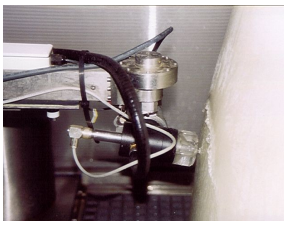
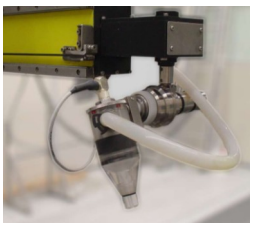
USL Ultrasonic Sciences Ltd

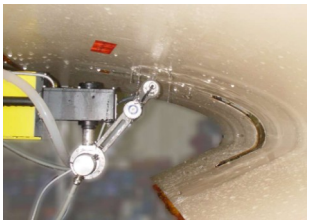
Ultrasonic squirter systems for inspection of aerospace composites

- Systems up to 18 metres long
- Tower and gantry configurations from 2 to 17 axes
- Contour following systems for complex curves with CAD input for scanner control
- Exceptional dynamic range using logarithmic receivers and remote pulser preamplifier
- Multiple gate acquisition and display in real time
- C scan, B scan, thickness mapping and full RF acquisition
- Multi-channel and combined immersion/squirter options

Ultrasonic testing using the through transmission squirter technique remains the predominant method of inspection of composite materials.
Relatively flat panels can be tested using simple 2 axis machines, but the increasingly complexity of components requires more sophisticated scanners.
USL can provide systems for both simple and complex applications. These combine highly rigid and highly accurate mechanical scanners with USL's established PC based instruments, to provide fast and effective testing of composite structures.
A unique range of precision manipulators is available, with the type selected to suit the application.

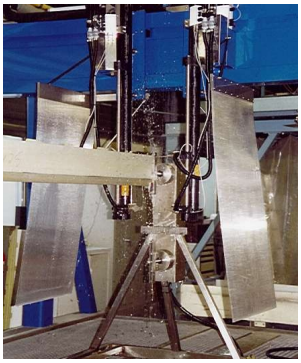






A range of manipulator designs
for multi-axis contour following applications

Systems can operate in pulse-echo mode from both sides and in through transmission simultaneously. Motorised part manipulators can be included as shown below.



Software features include real time C scan imaging from multiple monitor gates in a single scan, using logarithmic and linear amplifiers. Complex contour following programs can be set-up by simple teach and learn procedures (much faster than in competitive systems), or by importing from CAD data, such as CATIA.

System features

Mechanical

- Axis configuration from simple X-Z units for flat panels, to 17 axes for complex shapes.
- Vertical tower and horizontal gantry types.
- Custom designed, highly rigid structure.
- High quality construction throughout.
- Scanning speed up to 1m/sec.
- Optional turntable and rotate axes.
- DC servo drives, with rack and pinion, ballscrew or belt transmission.
- High quality linear bearings with permanent lubrication.
- Precision optical encoders on all axes.
- Exceptional resolution and repeatability.
- Precision manipulators - gimbal/gimbal, gimbal/ rotate and goniometric.
- Sand filtration and UV treatment of water, with active flow control.

Ultrasonics

- Fully integrated PC-based ultrasonics, data acquisition and motion control.
- High power pulser for optimum penetration.
- Remote Pulser preamplifiers for exceptional S/N ratio.
- Simultaneous log and linear data acquisition.
- Through transmission and pulse echo data in the same scan.
- Logarithmic receiver for wide dynamic range - instantaneous 95dB, total >120dB.
- High speed A-D conversion and processing.
- Multi-channel and dual frequency options for simultaneous low and high frequency scanning.
- Up to 8 independent gates per channel - amplitude and time of flight monitoring
- Frequency from 0.2MHz to 35MHz

Software

- Windows 7 based software.
- True simultaneous multi axis motion control for complex shapes.
- High refresh rate digital RF/A scan.
- C scan imaging from multiple gates simultaneously.
- Full RF data acquisition and processing, including B scan capability.
- On screen measurement and analysis.
- Histogram analysis of images and defects
- 3D image manipulation.
- Interfaces to network and offline computers.
- CATIA/CAD generated scan profiles.

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