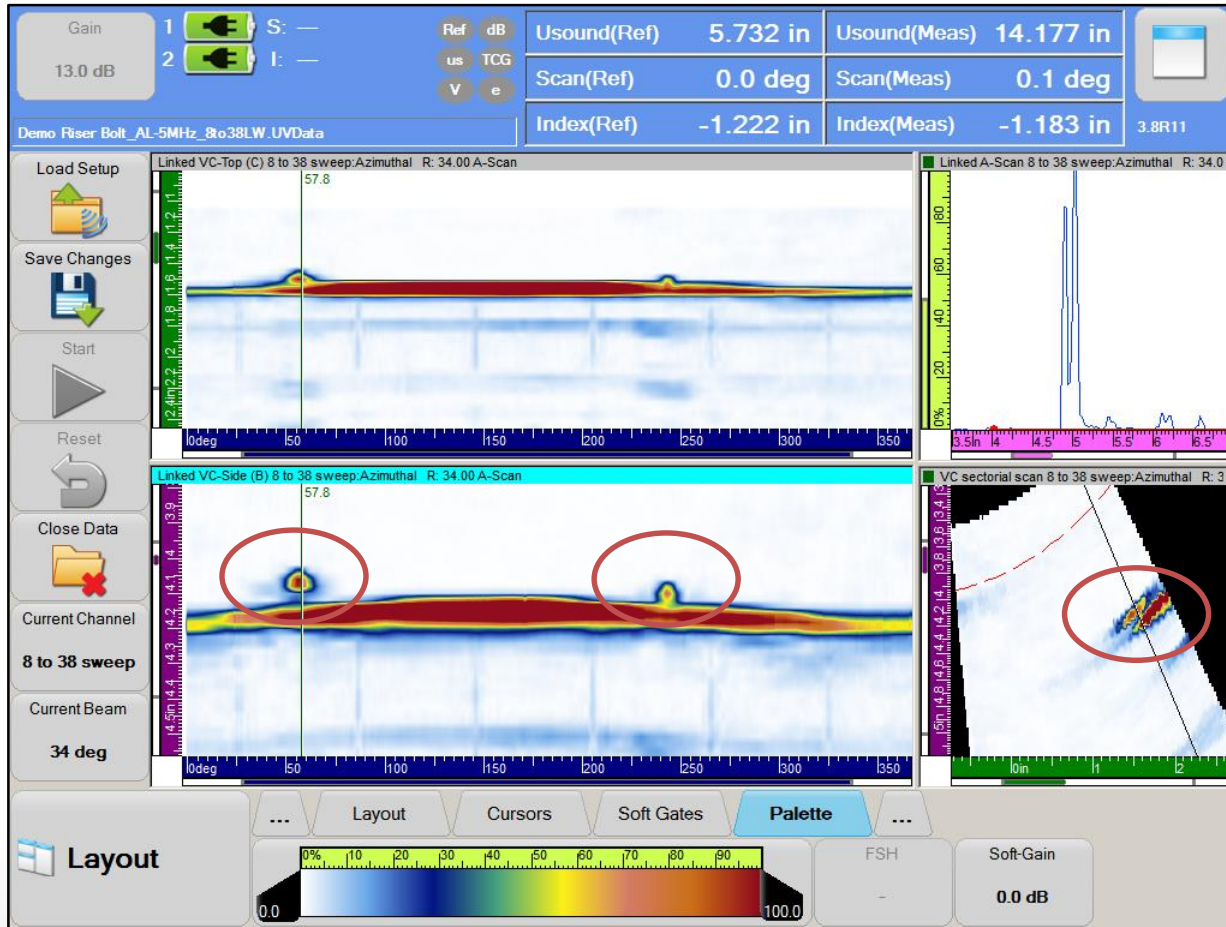
- Fully integrated, portable PA UT unit
- PA UT 32/128PR + 2 UT at 200 V
- 64-bit computer, fast processing
- Rugged, battery operated
- Driven by UltraVision Touch software for setup, recording and full data analysis
- 2GByte data files on-board
- Reporting Feature



Results on Test Bolt

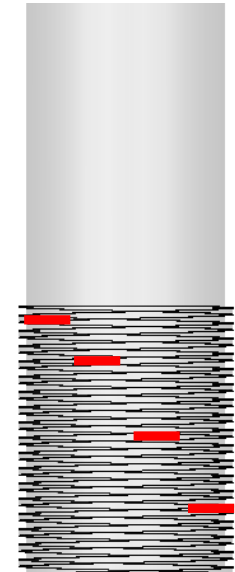
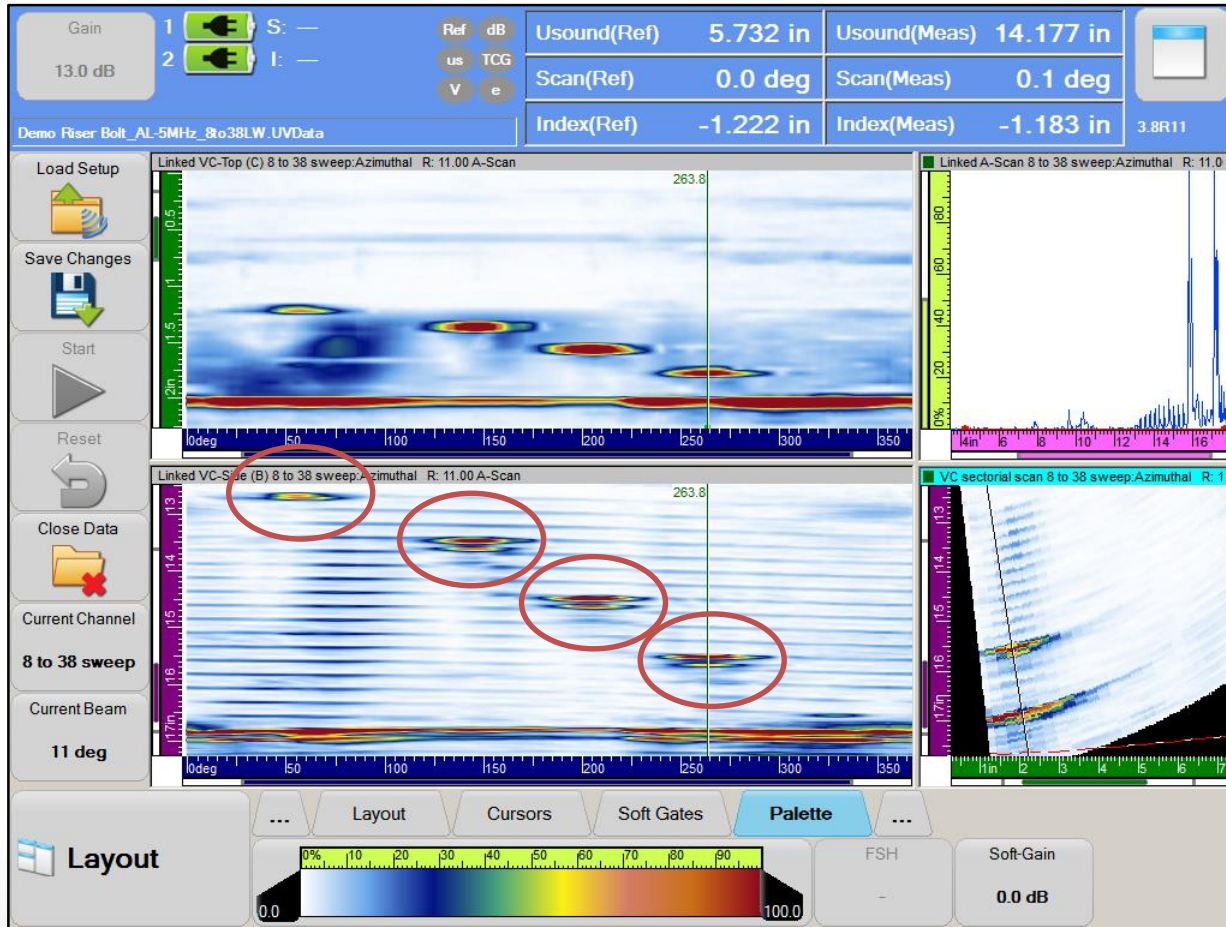


Results on Test Bolt



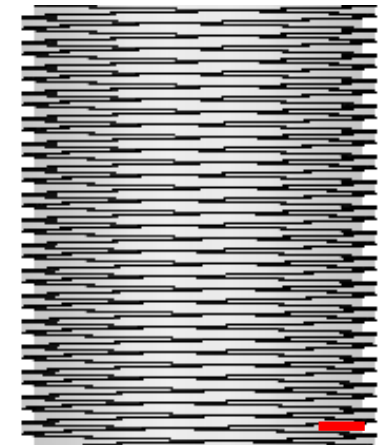
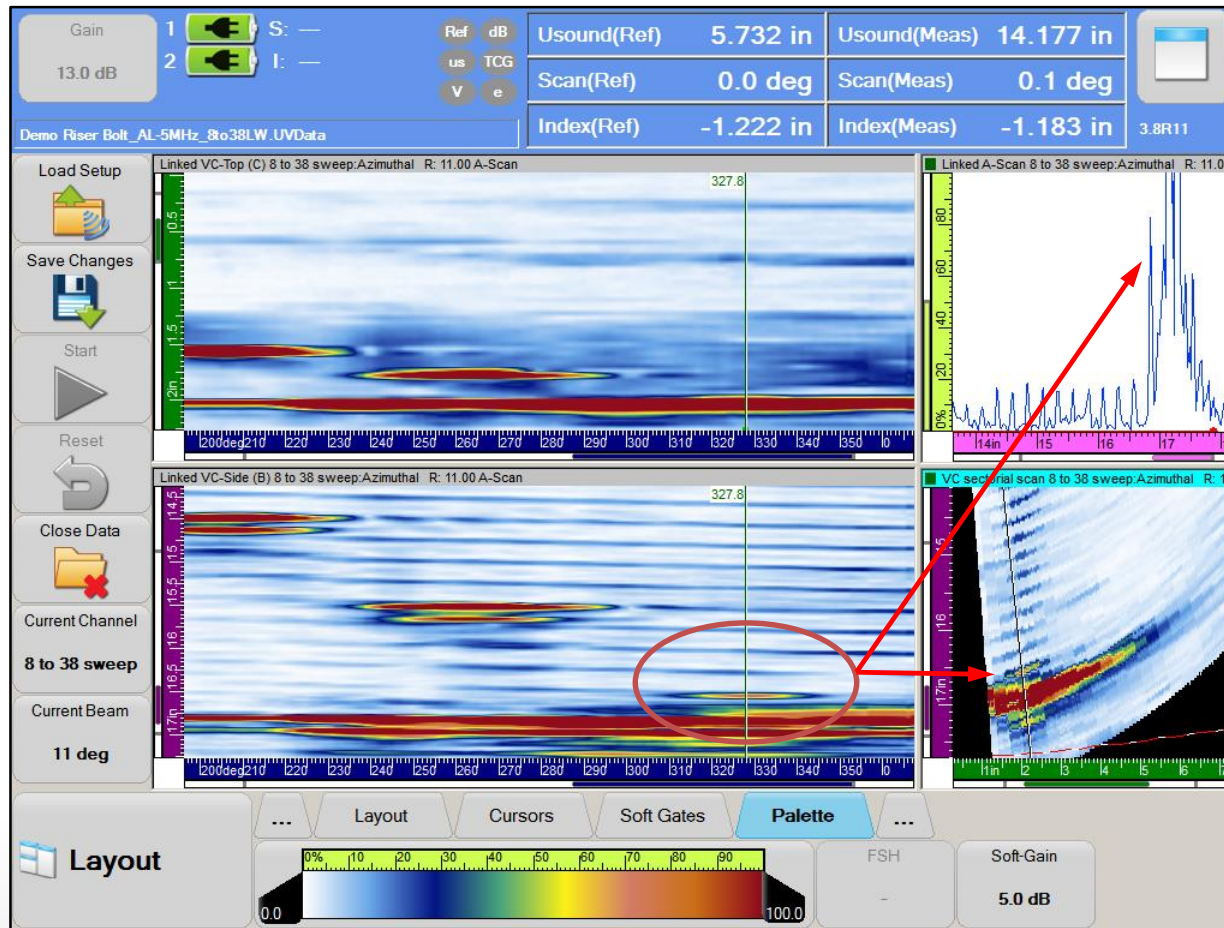
Notches 1 and 2, close to the echo from the bolt geometry, are well resolved by using the Linked B-Scan View; detection from A-scan only is challenging

Results on Test Bolt



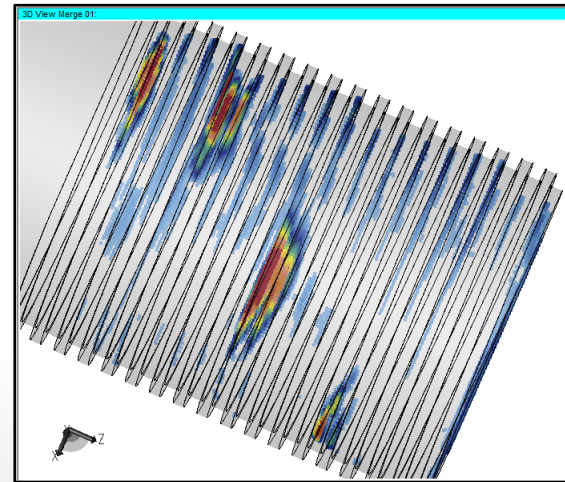
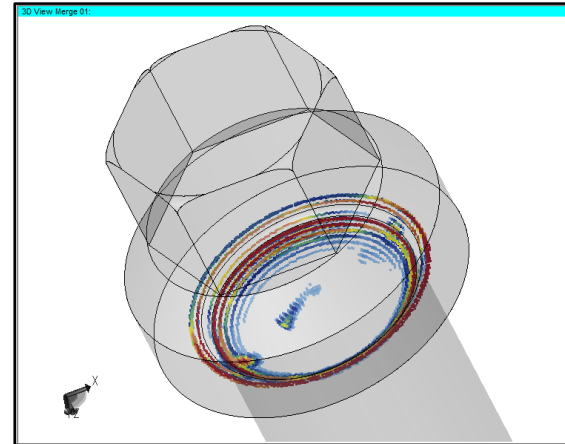
Notches 3, 4, 5 and 6, all in the threaded area, and with depths varying from 0.125" to 0.375", are clearly detected and resolved from the thread signals

Results on Test Bolt



Notch 7, only 0.06” deep, and located in close proximity of the back wall, can be clearly resolved from the geometry

Results on Test Bolt



3D imaging of phased array UT data in riser bolt CAD model, generated with UltraVision Classic 3D software, facilitates data interpretation by end users

Benefits of Zetec Solution



- Encoded manual scanning device provides repeatable results and permanent recording
- **TOPAZ³²**, a fully integrated portable system:
 - High performance from on-board 64-bit computer
 - On-board UltraVision Touch software provides all required tools from setup through reporting
 - Capability to record large data files (up to 2 GBytes)
- Easy to deploy:
 - Dynamic Merge views for on-line monitoring of inspection data
 - Complete data analysis capability
 - Indication Table & Report Generation
- Files fully compatible with UltraVision Classic 3D software

Thank You!

Learn more at: www.zetec.com