

TOSHIBA



Aplio™

INTELLIGENCE IN ULTRASOUND



VISUALIZATION

QUANTIFICATION

COMMUNICATION



TOSHIBA CORPORATION
MEDICAL SYSTEMS COMPANY

<http://www3.toshiba.co.jp/medical>

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A NEW LEVEL OF INTELLIGENCE

The most important requirement for complex diagnosis and research is the ability to perform high-quality examinations. With Aplio, Toshiba has reached a new level in ultrasound intelligence. One that meets the highest demands of diagnostic confidence and workflow optimization. Aplio's groundbreaking system architecture produces excellent diagnostic performance and offers great potential for new and advanced applications. But that's not all. Whether you are looking for innovative workflow management, sophisticated quantification analysis tools or communication and data management facilities, Aplio has it all.



Aplio's open architecture and innovative technology means it not only meets the highest clinical standards, it also keeps pace with technological developments. The system is already configured for "single crystal" technology for example, so it's a safe investment for the future.

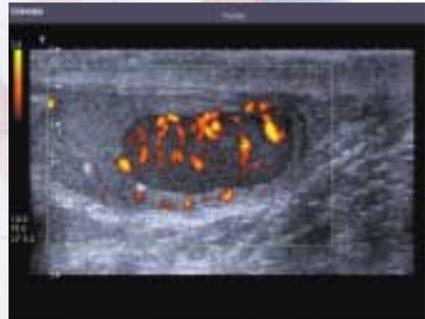


Aplio's system architecture is based on four solid foundations that meet the demands of today's clinical environments: Navigation, Visualization, Quantification and Communication. It's this user-focused approach that makes Aplio Intelligence in Ultrasound.



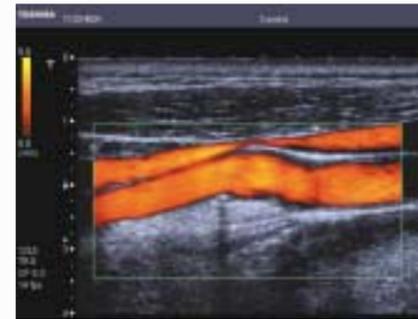
Intrahepatic artery. Advanced Dynamic Flow.

ENHANCED VISUALIZATION



Testis Tumor. Pulse subtraction combined with Power Angio.

Aplio's technology platform incorporates two core elements that make a real difference to clinical performance: Intelligent Component Architecture and the Tera Processing Beamformer. It's these breakthrough technologies that allow the system to give such excellent diagnostic results and include advanced new features.



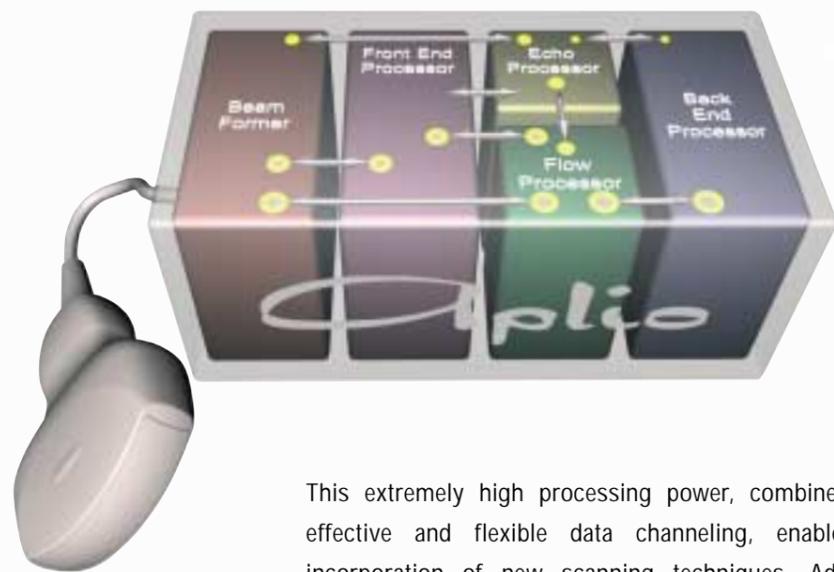
ICA with small plaque.

TERA PROCESSING BEAMFORMER

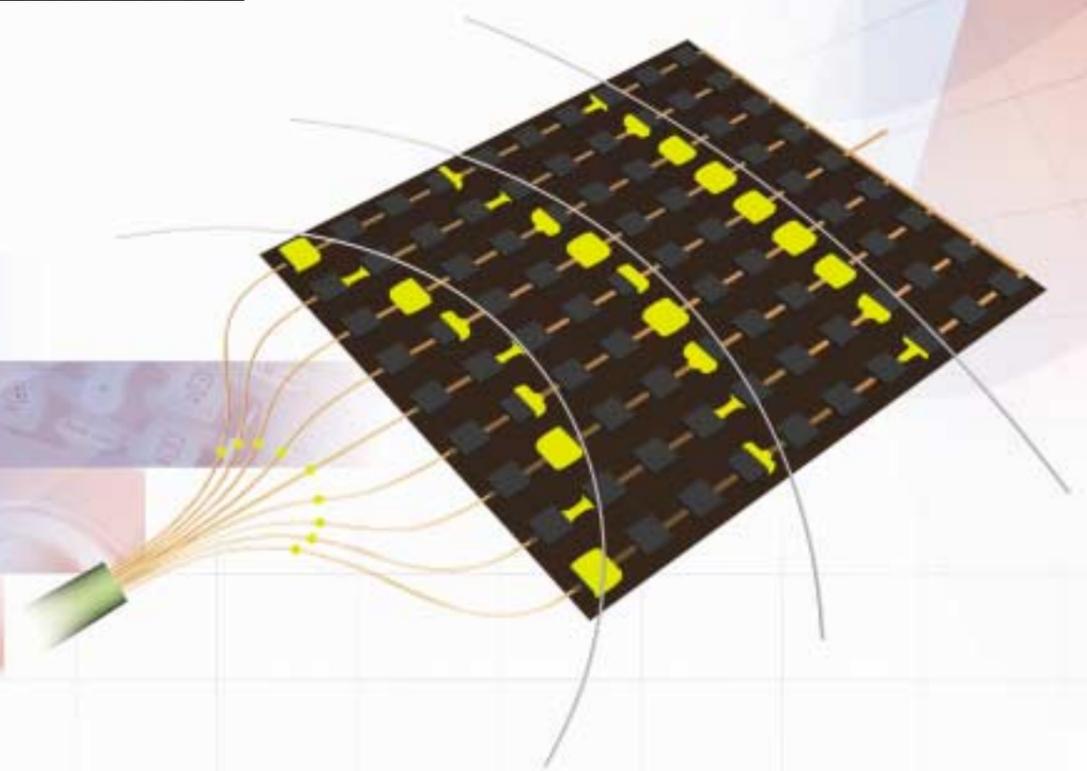
Specially developed to set new standards in beamforming technology, the Tera Processing Beamformer is one of Aplio's core components. It allows precision beamforming at ultra-high speed with an extended aperture.

INTELLIGENT COMPONENT ARCHITECTURE

Like synapses forming in the human brain, Aplio's components operate autonomously and actually communicate with one another directly. This enables the system to perform highly complex data operations in real time resulting in unparalleled image quality and sensitivity.



This extremely high processing power, combined with effective and flexible data channeling, enables the incorporation of new scanning techniques. Advanced Dynamic Flow and Vascular Recognition Imaging are just two of the techniques that enhance the capability of ultrasound diagnosis.

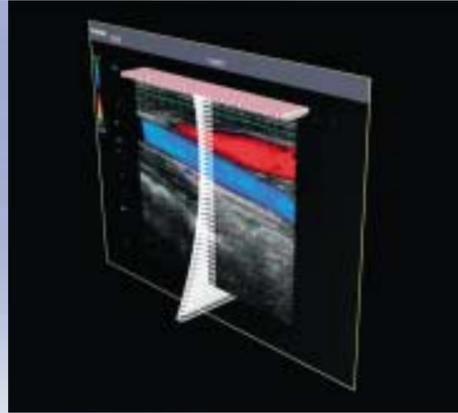


The key to the Tera Processing Beamformer's accuracy lies in dedicated processing channels for each individual transducer element. The system calculates the optimum delay pattern real-time for each element at each depth. And processing channels can be individually adapted dynamically to current scanning conditions. This unique technology produces a continuous thin beam with focal point uniformity over all depths resulting in excellent sensitivity and resolution.

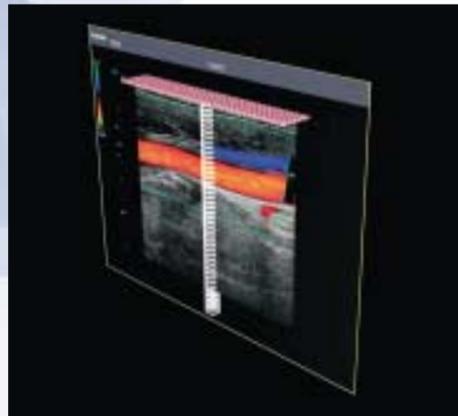


Excellent penetration is shown in an enlarged liver (20 cm depth) with metastases.

ADVANCED TRANSDUCER TECHNOLOGY



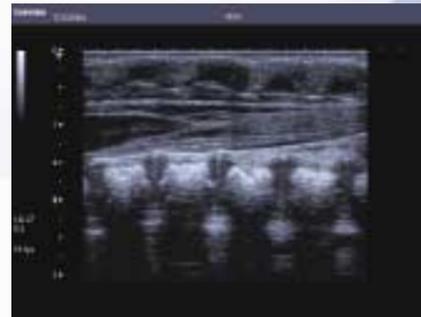
Variable slice thickness in one-dimensional transducers due to lens focusing in elevation direction.



Continuously thin ultrasonic beam of a Matrix Transducer due to Dynamic Micro Slice technology.

MATRIX TRANSDUCERS COMBINED WITH DYNAMIC MICRO SLICE

Aplio's performance is enhanced by a new generation of Matrix transducers combined with Dynamic Micro Slice**. This new technology controls the Matrix transducer beam in both lateral and elevation directions. Which means you get excellent contrast resolution and image uniformity throughout the entire field of view. So even small lesions can be captured much more accurately in both shallow regions and the far field. Matrix transducers are available as linear, convex and phased array sector* transducers.



Spine of a newborn obtained with Matrix high frequency transducer.

The ergonomic design, light weight and very thin and flexible cables considerably ease handling of the transducer.

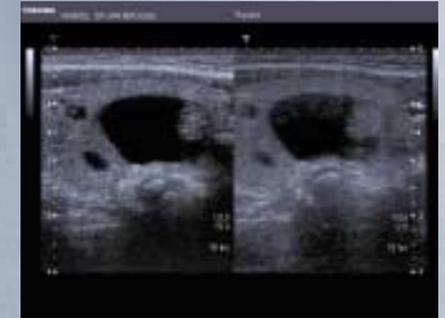


A NEW GENERATION OF TRANSDUCERS

Toshiba has developed a completely new range of transducers for Aplio that combines ergonomic design with technological innovation. The latest piezoelectric ceramics enable an added increase in bandwidth giving you the best spatial resolution available. Advanced impedance matching and improved acoustic lens material further minimize reverberations and losses. All of this adds up to improved sensitivity and image quality.

INNOVATIVE IMAGING TECHNIQUES

Aplio incorporates a whole host of newly developed imaging techniques which enhances its diagnostic capabilities for all clinical applications. Image quality is taken up an extra notch by combining Tissue Harmonic Imaging with Pulse Subtraction techniques.



Pulse Subtraction mode versus fundamental mode with the high frequency linear transducer.



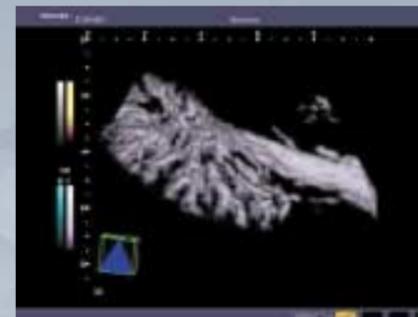
Splenic perfusion in a fetus.

ADVANCED DYNAMIC FLOW

Advanced Dynamic Flow (ADF) is Toshiba's revolutionary approach to blood flow imaging in B-mode resolution. ADF applies the same ultra-high bandwidth normally used in B-mode to Doppler signal processing. So it offers superior spatial and temporal resolution at high frame rates displaying blood flow accurately even in tiny vessels.

APLIPURE™

ApliPure™* is a technique that performs spatial compounding with echo signals that are simultaneously acquired from multiple frequency bands. The result are images of outstanding clarity and detail definition. By combining multiple uncorrelated tissue patterns with acoustic precision in real-time, excellent image contrast and significantly reduced artifacts are obtained. ApliPure™ works especially effective in combination with Aplio's new generation ultra-sensitive transducers.



Kidney perfusion visualized in 3D.

FAST FUSION 3D

Fast Fusion 3D combines volume imaging and CDI information in one 3D image, allowing complex vascular structures to be viewed distinct from surrounding tissue. The ability to rotate the 3D image in any direction also gives a good insight into complex vessel structures. And added functionality means that volume imaging, multiplanar reslicing and volume rendering can be performed. Fast Fusion 3D can also be used in combination with Contrast Imaging.

CONTRAST IMAGING TECHNIQUES

Aplio offers a comprehensive contrast imaging package, covering all main applications and introducing pioneering techniques that push the boundaries of contrast imaging applications.



Metastases appear as drop out in this late phase high MI mode. Levovist

TISSUE SIGNATURE IMAGING

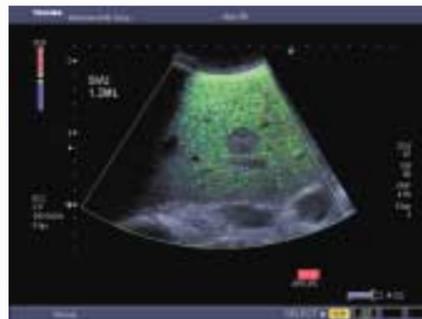
Tissue Signature Imaging is a highly sensitive method for detecting lesions, based on Advanced Dynamic Flow. Since it utilizes both harmonic and non-linear fundamental signals, Tissue Signature Imaging has high resolution and sensitivity. Couple this with real-time characteristics as well as ease of use and Tissue Signature Imaging becomes an extremely versatile tool for tracking microbubble behavior. Therefore, you don't experience the same clutter found with other contrast imaging techniques.

CONTRAST TISSUE DISCRIMINATOR

Contrast Tissue Discriminator is Toshiba's low MI pulse subtraction method. It is based on multi pulse technology. The resulting echoes are combined in such a way as to cancel the echoes from tissue while highlighting those from the micro bubbles. It gives high resolution grayscale images that show contrast agent flowing through the macro and micro circulation in real-time and allows continuous imaging of the contrast agent for several minutes.



Splenic infarction. Sonovue



Metastase highlighted with VRI. After more than 4 minutes, the red and blue from the vascular phase has disappeared, so that only the sinusoidal uptake is displayed in green. The metastase appears as a void in this phase.

VASCULAR RECOGNITION IMAGING

Vascular Recognition Imaging* (VRI) is Toshiba's latest and most advanced contrast imaging technique. Using ultra-low acoustic power, it visualizes vascularization and perfusion of contrast agents at the same time. And Toshiba's unique Tri-Color mode simultaneously displays and distinguishes contrast wash-in/wash-out and perfusion of microbubbles in a way that's easy to understand.

ACCURATE QUANTIFICATION AND FLEXIBLE COMMUNICATION



AplioGate™ is a fully integrated data management tool providing access to raw data at different levels of Aplio's signal processing chain for both routine and research purposes. Using AplioGate™ technology, raw data can be stored in Aplio's patient and image database within the usual examination workflow. A vast variety of advanced image and data processing tools like TDI-Q make use of the very flexible and versatile format. To enable maximum user comfort all data can be shared with remote workstations via network in a DICOM compatible format.

QUANTIFICATION

Aplio's system architecture allows both raw data*, image level data and data in PC format to be obtained making it ideal for research and quantification studies. For raw data, Aplio offers a selection of advanced measurement and analysis packages. These include contrast or 3D quantification and post measurement options that help make diagnosis that much more reliable. And with a report function that summarizes and displays results, measurements can be accessed quickly and easily.

COMMUNICATION

Aplio has an extensive range of communication and data management facilities that enable it to integrate into hospital and research environments. These include communication with HIS/RIS systems, patient databases, remote services and conversion to PC format. The system supports all DICOM service classes and can be adapted to a wide variety of clinical networks.



A NEW APPROACH TO NAVIGATION AND WORKFLOW

Navigation is a crucial factor when it comes to high patient throughput and efficiency in day-to-day practice. It is also important in research studies where flexibility is key. That's why Aplio's design is based on the latest scientific findings in ergonomics and workflow optimization.

ERGONOMICALLY ENHANCED CONTROL PANEL

With the needs of the operator in mind, the main panel's major functions are all grouped around the central Palm Controller. To further enhance user-friendliness, the panel can be customized according to personal preferences and clinical needs. Individual key functions are programmable, key tops can be exchanged and the panel can be tailored for right or left-handed use. It is also movable in all three directions and can be swiveled or adjusted in height to suit the position of the operator. The Touch Command Screen can be programmed as well, and preset adjustments are stored just by pushing a single button.



IASSIST™

IASSIST™ is Toshiba's innovative approach to streamlining workflow. Users can define their own exam protocols and activate them at the touch of a button. IASSIST™ does the rest, automatically switching imaging modes, parameters, display messages and record images. So both routine and highly complex examinations can be reproduced time and again using optimum scanning conditions. If necessary, protocols can be interrupted and resumed at any time.



Conceptual image of IASSIST™ programming interface.

IASSIST™ is also a valuable tool for performing multi-center studies. User-defined protocols can be shared between different Aplio systems. This means that an examination can be performed using the same system settings anywhere in the world.

THE ULTRASOUND PLATFORM THAT'S TAILORED TO YOUR NEEDS

Aplio's system architecture can be tailored to fit your clinical needs so it's not only suitable for current diagnostic requirements, the system can also be upgraded as the demands of your healthcare or research environment change over time. This future-proof approach makes Aplio a sound long-term investment.



Aplio 80

Aplio is available in two models. The premium performance version is perfectly suited for advanced diagnosis and research. The high performance version has the same basic architecture and performance and is ideal for high-end daily use.



Aplio 50



TOSHIBA MEDICAL SYSTEMS

Toshiba is one of the world's largest manufacturers of diagnostic imaging systems. From MRI and CT to X-ray and ultrasound. With a strong commitment to R&D, innovative technology is combined with a range of business services to produce total healthcare solutions. These advanced applications not only meet your most immediate clinical needs, they provide a solid foundation for a lifetime of diagnostic confidence.