



ZONE Sonography® Technology *Plus* is a revolutionary, software-driven approach to acoustic data acquisition and image formation that breaks the barriers of conventional ultrasound imaging based on innovative Channel Data processing methods.

## ZONE Sonography® Technology *Plus*

### A Breakthrough in Ultrasound Imaging

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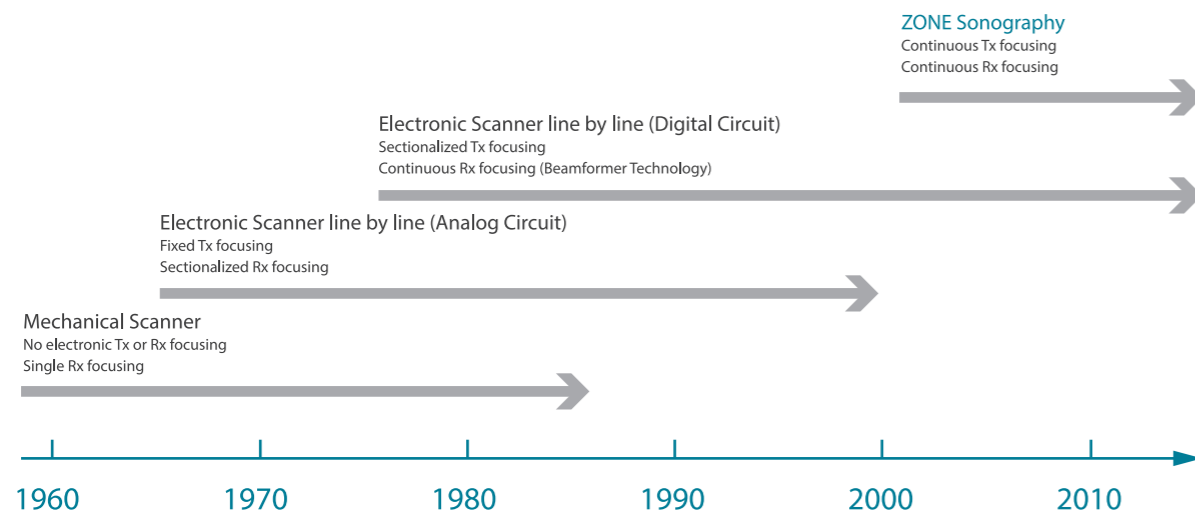
## ZONE Sonography® Technology Plus (ZST<sup>+</sup>)

ZST<sup>+</sup> is the most premium and innovative ultrasound platform, evolving with Powerful Processing Architecture and Enhanced Channel Data Processing based on ZONE Sonography®.

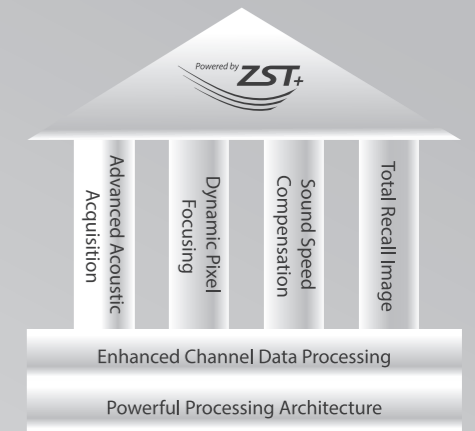
“ The next industry standard method of generating ultrasound images.  
Two generations ahead of traditional digital beam formation technology. ”

Frost & Sullivan Research Report  
November 2011

### Development of Real-Time Ultrasound



The Channel Data based ZST<sup>+</sup> is an extraordinary innovation, representing an ultrasound evolution. Transforming ultrasound metrics from conventional beamforming to channel data based processing, ZST<sup>+</sup> is able to deliver multiple imaging advances: Advanced Acoustic Acquisition, Dynamic Pixel Focusing, Sound Speed Compensation, Total Recall Imaging and evolving in ZST including Powerful Processing Architecture and Enhanced Channel Data Processing.

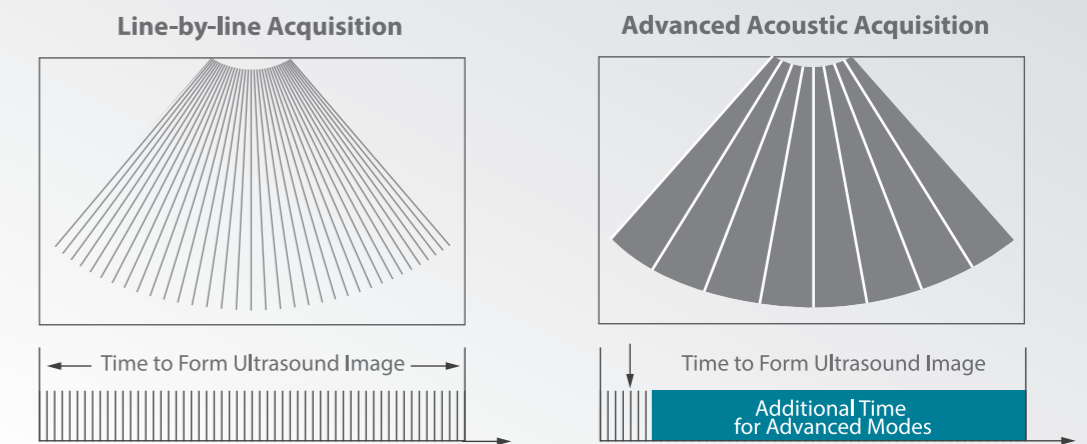


## Advanced Acoustic Acquisition

By transmitting and receiving with larger acoustic zones, Advanced Acoustic Acquisition improves the temporal resolution with 10 times faster comparing with conventional line-by-line beamforming methods.

This results in 2D real-time imaging with an extremely fast and accurate temporal display for both moving anatomical structure and high velocity hemodynamics.

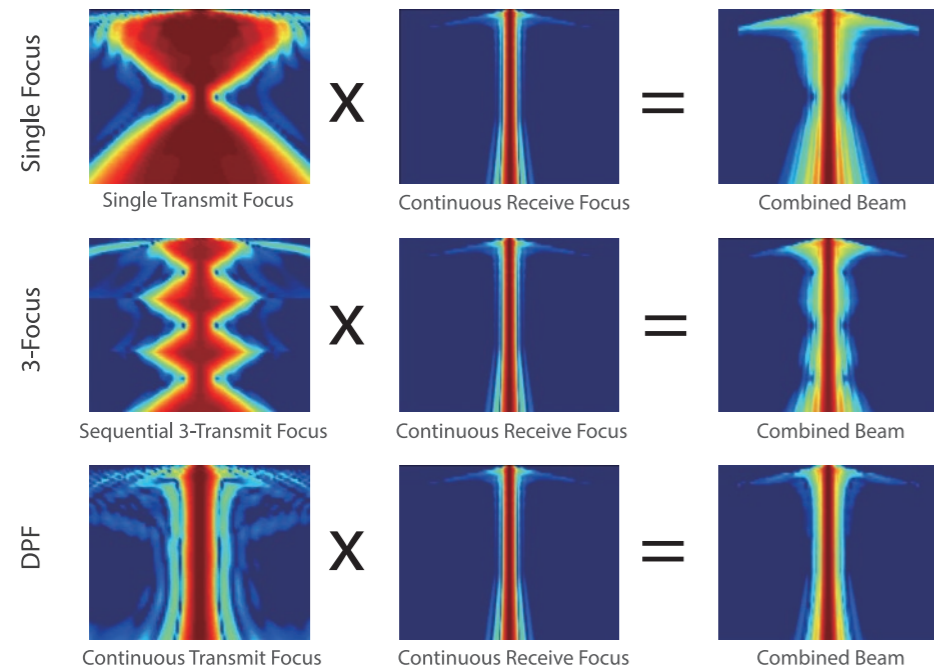
The much shorter acquisition time also provides the possibility of the system for advanced image processing technology during the non-scanning spare time. The processing technology can be performed for higher image quality performance, such as Sound Speed Compensation(SSC), or for advanced image analysis technology in real time, such as Elastography.



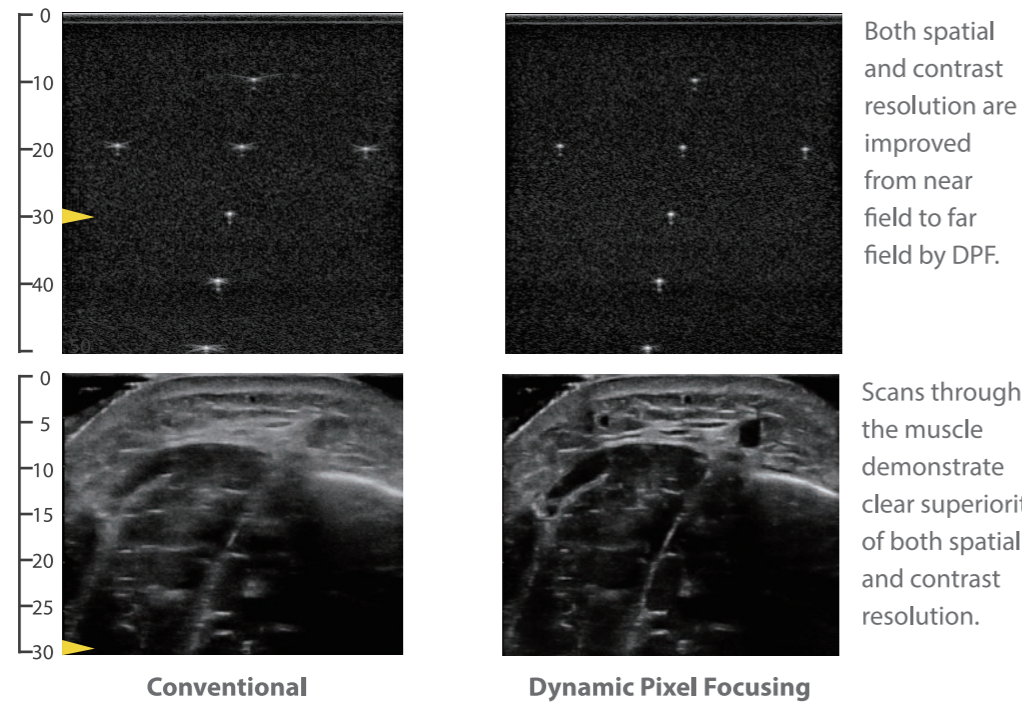
Traditional beamforming imaging methods create each frame line by line. ZONE Sonography frames are created 10 times faster by using large ZONES of ultrasound energy, accurately displaying anatomical motion & hemodynamic states and reducing tissue motion artifact.

# Dynamic Pixel Focusing (DPF)

Dynamic Pixel Focusing is the technology using Channel Data in different acquisition zone and time slot to achieve the most precise pixel focusing by Phase Alignment and Coherent Synthesis for ultrasound image.



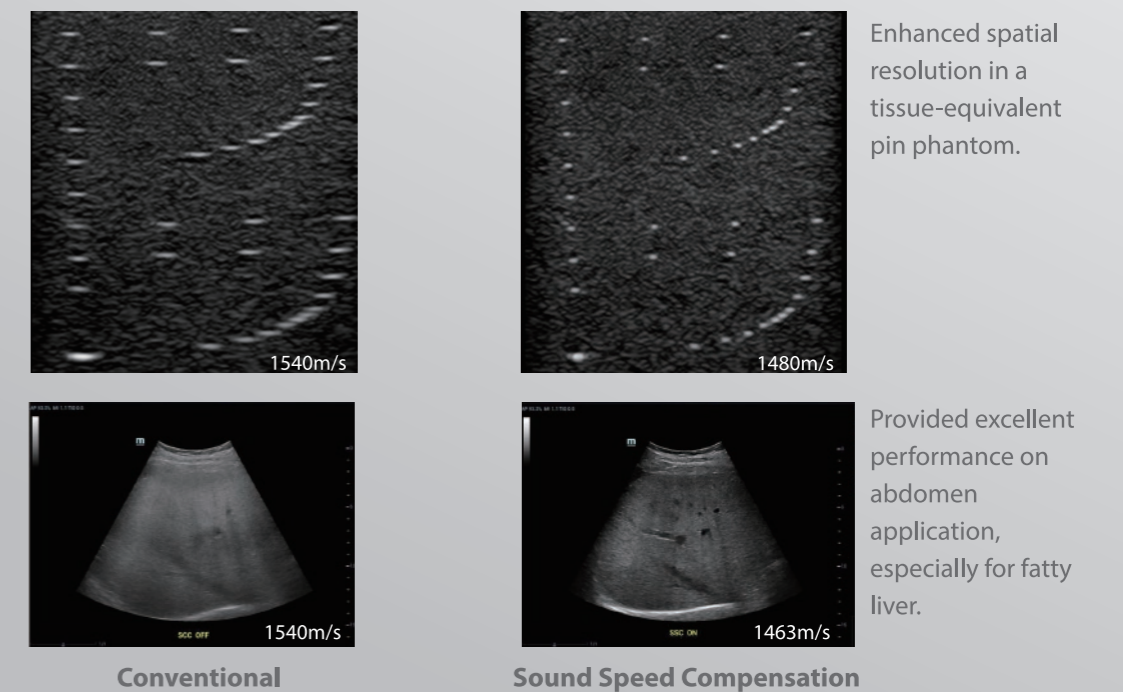
Dynamic Pixel Focusing provides continuous focus both on transmit and receive at every point in the image, resulting in a completely focused image from near field to far field.



# Sound Speed Compensation (SSC)

Historically, ultrasound imaging systems have been calibrated to the inaccurate assumption that ultrasound propagates through all human soft tissue at a velocity of 1,540 meters per second. At the touch of a button, SSC automatically samples the tissue being examined and recalibrates the software to reflect its specific speed of sound.

In principal, Sound Speed Compensation processes retrospectively of Channel Data with various sound speed, and acquires the optimal tissue-specific image adaptively.



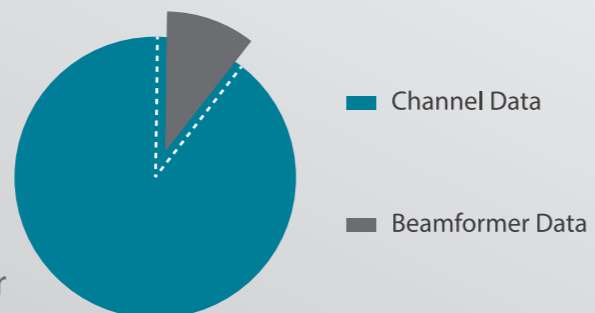


## Total Recall Imaging (TRI)

up to

# 10 times

more data acquisition  
than conventional beamformer



As ZONE Sonography® Technology captures and stores the complete acoustic data, Total Recall Imaging (TRI) allows the system to do retrospective processing on Channel Data and also permits user to modify numerous imaging parameters on stored images to optimize clinical information.

### TRI for Channel Data

The system with TRI has the capability for retrospective and multiple processing of original ultrasound data, extending the image processing and further signal research to a higher level than traditional beamformer data.

### TRI for Stored Images

The system with TRI has the ability to optimize images after scanning and reduce the non-necessary repeated scanning.

## Evolution of ZONE Sonography®

With Powerful Processing Architecture and Enhanced Channel Data Processing, ZST<sup>+</sup> is the evolution of ZONE Sonography®.

### Powerful Processing Architecture



CPU, GPU speed increases\*

↑ 175%



FPGA parallel processing increases\*

↑ 43%



Memory capacity increases\*

↑ 300%



Data Flow Bandwidth

> 20GB/s

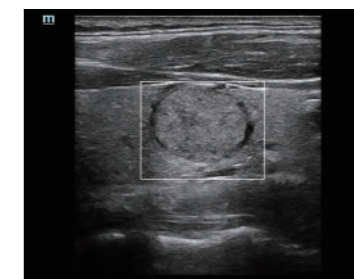
\* Compared with the average premium ultrasound systems

### Enhanced Channel Data Processing

#### HD Scope



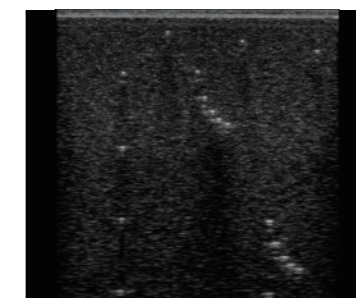
HD Scope OFF



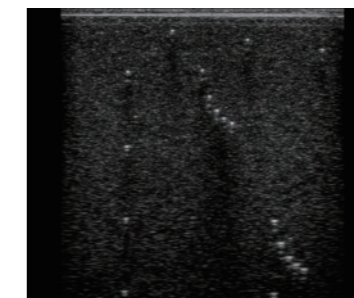
HD Scope ON

By processing Channel Data multiply and retrospectively, HD Scope can improve the detail information and image contrast on specific area maximally.

#### Coherent Spatial Synthesis (CSS)



Without CSS



With CSS

Enhanced contrast resolution and detail resolution in a tissue-equivalent pin phantom with focusing on each point.