



# Time Reversal—Simplifying Inspections

## Inspections are becoming more complex

The aerospace industry is constantly evolving to produce aircraft that are lighter to recognize fuel saving efficiencies. Composite materials (e.g., CFRP) offer an excellent weight to robustness ratio and are increasingly being incorporated into aircraft structures. Composite aircraft parts typically have complex and variable geometries requiring ultrasonic inspection systems to have intricate and expensive mechanical surface following scanners.

Currently, rapid and reliable phased array ultrasound (PAUT) inspection requires a combination of dedicated phased array probe configurations, high-performance

PAUT electronics, multi-axis scanners and advanced software algorithms.

Time Reversal allows for quick and precise PAUT inspections on complex and variable CFRP geometries.

## Simplify the inspection

Time Reversal is a real-time adaptive phased array ultrasound technique based on measurement of front wall surface echoes and TOF (time of flight) compensation of returned ultrasound data. Composite material manufacturers can now dynamically adjust for part misalignment, water column variations, and surface geometry changes. This can deliver improved cost and time efficiencies on the production floor.

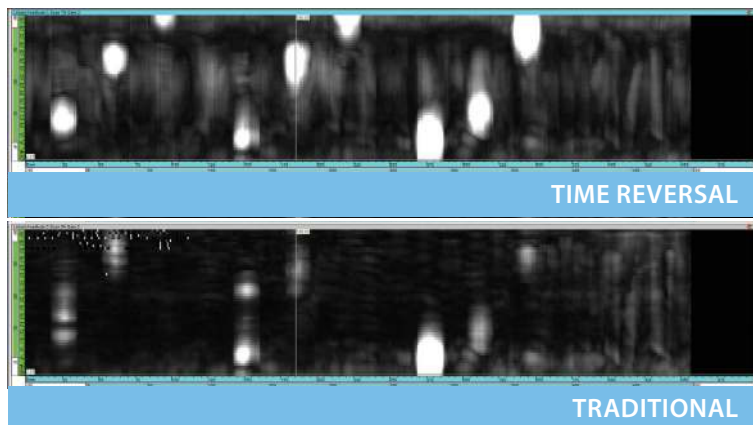
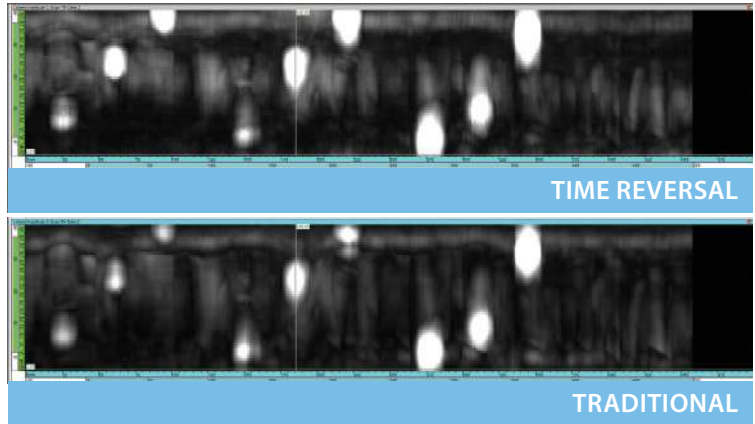
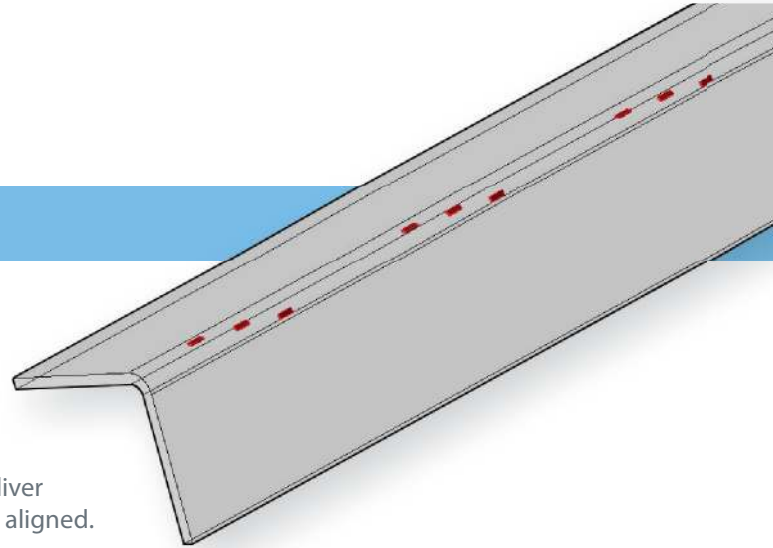


## Improving signal quality, every time

Applying Time Reversal, misalignments between probe and part surface are easily compensated, resulting in improved ultrasound signal quality.

Time Reversal and traditional PAUT inspection configurations deliver comparable results when the ultrasound probe and part are well aligned.

In the case of probe to part misalignment, Time Reversal extends the inspection limits way beyond those seen with a traditional PAUT configuration.



Zetec holds ISO 9001 and ISO/IEC 17025 certifications



For more information on Time Reversal, visit: [www.zetec.com](http://www.zetec.com)