As of December 2006, Aloka was the first company to reach a significant milestone in producing 200,000 diagnostic ultrasound systems.
We will continue to contribute to human health through our development of innovative and user-friendly systems.

● The specifications, shape and color of this product are subject to change without prior notice.
● Some models may not be available in certain countries.

We strive to provide quality products and services for our customers.

We operate with regard for the environment.

We care, Ultrasound@Aloka.

ALOKA CO.,LTD.

6-22-1, Mure, Mitaka-shi, Tokyo,181-8622, Japan
Telephone:+81 422 45 6049 Facsimile:+81 422 45 4058
www.aloka.com

Printed in Japan 2007-06 E201-3 ⑦(K)

prosound α10 Premier

ALOKA
Science & Humanity

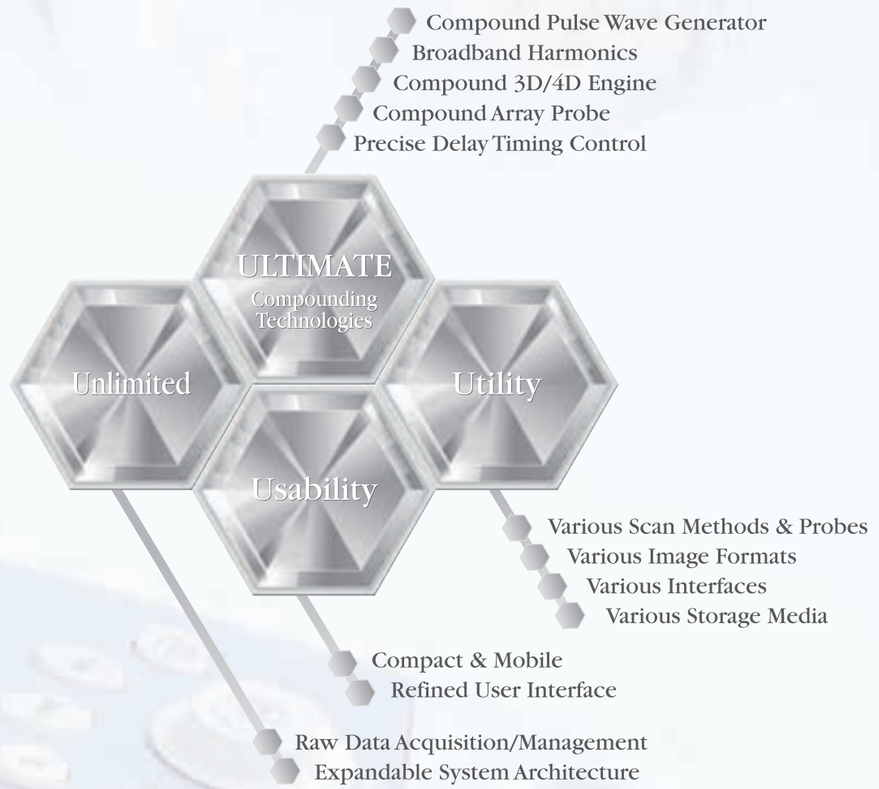
Explore Deeper, in Even More Detail, with More Usability

Aloka ProSound α10 is a boon for the new age of ultrasound diagnosis, offering outstanding usability. It enables more efficient routine diagnosis while boasting high-level performance capabilities comparable to those employed for research purposes. Doctors seeking significantly enhanced diagnostic accuracy can obtain the most precise information possible, while hard-pressed sonographers can handle examinations in a timely, efficient manner.

ProSound α10 features a Compound Pulse Wave Generator (CPWG) that allows ultrasound pulse waveforms to be organized and transmitted to fit a variety of conditions. CPWG functions are the basis for intelligent Broadband Harmonics, which provides greater spatial resolution as well as increased penetration. Coupled with multiple functions for improving image quality, the α10 facilitates quick diagnosis with confidence.

The α10 is highly adaptable to different user interfaces and diverse external IT environments, enhancing your diagnostic and management efficiencies. Patients spend less time awaiting diagnosis while you increase productivity.

ProSound α10 – constantly improving to remain in the vanguard of ultrasound diagnosis.



Ultimate Compounding Technologies

Dedicated to enhanced image quality
to ensure accurate and efficient diagnosis and greater patient satisfaction.

Broadband Harmonics by Compound Impulse Transmission

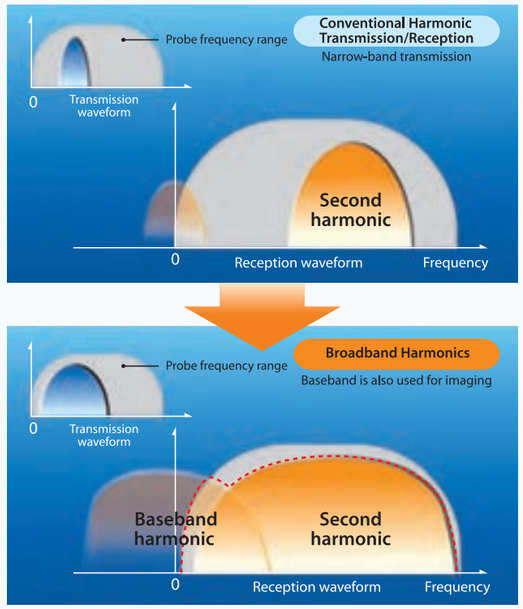
Compound Pulse Wave Generator (CPWG)

ProSound α10 incorporates a Compound Pulse Wave Generator designed to transmit pre-programmed waveforms. It produces highly efficient, high-quality beams optimized for each mode of operation and probe while also enabling highly sensitive transmission.

Compound Impulse Transmission

Aloka uses the Compound Pulse Wave Generator capabilities to create a Compound Impulse waveform* that allows for broadband transmission/reception in harmonic imaging. The result: higher penetration and greater axial resolution. In addition to the primary benefits of harmonics—the reduction of side lobes and multiple echoes—Broadband Harmonics, based on Compound Impulse transmission, offers significantly enhanced sensitivity and axial resolution for an unprecedented level of detail in the entire image.

*Patent pending



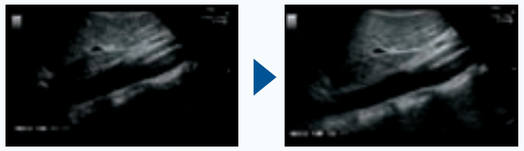
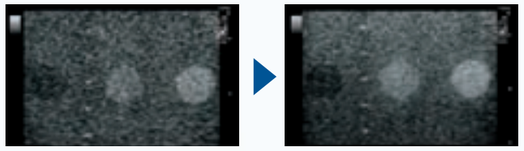


Image by conventional method ▶ Image by Broadband Harmonics



Conventional method ▶ Broadband Harmonics

Comparison by using a phantom

● HST+ Probes
maximize the α10's imaging performance

Transducers in the HST+ series consist of materials with high energy-conversion efficiency, making it possible to achieve greater uniform sensitivity from shallow to deep areas.

● Compound Array Probe
features thinner image slices

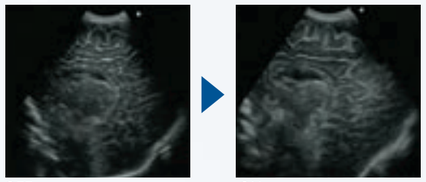
In addition to acoustic lens focusing, the Compound Array probe enables electronic control of the transmitted ultrasound beam in the elevation direction. It provides images with thinner and more uniform slice thickness along the entire depth.

● Precise Delay Timing Control
offers outstanding beam characteristics

α10 controls beam transmission/reception timing with a degree of precision four to eight times greater than conventional timing control. The reduction of side lobes significantly improves the S/N ratio of the overall image, realizing enhanced contrast and spatial resolutions.

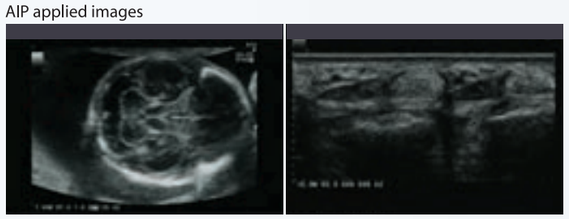
● Adaptive Image Processing (AIP)
for speckle reduction

AIP clearly displays differences in tissues, reducing speckle noise while maintaining the frame rate. It can also display outlines more clearly by selectively emphasizing boundaries.



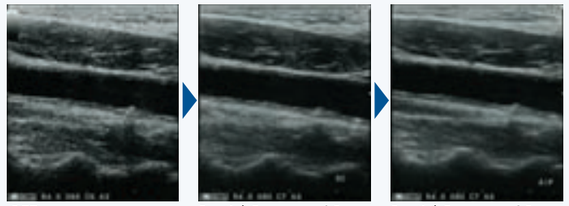
OFF ▶ ON

AIP applied images



● Spatial Compound Scan

Offers enhanced capability for depicting sidewall structures of tubular cavities and the like by superposing images created by steering the ultrasound beam in multiple directions. Speckle patterns of the parenchyma of organs are depicted much smaller while reducing artifacts dependent on beam direction.



OFF ▶ Spatial Compound Scan: On ▶ Spatial Compound Scan +AIP: ON

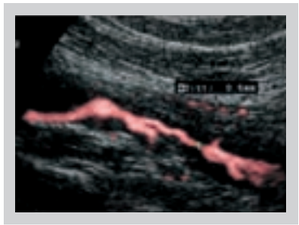
Clinically Useful functions

Directional *e*FLOW (D-*e*FLOW)

displays high-resolution blood flow with directional information

Compared with conventional blood flow display methods, D-*e*FLOW features enhanced spatial and time resolutions for greater detail. Blood flow can be displayed separately from tissues with little overlapping.
Furthermore, D-*e*FLOW uses color to differentiate blood vessels according to the direction of flow, facilitating discrimination of blood vessels.

●D-*e*FLOW imaging of clinical cases

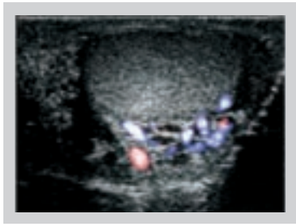


Vessels in the lower extremity

Horton's disease

Vertebral artery

Carotis loop



Varicocele

Thyroid nodules

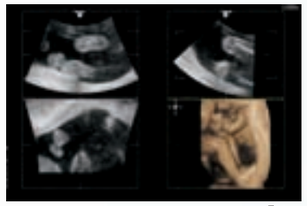
Courtesy of Dr. Lemasle, Le Chesnay, France

Real-time 3D (4D)

The trans-abdominal and transvaginal 4D probes are compact and lightweight. A single probe supports 2D, color flow, Doppler and real-time 3D (4D) monitoring.

Fetal face

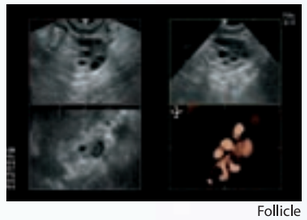
Gallstone



Fetus

Multi-Planar Reconstruction (MPR)

MPR provides images of planes that are impossible to capture with conventional scanning, and allows for planar measurement.



Follicle

Inversion Mode

This mode allows 3D black-and-white images to be inverted. It is especially useful for depicting cystic structures.

Gall bladder

3D Automated Volume Measurement

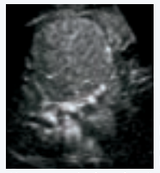
It is possible to easily measure volumes of cavities such as those of a gallbladder and cyst, or the volumes of parts where echo brightness is higher than that of the surrounding area by automatically detecting the three-dimensional boundaries.

Contrast Harmonic Echo (CHE)

fully supports contrast examinations

α10 supports a full range of contrast agents of high through to medium and low acoustic pressures.

Tumor in the liver



Hamartoma in the spleen*

*Courtesy of Prof. Fabrizio Calliada Policlinico San Matteo at Pavia in Italy

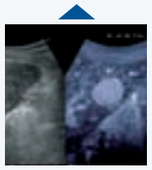
Abdominal CHE-compatible probes
Left: Convex probe
Right: Micro convex probe

Capture Mode (CHE)

This mode is used to display CHE information in thinner blood vessels. By retaining maximum brightness of blood flow display for a pre-set period of time and superimposing the resulting images, small blood vessels are depicted with good continuity.

Fundamental image CHE image

Immediately prior to contrast media injection

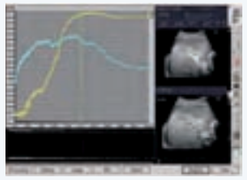


Contrast-enhanced image of intra-tumoral vessels

Note :These images are taken by using a medium-pressure type contrast agent (Sonazoid) in Japan.
Courtesy of Dr. Masashi Hirooka , Ehime University Graduate School of Medicine, Department of Gastroenterology and Metabology

Time-intensity curve

A time-intensity curve quantifies changes in contrast agent inflow time and brightness at regions of interest (ROI). Multiple ROI's can be placed for monitoring.



Color Agent Display

The Color Agent Display colorizes echoes from the contrast agent, superimposing this image over a B-mode image and displaying results in real time, allowing the user to observe, in an easy-to-comprehend manner, the contrast agent's inflow route and conditions.

Comprehensive Cardiovascular Examination Tool

Unmatched quantitative analysis makes ProSound α10 the right tool for any comprehensive cardiovascular examination, be it for the purpose of preventive medicine or diagnosis and treatment.

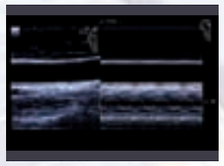
● Early detection of atherosclerosis and global analysis of the cardiovascular system

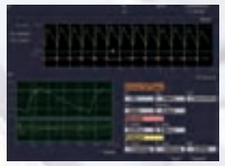
*e*TRACKING (Echo Tracking)

*e*TRACKING is designed to measure, automatically and in real time, changes in vessel diameter. The tracking gate follows movement of the vessel wall caused by pulsation with a precision as high as 0.01mm.

Arterial Stiffness

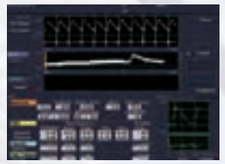
The parameters necessary for quantitative evaluation of early stage atherosclerosis – β (stiffness parameter), Ep, Augmentation Index (AI) and one-point PWV – are obtained at a single measurement and displayed onscreen.


Measurement screen


Analysis screen

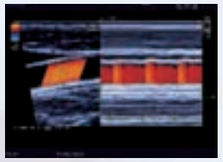
FMD (Flow Mediated Dilatation)

FMD analysis is known as an effective means for evaluating a blood vessel's endothelial function non-invasively. FMD analysis will make a significant contribution to the early detection of atherosclerosis. *e*TRACKING-based FMD analysis is capable of highly precise measurements. The system can continually record and graphically plot the entire process, automatically computing all relevant parameters.


FMD analysis

WI (Wave Intensity)

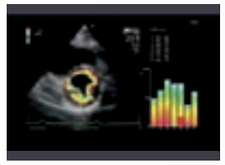
The heart and the arterial system are acting, constantly interfering with each other through forward traveling waves and reflected waves. WI is calculated based on changes in blood pressure and blood flow speed obtained at an arbitrary point in a circulatory system. WI is a new indicator of blood flow dynamics, which is expected to help pave the way for analysis of the interference between the heart and the arterial system. The analysis comprises of constriction and dilatation characteristics, influence of reflected waves from peripherals, and an index related to time.



● Evaluation of Ischemic Cascade

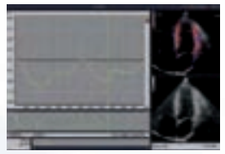
A-SMA (Automated Segmental Motion Analysis)

A-SMA employs a unique algorithm to automatically trace the endocardium. The cardiac cavity is divided into 2, 4, or 6 segments and cardiac wall motion is quantified by the change in the cross-sectional area of each segment. A very high frame rate of analysis – exceeding 90 frames/second – allows you to observe detailed motion of the cardiac muscle.


Histogram (systole)

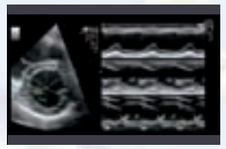
Strain/Strain rate

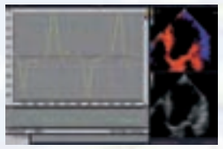
Strain analysis is used to examine local cardiac function by measuring the elongation and shrinkage of the regional myocardium between two designated points. Strain analysis is attracting attention since it is less affected by tethering and translation.


Strain analysis

● Contribution to CRT

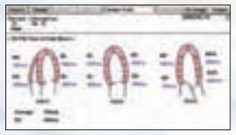
Asynchrony can be evaluated with greater precision using real-time FAM (Free Angular M-mode), which compares wall motion at multiple locations simultaneously, and TDI (Tissue Doppler Imaging) analysis, which lets the ROI automatically track regional myocardial motion for precise analysis.


FAM: Normal case


TDI analysis: A case of asynchrony

Asynchrony Measurement

Thanks to its high frame rate, ProSound α10 can perform high-precision temporal analysis in M-mode, D-mode and TDI. It offers various parameters necessary for evaluation of atrioventricular, inter-ventricular and intra-ventricular asynchrony as one Study.


Asynchrony measurement report

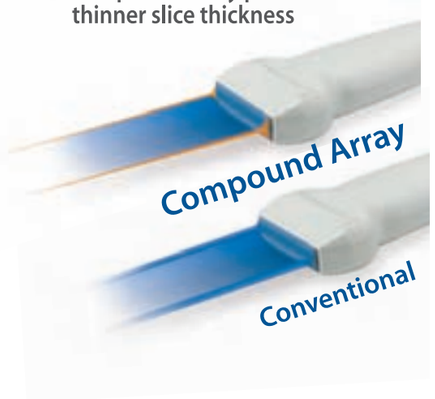
Various Scan Methods

Our diversified lineup of specialty probes is user and patient friendly.

Choose from our complete lineup of specialty probes to meet your particular application. Each probe is designed to be compact and lightweight for easy operation while providing excellent performance.

● HST+ probes that maximize the α10's performance

● Compound array probes for even thinner slice thickness



● Variety of Scan Methods & Probes


Convex Array


Micro convex


Linear Array


Phased Array


Mechanical Radial


Abdominal 4D


Transvaginal 4D


Microsurgery

Transesophageal Probe (TEP)

Variety of patient friendly transesophageal probes available

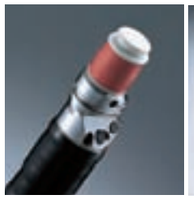
Our lineup of transesophageal probes include a neonatal probe with a 4.8mm-diameter insertion tube, a rotary plane probe, and motorized TE probes. For pediatric rotary plane probes, we have adopted a rotary system that allows the transducer to rotate freely despite an insertion tube diameter nearly identical (6.8mm) to that of conventional pediatric probes.

Note: Some models of transesophageal probes are not marketed in some countries and areas.

Ultrasonic Gastrovideoscopes
(Manufactured by Olympus Medical Systems)

● Electronic radial scanning scope

The electronic radial scanning scope covers a wide 360-degree ultrasound scanning range and supports early detection and staging of diseases. This system is equipped with Color Doppler function that is useful for differentiating blood vessels from lymph nodes by displaying moving objects with color. This function also enables easier orientation in the pancreatobiliary region.




● Electronic convex scanning scope

The electronic convex scanning scopes are designed mainly for endoscopic ultrasound-guided fine needle aspiration. A wide 180-degree ultrasound scanning range and Color Doppler function enable differentiation between blood vessels and lymph nodes and ensure comprehensive imaging of all structures surrounding the region of interest.


Notes : The above gastrovideoscopes are not marketed in some countries and areas. Marketable models are different from the above in some countries and areas.

Ultimate Imaging Capability

Abdomen

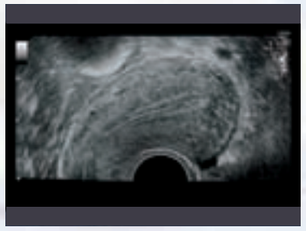
FNH (Focal nodular hyperplasia)
Radial blood flow detected with high sensitivity.

HCC (Hepatocellular carcinoma)
A distinct tumor plug is seen in the portal vein.

Liver cirrhosis
Marked ascites accumulation.

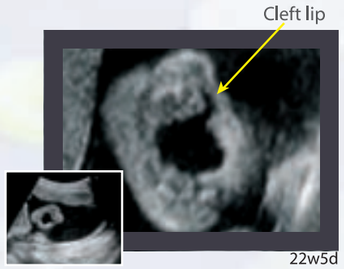
Ascites
Small intestine floating in ascites.

OB/GYN



Uterus
Normal uterus depicted with a transvaginal probe.

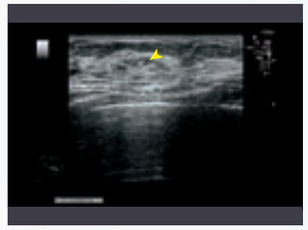
Fetal profile (normal)
24 weeks of gestation depicted with Real-time 3D (4D).



Even small abnormalities can be identified.

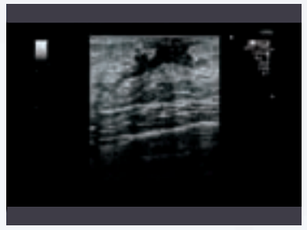
Fetal profile (normal)

Small parts



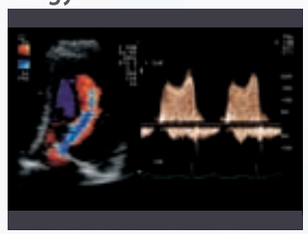
Microcalcification is clearly detected.

Thyroid tumor
Minute changes in tumor parenchyma are clearly detected.



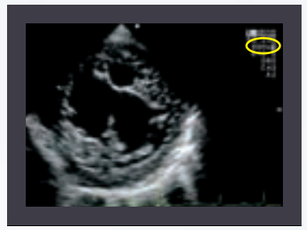
Ductal carcinoma
Mammary duct ectasia with solid echo pattern.

Cardiology



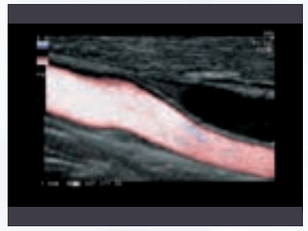
MS (Mitral Stenosis)
Highly sensitive Flow image and CW Doppler waveform with sharp edge are detected.

LVH with pericardial effusion
Myocardial tissue is depicted with high resolution.



High frame rate is available even under routine conditions.

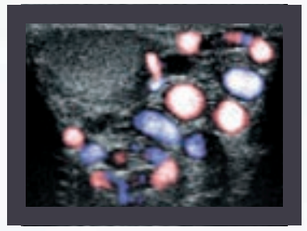
Vascular



Carotid artery
The high-resolution D-*e*FLOW can display the periphery of the plaque without overlapping with the blood flow image.

Urology

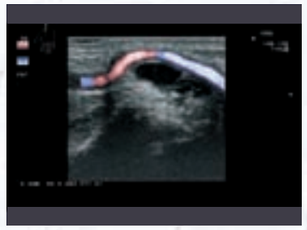
Testicle
DDD (Dual Dynamic Display) can display both gray-scale B-mode and *e*FLOW images simultaneously in real time.



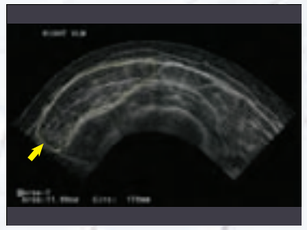
Varicocele
Blood flow is clearly depicted by *e*FLOW.

Extremities

Baker's cyst



Radial artery
Meandering radial artery pressed by the ganglion is clearly depicted by D-*e*FLOW.



Femur
Image using High Definition Extended Field of View (HD-EFV). Gradual movement of the probe allows a large area to be shown in a single image. Measurement is also possible.

ProSound Unlimited

ProSound α10 supports comprehensive data management with its versatility and expandability.

● High-level network compatibility reinforces examination efficiency

Reading of patient information (worklist acquisition), notification of the state of examination (MPPS), forwarding of images, and forwarding of the examination report (Structured Report (SR)-compatible*) - all these procedures can be performed using the DICOM standard.

* SR-compatible: OB/GYN, Cardiovascular

Compatible with IHE —
The α10 complies with the standard system architecture guidelines of IHE (Integrating Healthcare Enterprise).

● Consideration given to future expandability

Flexible system architecture will smoothly cope with measurement and analysis methods to be developed in the future.

● Raw data acquisition/management

Unprocessed original raw echo signals can be stored as digital data, facilitating their reuse in various analyses.

● Privacy protection and security

- Compatible with the log-in/password function designed to prevent unauthorized personnel from operating or accessing the system.
- Capable of video output of visual images only after patient IDs and names have been deleted. (Teaching File function)

● Compatibility with diverse formats and media

Image Formats	DICOM/ASF/AVI TIFF/BMP/JPEG
Storage Media	DVD/CD/MO/FD USB Flash Memory
I/O Interfaces	Ethernet/USB DV (IEEE1394)

ProSound Usability

For a comfortable operating environment.

Refined User Interface

The ergonomic panel design supports smooth operations.

- Menus displayed on the touch panel can be arranged as desired.
- Switches on the panel can be customized to meet your specific application needs.
- Integrated gain control/freeze switch means you can freeze an image with a simple touch without having to take your eyes off the screen.
- Keyboard keys are large and easy to manipulate. Placed under the panel when not in use, the retractable keyboard is unobtrusive but easy to access.

Ergonomic Design

Select the monitor you want: CRT or LCD.

- The 17-inch high-resolution SVGA non-interlaced CRT monitor delivers flicker-free images, reducing eyestrain.
- The 19-inch LCD monitor offers high resolution and high gradation and is tuned for ultrasonic diagnosis. It comes equipped with a low-reflection, hard-coat filter and swivels and tilts easily to facilitate examination. Its response speed, as high as 18 milliseconds, ensures smooth display of motion images. Its wide angle of view, 170 degrees each for horizontal and vertical, allows more than one person to view the image simultaneously.
- Control panel can be adjusted for swivel and height.
- Probe holders are detachable and can be positioned as desired.
- Console is the most compact and lightweight in its class, making it easy to transport within the hospital.
- Excellent mobility is provided by four casters. The front and rear casters can be locked or released with a single tap of the brake pedal.