User Manual

EDANUSA

DUS 60

Digital Ultrasonic Diagnostic Imaging System

Release 1.2

CE 0123

About this Manual

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Statement

This manual will help you understand the operation and maintenance of the product better. It is reminded that the product shall be used strictly complying with this manual. User's operation failing to comply with this manual may result in malfunction or accident for which Edan Instruments, Inc. (hereinafter called EDAN) can not be held liable.

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EDAN holds the rights to modify, update, and ultimately explain this manual.

Responsibility of the Manufacturer

EDAN only considers itself responsible for any effects on safety, reliability and performance of the equipment if:

Assembly operations, extensions, re-adjustments, modifications or repairs are carried out by persons authorized by EDAN, and

The electrical installation of the relevant room complies with international standards, and

The equipment is used in accordance with the instructions for use.

Upon request, EDAN may provide, with compensation, necessary circuit diagrams, and other information to help qualified technician to maintain and repair some parts, which EDAN may define as user serviceable.

Terms Used in this Manual

This guide is designed to give key concepts on safety precautions.

WARNING

A **WARNING** label advises against certain actions or situations that could result in personal injury or death.

CAUTION

A **CAUTION** label advises against actions or situations that could damage equipment, produce inaccurate data, or invalidate a procedure.

NOTE

A NOTE provides useful information regarding a function or a procedure.

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Chapter 1 Introduction

1.1. Intended Use

The DUS 60 Digital Ultrasonic Diagnostic Imaging System is intended for diagnostic ultrasound imaging analysis in gynecology rooms, obstetrics rooms, examination rooms, intensive care units, and emergency rooms. The DUS 60 is intended for use by or on the order of a physician or similarly qualified health care professional for ultrasound evaluation of Fetus; Abdomen; Pediatrics; Small Organ; Neonatal head; Cardiology; Peripheral Vessel; Musculo-skeleton (both Conventional and Superficial); Urology (including prostate); Transrecta and Transvagina.

1.2. Features

This portable device, Digital Ultrasonic Diagnostic Imaging System (DUS 60), is high-resolution linear/convex scanning diagnostic apparatus.

Applied technologies:

Tissue Specific Imaging (TSI), Tissue Harmonic Image (THI), Digital Beam-Forming (DBF), Dynamic Receiving Focusing (DRF), Real-time Dynamic Aperture (RDA), Dynamic Frequency Scanning (DFS), and Dynamic Apodization.

Display modes:

B, B+B, 4B, B+M, M, and PW.

File management:

It supports local disk and removable disk storage. USB 2.0 interface enables fast image uploading to your computer in the real-time mode. It has a 56 MB storage capacity.

Operation:

The folding keyboard designed with trackball is easy and convenient for various types of operation.

In addition, 12.1" LCD and diverse probes are adopted to provide clear and stable images.

1.3. Model

DUS 60

1.4. Contraindications

- The equipment is not applicable to the diagnosis of the pneumatic organs that contain gas such as lung, stomach, intestines, etc.

◆ It is recommended not to examine the parts with wounds or acute inflammation to avoid cross infection.

1.5. General Safety Precaution Information

1.5.1. General Information

WARNING

This equipment is not intended for treatment.

CAUTION

1. Federal (U.S.) law restricts this device to sale by or on the order of a physician.
2. The pictures and interfaces in this manual are for reference only.

NOTE: This equipment is not intended for home use.

The reliability of the device and the safety of operators and patients are considered during product design and production. The following safety and preventive measures should be carried out:

WARNING

1. The device should be operated by qualified operators or under their instructions.
2. The device should be operated appropriately to avoid mechanical damage to the transducer.
3. Do not alter parameters of the device at will. If it is necessary, please consult EDAN or authorized representatives for service.
4. The device has already been adjusted to its optimum performance. Do not adjust any presetting control or switch, unless it is listed in this manual.
5. If the device breaks down, please shut down the machine immediately and contact EDAN or authorized representatives.
6. Only accessories supplied or recommended by EDAN can be used, the battery and probes of EDAN can be only used on EDAN's systems. Otherwise, the performance and electric shock protection can not be guaranteed. If electrical or mechanical equipment from other companies need to be connected to the device, please contact EDAN or authorized representatives before connection.
7. EXPLOSION HAZARD-Equipment is not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.

WARNING

8. If the liquid crystal material leaks from the panel, it should be kept away from the eye or mouth. In case of contact with hands, skin or clothes, it has to be washed away thoroughly with soap.

1.5.2. Biohazard Considerations

WARNING

1. This device is not suitable for intracardiac use or direct cardiac contact.
2. For neonatal head imaging, EDAN recommends that you exercise special care during neonatal cephalic scanning to avoid possible damage to the posterior region of the eye. The ultrasound energy emitted by the probe easily penetrates the fontanels of the infant.
3. EDAN makes every effort to manufacture safe and effective probes. You must take all necessary precautions to eliminate the possibility of exposing patients, operators, or third parties to hazardous or infectious materials. These precautions should be considered in the use of any application that may indicate the need for such care, and during endocavity scanning.

Ultrasound may be harmful to human body. This device should be used for valid reasons, for the shortest period of time, and at the lowest mechanical and thermal indices necessary to produce clinically acceptable images. According to the ALARA (As Low As Reasonably Achievable) principles, acoustic output should be set to the lowest level required to satisfactorily perform the examination. Long time exposure should be avoided. For the parameters of sound output, please refer to appendix II.

The DUS 60 complies with the requirements of applicable International Electrotechnical Commission (IEC) standards in terms of safety and acoustic output levels.

1.5.3. Electrical Safety

WARNING

1. If you have any questions about the grounding connection, use the battery but not the AC power supply.
2. To ensure grounding reliability, only connect the system to a hospital-grade power receptacle.

WARNING

3. The AC power connector plug for the ultrasound system is a three-prong grounded plug and should never be adapted to any two-prong (non-grounded) outlet, either by modifying the plug or by using an adapter.
4. To avoid electrical shock, never modify the ultrasound system's AC power circuits. To ensure grounding reliability, connect the system only to an equivalent outlet.
5. **SHOCK HAZARD-**Do not attempt to connect or disconnect a power cord with wet hands. Make certain that your hands are clean and dry before touching a power cord.
6. The equipment should be installed by a qualified service engineer. Do not try to access the interior of the main unit. Only authorized service personnel could remove the unit cover.
7. Before use, you must make sure that there is no visible evidence of damage on the equipment, cables and probes, which may affect patient safety or diagnostic capability. The recommended inspection interval is once per week or less. If damage is evident, replacement is recommended before use.
8. Equipment connected to the DUS 60 and located in the patient zone must be powered from a medically-isolated power source or must be a medically-isolated device. Equipment powered from a non-isolated source can cause your system to exceed leakage current limits. Enclosure leakage current created by an accessory or device connected to a non-isolated outlet may add to the enclosure leakage current of the imaging system.
9. Use an extension cord or multi-socket outlet setup to provide power to the ultrasound system or to the system's peripheral devices, may compromise the system grounding and cause your system to exceed leakage current limits.
10. To avoid electrical shock and damage to the system, turn off and disconnect the device from the AC power source before cleaning and disinfecting.
11. When more than one medical device is connected to the patient, leakage current of the devices is summed together. Take caution.
12. Don't touch the signal input or output connector and the patient simultaneously.
13. Periodically have the integrity of the system ground checked by a qualified service engineer.
14. To avoid the possibility of electrostatic shock and damage to the system, avoid using aerosol spray cleansers on the monitor screens.

CAUTION

1. Do not spray cleansers on the system, as this may force cleaning fluid into the system and damage electronic components. It is also possible for the solvent fumes to build up and form flammable gases or damage internal components.
2. Do not use any fluid onto the system surface, as fluid seepage into the electrical circuitry may cause excessive leakage current or system failure.
3. To ensure proper grounding and leakage current levels, it is the policy of EDAN to have an authorized EDAN representative or an EDAN approved third party to perform all on-board connections of documentation and storage devices to the DUS 60.
4. The device and accessories are to be disposed of according to local regulations after their useful lives. Alternatively, they can be returned to the dealer or the manufacturer for recycling or proper disposal. Batteries are hazardous waste. Do not dispose them together with house-hold garbage. At the end of their life hand the batteries over to the applicable collection points for the recycling of waste batteries. For more detailed information about recycling of this product or battery, please contact your local Civic Office, or the shop where you purchased the product.
5. Please use the standard power cord as the input line of the network power supply for the adapter to reduce risk.

NOTE:

The probe stops transmission after freezing, disconnecting, falling off, or entering sleeping mode. Main control software checks the probe connection all the time, once probe disconnects from the probe socket, the system stops transmission.

Electromagnetic Compatibility (EMC)

Operating the DUS 60 in close proximity to sources of strong electromagnetic fields, such as radio transmitter stations or similar installations may lead to interference visible on the monitor screen. However, the device has been designed and tested to withstand such interference and will not be permanently damaged.

EMI Limitations

Ultrasound machines are susceptible to Electromagnetic Interference (EMI) from radio frequencies, magnetic fields, and transients in the air of wiring. Ultrasound machines also generate EMI. The DUS 60 complies with limits as stated on the EMC label. However, there is no guarantee that interference will not occur in a particular installation.

Possible EMI sources should be identified before the unit is installed.

Electrical and electronic equipment may produce EMI unintentionally due to one of the following defects:

- High frequency electrotome

- Transformer
- Defibrillator
- Wireless LAN equipment
- Medical lasers
- Scanners
- Cauterizing guns
- Computers
- Monitors
- Fans
- Gel warmers
- Microwave ovens
- Light dimmers
- Portable phones

The presence of a broadcast station or broadcast van may also cause interference.

If you find strong interference shows on the screen, please check the sources.

1.5.4. Battery Safety

To prevent the battery from igniting, emitting fumes, bursting, injuring personal, damaging equipment, pay attention to the following precautions.

WARNING

1. Do not expose the battery to temperatures above 60 °C, or leave the battery in strong and direct sunlight.
2. Do not charge the battery near heat sources, such as a fire, heater, or direct sunlight.
3. If the battery leaks or emits an odor, remove it from all possible flammable sources.
4. The battery has a safety device. Do not disassemble or alter the battery.
5. Do not heat the battery or discard it in fire.
6. Do not solder the battery.
7. The polarities of the battery terminals are marked near the connector, do not connect or storage them with a metal material.

WARNING

8. Do not connect the battery to the electrical power outlet.
9. Keep the battery away from fire and other heat sources.
10. Do not use a damaged battery.
11. Do not put the battery into a microwave oven or pressurized containers.
12. If the battery emits heat or an odor, is deformed, or in any way appears abnormal during use, recharging or storage, immediately remove it and stop using it. If you have any questions about the battery, consult EDAN or your local representatives.

CAUTION

1. Do not force the battery into the system.
2. Do not immerse the battery into water or allow it get wet.
3. Please recharge the battery every month if the battery is to remain idle for a long time.
4. Do not pierce the battery with sharp objects, or hit it.
5. Charge the battery between 0 °C and 40 °C and store it between -20 °C and 60 °C, which affects battery life.
6. Only use the battery and charge the battery with EDAN equipment, and charge the battery with the system.
7. To avoid the possibility of electrostatic shock and damage to the battery, avoid using the battery near the place where may cause static.
8. Prevent the battery from children.
9. Do not touch the battery's leaks that may make you uncomfortable. If the leaks go into eyes, do not knead eyes, but wash with clean water and send to hospital immediately.
10. Only use the battery with the DUS 60 system.

1.6. Labeling Symbols

Descriptions of symbols of the device are shown in table 1-1.

No.	Symbol	Definition
1	SN	Serial Number
2	P/N	Part Number
3		Date of Manufacture
4		Manufacturer
5		Consult Instructions for Use
6		Symbol for “Caution”
7		Biological Risks
8		It indicates that the equipment should be sent to special agencies according to local regulations for separate collection after its useful life.
9		General Symbol for Recovery / Recyclable
10	Rx only (U.S.)	Federal (U.S.) law restricts this device to sale by or on the order of a physician.
11	EC REP	Authorized Representative in the European Community
12	CE 0123	The symbol indicates that the device complies with the European Council Directive 93/42/EEC concerning medical devices.
13		Type B, Applied Part
14		Alternating Current (a.c.)
15		ON (AC power supply)
16		OFF (AC power supply)
17		Equipotentiality
18	VGA  	VGA output, External Monitor
19		Fuse
20		Probe socket

21		Net work port
22		Foots witch To identify a footswitch or the connection for a footswitch.
23		Protective earth (ground)
24		Recording on an information carrier
25	EDAN	Trademark
26		USB (Universal Serial Bus) Connection
27		Dangerous voltage
28		Variability, for rotating movement Rotate clockwise to increase the value, and counterclockwise to decrease.
29		Variability Adjust right to increase the value, and left to decrease.
30		Variation of ultrasound energy To adjust acoustic power
31		Electric energy
32		Battery check
33	IPX7	Degree of protection provided by enclosures (IP Code): temporary immersion. For the probe but not including the probe connector.
34		Power off/on the system
35		Brightness
36		Contrast
37		Sound muting
38		Loudspeaker To adjust volume in PW mode

Table 1-1 Descriptions of Symbols

Chapter 2 System Overview

2.1. Appearance

2.1.1. Front View

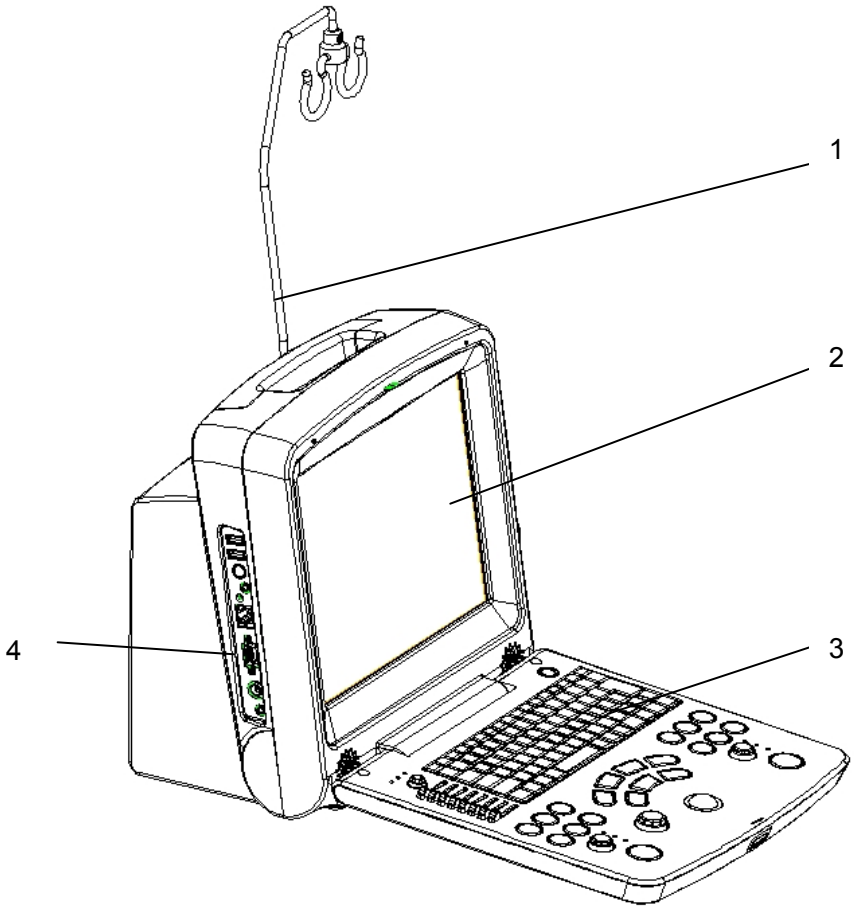


Figure 2-1 Front View

1. Cable holder
2. Display screen
3. Control panel
4. I/O ports

2.1.2. Rear View

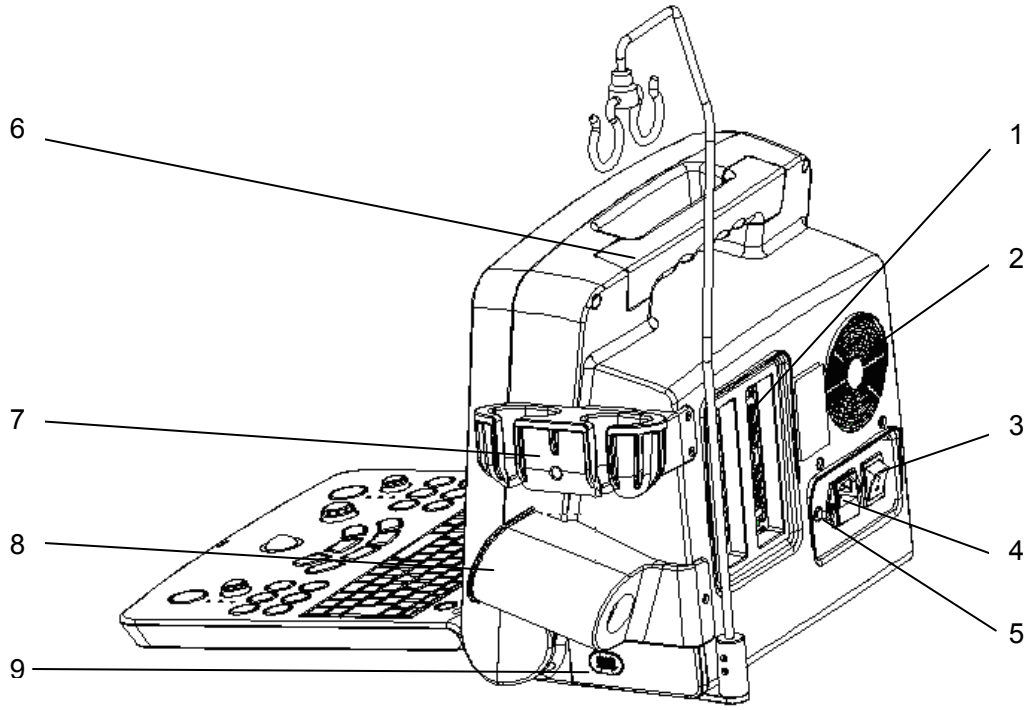


Figure 2-2 Rear View

1	Probe sockets
2	Air Fan
3	AC power switch
4	Appliance inlet
5	Equipotential terminal
6	Handle
7	Probe holder
8	Coupling gel trough
9	Rechargeable lithium battery

CAUTION

1. To have good aeration performance and be able to operate normally, please don't cover or plug the air fan or heat dissipation orifice partly or wholly by using any object.
2. For easy control, please don't cover or block the AC power switch using any object.

2.2. Configuration

2.2.1. Standard Configuration

- 1 DUS 60 main unit
- 1 convex array probe: C363UA
- 1 power cord (European Standard)
- 1 potential equalization conductor
- 1 cable holder
- 2 pieces of fuse, φ5×20, T3.15AL/250V
- 1 Netac U disk, U180 (2G)
- 1 bottle of coupling gel, 250 mL
- 1 user manual
- 2 packing lists

2.2.2. Options

The Digital Ultrasonic Diagnostic Imaging System supports the following options:

- Linear array probe: L743UA/L742UA/L763UA
- Endorectal probe: E743UA
- Convex array probe: C343UA/C362UA
- Micro-convex probe: C321UA/C613UA
- Endocavity probe: E613UA
- Ultrasonic Imaging Management System UMS 100
- Rechargeable lithium-Ion battery
- Printers are as shown below.

Printer type	Recommended Models
Video printer	SONY UP-895MD, SONY UP-897MD, MITSUBISHI P93W, MITSUBISHI P95W
USB printer	HP DeskJet D2368, HP DeskJet D2568 HP DeskJet D5568, HP LaserJet P2015, HP LaserJet P2035 HP Deskjet f2418*, HP Deskjet f2488*, HP2010, HP2050, HP1050

Table 2-1 Printers

NOTE：Calibration should be performed because HP2418* and HP2488* printers will print out calibration paper every time after replacing jet box, Please perform the calibration according to the operation method on the calibration paper.

The video printer output: 110 mm× 82 mm; The USB printer output: A4 paper, 210 mm× 297 mm

- Freeze footswitch
- Mobile trolley MT-805
- Hand carried bag
- DICOM 3.0

Chapter 3 Transportation and Storage

3.1. Moving the System

The system is designed to be portable and easily transported. Power off the system and secure all accessories before moving it to another location.

CAUTION

1. Switch off the ultrasound system. Unplug the power cord from the power source and secure the power cable.
2. Put the probes in the probe holder, or remove them and place them in the protective carrying cases.
3. Disconnect and secure the footswitch and the connecting cable.
4. Raise the brakes away from the front and back caster wheels.
5. Push the handle to roll the system forward and maneuver it to its new location and lock the wheel caster brakes.
6. Connect optional system accessories, such as the single-pedal footswitch.
7. Secure the system and complete the system setup, and then perform all the daily checking before using it.

3.2. Storage

- Do not place the device near the ground, walls or the roof.
- Keep good indoor ventilation. Avoid strong and direct sunlight, and erosive gas.

3.3. Transportation

To prepare the system for shipment over long distances or rough terrain, repack the system in the factory packing

To prepare the system for transport over distances: load the system into a vehicle using a lift gate.

To prevent lateral movement of the system, secure the system with cargo straps. To prevent sudden jarring of the system during transport, provide anti-shock cushions beneath the system.

It is suitable for transportation by air, railway, highway and ship. Protect the system from inversion, collision, and splashing with rain and snow.

Chapter 4 Installation Instructions

4.1. Environmental Requirements

Keep the device away from equipment with strong electric field, strong magnetic and high voltage field, and protect the display screen from direct exposure to strong sunlight. Keep good ventilation.

4.2. Unpacking Inspection

Visually examine the package prior to unpacking. If any signs of mishandling or damage are detected, contact the carrier to claim for damage. After unpacking the device, you should follow the packing list to check the product carefully and to make sure that no damage has occurred during transportation. Then, install the device according to the installation requirements and methods.

WARNING

1. Do not use the device if it is found to be damaged or defective.
2. Do not drop or collide with the probe. Otherwise you shall give up using it.

4.3. Connecting Procedure

1. Take the main unit and accessories out from the package.
2. Connect the cable holder and battery (if it is configured) to the main unit correctly.
3. Connect the probes to the main unit correctly.
4. Connect the printer and load the recording paper.
5. Connect the power cable
   1) Connect the main unit and the common earth terminal firmly via a potential equalization conductor.
   2) Plug one end of the power cable to the power socket of the main unit, and the other end to the special power output socket of the hospital.
6. Switch on the main unit.

   Press power switch on the rear side of the main unit, and press the power on/off key on the top right of the control panel. You can operate the main unit after the main interface appears.

4.3.1. Installing and Uninstalling a Cable Holder

To install the cable holder:

1. Take out the cable holder, three screws (M3×12) and packing foam from the package.
2. To avoid scraping the main unit, put one piece of packing foam on a flat ground.
3. Carefully turn the main unit upside down and put it on the packing foam and assemble the screws to the main unit with a cross-head screw driver as shown in figure 4-1.
4. Carefully turn the main unit with a cable holder to the normal state as shown in figure 4-2.

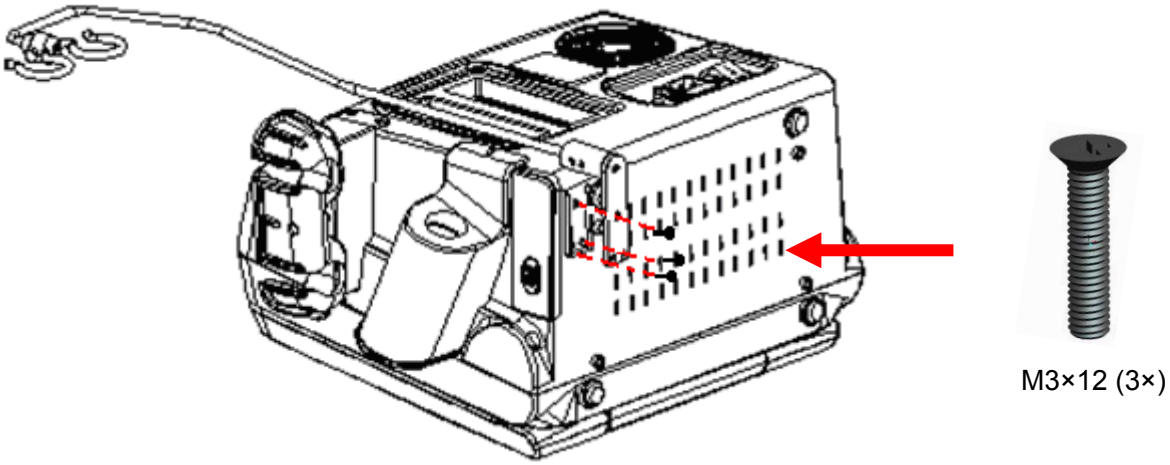


Figure 4-1 Assembling Cable Holder to Main Unit

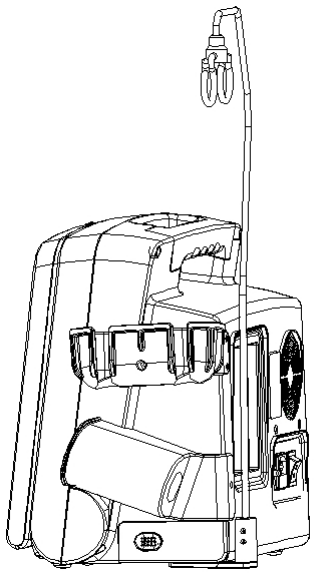


Figure 4-2 Main Unit with Cable Holder

To uninstall the cable holder:

Uninstall the cable holder in a reverse procedure.

4.3.2. Installing and Uninstalling a Battery

To install a battery (if necessary):

1. Take out the battery from the package.
2. Press the button on the battery cover and pull the cover out.
3. Turn the flicker counterclockwise to hide it and push the battery into place.
4. Turn the flicker clockwise to keep the battery in place.
5. Replace the battery cover.

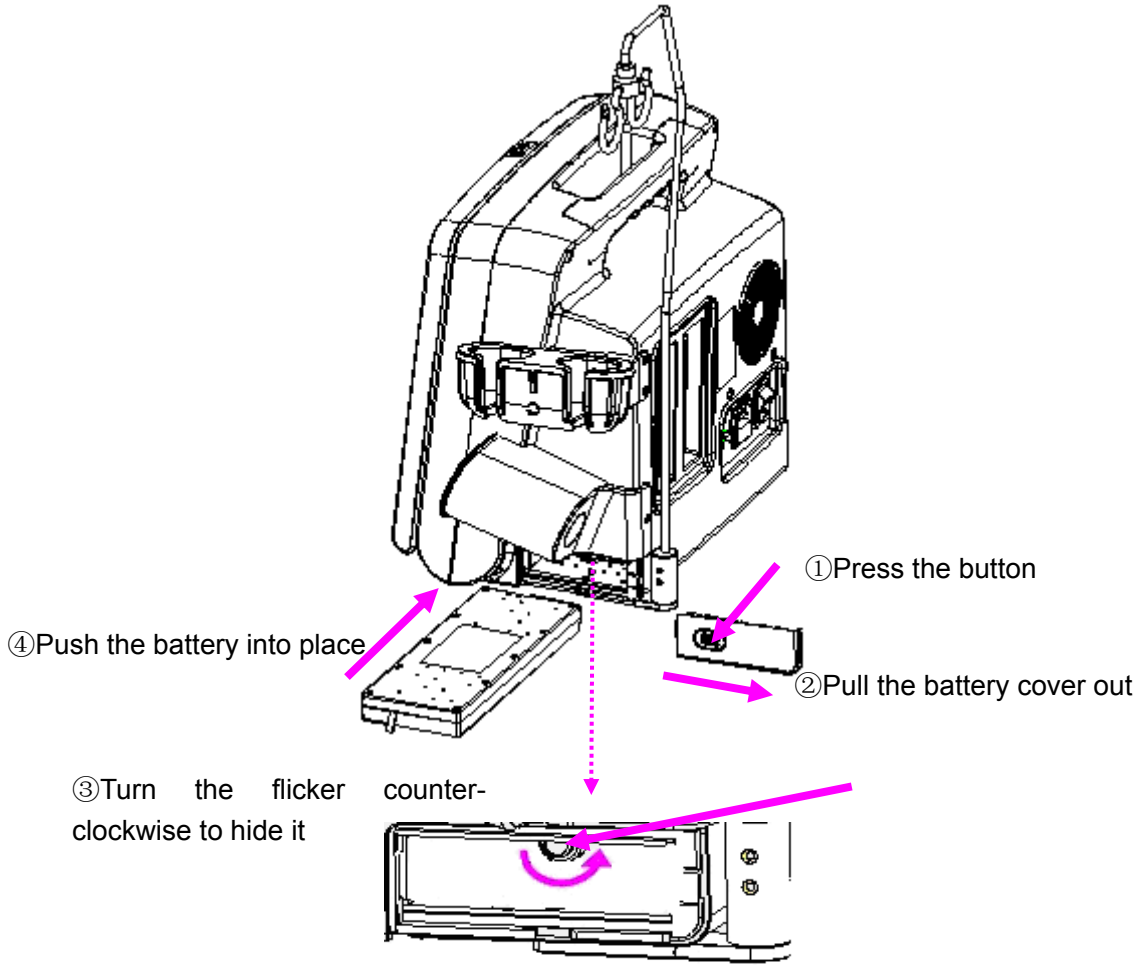


Figure 4-3 Installing Battery to Main Unit

To uninstall a battery:

1. Press the button on the battery cover and pull the cover out.
2. Pull the flicker counterclockwise to hide it.
3. Pull the battery out.
4. Replace the battery cover.

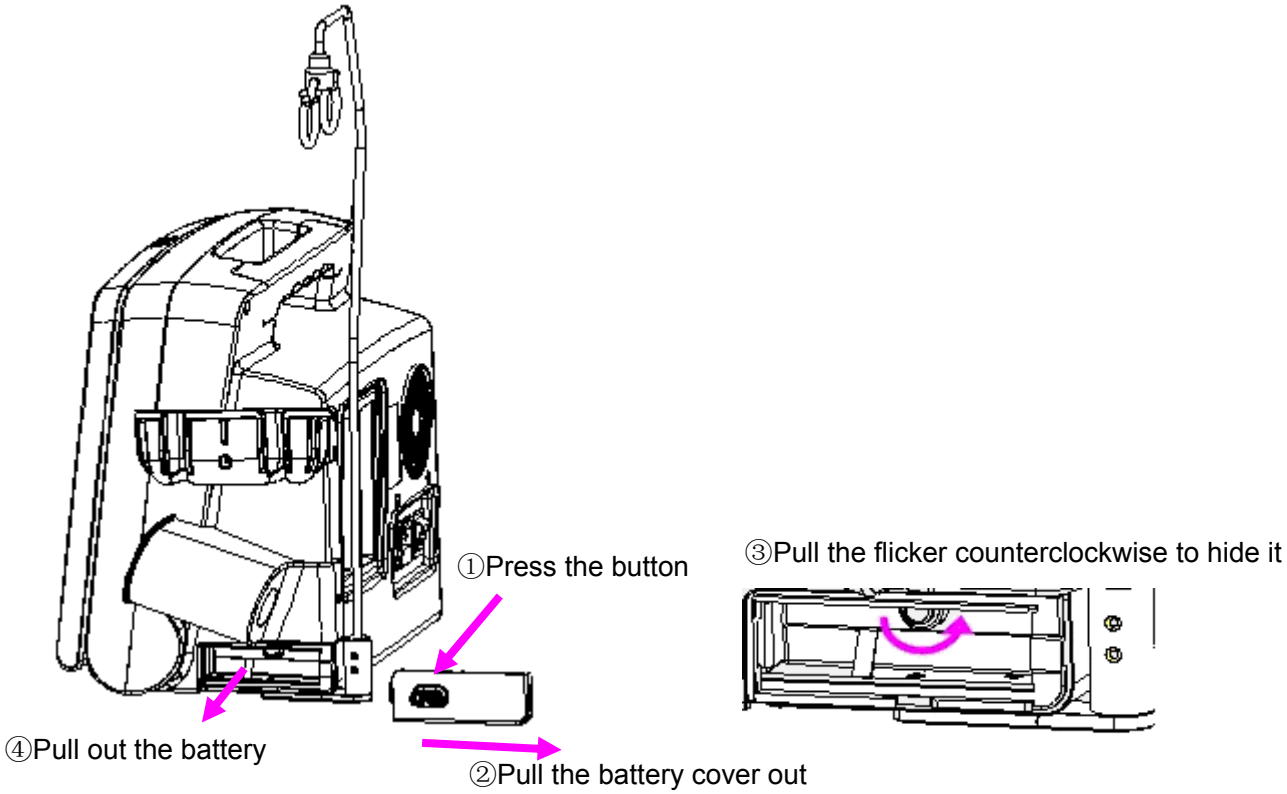


Figure 4-4 Uninstalling Battery from Main Unit

4.3.3. Connecting and Disconnecting Probes

NOTE:

Ensure that the system is shut down before connecting and disconnecting probes.

Flip images horizontally to change the scan direction or vertically to change the image orientation. The scan direction mark located at the side of probe indicates the beginning direction of scanning. The scan direction mark is shown below.

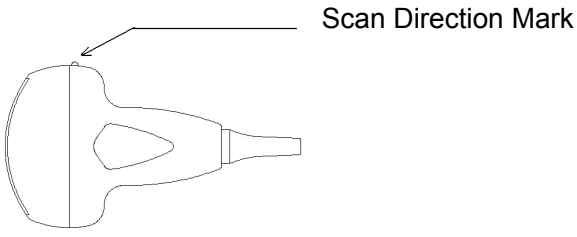


Figure 4-5 Probe Scan Direction Mark Schematic Diagram

There is information about Model and SN on the probe connector.

To connect a probe:

1. Place the probe's carrying case on a stable surface and open the case.
2. Carefully remove the probe and unwrap the probe cable.
3. Do not allow the probe head to hang free. Impact to the probe head could result in irreparable damage.

4. Turn the connector locking handle to the **OPEN** position.
5. Align the connector with the probe port and carefully push into place.
6. Turn the locking handle on the probe connector clockwise to **LOCK** position. This ensures the connector in position and ensures the best possible contact.
7. Place the probe in the probe holder.

To disconnect a probe:

1. Turn the locking handle on the connector housing counterclockwise to the **OPEN** position.
2. Firmly grasp the probe connector and carefully remove it from the system port.
3. Store each probe in its protective carrying case.

Figure 4-6 Lock and Open Marks on Probe Connectors

WARNING

Do not touch the pin of probe connector.

CAUTION

Do not plug in or pull out the connector when the device is activated. This is to avoid uncontrollable damage to the probe and the main unit.

NOTE:

Once the probe is connected to the main unit, please do not reinstall it frequently. This is to avoid poor contact between the probe and the main unit.

4.3.4. Peripheral Connections

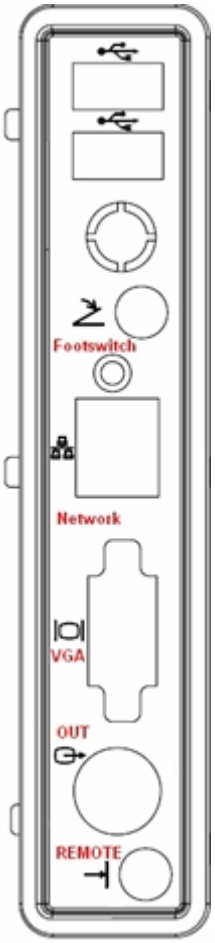
Video connections are located on the left panel of the DUS 60.

WARNING

Accessory equipment connected to the analog and digital interfaces must be certified according to the respective IEC/EN standards (e.g. IEC/EN 60950 for data processing equipment and IEC/EN 60601-1 for medical equipment). Furthermore, all configuration shall comply with the valid version of the standard IEC/EN 60601-1-1. Therefore, anybody, who connects additional equipment to the signal input or output connector to configure a medical system, must make sure that it complies with the requirements of the valid version of the system standard IEC/EN 60601-1-1. If in doubt, consult our technical service department or your local distributor.

CAUTION

To ensure proper grounding and leakage current levels, it is the policy of EDAN to have an authorized EDAN representative or EDAN approved third party perform all on-board connections of documentation and storage devices to the DUS 60.



Peripheral ports:

2 USB ports

1 footswitch port

1 Network port (DICOM 3.0)

1 VGA output port (15 pin)

1 remote port

1 video output port

Figure 4-7 I/O Ports on the Left Panel

4.3.5. Equipotential Bonding

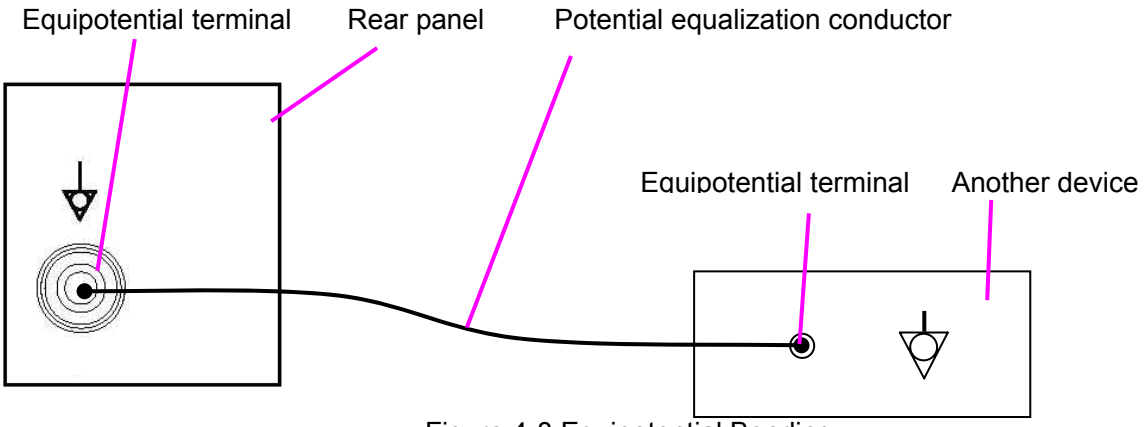


Figure 4-8 Equipotential Bonding

Any use of other devices with the system is at the user's risk and may void the system warranty. In order to fulfill IEC/EN 60601-1-1 requirements, connections of peripheral equipment to the DUS 60 must adhere to one of the following conditions:

- The peripheral equipment itself is a medical device approved according to IEC/EN 60601-1.
- Non-medical peripheral equipment approved according to any other EN or IEC standard must use the following setup for connection:
  - Connect the equipotential connector of DUS 60 to an independent protective earth terminal with a potential equalization conductor.
  - The peripheral equipment is located at least 1.5 meters (1.8 meters in Canada and the U.S.A) outside the patient environment. A patient environment is defined as the area in which medical examination, monitoring, or treatment of the patient takes place.
  - The peripheral equipment is connected to a main outlet outside the patient environment but still within the same room as the ultrasound system.

WARNING

1. Equipotential bonding: when the device is running with other instruments jointly, consideration should be given to equipotentiality.
2. Doctors and patients might be exposed to the hazardous and uncontrollable effects of compensating current caused by unbalanced equipotentiality between indoor medical device and touchable conducting parts. The safest solution is to build a unified equipotential network, to which the medical device is connected, using an angular plug.

4.3.6. Printer Installation

This system supports video printers and USB printers.

To install a video printer:

1. Power off the main unit and the printer.
2. Connect the VIDEO IN (video input) of the video printer with the VIDEO OUT (video output) of the main unit.
3. Connect the REMOTE of the video printer with the REMOTE of the main unit.

 Reference Figure 4-7 I/O Ports on the Left Panel

4. Power on the main unit and run the printer.

NOTE:
The video printers are used in patient vicinity.

To install an USB printer:

1. Power off the main unit and the printer.
2. Connect the printer with the main unit by using a USB cable.
3. Power on the main unit and run the printer.

If the printer can not work normally, check the printer presetting, see Section *5.7.3, General Presetting*.

NOTE:

1. Multiple portable socket-outlet is not intended for the device, anybody, who connects it to the signal input or output connector to configure a medical system, must make sure that it complies with the requirements of the valid version of the system standard IEC/EN 60601-1-1. If in doubt, consult our technical service department or your local distributor.
2. If you want to use a multiple portable socket-outlet to supply power to the whole DUS 60 system, you are suggested to calculate the system power consumption when building a DUS 60 system so as to match the system power consumption with the power sustained by a multiple portable socket-outlet.

Chapter 5 System Control

5.1. Powering On/Off Device

◆ To power on the device

Before powering on this device, check as below:

1. Check the potential equalization conductor and make sure it is connected properly.
2. Check all the cables and make sure there is no scrape or crack.
3. Check the control panel and the monitor and make sure there is no crack.
4. Check the probe and the connection and make sure there is no scrape or crack.
5. Check the power socket and the switch and make sure there is no damage.

To power on:

1. Connect the device to a standard three-pin power supply socket via the power cable, switch on the AC power switch on the rear panel; Or

   Use the battery as the power supply.
2. Press the power on/off key on the top right control panel, and a startup interface appears.

◆ To shut down the device

1. Press the power on/off key on the keyboard and the system displays a confirm dialog box.
2. Select **Yes** to power off the system.

Or,

If the system breaks down, press the power on/off key on the keyboard for about six seconds to shut down the system directly.

NOTE:

Please unplug the AC power cord from the power socket and disconnect the battery if the device is to remain idle for a long time.

CAUTION

1. You are forbidden to unplug or plug the power cord before switching off the system.
2. Wait approximately five seconds between powering the system off and then on again. This allows the system to complete its shutdown process.

◆ To restart the device

If there is any trouble described as below, please press the power on/off key to switch off the device and then press it again to restart the device.

- The device displays wrong information and it lasts a long time.
- The device displays abnormally.
- The device can not execute an operation.

5.2. Examining

Apply an appropriate amount of coupling gel (medical ultrasound coupling agent) to the body area to be examined, and then contact the area with the acoustic window of the probe firmly. A cross-sectional image of tissues will be displayed on the screen. Adjust **brightness**, **contrast**, **gain**, **TGC**, **acoustic output**, **dynamic range**, **focus combination**, etc properly. Adjusting the monitor's contrast and brightness is one of the most important factors for best image quality. If theses controls are set incorrectly, the **gain**, **TGC**, **dynamic range**, **focus combination** and even **acoustic output** may have to be changed more often than necessary to compensate. Meanwhile, properly move the probe to obtain an optimal image of the target area. Or if necessary, adjust **sweeping speed** to get satisfying images in the M mode, and adjust **D gain**, **sample line**, **sample volume**, **base line**, **PW angle**, **filter**, **steer**, **PRF**, etc in the PW mode.

CAUTION

1. Please be gentle when contacting the target area with a probe. This is to avoid making the probe damage or the patient disturbed.
2. Please choose a proper probe for the target area with an appropriate frequency to begin the diagnostic operation.
3. Adjust the gain knob slowly.

5.3. Screen Layout

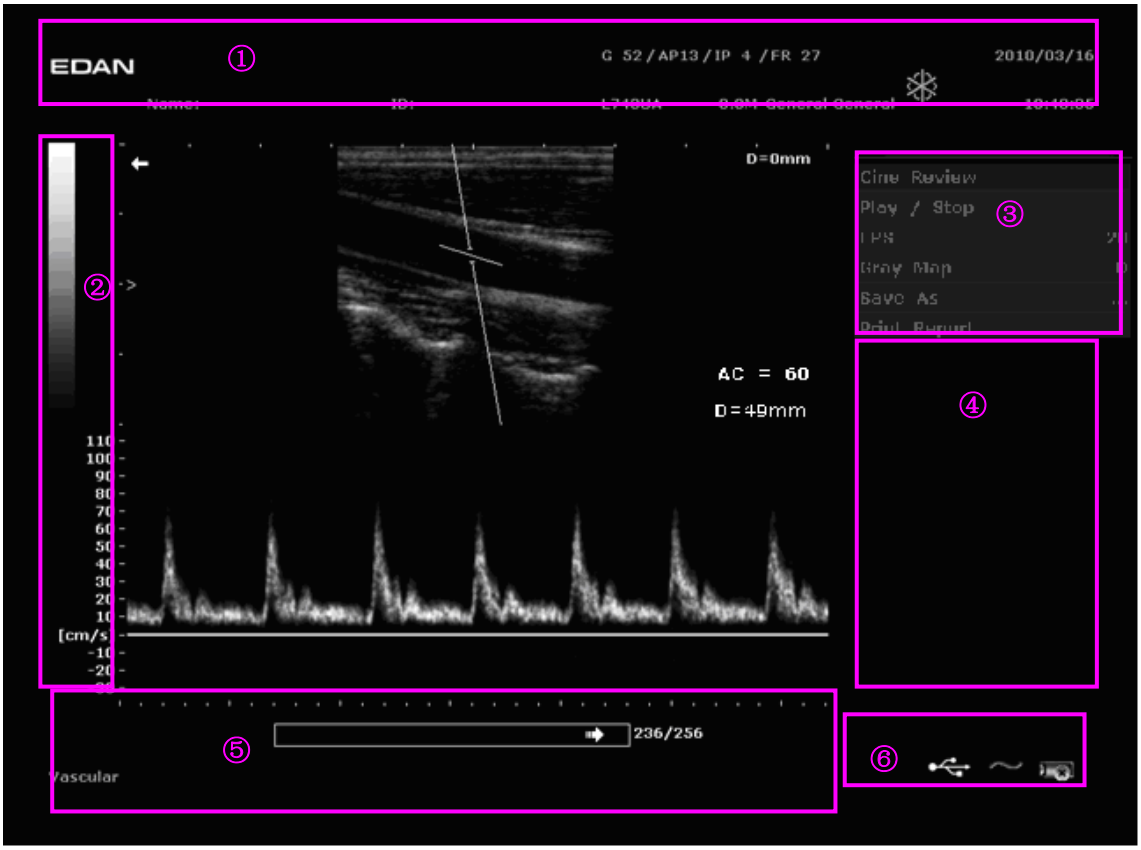


Figure 5-1 Typical Image Screen

①. Top status bar: logo image, hospital name, patient name, patient ID, system date and time, major parameter such as, probe name, probe frequency, THI, TSI, etc.
②. Gray map bar
③. System menu
④. Measurement result window
⑤. Bottom status bar: examination type, operation prompt, etc.
⑥. Bottom right corner: display the state of USB, input method, etc.

NOTE:

 : AC power supply, with battery connected;

 : AC power supply, without battery connected.

 : Battery power supply;

5.4. Control Panel

Figure 5-2 Control Panel

①  Power/running indicator lights	② Power on/off key	③ Acoustic power adjusting knob and TGC sliders
④ PC keyboard	⑤ Function controls	

5.4.1. Trackball

The trackball operation is easy and convenient. It can achieve the following functions:

- Move the measurement cursor during measurement.
- Move to select menu items in menu-based operations.
- Move the comment cursor in the comment status.
- Move the M Mark in the B/M mode.

- Move the sample line in the PW mode.
- Realize single frame playback in the frame-by-frame playback status.
- Move the zoomed window in the zoom status.

NOTE:

1. Please be gentle when running the trackball.
2. Please keep the surface of trackball clean.

5.4.2. "0~9" Numeric Keys

Numbers are used for time calibrating, data setting, age notating, and comment adding etc.

5.4.3. Alphabetic Keys

The system supports some language-specific characters through the use of SHIFT with a combination of keys on the keyboard. Press any of these keys in the annotation mode and the comment mode to display the corresponding character on the cursor position.

German Characters

Symbol	Key Combination
ä	SHIFT-A
ö	SHIFT-S
ü	SHIFT-D
β	SHIFT-F
ñ	SHIFT-G
ø	SHIFT-H

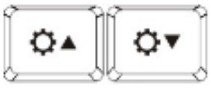
French Characters

Symbol	Key Combination
è	SHIFT-Z
à	SHIFT-X
ó	SHIFT-C
é	SHIFT-V
ç	SHIFT-B
å	SHIFT-N

Table 5-1 German and French Characters

5.4.4. Function Controls

Key	Description
Acoustic power	Rotate this knob to adjust the acoustic power, 16 levels, 0 ~ 15 (by way of changing power supply).
TGC sliders	Glide the slide controls to adjust the TGC, glide the upper segments to adjust the near field gain, and the lower segments to adjust the far field gain; glide rightward to increase TGC, and glide leftward to decrease.
Esc	To escape
Preset	Preset key Press this to activate or to deactivate the preset function.  Reference Section *5.7, Presetting.*

File	File management key Press this key to enter or to exit the file management system. Reference Section *6.8, File Management*.
THI	Tissue Harmonic Imaging Processing key Press this key to do the image processing, shifting between tissue harmonic imaging and general in real time.
TSI	Tissue Specific Imaging Processing key Press this key to switch among general, muscle, fatty and fluid in real time, adjust the acoustic speed to get the most satisfying image.
Colorize	Colorization key Press this key to colorize the image. Cobalt, Sage, Sepia, magenta, flame, tan, or gray.
	Brightness adjusting keys Press these two keys to adjust brightness. And the brightness symbol will be displayed at the bottom of the screen
	Contrast adjusting keys Press these two keys to adjust contrast. And the contrast symbol will be displayed at the bottom of the screen
	Volume adjusting keys Press these two keys to adjust volume in the PW mode. And the volume symbol will be displayed at the bottom of the screen
	Sound muting key Press this to close the loudspeaker in the PW mode. And the mute symbol will be displayed at the bottom of the screen
Space key	Space key Press this key in the annotation mode and comment mode to introduce a blank space on the cursor position.
Shift	Shift + Alphabetic key combination Press **SHIFT** and an alphabetic key corresponding to the language's special character.
Caps Lock	Alphabetic Shift key It is used to shift the characters between lowercase and uppercase.
Menu	Press this to display or to hide the menu.
Exam	Examine Menu key Press this key to display or to exit the examination type menu.
Probe	Probe Switch key Diverse probes are available for this device. Press this key to select a proper type of connected probe with the corresponding information in the top right corner. Reference *Figure 5-1 Typical Image Screen*.

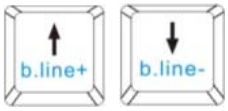
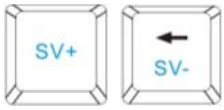
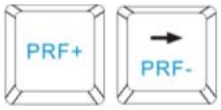
Freq	Frequency Shift Key Press this key to switch to the proper operating frequency for the activated probe. When you change the frequency, the G (gain) will change simultaneously.
Enter	Entering key In annotation mode and comment mode, press this key to move the cursor to insert a blank line.
Del/Bksp	Delete key In annotation mode and comment mode, press one of these two keys to delete text word by word.
	Sample line adjusting key Press this to activate and adjust the sample line in the PW mode, and adjust M mark in the B+M mode.
	Angle adjusting keys Press these two keys to adjust the correction angle in the PW mode.
	In the PW mode, press this key to freeze or unfreeze the B mode image.
	Baseline adjusting keys Press these two keys to adjust the baseline in the PW mode.
	Sample volume adjusting keys Press these two keys to adjust the sample volume in the PW mode.
	PRF adjusting keys Press these two keys to adjust the PRF (Pulsed Repetition Frequency) in the PW mode.
New patient	New Patient key Press this key to cancel all the recent patient data, comments, measurements, calculations and worksheet, except saved images.
Patient Info	Patient information annotation key Press this key to open or to close the Patient Data Input Dialog box.
Quick Save	Press this key to save the current image.  Reference Section *6.8.1, Saving Images*.

	Image up/down Flip key Press this key to flip the image vertically.
	Image left/right Flip key Press this key to flip the image horizontally.
Clear	Press this key to clear all the measurements, calculations, comments, and body marks displayed in the current image.
Cine	Cine key Press this key to enter or exit the frame-by-frame cine mode.
Comment	Comment key Press this key to activate or to exit annotation function.
BodyMark	Body Mark Key Press this key to activate or exit the body mark function. It is to indicate the examine position and the scan direction.
Measure	Measure key Press this key to activate or exit the measurement function.
Back	Back key In the measurement status, press this key to return to the previous operation. In comment mode, press the key to delete the entered text one by one. In parameter setting status, press the key to decrease the parameter value.
Change	Change key This key has dual functions. In measuring status, you can press **Change** once to change the settled point and the active point. In annotation status, press this key to display the comment library.
Set	Set key Press this key to confirm the selection of a specific function or command. Use this key to anchor calipers, select a menu item or image graphic. Or press it to increase the parameter value in parameter setting status.
Freeze	Freeze key Press this key to switch between the frozen and real-time states. When an image is frozen, the system inserts “ ❄ ” next to the system time clock and the clock pauses. When unfreezing the system, all the measurements, calculations, body marks, and comments will be erased.
Print	Print key Press this key to do the video printing.

	◆ Rotate it to adjust total gain in the B mode, 0 ~ 130, in increments of 2; ◆ Press it and then rotate it to adjust total gain in the PW mode. ◆ Gain can not be adjusted in freeze mode
	**Multi-function knob 1** Press this knob repeatedly to cycle among IP, F. position and F. number functions. When one of the functions is activated, rotate the knob to adjust the value. ◆ When the light of IP is on, rotate the knob to adjust the value of IP. ◆ In B, B/B, and 4B modes, 4 focuses and 16 segments of adjustable electronic focus are provided by the device. By adjusting focal point combination, a clear image can be obtained. The current focal point combination is shown in the FOCUS position on the left of the screen. ◆ When the light of focus position is on, rotate the knob to shift the position of the current focus, clockwise toward far field, and counterclockwise toward near field. ◆ When the light of focus number is on, rotate the knob clockwise to increase the focus number and counterclockwise to decrease the focus number.
	**Multi-function knob 2** Press this knob repeatedly to cycle between Depth and Zoom. When one of the functions is activated, rotate the knob to adjust the value. The rotation function is automatically activated when a body mark is added. ◆ When the light of Depth is on, rotate the knob to adjust scanning depth, and the current depth is displayed in the bottom right corner of the image. ◆ In real-time mode or frozen mode, press **Multi-function knob 2** till the zooming light is on, and the system displays a zooming window in the middle of the image; you can roll the trackball to move the zoom window to the desired area and rotate the zooming adjustment knob to adjust magnification of the zoom window. In frozen mode, 4 magnification levels are available. In real-time mode, 8 magnification

	levels are available: ×1.0, ×1.44, ×1.96, ×2.56, ×4.0, ×5.76, ×9.0 and 16.0. Press **Set** display the zoomed image, and then roll the trackball to move the zoomed image. **NOTE**: In real-time mode, magnification function is only available in B-mode and 2B-mode. In frozen mode, magnification function is only available in B-mode. ◆ When a body mark is added, the rotation function is automatically activated and the rotation light is on. You can rotate this button to adjust the scanning direction. ◆ When an arrow is added, the rotation function is automatically activated and the rotation light is on. You can rotate this button to adjust the arrow direction. ◆ In PW mode, after activating the PW angle adjustment function, the rotation function is automatically activated and the rotation light is on. You can rotate this button to adjust the arrow direction.
Footswitch	Pedaling on the footswitch is equivalent to pressing **Freeze**.

Table 5-2 Function Controls

5.4.5. Comment Function

The comment library is for positions and anatomical structures.

NOTE:

The entered text is in upper case by default.

To add a comment:

➢ **To add a comment by using the keyboard:**

1. Press **Comment**, and there is a cursor "l" displayed in the image area for annotating;
2. Enter text by using the keyboard;
3. Press **Set** to complete the comment.

➢ **To add a comment by using the comment library:**

1. Press **Comment**, and there is a cursor "l" displayed in the image area for annotating;
2. Press **Change** to display the comment library;
3. Highlight a comment in the comment library, and press **Set** to confirm the choice and complete the comment.

➢ **To add an arrow:**

1. Press **Comment**, and there is a cursor "l" displayed in the image area for annotating;
2. Press **Set** to display an arrow;
3. Move the trackball to move the position of the arrow; and the rotation function is automatically activated and the rotation light is on. You can rotate this button to adjust the arrow direction;
4. Press **Set** to set the position of the arrow.

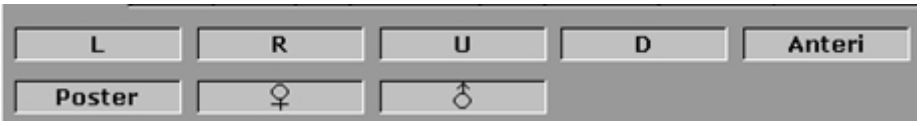
To move a comment:

1. Move the cursor to a comment, and there is a pane around the comment;
2. Press **Set** and move the cursor to a new position;
3. Press **Set** to confirm the new position.

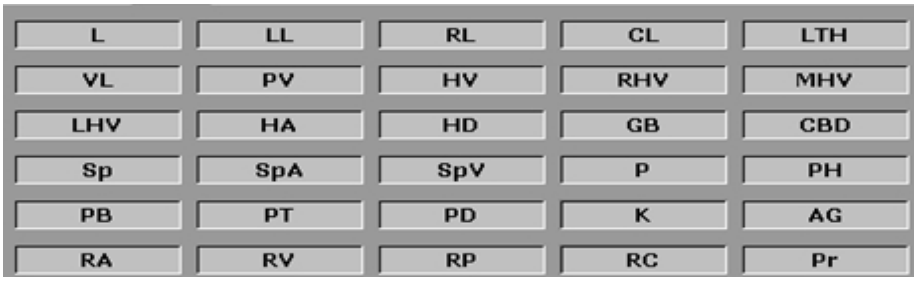
To delete a comment:

During commenting, you can use **DEL** or **Bksp** to cancel the undesired text word by word, or you can use **Back** to cancel the undesired text one by one.

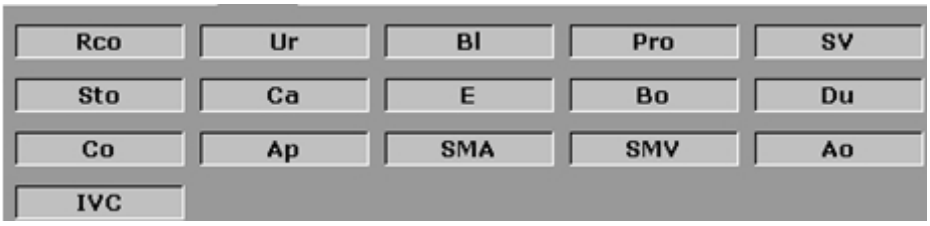
The comment library is shown below:



Generic

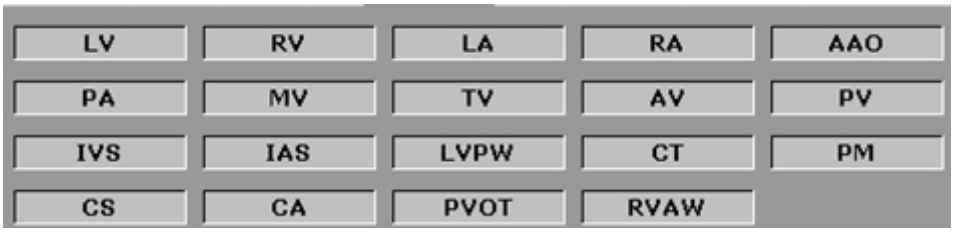


Abd 1

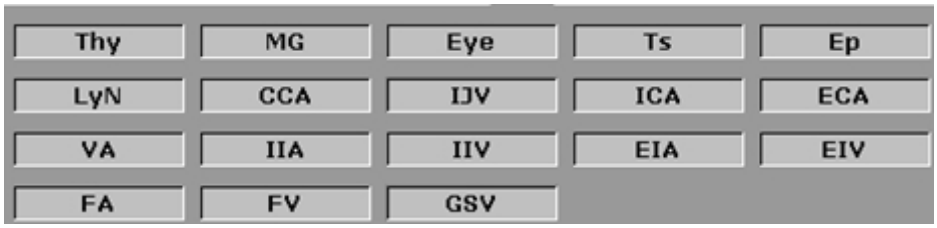


Abd 2

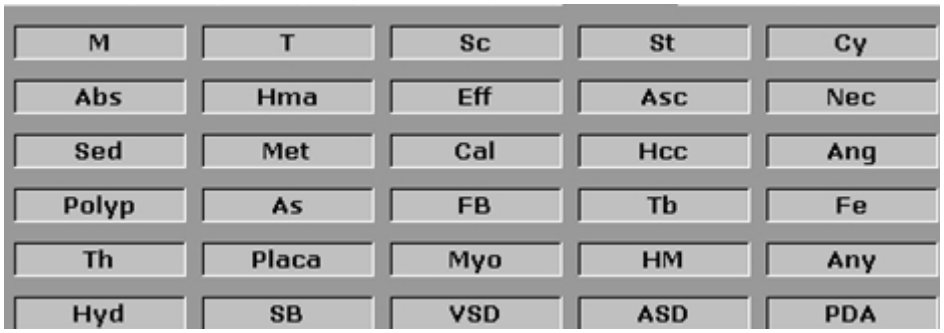
OB



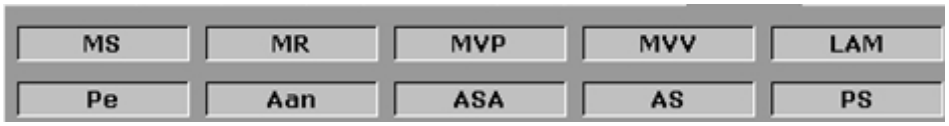
Cardiac



Sml



Lesion 1



Lesion 2

Figure 5-3 System-defined Comment Library

5.4.6. Body Mark Function

To add a body mark:

1. Press **Body Mark**, to display the body mark dialog box.
2. Highlight a body mark in the body mark dialog box, and press **Set** to confirm the choice to add the body mark. The selected body marks are displayed in the bottom left corner of the screen.

Reference *Figure 5-1 Typical Image Screen.*

3. After adding a body mark, use the trackball to move the position of the probe; and the rotation function is automatically activated and the rotation light is on, you can rotate this

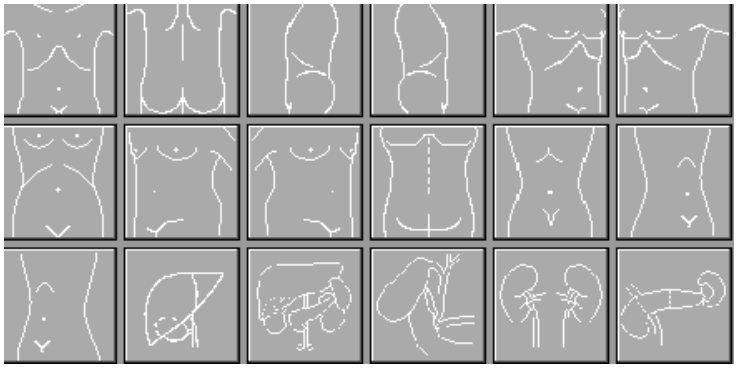
button to adjust the probe scanning direction.

4. Press **Set** to complete adding the body mark.

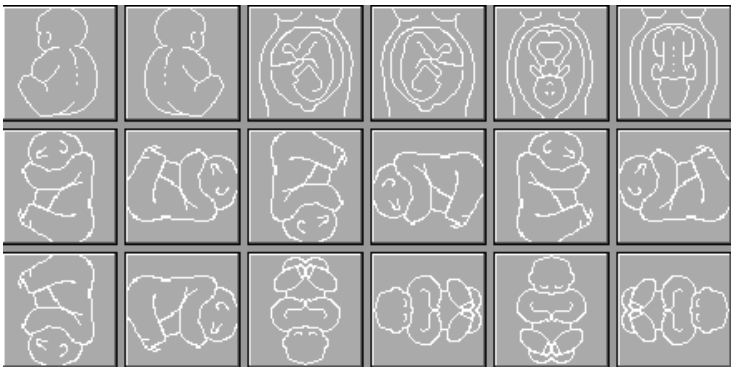
To move a body mark:

1. Move the cursor to a body mark, and there is a pane around the body mark;
2. Press **Set** and move the cursor to a new position;
3. Press **Set** to confirm the new position.

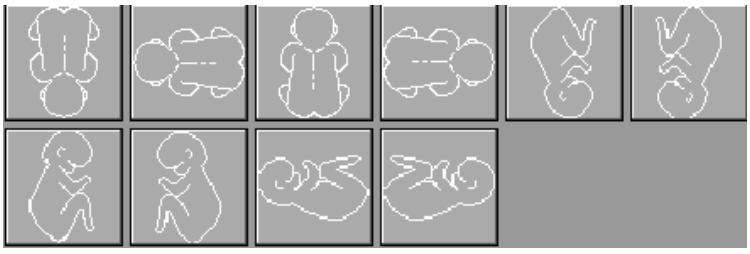
There are more than 130 types of body marks, as shown below:



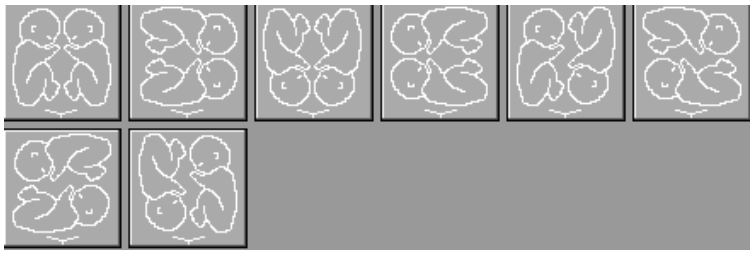
Abdomen



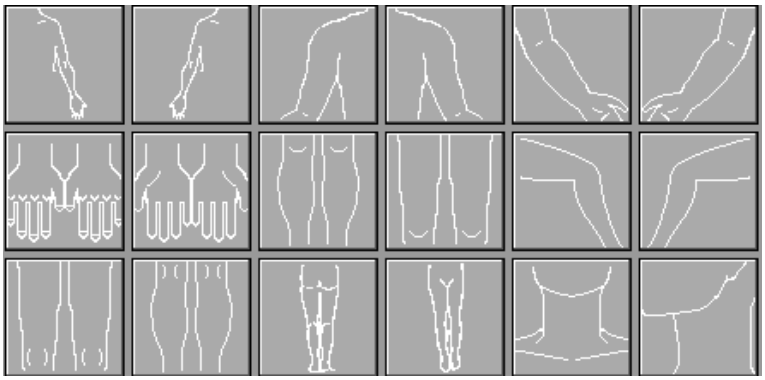
Obstetric 1



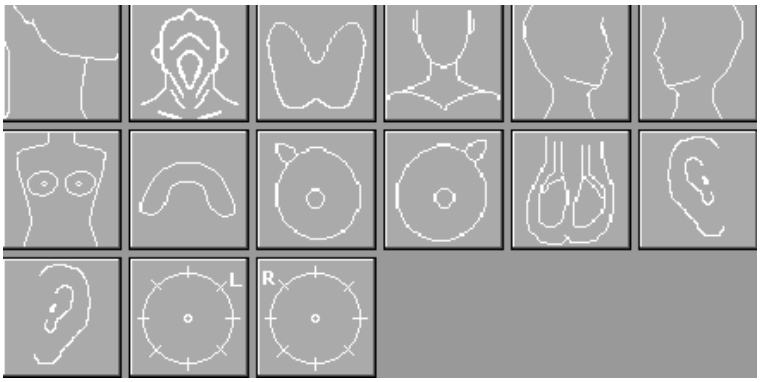
Obstetric 2



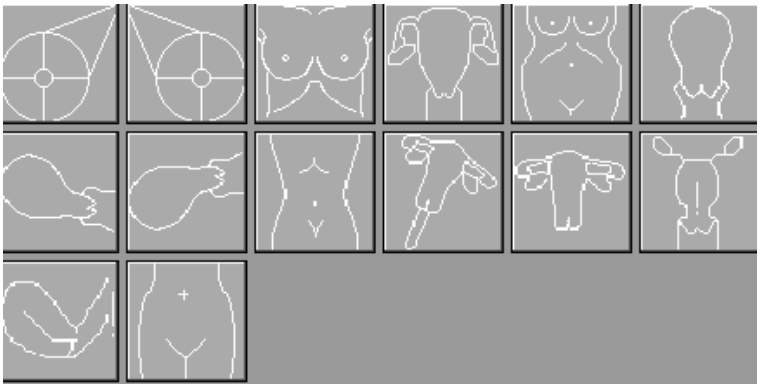
Twins



Small parts 1

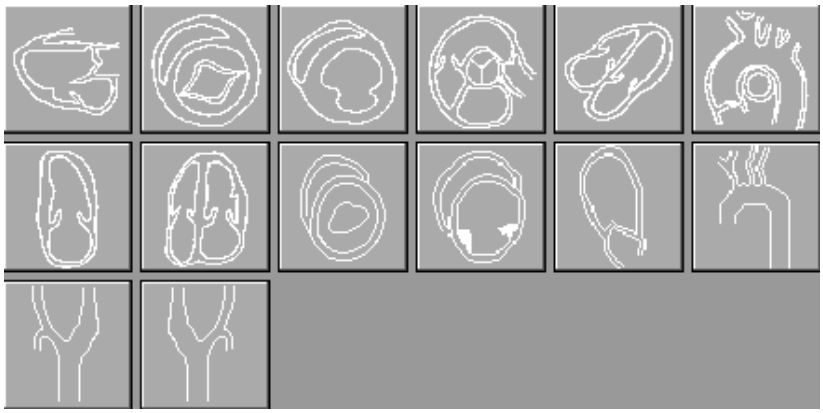


Small parts 2



Gynecology

Orthopedics



Cardiology

Urology

Figure 5-4 Body Marks

5.4.7. Imaging Functions

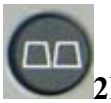
 **B mode Imaging Control**

Press this key to enter the B mode. The system displays a single real-time B mode image.

B indicates brightness, or two-dimensional (2D) gray scale imaging.

NOTE:

To return to a real-time B mode image from any imaging mode, press B control. This also deletes all measurements, calculations, comments, or body marks that are displayed on the screen.

 **2B mode Imaging Control**

This key has two functions:

- Press this key to enter the 2B mode.
- Press this key to activate one of the dual images. The probe direction of the activated image is brighter than that of the frozen image.

 **4B mode Imaging Control**

Press this key to enter the 4B mode. The system divides the image area into four quadrants: the first quadrant is on the top left, the second on the top right, the third on the bottom left, and the fourth on the bottom right.

Press it repeatedly to active one of the four images. The probe direction of the activated image is brighter than the direction of the frozen images. The four images are obtained separately and only one image at a time is displayed in real time.

 **B/M mode Display Control**

Press it to enter the B/M mode, the B mode and the M mode images are displayed on the screen at the same time (Abbreviated as B/M or B+M). There is a line constituted by points with regular spacing on B mode image, which is called the M Mark. Roll the trackball to move the M Mark. Press **Set** to locate the M Mark.

 **M mode Display Control**

Press this key to enter the M mode. It displays an M mode sweep. The slope of this mode has four levels.

 **Pulsed-Wave Doppler mode Display Control**

Press this key to switch between the B mode the B+PW mode.

A pulsed-wave Doppler (PW) scan produces a series of pulses used to study the motion of blood flow in a small region along a desired scan line, called the sample volume.

The X-axis of the graph represents time, and the Y-axis represents Doppler frequency shift. The shift in frequency between successive ultrasound pulses, caused mainly by moving red blood cells, can be converted into velocity and flow if an appropriate angle between the insonating beam and blood flow is known.

Shades of gray in the spectral display represent the strength of the signal. The thickness of the spectral signal is indicative of laminar or turbulent flow (laminar flow typically shows a narrow band of blood flow information).

Pulsed-Wave Doppler mode and B mode are shown together in a mixed mode display. This combination lets you monitor the exact location of the sample volume on the B image in the B

Image Display window, while acquiring Pulsed-Wave Doppler data in the Time Series window.

Operation:

In the B scan, the long line lets you adjust the sample line position, the two parallel lines (that look like =) let you adjust the sample volume (SV) size and depth, and the line that crosses them lets you adjust the correction angle (PW angle).

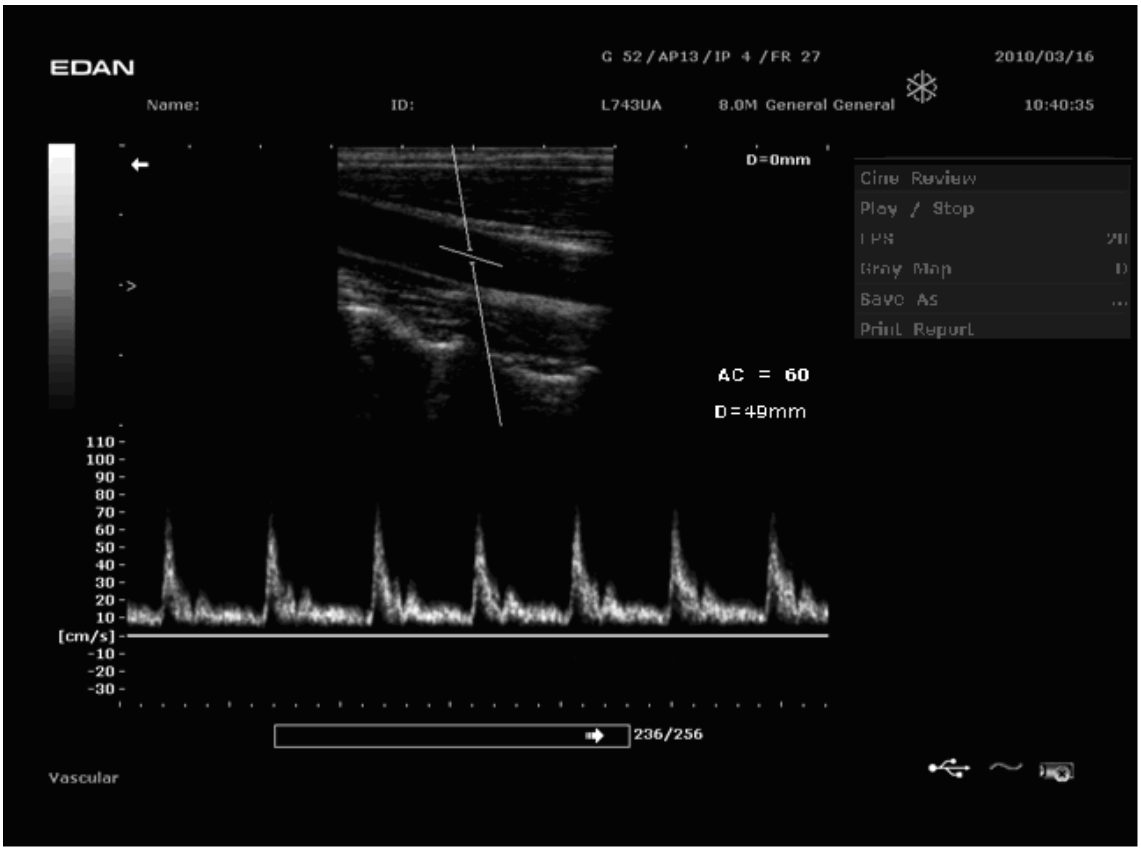


Figure 5-5 Example PW Scan

In PW mode, you can choose scanning in B mode or PW mode by pressing **Update**. When you are scanning in non-simultaneous mode either the B or the time series window receives data. This lets you independently change the PW PRF. When scanning in simultaneous mode, both the 2D and the time series window receive data. This feature lets you define which method is used, based on the exam type.

The sample volume indicator allows you to start a scan in a B scan mode, set the sample volume, and switch to Doppler mode. The sample volume locks in position.

1. Press **PW** to enter B mode and adjust all image control settings appropriate for the current exam.
2. Place the cursor inside the vessel of interest.
3. You can now adjust the sample line, SV size, or correction angle as needed for the scan: move

the trackball to adjust the sample line, press **SV+**/**SV-** to adjust the sample volume, press **PW angle+**/**PW angle –** to adjust correction angle, etc.

4. Press **PW** again to enter B+PW mode. The system locks the sample volume indicator and adds the Time Series window.

5.4.8. Additional Control Functions

The DUS 60 also provides the following additional control functions, which are available through status menus.

Control function	Description
Scan Angle (sector angle/ scan width)	Adjusts the sector angle for curve probes, and the scan width for linear probes, providing a larger field of view in the far field.
Scan Mode	Selects the scan mode, High density or High FPS (frame rate, in frames per second)
Dynamic Range	Controls the overall contrast resolution of B mode and M mode images.
Edge Enhance	Improves the contour enhancement of the image for distinguishing the edges of a structure in B mode.
Smooth	Adjusts the smooth level.
Frame Persist	Selects the number of frames for frame averaging to present a smoother, softer image.
Line Persist	Adjusts the line persist level.
Line Average	Adjusts the line average level.
AGC	Adjusts auto gain control.
Rejection	Adjusts the rejection level.
Speckle Reduction	Set image speckle reduction attribute.
ATO	Set the degree of auto tissue optimization
Gray Map	Selects the post-processing gray curve map.
B/W Invert	Set the color to black or white.
90° Rotate	Rotate the image by 90 degrees (in B mode).
γ Correction	Adjusts γ correction.
Sweep Speed	Adjusts the scrolling speed level of the M mode and PW mode sweep.
Steer	Adjust the sample line position, linear probe only. (0~7)
Filter	Adjust the filter wave. (0~3)

PW Invert	Invert the PW wave. (Up or Down)
D gain	Adjust D gain in the PW mode

Table 5-3 Additional Control Functions

These functions can be set using the **Set** and the **Back** keys.

5.5. Menu

Menus are displayed on the right of the screen. Only one menu can be activated at a time. The types are shown as follows:

System status menu

In B mode or B/M mode, the system status menu provides information about the current imaging mode. In 2B and 4B modes, it indicates the status and parameters of the active image. In M mode, it indicates the status and parameters of M sweep. In the PW mode, it indicates the status and parameters of Doppler wave and 2D image. The following are the system status menus of B mode, B/M mode, M mode, and PW mode respectively.

Figure 5-6 System Status Menu

Measurement and calculation menu

Perform an operation. For instance, begin a distance measurement, and then the corresponding measurement cursor is displayed.

After entering B mode, press **Measure** to display the menu below.

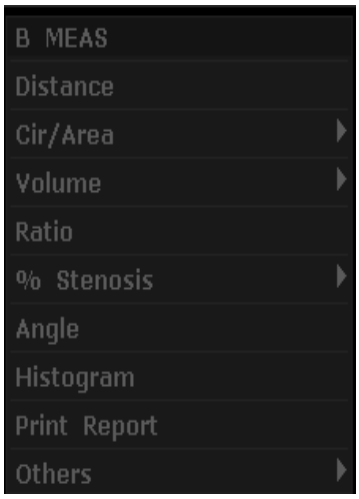


Figure 5-7 B Mode Generic Measurement and Calculation Menu

Secondary menu

The symbol "►" indicates that there is a secondary menu associated with the menu option. Roll the trackball to highlight the menu option with "►", the system displays a secondary menu for the selected option.

Example: The secondary menu of **Cir/Area** contains **Ellipse** and **Trace**, shown as below.

After entering B mode, press **Measure** to display the menu below, and highlight the option **Cir/Area**, the system will display the secondary menu **Ellipse** and **Trace**.

Figure 5-8 Secondary Menu

Figure 5-9 File Menu

5.6. Dialog Box Operation

The dialog box may have a few tabs, as shown below. You can select one tab at a time with trackball and **Set**. Also, you can modify the parameter following the prompt instruction, and then highlight **OK** and press **Set** to save the modified parameters and close the dialog box; or highlight **Cancel** to give up the modification and close the dialog box directly.

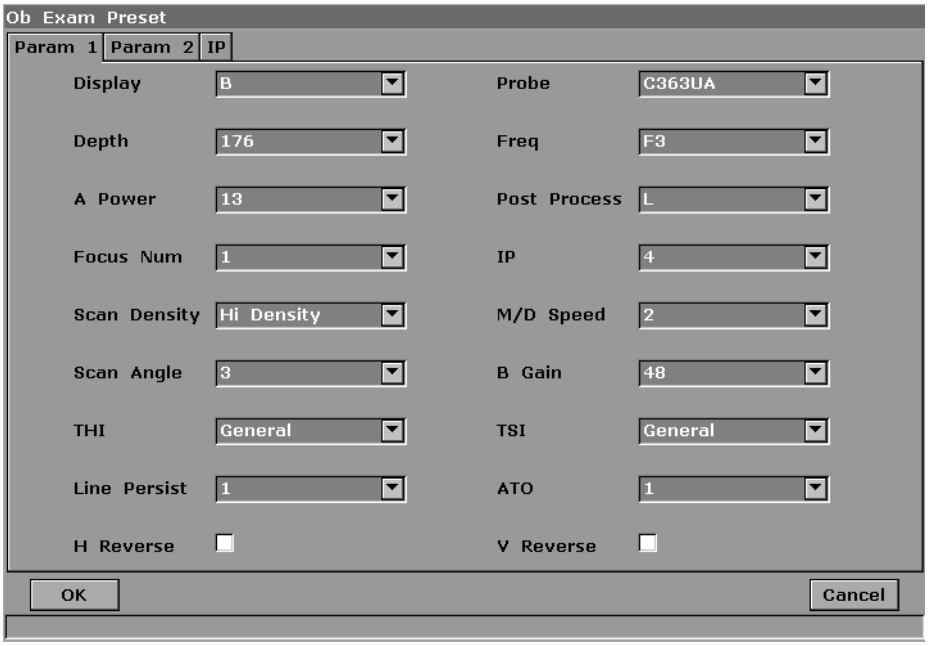


Figure 5-10 Obstetric Examination Presetting Dialog Box

5.7. Presetting

5.7.1. Entering and Exiting

To activate presetting function:

1. Press **Preset**, and the system displays the preset menu, as shown below.

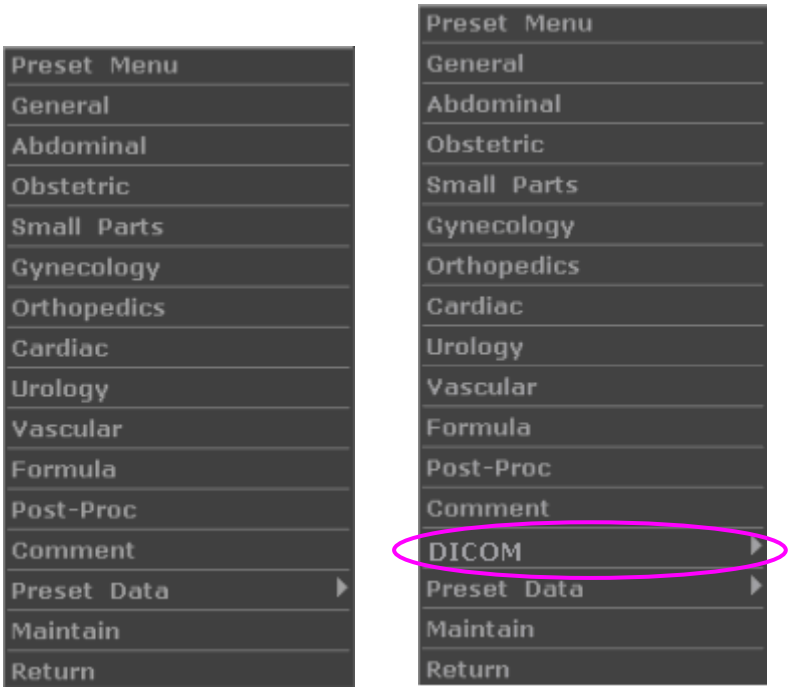


Figure 5-11 Preset Menu (the left—with no DICOM installed, and the right—with DICOM installed)

2. Roll the trackball to highlight one of the options and then press **Set** to display the menu of the corresponding option.

To exit presetting:

Highlight **Return** and press **Set**. Then the system restarts automatically. The system runs with the new modified parameters after being restarted.

5.7.2. Displaying / Modifying Presetting Parameters

Select a type of preset and press **Set** to display the corresponding dialog box, and you can modify the parameter following the prompt instruction.

Reference Section *5.6, Dialog box operation.*

5.7.3. General Presetting

1. In preset menu, move the cursor to highlight **General** and press **Set** to display general presetting dialog box, as shown below.
2. Roll the trackball to highlight an item and then press **Set**. Then use the keyboard to enter text.

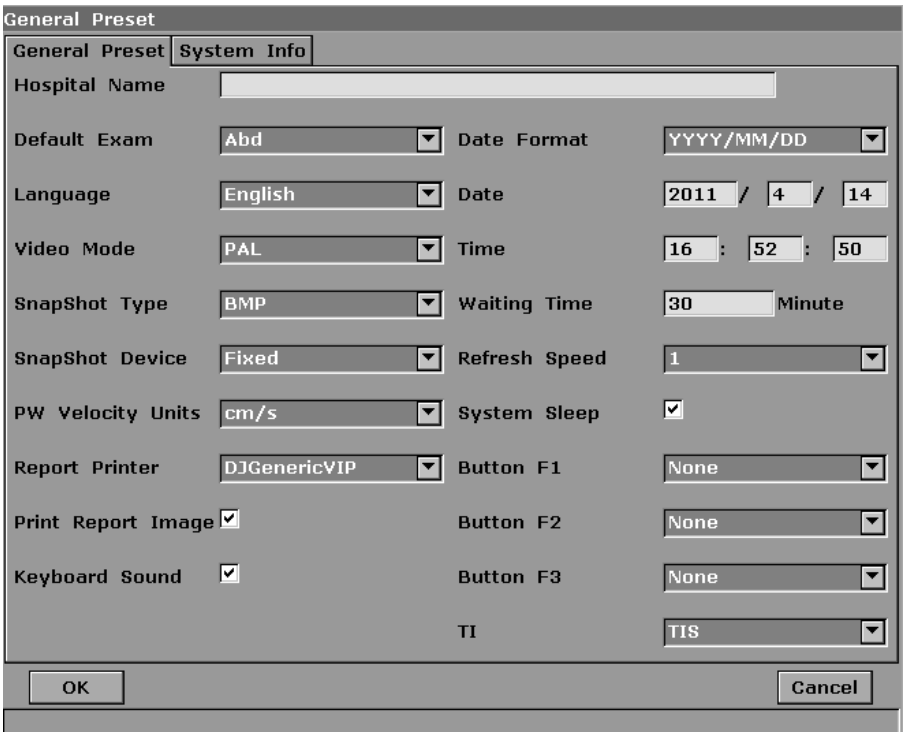


Figure 5-12 General Presetting Dialog Box

Item	**Setting**	**Allows you to**
Hospital Name	Input freely	Set hospital name displayed on the key top left of the screen and diagnosis report, with a maximum of 32 characters.
Default Exam	Abdomen, obstetric, small parts, gynecology, orthopedics, cardiology, urology, or vascular.	Preset the examination type.
Language	Chinese, English, etc.（The language options vary with language software installed.）	Set the overlay language
Video Mode	PAL/NTSC	Set the video mode
SnapShot Type	BMP/JPG/FRM/DCM (if DICOM is installed)	Set the storage file format type of snap shot.
Keyboard Sound	√/ Null	Turn on or off the keyboard sound.
Report Printer	DJ 3600, DJ4100, DJ Generic VIP, LJ Mono	Select the printer type, see table 5-5 for the corresponding printer model.
Print Report Image	Select whether to print image in report.	Select whether to print image in report when using USB printer.
Date Format	Set freely	YYYY/MM/DD, MM/DD/YYY or DD/MM/YYYY.

Date	Set freely	Set the system date.
Time	Set freely	Set the system time, format: H/M/S.
SnapShot Device	USB-Disk/Fixed	Set the storage device of snap shot.
System Sleep	√ / Null	Select whether the device enters sleep mode when no operation is performed for certain minutes.
Waiting time	Set freely	Set the system waiting time to enter sleep mode (5-60 min).
Refresh Speed	1~10	Set the grade of glint speed of system dormancy.
F1	None, save frame, save cine, save AVI, file manager, sweep speed, PW invert, wall filter.	Define the F1 key, select one of the pull-down options.
F2	None, save frame, save cine, save AVI, file manager, sweep speed, PW invert, wall filter.	Define the F2 key, select one of the pull-down options.
F3	None, save frame, save cine, save AVI, file manager, sweep speed, PW invert, wall filter.	Define the F3 key, select one of the pull-down options.
TI	TIS, TIB, TIC	Select the application tissue of thermal index.

Table 5-4 General Presetting Information

Printer type	**Printer model**
DJ 3600	HP DeskJet D2368
DJ Generic VIP	HP DeskJet D2568, HP DeskJet D5568 HP DeskJet F2418, HP DeskJet F2488 HP Deskjet 2050, HP Deskjet 1050 HP Deskjet Ink Advantage 2010
LJ Mono	HP LaserJet P2015, HP LaserJet P2035

Table 5-5 Presetting a Report Printer

You must restart the system to validate the change, including **Language**, **Keyboard Sound**, and **Report Printer**. After you perform those presetting, and press **Return**, the system displays a confirm dialog box to prompt you whether to restart the system.

5.7.4. Presetting Examination

Examination types include abdomen, obstetrics, small parts, gynecology, orthopedics, cardiology, urology and vascular.

Take obstetric examination presetting for example, in the preset menu, move the cursor to

highlight **Obstetric** and press **Set** to display obstetric examination presetting dialog box.

Parameter 1 Tab

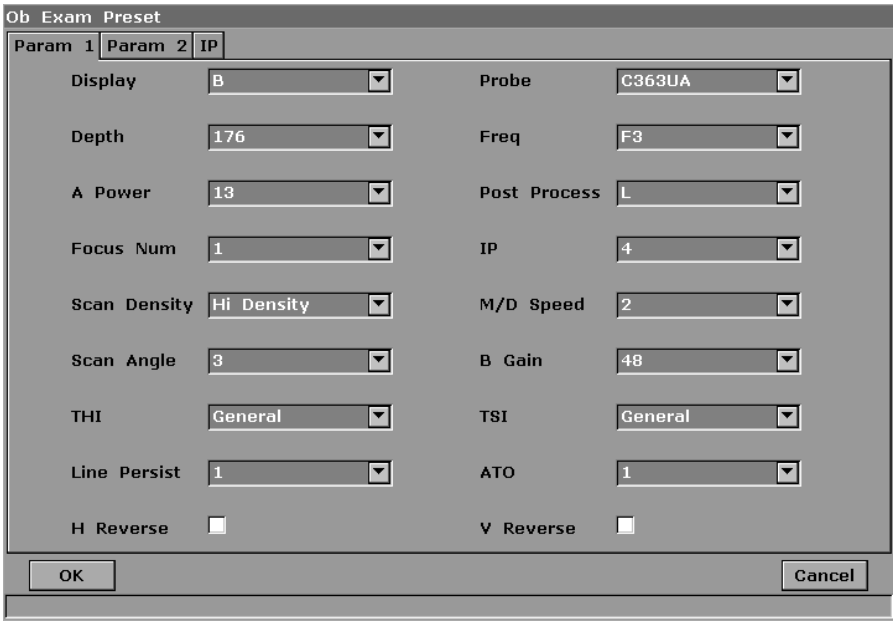


Figure 5-13 Obstetric Presetting -- Parameter 1 Tab

Item	Setting	Allows you to
Display	B, M, B+B, 4B, B+M, PW	Set display mode type.
Depth	19 mm ~ 245 mm (C363UA)	Set examine depth.
A Power	0~15	Set acoustic power, 16 levels.
Focus Num	1/2/3/4	Set the number of focuses.
Scan Density	High density/high frequency	Set scanning density.
Scan Angle	0/1/2/3	Set scanning angle.
THI	Tissue harmonic imaging / General	Set THI.
Line Persist	0~7	Set image line correlation.
H Reverse	√ / Null	Set the attribute of Horizontal reversal.
Probe	Display all the probe type this device supports	Set the probe type to use.
Freq	F1/F2/F3/F4/F5	Set the frequency of probe.
Post Process	Gray map (L, A, B, C, D, S)	Select a default gray map.
IP	0~7	Set the image parameter.
M/D speed	0/1/2/3	Set the M mode or D mode sweeping speed.
B Gain	0~130	Set the gain of 2D image, in 2 increments.
TSI	General/muscle/fatty/fluid	Set the type of TSI.
ATO	0/1/2/3	Set the degree of auto tissue optimization
V Reverse	√ / Null	Set the attribute of Vertical reversal.

Table 5-6 Obstetric Presetting Information – Parameter 1

Parameter 2 Tab

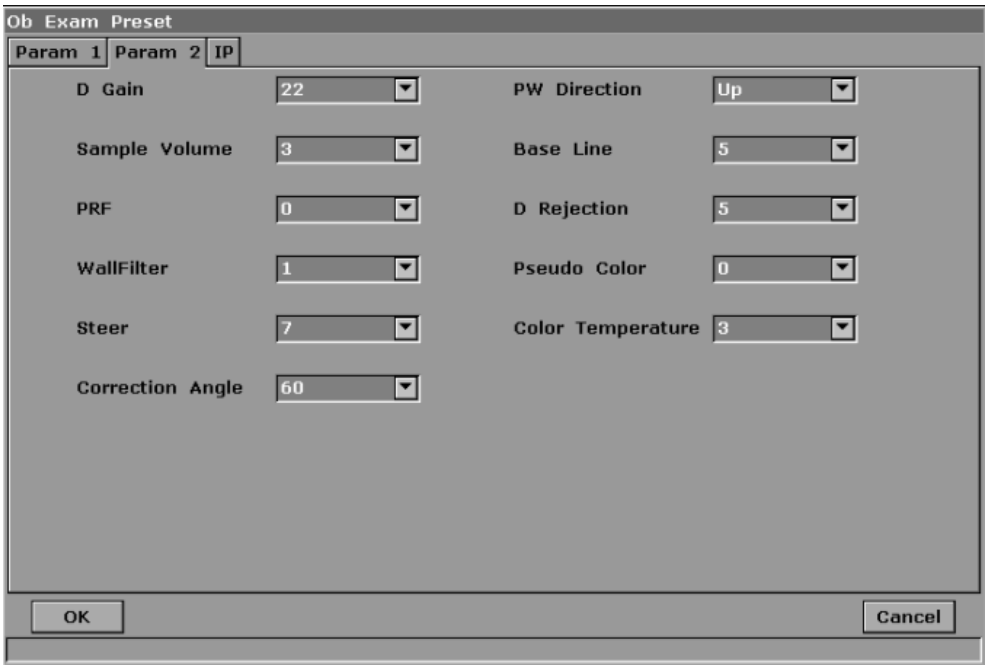


Figure 5-14 Obstetric Presetting – Parameter 2 Tab

Item	Setting	Allows you to
D gain	0~130	Set the gain of PW image, in 2 increments.
Sample volume	1~7	Set the size of the sample volume.
PRF	0~12	Set the level of PRF.
Wall filter	0~3	Set the level of wall filter.
PW direction	Up/down	Set the PW direction.
Steer	0~7	Set the position of the sample line (for linear probes).
Correction angle	15~165	Set the correction angle.
Base line	0~6	Set the base line position.
D rejection	0~7	Set the PW rejection.
Pseudo color	0~6	Set the colorization colors.
Color temperature	0~3	Set the color temperature.

Table 5-7 Obstetric Presetting Information – Parameter 2

IP Tab

NOTE: IP----Image Parameter

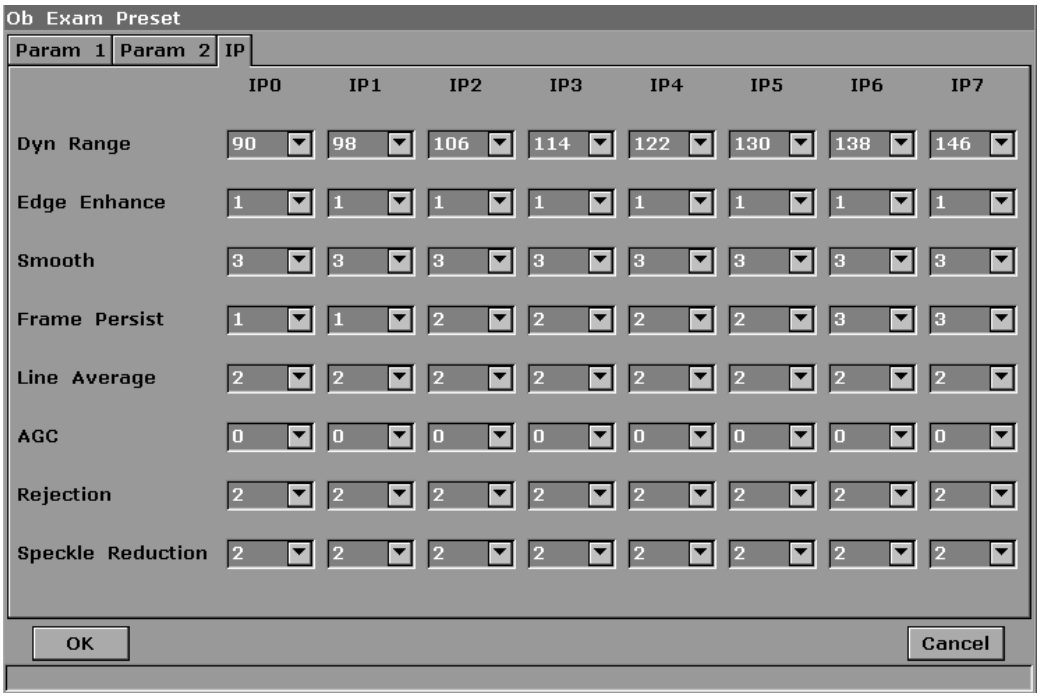


Figure 5-15 Obstetric Presetting – IP Tab

Item	Setting	Allows you to
Dynamic Range	30~150	Select the default dynamic range for the examination, in decibels (dB). During imaging, the dynamic range can be adjusted in 4 dB increments.
Edge Enhancement	0~7	Select the default amount of edge enhancement to be applied.
Smooth	0~7	Set image smoothing.
Frame Persist	0~7	Set image frame correlation.
Line Average	0~7	Set image line softening attribute.
AGC	0~3	Set Automatic Gain Control.
Rejection	0~7	Set image noise restrain attribute.
Speckle Reduction	0~7	Set image speckle reduction attribute.

Table 5-8 Obstetric Presetting Information – IP

5.7.5. Presetting Formula

In the preset menu, move the cursor to highlight **Formula** and press **Set** to display formula presetting dialog box, as shown below:

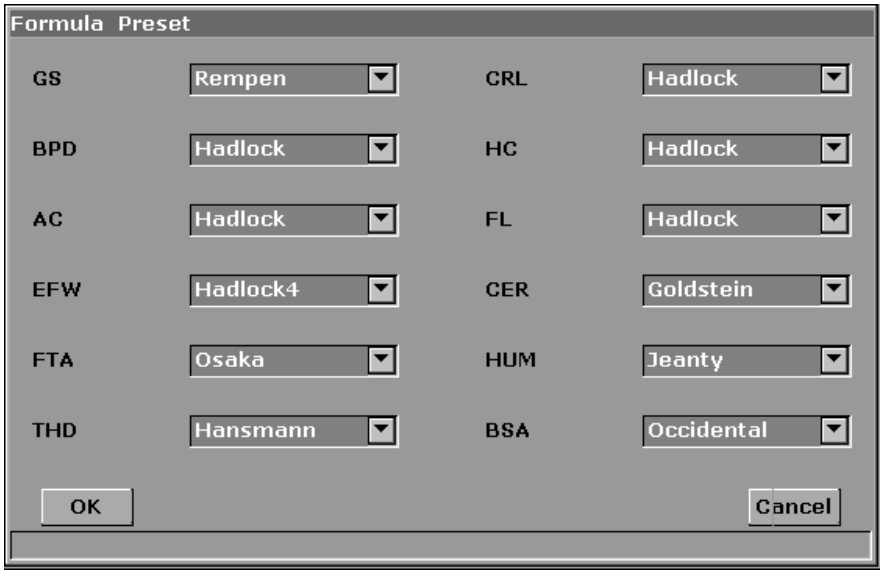


Figure 5-16 Formula Presetting

Parameter	References	Parameter	References
GS	Tokyo Hellman Rempen China	CRL	Tokyo Hadlock Hansmann China Robinson
BPD	Tokyo Hadlock Merz Rempen Osaka China	EFW	Tokyo Hadlock1 Hadlock2 Hadlock3 Hadlock4 Shepard Campbell Merz1 Merz2 Hansmann Osaka
AC	Hadlock Merz	FL	Tokyo Hadlock China Jeanty Merz Osaka
HC	Hadlock, Merz	HUM	Jeanty
FTA	Osaka	CER	Goldstein
THD	Hansmann	BSA	Oriental, Occidental

Table 5-9 Formula Presetting Information

5.7.6. Presetting Post Processing

The preset items include gray map, rejection and gamma correction.

In the preset menu, roll the trackball to highlight **Post-Proc** and press **Set**, and then display post processing presetting dialog box, as shown below:

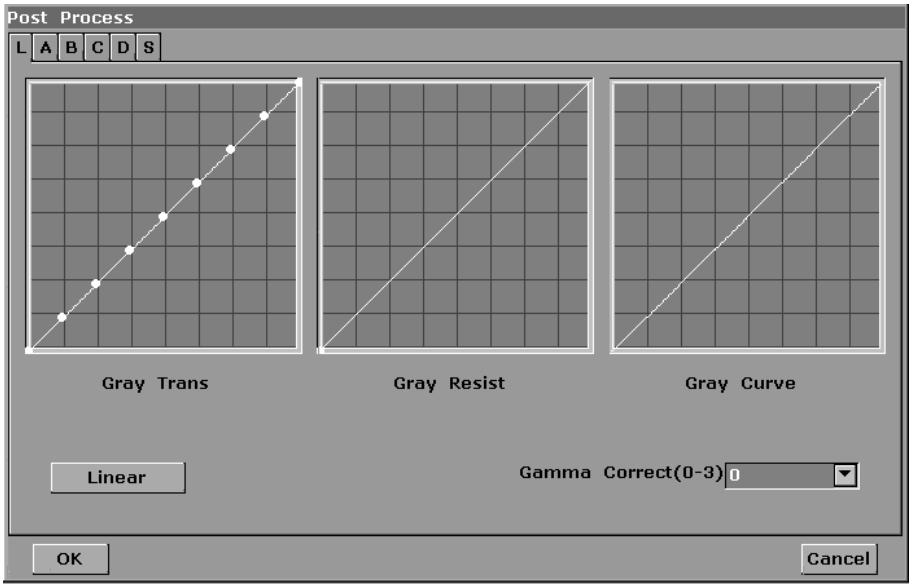


Figure 5-17 Post Processing Presetting

Gray transformation presetting

The gray transformation (Gray Trans) curve has nine infection round nodes. You can reposition them within a specific range to recalculate the curve and update the image.

To preset gray map (take map L for instance):

1. Move the cursor to one of the nine round nodes. Press **Set**, move the node with trackball to adjust the curve.
2. Press **Set** to complete the adjustment, and the Gray Curve is renewed simultaneously.
3. Adjust other nodes using the same method.
4. Roll the trackball to **Linear** and press **Set**. Then the gray map curve turns a 45° line, and the Gray Curve is renewed simultaneously.

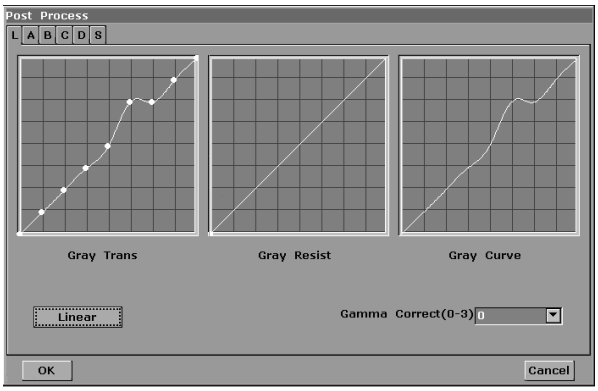


Figure 5-18 Gray Transformation Presetting

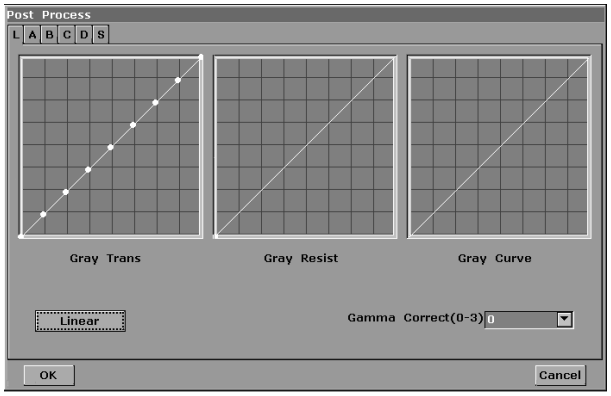


Figure 5-19 Gray Transformation Presetting ---Linear

5. Press **OK** to save the modification, or press **Cancel** to give up. At the same time, the dialog box is closed.

NOTE:

Linear is effective for changing the gray transformation curve only, having no effect on the resistance or gamma correction.

Gray resistance **presetting**

The gray resistance (Gray Resist) curve has one round node. You can reposition it within a specific range to recalculate the curve and update the image.

To preset rejection (take map L for instance):

Move the cursor to the node. Press **Set**, and move the node with trackball to adjust the gray resistance curve.

Press **Set** to complete the adjustment, and the result curve is renewed simultaneously.

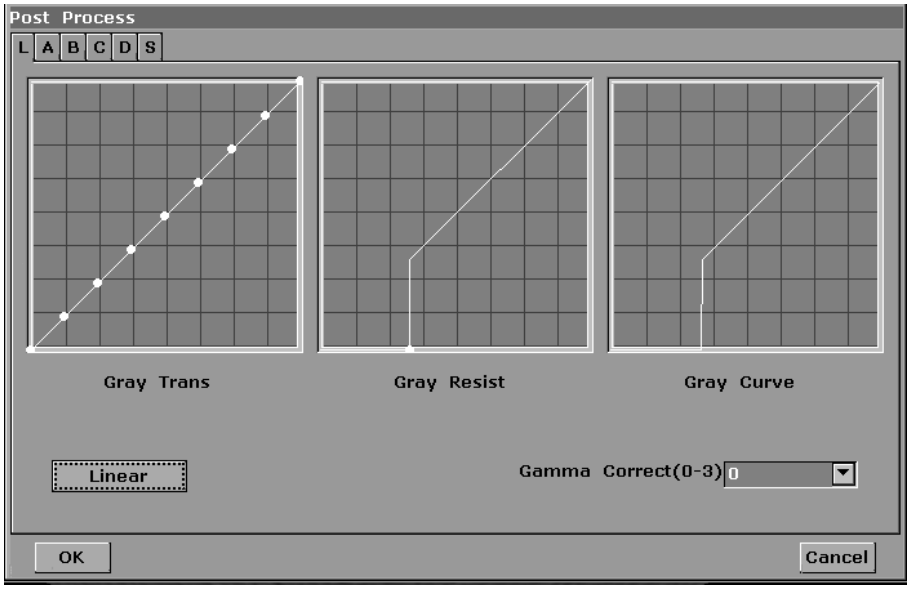


Figure 5-20 Gray Resistance Presetting

Press **OK** to save the modification, or **Cancel** to give up. At the same time, the dialog box is

closed.

Gamma correction presetting (γ correction):

γ correction has four levels: 0, 1, 2 and 3. You can select any one of the four levels.

5.7.7. Editing Comment Library

There are eight tabs of comment library: generic, abdomen 1, abdomen 2, obstetric, cardiac, small parts, lesion 1 and lesion 2. Each tab has a few sets of comments defined at factory, and you can create up to 6 user-defined comments for each tab. Creating a comment library for a patient report saves your time, especially for recurring examinations. You can quickly add a comment by using the comment library.

Operation procedure:

1. Press **Preset** on the keyboard to activate the presetting function.
2. Roll the trackball to highlight **Comment** and then press **Set**. Then the Comment Preset dialog box is displayed, as shown below:

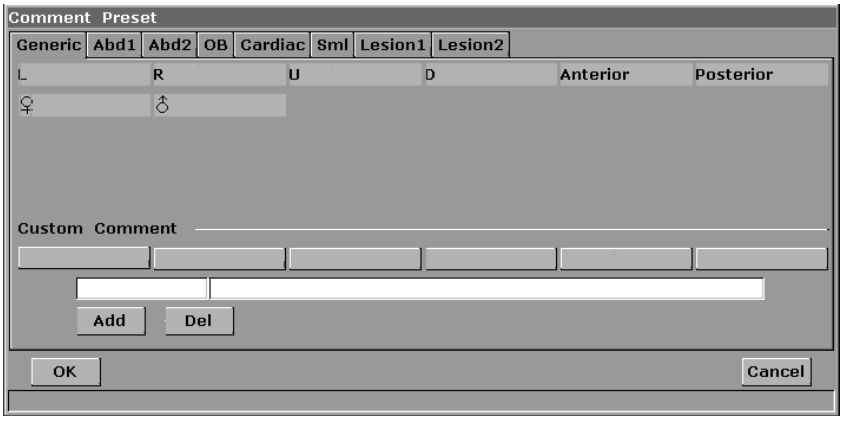


Figure 5-21 Comment Library Presetting

To create text for text list:

Take **Generic** for instance:

1. Press **Generic** to open the **Generic comment library**.
2. Roll the trackball to highlight one of the custom comments, and press **Set**.
3. Roll the trackball to highlight the left side frame of User-defined, and press **Set**. Then the cursor turns to "ı", as shown below. You can enter comment with the keyboard.

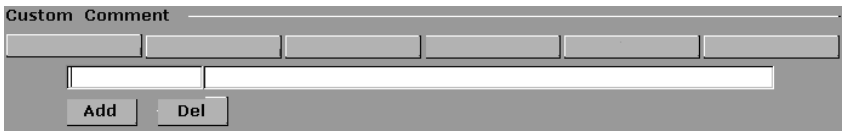


Figure 5-22 User-defined Comment Library

4. Roll the trackball to highlight the right side frame of User-defined, and press **Set**. Then the cursor turns to "I", as shown below. You can enter some detailed help information about the new created comment with the keyboard.

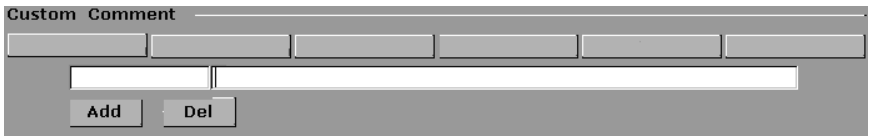


Figure 5-23 User-defined Detailed Information of Comment Library

5. Roll the trackball to highlight **Add** to add the new created comment to Generic.
6. Press **OK** to save the modification, or press **Cancel** to give up and close the dialog box.

To delete text from text list:

1. Press **Generic** to open the **Generic**.
2. Roll the trackball to highlight the created comment, and press **Set**.
3. Press **Del** to delete the created comment.
4. Press **OK** to save the modification, or press **Cancel** to give up and close the dialog box.

5.7.8. Presetting Data

The secondary menu of preset data is shown below: 

You can use this option to return to the factory default data.

5.7.9. Presetting DICOM

If you have installed the DICOM software, perform the DICOM presetting as shown below.

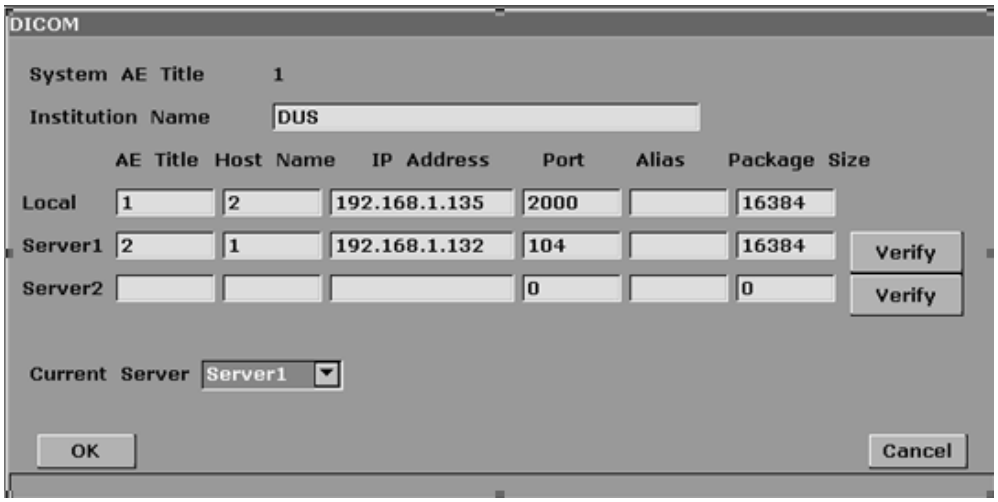


Figure 5-24 DICOM Presetting

Item	Description	
System AE Title	The same as the title set in the **AE Title** of **Local**	
Institution Name	Set the name of the institution	
Local	AE Title	Set the local AE title
	Host Name	Set the local host name
	IP Address	Set the local IP address
	Port	Set the local port
	Alias	Set the alias of the local system
	Package Size	Set the PDU transmission package size, from 4K to 64K, and the default value is **16K**.
Server 1/2	AE Title	Set the server AE title, the same as the **System AE Title** displays
	Host Name	Set the server host name
	IP Address	Set the server IP address
	Port	Set the server port
	Alias	Set the alias of the server
	Package Size	Set the PDU receiving package size, from 4K to 64K, and the default value is **16K**.
Verify	After presetting the server information, press **Verify** to verify the server's connection.	
Current Server	To choose the current server that is connected to the system.	

Table 5-10 DICOM Presetting Information

Press **OK** to save the presetting and exit, or **Cancel** to exit without saving the presetting.

NOTE:

1. Do not set a same IP Address for the local system and the server.
2. Ensure that you have turned on the server before verifying it.

5.7.10. Maintenance

The maintenance can be only done by EDAN authorized personnel.

5.8. Printing

To connect a video printer:

1. Connect **VIDEO IN** (video input) of the video printer to **VIDEO OUT** (video output) of the main unit.
2. Connect **REMOTE** of the video printer to **REMOTE** of the main unit.

3. Check the printer, referring to the printer user manual.
4. Make sure the **Report Printer** and **Print Report Image** options in the **General Presetting** window are set correctly.
5. Run the printer.

Video printing:

Press **Print** on the keyboard to print the image currently displayed.

To connect a USB printer:

1. Connect the USB printer via the USB port.
2. Check the printer, referring to the printer user manual.
3. Check the **Report Printer** and **Print Report Image** in general preset.
4. Enter the desired worksheet to edit the examination and diagnosis information.
5. Run the printer.

USB printing:

Press **Print** of the worksheet dialog box. Printer begins to print.

NOTE:

1. Before printing, make sure there is enough paper for printing.
2. Before printing, make sure the presetting printer type is correct.
3. Before printing, make sure the printer power cord and the USB cable are connected well.
4. Do not cut off the printer power supply or the USB cable during printing.
5. If the printer can not work normally, please restart the printer and the DUS 60.

Chapter 6 Operation

6.1. Entering New Patient

Press **New Patient** to clear all the information displayed on the screen, and then begin a new patient examination.

NOTE:

When you press **New Patient**, the system clears all the recent patient data, comments, measurements, calculations and worksheets, except saved images.

6.2. Entering or Editing Patient Information

Press **Patient Info.** to activate the patient data annotation function, and then enter or edit the patient data, as shown below:

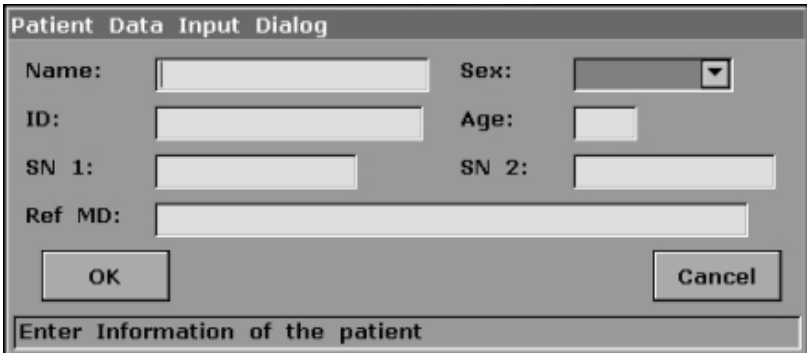


Figure 6-1 Patient Data Input Dialog Box

To switch the input text box: press **Enter**;

To enter the patient information, use the keyboard;

To exit: select **OK** or **Cancel**, and then press **Enter** or **Set**.

6.3. Selecting an Examination Type

Press **Exam** to select an examination type. You can change the examination type at any time by making a selection from the Exam Type menu list, as shown below. Roll the trackball to highlight an examination type and press **Set** to select.

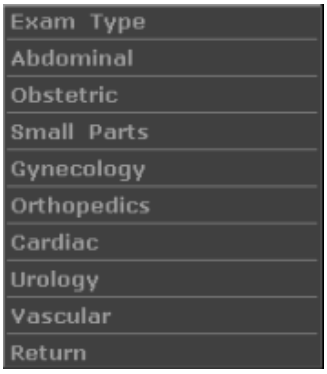


Figure 6-2 Examination Type Menu

6.4. Activating and Deactivating a Probe

While multiple probes are connected to the ultrasound system, only one can be activated at a time.

Press **Probe** repeatedly to cycle through the probes currently connected to the system. The model of the activated probe is displayed in the top right corner of the screen.

Press **Freeze** to activate or deactivate a probe.

WARNING

DO NOT activate intra-corporeal transducers outside the patient's body (such as E613UA and E743UA). Otherwise, EMC requirements will not be met and harmful interference to other devices in the environment may be caused.

NOTE:

1. You can preset the default probe for the corresponding examination type, see section *5.7.4. Presetting Examination*.
2. The surface temperatures of probes C363UA, C362UA, and C321UA are 47.2℃, 45.8℃, and 46.4℃ respectively when they work normally but don't contact with human body.

6.5. Selecting an Imaging Mode

You can select an imaging mode by pressing  ,  ,  ,  ,  , or  , and then begin an examination.

 Reference Section *5.4.7, Imaging functions* and section *5.2, Examining*.

6.6. Measurements and Calculations

Measurement and calculation functions are contained in each examination type and imaging

mode. Distance and circumference will be presented in mm; area, in mm^2, cm^2, or dm^2; volume, in mm^3, cm^3, dm^3, mL or L; time in ms or s, and heart rate in bpm, etc.

To activate the measurement function, press **Measure**, and the light will be on.

There is one type of mark in B mode measurement: "+".

There are three types of marks in M mode measurement: "+", big "+", and a line.

The measurement results will be displayed in real-time. After measurement, the outcome is displayed in measurement result window with a serial number. You can measure one to four groups of data. If you continue to measure, the earliest group will be automatically covered by the newest one.

NOTE:

1. If you perform the measurements in the frozen status, all the measurements will be cleared when you unfreeze the image.
2. During measurement, press **Back** to delete the previous operation.
3. After a complete measurement, press **Back** to erase a measurement at a time.

The generic measurements and calculations include four sets of measurement calipers, four sets of ellipses, four sets of measurement results at most.

The examination labels and results are shown in table 6-1.

Examination	Specific measurement labels	Result
Obstetric	B mode: GS, CRL, BPD, HC, AC, FL, AFI, TAD, APAD, CER, FTA, HUM, OFD, THD, and EFW	Fetus growth analysis curve and standard obstetric report
	PW mode: Velocity, Umb A, MCA, Fetal AO, Desc.AO, Placent A, Ductus V	
Cardiology	LV, RV, Mitral, Aorta, etc.	Cardiac report
Gynecology	B mode: UT, Endo, OV-Vol, FO, CX-L, UT-L/CX-L	Gynecology report
	PW mode: Velocity, L UT A, R UT A, L OV A, R OV A	
Small parts	THY	THY report
Urology	RUV and PV	Urology report
Vascular	PW mode: Velocity, CCA, ICA, ECA, Vert A	Vascular report
Orthopedics	HIP	HIP report
Abdominal	None	General report

Table 6-1 Examination Items and Results

The system-defined examinations are abbreviated as follows:

Abd: Abdominal; OB: Obstetric; Sml: Small Parts; Gyn: Gynecology; Ortho: Orthopedics

Urol: Urology; Vas: Vascular

6.6.1. Generic Measurements in B Mode

The default measurement of B mode is distance measurement. B mode measurement menus are shown as follows:

Figure 6-3 B Mode Generic Measurement and Calculation Menu

Distance

To measure distance:

1. Press **Measure** to activate measurement function.
2. Roll the trackball to highlight **Distance**, press **Set** to activate a measurement cursor "+" on the screen.
3. Roll the trackball and press **Set** to anchor the start point.
4. Roll the trackball and press **Set** to anchor the end point.
5. Roll the trackball and press **Set** to begin a new distance measurement. You can measure a maximum of four groups of data. The outcome will be displayed in the measurement result window, as shown below.
6. Press **Measure** to finish and exit.

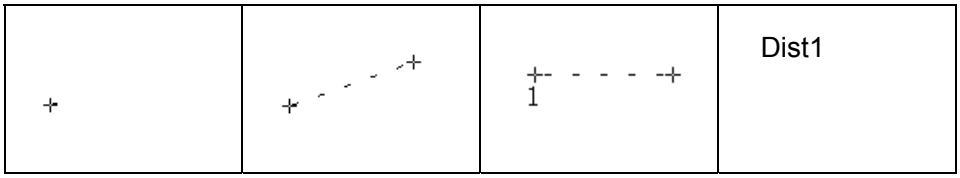


Figure 6-4 Distance Measurement and the Results

Circumference/Area

- **Ellipse Method**

To measure Circumference / Area:

1. Press **Measure** to activate measurement function.
2. Roll the trackball to highlight **Cir/Area**. Then select **Ellipse**, and press **Set** to activate a measurement cursor "+" on the screen.
3. Roll the trackball and press **Set** to anchor the start point of fixed axis of ellipse.
4. Roll the trackball and press **Set** to anchor the end point of fixed axis of ellipse.
5. Roll the trackball, and press **Set** to define the size of the ellipse.
6. Roll the trackball and press **Set** to begin a new circumference/area measurement. You can measure a maximum of four groups of data. The outcome will be displayed in the measurement result window, as shown below.
7. Press **Measure** to finish and exit.

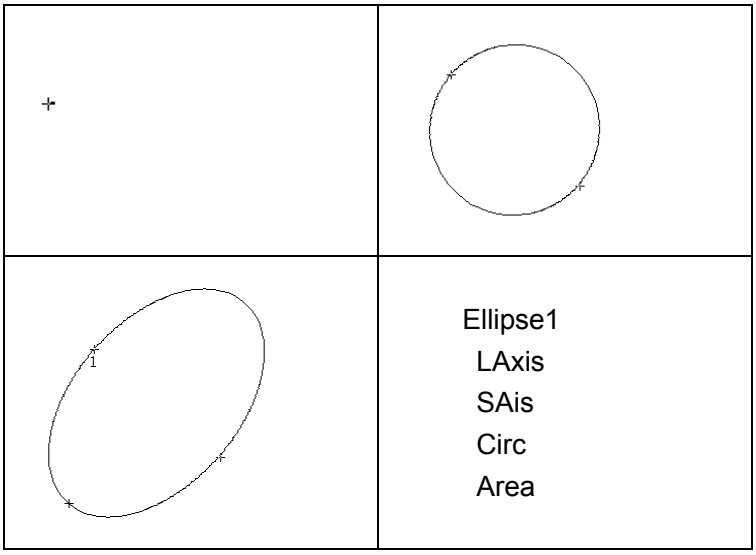


Figure 6-5 Ellipse Circumference/Area Method and the Results

- **Trace Method**

To measure Circumference / Area:

1. Press **Measure** to activate measurement function.
2. Roll the trackball to highlight **Cir/Area**. Then select **Trace**, and press **Set** to activate a measurement cursor on the screen.
3. Roll the trackball and press **Set** to anchor the start point.
4. Roll the trackball to outline the region of interest. As you move the

trackball, the system displays dots to outline the structure. To correct an error in the trace, press **Back** to move in reverse along the traced outline. Roll the trackball to move forward again. The system automatically closes the loop when the last measurement marker is moved very near to the start point. Or press **Set** to close the loop. The system draws a line from the position of the active measurement marker to the beginning of the loop.

5. Roll the trackball and press **Set** to begin a new circumference/area measurement. You can measure a maximum of four groups of data. The outcome will be displayed in the measurement result window, as shown below.

6. Press **Measure** to finish and exit.

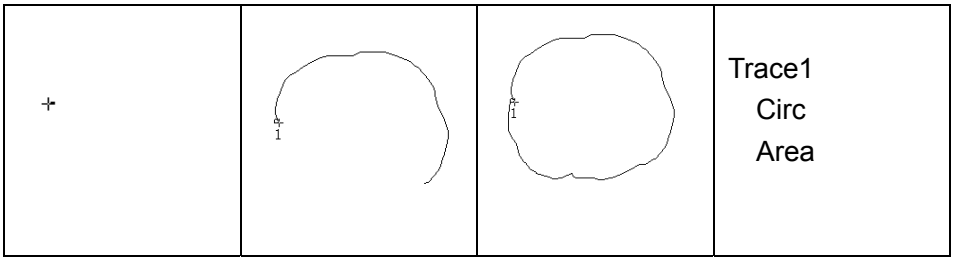


Figure 6-6 Trace Circumference/Area Method and the Results

Volume

- **2-Axis volume method**

$V= (\pi/6) \times A \times B^2$, (A: the length of major axis. B: the length of minor axis)

Two-axis volume method can be used to perform volume measurement by calculating only one set of measured data.

Operating Method:

The two-axis volume method is similar to the generic B mode Cir/Area measurement ellipse method. You can measure a maximum of four groups of data.

- **3-Axis method**

$V= (\pi/6) \times A \times B \times M$,

(A: the length of major axis. B: the length of minor axis. M: the length of the third axis.)

Three-axis method can be used to perform volume measurement by calculating two sets of measured data, EA and the length of the third axis. To complete volume measurement, first measure EA by ellipse method, and then measure the length of the third axis with the distance measurement method, and the value of volume will be displayed automatically.

To measure volume:

In the **B mode**

1. Obtain a cross-section image and freeze the system.
2. Measure the lengths of the major axis and the minor axis of the cross section with the ellipse method.
3. Unfreeze the system to acquire a new image (vertical-section image), and then freeze it.
4. Measure the length of the third axis in the vertical section image with the distance measurement method. You can measure a maximum of one group of data. The outcome will be displayed in the measurement result window.

In the **2B mode** or **4B mode**

To measure volume:

1. Obtain the cross-section image and the vertical-section image.
2. Measure the length of the major axis and the minor axis of the cross section with the ellipse method.
3. Roll the trackball to the next image, vertical section image, measure the length of the third axis with the distance measurement method. The outcome will be displayed in the measurement result window, as shown below.
4. Press **Measure** to finish and exit.

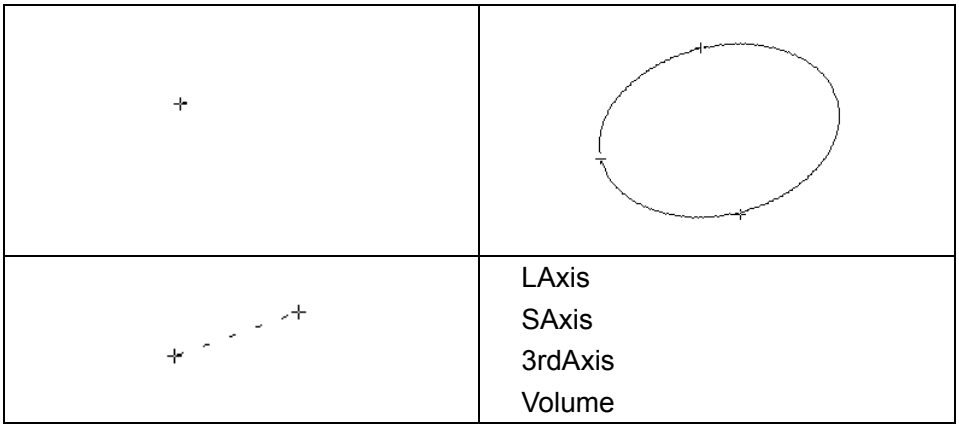


Figure 6-7 3-Axis Volume Method and the Results

- **3-Axis (LWH) method**

$V= (\pi/6) \times L \times W \times H$,

(L: the length. W: the width. H: the height.)

Three-axis (LWH) method can be used to perform volume measurement

by calculating 3 sets of distance data, L, W, and H. Measure the three pieces of data in the method of B mode generic distance measurement, and then the value of volume will be displayed automatically.

To measure volume:

In the **B mode**

1. Obtain a cross-section image and freeze the system.

2. Measure the length and the width.

3. Unfreeze the system to acquire a new image (vertical-section image), and then freeze it.

4. Measure the height. You can measure a maximum of one group of data. The outcome will be displayed in the measurement result window.

In the **2B mode** or **4B mode**

1. Obtain the cross-section image and the vertical-section image.

2. Measure the length and the width.

3. Roll the trackball to the next image, vertical section image, measure the height. The outcome will be displayed in the measurement result window, as shown below.

4. Press **Measure** to finish and exit.

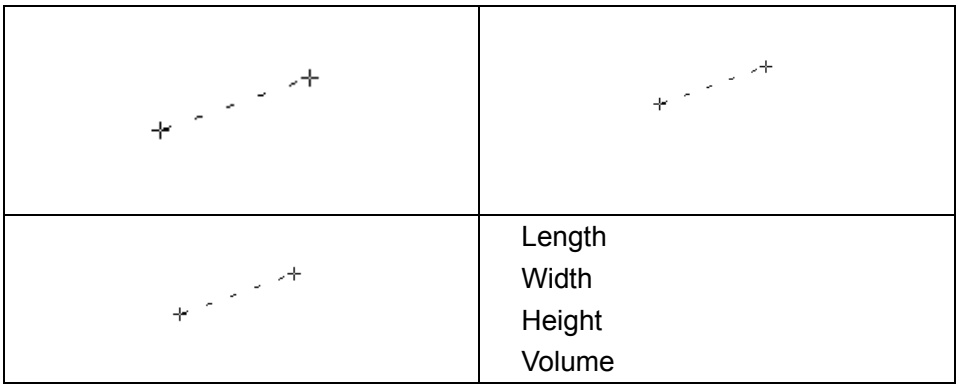


Figure 6-8 3-Axis (LWH) Volume Method and the Results

Ratio

To determine the ratio, take two measurements: A and B. The system calculates the ratio: A/B or B/A.

To measure ratio:

1. Press **Measure** to activate measurement function.
2. Roll the trackball to highlight **Ratio**, press **Set** to activate a measurement cursor on the screen.
3. Measure the first distance A with the distance measurement method.

4. Measure the second distance B, move the cursor and press **Set** to anchor the start point, and the mark "+" appears. Move the cursor with trackball, Measurement Results displays the real time measurement value and calculation result.
5. During measurement, you can press **Change** once to change the settled point and the active point; if you press **Change** a second time, the system interchanges the numerator and denominator.
6. Roll the trackball and press **Set** to complete the measurement, and the calculation result will be displayed in the measurement result window.
7. Roll the trackball and press **Set** to begin a new ratio measurement. You can measure a maximum of four groups of data. The outcome will be displayed in the measurement result window.
8. Press **Measure** to finish and exit.

Figure 6-9 Ratio Measurement and the Results

% Stenosis

- **Distance stenosis**

To determine the distance stenosis, take two distance measurements: A and B. The system calculates the stenosis: (A-B)/A * 100%.

To measure distance stenosis:

1. Press **Measure** to activate measurement function.
2. Roll the trackball to highlight **% Stenosis**, and select **Distance**, and then press **Set** to activate a measurement cursor on the screen.
3. Measure the first distance with the distance measurement method.
4. Measure the second distance, move the cursor and press **Set** to anchor the start point, and the mark "+" appears. Move the cursor with trackball, Measurement Results displays the real time measurement

value and calculation result.

5. During measurement, you can press **Change** to change the start point and the end point; if you press **Change** again, the system interchanges the numerator and denominator.
6. Roll the trackball and press **Set** to complete the measurement, and the calculation result will be displayed in the measurement result window.
7. Roll the trackball and press **Set** to begin a new stenosis measurement. You can measure a maximum of four groups of data. The outcome will be displayed in the measurement result window.
8. Press **Measure** to finish and exit.

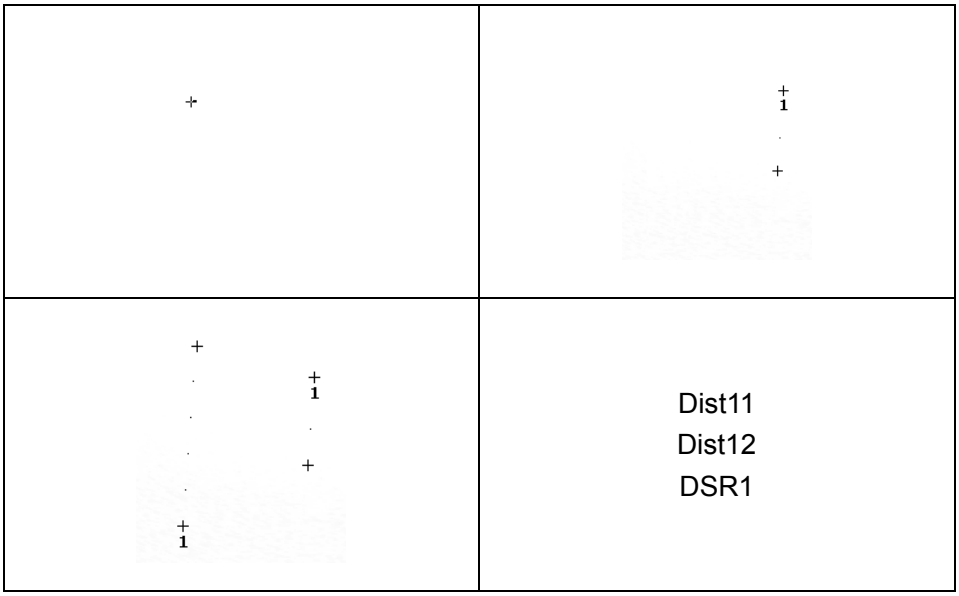


Figure 6-10 Distance Stenosis Measurement and the Results

- **Area stenosis**

To determine the area stenosis, take two area measurements: A and B. The system calculates the stenosis: (A-B)/A * 100%.

To measure area stenosis:

1. Press **Measure** to activate measurement function.
2. Roll the trackball to highlight **% Stenosis**, and select **Area**, and then press **Set** to activate a measurement cursor on the screen.
3. Measure the first area with the ellipse method.
4. Measure the second area, move the cursor and press **Set** to anchor the start point, and the mark "+" appears. Move the cursor with trackball, Measurement Results displays the real time measurement value and calculation result.
5. During measurement, you can press **Change** to change the start point

and the end point.

6. Roll the trackball and press **Set** to complete the measurement. You can measure a maximum of one group of data. The outcome will be displayed in the measurement result window.
7. Press **Measure** to finish and exit.

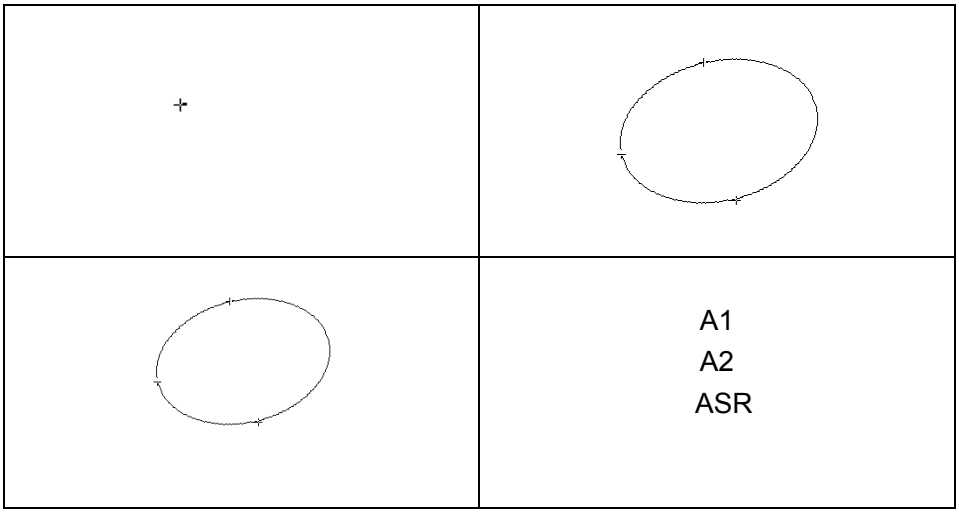


Figure 6-11 Area Stenosis Measurement and the Results

Angle

To determine an angle, draw two lines: A and B. The system calculates the angle.

To measure angle:

1. Press **Measure** to activate measurement function.
2. Roll the trackball to highlight **Angle**, and then press **Set** to activate a measurement cursor on the screen.
3. Draw the first line A with the distance measurement method.
4. Draw the second line B, move the cursor and press **Set** to anchor the start point, and the mark "+" appears. Move the cursor with trackball, Measurement Results displays the real time measurement value and calculation result.
5. During measurement, you can press **Change** to change the start point and the end point; if you press **Change** again, the system interchanges line A and line B.
6. Roll the trackball and press **Set** to complete this measurement.
7. Roll the trackball and press **Set** again to begin a new angle measurement. You can measure a maximum of four groups of data. The angles formed by the two lines are displayed in measurement result window, in units of degrees. The outcome will be displayed in

the measurement result window.

8. Press **Measure** to finish and exit.

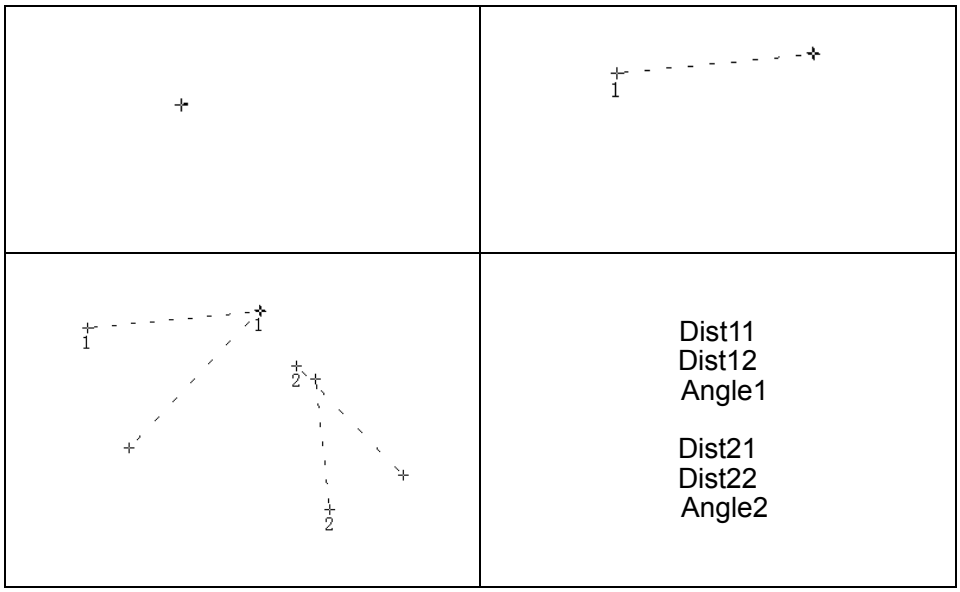


Figure 6-12 Angle measurement

Histogram

Freeze the image first before histogram measurement, otherwise the prompt “Image is not frozen, please freeze and retry!” will pop up.

1. Press **Measure** to activate measurement function.
2. Roll the trackball to highlight menu **Histogram**, and then press **Set** to activate a measurement cursor on the screen.
3. Roll the trackball, press **Set** to anchor the start point.
4. Roll the trackball, adjust the position and size of the histogram, and then press **Set** to anchor the end point.
5. During measurement, you can press **Change** to change the start point and the end point.
6. Roll the trackball and press **Set** again to begin a new histogram measurement. You can measure a maximum of four groups of data. The outcome is displayed in Measured Results.
7. Press **Measure** to finish and exit.

Others

Roll the trackball to highlight **Others** to select the desired measurements and calculations.

6.6.2. Generic Measurements in M Mode

M mode measurements and calculations include distance, time, slope and heart rate (2 cycles).

These are for B/M and M display modes only. The default measurement of B/M and M mode is heart rate measurement. M mode measurement menus are shown as follows:

Figure 6-13 M Mode Generic Measurement and Calculation Menu

Distance To measure distance:

1. Press **Measure** to activate a measurement cursor "+".
2. Roll the trackball to highlight **Distance** and press **Set**.
3. Roll the trackball and press **Set** to anchor the start point, and a big "+" is displayed.
4. Roll the trackball and press **Set** to anchor the end point.
5. Roll the trackball and press **Set** to begin a new distance measurement. You can measure a maximum of four groups of data. The outcome will be displayed in the measurement result window, as shown below.
6. Press **Measure** to finish and exit.

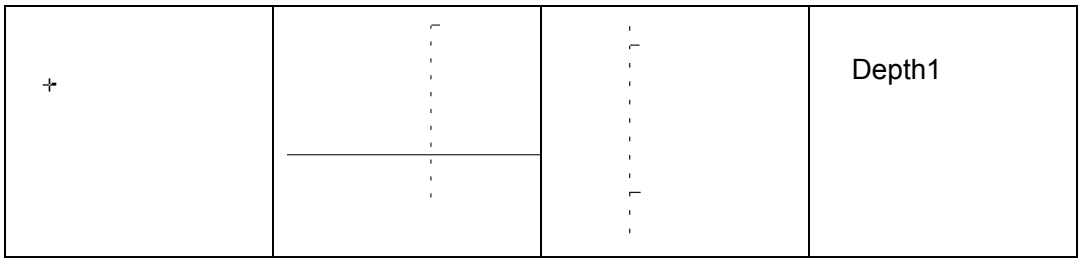


Figure 6-14 Distance Measurement and the Results

Time To measure time:

1. Press **Measure** to activate a measurement cursor "+".
2. Roll the trackball to highlight **Time** and press **Set**.
3. Roll the trackball to move the first measurement cursor at the beginning of the time interval and then press **Set**, and the measurement mark turns to a vertical line.
4. Roll the trackball to move the first measurement cursor at the end of the time interval and then press **Set**.
5. Roll the trackball and press **Set** to begin a new time measurement. You can measure a maximum of four groups of data. The outcome will be displayed in

the measurement result window, as shown below.

6. Press **Measure** to finish and exit.

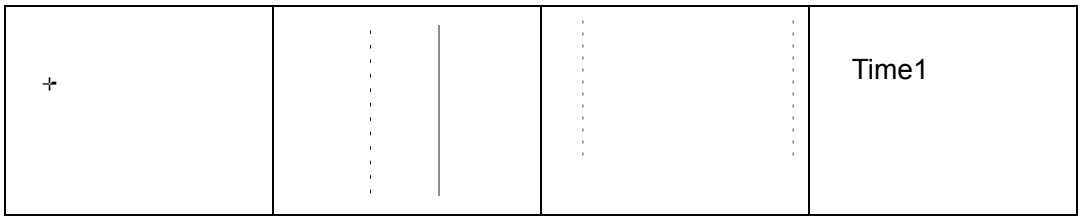


Figure 6-15 Time Measurement

Slope To measure slope:

1. Press **Measure** to activate a measurement cursor "+".
2. Roll the trackball to highlight **Slope** and press **Set** and a big "+" is displayed.
3. Roll the trackball and press **Set** to anchor the start point, and displays a big "+".
4. Roll the trackball and press **Set** to anchor the end point.
5. Roll the trackball and press **Set** to begin a new slope measurement. You can measure a maximum of four groups of data. The outcome will be displayed in the measurement result window, as shown below.
6. Press **Measure** to finish and exit.

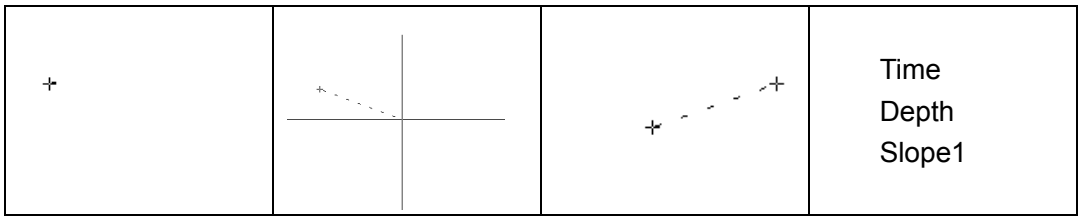


Figure 6-16 Slope Measurement and the Results

Heart Rate To measure heart rate:

1. In the **B/M mode**, roll the trackball to change the position of the M Mark and press **Set** to obtain a satisfying electrocardiogram, and then freeze it.
2. In the **M mode**, freeze the desired image.

Measure the distance between two peaks of cardiac cycles with the time measurement method.

1. Press **Measure** to activate a measurement cursor "+".
2. Roll the trackball to highlight **Heart Rate** and press **Set** and a "+" is displayed.
3. Roll the trackball to move the first measurement maker on the first peak systole and then press **Set** to anchor start position, and the measurement mark turns to a vertical line.
4. Roll the trackball to move the second measurement maker on the peak systole

following two complete cycles and then press **Set** to anchor end position.

5. Roll the trackball and press **Set** to begin a new heart rate measurement. You can measure a maximum of four groups of data. The outcome will be displayed in the measurement result window.
6. Press **Measure** to finish and exit.

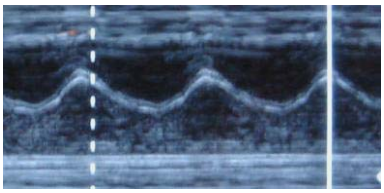


Figure 6-17 Heart Rate Measurement

NOTE:

In **B/M mode**, you should define the M Mark position, and then begin the measurement.

6.6.3. Generic Measurements in PW Mode

PW mode measurements and calculations include velocity, heart rate, time, acceleration, RI, and D trace. The default measurement is velocity measurement. The measurement menu is shown below.

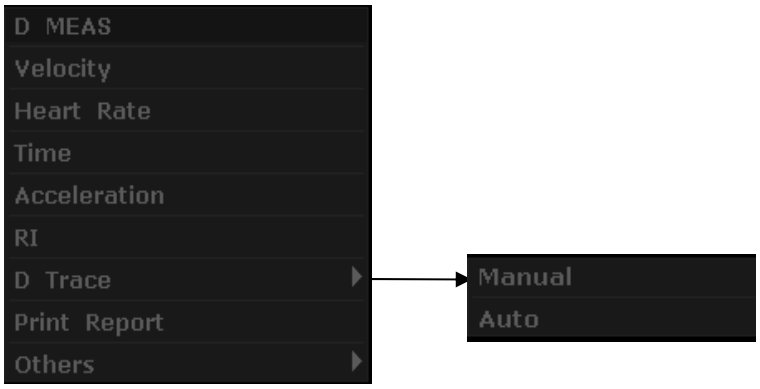


Figure 6-18 PW Mode Generic Measurement and Calculation Menu

NOTE:

Heart rate and time measurement methods are the same as those in the M mode.

Reference Section *6.6.2 Generic Measurements in M Mode.*

Velocity To measure velocity of a point on the Doppler wave:

1. Press **Measure** to activate a measurement cursor "+".
2. Roll the trackball to highlight **Velocity** and press **Set** and a "+" is displayed.
3. Roll the trackball and press **Set** to anchor the point, measuring velocity.

4. Roll the trackball and press **Set** to begin a new velocity measurement. You can measure a maximum of four groups of data. The outcome will be displayed in the measurement result window, as shown below.
5. Press **Measure** to finish and exit.

Acceleration

To measure velocities of two points on the Doppler wave, and calculate the acceleration:

Acceleration = (Vel1－Vel2) / Interval

1. Press **Measure** to activate a measurement cursor "+".
2. Roll the trackball to highlight **Acceleration** and press **Set** and a "+" is displayed.
3. Roll the trackball and press **Set** to anchor the first point, measuring **Vel1**.
4. Roll the trackball and press **Set** to anchor the second point, measuring **Vel2** and **Interval**, and calculating **Acceleration**.
5. Roll the trackball and press **Set** to begin a new acceleration measurement. You can measure a maximum of four groups of data. The outcome will be displayed in the measurement result window, as shown below.
6. Press **Measure** to finish and exit.

RI (Resistance Index)

To measure velocities of two peak points on the Doppler wave, and calculate RI and S/D:

RI = (Vel1－Vel2)/Vel1

1. Press **Measure** to activate a measurement cursor "+".
2. Roll the trackball to highlight **RI** and press **Set** and a "+" is displayed.
3. Roll the trackball and press **Set** to anchor the first peak point, measuring **Vel1**.
4. Roll the trackball and press **Set** to anchor the second peak point, measuring **Vel2**, calculating **RI**.
5. Roll the trackball and press **Set** to begin a new RI measurement. You can measure a maximum of four groups of data. The outcome will be displayed in the measurement result window.
6. Press **Measure** to finish and exit.

D Trace

The trace in PW mode is shown below:

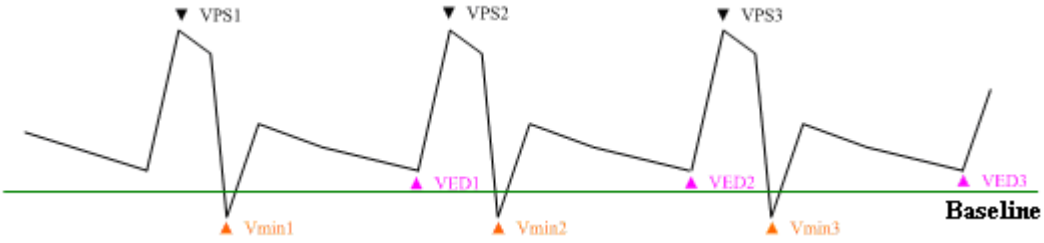


Figure 6-19 Trace Diagram

Where,

- VPS is the maximum velocity in the cycle;
- VED is the minimum velocity in the cycle;
- V_{min} is the minimum absolute value.

NOTE:

1. The trace function is effective above the baseline only.
2. Freeze the system before performing the tracing function.

- **To perform D Trace function (manual tracing)**

1. Press **Measure** to activate a measurement cursor "+".
2. Roll the trackball to highlight **D Trace** and press **Set**.
3. Select **Manual** and a "+" is displayed.
4. Roll the trackball and press **Set** to anchor the start point.
5. Roll the trackball to trace along the Doppler wave forward, or press **Back** to erase the trace backward.
6. Press **Set** to anchor the end point, the system displays the results of PS, ED, RI, etc. in measurement result window.
7. Roll the trackball and press **Set** to begin a new tracing measurement. You can measure a maximum of four groups of data. The outcome will be displayed in the measurement result window.
8. Press **Measure** to finish and exit.

- **To perform D Trace function (automatic tracing)**

1. Press **Measure** to activate a measurement cursor "+".
2. Roll the trackball to highlight **D Trace** and press **Set**.
3. Select **Auto** and a big "+" is displayed.
4. Roll the trackball and press **Set** to anchor the start point.
5. Roll the trackball press **Set** to anchor the end point, the system displays the results of PS, ED, RI, etc. in measurement result window.

6. Roll the trackball and press **Set** to begin a new tracing measurement. You can measure a maximum of four groups of data. The outcome will be displayed in the measurement result window.
7. Press **Measure** to finish and exit.

6.6.4. General Report

To preview the general ultrasound report:
Highlight **Print Report** in the B MEAS menu (B Mode Generic Measurement and Calculation Menu), and press **Set** to display the **general worksheet** dialog box, as shown below:

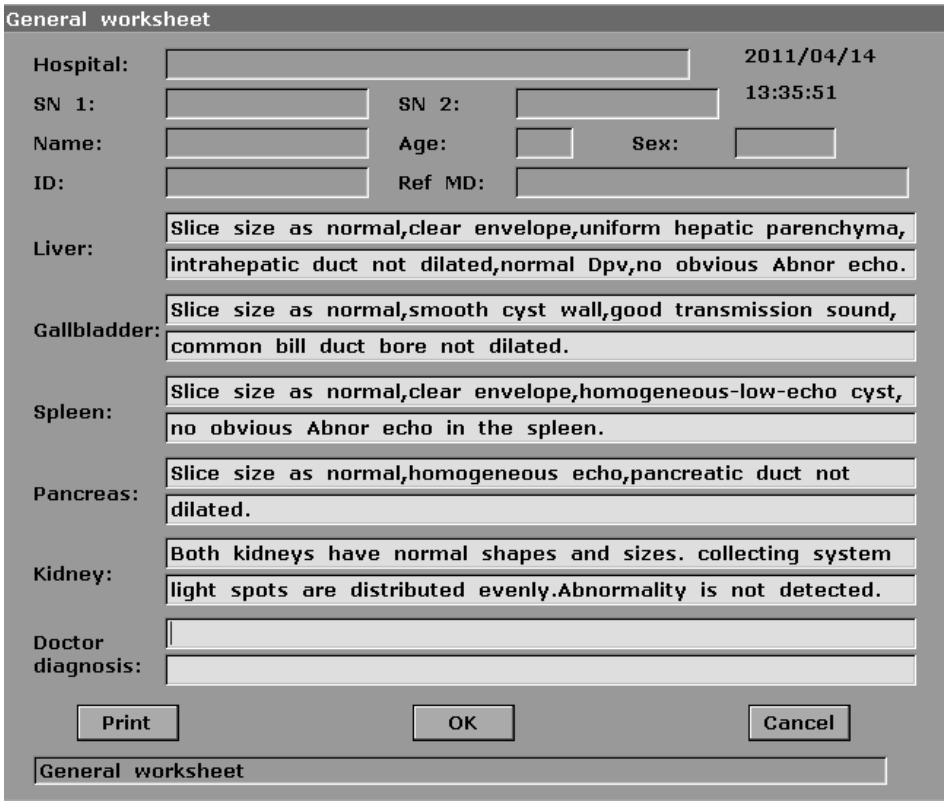


Figure 6-20 General Worksheet

To edit the general ultrasound report:

Move the trackball to the text box and edit the report, and select **OK** to save the report and close the dialog box.

To print the general ultrasound report:

Press **Print** in the General worksheet dialog box.

Printing reference Section *5.8, Printing*.

6.7. CINE Review

The system provides a storage capacity of 256 frames for CINE Review playback.

Activate the device and enter the real-time B, B/B, 4B, B/M, or PW scanning mode. Enable the system to collect images before CINE Review playback. The cine function includes frame-by-frame playback (manual playback) and motion playback (automatic playback). The cine review symbol is displayed on the bottom of the screen, as shown below:

Figure 6-21 CINE Review Symbol

To perform the CINE Review playback:

1. Press **Freeze** to freeze the image, and the system displays the cine menu, as shown below:

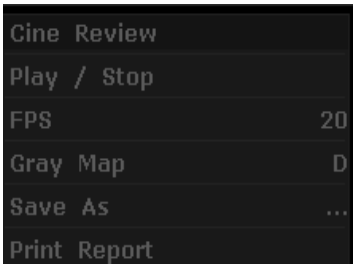


Figure 6-22 Cine Review Menu

2. Roll the trackball to start playing back frame by frame. Roll the trackball to the right to advance the cine data one frame at a time, or to the left to move the data in reverse. The arrow on the CINE Review Symbol indicates the direction toward which the data is moving. The loop of data wraps around when either end is reached. As the trackball is moved, the current cine number is displayed on the right of the CINE Review Symbol.
3. Press **Cine** to exit frame-by-frame playback mode and enter the motion playback mode.
4. In motion playback mode, press **Play/Stop** to play or to stop.
5. Press **Cine** to go back to the frame-by-frame mode.
6. Press **Freeze** to exit the CINE Review playback.

The default setting is to load images by serial numbers forward. When the number reaches the last, it will return to 1.

During playing back, press **Save As** to save the file in BMP, JPG, RFM, DCM, CIN or AVI format. You can save files to the local disk or U disk. For details about operation method, please refer to 6.8.1 “Saving Files”

NOTE:

1. Cine review is unavailable in M-mode.

2. Cine review can't be performed at the beginning of scanning or probe switching. You should wait until 30 seconds later.
3. The FPS (frames per second) is adjustable, from 5 to 50, in increments of 5.
4. After opening a cine file, you can perform measurements, add comments and the body mark on the image and print them in the report. See section *5.4.5 Comment function* and section *5.4.6. Body mark function* for detailed operation information.

6.8. File Management

Press **File** to display the file menu, shown as below.

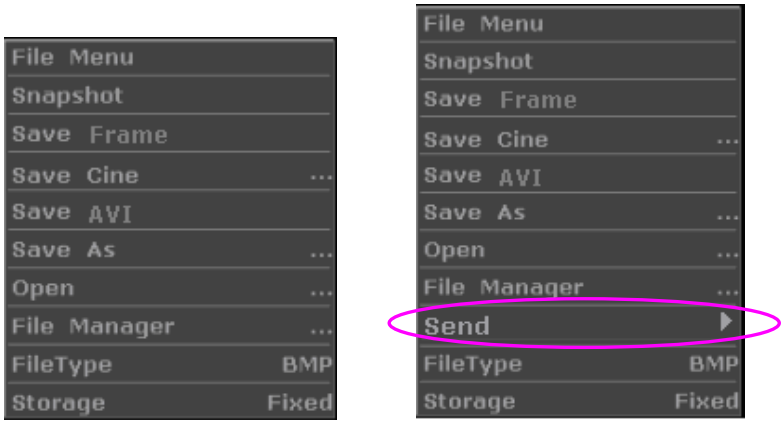


Figure 6-23 File Menu (the left—with no DICOM installed, the right—with DICOM installed)

6.8.1. Saving Files

File types:

The file types include BMP, JPG, DCM (if DICOM is installed), CIN, FRM, and AVI.

To choose a storage disk:

The storage disk can be set to **Fixed** or **USB-Disk** by the **Storage** option in the file menu.

To choose a storage disk: highlight **Storage** in the file menu and press **Set** repeatedly to cycle between **Fixed** and **USB-Disk**.

NOTE:

1. After connecting a removable disk, the interface displays a USB symbol on the bottom left corner.
2. Please do not use the two USB ports at a time, otherwise, the system may fail to read / write data.

To set a file type:

The **File Type** in the file menu means the file type for the quick saved images.

To choose a file type for the quick saved images: highlight **File Type** in the file menu and press

Set repeatedly to cycle between **JPG**, **BMP**, **FRM and DCM** (if DICOM is installed).

To save a file:

The system provides two ways to save images:

- Press **Quick Save** on the keyboard;

  Press **Quick Save** on the keyboard to save the current displaying image in BMP, JPG, FRM or DCM (if DICOM is installed) format (set by **File Type** in the file menu, as shown above).

- Use **Snapshot**, **Save Cine**, **Save As**, **Save Frame** or **Save AVI** of the file menu to save files.

  - **Snapshot**

    Highlight **Snapshot** in the file menu and press **Set** to save the current displaying image in BMP, JPG, FRM or DCM (if DICOM is installed) format (set by **File Type** in the file menu, as shown above).

  - **Save Frame**

    1. Press **Freeze** to freeze the system;
    2. Play back and find the desired image;
    3. Press **File** to open the file menu;
    4. Highlight **Save Frame** in the file menu, and press **Set** to save the current displaying image.

  - **Save Cine**

    1. Press **Freeze** to freeze the system;
    2. Press **File** to open the file menu;
    3. Highlight **Save Cine** in the file menu, and press **Set**.

  - **Save AVI**

    1. Press **Freeze** to freeze the system;
    2. Press **File** to open the file menu;
    3. Highlight **Save AVI** in the file menu, and press **Set**.

NOTE:

The AVI files can not be viewed on this system, please use a U disk to copy the AVI files to a PC, and view them by using the WINDOWS RealPlayer.

➢ **Save As**

When obtaining a satisfying image:

1. Press **File** and select **Save As…**in the file menu to display the **File Save As** dialog box.
2. Choose the driver and the file type.
3. Press **Set** on the pane next to **File Name**, and use the keyboard to enter a file name with a maximum of ten characters.
4. Press **OK** to save.

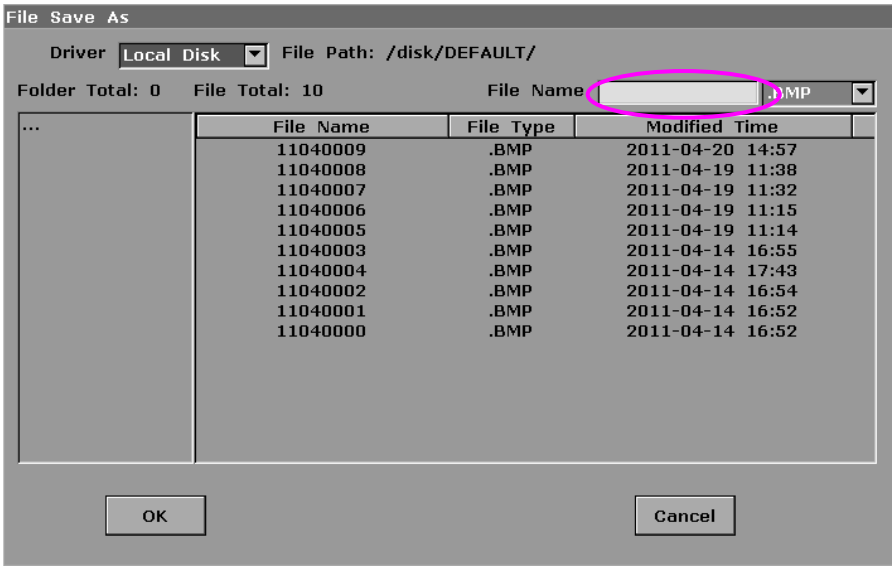


Figure 6-24 File Saving Dialog Box

NOTE:

If you do not enter the name for the file, the system will automatically number the file in sequence. For instance, if the latest number comes to YYMM0020 (“Y” stands for “year”, and “M” stands for “month”), and if you save a file the next time, the file is numbered as YYMM0021.

When saving a file, the saving information is automatically displayed in the middle of image area.

6.8.2. Opening Files

Press **File** in the real-time or freezing mode, and the system displays the file menu. Then select **Open** and press **Set** to display an **Open File** dialog box, as shown below.

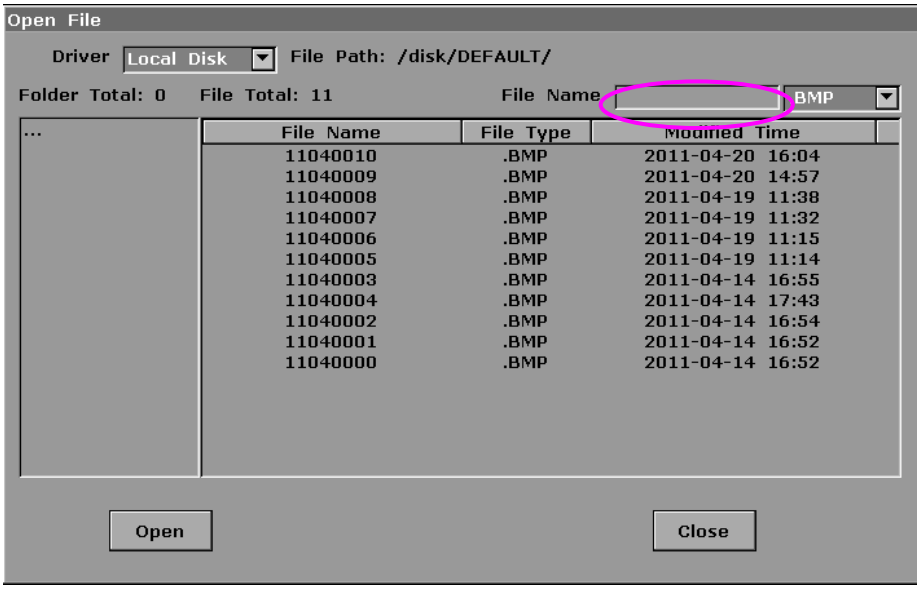


Figure 6-25 File Opening Dialog Box

The default driver is the local disk, and the default file type is **.BMP**. The file types include BMP, JPG, FRM, DCM, and CIN. Pressing the symbol "▼" to display the driver or the file type, and then roll the trackball to choose one.

Select a desired file name or enter a file name, and press **Open**, or double-click on a file name, the system begins to load the corresponding image. A prompt instruction ***Loading file…*** is displayed in the middle of the screen. Then the prompt instruction disappears and the system displays the designated image.

NOTE:

1. Images that have not yet been saved in the saving zone can not be loaded.
2. When saving or loading an image is still in process (prompt instruction *Saving file…* or *Loading file…*), please do not perform any other operation. This is to avoid damaging the device.
3. You should freeze the system before opening Cine images.

6.8.3. Browsing Images

After you open an image, press << on the bottom of the screen to open the previous image, and >> to open the next image; press Play to perform automatic browsing, and press Stop to stop automatic browsing; press Exit or **Esc** to exit.

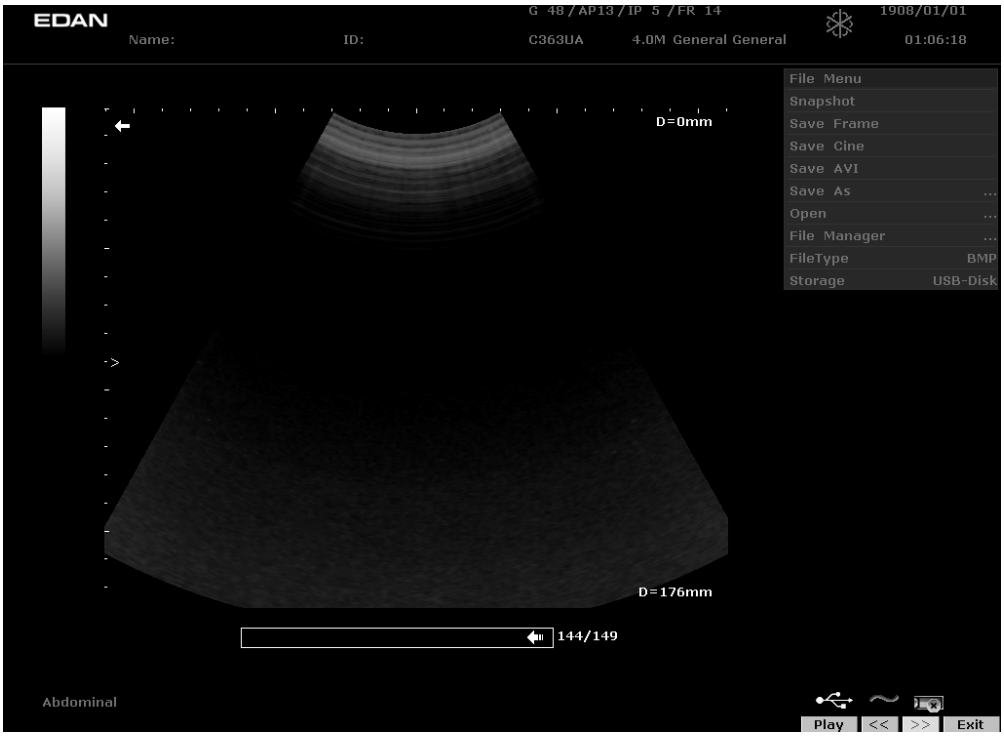


Figure 6-26 Image Browsing Dialog Box

NOTE:

The JPG, BMP, and DCM (if DICOM is installed) images are available to the browsing function.

6.8.4. File Manager

The file manager dialog box is shown as below.

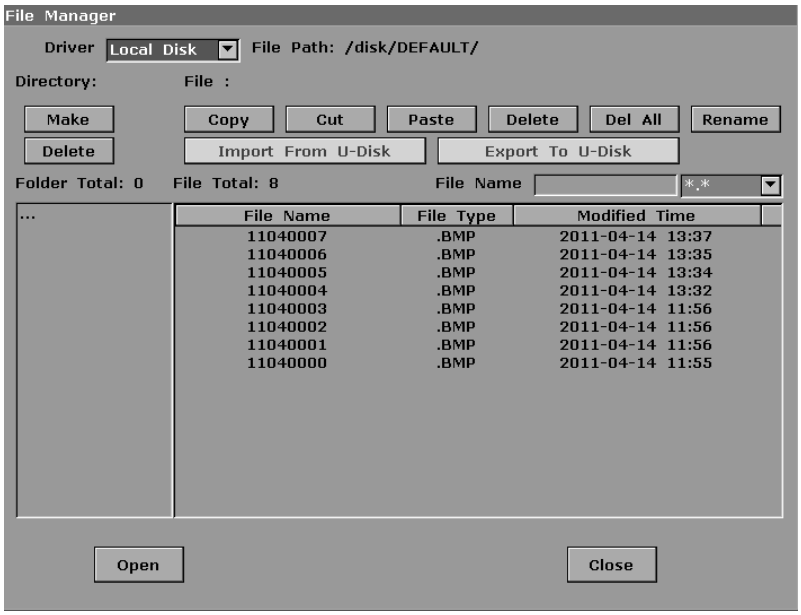


Figure 6-27 File Manager Dialog Box

You can use the file manager to perform the file management. After you open an image, you can perform the image viewing as shown in section 6.8.3.

NOTE:

1. When you are copying & pasting a file, cutting & pasting a file, importing a file or exporting a file, do not connect or disconnect the U disk.
2. USB disk must be in FAT32 format.
3. Do not use the U disk for other uses, but only for this device. Otherwise the storage and the transmission function may not be stable.
4. We suggest that you use the Netac U disk: Netac U180 (2G).

To create a file folder

1. Roll the trackball to select the driver and then press **Set**.
2. Press **Make** and a dialog box pops up. Enter the file folder name.
3. Press **Confirm** to create a file folder, or **Cancel** to give up the creating operation.

To delete a file folder

1. Roll the trackball to select the driver and then press **Set**.
2. Roll the trackball to select the file folder to be deleted, and then press **Set**.
3. Press **Delete**, and a confirmation dialog box is displayed to ask you whether to delete the file folder.
4. Press **Yes** to delete the designated file folder, or **No** to give up the deleting operation

To copy & paste a file:

1. Roll the trackball to select the source driver and the type of file, and then press **Set**.
2. Roll the trackball to highlight the source file, and press **Set**, and then press **Copy**.
3. Roll the trackball to select the destination driver and press **Set**.
4. Press **Paste**.

To cut & paste a file:

1. Roll the trackball to select the driver and the type of file, and then press **Set**.
2. Roll the trackball to highlight the file that will be cut, and press **Set**, and then press **Cut**.
3. Roll the trackball to select the destination driver and press **Set**.
4. Press **Paste**.

To delete a file:

1. Roll the trackball to select the driver and the type of file, and then press **Set**.
2. Roll the trackball and then press **Set** to select the file you want to delete.
3. Press **Delete**, and a confirmation dialog box is displayed to ask you whether to delete the file.
4. Press **Yes** to delete the designated file, or **No** to give up the deleting operation.

To delete all:

1. Roll the trackball to select the driver and the type of file, and then press **Set**.
2. Press **Del All**, and confirmation dialog box is displayed to ask you whether to delete all the files.
3. Press **Yes** to delete all the files, or **No** to give up the deleting operation.

To rename a file:

1. Roll the trackball to select the driver and the type of file, and then press **Set**
2. Roll the trackball and press **Set** to select the file you want to rename.
3. Press **Rename** to open the dialog box to enter the new name of the file using the keyboard, with a maximum of eight characters.
4. Press **OK** to rename the designated file, or **Cancel** to give up the renaming operation.

To import from U-disk:

You can use the **Import From U-Disk** button to import all the files from the U disk to the local disk.

To export to U-disk:

You can use the **Export To U-Disk** button to export all the files from local disk to a U disk.

6.8.5. Sending Files

If you have installed the DICOM software, and the DICOM presetting has been performed correctly, you can send images / files.

Figure 6-28 File Menu (with DICOM Function)

To send a DCM Image

1. Highlight the secondary menu **DCM Image**, and then press **Set**.

2. If the server is running normally, the current image will be sent to the server.

3. The system displays a prompt indicating the successful transmission.

To send a DCM file

1. Highlight the secondary menu **DCM File**, and then press **Set**.
2. The system displays the File Opening Dialog Box for selecting a DCM file to be transmitted.
3. If the server is running normally, the selected file will be sent to the server.
4. The system displays a prompt indicating the successful transmission.

To send a DCM package

1. Highlight the secondary menu **DCM package**, and then press **Set**.
2. The system displays the File Opening Dialog Box for selecting the driver.
3. If the server is running normally, all the DCM files of the selected driver will be sent to the server.
4. The progress bar disappears after successful transmission.

To send Cine Images

1. Freeze the system.
2. Press **File** to enter the file menu.
3. Highlight the secondary menu **Cine Images**, and then press **Set**.
4. If the server is running normally, the current Cine images will be sent to the server.
5. The progress bar disappears after successful transmission.

To send a Cine File

1. Highlight the secondary menu **Cine File**, and then press **Set**.
2. The system displays the File Opening Dialog Box for selecting a cine file to be transmitted.
3. If the server is running normally, the selected file will be sent to the server.
4. The progress bar disappears after successful transmission.

Chapter 7 Obstetric Measurements and Calculations

The obstetric examination is usually in the B mode and the PW mode.

7.1. Obstetric Measurements and Calculations in B Mode

To enter B mode obstetric examination:

1. Press **Exam** and select **Obstetric**, and then press **Set**.
2. Press  to enter B mode.
3. Press **Measure** to activate the measurement function. The system displays the measurement menu as shown in figure 7-1.

Items of Measurement and Calculation:

B-OB MEAS: GS, CRL, BPD, HC, AC, FL, EFW, and AFI.

B-OB MEAS 2: TAD, APAD, CER, FTA, HUM, OFD, THD and FBP.

Figure 7-1 Obstetric Measurement and Calculation Menu in B mode

Items of input: LMP and BBT

Fetus growth is usually measurement by the following parameters.

Abbreviations:

- EDC: Estimated Date of Confinement
- MA: Menstrual Age
- LMP: Last Menstrual Period
- BBT: Basal Body Temperature

◆ EFW: Estimated Fetal Weight

B-OB MEAS: the default measurement is distance measurement.

Label	Description	Channel	Method	Results display
GS	Gestational Sac Diameter	1	Distance (mm)	The measurement results will be displayed in the result window.
CRL	Crown Rump Length	1		
BPD	Biparietal Diameter	1		
HC	Head Circumference	1	Ellipse or Trace Circumference (mm)	
AC	Abdominal Circumference	1		
FL	Femur Length	1	Distance (mm)	
AFI	Amniotic Fluid Index	1	Calculating AFI requires 4 sets of distance measurement data, AF1, AF2, AF3, and AF4.	
EFW	Estimated Fetal Weight	1	According to the selected formula, described as follows. (g or kg)	

Table 7-1 Obstetric Measurements 1 in B Mode

B-OB MEAS 2: the default measurement is TAD measurement.

Label	Description	Channel	Method	Results display
TAD	Transverse Abdominal Diameter	1	Distance (mm)	The measurement results will be displayed in the result window.
APAD	Antero Posterior Diameter of the Abdomen	1		
CER	Cerebellum Diameter	1		
FTA	Fetus Trunk cross section Area	1	Ellipse or Trace Area (mm^2 or dm^2)	
HUM	Humerus Length	1	Distance (mm)	
OFD	Occipital Frontal Diameter	1		
THD	Thorax Diameter	1		
FBP	Fetal Biophysical Profile	1		

Table 7-2 Obstetric Measurements 2 in B Mode

The system will calculate MA and AVE EDC automatically after measuring each parameter.

7.1.1. GS

To measure GS (use the Maximum diameter method):

1. Press **Measure** to activate obstetric measurement.
2. In the obstetric menu, roll the trackball to highlight the menu **GS**, press **Set**, and move the cursor to image and display "+".
3. Measure GS, in the method of distance measurement.

 Reference Section 6.6.1, Generic Measurements in B Mode

4. The results are displayed in measurement result window.
5. To begin a new GS measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

7.1.2. CRL

To measure CRL:

1. Press **Measure** to activate obstetric measurement.
2. In the obstetric menu, roll the trackball to highlight the menu **CRL**, press **Set**, and move the cursor to image and display "+".
3. Measure CRL, in the method of distance measurement.

 Reference Section 6.6.1, Generic Measurements in B Mode

4. The results are displayed in measurement result window.
5. To begin a new CRL measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

7.1.3. BPD

To measure BPD:

1. Press **Measure** to activate obstetric measurement.
2. In the obstetric menu, roll the trackball to highlight the menu **BPD**, press **Set**, and move the cursor to image and display "+".

3. Measure BPD, in the method of distance measurement.

 Reference Section 6.6.1, Generic Measurements in B Mode

4. The results are displayed in measurement result window.
5. To begin a new BPD measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

7.1.4. HC

To measure HC:

1. Press **Measure** to activate obstetric measurement.
2. In the obstetric menu, roll the trackball to highlight the menu **HC**, press **Set**, and move the cursor to image and display "+".
3. Measure HC, in the method of ellipse or trace circumference measurement.

 Reference Section 6.6.1, Generic Measurements in B Mode

4. The results are displayed in measurement result window.
5. To begin a new HC measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

7.1.5. AC

To measure AC:

1. Press **Measure** to activate obstetric measurement.
2. In the obstetric menu, roll the trackball to highlight the menu **AC**, press **Set**, and move the cursor to image and display "+".
3. Measure AC, in the method of ellipse or trace circumference measurement.

 Reference Section 6.6.1, Generic Measurements in B Mode

4. The results are displayed in measurement result window.
5. To begin a new AC measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

7.1.6. FL

To measure FL:

1. Press **Measure** to activate obstetric measurement.
2. In the obstetric menu, roll the trackball to highlight the menu **FL**, press **Set**, and move the cursor to image and display "+".
3. Measure FL, in the method of distance measurement.


Reference Section 6.6.1, Generic Measurements in B Mode

4. The results are displayed in measurement result window.
5. To begin a new FL measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

7.1.7. AFI

To measure AFI:

1. Press **Measure** to activate obstetric measurement.
2. In the obstetric menu, roll the trackball to highlight the menu **AFI**, press **Set**, and move the cursor to image and display "+".
3. Measure four groups of AF, in the method of distance measurement.


Reference Section 6.6.1, Generic Measurements in B Mode

4. The results, AF1, AF2, AF3, AF4, and AFI are displayed in measurement result window.
5. To begin a new AFI measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

7.1.8. TAD

To measure TAD:

1. Press **Measure** to activate obstetric measurement.
2. In the obstetric menu, roll the trackball to highlight the menu **TAD**, press **Set**, and move the cursor to image and display "+".
3. Measure TAD, in the method of distance measurement.

 Reference Section 6.6.1, Generic Measurements in B Mode

4. The results are displayed in measurement result window.
5. To begin a new TAD measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

7.1.9. APAD

To measure APAD:

1. Press **Measure** to activate obstetric measurement.
2. In the obstetric menu, roll the trackball to highlight the menu **APAD**, press **Set**, and move the cursor to image and display "+".
3. Measure APAD, in the method of distance measurement.

 Reference Section 6.6.1, Generic Measurements in B Mode

4. The results are displayed in measurement result window.
5. To begin a new APAD measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

7.1.10. CER

To measure CER:

1. Press **Measure** to activate obstetric measurement.
2. In the obstetric menu, roll the trackball to highlight the menu **CER**, press **Set**, and move the cursor to image and display "+".
3. Measure CER, in the method of distance measurement.

 Reference Section 6.6.1, Generic Measurements in B Mode

4. The results are displayed in measurement result window.
5. To begin a new CER measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

7.1.11. FTA

To measure FTA:

1. Press **Measure** to activate obstetric measurement.
2. In the obstetric menu, roll the trackball to highlight the menu **FTA**, press **Set**, and move the cursor to image and display "+".
3. Measure FTA, in the method of ellipse or trace area measurement.

 Reference Section 6.6.1, Generic Measurements in B Mode

4. The results are displayed in measurement result window.
5. To begin a new FTA measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

7.1.12. HUM

To measure HUM:

1. Press **Measure** to activate obstetric measurement.
2. In the obstetric menu, roll the trackball to highlight the menu **HUM**, press **Set**, and move the cursor to image and display "+".
3. Measure HUM, in the method of distance measurement.

 Reference Section 6.6.1, Generic Measurements in B Mode

4. The results are displayed in measurement result window.
5. To begin a new HUM measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

7.1.13. OFD

To measure OFD:

1. Press **Measure** to activate obstetric measurement.
2. In the obstetric menu, roll the trackball to highlight the menu **OFD**, press **Set**, and move the cursor to image and display "+".
3. Measure OFD, in the method of distance measurement.

 Reference Section 6.6.1, Generic Measurements in B Mode

4. The results are displayed in measurement result window.
5. To begin a new OFD measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

7.1.14. THD

To measure THD:

1. Press **Measure** to activate obstetric measurement.
2. In the obstetric menu, roll the trackball to highlight the menu **THD**, press **Set**, and move the cursor to image and display "+".
3. Measure THD, in the method of distance measurement.

 Reference Section 6.6.1, Generic Measurements in B Mode

4. The results are displayed in measurement result window.
5. To begin a new THD measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

7.1.15. FBP

To measure AF:

1. Press **Measure** to activate obstetric measurement.
2. In the obstetric menu, roll the trackball to highlight the menu **FBP**, select **AF** and press **Set**.
3. Measure AF, in the method of distance measurement.

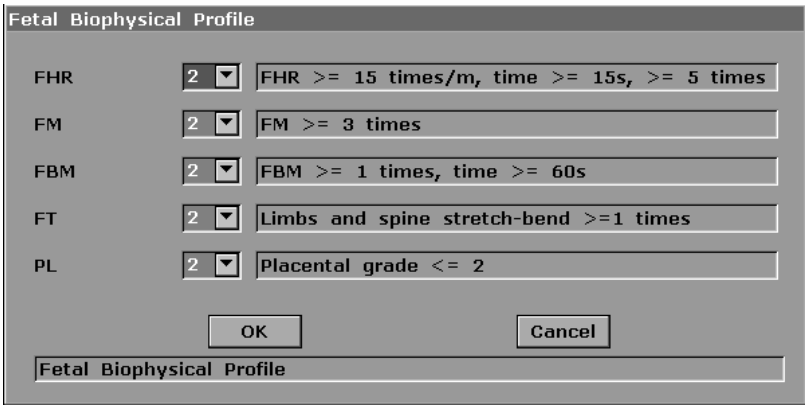
 Reference Section *6.6.1, Generic Measurements in B Mode*

4. The results are displayed in Measured Results window.
5. To begin a new AF measurement, repeat steps 1 through 3. Otherwise the system will return to the default measurement of TAD.

Fetal Biophysical Profile

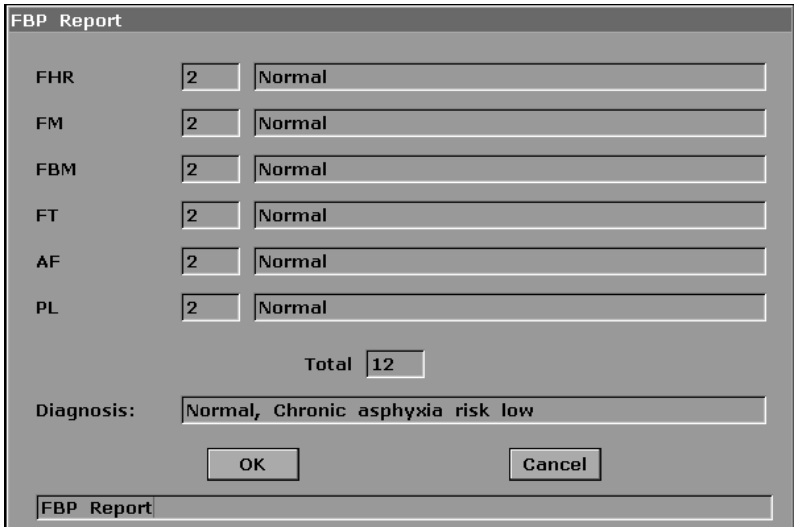
1. Press **Measure** to activate obstetric measurement.
2. In the obstetric menu, roll the trackball to highlight the menu **FBP**, select **Key In** and press **Set**.

3. The Fetal Biophysical Profile window displays as the following figure shows. Select the parameters from the pull-down menu of FHR, FM, FBM, FT and PL, and then press **OK** to confirm, the biophysical evaluation result will be displayed in the FBP Report.



FBP Report

1. In the obstetric menu, roll the trackball to highlight the menu **FBP**, select **FBP Report** and press **Set** to get the FBP report window.



2. Press **Cancel** to exit.

NOTE: To get the Total result in the FBP report, you have to measure the AF and input the fetal biophysical profile and save them.

7.1.16. EDC Calculation

EDC Calculation by LMP

To calculate EDC according to LMP:

1. In the obstetric menu, roll the trackball to highlight the menu **Input**, and it will display secondary menu automatically, as shown below:

Figure 7-2 Obstetric Input Items

2. Select LMP and press Set, and the LMP input dialog box will be displayed on the screen.

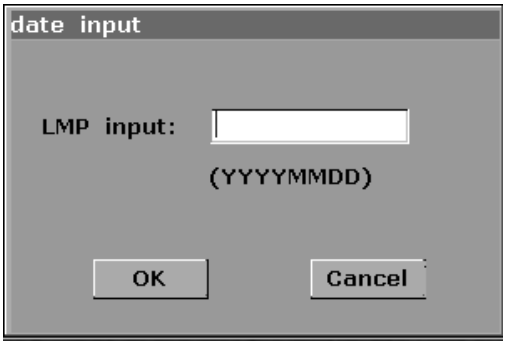


Figure 7-3 LMP Input Dialog Box

3. Enter the LMP in YYYYMMDD ("Y" stands for "year", "M" stands for "month", and "D" stands for "day") format with the keyboard.
4. Select **OK** and press **Set** to perform the calculation automatically, or **Cancel** to give up the calculation.

EDC Calculation by BBT

To calculate EDC according to BBT:

1. In the obstetric menu, roll the trackball to highlight **Input**, and the system will display the secondary menu automatically.
2. Select **BBT** in the list of input items and press **Set**, and the **BBT input** dialog box will be displayed.

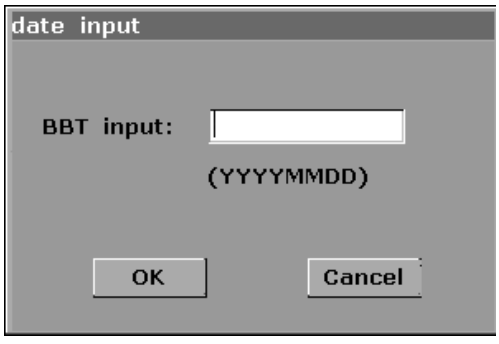


Figure 7-4 BBT Input Dialog Box

3. Enter the BBT in YYYYMMDD ("Y" stands for "year", "M" stands for "month", and "D" stands for "day") format with the keyboard.
4. Select **OK** and press **Set** to do the calculation automatically, or **Cancel** to give up the calculation.

NOTE:

1. For EDC calculation, make sure that the system date is correct. The default standard pregnancy period in the system is 40 weeks. For the LMP method calculation, if the interval between the input date and the current system date exceeds 40 weeks, the system will not accept it. For the BBT method calculation, if the interval between the input date and the current system date exceeds 266 days, system will not accept it.
2. The date format of EDC here accords with what you have set in General Presetting window.

7.1.17. EFW Calculation

This system can calculate EFW according to the measured data corresponding to different formulas.

Select a Formula in Preset

This system provides eleven types of EFW formula, as shown below.

Options	Formula	
Tokyo	EFW = 1.07* (BPD^3)+3.42*APTD*TTD*FL EFW: g; Others: cm	
Osaka	EFW = 1.25674* (BPD^3)+3.50665*FTA*FL+6.3 EFW: g; FTA: cm^2; Others: cm	
HADLOCK1	EFW = 10^{1.304+ (0.05281*AC)+ (0.1938*FL)- (0.004*FL*AC)}	EFW: g; Others: cm
HADLOCK2	EFW = 10^{1.335- (0.0034*AC*FL)+ (0.0316*BPD)+ (0.0457*AC) + (0.1623*FL) }	
HADLOCK3	EFW = 10^{1.326- (0.00326*AC*FL)+ (0.0107*HC)+ (0.0438*AC) + (0.158*FL) }	
HADLOCK4	EFW = 10^{1.3596- (0.00386*AC*FL)+ (0.0064*HC)+ (0.00061*BPD*AC) + (0.0424*AC)+ (0.174*FL) }	
Shepard	EFW = 10^{-1.7492+ (0.166*BPD)+ (0.046*AC) - (2.646*AC*BPD/1000)} EFW: kg; Others: cm	
Merz1	EFW = (-3200.40479+ (157.07186*AC)+{15.90391* (BPD^2)}	EFW: g; Others: cm
Merz2	EFW = 0.1* (AC^3)}	
Hansmann	EFW = (-1.05775*BPD+0.0930707* (BPD^2) + {0.649145*THD) - 0.020562* (THD^2) +0.515263	EFW: kg; Others: cm
Campbell	EFW = EXP{-4.564+ (0.282*AC)-[0.00331* (AC^2)]}	

Table 7-3 Obstetric Calculation Formula

Measurement

Measurement items vary with formulas. So you should perform the measurement items according to the preset formula.

Take Osaka formula for instance, to calculate EFW:

EFW = 1.25674* (**BPD**^3) + 3.50665***FTA*****FL**+6.3

1. In the obstetric menu, roll the trackball to highlight **EFW**, and then press **Set**.
2. Use the distance measurement method to measure **BPD**.
3. Use the ellipse method to measure **FTA**.
4. Use the distance measurement method to measure **FL**, and the result of EFW will be displayed in the measurement result window.

7.2. Obstetric Measurements and Calculations in PW mode

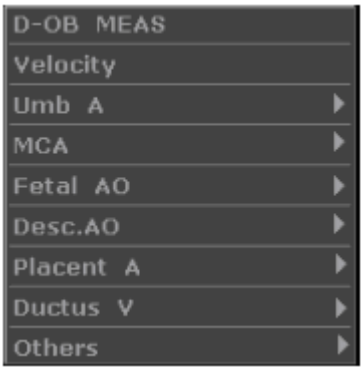
1 Press **Exam** and select **Obstetric** and then press **Set**.

2 Press  to enter the PW mode.

3 Press **Measure** to activate the measurement function. The system displays the measurement menu shown as below.

Items of Measurement and Calculation

Umb A, MCA, Fetal AO, Desc.AO, Placent A, and Ductus V.



Secondary menu of the obstetric measurement items in the PW mode:

Figure 7-5 Obstetric Measurement and Calculation Menu in PW mode

Label	Description	Channel	Method
Umb A	Umbilical Artery	1	D trace
MCA	Middle Cerebral Artery	1	
Fetal AO	Fetal Aorta	1	
Desc.AO	Descending Aorta	1	
Placent A	Placent Aorta	1	
Ductus V:	Ductus Venosus	1	

Table 7-4 Obstetric Measurements in PW Mode

7.2.1. Umb A

To measure Umb A:

1. Press **Measure** to activate obstetric measurement.
2. In the obstetric menu, select **Umb A**.

3. Measure **Umb A**, in the method of D trace measurement.

 Reference Section 6.6.3, Generic Measurements in PW Mode

4. The results are displayed in measurement result window.
5. To begin a new **Umb A** measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

7.2.2. MCA

To measure MCA :

1. Press **Measure** to activate obstetric measurement.
2. In the obstetric menu, select **MCA**.
3. Measure **MCA**, in the method of D trace measurement.

 Reference Section 6.6.3, Generic Measurements in PW Mode

4. The results are displayed in measurement result window.
5. To begin a new **MCA** measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

7.2.3. Fetal AO

To measure Fetal AO:

1. Press **Measure** to activate obstetric measurement.
2. In the obstetric menu, select **Fetal AO**.
3. Measure **Fetal AO**, in the method of D trace measurement.

 Reference Section 6.6.3, Generic Measurements in PW Mode

4. The results are displayed in measurement result window.
5. To begin a new **Fetal AO** measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

7.2.4. Desc.AO

To measure Desc. AO:

1. Press **Measure** to activate obstetric measurement.
2. In the obstetric menu, select **Desc. AO**.
3. Measure **Desc. AO**, in the method of D trace measurement.

Reference Section 6.6.3, Generic Measurements in PW Mode

4. The results are displayed in measurement result window.
5. To begin a new **Desc. AO** measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

7.2.5. Placent A

To measure Placent A:

1. Press **Measure** to activate obstetric measurement.
2. In the obstetric menu, select **Placent A**.
3. Measure **Placent A**, in the method of D trace measurement.

Reference Section 6.6.3, Generic Measurements in PW Mode

4. The results are displayed in measurement result window.
5. To begin a new **Placent A** measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

7.2.6. Ductus V

To measure Desc. AO:

1. Press **Measure** to activate obstetric measurement.
2. In the obstetric menu, select **Desc. AO**.
3. Measure **Desc. AO**, in the method of D trace measurement.

Reference Section 6.6.3, Generic Measurements in PW Mode

4. The results are displayed in measurement result window.

5. To begin a new **Desc. AO** measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

7.3. Results

Obstetric results include **Growth Curve** and **OB Worksheet**.

7.3.1. Growth Curve

You can define the fetus growth by comparing the measured parameter value with the fetus growth curve.

Operation procedure:

1. Measure one or more fetus growth parameter (GS, CRL, BPD, FL, AC, HC, APAD, TAD, CER, FTA, HUM, OFD, or THD).
2. Enter LMP or BBT.
3. In the obstetric menu, roll the trackball to highlight **Results**, and the secondary menu will be displayed. Then select **Growth Curve** and press **Set**, and the Fetus Growth Analysis dialog box will be displayed in the middle of the screen.
4. The default tab is GS and the corresponding formula of the current growth curve. Move the cursor to another formula in the pull-down menu, and press **Set** to display the normal growth curve based on the selected formula, which can define how the fetus grows.
5. Move the cursor to another tab in the pull-down menu, and press **Set** to display the growth curve of another measurement item and the phase of the growth corresponding to the measured data.

The signification of the growth curves is shown below and the x-coordinate shows the phase of the growth corresponding to the entered LMP or BBT, and the y-coordinate shows the measured data.

Move the cursor to **Close**, and press **Set** to exit.

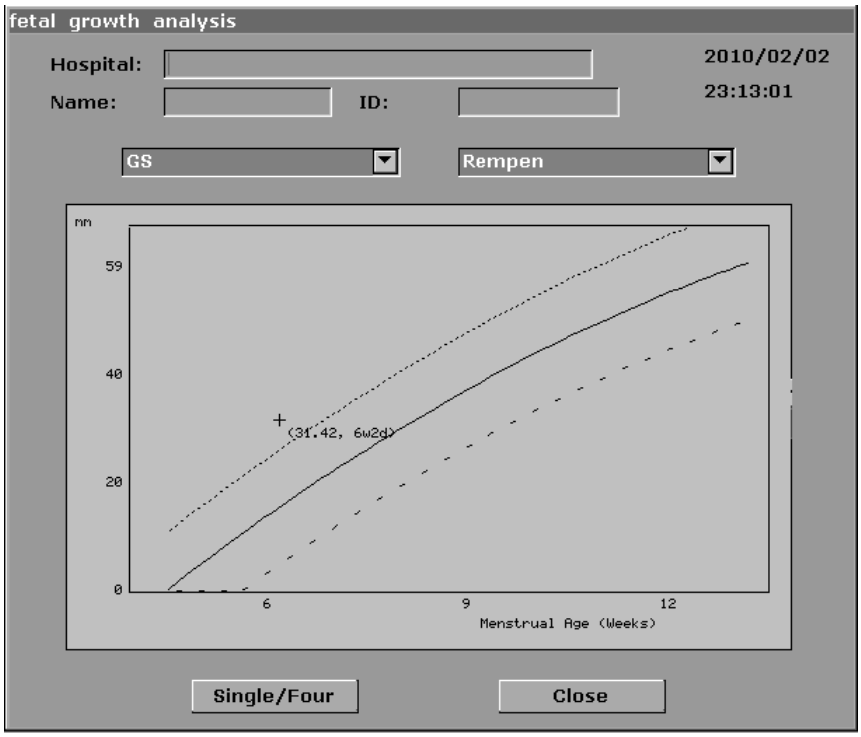


Figure 7-6 Fetal Growth Curve (Single)

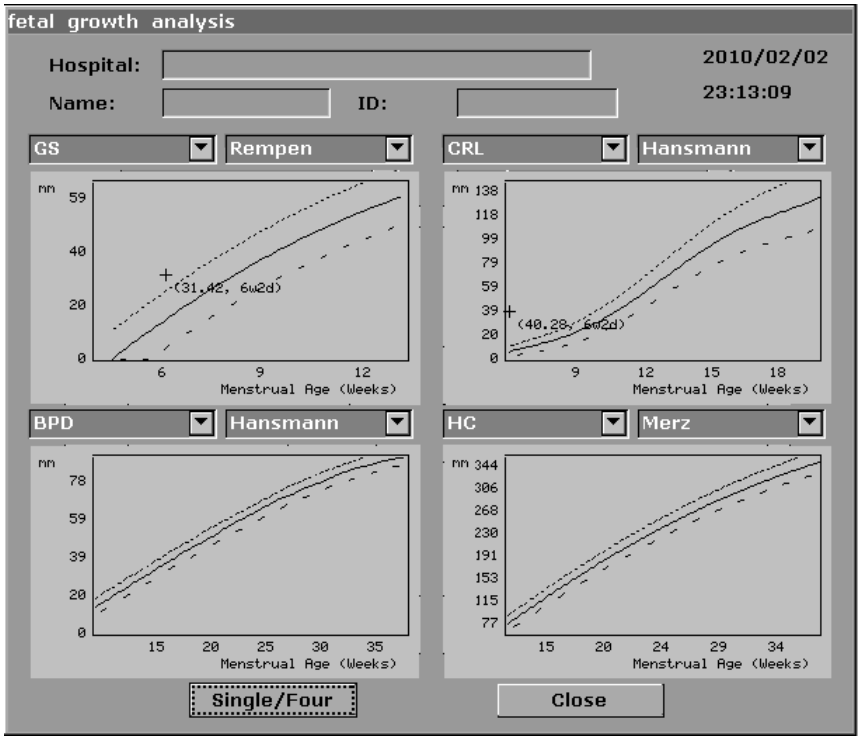


Figure 7-7 Fetal Growth Curve (Four)

NOTE:

Press **Single/Four** to display single growth graphics or four growth graphics.

7.3.2. Obstetric Report

After obstetric examination, the system will generate an obstetrical diagnosis worksheet automatically.

1. In the obstetric menu, roll the trackball to highlight **Results**, and it will display secondary menu automatically.
2. Select **OB Worksheet** and press **Set** to open **Obstetric Worksheet**, as shown below:

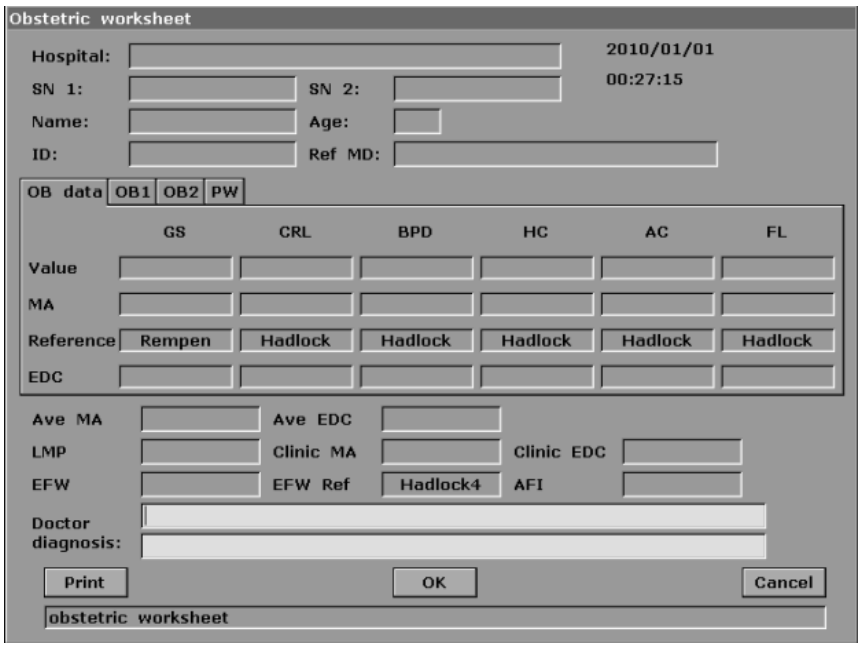


Figure 7-8 Obstetric Worksheet

The diagnosis editing column displays the cursor "I", and you can enter diagnosis information.

NOTE:

1. The system will display the completed measurements and calculations, the uncompleted measurements and calculations will not be displayed.
2. You can check the measured items by opening the obstetric worksheet dialog box whenever you want, during measurement or after that. Then press **OK** or **Cancel** to close the dialog box, and continue to measure.

To print the report:

Press **Print** in the Obstetric Worksheet.

Printing reference Section *5.8, Printing.*

7.4. Others

Select **Others** to enter another application measurement.

Chapter 8 Cardiology Measurements and Calculations

The cardiology examination is usually in the B mode, the B/M mode or the M mode.

Press **Exam** and select **Cardiac**, and then press **Set**.

The result of ventricle volume measurement is more exact in two-dimension. You can get the two-dimension heart image of end diastolic and end systolic exactly and conveniently in the B/M mode. So we suggest that you do the cardiac measurement and calculation in the B/M mode.

8.1. Cardiac Measurements and Calculations in M Mode

Press  to enter the M mode, or press  to enter the B/M mode, and then press **Measure** to activate the measurement function. The system displays the measurement menu shown as below.

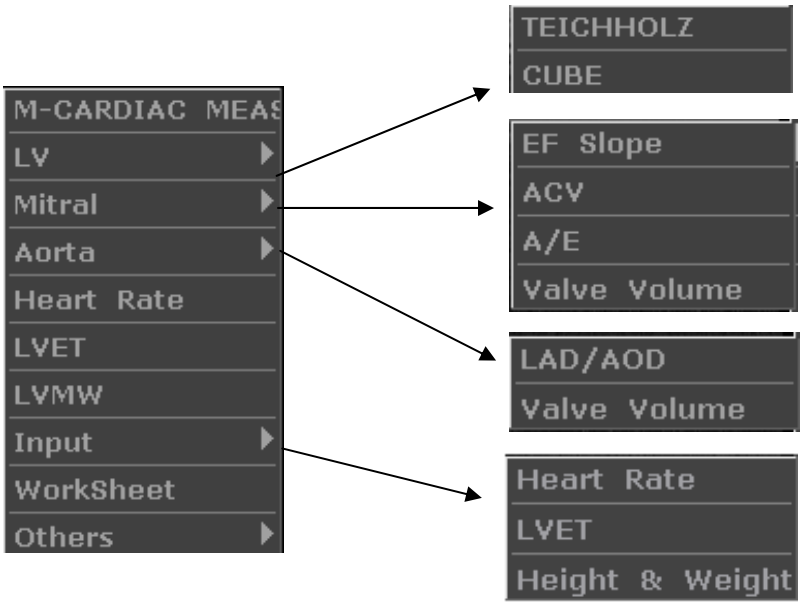


Figure 8-1 M Mode Cardiac Measurement and Calculation Menu

1. Items of Measurement and Calculation

   M-CARDIAC MEAS: LV, Mitral, Heart Rate, LVET, and LVMW.

2. Items of input

   Heart Rate, LVET, and Height &Weight.

   The formulas of B/M mode and M mode cardiac LV measurement include TEICHHOLZ and CUBE, as shown below, and the default formula is TEICHHOLZ.

1. CUBE formula:

NOTE: d: end diastolic; s: end systolic

Label	Description	Method
LVIDd	Left Ventricle Internal Diameter	Distance (mm)
LVIDs	Left Ventricle Internal Diameter	
ET	Ejection Time	Time (ms or s)
HR	Heart Rate	M mode heart rate measurement or key in (bpm)
EDV	End Diastolic Volume	EDV (mL) = $LVIDd^3$ (mm^3)/1000
ESV	End Systolic Volume	ESV (mL) = $LVIDs^3$ (mm^3)/1000
SV	Stroke volume	SV (mL) = EDV (mL)-ESV (mL)
CO	Cardiac Output	CO (L/min) = SV (mL) x HR (bpm)/1000
EF	Ejection fraction (M mode)	EF (No unit) = SV (mL)/ EDV (mL) x 100%
FS	Fractional Shortening	FS (No unit) = [{ LVIDd (mm)- LVIDs (mm)}/ LVIDd (mm)]x 100%
SI	Stroke Index	SI (No unit) = SV (mL)/ BSA (m^2)
CI	Cardiac Index	CI (No unit) = CO (L/min)/ BSA (m^2)
MVCF	Mean Velocity Circumferential Fiber Shortening	MVCF (No unit) = { LVIDd (mm)- LVIDs (mm)}/ {LVIDd (mm) x ET (ms)/1000}
BSA	Body Surface Area	Calculate by the selected formula (m^2)

Table 8-1 Measurement and Calculation Items with CUBE formula

The formulas of BSA calculation:

Oriental: $BSA=Weight^{0.425}*Height^{0.725}*73.58/10000$

Occidental: $BSA=Weight^{0.425}*Height^{0.725}*71.84/10000$

Height: height cm.

Weight: weight kg.

BSA: body surface area m^2.

2. TEICHHOLZ formula:

NOTE: d: end diastolic; s: end systolic

Label	Description	Method
LVIDd	Left Ventricle Internal Diameter	Distance (mm)
LVIDs	Left Ventricle Internal Diameter	Distance (mm)
ET	Ejection Time	Time (ms or s)
HR	Heart Rate	M mode heart rate measurement or key in (bpm)
EDV	End Diastolic Volume	EDV (mL) = {7 × LVIDd ^{3} (cm)^3}/{2.4+ LVIDd (cm)}
ESV	End Systolic Volume	ESV (mL) = {7 × LVIDs ^{3} (cm)^3}/{2.4+ LVIDs (cm)}
SV	Stroke volume	SV (mL) = EDV (mL)-ESV (mL)
CO	Cardiac Output	CO (L/min) = SV (mL) × HR (bpm)/1000
EF	Ejection fraction (M mode)	EF (No unit) = SV (mL)/ EDV (mL) ×100%
FS	Fractional Shortening	FS (No unit) = [{ LVIDd (mm)- LVIDs (mm)}/ LVIDd (mm)] ×100%
SI	Stroke Index	SI (No unit) = SV (mL)/ BSA (m^2)
CI	Cardiac Index	CI (No unit) = CO (L/min)/ BSA (m^2)
MVCF	Mean Velocity Circumferential Fiber Shortening	MVCF (No unit) = {LVIDd (mm)- LVIDs (mm)}/ {LVIDd (mm) x ET (ms)/1000}
BSA	Body Surface Area	Calculate by the selected formula (m^2)

Table 8-2 Measurement and Calculation Items with TEICHHOLZ formula

3. Other measurement items:

Label	Description	Method
AOD	Aortic root Diameter	Distance (mm)
LAD	Left Atrium Diameter	
CA	Cardiac cycle apex A	
CE	Cardiac cycle apex E	
EF SLP	Ejection Fraction Slope	Slope (mm/s)
ACV	AC Decreasing Velocity	
DEV	Deceleration Velocity	
DCT	Deceleration Time	Time (ms or s)

MAVO1	Aortic Valve Volume Opened, beginning	Distance (mm)
MAVO2	Aortic Valve Volume Opened, ending	
AA	Aortic Amplitude	
LVMW	Left Ventricular Muscle Weight	LVMW (g) =1.04* ({IVSTd (cm)+LVIDd (cm)+LVPWd (cm)}^{3}-LVIDd^3 (cm)^3)-13.6
LVMWI	Left Ventricular Muscle Weight Index	LVMWI (No unit) = LVMW/BSA
A/E	The ratio of CA to CE	A/E (No unit) = CA (mm)/CE (mm)
LAD/AOD	Left Atrium Diameter / Aortic root Diameter	LAD/AOD (No unit) = LAD (mm) / AOD (mm)
AVSV	Aortic Valve Stoma Valve flow	AVSV (mL) = MAVO1 (cm)+MAVO2 (cm)* ET (s)*50+AA (cm)
QMV	Mitral Valve Flow	QMV (mL) = 4*DEV (cm/s)*DCT (s)

Table 8-3 Other Measurement Items

4. Calculation items:

Label	Description	Method
EDV	End Diastolic Volume	EDV (mL) = LVIDd^3 (mm^3)/1000 CUBE formula
ESV	End Systolic Volume	ESV (mL) = LVIDs ^{3} (mm^3)/1000 CUBE formula
SV	Stroke volume	SV (mL) = EDV (mL)-ESV (mL)
CO	Cardiac Output	CO (L/min) = SV (mL) × HR (bpm)/1000
EF	Ejection fraction (M mode)	EF (No unit) = SV (mL)/ EDV (mL) × 100%
FS	Fractional Shortening	FS (No unit) =[{LVIDd (mm)- LVIDs (mm)}/ LVIDd (mm)]x 100%
SI	Stroke Index	SI (No unit)= SV (mL)/ BSA (m^2)
CI	Cardiac Index	CI (No unit)= CO (L/min)/ BSA (m^2)
MVCF	Mean Velocity Circumferential Fiber Shortening	MVCF (No unit)= { LVIDd (mm)- LVIDs (mm)}/ {LVIDd (mm) × ET (ms)/1000}

BSA	Body Surface Area (m^2)	Calculate by to the selected formula
LVMW	Left Ventricular Muscle Weight	LVMW (g)=1.04*[{IVSTDd (cm)+LVIDd (cm) + LVPWd^3 (cm)}^{3}-LVIDd^3 (cm)^3]-13.6
LVMWI	Left Ventricular Muscle Weight Index	LVMWI (No unit)=LVMW/BSA
A/E	The ratio of CA to CE	A/E (No unit)= CA (mm)/CE (mm)
LAD/AOD	Left Atrium Diameter / Aortic root Diameter	LAD/AOD (No unit)= LAD (mm)/AOD (mm)
AVSV	Aortic Valve Stoma Valve flow	AVSV (mL)=MAVO1 (cm)+MAVO2 (cm)* ET (s)*50+AA (cm)
QMV	Mitral Valve Flow	QMV (mL)=4*DEV (cm/s)*DCT (s)

Table 8-4 Calculation Items

8.1.1. LV

The B/M mode and M mode measurements of LV are based on ESV and EDV measurements, which are calculated by LVIDs and LVIDd measurements.

After measuring LVIDs and LVIDd and entering Heart Rate, LVET, and Height & Weight, the system calculates some physiological parameters, such as ESV, EDV, SV, EF, FS, CO, MVCF, SI, and CI.

There are two calculation formulas for heart antrum volume in the B/M mode and the M mode, as shown below.

Item	**Formula**
TEICHHOLZ	EDV (mL)= 7 x LVIDd^3 (cm^3)/{2.4 + LVIDd (cm)} ESV (mL)= 7 x LVIDs^3 (cm^3)/{2.4 + LVIDs (cm)}
CUBE	EDV (mL) = LVIDd^3 (mm)^3 / 1000 ESV (mL) = LVIDs^3 (mm)^3 / 1000

Table 8-5 TEICHHOLZ and CUBE Formula

NOTE:

Ensure that the value of LVIDd is bigger than that of LVIDs, or the system can not display the calculation items.

SV and EF calculation is as below.

Measurement items:

LVIDs and LVIDd

To measure LV:

1. In the M-cardiac measurement menu, roll the trackball to highlight **LV**, and the secondary

menu will be displayed. Select TEICHHOLZ or CUBE and press **Set**. Then move the cursor to the image area and a "+" is displayed.

2. Move the cursor to the end systolic of left ventricle, and measure LVIDs. The method is similar to generic M mode distance measurement. LVIDs and ESV will be displayed in the measurement result window.
3. Move the cursor to the end diastolic of the left ventricle, and then measure LVIDd. The method is the same as the generic M mode distance measurement method. LVIDd, EDV, SV, EF, and FS will be displayed in the measurement result window.

To enter HR

1. In the M-cardiac measurement menu, roll the trackball to highlight **Input**. Then select the secondary menu **Heart Rate** and press **Set** to display an **HR input** dialog box, as shown below.

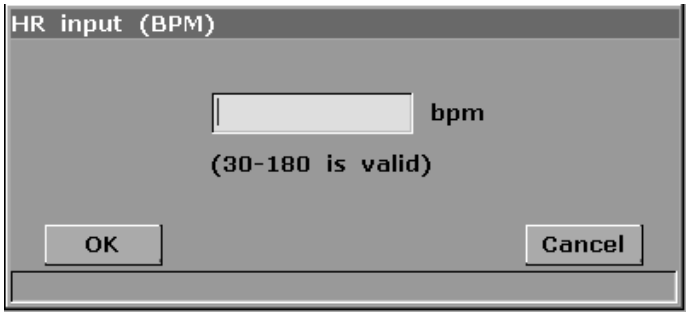


Figure 8-2 HR Input Dialog Box

2. Input a suitable value in the HR (bpm) box.
3. Roll the trackball to highlight **OK** and press **Set**, and after measuring LV, the result of CO will be displayed in the measurement result window.

To enter LVET

1. In the M-cardiac measurement menu, roll the trackball to highlight **Input**. Then select the secondary menu **LVET** and press **Set** to display an **ET input** dialog box, as shown below.

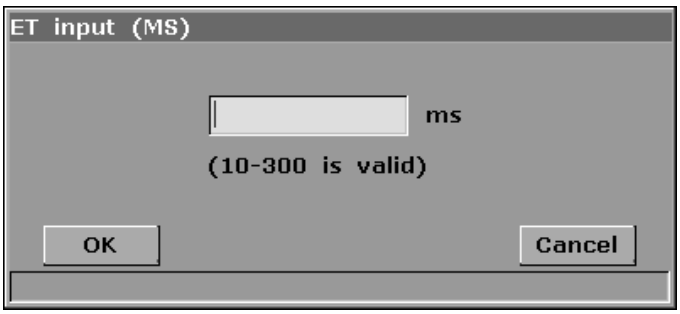


Figure 8-3 ET Input Dialog Box

2. Input a suitable value in the LVET (ms) box.

3. Roll the trackball to highlight **OK** and press **Set**.

To enter Height and Weight

1. In the M-cardiac measurement menu, roll the trackball to highlight **Input**. Then select the secondary menu **Height & Weight** and press **Set** to display a **Height and Weight** entering dialog box, as shown below.

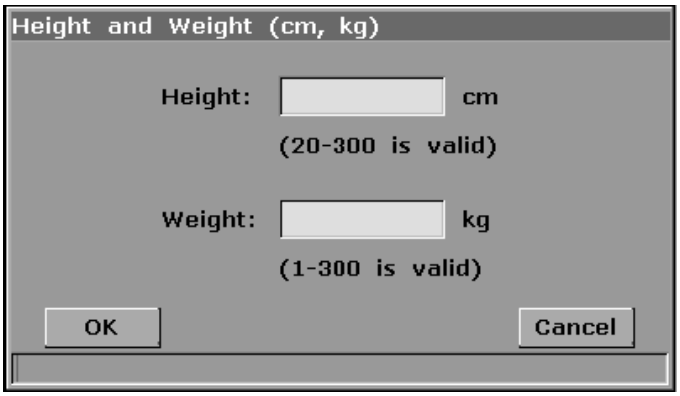


Figure 8-4 Height and Weight Input Dialog Box

2. Input suitable values in the Height and Weight boxes.
3. Roll the trackball to highlight **OK** and press **Set**.

The measurements and calculations of all the LV parameters are as below.

Measurement or input items:

Input or measurement items: HR, LVET, and Height & Weight;

Measurement items: LVIDs and LVIDd

To calculate all the LV parameters:

1. Input or measure HR, LVET, and Height & Weight.
2. Measure LVIDs and LVIDd following the prompt instruction.
3. All the LV parameters, ESV, EDV, SV, FS, EF, CO, MVCF, SI and CI will be displayed in the measurement result window.

8.1.2. Mitral Valve

Measurement items of mitral valve include EF slope, ACV, A/E, DEV, and DCT.

To measure EF slope, ACV, and A/E

1. In the M-cardiac measurement menu, roll the trackball to highlight **Mitral** to display the secondary menu.
2. Roll the trackball to highlight **EF Slope**, **ACV**, or **A/E**, and press **Set**.
   a) To measure **EF Slope** and **ACV**, in the method of generic M mode slope measurement;
   b) To measure **A/E**, measure the breadth from apex A to point C and the breadth from apex

E to point C respectively, in the method of generic M mode distance measurement.

3. After the measurements, the results of EF SLP, ACV and A/E will be displayed in the measurement result window.

To measure Valve Volume (QMV)

Calculation formula:

QMV (mL) = 4*DEV (cm/s)*DCT (s)

Measurement operation procedure:

1. In the M-cardiac measurement menu, roll the trackball to highlight **Mitral** to display the secondary menu.
2. Roll the trackball to highlight **Valve Volume**, and press **Set**.
3. Measure DEV, in the method of generic M mode slope measurement.
4. Measure DCT, in the method of generic M mode time measurement.
5. After the measurement, the result of QMV will be displayed in the measurement result window.

8.1.3. Aortia

Aortia calculation is as below.

- Measurement items:

LAD/ AOD and Valve Volume

- Aortia calculation

In the M-cardiac measurement menu, roll the trackball to highlight **Aortia** to display the secondary menu.

✧ **LAD/AOD measurement**

1. Roll the trackball to highlight **LAD/AOD** and press **Set**.
2. Measure LAD and AOD respectively, in the method of generic M mode distance measurement.
3. The results will be displayed in the measurement result window.

✧ **AVSV measurement**

The calculation formula:

AVSV (mL) = MAVO1 (cm)+MAVO2 (cm)*ET (s)*50+AA (cm)

The measurement operation procedure:

1. Roll the trackball to highlight **Valve Volume** and press **Set**.
2. Measure MAVO1, in the method of generic M mode distance measurement.

3. Measure MAVO2, in the method of generic M mode distance measurement.
4. Measure AA, in the method of M mode distance measurement.
5. Measure LVET, in the method of generic M mode time measurement.
6. After the measurements, the result of AVSV will be displayed in the measurement result window.

8.1.4. LVMW, LVMWI

LVMW and LVMWI calculations are as below.

- Measurement items:

LVPWd, IVSTd and LVIDd

- The calculation formula

LVMW (g) = 1.04*[{IVSTd (cm) +LVIDd (cm) +LVPWd (cm)}^{3}-LVIDd^3 (cm)^3]-13.6

LVMWI = LVMW (g)/BSA (m)^2

- To calculate LVMW, LVMWI

1. In the M-cardiac measurement menu, roll the trackball to highlight **LVMW**, and press **Set**.
2. Measure LVPWd, IVSTd and LVIDd respectively following the prompt instruction.
3. After the measurements, the result of LVMW will be displayed in the measurement result window. The system will display LVWMI if you have keyed in Height and Weight before the measurement. If you had measured LV before, it will renovate the LV results.

8.2. Cardiac Measurements and Calculations in B Mode

1. Press **Exam** to select cardiology and press **Set**.
2. In B mode, press **Measure**, the system will enter B mode cardiac measurement. The B mode cardiac measurement menus are shown as follows:

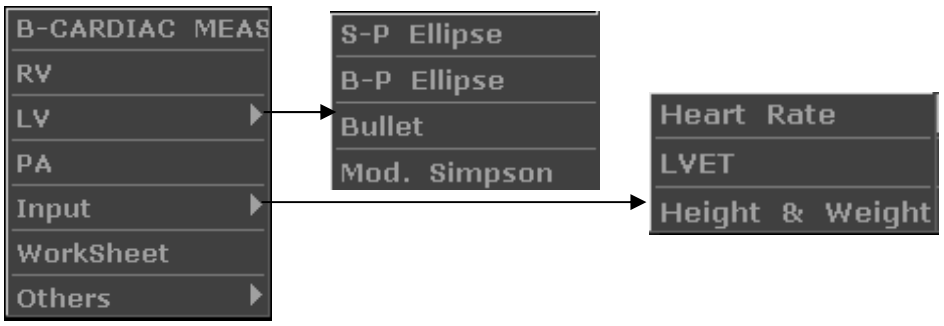


Figure 8-5 B Mode Cardiac Measurement and Calculation Menu

1. Items of Measurement and Calculation

   B-CARDIAC MEAS: RV, LV, and PA.

2. Items of input

   Heart Rate, LVET, and Height & Weight

   The default measurements are LVLs, LVALs, LVLd, and LVALd measurements, in the method of single-plane ellipse (S-P Ellipse) measurement.

   The formulas of B mode cardiac LV measurement include Single plane ellipse (S-P Ellipse), Dual plane ellipse (B-P Ellipse), Bullet, and Modified Simpson (Mod. Simpson), shown as follows:

1. Single plane ellipse formula:

NOTE: d: end diastolic; s: end systolic

Label	Description	Method
LVLd	Left Ventricle Long-axle Diameter	Distance (mm)
LVALd	Left Ventricle Area of Long-axle	Ellipse Area (mm^2, cm^2, or dm^2)
LVLs	Left Ventricle Long-axle Diameter	Distance (mm)
LVALs	Left Ventricle Area of Long-axle	Ellipse Area (mm^2, cm^2, or dm^2)
HR	Heart Rate	Key in (bpm)
EDV	End Diastolic Volume	EDV (mL)= $(8/3/\pi)\times\{LVALd\ (mm^2)\}^2/LVLd$ (mm) /1000
ESV	End Systolic Volume	ESV (mL)= $(8/3/\pi)\times\{LVALs\ (mm^2)\}^2/LVLs$ (mm) /1000
SV	Stroke volume	SV (mL)=EDV (mL)-ESV (mL)
CO	Cardiac Output	CO (L/min)= SV (mL) × HR (bpm)/1000
EF	Ejection fraction (B mode)	EF (No unit)= SV (mL)/ EDV (mL) x 100%
SI	Stroke Index	SI (No unit)= SV (mL)/ BSA (m^2)
CI	Cardiac Index	CI (No unit)= CO (L/min)/ BSA (m^2)
BSA	Body Surface Area	Calculate by the selected formula (m^2)

Table 8-6 Measurement and Calculation Items with Single Plane Ellipse Formula

2. Dual plane ellipse formula:

NOTE: d: end diastolic; s: end systolic

Label	Description	Method
LVALd	Left Ventricle Area of Long-axle	Ellipse Area (mm^2, cm^2, or dm^2)
LVAMd	Left Ventricular Fractional Area of Mitral Valve	
LVIDd	Left Ventricle Internal Diameter	Distance (mm)
LVALs	Left Ventricle Area of Long-axle	Ellipse Area (mm^2, cm^2, or dm^2)
LVAMs	Left Ventricular Fractional Area of Mitral Valve	
LVIDs	Left Ventricle Internal Diameter	Distance (mm)
HR	Heart Rate	Key in (bpm)
EDV	End Diastolic Volume	EDV (mL)= $(8/3/\pi)\times\{LVALd\ (mm^2)\}^2/LVLd$ (mm) /1000
ESV	End Systolic Volume	ESV (mL)= $(8/3/\pi)\times\{LVALs\ (mm^2)\}^2/LVLs$ (mm) /1000
SV	Stroke volume	SV (mL)=EDV (mL)-ESV (mL)
CO	Cardiac Output	CO (L/min)= SV (mL) × HR (bpm)/1000
EF	Ejection fraction (B mode)	EF (No unit)= SV (mL)/ EDV (mL) x 100%
SI	Stroke Index	SI (No unit)= SV (mL)/ BSA (m^2)
CI	Cardiac Index	CI (No unit)= CO (L/min)/ BSA (m^2)
BSA	Body Surface Area	Calculate by the selected formula (m^2)

Table 8-7 Measurement and Calculation Items with Dual Plane Ellipse Formula

3. Bullet volume formula:

NOTE: d: end diastolic; s: end systolic

Label	Description	Method
LVAMd	Left Ventricular Fractional Area of Mitral Valve	Ellipse Area (mm^2, cm^2, or dm^2)
LVLd	Left Ventricular Length	Distance (mm)
LVAMs	Left Ventricular Fractional Area of Mitral Valve	Ellipse Area (mm^2, cm^2, or dm^2)

LVLs	Left Ventricular Length	Distance (mm)
HR	Heart Rate	Key in (bpm)
EDV	End Diastolic Volume	EDV (mL)= (5/6)×LVLd (mm)×LVAMd (mm^2) /1000
ESV	End Systolic Volume	ESV (mL)= (5/6)×LVLs (mm)× LVAMs (mm^2) /1000
SV	Stroke volume	SV (mL)=EDV (mL)-ESV (mL)
CO	Cardiac Output	CO (L/min)= SV (mL) × HR (bpm)/1000
EF	Ejection fraction (B mode)	EF (No unit)= SV (mL)/ EDV (mL) x 100%
SI	Stroke Index	SI (No unit)= SV (mL)/ BSA (m^2)
CI	Cardiac Index	CI (No unit)= CO (L/min)/ BSA (m^2)
BSA	Body Surface Area	Calculate by the selected formula (m^2)

Table 8-8 Measurement and Calculation Items with Bullet Formula

4. Modified SIMPSON formula:

NOTE: d: end diastolic; s: end systolic

Label	**Description**	**Method**
LVAMd	Left Ventricular Fractional Area of Mitral Valve	Ellipse Area (mm^2, cm^2, or dm^2)
LVLd	Left Ventricular Length	Distance (mm)
LVAPd	Left Ventricular Fractional Area of Papillary Muscles	Ellipse Area (mm^2, cm^2, or dm^2)
LVAMs	Left Ventricular Anterior Wall	
LVLs	Left Ventricular Length	Distance (mm)
LVAPs	Left Ventricular Fractional Area of Papillary Muscles	Ellipse Area (mm^2, cm^2, or dm^2)
HR	Heart Rate	Key in (bpm)
EDV	End Diastolic Volume	*1
ESV	End Systolic Volume	
SV	Stroke volume	SV (mL)=EDV (mL)-ESV (mL)
CO	Cardiac Output	CO (L/min)= SV (mL) x HR (bpm)/1000
EF	Ejection fraction (B mode)	EF (No unit)= SV (mL)/ EDV (mL) x 100%

SI	Stroke Index	SI (No unit)= SV (mL)/ BSA (m^2)
CI	Cardiac Index	CI (No unit)= CO (L/min)/ BSA (m^2)
BSA	Body Surface Area	Calculate by to the selected formula (m^2)

Table 8-9 Measurement and Calculation Items with Modified SIMPSON Formula

*1

$$EDV(mL) = LVLd(mm)/9 \times \left\{4 \times LVAMd(mm^2) + 2 \times LVAPd(mm^2) + \sqrt{LVAMd(mm^2) \times LVAPd(mm^2)}\right\}/1000$$

$$ESV(mL) = LVLs(mm)/9 \times \left\{4 \times LVAMs(mm^2) + 2 \times LVAPs(mm^2) + \sqrt{LVAMs(mm^2) \times LVAPs(mm^2)}\right\}/1000$$

5. Other measurement and calculation items:

Label	Description	Method
LVET	Left Ventricular Ejection Time	Time (ms)
FS	Fractional Shortening	FS (No unit)={ LVIDd (mm)- LVIDs (mm)}/ LVIDd (mm) x 100%
MVCF	Mean Velocity Circumferential Fiber Shortening	MVCF (No unit)= { LVIDd (mm)- LVIDs (mm)}/ {LVIDd (mm) x ET (ms)/1000}

Table 8-10 Other Measurement and Calculation Items

8.2.1. LV

LV measurement is as below.

Single plane ellipse (**S-P Ellipse**)

- Measurement items:

  LVLs, LVALs, LVLd, and LVALd

- To measure LV:

1. In the B-cardiac measurement menu, roll the trackball to highlight **LV**. Then select **S-P Ellipse** and press **Set**.
2. During end systolic, measure LVLs and LVALs respectively. The system calculates and displays the result of ESV.
3. During end diastolic, measure LVLd and LVALd respectively, in the method of generic B mode distance measurement and generic B mode ellipse area measurement respectively. The system calculates and displays the results of EDV, SV, and EF.

Dual plane ellipse (B-P Ellipse), Bullet, and Modified Simpson (Mod. Simpson)

The operations in these methods are similar to those in the single plane ellipse method. Please refer to the corresponding B mode generic measure method for details, and refer to the prompt instruction to help you.

CO calculation is as below.

- Measurement and input items:

  Measure LV;

  Key in: HR

- To calculate CO:

  1. In the B-cardiac measurement menu, roll the trackball to highlight **Input**. Then select the secondary menu **Heart Rate** and press **Set** to display an **HR input** dialog box, as shown below.

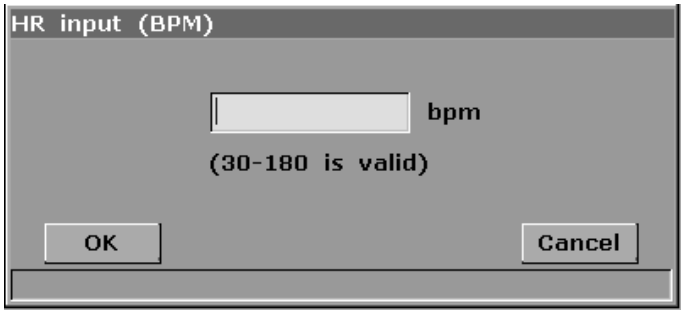


Figure 8-6 HR Input Dialog Box

  2. Input a suitable value in the HR (bpm) box.
  3. Roll the trackball to highlight **OK** and press **Set**. After measuring LV, CO will be displayed in the measurement result window.

MVCF calculation is as below.

- Measurement and input items:

  Measure: LV;

  Key in: LVET

- To calculate MVCF:

  1. Move the cursor to **Input**. Then select the secondary menu **LVET** and press **Set** to display an **ET input** dialog box, as shown below.

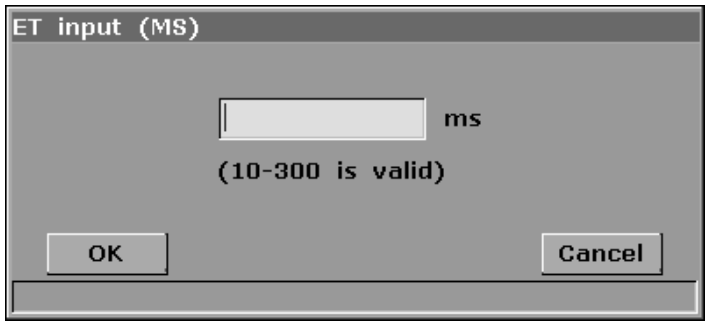


Figure 8-7 ET Input Dialog Box

2. Input a suitable value in the LVET (ms) box.
3. Roll the trackball to highlight **OK** and press **Set**. After measuring LV, MVCF will be displayed in the measurement result window.

CI and SI calculations are as below.

- Measurement and input items:

  Measure: LV and HR;

  Key in: Height and Weight

- To calculate CI and SI:

  1. In the B-cardiac measurement menu, roll the trackball to highlight **Input**. Then select the secondary menu **Height & Weight** and press **Set** to display a **Height and Weight** entering dialog box, as shown below.

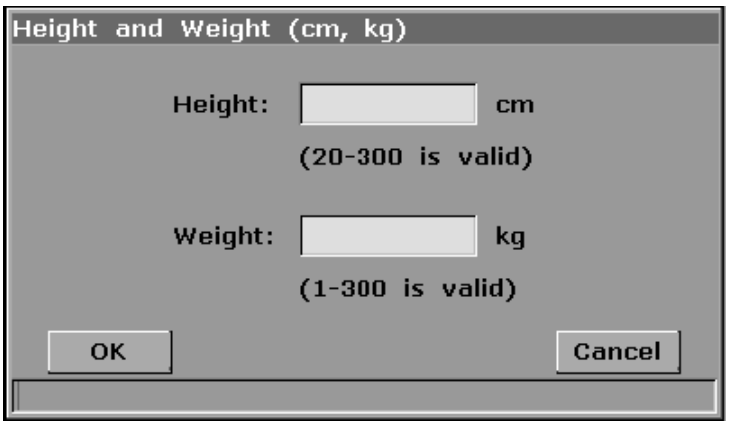


Figure 8-8 Height and Weight Input Dialog Box

  2. Input suitable values in the Height (cm) and Weight (Kg) boxes.
  3. Roll the trackball to highlight **OK** and press **Set**. BSA will be displayed in the measurement result window. After measuring LV and HR, SI and CI will also be displayed in measurement result window.

8.2.2. RV (Right Ventricle Internal Diameter)

1. In the B-cardiac measurement menu, roll the trackball to highlight **RV**.
2. Measure RV in the method of distance.
3. The result will be displayed in the measurement result window.

8.2.3. PA (Pulmonary Artery)

1. In the B-cardiac measurement menu, roll the trackball to highlight **PA**, and press **Set** to display a "+" in the image area.

2. Measure **PA** in the method of distance measurement.

3. The result will be displayed in the measurement result window.

Other parameters:

If you want to perform other cardiac parameter measurements, please enter B/M mode or M mode cardiac measurement.

8.3. Cardiac Report

After the cardiac examination, the system generates a cardiology examination and diagnosis worksheet. Roll the trackball to highlight **Worksheet**, and press **Set** to display **Cardiac Worksheet** dialog box, as shown in figure 8-8.

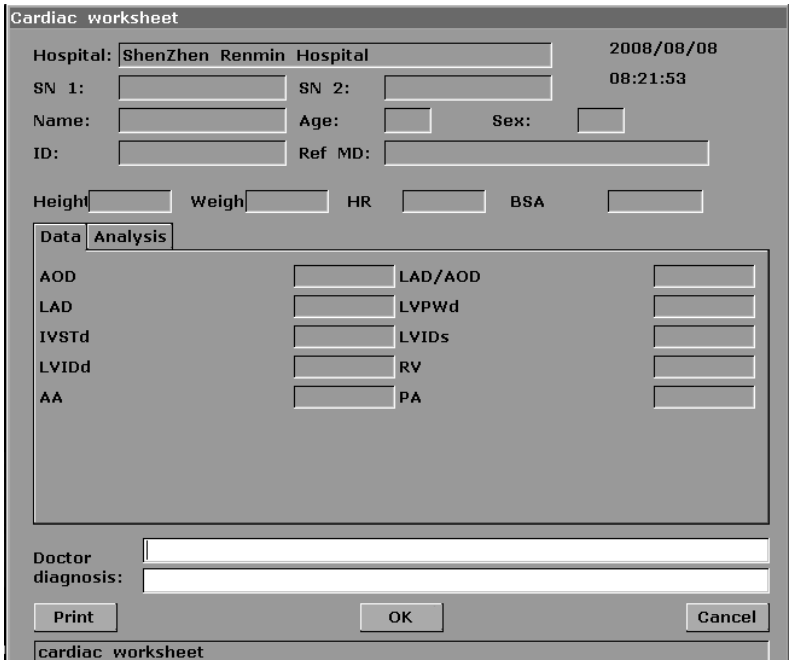


Figure 8-9 Cardiac Worksheet

The diagnosis editing column displays the cursor "I", and you can enter diagnosis information.

To print the report:

Press **Print** in the Cardiac Worksheet.

Printing reference *Section 5.8, Printing.*

8.4. Others

Select **Others** to enter another application measurement.

Chapter 9 Gynecology Measurements and Calculations

The gynecology examination is usually in the B mode and the PW mode.

9.1. Measurements and Calculations in B Mode

1. Press **Exam** and select **Gynecology**, and then press **Set**.
2. Press  to enter the B mode.
3. Press **Measure** to activate the measurement function. The system displays the measurement menu shown as below.

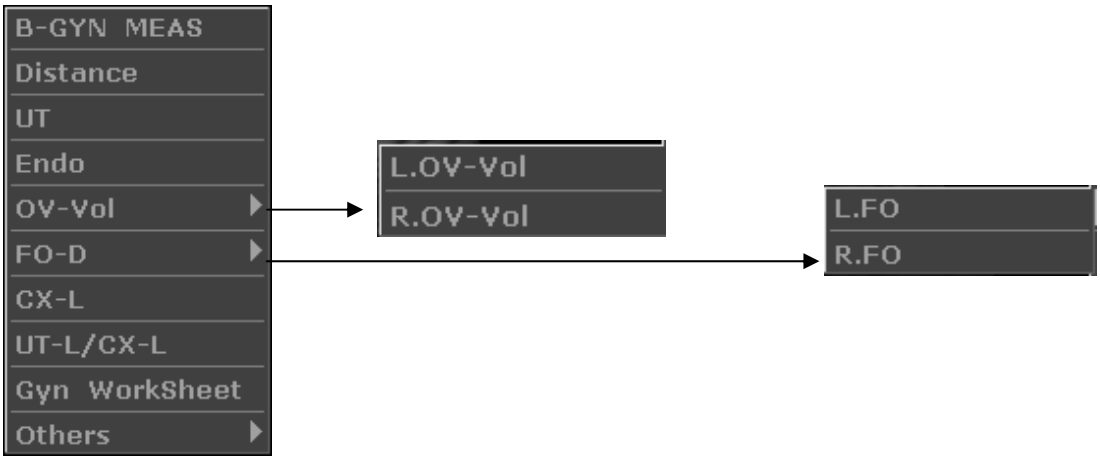


Figure 9-1 Gynecology Measurement and Calculation Menu in B Mode

To determine the volume of right ovary or left ovary, take three measurements: length, width, and height. The system calculates the volume.

The gynecology measurement items of the B mode are as follows.

Label	Description	Method
UT	Uterus	UT (mm) = UT-L (mm)+UT-W (mm)+UT-H (mm)
UT-L UT-W UT-H	Uterus Length Uterus width Uterus Height	Distance (mm)
Endo	Uterus Endo- membrane Thickness	Distance (mm)
L. OV-Vol	Left Ovary Volume	L. OV-V (mL) = 0.523 x L. OV-L (mm) x L. OV-W (mm) x L. OV-H (mm)/1000
L. OV-L L. OV-W L. OV-H	Left Ovary Length Left Ovary Width Left Ovary Height	Distance (mm)
R. OV-Vol	Right Ovary Volume	R. OV-V (mL) = 0.523 x R. OV-L (mm) x R. OV-W (mm) x R. OV-H (mm)/1000

R. OV-L R. OV-W R. OV-H	Right Ovary Length Right Ovary Width Right Ovary Height	Distance (mm)
L. FO-L L. FO-W	Left Follicle Length Left Follicle Width	
R. FO-L R. FO-W	Right Follicle Length Right Follicle Width	
CX-L	Cervix Length	
UT-L/CX-L	The ratio of Uterus Length and Cervix Length	UT-L/CX-L Ratio

Table 9-1 Gynecology Measurement and Calculation Items in B Mode

9.1.1. UT

To measure UT:

1. In the gynecology measurement menu, roll the trackball to highlight **UT** and press **Set**.
2. Take three measurements, UT-L, UT-W and UT-H, in the method of distance measurement.


Reference Section 6.6.1, Generic Measurements in B Mode

3. After the three measurements are taken, the result of UT will be displayed in the measurement result window. You can measure a maximum of one group of data.

9.1.2. Endo

To measure endometrium:

1. In the gynecology measurement menu, roll the trackball to highlight **Endo** and press **Set**.
2. Measure Endo, in the method of distance measurement.


Reference Section 6.6.1, Generic Measurements in B Mode

3. The result of Endo will be displayed in the measurement result window. You can measure a maximum of one group of data.

9.1.3. OV-V

The measurement of OV-Vol includes L.OV-Vol and R.OV-Vol.

To measure L.OV-Vol:

1. In the gynecology measurement menu, roll the trackball to highlight **OV-Vol**, and then highlight the secondary menu **L.OV-Vol**, press **Set**.

2. Take three measurements, L.OV-L, L.OV-W and L.OV-H, in the method of distance measurement.


Reference Section 6.6.1, Generic Measurements in B Mode

3. After the three measurements are taken, the result of L.OV-Vol will be displayed in the measurement result window.

To measuree R.OV-Vol:

1. In the gynecology measurement menu, roll the trackball to highlight **OV-Vol**, and then highlight the secondary menu **R.OV-Vol**, press **Set**.
2. Take three measurements, R.OV-L, R.OV-W and R.OV-H, in the method of distance measurement.


Reference Section 6.6.1, Generic Measurements in B Mode

3. After the three measurements are taken, the result of R.OV-Vol will be displayed in the measurement result window.

9.1.4. FO

The measurement of FO includes L. FO and R. FO.

To measure L. FO:

1. In the gynecology measurement menu, roll the trackball to highlight **FO**, and then highlight the secondary menu **L. FO**, press **Set**.
2. Take two measurements, L. FO-L and L. FO-W, in the method of distance measurement.


Reference Section 6.6.1, Generic Measurements in B Mode

3. After the two measurements are taken, the result of **L. FO** will be displayed in the measurement result window.

To measure R. FO:

1. In the gynecology measurement menu, roll the trackball to highlight **FO**, and then highlight the secondary menu **R. FO**, press **Set**.
2. Take two measurements, R. FO-L and R. FO-W, in the method of distance measurement.


Reference Section 6.6.1, Generic Measurements in B Mode

3. After the two measurements are taken, the result of **R. FO** will be displayed in the measurement result window.

9.1.5. CX-L

To measure CX-L:

1. In the gynecology measurement menu, roll the trackball to **CX-L**, and press **Set**.
2. Measure **CX-L** with distance method.

 Reference Section 6.6.1, Generic Measurements in B Mode

3. The result will be displayed in the measurement result window, if you have already measured UT-L, the UT-L/CX-L will also be displayed.

9.1.6. UT-L/CX-L

To measure UT-L/CX-L:

1. In the gynecology measurement menu, roll the trackball to highlight **UT-L/CX-L**, and press **Set**.
2. Measure UT-L and CX-L, in the method of distance measurement.

 Reference Section 6.6.1, Generic Measurements in B Mode

3. The results will be displayed in the measurement result window.

NOTE:

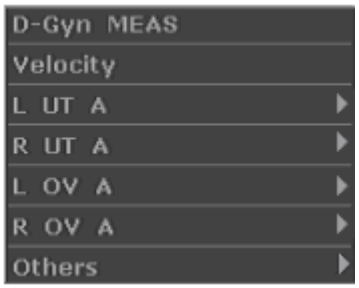
During measurement, if you have already measured any one of the items, UT-L or CX-L, when you finished the other one, the UT-L/CX-L will be displayed automatically.

9.2. Measurements and Calculations in PW Mode

1. Press **Exam** and select **Gynecology**, and then press **Set**.
2. Press  to enter the PW mode.
3. Press **Measure** to activate the measurement function. The system displays the measurement menu shown as below.

Items of Measurement and Calculation

L UT A, R UT A, L OV A, and R OV A.



Secondary menu of the gynecology measurement items in the PW mode:

Figure 9-2 Gynecology Measurement and Calculation Menu in PW Mode

Label	Description	Channel	Method
L UT A	Left Uterus Aorta	1	D trace
R UT A	Right Uterus Aorta	1	
L OV A	Left Ovary Aorta	1	
R OV A	Right Ovary Aorta	1	

Table 9-2 Gynecology Measurement and Calculation Items in PW Mode

9.2.1. L UT A:

1. Press **Measure** to activate the measurement.
2. In the gynecology measurement menu, select **L UT A**.
3. Measure **L UT A**, in the method of D trace measurement.

Reference Section 6.6.3, Generic Measurements in PW Mode

4. The results are displayed in measurement result window.
5. You can measure a maximum of one group of data. To begin a new **L UT A** measurement, repeat steps 1 through 3.

9.2.2. R UT A:

1. Press **Measure** to activate the measurement.
2. In the gynecology measurement menu, select **R UT A**.
3. Measure **R UT A**, in the method of D trace measurement.

Reference Section 6.6.3, Generic Measurements in PW Mode

4. The results are displayed in measurement result window.
5. You can measure a maximum of one group of data. To begin a new **R UT A** measurement, repeat steps 1 through 3.

9.2.1. L OV A:

1. Press **Measure** to activate the measurement.
2. In the gynecology measurement menu, select **L OV A**.
3. Measure **L OV A**, in the method of D trace measurement.

Reference Section 6.6.3, Generic Measurements in PW Mode

4. The results are displayed in measurement result window.
5. You can measure a maximum of one group of data. To begin a new **L OV A** measurement, repeat steps 1 through 3.

9.2.2. R OV A:

1. Press **Measure** to activate the measurement.
2. In the gynecology measurement menu, select **R OV A**.
3. Measure **R OV A**, in the method of D trace measurement.

Reference Section 6.6.3, Generic Measurements in PW Mode

4. The results are displayed in measurement result window.
5. You can measure a maximum of one group of data. To begin a new **R OV A** measurement, repeat steps 1 through 3.

9.3. Gynecologic Report

After the gynecologic examination, the system generates a gynecologic worksheet.

Roll the trackball to highlight **Worksheet**, and press **Set** to display **Gynecologic Worksheet** dialog box. Gynecologic worksheet has three tabs, uterus, ovary, and follicle, as shown in figure 9-2.

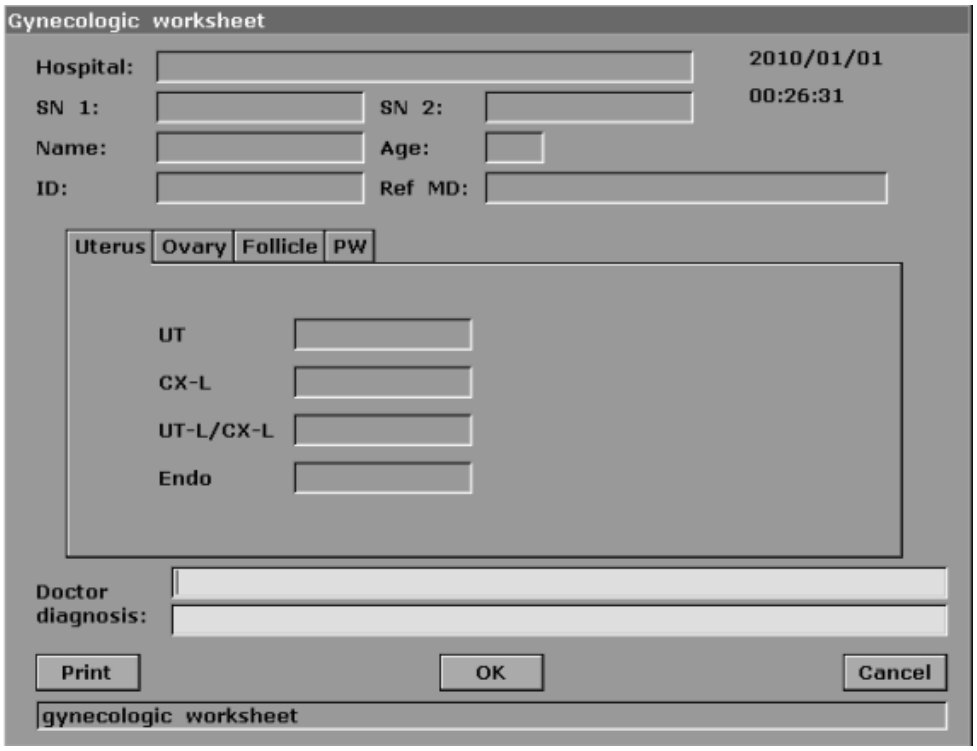


Figure 9-2 Gynecology Worksheet

The diagnosis editing column displays the cursor "I", and you can enter diagnosis information.

To print the report:

Press **Print** in the Gynecology Worksheet.

Printing reference *Section 5.8, Printing.*

9.4. Others

Select **Others** to enter another application measurement.

Chapter 10 Small Parts Measurements and Calculations

10.1. Measurements and Calculations

The small parts examination is usually in the B mode.

1. Press **Exam** and select **Small Parts**, and then press **Set**.
2. Press  to enter the B mode.
3. Press **Measure** to activate the measurement function. The measurement menu will be displayed. The default measurement is distance measurement.

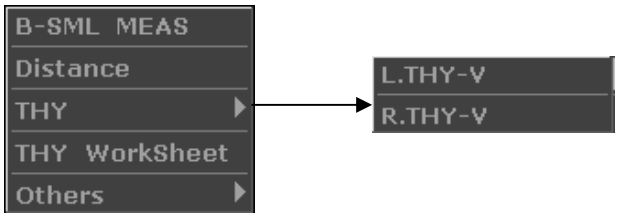


Figure 10-1 Small Parts Measurement and Calculation Menu

To determine the right thyroid gland volume or left thyroid gland volume, take three measurements: length, width, and height. The system calculates the volume.

The measurement items of small parts of B mode are as follows.

Label	Description	Method
THY	Thyroid Gland	/
L. THY-V	Left Thyroid Gland Volume	L. THY-V (mm^3) = 0.497 × L. THY-L (mm) × L. THY-W (mm) × L. THY-H (mm)
L. THY-L L. THY-W L. THY-H	Left Thyroid Gland Length Left Thyroid Gland Width Left Thyroid Gland Height	Distance (mm)
R. THY-V	Right Thyroid Gland Volume	R. THY-V (mm^3) = 0.497 x R. THY-L (mm) × R. THY-W (mm) × R. THY-H (mm)
R. THY-L R. THY-W R. THY-H	Right Thyroid Gland Length Right Thyroid Gland Width Right Thyroid Gland Height	Distance (mm)

Table 10-1 Small Parts Measurement and Calculation Items

The measurements of THY include L.THY-V and R.THY-V.

To measure L.THY-V:

1. In the small parts measurement menu, roll the trackball to highlight **THY-V**, and then highlight the secondary menu **L.THY-V**, press **Set**.
2. Measure three pieces of data: L.THY-L, L.THY-W and L.THY-H, in the method of distance measurement.


Reference Section 6.6.3, Generic Measurements in PW Mode

3. After the three measurements, the result of L.THY-V will be displayed in the measurement result window.

To measure R. THY-V:

1. In the small parts measurement menu, roll the trackball to highlight **THY-V**, and then highlight the secondary menu **R.THY-V**, press **Set**.
2. Measure three pieces of data: R.THY-L, R.THY-W and R.THY-H, in the method of distance measurement.


Reference Section 6.6.3, Generic Measurements in PW Mode

3. After the three measurements, the result of R.THY-V will be displayed in the measurement result window.

10.2. Small Parts Report

After the small parts examination, the system generates a THY worksheet.

Roll the trackball to highlight **THY Worksheet**, and press **Set** display **Small Parts Worksheet** dialog box, as shown below:

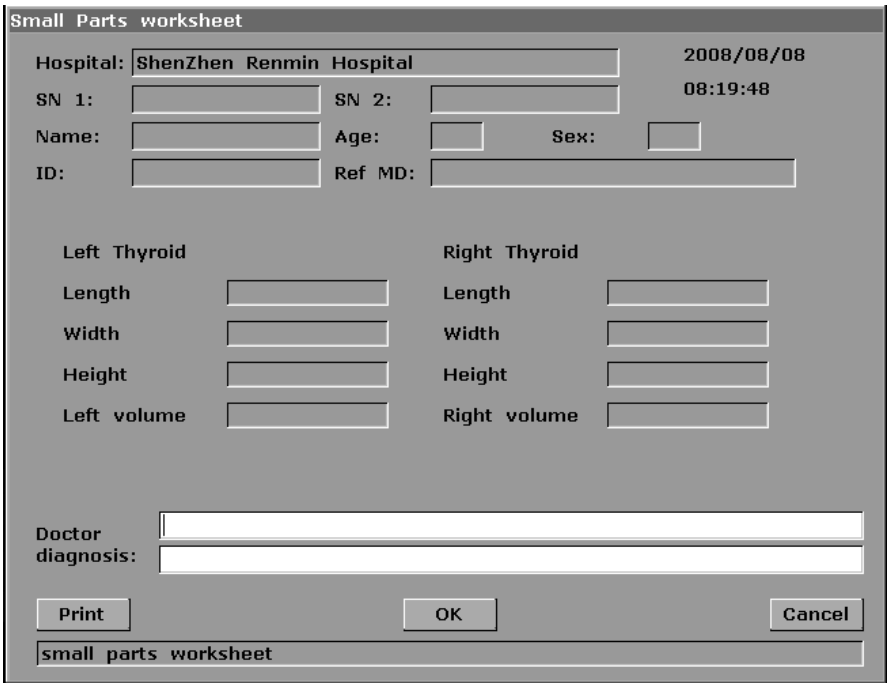


Figure 10-2 Small Parts Worksheet

The diagnosis editing column displays the cursor "I", and you can enter diagnosis information.

To print the report:

Press **Print** in the Small Parts Worksheet.

Printing reference Section *5.8, Printing.*

10.3. Others

Select **Others** to enter another application measurement.

Chapter 11 Urology Measurements and Calculations

11.1. Measurement and Calculation

The urology examination is usually in the B mode.

1. Press **Exam** and select **Urology**, and then press **Set**.
2. Press  to enter the B mode.
3. Press **Measure** to activate the measurement function. The system displays the measurement menu shown as below.

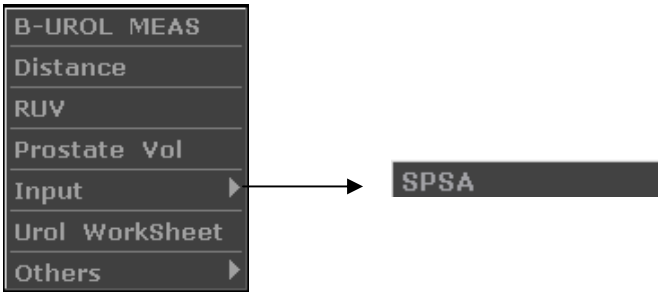


Figure 11-1 Urology Measurement and Calculation Menu

Label	Description	Method
RUV	Residual Urine Volume (mL or L)	RUV (mL) = 0.7x RUV-L (mm) × RUV-W (mm) × RUV-H (mm) /1000
RUV-L RUV-W RUV-H	Residual Urine Length Residual Urine Width Residual Urine Height	Distance (mm)
PV	Prostate Volume (mm^3, cm^3, or dm^3)	PV (mm^3) = 0.52 x PV-L (mm) × PV-W (mm) × PV-H (mm) /1000
PV-L PV-W PV-H	Prostate Length Prostate Width Prostate Height	Distance (mm)
PPSA	Predicted Prostate Specific Antigen Density	PPSA (ng/mL) = 0.12 × PV
SPSA	Serum of Prostate Specific Antigen	Key in SPSA (ng)
PSAD	Prostate Specific Antigen Density	PSAD (ng/mL) = SPSA (ng)/ PV (mL), (0.01ng ≤SPSA≤100ng)

Table 11-1 Urology Measurement and Calculation Items

To determine the residual urine volume or prostate volume, take three measurements: length, width, and height. The system calculates the volume.

To measure RUV:

1. In the urology menu, roll the trackball to highlight **RUV**, and then press **Set**.
2. Measure threes pieces of data: RUV-L, RUV-W and RUV-H, in the method of distance measurement.

Reference Section 6.6.3, Generic Measurements in PW Mode

3. After the three measurements, the result of RUV will be displayed in the measurement result window.

To measure PV:

1. In the urology menu, roll the trackball to highlight **PV**, and then press **Set**.
2. Measure threes pieces of data: PV-L, PV-W and PV-H, in the method of distance measurement.

Reference Section 6.6.3, Generic Measurements in PW Mode

3. After the three measurements, the result of RUV will be displayed in the measurement result window.

To measure PSAD:

Measure PV and input SPSA. The SPSA input dialog box is as shown below. Input the SPSA with the keyboard.

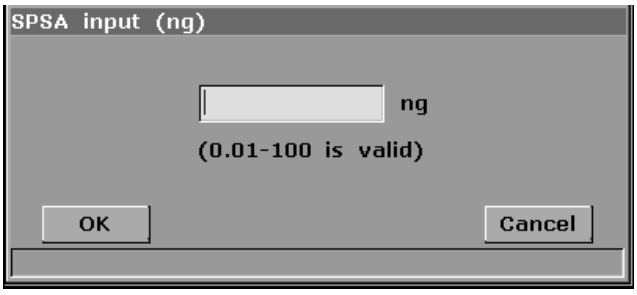


Figure 11-2 SPSA Input Dialog Box

11.2. Urologic Report

After the urologic examination, the system generates a urologic worksheet.

Roll the trackball to highlight **Urol Worksheet**, and press **Set** display **Urologic Worksheet** dialog box, as shown below:

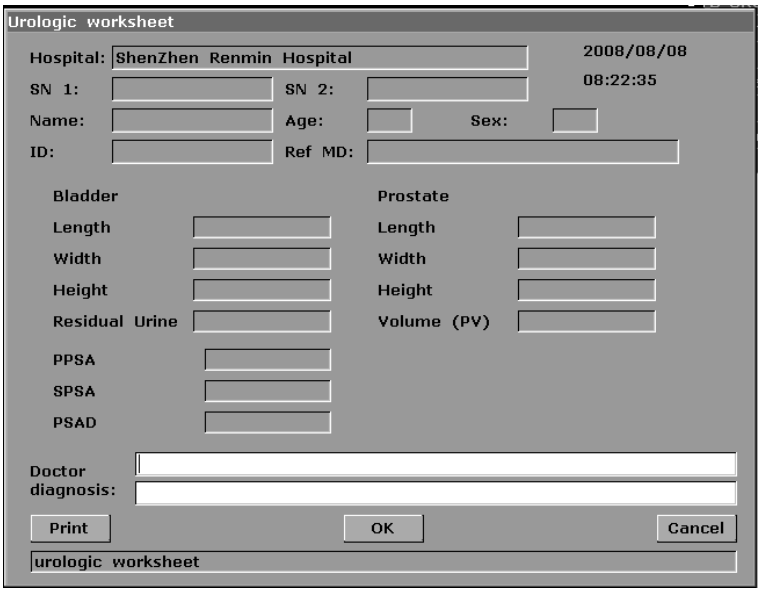


Figure 11-3 Urology Worksheet

The diagnosis editing column displays the cursor "I", and you can enter diagnosis information.

To print the report:

Press **Print** in the Urology Worksheet.

Printing reference Section *5.8, Printing.*

11.3. Others

Select **Others** to enter another application measurement.

Chapter 12 Orthopedics Measurements & Calculations

The orthopedics measurements include distance and HIP.

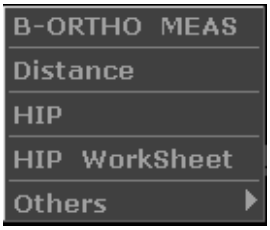


Figure 12-1 Orthopedics Measurement and Calculation Menu

12.1. Measurements and Calculations

Label	Description	Method
HIP	The Angle of Hipbone (/)	HIP
α	The Angle of BL and ARL (°)	
β	The Angle of BL and IL (°)	

Table 12-1 Orthopedics Measurement and Calculation Items

12.2. Orthopedics Report

After the orthopedics examination, the system generates a HIP worksheet.

Roll the trackball to highlight **HIP Worksheet**, and press **Set** to display **HIP Worksheet** dialog box, as shown below:

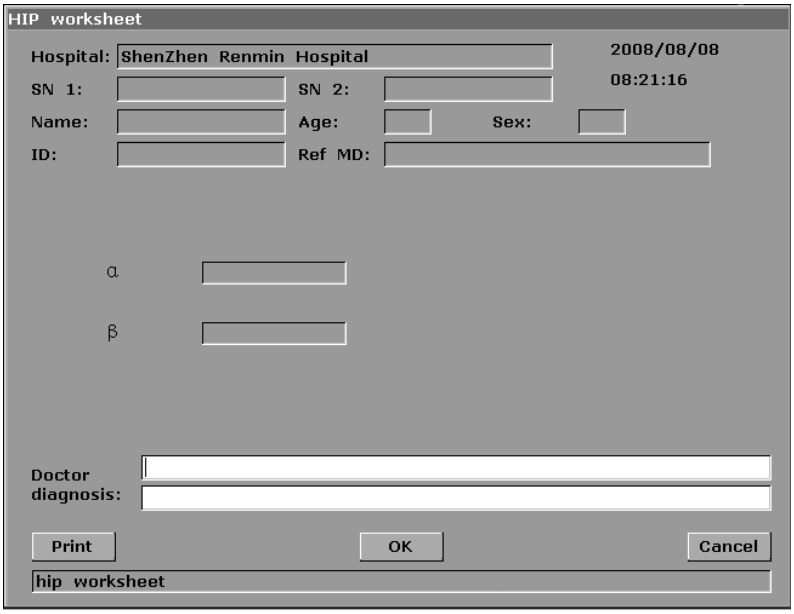


Figure 12-2 HIP Worksheet

The diagnosis editing column displays the cursor “I”, and you can enter diagnosis information.

To print the report:

Press **Print** in the HIP Worksheet.

 Printing reference Section *5.8, Printing.*

12.3. Others

Select **Others** to enter another application measurement.

Chapter 13 Vascular Measurements & Calculations

Usually the vascular examination is in the PW mode.

13.1. Measurements and Calculations in PW Mode

1 Press **Exam** and select **Vascular** and then press **Set**.

2 Press  to enter the PW mode.

3 Press **Measure** to activate the measurement function. The system displays the measurement menu as shown below.

Items of Measurement and Calculation

Velocity, CCA, ICA, ECA, Vert A, Upper, and Lower.

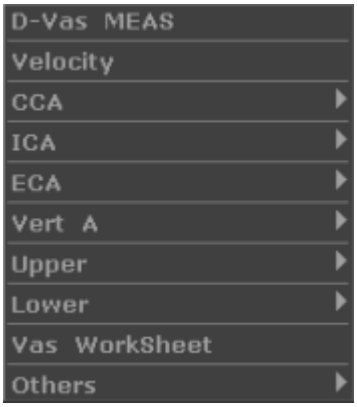


Figure 13-1 Vascular Measurement and Calculation Menu in PW Mode

Label	Description	Channel	Method
CCA	Common Cartid Artery	1	D trace
ICA	Internal Cartid Artery	1	
ECA	External Cartid Artery	1	
Vert A	Vertebral Artery	1	

Table 13-1 Vascular Measurement and Calculation Items in PW Mode

13.1.1. CCA

To measure CCA:

1. Press **Measure** to activate obstetric measurement.
2. In the vascular menu, select **CCA**.
3. Measure **CCA**, in the method of D trace measurement.

 Reference Section 6.6.3, Generic Measurements in PW Mode

4. The results are displayed in measurement result window.
5. To begin a new **CCA** measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

13.1.2. ICA

To measure ICA:

1. Press **Measure** to activate obstetric measurement.
2. In the vascular menu, select **ICA**.
3. Measure **ICA**, in the method of D trace measurement.

 Reference Section 6.6.3, Generic Measurements in PW Mode

4. The results are displayed in measurement result window.
5. To begin a new **ICA** measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

13.1.3. ECA

To measure ECA:

1. Press **Measure** to activate obstetric measurement.
2. In the vascular menu, select **ECA**.
3. Measure **ECA**, in the method of D trace measurement.

 Reference Section 6.6.3, Generic Measurements in PW Mode

4. The results are displayed in measurement result window.
5. To begin a new **ECA** measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

13.1.4. Vert A

To measure Vert A:

1. Press **Measure** to activate obstetric measurement.

2. In the vascular menu, select **Vert A**.
3. Measure **Vert A**, in the method of D trace measurement.


Reference Section 6.6.3, Generic Measurements in PW Mode

4. The results are displayed in measurement result window.
5. To begin a new **Vert A** measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

13.1.5. UPPER

To measure UPPER:

1. Press **Measure** to activate obstetric measurement.
2. In the vascular menu, select **UPPER**.
3. Measure **UPPER**, in the method of D trace measurement.


Reference Section 6.6.3, Generic Measurements in PW Mode

4. The results are displayed in measurement result window.
5. To begin a new **UPPER** measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

13.1.6. LOWER

To measure LOWER:

1. Press **Measure** to activate obstetric measurement.
2. In the vascular menu, select **LOWER**.
3. Measure **LOWER**, in the method of D trace measurement.


Reference Section 6.6.3, Generic Measurements in PW Mode

4. The results are displayed in measurement result window.
5. To begin a new **LOWER** measurement, repeat steps 1 through 3. You can measure a maximum of one group of data.

13.2. Vascular Report

After finishing the vascular examination, the system generates a vascular worksheet.

Roll the trackball to highlight **Vascular Worksheet**, and press **Set** to display **Vascular Worksheet** dialog box, as shown below:

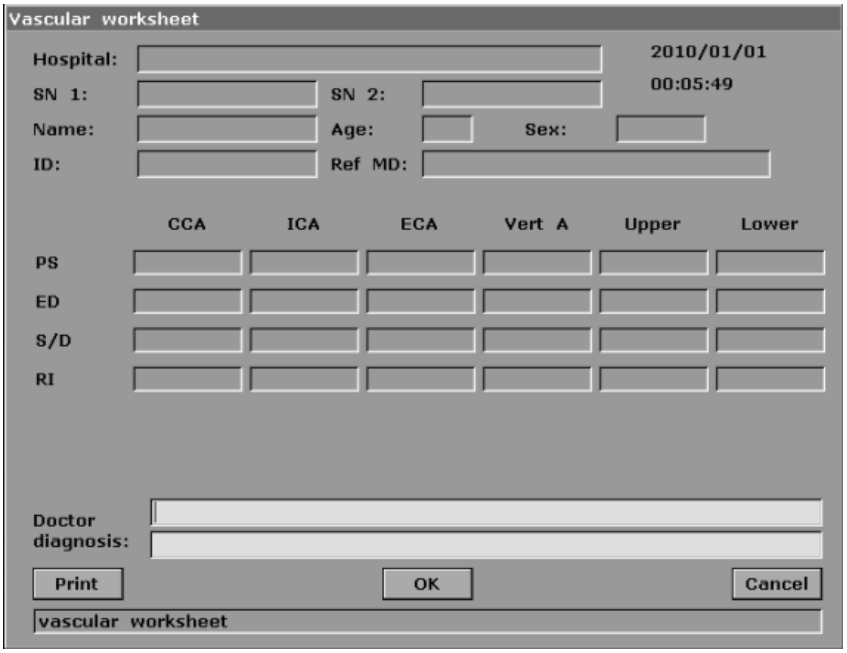


Figure 13-2 Vascular Worksheet

The diagnosis editing column displays the cursor "I", and you can enter diagnosis information.

To print the report:

Press **Print** in the vascular worksheet.

Printing reference Section *5.8, Printing.*

13.3. Others

Select **Others** to enter another application measurement.

Chapter 14 Inspection and Maintenance

CAUTION

The device and accessories are to be disposed of according to local regulations after their useful lives. Alternatively, they can be returned to the dealer or the manufacturer for recycling or proper disposal. Batteries are hazardous waste. Do not dispose them together with house-hold garbage. At the end of their life hand the batteries over to the applicable collection points for the recycling of waste batteries. For more detailed information about recycling of this product or battery, please contact your local Civic Office, or the shop where you purchased the product.

14.1. Daily Checklist

Check before the system is switched on:

- Visually inspect all the probes. Do not use any damaged probe.
- Visually inspect all the probe assembly cables and associated connectors.
- Visually inspect all the power cords. Do not turn on the power if a cord is frayed or split, or shows signs of wear.
- Verify that the trackball and TGC slide controls are clean and free from gel or contaminants.

Check after the system is switched on:

- Visually check the on-screen display and lighting. Verify that the monitor displays the current date and time and there isn't any error message.
- Verify that the probe identification and indicated frequency on the screen are correct for the activated probe.
- Ensure that there isn't obvious abnormal noise, discontinuous image or dark area.
- Ensure that it isn't smelly or too hot.
- Ensure that the ultrasound window isn't too hot, checking with your hand.
- Verify that the buttons and knobs on the keyboard are good to operate.

14.2. Cleaning and Disinfection

All exterior parts of the device, including the control panel and probes, should be cleaned and/or disinfected as necessary or between uses with a recommended cleanser or disinfectant. Clean

each part to remove any surface particles. Disinfect the parts to kill vegetative organisms and viruses.

You must take all necessary precautions to eliminate the possibility of exposing patients, operators or third parties to hazardous or infectious materials. Use universal precautions during cleaning and disinfection. You should treat all parts of the device that come in contact with human blood or other body fluids as they were known to be infectious.

After use, clean the outer shell of the device with soft and dry cloth gently. Medical cotton ball immerged with a 75% medical alcohol solution should be used to wipe probes gently and thoroughly.

The cleaning of internal components of the device should be performed by authorized and qualified personnel.

WARNING

1. To avoid electrical shock and damage to the system, always shut down and disconnect the device from the AC power source before cleaning and disinfection.
2. To avoid infection, always use protective gloves when performing cleaning and disinfecting procedures.
3. To avoid infection, ensure that the solution expiration date has not passed.

CAUTION

1. Be careful when cleaning the display screen. Since the display screen is easily scratched or damaged, we should wipe it with a soft and dry cloth.
2. To avoid the possibility of electrostatic shock and damage to the system, avoid the use of aerosol spray cleansers on the monitor.
3. Do not clean the internal base of the device.
4. Do not clean the system with chlorinated or aromatic solvents, acidic or basic solutions, isopropyl alcohol or strong detergents such as ammoniated products as they may damage the surface of the system.
5. Do not use spray detergents on the system or it may force cleaning fluid into the system and damage electronic parts. Solvent fumes build up and form flammable gases or damage internal parts.
6. Do not pour any fluid onto the system surface, as fluid seepage into the electrical circuitry may cause excessive leakage current or system failure.
7. Do not leave residual detergent on the surface of the device.

14.2.1. System Surface Cleaning

To clean the system surface:

1. Power off the system and disconnect it from power supply.
2. Use a clean gauze pad or lint-free cloth, moistened lightly with a mild detergent, to wipe the surface.
3. After cleaning, reconnect the system to power source.

CAUTION

Make sure the cleaning solution does not seep into the control panel or any other openings.

NOTE:

1. Take particular care when cleaning the areas near trackball and the slide controls.
2. Make sure they are free of gel and any other visible residue.
3. Use a soft dry cloth without chemicals for cleaning, because the surface of polarizer is very soft and easily scratched.

14.2.2. Probe and Probe Holder Cleaning and Disinfection

To clean probe holder:

1. Disassemble the probe holder by uninstalling the two screws.
2. Wash the holder with flowing water, using a mild detergent.
3. After cleaning and drying, assemble the probe holder to the main unit.

Every time before use, layer of medical ultrasound coupling gel should be applied evenly on the area of the acoustical window of the probe. Be careful not to generate any air bubble.

To clean the probes:

1. Disconnect the probe from the system.
2. Wipe off all the gel gently with a soft cloth.
3. Wash the probe with mild soap in lukewarm water. Wipe off the entire residue gently with a soft cloth gently.
4. Rinse the probe with enough distilled water to remove all visible soap residues.
5. Air dry or dry with a soft cloth.

NOTE: The single-use sheath should be used on E743UA probe and E613UA probe. Before cleaning the probe, remove the sheath gently and discard it. Put on a new single-use sheath before using the probe.

CAUTION

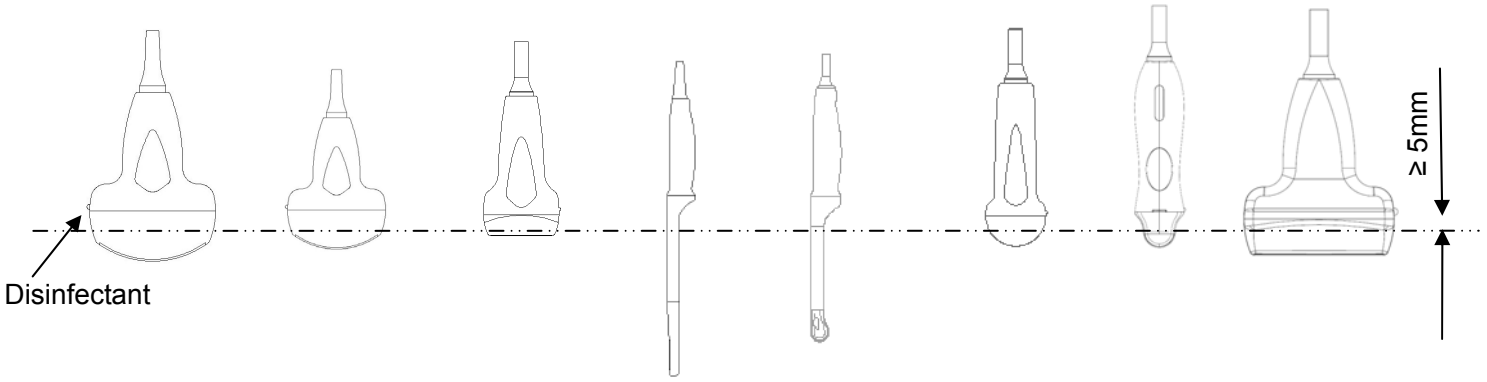
We recommend that the single-use sheath should be CE marked or FDA 510(k) cleared.

To disinfect the probe:

Disinfection should be performed each time after use.

1. Prepare the disinfectant.
2. Place the cleaned and dried probe in contact with the disinfectant (refers to figure 13-1 for the contacting area) for the time specified by the disinfectant manufacturer.

The following figure defines how much of the probe can be submerged.



C363UA/ C362UA | C343UA | L743UA/ L742UA | E743UA | E613UA | C321UA | C613UA | L763UA

Figure 14-1 Depth of the Probe Immerged into Disinfectant

3. After removing from the disinfectant, rinse the probe according to the disinfectant instructions. Flush all residues from the probe and perform air dry.

WARNING

1. Do not immerse the probe connector. If the cable connector is immersed, do not plug the connector into the system. Rinse the connector under running water and dry it thoroughly. If necessary, contact EDAN for service.
2. Prohibit infiltration of any type of liquid into the device or the probe.
3. Do not sterilize the probe using techniques such as autoclave, ultraviolet, gamma radiation, gas, steam, or heat. Otherwise, severe damage will result.
4. The coupling gel adapted to the probe is a medial ultrasound coupling gel.
5. Do not immerse the power cord and connector of the probe into solutions. Probes can be submerged to, but not including, the strain relief of the probe array. Do not immerse or soak any part of a probe in any cleaning material not listed in the recommended list of disinfectants.

Proper Use of Probes

In order to extend the service life and to obtain optimum performance of the probe, please operate as follows:

Inspect power cord, socket and acoustical window of the probe periodically.

Shut down the machine before connecting or disconnecting the probe.

Do not drop the probe onto the floor or collide with hard objects. Otherwise it will be damaged easily.

When the probe is not used, put it in the probe holder.

Heating the probe is strictly forbidden.

Pulling or bending the power cord of the probe is strictly forbidden; otherwise internal connecting lines of the power cord may rupture.

Coupling gel can only be used on the head of the probe, and it should be wiped off after use.

Each time after use, clean and disinfect the probe.

The acoustical window and the shell of the probe should be examined frequently.

WARNING

The DUS 60 cannot be used together with high-frequency surgical equipment.

CAUTION

1. Do not disinfect or clean probes under high temperature, and the temperature should be below 45°C.
2. In order to avoid damaging the device, the disinfection method is limited to regular maintenance of devices in hospitals. Disinfecting instruments should be cleaned first.

14.2.3. Trackball Cleaning

To clean the trackball:

1. Remove the front panel bezel.
2. Remove the trackball as shown in figure 13-2.
3. Clean trackball with a tissue and isopropyl alcohol.
4. Clean the inside of the trackball assembly with a cotton swab and isopropyl alcohol.
5. Assemble the trackball and front panel bezel after the assembly parts completely dry.

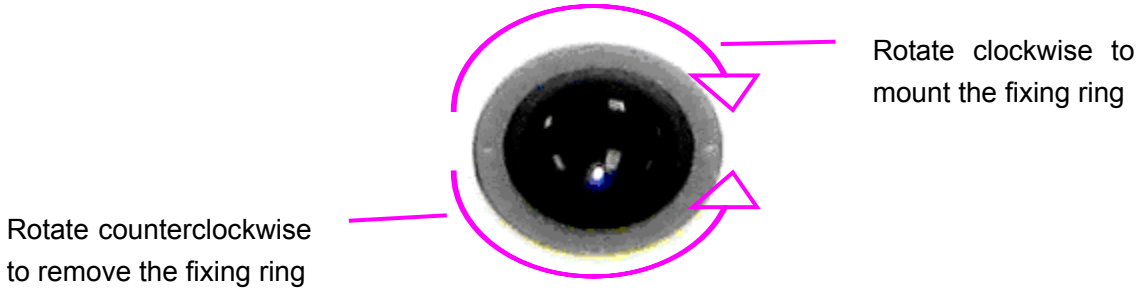


Figure 14-2 Assembling and Disassembling Trackball

CAUTION

Do not drop or place foreign objects inside the trackball assembly or it may affect the trackball operation and damage the system.

NOTE:

Be sure to clean the X and Y encoders and the idler wheel.

14.2.4. Replacing Fuses

You can replace the fuses if necessary.

Step 1. Pull out the fuse-box using a minus screwdriver;

Step 2. Use the tweezers to pull the fuses out through the small hole on the bottom of the box;

Step 3. Put new fuses (φ5×20, T3.15AH250V) provided by EDAN in position, and reposition the fuse-box.

Step 1

Step 2

Step 3

14.2.5. Disinfectants

Probe: 75% medical alcohol, Cidex (2.4%), Cidex OPA (0.55%).

WARNING

1. Be sage to choose the cleansers and disinfectants. The concentration in the air must not exceed an applicable specified limit. Comply with the manufacturer's instructions when using the cleansers and disinfectants.
2. The use of diluent paint, vinyl oxide or other organic solvents is prohibited. These solvents will damage the protective film of the probe surface.

14.3. Maintenance

Maintenance must be performed every 12 months, including safety and functionality of the system.

The following safety checks should be performed at least every 12 months by a qualified person who has adequate training, knowledge, and practical experience to perform these tests.

- Inspect the safety-related labels for legibility.
- Inspect the fuse to verify compliance with rated current and breaking characteristics.
- Verify that the device function properly as described in the instructions for use.
- Test the protection earth resistance according to IEC/EN 60601-1 and IEC/EN 60601-2-37: Limit: 0 ~ 0.1 Ω.
- Test the earth leakage current according to IEC/EN 60601-1 and IEC/EN 60601-2-37: Limit: NC 500 μA ~ SFC 1000 μA.
- Test the patient leakage current according to IEC/EN 60601-1 and IEC/EN 60601-2-37: Limit: NC 100 μA ~SFC 500 μA.
- Test the Covers leakage current according to IEC/EN 60601-1 and IEC/EN 60601-2-37: Limit: NC100 μA ~ SFC 500 μA.
- The leakage current should never exceed the limit.

The data should be recorded in an equipment log. If the device is not functioning properly or any of the above tests fail, please contact the maintenance personnel of EDAN.

Chapter 15 Troubleshooting

15.1. Checkup

- Check whether the power supply works properly and the power cord is well connected and plugged into the power socket.
- Check whether the probe is properly connected to the main unit.

15.2. Troubleshooting

- Changing the cartridge fuse (by the professional personnel of EDAN).
- Troubleshooting (see table 14-1)

Item	Problem	Solution
1	When the power switch is on, there isn't any image displayed.	1. Check power supply. 2. Check wires and plugs. 3. Check whether the cartridge fuse is melted. 4. Check the brightness control knob.
2	Strip-shape or snowflake-shape disturbance occurs on the display screen.	1. Inspect the power supply. 2. Check whether it is disturbed by the ignition action of any other device. 3. Check the disturbance of electric or magnetic field in the surrounding environment. 4. Check whether the plug and socket of power supply and probe are properly connected.
3	Image is not displayed clearly on the screen.	1. Adjust overall gain (Gain). 2. Adjust eight TGC slide controls. 3. Adjust the brightness and contrast potentiometer. 4. Adjust focus (the number and the position). 5. Clean the light filter of the display screen.
4	Near-field image is not clear.	Adjust the key total gain and the upper TGC
5	Far-field image is not clear.	Adjust the key total gain and the lower TGC
6	Image window is dark.	Adjust the brightness and contrast knobs.

Table 15-1 Troubleshooting Examples

Chapter 16 Warranty and Service Policy

16.1. Warranty

EDAN warrants that EDAN's products meet the labeled specifications of the products and will be free from defects in materials and workmanship that occur within warranty period. The warranty period begins on the date the products are shipped to distributors.

The warranty is void in case of:

- Damage caused by handling during shipping.
- Subsequent damage caused by improper use or maintenance.
- Damage caused by alteration or repair by anyone not authorized by EDAN.
- Damage caused by accidents.
- Replacement or removal of serial number label and manufacture label.

If a product covered by this warranty is determined to be defective because of defective materials, components, or workmanship, and the warranty claim is made within the warranty period, EDAN will, at its discretion, repair or replace the defective part(s) free of charge. EDAN will not provide a substitute product for use when the defective product is being repaired.

16.2. Service Policy

All repairs on products must be performed or approved by EDAN. Unauthorized repairs will void the warranty. In addition, whether or not covered under warranty, any product repair shall be exclusively be performed by EDAN certified service personnel.

If the product fails to function properly — or if you need assistance, service, or spare parts — contact EDAN's service center. A representative will assist you in troubleshooting the problem and will make every effort to solve it over the phone or Email, avoiding potential unnecessary returns.

In case a return can not be avoided, the representative will record all necessary information and will provide a Return Material Authorization (RMA) form that includes the appropriate return address and instructions. An RMA form must be obtained prior to any return.

Freight policy:

Under warranty: the service claimer is responsible for freight & insurance charges when a retrun is shipped to EDAN for service including custom charges. EDAN is responsible for freight, insurance & custom charges from EDAN to service claimer.

Out of warranty: the service claimer is responsible for any freight, insurance & custom charges for product.

Contact information:

If you have any question about maintenance, technical specifications or malfunctions of devices, contact your local distributor.

Alternatively, you can send an email to EDAN service department at: support@edan.com.cn.

Appendix I: Specifications

A1.1: Electrical Safety Classifications

According to the type of protection against electric shock	Internally powered equipment, Class I equipment
According to the degree of protection against electric shock	Type B
According to the degree of protection against harmful ingress of liquid	Whole device: IPX0; Probe (do not include the probe connector): IPX7; Footswitch (optional): IP68.
According to the degree of safety of application in the presence of a flammable gas	Equipment not suitable for use in the presence of a flammable gas
According to the mode of operation	Continuous operation
According to the grade of EMC	Group I, Class A

A1.2: Standards Compliance

Standard	**Description**
IEC 60601-1:1988+A1+A2 EN 60601-1:1990+A1+A2	Medical electrical equipment; Part 1: General requirements for safety
IEC/EN 60601-1-2:2001+A1	Medical electrical equipment-Part 1-2: General requirements for safety-Collateral standard: Electromagnetic compatibility -Requirements and tests
IEC/EN 60601-1-4	Medical electrical equipment - Part 1-4: General requirements for safety - Collateral standard: Programmable electrical medical systems
IEC/EN 60601-2-37	Medical electrical equipment-Part 2-37: Particular requirements for the safety of ultrasonic medical diagnostic and monitoring equipment
IEC/EN 61157	Requirements for the declaration of the acoustic output of medical diagnostic ultrasonic equipment

A1.3: Power Supply

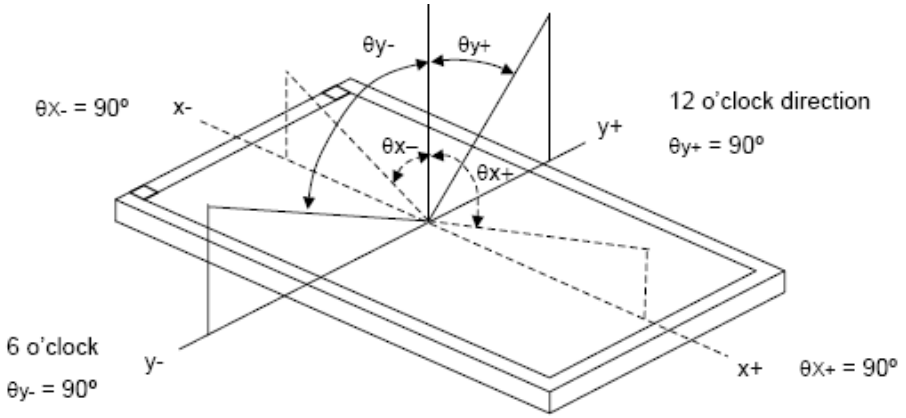
Operating Voltage	100 V-240 V~
Operating Frequency	50 Hz/60 Hz
Input Power	150 VA
Lithium battery	
Capacity	6400 mAh
Voltage	14.8 VDC
Average working time	2 h
Maximum charging time	8 h
Cycle life	300 times

A1.4: Machine Specifications

Main unit dimensions	330 mm (W) × 320 mm (L) × 220 mm (H)
Net weight	7.1 kg

A1.5: Display Specifications

Display	TFT-LCD
Diagonal Size	12.1-inch
View Angle	Horizontal: $\Theta x_{Typ.}$: 80°; Vertical: $\Theta y_{Typ.}$: 80°; see the figure below.
Pixel Number	1024*768
Center Luminance of White	Typ.: 450 cd/m^2
Contrast Ratio	Typ.: 700



A1.6: General Technical Specifications

Display Modes	B, B+B, 4B, B+M, M, and PW
Image Gray Scale	256 levels
Image Magnification	In area Real time: ×1.0, ×1.44, ×1.96, ×2.56, ×4.0, ×5.76, ×9.0, ×16.0 Frozen (only available in B mode): ×1.0, ×1.78, ×4.0, ×16.0
Storage	504 MB
Cine Review	256 frames
Depth Adjustment	Adjustable in real time in B, B+B, 4B, B+M, M, and PW modes
Frame Correlation Coefficient	8 levels to adjust (0~7), (B, B+B, 4B, B+M modes, ineffective when freezing)
Image Conversion	Up/Down flip, Left/Right flip, 90° rotate
Language Conversion	Chinese, English, etc. (The language options varies with language software installed.)
Focus Position	16 levels to adjust
Focus Number	Max. 4
Software Packages	Abdomen, obstetric, small parts, gynecology, orthopedics, cardiology, urology, and vascular
B mode Measurement	Distance, circumference, area, volume, ratio, % stenosis, histogram and angle
M mode Measurement	Distance, time, slope, and heart rate
D mode Measurement	Time, heart rate, velocity, acceleration, trace, and RI
Annotations	Patient name, age, sex, time, date, hospital name, doctor name, comment (full-screen character editing)
Body Mark	130 types
USB Port	USB 2.0

A1.7: Probe Specifications

This device can detect the probe automatically.

Model	Application
C363UA/C362UA	Abdomen, Gynecology, Fetal / Obstetrics, and Pediatrics
C343UA	Abdomen, Gynecology, Fetal / Obstetrics, and Pediatrics
C321UA	Abdomen, Gynecology, Fetal / Obstetrics, Pediatrics and Cardiology
C613UA	Abdomen, Gynecology, Fetal / Obstetrics, Pediatrics and Cardiology
E613UA	(Transvaginal / Transrectal): Gynecology, Fetal / Obstetrics, and Urology
E743UA	(Transrectal): Rectum and the surrounding viscera, uterus, ovary and prostate
L743UA/L742UA /L763UA	Small parts (galactophore, thyroid gland, prostate), Neonatal Cephalic, Peripheral Vascular, Musculo-skeletal (both Conventional and Superficial)
NOTE: Maximum transducer temperature rise during use: Less than 10 °C. Expanded uncertainty of temperature test: U=0.4°C, k=2.	

	Specifications								
Probe	Standard Probe	Optional Probe							
	R60 convex array transducer	L43 High frequency linear array transducer, Endorectal transducer	R20 Micro-convex array transducer	R10 Endocavity transducer	R40 convex array transducer	R10 Micro-convex array transducer	L63 High frequency linear array transducer	R60 convex array transducer	L43 High frequency linear array transducer
	C363UA	L743UA/ E743UA	C321UA	E613UA	C343UA	C613UA	L763UA	C362UA	L742UA
Central frequency	3.5 MHz	7.5 MHz	3.5 MHz	6.5 MHz	3.5 MHz	6.5 MHz	7.5 MHz	3.5 MHz	7.5 MHz
Elements number	96	96	80	96	96	96	96	128	128
Space of elements	0.66mm	0.42mm	0.40mm	0.34mm	0.63mm	0.28mm	0.63mm	0.50mm	0.30mm
Max. number of active elements	32	32	32	32	32	32	32	32	32

Length of probe cable		2200±50 mm

Transducer Models	Parameter（mm）	Mode		
		B	B+M	PW
L743UA	F_{LX}	0.7188	0.7188	0.5274
	F_{LY}	7.8222	7.8222	4.635
E743UA	F_{LX}	0.7188	0.7188	0.5274
	F_{LY}	7.8222	7.8222	4.635
L763UA	F_{LX}	0.3902	0.3902	0.3943
	F_{LY}	2.2322	2.2322	2.5852
L742UA	F_{LX}	0.6584	0.6584	0.8462
	F_{LY}	6.3649	6.3649	12.3959
C613UA	F_{LX}	0.5431	0.5431	0.469
	F_{LY}	4.4323	4.4323	3.8273
E613UA	F_{LX}	0.702	0.702	0.9829
	F_{LY}	7.4919	7.4919	12.649
C363UA	F_{LX}	1.5429	1.5429	1.6648
	F_{LY}	20.3404	20.3404	22.1698
C343UA	F_{LX}	1.5726	1.5726	1.7654
	F_{LY}	21.5005	21.5005	24.6285
C321UA	F_{LX}	2.186	2.186	2.6236
	F_{LY}	42.2692	42.2692	54.189
C362UA	F_{LX}	1.7369	1.7369	1.9452
	F_{LY}	26.6692	26.6692	33.9865

A1.8: Operating, Storage and Transportation Environment

A1.8.1. Operating Environment:

Temperature	+5 °C ~ +40 °C
Relative humidity range	25% RH ~ 80% RH
Atmospheric pressure range	860 hPa ~ 1060 hPa
Maximum altitude	3 km

A1.8.2. Storage and Transportation Environment:

Temperature	-20 °C ~ +55 °C
Relative humidity range	25% RH ~ 93% RH
Atmospheric pressure range	700 hPa ~ 1060 hPa
Maximum altitude	3 km

Appendix II: Ultrasound Intensity and Safety

A2.1: Ultrasound in Medicine

The use of diagnostic ultrasound has proved to be a valuable tool in medical practice. Given its known benefits for non-invasive investigations and medical diagnosis, including investigation of the human fetus, the question of clinical safety with regards to ultrasound intensity arises.

There is no easy answer to the question of safety surrounding the use of diagnostic ultrasound equipment. Application of the ALARA (As Low As Reasonably Achievable) principle serves as a rule-of-thumb that will help you to get reasonable results with the lowest possible ultrasonic output.

The American Institute of Ultrasound in Medicine (AIUM) states that given its track record of over 25 years of use and no confirmed biological effects on patients or instrument operators, the benefits of the prudent use of diagnostic ultrasound clearly outweigh any risks.

A2.2: Ultrasound Safety and the ALARA Principle

Ultrasound waves dissipate energy in the form of heat and can therefore cause tissue warming. Although this effect is extremely low with Transcranial Doppler, it is important to know how to control and limit patient exposure. Major governing bodies in ultrasound have issued statements to the effect that there are no known adverse effects from the use of diagnostic ultrasound, however, exposure levels should always be limited to As Low As Reasonably Achievable (the ALARA principle). You can control the ultrasonic power or patient exposure to ultrasound in any of the following three ways:

- Adjust the pulse strength (amplitude)
- Adjust the duration of the pulse (pulse duration)
- Adjust the pulse rate (pulse repetition frequency or PRF)

To change these settings for your system, use the following controls:

Amplitude

The power setting directly influences the amplitude of the pulse burst. A higher setting increases the amplitude, resulting in a higher ultrasound output at the probe.

Sample Volume

The Sample volume is the axial length of the area from which the Doppler signals are obtained. The larger the sample volume, the longer the duration of the pulse burst, and consequently the higher the ultrasound output and power.

Spectrum Velocity Scale

The higher the scale setting, the higher the pulse repetition frequency (number of pulses per second), and consequently the higher the ultrasound output. More pulses per second are

equivalent to a higher power output.

Proper use of these instrument settings can minimize patient exposure, and optimize the results and efficiency of the equipment.

Always apply the ALARA principle; use power levels that are: As Low As Reasonably Achievable.

Imaging Functions Affecting Acoustic Output

In addition to the level of voltage transmitted, adjustment of the following imaging functions and /or controls may affect the acoustic output.

Item	Affection
Probe	Acoustic output will be changed with the change of probe.
Imaging mode	There are different parameters applied in B mode, M mode, and PW mode, so acoustic output will be changed with the change of among B mode, M mode, and PW mode.
Field of view (scan angle or scan width)	Frame rate may be changed with the change of the scan angle of the scan width, and the acoustic output will also be changed.
Image depth	Pulse repeated frequency will be changed with the change of the image depth, and the acoustic output will be changed.
Focus number	Frame rate and focus position will be changed with the change of the focus number, and acoustic output will also be changed.
Focus position	Acoustic output will be changed with the change of the focus position even the beam power level and the beam aperture have not been changed. Generally, the acoustic output will be higher with it gets nearer to the probe.
Freeze	When freezing the system, it will stop transmitting ultrasonic wave.
Transmission power	The output of probe will be changed with the change of the transmission power, and acoustic output will be changed.
Multi-frequency	The character of the wave focus will be changed with the change of the frequency, and acoustic output will be changed.
Line density	The acoustic output will be changed with the change of the number of the scanning line (line density).
PRF	The acoustic power will be changed with the change of PRF.
Sample volume	The pulsed wave and the power will be changed with the change of the sample volume, and acoustic output will be changed.
AP (acoustic power)	The AP adjustment will directly change the acoustic output.
Presets	Presets contain all the parameters above, so any change of the presetting will change acoustic output.
Restart, or power on/off	System will return to the default setting when restarting, or powering on/off the system, and acoustic output will be changed.

Operator Control Features：

The user should be aware that certain operator controls may affect the acoustic output. It is recommended to use the default (or lowest) output power setting and compensate using Gain control to acquire an image. Other than the output power setting in the soft-menu, which has the most direct impact on the power; the PRF, image sector size, frame rate, depth, and focal position also slightly affect the output power. The default setting is normally around 70% of the allowable power which will not cause any harm to users and is validated to be the most effective for all the transducers.

A2.3: Probe Acoustic Output Parameters List

A2.3.1: Test of Probe C321UA:

Test Item	B	B+M	PW
p-, MPa	2.547	2.547	1.244
$I_{spta,}$ mW/cm^2	18.3025	41.5535	1324
System settings	Control1	Control1	Control1
$Z_{p,}$ mm	44.5	44.5	49.5
$W_{pb6,}$ (∥), mm (⊥), mm	0.2861 0.5062	0.2861 0.5062	0.2958 0.3126
prr, kHz	1.872	--	6.361
srr, Hz	43	29	--
Output beam Dimensions, cm^2	1.92	1.92	1.92
$f_{awf,}$ MHz	3.17	3.17	3.065
APF, %	--	--	--
AIF, %	--	--	--
Maximum power, mW	38.73	33.717	87.47
$I_{ob,}$ mW/cm^2	20.1719	17.5609	45.5573
Power-up mode	B mode	B mode	B mode
Initialization mode	B mode	B mode	B mode
Acoustic output freeze	Yes	Yes	Yes
Z_{tt} (mm)	--	--	--
Z_{ts} (mm)	contact	contact	contact
Inclusive modes	--	--	--

Control1: AP=15; Frequency=3.0MHz; Depth=98mm; Focus=60mm;

Acoustic Output Reporting Table

Transducer Model: C321UA Operating Model: B Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			0.8458	0.5959				1.6912
Associated Acoustic Parameters	$P_{r.3}$ MPa		1.506					
	W_0 mW			38.73				38.73
	Min of[$W_{.3}$(z1),($I_{ta.3}$(z1)] (mW)							
	Z_1 (cm)							
	Z_{bp} (cm)							
	Z_{sp} (cm)		4.45					
	deq(Z_{sp}) (cm)							
	f_c (MHz)		3.17	3.17				3.17
	Dim of Aaprt	X(cm)		1.28				1.28
		Y (cm)		1.5				1.5
Other Information	PD (usec)		0.4958					
	PRF (Hz)		1872					
	P_r@PII_{max} (MPa)		2.4931					
	d_{eq}@PII_{max} (cm)		0.013					
	Focal Length	FL_x (cm)		2.186				2.186
		Fl_y (cm)		42.2692				42.2692
	$I_{pa.3}$@MI_{max}(W/cm^2)		0.1468					
Control Conditions	Control1		AP=15; Frequency=2.0MHz; Depth=98mm; Focus=60mm;					

Acoustic Output Reporting Table

Transducer Model: C321UA Operating Model: B+M Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			0.8458	0.1768		0.0178	0.0639	0.5391
Associated Acoustic Parameters	$P_{r.3}$	MPa	1.506					
	W_0	mW		31.4			2.317	33.717
	Min of[$W_{.3}(z1)$,(mW) $I_{ta.3}(z1)$]					1.23		
	Z_1	(cm)				3.0		
	Z_{bp}	(cm)				2.3417		
	Z_{sp}	(cm)	4.45				4.45	
	deq(Z_{sp})	(cm)					0.3579	
	f_c	(MHz)	3.17	3.17		3.17	3.17	3.17
	Dim of Aaprt	X(cm)		1.28		1.28	1.28	1.28
		Y (cm)		1.5		1.5	1.5	1.5
Other Information	PD	(usec)	0.4958					
	PRF	(Hz)	1518					
	P_r@PII_{max}	(MPa)	2.4931					
	d_{eq}@PII_{max}	(cm)	0.0264				0.3579	
	Focal Length	FL_x (cm)		2.186		2.186		2.186
		Fl_y (cm)		42.2692		42.2692		42.2692
	$I_{pa.3}$@MI_{max}(W/cm^2)		0.1468					
Control Conditions	Control1		AP=15; Frequency=3.0MHz; Depth=98mm; Focus=60mm;					

Acoustic Output Reporting Table

Transducer Model: C321UA Operating Model: PW Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			0.4616			0.6412	3.0623	1.3986
Associated Acoustic Parameters	$P_{r.3}$	MPa	0.8082					
	W_0	mW					87.47	87.47
	Min of[$W_{.3}(z1)$,(mW) $I_{ta.3}(z1)$]					50.0		
	Z_1	(cm)				3.0		
	Z_{bp}	(cm)				2.3417		
	Z_{sp}	(cm)	4.95				4.95	
	deq(Z_{sp})	(cm)					0.0075	
	f_c	(MHz)	3.065			3.065	3.065	3.065
	Dim of Aaprt	X(cm)				1.28	1.28	1.28
		Y (cm)				1.5	1.5	1.5
Other Information	PD	(usec)	1.9784					
	PRF	(Hz)	6361					
	P_r@PII_{max}	(MPa)	1.2714					
	d_{eq}@PII_{max}	(cm)	0.0075				0.0075	
	Focal Length	FL_x (cm)				2.6236		2.6236
		Fl_y (cm)				54.189		54.189
	$I_{pa.3}$@MI_{max}(W/cm^2)		0.036					
Control Conditions	Control1		AP=15; Frequency=2.0MHz; Depth=98mm; Focus=60mm;					

A2.3.2: Test of Probe C613UA:

Test Item	B	B+M	PW
p-, MPa	2.629	2.629	1
$I_{spta,}$ mW/cm^2	12.5948	25.1724	592.3
System settings	Control1	Control1	Control2
$Z_{p,}$ mm	14.5	14.5	13
$W_{pb6,}$ (∥), mm (⊥), mm	0.183 0.165	0.183 0.165	0.1569 0.175
prr, kHz	--	--	6361
srr, Hz	49	39	--
Output beam Dimensions, cm^2	0.5197	0.5197	0.5197
$f_{awf,}$ MHz	5.791	5.791	6.3165
APF, %	--	--	--
AIF, %	--	--	--
Maximum power, mW	5.156	4.9798	17.17
$I_{ob,}$ mW/cm^2	9.9211	9.5821	33.0383
Power-up mode	B mode	B mode	B mode
Initialization mode	B mode	B mode	B mode
Acoustic output freeze	Yes	Yes	Yes
Z_{tt} (mm)	--	--	--
Z_{ts} (mm)	contact	contact	contact
Inclusive modes	--	--	--

Control1: AP=15; Frequency=5.5MHz; Depth=29mm; Focus=10mm;

Control2: AP=15; Frequency=4.5MHz; Depth=29mm; Focus=10mm;

Acoustic Output Reporting Table

Transducer Model: C613UA Operating Model: B Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			0.8883	0.0725				0.1634
Associated Acoustic Parameters	$P_{r.3}$	MPa	2.155					
	W_0	mW		5.316				5.316
	Min of[$W_{.3}$(z1),(mW) $I_{ta.3}$(z1)]							
	Z_1	(cm)						
	Z_{bp}	(cm)						
	Z_{sp}	(cm)	1.3					
	deq(Z_{sp})	(cm)						
	f_c	(MHz)	5.8865	5.8865				5.8865
	Dim of Aaprt	X(cm)		0.896				0.896
		Y (cm)		0.58				0.58
Other Information	PD	(usec)	0.274					
	PRF	(Hz)	2342					
	P_r@PII_{max}	(MPa)	2.4022					
	d_{eq}@PII_{max}	(cm)	0.0479					
	Focal Length	FL_x (cm)		0.5431				0.5431
		Fl_y (cm)		4.4323				4.4323
	$I_{pa.3}$@MI_{max}(W/cm^2)		0.2133					
Control Conditions	Control1		AP=15; Frequency=4.5MHz; Depth=29mm; Focus=10mm;					

Acoustic Output Reporting Table

Transducer Model: C613UA Operating Model: B+M Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			0.8883	0.0655	0.0082		0.0302	0.1578
Associated Acoustic Parameters	$P_{r.3}$ MPa		2.155					
	W_0 mW			4.799	0.336		0.336	5.135
	Min of[$W_{.3}$(z1),(mW) $I_{ta.3}$(z1)]							
	Z_1 (cm)							
	Z_{bp} (cm)							
	Z_{sp} (cm)		1.3				1.3	
	deq(Z_{sp}) (cm)						0.7584	
	f_c (MHz)		5.8865	5.8865	5.8865		5.8865	5.8865
	Dim of Aaprt	X(cm)		0.896	0.896		0.896	0.896
		Y (cm)		0.58	0.58		0.58	0.58
Other Information	PD (usec)		0.274					
	PRF (Hz)		2114					
	P_r@PII_{max} (MPa)		2.4022					
	d_{eq}@PII_{max} (cm)		0.0531				0.7584	
	Focal Length	FL_x (cm)		0.5431	0.5431			0.896
		Fl_y (cm)		4.4323	4.4323			0.58
	$I_{pa.3}$@MI_{max}(W/cm^2)		0.2133					
Control Conditions	Control1		AP=15; Frequency=4.5MHz; Depth=29mm; Focus=10mm;					

Acoustic Output Reporting Table

Transducer Model: C613UA Operating Model: PW Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt}\leq 1$	$A_{aprt}>1$		
Global Maximum Index Value			0.4034		0.4474		1.5775	0.5415
Associated Acoustic Parameters	$P_{r.3}$ MPa		0.9316					
	W_0 mW				17.62		17.62	17.62
	Min of[$W_{.3}$(z1),(mW) $I_{ta.3}$(z1)]							
	Z_1 (cm)							
	Z_{bp} (cm)							
	Z_{sp} (cm)		1.4				1.4	
	deq(Z_{sp}) (cm)						0.0144	
	f_c (MHz)		5.3316		5.3316		5.3316	5.3316
	Dim of Aaprt	X(cm)			0.896		0.896	0.896
		Y (cm)			0.58		0.58	0.58
Other Information	PD (usec)		1.7398					
	PRF (Hz)		6361					
	P_r@PII_{max} (MPa)		1.3869					
	d_{eq}@PII_{max} (cm)		0.0144				0.0144	
	Focal Length	FL_x (cm)			0.469			0.469
		Fl_y (cm)			3.8273			3.8273
	$I_{pa.3}$@MI_{max}(W/cm^2)		0.053					
Control Conditions	Control1		AP=15; Frequency=5.5MHz; Depth=29mm; Focus=10mm;					

A2.3.3: Test of Probe C343UA:

Test Item	B	B+M	PW
p-, MPa	2.381	2.381	1.244
$I_{spta,}$ mW/cm^2	21.6333	54.3890	1677
System settings	Control1	Control1	Control1
$Z_{p,}$ mm	48.5	48.5	52
$W_{pb6,}$ (∥), mm (⊥), mm	0.2901 0.3493	0.2901 0.3493	0.2878 0.2957
prr, kHz	--	--	5112
srr, Hz	37	27	--
Output beam Dimensions, cm^2	3.024	3.024	3.024
$f_{awf,}$ MHz	2.9572	2.9572	2.7031
APF, %	--	--	--
AIF, %	--	--	--
Maximum power, mW	39.97	34.47	82.8
$I_{ob,}$ mW/cm^2	13.2176	11.3988	27.381
Power-up mode	B mode	B mode	B mode
Initialization mode	B mode	B mode	B mode
Acoustic output freeze	Yes	Yes	Yes
Z_{tt} (mm)	--	--	--
Z_{ts} (mm)	contact	contact	contact
Inclusive modes	--	--	--

Control1: AP=15; Frequency=2.0MHz; Depth=98mm; Focus=60mm;

Acoustic Output Reporting Table

Transducer Model: C343UA Operating Model: B Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			0.9043	0.146				0.5312
Associated Acoustic Parameters	$P_{r.3}$ MPa		1.557					
	W_0 mW			41.69				41.69
	Min of[$W_{.3}$(z1),(mW) $I_{ta.3}$(z1)]							
	Z_1 (cm)							
	Z_{bp} (cm)							
	Z_{sp} (cm)		4.85					
	deq(Z_{sp}) (cm)							
	f_c (MHz)		2.9652	2.9652				2.9652
	Dim of Aaprt	X(cm)		2.061				2.061
		Y (cm)		1.5				1.5
Other Information	PD (usec)		0.5188					
	PRF (Hz)		2159					
	P_r@PII_{max} (MPa)		2.5988					
	d_{eq}@PII_{max} (cm)		0.0184					
	Focal Length	FL_x (cm)		1.5726				1.5726
		Fl_y (cm)		21.5005				21.5005
	$I_{pa.3}$@MI_{max}(W/cm^2)		0.1552					
Control Conditions	Control1		AP=15; Frequency=2.0MHz; Depth=98mm; Focus=60mm;					

Acoustic Output Reporting Table

Transducer Model: C343UA Operating Model: B+M Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			0.9043	0.1146		0.0248	0.0961	0.4581
Associated Acoustic Parameters	$P_{r.3}$ MPa		1.557					
	W_0 mW			32.71			3.244	35.954
	Min of[$W_{.3}$(z1),(mW) $I_{ta.3}$(z1)]					1.75		
	Z_1 (cm)					2.9389		
	Z_{bp} (cm)					2.9389		
	Z_{sp} (cm)		4.85				4.85	
	deq(Z_{sp}) (cm)						0.236	
	f_c (MHz)		2.9652	2.9652		2.9652	2.9652	2.9652
	Dim of Aaprt	X(cm)		2.061		2.061	2.061	2.061
		Y (cm)		1.5		1.5	1.5	1.5
Other Information	PD (usec)		0.5188					
	PRF (Hz)		1694					
	P_r@PII_{max} (MPa)		2.5988					
	d_{eq}@PII_{max} (cm)		0.0234				0.236	
	Focal Length	FL_x (cm)		1.5726		1.5726		1.5726
		Fl_y (cm)		21.5005		21.5005		21.5005
	$I_{pa.3}$@MI_{max}(W/cm^2)		0.1552					
Control Conditions	Control1		AP=15; Frequency=2.0MHz; Depth=98mm; Focus=60mm;					

Acoustic Output Reporting Table

Transducer Model: C343UA Operating Model: PW Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			0.5245			0.6354	3.006	1.2387
Associated Acoustic Parameters	$P_{r.3}$	MPa	0.861					
	W_0	mW					86.45	86.45
	Min of[$W_{.3}(z1)$,(mW) $I_{ta.3}(z1)$]					49.46		
	Z_1	(cm)				2.9389		
	Z_{bp}	(cm)				2.9389		
	Z_{sp}	(cm)	5.0				5.0	
	deq(Z_{sp})	(cm)					0.0077	
	f_c	(MHz)	2.7017			2.7017	2.7017	2.7017
	Dim of Aaprt	X(cm)				2.061	2.061	2.061
		Y (cm)				1.5	1.5	1.5
Other Information	PD	(usec)	1.4078					
	PRF	(Hz)	8289					
	P_r@PII_{max}	(MPa)	1.3522					
	d_{eq}@PII_{max}	(cm)	0.0077				0.0077	
	Focal Length	FL_x (cm)				1.7654		1.7654
		Fl_y (cm)				24.6285		24.6285
	$I_{pa.3}$@MI_{max}(W/cm^2)		0.042					
Control Conditions	Control1		AP=15; Frequency=2.0MHz; Depth=98mm; Focus=60mm;					

A2.3.4: Test of Probe L763UA:

Test Item	B	B+M	PW
p-, MPa	2.887	2.887	1.612
$I_{spta,}$ mW/cm^2	16.2887	45.5992	1186
System settings	Control1	Control1	Control1
$Z_{p,}$ mm	25	25	25
$W_{pb6,}$ (∥), mm (⊥), mm	0.1197 0.2802	0.1197 0.2802	0.1584 0.2537
prr, kHz	--	--	6361
srr, Hz	42	37	--
Output beam Dimensions, cm^2	1.2091	1.2091	1.2091
$f_{awf,}$ MHz	5.0027	5.0027	5.6794
APF, %	--	--	--
AIF, %	--	--	--
Maximum power, mW	9.024	10.2402	45.17
$I_{ob,}$ mW/cm^2	7.4603	8.2871	37.3429
Power-up mode	B mode	B mode	B mode
Initialization mode	B mode	B mode	B mode
Acoustic output freeze	Yes	Yes	Yes
Z_{tt} (mm)	--	--	--
Z_{ts} (mm)	contact	contact	contact
Inclusive modes	--	--	--

Control1: AP=15; Frequency=6.0MHz; Depth=80mm; Focus=30mm;

Acoustic Output Reporting Table

Transducer Model: L763UA Operating Model: B Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			0.8131	0.0631				0.2158
Associated Acoustic Parameters	$P_{r.3}$ MPa		1.816					
	W_0 mW			10.71				10.71
	Min of[$W_{.3}$(z1),(mW) $I_{ta.3}$(z1)]							
	Z_1 (cm)							
	Z_{bp} (cm)							
	Z_{sp} (cm)		2.25					
	deq(Z_{sp}) (cm)							
	f_c (MHz)		4.9898	4.9898				4.9898
	Dim of Aaprt	X(cm)		2.016				2.016
		Y (cm)		0.6				0.6
Other Information	PD (usec)		0.3435					
	PRF (Hz)		2218					
	P_r@PII_{max} (MPa)		2.6699					
	d_{eq}@PII_{max} (cm)		0.0527					
	Focal Length	FL_x (cm)		0.3902				0.3902
		Fl_y (cm)		2.2322				2.2322
	$I_{pa.3}$@MI_{max}(W/cm^2)		0.12					
Control Conditions	Control1		AP=15; Frequency=6.0MHz; Depth=80mm; Focus=30mm;					

Acoustic Output Reporting Table

Transducer Model: L763UA Operating Model: B+M Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			0.8131	0.0653		0.0132	0.0443	0.2448
Associated Acoustic Parameters	$P_{r.3}$ MPa		1.816					
	W_0 mW			11.08			1.072	12.152
	Min of[$W_{.3}(z_1)$,(mW) $I_{ta.3}(z_1)$]					0.565		
	Z_1 (cm)					1.8587		
	Z_{bp} (cm)					1.8587		
	Z_{sp} (cm)		2.25				2.25	
	deq(Z_{sp}) (cm)						0.5263	
	f_c (MHz)		4.9898	4.9898		4.9898	4.9898	4.9898
	Dim of Aaprt	X(cm)		2.016		2.016	2.016	2.016
		Y (cm)		0.6		0.6	0.6	0.6
Other Information	PD (usec)		0.3435					
	PRF (Hz)		2295					
	P_r@PII_{max} (MPa)		2.6699					
	d_{eq}@PII_{max} (cm)		0.0509				0.5263	
	Focal Length	FL_x (cm)		0.3902		0.3902		0.3902
		Fl_y (cm)		2.2322		2.2322		2.2322
	$I_{pa.3}$@MI_{max}(W/cm^2)		0.12					
Control Conditions	Control1		AP=15; Frequency=6.0MHz; Depth=80mm; Focus=30mm;					

Acoustic Output Reporting Table

Transducer Model: L763UA Operating Model: PW Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			0.3692			0.5655	1.5	0.6092
Associated Acoustic Parameters	$P_{r.3}$	MPa	0.8751					
	W_0	mW					30.24	30.24
	Min of[$W_{.3}(z1)$,(mW) $I_{ta.3}(z1)$]					23.12		
	Z_1	(cm)				1.8587		
	Z_{bp}	(cm)				1.8587		
	Z_{sp}	(cm)	2.55				2.55	
	deq(Z_{sp})	(cm)					0.0152	
	f_c	(MHz)	5.6693			5.6693	5.6693	5.6693
	Dim of Aaprt	X(cm)				2.016	2.016	2.016
		Y (cm)				0.6	0.6	0.6
Other Information	PD	(usec)	1.4748					
	PRF	(Hz)	6361					
	P_r@PII_{max}	(MPa)	1.3668					
	d_{eq}@PII_{max}	(cm)	0.0152				0.0152	
	Focal Length	FL_x (cm)				0.3943		0.3943
		Fl_y (cm)				2.5852		2.5852
	$I_{pa.3}$@MI_{max}(W/cm^2)		0.031					
Control Conditions	Control1		AP=15; Frequency=6.0MHz; Depth=78mm; Focus=30mm;					

A2.3.5: Test of Probe C362UA:

Test Item	B	B+M	PW
p-, MPa	2.167	2.167	1.081
$I_{spta,}$ mW/cm^2	15.0804	33.0502	1150
System settings	Control1	Control1	Control2
$Z_{p,}$ mm	43.5	43.5	46
$W_{pb6,}$ (∥), mm (⊥), mm	0.2774 0.4072	0.2774 0.4072	0.2871 0.2923
prr, kHz	--	--	8478
srr, Hz	26	22	--
Output beam Dimensions, cm^2	2.3904	2.3904	2.3904
$f_{awf,}$ MHz	3.2164	3.2164	2.6985
APF, %	--	--	--
AIF, %	--	--	--
Maximum power, mW	48.41	30.758	73.93
$I_{ob,}$ mW/cm^2	20.2518	12.8673	32.0126
Power-up mode	B mode	B mode	B mode
Initialization mode	B mode	B mode	B mode
Acoustic output freeze	Yes	Yes	Yes
Z_{tt} (mm)	--	--	--
Z_{ts} (mm)	contact	contact	contact
Inclusive modes	--	--	--

Control1: AP=15; Frequency=3.0MHz; Depth=98mm; Focus=60mm;

Control2: AP=15; Frequency=2.0MHz; Depth=98mm; Focus=60mm;

Acoustic Output Reporting Table

Transducer Model: C362UA Operating Model: B Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			0.8549	0.1619				0.769
Associated Acoustic Parameters	$P_{r.3}$ MPa		1.528					
	W_0 mW			53.67				53.67
	Min of[$W_{.3}$(z1),(mW) $I_{ta.3}$(z1)]							
	Z_1 (cm)							
	Z_{bp} (cm)							
	Z_{sp} (cm)		4.45					
	deq(Z_{sp}) (cm)							
	f_c (MHz)		3.2169	3.2169				3.2169
	Dim of Aaprt	X(cm)		1.5936				1.5936
		Y (cm)		1.5				1.5
Other Information	PD (usec)		0.4834					
	PRF (Hz)		3223					
	P_r@PII_{max} (MPa)		2.3303					
	d_{eq}@PII_{max} (cm)		0.0138					
	Focal Length	FL_x (cm)		1.7369				1.7369
		Fl_y (cm)		26.6692				26.6692
	$I_{pa.3}$@MI_{max}(W/cm^2)		0.1409					
Control Conditions	Control1		AP=15; Frequency=2.0MHz; Depth=98mm; Focus=60mm;					

Acoustic Output Reporting Table

Transducer Model: C362UA Operating Model: B+M Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			0.8549	0.0922		0.0146	0.0582	0.4652
Associated Acoustic Parameters	$P_{r.3}$	MPa	1.528					
	W_0	mW		30.57			1.898	32.468
	Min of[$W_{.3}$(z1),(mW) $I_{ta.3}$(z1)]					1.01		
	Z_1	(cm)				30.0		
	Z_{bp}	(cm)				2.6132		
	Z_{sp}	(cm)	4.45				4.45	
	deq(Z_{sp})	(cm)					0.3908	
	f_c	(MHz)	3.2169	3.2169		3.2169	3.2169	3.2169
	Dim of Aaprt	X(cm)		1.5936		1.5936	1.5936	1.5936
		Y (cm)		1.5		1.5	1.5	1.5
Other Information	PD	(usec)	0.4834					
	PRF	(Hz)	1836					
	P_r@PII_{max}	(MPa)	2.3303					
	d_{eq}@PII_{max}	(cm)	0.0243				0.0243	
	Focal Length	FL_x (cm)		1.7369		1.7369		1.7369
		Fl_y (cm)		26.6692		26.6692		26.6692
	$I_{pa.3}$@MI_{max}(W/cm^2)		0.1409					
Control Conditions	Control1		AP=15; Frequency=2.0MHz; Depth=98mm; Focus=60mm;					

Acoustic Output Reporting Table

Transducer Model: C362UA Operating Model: PW Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			0.4772			0.5209	2.1213	0.9647
Associated Acoustic Parameters	$P_{r.3}$	MPa	0.7812					
	W_0	mW					67.33	67.33
	Min of[$W_{.3}(z1)$,(mW) $I_{ta.3}(z1)$]					35.5		
	Z_1	(cm)				30.0		
	Z_{bp}	(cm)				2.6132		
	Z_{sp}	(cm)	4.45				4.45	
	deq(Z_{sp})	(cm)					0.0108	
	f_c	(MHz)	2.6875			2.6875	2.6875	2.6875
	Dim of Aaprt	X(cm)				1.5936	1.5936	1.5936
		Y (cm)				1.5	1.5	1.5
Other Information	PD	(usec)	1.4124					
	PRF	(Hz)	8186					
	P_r@PII_{max}	(MPa)	1.3549					
	d_{eq}@PII_{max}	(cm)	0.0108				0.0108	
	Focal Length	FL_x (cm)				1.9452		1.9452
		Fl_y (cm)				33.9865		33.9865
	$I_{pa.3}$@MI_{max}(W/cm^2)		0.0338					
Control Conditions	Control1		AP=15; Frequency=3.0MHz; Depth=98mm; Focus=60mm;					

A2.3.6: Test of Probe L742UA:

Test Item	B	B+M	PW
p-, MPa	2.454	2.454	1.203
$I_{spta,}$ mW/cm^2	33.5887	46.7667	588.2
System settings	Control1	Control1	Control2
$Z_{p,}$ mm	19	19	34
$W_{pb6,}$ (∥), mm (⊥), mm	0.3249 0.2199	0.3249 0.2199	0.3533 0.2639
prr, kHz	--	--	8407
srr, Hz	35	29	--
Output beam Dimensions, cm^2	0.5568	0.5568	0.5568
$f_{awf,}$ MHz	5.4618	5.4618	5.6598
APF, %	--	--	--
AIF, %	--	--	--
Maximum power, mW	9.958	10.6826	26.65
$I_{ob,}$ mW/cm^2	17.8843	19.1857	47.8628
Power-up mode	B mode	B mode	B mode
Initialization mode	B mode	B mode	B mode
Acoustic output freeze	Yes	Yes	Yes
Z_{tt} (mm)	--	--	--
Z_{ts} (mm)	contact	contact	contact
Inclusive modes	--	--	--

Control1: AP=15; Frequency=7.0MHz; Depth=78mm; Focus=50mm;

Control1: AP=15; Frequency=6.0MHz; Depth=78mm; Focus=50mm

Acoustic Output Reporting Table

Transducer Model: L742UA Operating Model: B Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			0.9257	0.1136				0.4053
Associated Acoustic Parameters	$P_{r.3}$	MPa	2.017					
	W_0	mW		13.65				13.65
	Min of[$W_{.3}$(z1),(mW) $I_{ta.3}$(z1)]							
	Z_1	(cm)						
	Z_{bp}	(cm)						
	Z_{sp}	(cm)	1.7					
	deq(Z_{sp})	(cm)						
	f_c	(MHz)	5.0334	5.0334				5.0334
	Dim of Aaprt	X(cm)		0.96				0.96
		Y (cm)		0.58				0.58
Other Information	PD	(usec)	0.4574					
	PRF	(Hz)	2687					
	P_r@PII_{max}	(MPa)	2.7789					
	d_{eq}@PII_{max}	(cm)	0.0311					
	Focal Length	FL_x (cm)		0.6584				0.6584
		Fl_y (cm)		6.3649				6.3649
	$I_{pa.3}$@MI_{max}(W/cm^2)		0.1291					
Control Conditions	Control1		AP=15; Frequency=6.0MHz; Depth=78mm; Focus=50mm;					

Acoustic Output Reporting Table

Transducer Model: L742UA Operating Model: B+M Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			0.9257	0.1148	0.0205		0.0455	0.4348
Associated Acoustic Parameters	$P_{r.3}$	MPa	2.017					
	W_0	mW		13.79	0.8535		0.8535	14.6435
	Min of[$W_{.3}$(z1),$I_{ta.3}$(z1)]	(mW)						
	Z_1	(cm)						
	Z_{bp}	(cm)						
	Z_{sp}	(cm)	1.7				1.7	
	deq(Z_{sp})	(cm)					0.4978	
	f_c	(MHz)	5.0334	5.0334	5.0334		5.0334	5.0334
	Dim of Aaprt	X(cm)		0.96	0.96		0.96	0.96
		Y (cm)		0.58	0.58		0.58	0.58
Other Information	PD	(usec)	0.4574					
	PRF	(Hz)	2715					
	P_r@PII_{max}	(MPa)	2.7789					
	d_{eq}@PII_{max}	(cm)	0.0308				0.4978	
	Focal Length	FL_x (cm)		0.6584	0.6584			0.6584
		Fl_y (cm)		6.3649	6.3649			6.3649
	$I_{pa.3}$@MI_{max}	(W/cm^2)	0.1291					
Control Conditions	Control1		AP=15; Frequency=6.0MHz; Depth=78mm; Focus=50mm;					

Acoustic Output Reporting Table

Transducer Model: L742UA Operating Model: PW Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt}\leq 1$	$A_{aprt}>1$		
Global Maximum Index Value			0.2692		0.7442		0.6186	0.7842
Associated Acoustic Parameters	$P_{r.3}$	MPa	0.6542					
	W_0	mW			26.41		26.41	26.41
	Min of[$W_{.3}$(z1),$I_{ta.3}$(z1)]	(mW)						
	Z_1	(cm)						
	Z_{bp}	(cm)						
	Z_{sp}	(cm)	3.35				3.35	
	deq(Z_{sp})	(cm)					0.0406	
	f_c	(MHz)	5.9179		5.9179		5.9179	5.9179
	Dim of Aaprt	X(cm)			0.96		0.96	0.96
		Y (cm)			0.58		0.58	0.58
Other Information	PD	(usec)	0.8333					
	PRF	(Hz)	8503					
	P_r@PII_{max}	(MPa)	1.2953					
	d_{eq}@PII_{max}	(cm)	0.0406				0.0406	
	Focal Length	FL_x (cm)			0.8462			0.8462
		Fl_y (cm)			12.3959			12.3959
	$I_{pa.3}$@MI_{max}	(W/cm^2)	0.0158					
Control Conditions	Control1		AP=15; Frequency=7.0MHz; Depth=78mm; Focus=50mm;					

A2.3.7: Test of Probe E613UA:

Test Item	B	B+M	PW
p-, MPa	1.801	1.801	0.7348
$I_{spta,}$ mW/cm^2	7.5499	17.579	296.2
System settings	Control1	Control1	Control2
$Z_{p,}$ mm	20.45	20.45	16
$W_{pb6,}$ (∥), mm (⊥), mm	0.2289 0.2097	0.2289 0.2097	0.2823 0.2589
prr, kHz	--	--	6361
srr, Hz	49	37	--
Output beam Dimensions, cm^2	0.896	0.896	0.896
$f_{awf,}$ MHz	5.1141	5.1141	4.4513
APF, %	--	--	--
AIF, %	--	--	--
Maximum power, mW	4.542	4.8314	13.25
$I_{ob,}$ mW/cm^2	5.0692	5.3922	14.7879
Power-up mode	B mode	B mode	B mode
Initialization mode	B mode	B mode	B mode
Acoustic output freeze	Yes	Yes	Yes
Z_{tt} (mm)	--	--	--
Z_{ts} (mm)	contact	contact	contact
Inclusive modes	--	--	--

Control1: AP=15; Frequency=5.5MHz; Depth=29mm; Focus=10mm;

Control2: AP=15; Frequency=4.5MHz; Depth=29mm; Focus=10mm

Acoustic Output Reporting Table

Transducer Model: E613UA Operating Model: B Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			0.7349	0.0841				0.1426
Associated Acoustic Parameters	$P_{r.3}$ MPa		1.677					
	W_0 mW			6.094				6.094
	Min of[$W_{.3}$(z1),(mW) $I_{ta.3}$(z1)]							
	Z_1 (cm)							
	Z_{bp} (cm)							
	Z_{sp} (cm)		1.75					
	deq(Z_{sp}) (cm)							
	f_c (MHz)		5.1924	5.1924				5.1924
	Dim of Aaprt	X(cm)		0.896				0.896
		Y (cm)		0.6				0.6
Other Information	PD (usec)		0.3274					
	PRF (Hz)		2323					
	P_r@PII_{max} (MPa)		2.3518					
	d_{eq}@PII_{max} (cm)		0.0575					
	Focal Length	FL_x (cm)		0.702				0.702
		Fl_y (cm)		7.4919				7.4919
	$I_{pa.3}$@MI_{max}(W/cm^2)		0.1489					
Control Conditions	Control1		AP=15; Frequency=4.5MHz; Depth=39mm; Focus=25mm;					

Acoustic Output Reporting Table

Transducer Model: E613UA Operating Model: B+M Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			0.7349	0.0765	0.0096		0.0264	0.1389
Associated Acoustic Parameters	$P_{r.3}$	MPa	1.677					
	W_0	mW		5.545	0.3882		0.3882	5.9332
	Min of[$W_{.3}$(z1),(mW) $I_{ta.3}$(z1)]							
	Z_1	(cm)						
	Z_{bp}	(cm)						
	Z_{sp}	(cm)	1.75				1.75	
	deq(Z_{sp})	(cm)					0.9021	
	f_c	(MHz)	5.1924	5.1924	5.1924		5.1924	5.1924
	Dim of Aaprt	X(cm)		0.896	0.896		0.896	0.896
		Y (cm)		0.6	0.6		0.6	0.6
Other Information	PD	(usec)	0.3274					
	PRF	(Hz)	2114					
	P_r@PII_{max}	(MPa)	2.3518					
	d_{eq}@PII_{max}	(cm)	0.0632				0.9021	
	Focal Length	FL_x (cm)		0.702	0.702			0.702
		Fl_y (cm)		7.4919	7.4919			7.4919
	$I_{pa.3}$@MI_{max}(W/cm^2)		0.1541					
Control Conditions	Control1		AP=15; Frequency=4.5MHz; Depth=39mm; Focus=25mm;					

Acoustic Output Reporting Table

Transducer Model: E613UA Operating Model: PW Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			0.3292		0.3405		1.0256	0.3745
Associated Acoustic Parameters	$P_{r.3}$	MPa	0.696					
	W_0	mW			16		16	16
	Min of[$W_{.3}(z1)$,(mW) $I_{ta.3}(z1)$]							
	Z_1	(cm)						
	Z_{bp}	(cm)						
	Z_{sp}	(cm)	1.8				1.8	
	deq(Z_{sp})	(cm)					0.0229	
	f_c	(MHz)	4.4688		4.4688		4.4688	4.4688
	Dim of Aaprt	X(cm)			0.896		0.896	0.896
		Y (cm)			0.6		0.6	0.6
Other Information	PD	(usec)	1.9666					
	PRF	(Hz)	6361					
	P_r@PII_{max}	(MPa)	0.919					
	d_{eq}@PII_{max}	(cm)	0.0229				0.0229	
	Focal Length	FL_x (cm)			0.9829			0.9829
		Fl_y (cm)			12.649			12.649
	$I_{pa.3}$@MI_{max}(W/cm^2)		0.0212					
Control Conditions	Control1		AP=15; Frequency=4.5MHz; Depth=39mm; Focus=25mm;					

A2.3.8: Test of Probe C363UA:

Test Item	B	B+M	PW
p-, MPa	2.49	2.49	1.299
$I_{spta,}$ mW/cm^2	31.2484	38.16	1644
System settings	Control1	Control1	Control2
$Z_{p,}$ mm	45	45	50
$W_{pb6,}$ (∥), mm (⊥), mm	0.4256 0.3225	0.4256 0.3225	0.2735 0.2895
prr, kHz	--	--	6361
srr, Hz	39	26	--
Output beam Dimensions, cm^2	3.168	3.168	3.168
$f_{awf,}$ MHz	3.083	3.083	2.96
APF, %	---	---	---
AIF, %	---	---	---
Maximum power, mW	92.42	37.613	79.26
$I_{ob,}$ mW/cm^2	29.1951	11.8728	25.0189
Power-up mode	B mode	B mode	B mode
Initialization mode	B mode	B mode	B mode
Acoustic output freeze	Yes	Yes	Yes
Z_{tt} (mm)	--	--	--
Z_{ts} (mm)	contact	contact	contact
Inclusive modes	--	--	

Control1: AP=15; Frequency=3.0MHz; Depth=98mm; Focus=60mm;

Control2: AP=15; Frequency=2.0MHz; Depth=98mm; Focus=70mm

Acoustic Output Reporting Table

Transducer Model: C363UA Operating Model_ B Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			0.8507	0.1496				0.5623
Associated Acoustic Parameters	$P_{r.3}$	MPa	1.493					
	W_0	mW		45.17				45.17
	Min of[$W_{.3}(z1)$,(mW) $I_{ta.3}(z1)$]							
	Z_1	(cm)						
	Z_{bp}	(cm)						
	Z_{sp}	(cm)	4.5					
	deq(Z_{sp})	(cm)						
	f_c	(MHz)	3.083	3.083				3.083
	Dim of Aaprt	X(cm)		2.112				2.112
		Y (cm)		1.5				1.5
Other Information	PD	(usec)	0.504					
	PRF	(Hz)	2097					
	P_r@PII_{max}	(MPa)	2.3798					
	d_{eq}@PII_{max}	(cm)	0.0211					
	Focal Length	FL_x (cm)		1.5429				1.5429
		Fl_y (cm)		20.3404				20.3404
	$I_{pa.3}$@MI_{max}(W/cm^2)		0.1041					
Control Conditions	Control1		AP=15; Frequency=3.0MHz; Depth=98mm; Focus=60mm;					

Acoustic Output Reporting Table

Transducer Model: C363UA Operating Model: B+M Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			0.8507	0.1166		0.0182	0.0598	0.4682
Associated Acoustic Parameters	$P_{r.3}$ MPa		1.493					
	W_0 mW			35.2			2.413	37.613
	Min of[$W_{.3}$(z1),(mW) $I_{ta.3}$(z1)]					1.3		
	Z_1 (cm)					3.008		
	Z_{bp} (cm)					3.008		
	Z_{sp} (cm)		4.5				5.45	
	deq(Z_{sp}) (cm)						0.3944	
	f_c (MHz)		3.083	3.083		3.083	3.083	3.083
	Dim of Aaprt	X(cm)		2.112		2.112	2.112	2.112
		Y (cm)		1.5		1.5	1.5	1.5
Other Information	PD (usec)		0.504					
	PRF (Hz)		1634					
	P_r@PII_{max} (MPa)		2.3798					
	d_{eq}@PII_{max} (cm)		0.027				0.3944	
	Focal Length	FL_x (cm)		1.5429		1.5429		1.5429
		Fl_y (cm)		20.3404		20.3404		20.3404
	$I_{pa.3}$@MI_{max}(W/cm^2)		0.1041					
Control Conditions	Control1		AP=15; Frequency=2.0MHz; Depth=98mm; Focus=70mm;					

Acoustic Output Reporting Table

Transducer Model: C363UA Operating Model: PW Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			0.5314			0.5852	2.75	1.1357
Associated Acoustic Parameters	$P_{r.3}$	MPa	0.8781					
	W_0	mW					79.26	79.26
	Min of[$W_{.3}(z1)$,$I_{ta.3}(z1)$]	(mW)				45.01		
	Z_1	(cm)				3.0		
	Z_{bp}	(cm)				2.6132		
	Z_{sp}	(cm)	5.0				5.0	
	deq(Z_{sp})	(cm)					0.0083	
	f_c	(MHz)	2.7296			2.7296	2.7296	2.7296
	Dim of Aaprt	X(cm)				2.112	2.112	2.112
		Y (cm)				1.5	1.5	1.5
Other Information	PD	(usec)	1.4049					
	PRF	(Hz)	6361					
	P_r@PII_{max}	(MPa)	1.4072					
	d_{eq}@PII_{max}	(cm)	0.0083				0.0083	
	Focal Length	FL_x (cm)				1.6648		1.6648
		Fl_y (cm)				22.1698		22.1698
	$I_{pa.3}$@MI_{max}	(W/cm^2)	0.0441					
Control Conditions	Control1		AP=15; Frequency=2.0MHz; Depth=98mm; Focus=70mm;					

A2.3.9: Test of Probe L743UA/E743UA:

Test Item	B	B+M	PW
p-, MPa	1.967	1.967	0.4087
$I_{spta,}$ mW/cm^2	13.5466	23.9966	428.8
System settings	Control1	Control1	Control2
$Z_{p,}$ mm	17	17	2.7
$W_{pb6,}$ (∥), mm (⊥), mm	2.757 2.085	2.757 2.085	2.565 2.052
prr, kHz	2.287	--	6.361
srr, Hz	39	39	--
Output beam Dimensions, cm^2	0.8064	0.8064	0.8064
$f_{awf,}$ MHz	5.262	5.262	5.6718
APF, %	--	--	--
AIF, %	--	--	--
Maximum power, mW	8.36	9.0469	39.88
$I_{ob,}$ mW/cm^2	10.3671	11.2189	49.4544
Power-up mode	B mode	B mode	B mode
Initialization mode	B mode	B mode	B mode
Acoustic output freeze	Yes	Yes	Yes
Z_{tt} (mm)	--	--	--
Z_{ts} (mm)	contact	contact	contact
Inclusive modes	--	--	--

Acoustic Output Reporting Table

Transducer Model: L743UA Operating Model: B Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			0.7874	0.0863				0.2326
Associated Acoustic Parameters	$P_{r.3}$	MPa	1.985					
	W_0	mW		8.067				8.067
	Min of[$W_{.3}$(z1),(mW) $I_{ta.3}$(z1)]							
	Z_1	(cm)						
	Z_{bp}	(cm)						
	Z_{sp}	(cm)	2.6					
	deq(Z_{sp})	(cm)						
	f_c	(MHz)	5.2224	5.2224				5.2224
	Dim of Aaprt	X(cm)		1.344				1.344
		Y (cm)		0.6				0.6
Other Information	PD	(usec)	0.3289					
	PRF	(Hz)	2287					
	P_r@PII_{max}	(MPa)	3.0623					
	d_{eq}@PII_{max}	(cm)	0.0483					
	Focal Length	FL_x (cm)		0.7188				0.7188
		Fl_y (cm)		7.8222				7.8222
	$I_{pa.3}$@MI_{max}(W/cm^2)		0.1536					
Control Conditions	Control1		AP=15; Frequency=6.0MHz; Depth=78mm; Focus=35mm;					

Acoustic Output Reporting Table

Transducer Model: L743UA Operating Model: B+M Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			0.7874	0.0866	0.0183		0.0368	0.2517
Associated Acoustic Parameters	$P_{r.3}$	MPa	1.985					
	W_0	mW		8.0099	0.72		0.72	8.2799
	Min of[$W_{.3}$(z1),(mW) $I_{ta.3}$(z1)]							
	Z_1	(cm)						
	Z_{bp}	(cm)						
	Z_{sp}	(cm)	2.6				2.6	
	deq(Z_{sp})	(cm)					0.6139	
	f_c	(MHz)	5.2224	5.2224	5.2224		5.2224	5.2224
	Dim of Aaprt	X(cm)		1.344	1.344		1.344	1.344
		Y (cm)		0.6	0.6		0.6	0.6
Other Information	PD	(usec)	0.3289					
	PRF	(Hz)	2295					
	P_r@PII_{max}	(MPa)	3.0623					
	d_{eq}@PII_{max}	(cm)	0.0482				0.6139	
	Focal Length	FL_x (cm)		0.7188	0.7188			0.7188
		Fl_y (cm)		7.8222	7.8222			7.8222
	$I_{pa.3}$@MI_{max}(W/cm^2)		0.1536					
Control Conditions	Control1		AP=15; Frequency=6.0MHz; Depth=78mm; Focus=35mm;					

Acoustic Output Reporting Table

Transducer Model: L743UA Operating Model: PW Mode

Index Label			MI	TIS			TIB	TIC
				Scan	Non-Scan		Non-scan	
					$A_{aprt}\leq 1$	$A_{aprt}>1$		
Global Maximum Index Value			0.4043		0.9339		3.0125	0.8505
Associated Acoustic Parameters	$P_{r.3}$	MPa	0.9634					
	W_0	mW			35.2		35.2	35.2
	Min of[$W_{.3}$(z1),(mW) $I_{ta.3}$(z1)]							
	Z_1	(cm)						
	Z_{bp}	(cm)						
	Z_{sp}	(cm)	2.15				2.15	
	deq(Z_{sp})	(cm)					0.0076	
	f_c	(MHz)	5.6782		5.6782		5.6782	5.6782
	Dim of Aaprt	X(cm)			1.344		1.344	1.344
		Y (cm)			0.6		0.6	0.6
Other Information	PD	(usec)	1.5134					
	PRF	(Hz)	6361					
	P_r@PII_{max}	(MPa)	2.35					
	d_{eq}@PII_{max}	(cm)	0.0076				0.0076	
	Focal Length	FL_x (cm)			0.5274			0.5274
		Fl_y (cm)			4.635			4.635
	$I_{pa.3}$@MI_{max}(W/cm^2)		0.1433					
Control Conditions	Control1		AP=15; Frequency=6.0MHz; Depth=78mm; Focus=35mm;					

WARNING

The device is not intended for ophthalmic use. Do not use it for examining ophthalmic vessels, or any other procedures which may cause the ultrasound beam to pass through the eye.

A2.4: TI (Thermal Index)

TI is determined by the ratio of the total acoustic power to the acoustic power required to raise the tissue temperature by 1degree Celsius. Once there is a situation that a TI value is greater than 1.0, the TI value will be displayed in the upper part of the screen.

The adverse biological effects of ultrasound on tissue appear to be, in contrary to what is assumed for X-ray, threshold effects. When tissue is repeatedly exposed to ultrasound, with intervals in between, there will likely be no cumulative biological effect. If a certain threshold has been passed, biological effects may occur. A temperature rise from 37 °C to 41 °C is acceptable for quite a long time, whereas a temperature rise to 45 °C may not be acceptable. The same counts for cavitation in that, below a certain level, there will be no cavitation and hence no biological effect.

A prudent starting-point for each examination would be first to set the machine for the lowest index setting and then modify from this level until a satisfactory image or Doppler signal is obtained, keeping track of the TI; and second, the exposure time, during one examination, should be kept as short as possible. A safety guideline on this should be included.

Appendix III: Obstetrical References

A3.1: Application Table of Obstetrical Reference Formulas

Parameter	Formula	Measurement range (mm)	MA range	±2 SD
GS	Tokyo	[10, 68]	4w0d ~ 12w1d	See table GS, Tokyo
	Hellman	[17, 60]	6w0d ~ 12w1d	0
	Rempen	[2, 73]	4w6d ~ 14w1d	±12 days See table GS, Rempen for details
	China	[10, 68]	5w0d ~ 12w0d	See table GS, China
CRL	Tokyo	[6, 100]	6w3d ~ 16w0d	See table CRL, Tokyo
	Hadlock	[2, 121.1]	5w5d ~ 18w0d	8.826%
	Robinson	[6.7, 82.4]	6w3d ~ 13w6d	±5 days
	Hansmann	[6, 150]	6w1d ~ 21w3d	See table CRL, Hansmann
	China	[9, 105]	7w0d ~ 17w0d	See table CRL, China
BPD	Tokyo	[16, 92]	11w3d ~ 40w0d	See table BPD, Tokyo
	Hadlock	[15, 102]	12w1d ~ 42w1d	12-18 wk ± 1.19 wk (8 days) 18-24 wk ± 1.73 wk (12 days) 24-30 wk ± 2.18 wk (15 days) 30-36 wk ± 3.08 wk (22 days) 36-42 wk ± 3.20 wk (22 days)
	Merz	[21, 102]	12w1d ~ 40w2d	See table BPD, Merz
	Rempen	[3, 27]	6w6d ~ 13w5d	±10 days See table BPD, Rempen for details

	Osaka	[13.3, 93.6]	10w0d ~ 40w0d	See table BPD, Osaka
	China	[19, 94]	12w0d ~ 40w0d	See table BPD, China
HC	Hadlock	[56, 358]	12w0d ~ 41w6d	12-18 wk ± 1.19 wk (8 days) 18-24 wk ± 1.48 wk (10 days) 24-30 wk ± 2.06 wk (14 days) 30-36 wk ± 2.98 wk (21 days) 36-42 wk ± 2.70 wk (19 days)
	Merz	[72, 364]	12w1d ~ 40w4d	See table HC, Merz
AC	Hadlock	[50, 381]	11w6d ~ 41w6d	12-18 wk ± 1.66 wk (12 days) 18-24 wk ± 2.06 wk (14 days) 24-30 wk ± 2.18 wk (15 days) 30-36 wk ± 2.96 wk (21 days) 36-42 wk ± 3.04 wk (19 days)
	Merz	[56, 348]	12w1d ~ 39w6d	See table AC, Merz
FL	Tokyo	[8, 72]	12w3d ~ 40w2d	See table FL, Tokyo
	Hadlock	[7, 82]	12w1d ~ 42w0d	12-18 wk ± 1.38 wk (10 days) 18-24 wk ± 1.80 wk (13 days) 24-30 wk ± 2.08 wk (15 days) 30-36 wk ± 2.96 wk (21 days) 36-42 wk ± 3.12 wk (22 days)
	Jeanty	[10, 80]	12w4d ~ 40w0d	±19 days
	Merz	[10, 80]	12w2d ~ 40w1d	See table FL, Merz
	Osaka	[9.4, 71.2]	13w0d ~ 40w0d	See table FL, Osaka
	China	[6, 75]	12w4d ~ 40w2d	See table FL, China
HUM	Jeanty	[9, 69]	12w0d ~ 40w0d	±23 days (±3.3104 wks)
FTA	Osaka	[5.6, 86.6] (cm^2)	14w0d ~ 40w0d	See table FTA, Osaka
CER	Goldstein	[14, 52] mm	/	/

THD	Hansmann	[20, 130] mm	/	/

A3.2: GS

Hellman:

Hellman LM, Kobayashi M, Fillisti L etc. “Growth and development of the human fetus prior to the 20th week of gestation.” Am J Obstetrics Gynecology 103:789, 1969

MA (GS mm) = (GS+25.43)/7.02

Rempen:

Rempen A. “Biometrie in der Frühgravidität” (I. Trimenon) (Biometry in Early Pregnancy (1st Trimester)).” Der Frauenarzt 32:425, 1991

Table GS, **Rempen**

GS mm	MA	+/- 2SD	GS mm	MA	+/- 2SD	GS mm	MA	+/- 2SD	GS mm	MA	+/- 2SD
02.0	4w6d	12	20.0	6w6d	12	38.0	9w1d	12	56.0	11w4d	12
03.0	5w0d	12	21.0	7w0d	12	39.0	9w2d	12	57.0	11w5d	12
04.0	5w1d	12	22.0	7w1d	12	40.0	9w3d	12	58.0	11w6d	12
05.0	5w1d	12	23.0	7w2d	12	41.0	9w4d	12	59.0	12w0d	12
06.0	5w2d	12	24.0	7w3d	12	42.0	9w5d	12	60.0	12w1d	12
07.0	5w3d	12	25.0	7w4d	12	43.0	9w6d	12	61.0	12w2d	12
08.0	5w4d	12	26.0	7w4d	12	44.0	9w6d	12	62.0	12w3d	12
09.0	5w5d	12	27.0	7w5d	12	45.0	10w0d	12	63.0	12w4d	12
10.0	5w5d	12	28.0	7w6d	12	46.0	10w1d	12	64.0	12w5d	12
11.0	5w6d	12	29.0	8w0d	12	47.0	10w2d	12	65.0	12w6d	12
12.0	6w0d	12	30.0	8w1d	12	48.0	10w3d	12	66.0	13w0d	12
13.0	6w1d	12	31.0	8w2d	12	49.0	10w4d	12	67.0	13w1d	12
14.0	6w2d	12	32.0	8w3d	12	50.0	10w5d	12	68.0	13w2d	12
15.0	6w2d	12	33.0	8w3d	12	51.0	10w6d	12	69.0	13w3d	12
16.0	6w3d	12	34.0	8w4d	12	52.0	11w0d	12	70.0	13w4d	12
17.0	6w4d	12	35.0	8w5d	12	53.0	11w1d	12	71.0	13w5d	12
18.0	6w5d	12	36.0	8w6d	12	54.0	11w2d	12	72.0	14w0d	12
19.0	6w6d	12	37.0	9w0d	12	55.0	11w3d	12	73.0	14w1d	12

Tokyo:

Studies on Fetal Growth and Functional Developments, Takashi Okai, Department of Obstetrics and Gynecology, Faculty of Medicine, University of Tokyo

Table GS, **Tokyo**

GS cm	MA	+/- 2SD	GS cm	MA	+/- 2SD	GS cm	MA	+/- 2SD	GS cm	MA	+/- 2SD
1	4w0d	7	2.6	6w6d	12	4.2	9w1d	14	5.8	11w1d	16
1.2	4w1d	7	2.8	7w1d	12	4.4	9w3d	14	6	11w3d	16

1.4	4w4d	7	3	7w3d	12	4.6	9w4d	14	6.2	11w4d	16
1.6	5w0d	8	3.2	7w4d	12	4.8	10w0d	15	6.4	11w6d	16
1.8	5w1d	8	3.4	8w0d	13	5	10w1d	15	6.6	11w6d	16
2	5w4d	8	3.6	8w1d	13	5.2	10w3d	15	6.8	12w1d	17
2.2	6w0d	11	3.8	8w3d	13	5.4	10w4d	15			
2.4	6w1d	11	4	8w6d	13	5.6	10w6d	15			

China:

Wu Zhongyu, “Ultrasound Diagnosis in Obstetrics and Gynecology”, Tianjin Science and Technology Publisher, 1995

Table **GS**, **China**

GS cm	MA	+/- 2SD	GS cm	MA	+/- 2SD	GS cm	MA	+/- 2SD	GS cm	MA	+/- 2SD
1	5w0d	4	2.5	6w6d	7	4	8w3d	11	5.5	10w3d	12
1.1	5w1d	5	2.6	7w0d	7	4.1	8w4d	11	5.6	10w4d	12
1.2	5w2d	5	2.7	7w0d	7	4.2	8w5d	11	5.7	10w5d	12
1.3	5w3d	5	2.8	7w1d	8	4.3	8w6d	12	5.8	10w5d	12
1.4	5w4d	5	2.9	7w2d	8	4.4	9w0d	12	5.9	10w6d	12
1.5	5w5d	5	3	7w3d	8	4.5	9w1d	12	6	11w0d	12
1.6	5w6d	5	3.1	7w4d	8	4.6	9w2d	12	6.1	11w1d	12
1.7	6w0d	6	3.2	7w4d	9	4.7	9w3d	12	6.2	11w2d	13
1.8	6w0d	6	3.3	7w5d	9	4.8	9w4d	12	6.3	11w3d	13
1.9	6w1d	6	3.4	7w6d	9	4.9	9w4d	12	6.4	11w4d	13
2	6w2d	6	3.5	8w0d	9	5	9w5d	12	6.5	11w5d	13
2.1	6w3d	6	3.6	8w0d	10	5.1	9w6d	12	6.6	11w5d	13
2.2	6w4d	6	3.7	8w1d	10	5.2	10w0d	12	6.7	11w6d	13
2.3	6w4d	6	3.8	8w2d	10	5.3	10w1d	12	6.8	12w0d	13
2.4	6w5d	7	3.9	8w3d	10	5.4	10w2d	12			

A3.3: CRL

Hadlock:

Hadlock FP, Shah YP, Kanon DJ etc. “Fetal Crown-Rump Length: Reevaluation of Relation to Menstrual Age (5-18 weeks) with High-Resolution Real-Time US.” Radiology 182(2):501, 1992

MA (CRL mm) = 1.684969 + (0.315646*CRL) - (0.049306*CRL^2) + (0.004057*CRL^3) - (0.000120456*CRL^4)

Robinson:

Robinson HP and Fleming JEE. “A critical evaluation of sonar ‘crown-rump length’ measurements.” British Journal of Obstetrics and Gynecology 82:702, 1975

MA = (8.**052***$CRL^{1/2}$ + 23.73) / 7

Hansmann:

Hansmann M, Hackelöer B-J, Staudach A. Ultrasound Diagnosis in Obstetrics and Gynecology. New York: Spring-Verlag, 1985, P. 439

Table **CRL**, **Hansmann**

CRL mm	MA	+/- 2SD	CRL mm	MA	+/- 2SD	CRL mm	MA	+/- 2SD	CRL mm	MA	+/- 2SD
6.0	6w1d	6	22.0	9w1d	7	52.0	12w2d	9	100.0	15w5d	12
7.0	6w2d	7	23.0	9w2d	7	54.0	12w3d	9	103.0	16w0d	13
8.0	6w4d	6	24.0	9w3d	7	56.0	12w4d	9	106.0	16w2d	13
9.0	6w6d	7	26.0	9w5d	7	58.0	12w5d	9	110.0	16w4d	14
10.0	7w0d	7	28.0	10w0d	7	60.0	12w6d	9	113.0	17w0d	14
11.0	7w2d	6	30.0	10w2d	7	63.0	13w0d	10	116.0	17w2d	14
12.0	7w3d	7	32.0	10w3d	8	66.0	13w2d	10	120.0	17w4d	14
13.0	7w4d	7	34.0	10w5d	7	70.0	13w3d	11	123.0	18w0d	14
14.0	7w6d	7	36.0	10w6d	8	73.0	13w5d	10	126.0	18w2d	15
15.0	8w0d	7	38.0	11w1d	8	76.0	13w6d	11	130.0	18w6d	14
16.0	8w2d	6	40.0	11w2d	8	80.0	14w1d	11	133.0	19w1d	15
17.0	8w3d	6	42.0	11w3d	8	83.0	14w2d	12	136.0	19w4d	16
18.0	8w4d	7	44.0	11w4d	9	86.0	14w4d	12	140.0	20w0d	16
19.0	8w5d	7	46.0	11w6d	8	90.0	14w6d	12	143.0	20w3d	16
20.0	8w6d	7	48.0	12w0d	9	93.0	15w1d	12	146.0	20w6d	16
21.0	9w0d	7	50.0	12w1d	9	96.0	15w3d	12	150.0	21w3d	16

Tokyo:

Studies on Fetal Growth and Functional Developments, Takashi Okai, Department of Obstetrics and Gynecology, Faculty of Medicine, University of Tokyo

Table CRL, **Tokyo**

CRL cm	MA	+/- 2SD	CRL cm	MA	+/- 2SD	CRL cm	MA	+/- 2SD	CRL cm	MA	+/- 2SD
0.6	6w3d	7	3	10w3d	7	5.4	12w4d	7	7.8	14w3d	8
0.8	6w6d	7	3.2	10w4d	7	5.6	12w5d	7	8	14w4d	8
1	7w1d	7	3.4	10w6d	7	5.8	13w0d	7	8.2	14w5d	8
1.2	7w4d	7	3.6	11w0d	7	6	13w1d	7	8.4	14w6d	8
1.4	7w6d	7	3.8	11w1d	7	6.2	13w2d	7	8.6	15w0d	14
1.6	8w1d	7	4	11w3d	7	6.4	13w3d	7	8.8	15w1d	14
1.8	8w4d	7	4.2	11w4d	7	6.6	13w4d	7	9	15w2d	14
2	9w1d	7	4.4	11w6d	7	6.8	13w5d	7	9.2	15w3d	14
2.2	9w2d	7	4.6	12w0d		7	13w6d	7	9.4	15w4d	14
2.4	9w4d	7	4.8	12w1d		7.2	14w0d	7	9.6	15w5d	14
2.6	9w6d	7	5	12w2d		7.4	14w1d	7	9.8	15w6d	14
2.8	10w2d	7	5.2	12w3d		7.6	14w2d	7	10	16w0d	14

China:

Wu Zhongyu, “Ultrasound Diagnosis in Obstetrics and Gynecology”, Tianjin Science and Technology Publisher, 1995

Table CRL, **China**

CRL cm	MA	+/- 2SD	CRL cm	MA	+/- 2SD				CRL cm	MA	+/- 2SD
0.9	7w0d	6	3.4	10w3d	7	5.9	12w6d	10	8.4	15w1d	12
1	7w1d	6	3.5	10w4d	7	6	13w0d	10	8.5	15w1d	13
1.1	7w2d	6	3.6	10w5d	7	6.1	13w0d	10	8.6	15w2d	13
1.2	7w3d	6	3.7	10w5d	7	6.2	13w1d	10	8.7	15w2d	13
1.3	7w4d	6	3.8	10w6d	7	6.3	13w2d	11	8.8	15w3d	13
1.4	7w5d	6	3.9	11w0d	7	6.4	13w2d	11	8.9	15w4d	13
1.5	7w6d	6	4	11w1d	8	6.5	13w3d	11	9	15w4d	13
1.6	8w0d	6	4.1	11w1d	8	6.6	13w3d	11	9.1	15w5d	13
1.7	8w1d	6	4.2	11w2d	8	6.7	13w4d	11	9.2	15w6d	13
1.8	8w2d	6	4.3	11w3d	8	6.8	13w5d	11	9.3	15w6d	13
1.9	8w3d	6	4.4	11w4d	8	6.9	13w5d	11	9.4	16w0d	13
2	8w4d	6	4.5	11w4d	8	7	13w6d	11	9.5	16w1d	13
2.1	8w5d	6	4.6	11w5d	8	7.1	14w0d	11	9.6	16w1d	13
2.2	8w6d	6	4.7	11w6d	9	7.2	14w0d	12	9.7	16w2d	14
2.3	9w0d	6	4.8	11w6d	9	7.3	14w1d	12	9.8	16w3d	14
2.4	9w1d	6	4.9	12w0d	9	7.4	14w1d	12	9.9	16w3d	14
2.5	9w2d	6	5	12w0d	9	7.5	14w2d	12	10	16w4d	14
2.6	9w3d	6	5.1	12w1d	9	7.6	14w3d	12	10.1	16w5d	14
2.7	9w4d	7	5.2	12w2d	9	7.7	14w3d	12	10.2	16w6d	14
2.8	9w5d	7	5.3	12w2d	9	7.8	14w4d	12	10.3	16w6d	14
2.9	9w6d	7	5.4	12w3d	9	7.9	14w5d	12	10.4	17w0d	14
3	10w0d	7	5.5	12w3d	9	8	14w5d	12	10.5	17w0d	14
3.1	10w1d	7	5.6	12w4d	9	8.1	14w6d	12			
3.2	10w2d	7	5.7	12w5d	10	8.2	15w0d	12			
3.3	10w3d	7	5.8	12w5d	10	8.3	15w0d	12			

A3.4: BPD

Hadlock:

Hadlock FP, Deter RL etc. “Estimation Fetal Age: Computer-Assisted Analysis of Multiple Fetal Growth Parameters.” Radiology 152:497, 1984

MA (BPD cm)= 9.54 + 1.482*(BPD) + 0.1676 * (BPD^2)

Merz:

Merz E. Ultrasound in Gynecology and Obstetrics. Stuttgart and New York: Thieme Medical Publishers, Inc., 1991, p. 326

Table **BPD**, Merz

BPD mm	MA	+/- 2SD	BPD mm	MA	+/- 2SD	BPD mm	MA	+/- 2SD	BPD mm	MA	+/- 2SD
21.0	12w1d	13	41.0	17w5	16	61.0	23w6d	17	82.0	31w2d	19
22.0	12w3d	12	42.0	18w0	16	62.0	24w1d	17	83.0	31w5d	18
23.0	12w5d	12	43.0	18w2	16	63.0	24w4d	17	84.0	32w1d	18
24.0	13w0d	13	44.0	18w4	16	64.0	24w6d	17	85.0	32w4d	18
25.0	13w1d	13	45.0	18w6	16	65.0	25w1d	17	86.0	32w6d	19
26.0	13w4d	12	46.0	19w1	13	66.0	25w4d	17	87.0	33w2d	19
27.0	13w6d	13	47.0	19w3	15	67.0	25w6d	17	89.0	34w1d	21
28.0	14w1d	13	48.0	19w5	16	68.0	26w1d	18	90.0	34w4d	19
29.0	14w2d	13	49.0	20w0	16	69.0	26w4d	17	91.0	35w1d	19
30.0	14w4d	13	50.0	20w3	15	70.0	26w6d	17	92.0	35w4d	19
31.0	14w6d	15	51.0	20w5	16	71.0	27w1d	18	93.0	35w6d	19
32.0	15w1d	15	52.0	21w0	16	72.0	27w4d	18	94.0	36w3d	21
33.0	15w3d	13	53.0	21w2	16	73.0	27w6d	18	95.0	36w6d	21
34.0	15w5d	15	54.0	21w4	17	74.0	28w2d	18	96.0	37w2d	21
35.0	16w0d	15	55.0	21w6	17	75.0	28w4d	18	97.0	37w6d	19
36.0	16w2d	15	56.0	22w1	17	76.0	29w0d	18	98.0	38w2d	21
37.0	16w4d	13	57.0	22w3	16	77.0	29w3d	18	99.0	38w6d	19
38.0	16w6d	15	58.0	22w6	16	78.0	29w6d	18	100.0	39w2d	22
39.0	17w1d	15	59.0	23w1	17	79.0	30w1d	18	101.0	39w6d	21
40.0	17w3d	15	60.0	23w4	17	81.0	30w6d	19	102.0	40w2d	22

Rempen:

Rempen A. “Biometrie in der Frühgravidität” (I. Trimenon) (Biometry in Early Pregnancy (1st Trimester)).” Der Frauenarzt 32:425, 1991

Table **BPD**, **Rempen**

BPD mm	MA	+/- 2SD	BPD mm	MA	+/- 2SD	BPD mm	MA	+/- 2SD	BPD mm	MA	+/- 2SD
03.0	6w6d	10	10.0	8w6d	10	17.0	10w6d	10	24.0	12w6d	10
04.0	7w1d	10	11.0	9w1d	10	18.0	11w1d	10	25.0	13w1d	10
05.0	7w3d	10	12.0	9w3d	10	19.0	11w3d	10	26.0	13w3d	10
06.0	7w5d	10	13.0	9w5d	10	20.0	11w5d	10	27.0	13w5d	10
07.0	8w0d	10	14.0	10w0d	10	21.0	12w0d	10			
08.0	8w2d	10	15.0	10w2d	10	22.0	12w2d	10			
0.90	8w4d	10	16.0	10w4d	10	23.0	12w4d	10			

Osaka:

Fetal Growth Chart Using the Ultrasonotomographic Technique, Keiichi Kurachi, Mineo Aoki, Department of Obstetrics and Gynecology, Osaka University Medical School Revision 3 (September 1983)

Table BPD, Osaka

BPD cm	MEAN	MIN	MAX	BPD cm	MEAN	MIN	MAX	BPD cm	MEAN	MIN	MAX
1.33	10w0d	9w4d	10w3d	4.94	20w2d	19w3d	21w1d	7.88	30w4d	29w0d	32w1d
1.44	10w2d	9w6d	10w5d	5.03	20w4d	19w5d	21w3d	7.95	30w6d	29w2d	32w3d
1.55	10w4d	10w0d	11w0d	5.12	20w6d	20w0d	21w5d	8.02	31w1d	29w4d	32w5d
1.66	10w6d	10w2d	11w2d	5.21	21w1d	20w1d	22w0d	8.08	31w3d	29w6d	33w0d
1.77	11w1d	10w4d	11w4d	5.30	21w3d	20w3d	22w2d	8.15	31w5d	30w1d	33w3d
1.88	11w3d	10w6d	11w6d	5.39	21w5d	20w5d	22w4d	8.21	32w0d	30w3d	33w5d
1.99	11w5d	11w1d	12w2d	5.48	22w0d	21w0d	22w6d	8.27	32w2d	30w4d	34w0d
2.09	12w0d	11w3d	12w3d	5.57	22w2d	21w2d	23w2d	8.34	32w4d	30w6d	34w3d
2.20	12w2d	11w5d	12w6d	5.66	22w4d	21w4d	23w4d	8.40	32w6d	31w1d	34w5d
2.31	12w4d	12w0d	13w1d	5.74	22w6d	21w5d	23w6d	8.46	33w1d	31w3d	35w1d
2.41	12w6d	12w1d	13w3d	5.83	23w1d	22w1d	24w1d	8.51	33w3d	31w4d	35w3d
2.52	13w1d	12w3d	13w5d	5.92	23w3d	22w3d	24w3d	8.57	33w5d	31w6d	35w6d
2.62	13w3d	12w5d	14w0d	6.00	23w5d	22w4d	24w5d	8.62	34w0d	32w1d	36w1d
2.72	13w5d	13w0d	14w2d	6.09	24w0d	22w6d	25w0d	8.68	34w2d	32w3d	36w4d
2.82	14w0d	13w2d	14w4d	6.17	24w2d	23w1d	25w2d	8.73	34w4d	32w4d	37w0d
2.93	14w2d	13w4d	14w6d	6.26	24w4d	23w3d	25w4d	8.78	34w6d	32w6d	37w3d
3.03	14w4d	13w6d	15w1d	6.34	24w6d	23w5d	25w6d	8.83	35w1d	33w0d	38w0d
3.13	14w6d	14w1d	15w3d	6.43	25w1d	24w0d	26w2d	8.87	35w3d	33w2d	38w2d
3.23	15w1d	14w3d	15w6d	6.51	25w3d	24w2d	26w4d	8.92	35w5d	33w4d	39w0d
3.33	15w3d	14w5d	16w1d	6.59	25w5d	24w4d	26w6d	8.96	36w0d	33w5d	39w4d
3.42	15w5d	14w6d	16w3d	6.67	26w0d	24w6d	27w1d	9.00	36w2d	34w0d	40w0d
3.52	16w0d	15w1d	16w5d	6.75	26w2d	25w0d	27w3d	9.04	36w4d	34w1d	40w1d
3.62	16w2d	15w3d	17w0d	6.84	26w4d	25w3d	27w5d	9.08	36w6d	34w3d	40w2d
3.72	16w4d	15w6d	17w2d	6.92	26w6d	25w4d	28w0d	9.12	37w1d	34w4d	40w3d
3.81	16w6d	16w0d	17w4d	6.99	27w1d	25w6d	28w2d	9.15	37w3d	34w5d	40w4d
3.91	17w1d	16w2d	17w6d	7.07	27w3d	26w1d	28w4d	9.18	37w5d	35w0d	40w5d
4.01	17w3d	16w4d	18w1d	7.15	27w5d	26w3d	29w0d	9.21	38w0d	35w1d	40w6d
4.10	17w5d	16w6d	18w3d	7.23	28w0d	26w5d	29w2d	9.24	38w2d	35w2d	41w0d
4.20	18w0d	17w1d	18w5d	7.30	28w2d	27w0d	29w5d	9.27	38w4d	35w3d	41w0d
4.29	18w2d	17w3d	19w0d	7.38	28w4d	27w2d	29w6d	9.29	38w6d	35w4d	41w0d
4.39	18w4d	17w5d	19w2d	7.45	28w6d	27w3d	30w1d	9.31	39w1d	35w5d	41w0d
4.48	18w6d	18w0d	19w5d	7.53	29w1d	27w5d	30w4d	9.33	39w3d	35w6d	41w0d
4.57	19w1d	18w2d	20w0d	7.60	29w3d	28w0d	30w6d	9.35	39w5d	36w0d	41w0d
4.67	19w3d	18w4d	20w2d	7.67	29w5d	28w2d	31w1d	9.36	40w0d	36w0d	41w0d
4.76	19w5d	18w6d	20w4d	7.74	30w0d	28w4d	31w3d				
4.85	20w0d	19w1d	20w6d	7.81	30w2d	28w6d	31w5d				

Tokyo:

Studies on Fetal Growth and Functional Developments, Takashi Okai, Department of Obstetrics and Gynecology, Faculty of Medicine, University of Tokyo

Table **BPD**, Tokyo

BPD cm	MA	+/- 2SD	BPD cm	MA	+/- 2SD	BPD cm	MA	+/- 2SD	BPD cm	MA	+/- 2SD
1.6	11w3d	7	3.6	16w3d	8	5.6	23w0d	11	7.6	30w1d	15
1.8	11w6d	7	3.8	17w0d	8	5.8	23w5d	11	7.8	31w0d	16
2	12w0d	7	4	17w5d	8	6	24w2d	12	8	32w0d	16
2.2	12w4d	7	4.2	18w2d	9	6.2	25w0d	12	8.2	33w0d	16
2.4	13w0d	7	4.4	19w0d	9	6.4	25w6d	12	8.4	34w0d	20
2.6	13w6d	7	4.6	19w5d	10	6.6	26w3d	13	8.6	35w5d	25
2.8	14w2d	7	4.8	20w2d	10	6.8	27w3d	13	8.8	37w0d	25
3	14w6d	7	5	21w0d	10	7	28w0d	13	9	39w0d	25
3.2	15w2d	7	5.2	21w4d	10	7.2	29w0d	14	9.2	40w0d	25
3.4	16w0d	8	5.4	22w2d	10	7.4	29w5d	14			

China:

Wu Zhongyu, “Ultrasound Diagnosis in Obstetrics and Gynecology”, Tianjin Science and Technology Publisher, 1995

Table BPD, China

BPD cm	MA	+/- 2SD	BPD cm	MA	+/- 2SD	BPD cm	MA	+/- 2SD	BPD cm	MA	+/- 2SD
1.9	12w0d	7	3.8	17w3d	9	5.7	23w1d	13	7.6	30w0d	20
2	12w2d	7	3.9	17w5d	9	5.8	23w3d	14	7.7	30w3d	20
2.1	12w4d	7	4	18w0d	9	5.9	23w5d	14	7.8	30w6d	21
2.2	12w6d	7	4.1	18w2d	9	6	24w0d	14	7.9	31w3d	21
2.3	13w1d	7	4.2	18w4d	9	6.1	24w2d	15	8	31w6d	21
2.4	13w3d	7	4.3	18w6d	10	6.2	24w5d	15	8.1	32w3d	22
2.5	13w5d	7	4.4	19w1d	10	6.3	25w0d	15	8.2	32w6d	22
2.6	14w0d	7	4.5	19w4d	10	6.4	25w2d	15	8.3	33w2d	23
2.7	14w2d	7	4.6	19w6d	10	6.5	25w5d	16	8.4	33w6d	23
2.8	14w4d	7	4.7	20w1d	11	6.6	26w0d	16	8.5	34w3d	23
2.9	14w6d	8	4.8	20w3d	11	6.7	26w3d	16	8.6	34w6d	24
3	15w1d	8	4.9	20w5d	11	6.8	26w5d	16	8.7	35w4d	24
3.1	15w3d	8	5	21w0d	11	6.9	27w1d	18	8.8	36w1d	24
3.2	15w5d	8	5.1	21w2d	11	7	27w3d	18	8.9	36w5d	24
3.3	16w0d	8	5.2	21w4d	12	7.1	27w6d	18	9	37w1d	25
3.4	16w2d	8	5.3	21w6d	12	7.2	28w1d	18	9.1	37w1d	25
3.5	16w4d	8	5.4	22w1d	12	7.3	28w4d	19	9.2	38w4d	25
3.6	16w6d	8	5.5	22w3d	13	7.4	29w1d	19	9.3	39w2d	25
3.7	17w1d	8	5.6	22w5d	13	7.5	29w4d	20	9.4	40w0d	25

A3.5: HC

Hadlock:

Hadlock FP, Deter RL etc. “Estimation Fetal Age: Computer-Assisted Analysis of Multiple Fetal Growth Parameters.” Radiology 152:497, 1984

MA(HC cm) = 8.96 + 0.540 * (HC) + 0.0003 * (HC^3)

Merz:

Merz E. Ultrasound in Gynecology and Obstetrics. Stuttgart and New York: Thieme Medical Publishers, Inc., 1991, p. 326

Table HC, Merz

HC mm	MA	+/- 2SD	HC mm	MA	+/- 2SD	HC mm	MA	+/- 2SD	HC mm	MA	+/- 2SD
72	12w1	9	146	17w2	12	220	23w2	15	294	30w5	16
74	12w2	11	148	17w4	12	222	23w4	15	296	30w6	17
76	12w3	10	150	17w4	13	224	23w4	15	298	31w1	16
78	12w4	10	152	17w6	12	226	23w6	15	300	31w3	17
80	12w5	10	154	17w6	13	228	24w0	16	302	31w4	17
82	12w6	10	156	18w1	12	230	24w1	16	304	31w6	17
84	12w6	11	158	18w1	13	232	24w3	15	306	32w1	17
86	13w1	10	160	18w3	12	234	24w4	15	308	32w2	17
88	13w1	11	162	18w4	12	236	24w4	15	310	32w4	17
90	13w2	11	164	18w5	12	238	24w6	16	312	32w6	17
92	13w4	10	166	18w6	12	240	25w1	15	314	33w1	17
94	13w4	11	168	19w0	13	242	25w2	16	316	33w3	17
96	13w5	10	170	19w1	12	244	25w4	15	318	33w4	17
98	13w6	11	172	19w2	13	246	25w5	16	320	33w6	18
100	14w0	10	174	19w3	12	248	25w6	16	322	34w1	17
102	14w1	12	176	19w4	13	250	26w0	16	324	34w3	18
104	14w2	11	178	19w6	13	252	26w1	16	326	34w5	18
106	14w3	11	180	19w6	15	254	26w3	15	328	34w6	18
108	14w4	11	182	20w1	13	256	26w4	16	330	35w1	18
110	14w5	11	184	20w1	15	258	26w6	15	332	35w4	18
112	14w6	11	186	20w3	13	260	27w0	16	334	35w6	18
114	15w0	11	188	20w4	13	262	27w1	16	336	36w1	18
116	15w1	11	190	20w5	13	264	27w3	15	338	36w3	18
118	15w2	11	192	20w6	15	266	27w4	16	340	36w4	19
120	15w3	11	194	21w1	13	268	27w6	15	342	36w6	19
122	15w4	12	196	21w1	15	270	28w1	16	344	37w1	19
124	15w5	12	198	21w3	13	272	28w2	16	346	37w4	18
126	15w6	11	200	21w4	15	274	28w4	16	348	37w6	19
128	16w0	12	202	21w5	15	276	28w5	16	350	38w1	21

130	16w1	12	204	21w6	15	278	28w6	17	352	38w4	19
132	16w2	12	206	22w1	15	280	29w1	16	354	38w6	19
134	16w3	12	208	22w1	15	282	29w2	16	356	39w1	19
136	16w4	12	210	22w3	15	284	29w4	17	358	39w4	19
138	16w5	12	212	22w3	15	286	29w6	16	360	39w6	19
140	16w6	12	214	22w5	15	288	30w0	16	362	40w1	19
142	17w0	12	216	22w6	15	290	30w1	17	364	40w4	19
144	17w1	12	218	23w1	15	292	30w4	16			

A3.6: AC

Hadlock:

Hadlock FP, Deter RL etc. “Estimation Fetal Age: Computer-Assisted Analysis of Multiple Fetal Growth Parameters.” Radiology 152:497, 1984

MA (AC cm) = 8.14 + 0.753 * (AC) + 0.0036 * (AC^2)

Merz:

Merz E. Ultrasound in Gynecology and Obstetrics. Stuttgart and New York: Thieme Medical Publishers, Inc., 1991, p. 326

Table AC, Merz

AC mm	MA	+/- 2SD	AC mm	MA	+/- 2SD	AC mm	MA	+/- 2SD	AC mm	MA	+/- 2SD
56	12w1	10	130	19w1	12	206	26w3	15	280	33w3	17
58	12w2	11	132	19w2	12	208	26w4	15	282	33w4	17
60	12w4	10	134	19w3	12	210	26w6	15	284	33w6	17
62	12w5	10	136	19w5	12	212	27w0	15	286	34w0	17
64	12w6	11	138	19w6	12	214	27w1	15	288	34w1	18
66	13w1	11	140	20w1	12	216	27w2	15	290	34w3	18
68	13w2	11	142	20w2	13	218	27w4	15	292	34w4	18
70	13w4	11	144	20w4	12	220	27w5	16	294	34w5	18
72	13w4	11	146	20w5	12	222	27w6	16	296	34w6	19
74	13w6	11	148	20w6	13	224	28w1	15	298	35w1	17
76	14w0	11	150	21w1	15	226	28w2	16	300	35w2	18
78	14w1	12	152	21w1	15	228	28w4	16	302	35w4	17
80	14w3	11	154	21w3	15	230	28w5	16	304	35w5	18
82	14w4	11	156	21w4	13	232	28w6	16	306	35w6	18
84	14w6	11	158	21w6	13	234	29w0	16	308	36w1	17
86	15w0	11	160	22w0	13	236	29w1	17	310	36w2	18
88	15w1	11	162	22w1	15	238	29w3	16	312	36w4	17
90	15w3	11	164	22w3	13	240	29w4	17	314	36w4	19
92	15w4	11	168	22w6	13	242	29w6	16	316	36w6	18

94	15w5	12	170	23w0	13	244	30w0	16	318	37w0	18
96	15w6	12	172	23w1	15	246	30w1	17	320	37w1	18
98	16w1	12	174	23w2	15	248	30w3	16	322	37w3	18
100	16w2	12	176	23w4	13	250	30w4	17	324	37w4	19
102	16w4	11	178	23w5	15	252	30w6	16	326	37w6	18
104	16w5	12	180	23w6	15	254	30w6	17	328	38w0	18
106	16w6	12	182	24w1	15	256	31w1	17	330	38w1	18
108	17w1	11	184	24w2	15	258	31w2	17	332	38w3	18
110	17w2	11	186	24w4	15	260	31w4	17	334	38w4	18
112	17w3	12	188	24w5	15	262	31w5	17	336	38w5	18
114	17w4	12	190	24w6	16	264	31w6	17	338	38w6	19
116	17w6	12	192	25w0	16	266	32w1	17	340	39w1	19
118	18w0	12	194	25w1	16	268	32w2	17	342	39w2	19
120	18w1	12	196	25w3	15	270	32w4	17	344	39w4	19
122	18w3	12	198	25w4	16	272	32w5	17	346	39w5	19
124	18w4	12	200	25w6	15	274	32w6	17	348	39w6	19
126	18w6	12	202	26w0	16	276	33w0	17			
128	19w0	12	204	26w1	15	278	33w1	17			

A3.7: FL

Hadlock:

Hadlock FP, Deter RL etc. “Estimation Fetal Age: Computer-Assisted Analysis of Multiple Fetal Growth Parameters.” Radiology 152:497, 1984

MA (FL cm) = 10.35 + 2.460 * (FL) + 0.170 * (FL^2)

Merz:

Merz E. Ultrasound in Gynecology and Obstetrics. Stuttgart and New York: Thieme Medical Publishers, Inc., 1991, p. 326

Table FL, **Merz**

FL mm	MA	+/- 2SD	FL mm	MA	+/- 2SD	FL mm	MA	+/- 2SD	FL mm	MA	+/- 2SD
10	12w2d	11	28	18w4d	13	47	25w6d	15	65	33w1d	17
11	12w5d	10	29	19w0d	12	48	26w1d	16	66	33w4d	17
12	13w2d	10	30	19w3d	12	49	26w4d	15	68	34w4d	17
13	13w4d	11	31	19w5d	12	50	26w6d	16	69	35w0d	18
14	13w5d	11	32	20w1d	12	51	27w2d	16	70	35w3d	18
15	14w0d	11	33	20w4d	13	52	27w5d	16	71	35w6d	18
16	14w3d	11	34	20w6d	13	53	28w1d	16	72	36w2d	18
17	14w5d	11	35	21w1d	15	54	28w4d	17	73	36w6d	18
18	15w1d	11	36	21w4d	13	55	29w0d	17	74	37w2d	19

19	15w3d	11	37	21w6d	15	56	29w3d	17	75	37w5d	18
20	15w6d	11	38	22w2d	13	57	29w6d	17	76	38w1d	19
21	16w1d	11	40	23w1d	15	58	30w1d	17	77	38w5d	19
22	16w4d	11	41	23w3d	15	59	30w4d	17	78	39w1d	19
23	16w4d	11	42	23w5d	15	60	31w0d	17	79	39w4d	19
24	17w1d	12	43	24w1d	15	61	31w4d	17	80	40w1d	18
25	14w7d	13	44	24w4d	16	62	31w6d	17			
26	17w6d	13	45	25w0d	16	63	32w2d	17			
27	18w2d	13	46	25w3d	15	64	32w6d	17			

Jeanty:

Jeanty P, Rodesch F etc. “Estimation of Gestational Age from measurement of Fetal Long Bones.” Journal of Ultrasound in Medicine 3:75, 1984

MA (FL mm) = (9.5411757+0.2977451 * FL) + (0.0010388013 * FL^2)

Tokyo:

Studies on Fetal Growth and Functional Developments, Takashi Okai, Department of Obstetrics and Gynecology, Faculty of Medicine, University of Tokyo

Table FL, Tokyo

FL cm	MA	+/- 2SD	FL cm	MA	+/- 2SD	FL cm	MA	+/- 2SD	FL cm	MA	+/- 2SD
0.8	12w3d	10	2.6	17w6d	10	4.4	25w2d	25	6.2	34w0d	42
1	13w0d	10	2.8	18w4d	14	4.6	26w0d	25	6.4	35w0d	46
1.2	13w4d	10	3	19w2d	17	4.8	27w0d	25	6.6	36w0d	50
1.4	14w1d	10	3.2	20w5d	17	5	28w0d	25	6.8	38w0d	57
1.6	14w5d	10	3.4	21w5d	18	5.2	29w0d	30	7	40w0d	64
1.8	15w2d	10	3.6	22w3d	19	5.4	29w5d	30	7.2	40w2d	64
2	16w0d	10	3.8	23w0d	21	5.6	30w2d	30			
2.2	16w4d	10	4	24w0d	22	5.8	31w3d	32			
2.4	17w1d	10	4.2	24w5d	24	6	33w0d	38			

China:

Wu Zhongyu, “Ultrasound Diagnosis in Obstetrics and Gynecology”, Tianjin Science and Technology Publisher, 1995

Table **FL**, China

FL cm	MA	+/- 2SD	FL cm	MA	+/- 2SD	FL cm	MA	+/- 2SD	FL cm	MA	+/- 2SD
0.6	12w4d	7	2.4	18w0d	9	4.2	24w0d	16	6	33w0d	18
0.7	12w5d	7	2.5	18w2d	9	4.3	24w3d	16	6.1	33w3d	18
0.8	13w0d	8	2.6	18w4d	10	4.4	24w6d	16	6.2	34w0d	18
0.9	13w2d	8	2.7	18w6d	10	4.5	25w2d	16	6.3	34w3d	19
1	13w5d	8	2.8	19w2d	11	4.6	25w6d	16	6.4	35w0d	20
1.1	14w0d	8	2.9	19w4d	11	4.7	26w3d	16	6.5	35w3d	20
1.2	14w2d	8	3	19w6d	12	4.8	26w6d	16	6.6	35w6d	20
1.3	14w4d	8	3.1	20w1d	13	4.9	27w4d	17	6.7	36w3d	20
1.4	14w6d	8	3.2	20w3d	13	5	27w6d	17	6.8	37w0d	21
1.5	15w1d	8	3.3	20w5d	14	5.1	28w3d	17	6.9	37w3d	22
1.6	15w3d	8	3.4	21w1d	14	5.2	28w6d	17	7	38w0d	23
1.7	15w5d	8	3.5	21w3d	15	5.3	29w3d	17	7.1	38w3d	23
1.8	16w0d	8	3.6	21w6d	15	5.4	29w6d	17	7.2	38w6d	23
1.9	16w3d	8	3.7	22w2d	15	5.5	30w3d	17	7.3	39w3d	23
2	16w5d	8	3.8	22w4d	15	5.6	30w6d	17	7.4	39w6d	23
2.1	17w0d	8	3.9	23w0d	15	5.7	31w3d	17	7.5	40w2d	23
2.2	17w2d	8	4	23w2d	16	5.8	31w6d	18			
2.3	17w4d	8	4.1	23w4d	16	5.9	32w3d	18			

Osaka:

Osaka University (2002/April/08)

Table FL, Osaka

FL cm	Mean	Min	Max	FL cm	Mean	Min	Max	FL cm	Mean	Min	Max
0.94	13w0d	12w3d	13w4d	3.61	22w1d	21w1d	23w1d	5.69	31w2d	29w6d	32w5d
1.03	13w2d	12w5d	13w6d	3.68	22w3d	21w3d	23w3d	5.74	31w4d	30w1d	33w0d
1.12	13w4d	12w6d	14w1d	3.75	22w5d	21w5d	23w4d	5.80	31w6d	30w2d	33w3d
1.21	13w6d	13w1d	14w3d	3.83	23w0d	22w0d	24w0d	5.85	32w1d	30w4d	33w5d
1.30	14w1d	13w3d	14w5d	3.90	23w2d	22w2d	24w2d	5.90	32w3d	30w6d	34w0d
1.39	14w3d	13w5d	15w1d	3.97	23w4d	22w4d	24w4d	5.96	32w5d	31w1d	34w2d
1.48	14w5d	14w0d	15w3d	4.04	23w6d	22w6d	24w6d	6.01	33w0d	31w3d	34w4d
1.57	15w0d	14w2d	15w5d	4.11	24w1d	23w0d	25w1d	6.06	33w2d	31w5d	34w6d
1.66	15w2d	14w4d	16w0d	4.18	24w3d	23w2d	25w3d	6.11	33w4d	32w0d	35w1d
1.75	15w4d	14w6d	16w2d	4.25	24w5d	23w4d	25w5d	6.16	33w6d	32w1d	35w3d
1.83	15w6d	15w1d	16w4d	4.32	25w0d	23w6d	26w0d	6.21	34w1d	32w3d	35w6d
1.92	16w1d	15w3d	16w6d	4.39	25w2d	24w1d	26w3d	6.26	34w3d	32w5d	36w1d
2.01	16w3d	15w4d	17w1d	4.45	25w4d	24w3d	26w4d	6.31	34w5d	33w0d	36w3d
2.09	16w5d	15w6d	17w3d	4.52	25w6d	24w5d	27w0d	6.36	35w0d	33w2d	36w6d
2.18	17w0d	16w1d	17w5d	4.59	26w1d	25w0d	27w2d	6.41	35w2d	33w4d	37w1d

2.26	17w2d	16w3d	18w0d	4.65	26w3d	25w2d	27w4d	6.46	35w4d	33w6d	37w3d
2.34	17w4d	16w5d	18w2d	4.72	26w5d	25w4d	27w6d	6.50	35w6d	34w0d	37w5d
2.43	17w6d	17w0d	18w4d	4.78	27w0d	25w5d	28w1d	6.55	36w1d	34w2d	38w0d
2.51	18w1d	17w2d	18w6d	4.85	27w2d	26w0d	28w3d	6.60	36w3d	34w4d	38w3d
2.59	18w3d	17w4d	19w1d	4.91	27w4d	26w2d	28w5d	6.64	36w5d	34w6d	38w5d
2.67	18w5d	17w6d	19w3d	4.97	27w6d	26w4d	29w0d	6.69	37w0d	35w0d	39w1d
2.75	19w0d	18w1d	19w6d	5.04	28w1d	26w6d	29w3d	6.73	37w2d	35w2d	39w3d
2.83	19w2d	18w3d	20w1d	5.10	28w3d	27w1d	29w5d	6.77	37w4d	35w4d	39w5d
2.91	19w4d	18w5d	20w3d	5.16	28w5d	27w3d	30w0d	6.82	37w6d	35w6d	40w0d
2.99	19w6d	19w0d	20w5d	5.22	29w0d	27w5d	30w2d	6.86	38w1d	36w1d	40w1d
3.07	20w1d	19w2d	21w0d	5.28	29w2d	27w6d	30w4d	6.90	38w3d	36w2d	40w2d
3.15	20w3d	19w4d	21w2d	5.34	29w4d	28w1d	30w6d	6.94	38w5d	36w4d	40w3d
3.23	20w5d	19w6d	21w4d	5.40	29w6d	28w3d	31w1d	6.98	39w0d	36w6d	40w4d
3.30	21w0d	20w0d	21w6d	5.46	30w1d	28w5d	31w4d	7.02	39w2d	37w1d	40w5d
3.38	21w2d	20w2d	22w1d	5.52	30w3d	29w0d	31w6d	7.06	39w4d	37w2d	40w6d
3.46	21w4d	20w4d	22w3d	5.57	30w5d	29w2d	32w1d	7.10	39w6d	37w4d	41w0d
3.53	21w6d	20w6d	22w5d	5.63	31w0d	29w4d	32w3d	7.12	40w0d	37w5d	41w0d

A3.8: FTA

Osaka:

Osaka University (2002/April/08)

Table FTA, Osaka

FTA cm^2	MEAN	MIN	MAX	FTA cm^2	MEAN	MIN	MAX	FTA cm^2	MEAN	MIN	MAX
5.6	14w0d	13w2d	14w5d	26.4	22w6d	21w5d	23w6d	57.2	31w5d	29w6d	33w3d
6.0	14w2d	13w4d	14w6d	27.2	23w1d	22w0d	24w1d	58.3	32w0d	30w1d	33w5d
6.5	14w4d	13w6d	15w2d	28.1	23w3d	22w1d	24w3d	59.4	32w2d	30w3d	34w0d
7.1	14w6d	14w1d	15w4d	29.0	23w5d	22w3d	24w6d	60.4	32w4d	30w5d	34w2d
7.6	15w1d	14w2d	15w6d	29.9	24w0d	22w5d	25w1d	61.5	32w6d	31w0d	34w5d
8.1	15w3d	14w4d	16w1d	30.8	24w2d	23w0d	25w3d	62.6	33w1d	31w1d	35w0d
8.7	15w5d	14w6d	16w3d	31.7	24w4d	23w2d	25w5d	63.7	33w3d	31w3d	35w2d
9.2	16w0d	15w1d	16w5d	32.6	24w6d	23w4d	26w0d	64.7	33w5d	31w5d	35w4d
9.8	16w2d	15w3d	17w0d	33.6	25w1d	23w6d	26w2d	65.8	34w0d	32w0d	36w0d
10.4	16w4d	15w5d	17w2d	34.5	25w3d	24w1d	26w5d	66.9	34w2d	32w1d	36w2d
11.0	16w6d	16w0d	17w5d	35.5	25w5d	24w2d	26w6d	67.9	34w4d	32w3d	36w5d
11.6	17w1d	16w2d	17w6d	36.5	26w0d	24w4d	27w2d	69.0	34w6d	32w5d	37w0d

12.2	17w3d	16w3d	18w2d	37.4	26w2d	24w6d	27w4d	70.1	35w1d	33w0d	37w2d
12.8	17w5d	16w5d	18w4d	38.4	26w4d	25w1d	27w6d	71.1	35w3d	33w1d	37w5d
13.5	18w0d	17w0d	18w6d	39.4	26w6d	25w3d	28w1d	72.2	35w5d	33w3d	38w0d
14.1	18w2d	17w2d	19w1d	40.4	27w1d	25w5d	28w3d	73.2	36w0d	33w5d	38w3d
14.8	18w4d	17w4d	19w3d	41.4	27w3d	26w0d	28w5d	74.2	36w2d	33w6d	38w5d
15.5	18w6d	17w6d	19w5d	42.4	27w5d	26w2d	29w1d	75.2	36w4d	34w1d	39w1d
16.2	19w1d	18w1d	20w0d	43.4	28w0d	26w3d	29w2d	76.2	36w6d	34w3d	39w3d
16.9	19w3d	18w3d	20w2d	44.5	28w2d	26w5d	29w5d	77.3	37w1d	34w4d	39w6d
17.6	19w5d	18w4d	20w4d	45.5	28w4d	27w0d	30w0d	78.2	37w3d	34w6d	40w0d
18.4	20w0d	19w0d	20w6d	46.6	28w6d	27w2d	30w2d	79.2	37w5d	35w0d	40w1d
19.1	20w2d	19w1d	21w1d	47.6	29w1d	27w4d	30w4d	80.2	38w0d	35w2d	40w2d
19.9	20w4d	19w3d	21w4d	48.7	29w3d	27w6d	30w6d	81.1	38w2d	35w3d	40w3d
20.6	20w6d	19w5d	21w6d	49.7	29w5d	28w1d	31w1d	82.1	38w4d	35w5d	40w4d
21.4	21w1d	20w0d	22w1d	50.8	30w0d	28w3d	31w3d	83.0	38w6d	36w0d	40w5d
22.2	21w3d	20w2d	22w3d	51.8	30w2d	28w4d	31w6d	83.9	39w1d	36w1d	40w6d
23.0	21w5d	20w4d	22w5d	52.9	30w4d	28w6d	32w1d	84.8	39w3d	36w3d	41w0d
23.8	22w0d	20w6d	23w0d	54.0	30w6d	29w1d	32w3d	85.7	39w5d	36w4d	41w0d
24.7	22w2d	21w1d	23w2d	55.0	31w1d	29w3d	32w5d	86.6	40w0d	36w6d	41w0d
25.5	22w4d	21w3d	23w4d	56.1	31w3d	29w5d	33w0d				

A3.9: HUM

Jeanty:

Jeanty P, Rodesch F etc. “Estimation of Gestational Age from measurement of Fetal Long Bones.” Journal of Ultrasound in Medicine 3:75, 1984

MA (HUM mm) = 9.6519438 + (0.26200391 * HUM) + (0.0026105367 * HUM^2)

A3.10: CER

Goldstein:

MA（CER mm）=6.329+4.807*(CER)/10+1.484*(CER/10)²-0.2474*(CER/10)³

A3.11: THD

Hansmann:

MA（THD mm）=6.963496+3.829853*(THD/10)-0.443065*$(THD/10)^2$+0.1010238*$(THD/10)^3$-0.0099702*$(THD/10)^4$+ 0.0003773$(THD/10)^5$

A3.12: Estimated Fetal Weight

Merz E. Werner G. & Ilan E. T., 1991, Ultrasound in Gynecology and Obstetrics Textbook and Atlas 312, 326-336.

Hansmann M, Hackelöer B-J, Staudach A, Ultraschalldiagostik in Geburtshilfe und Gynäkologie 1995.

Campbell S, Wilkin D. “Ultrasonic Measurement if Fetal Abdomen Circumference in the Estimation of Fetal Weight.” Br J Obstetrics and Gynecology September 82 (9):689-697, 1975.

Hadlock F, Harrist R, et al. Estimation of fetal weight with the use of head, body, and femur measurement – a prospective study. American Journal of Obstetrics and Gynecology February 1, 151 (3): 333-337, 1985.

Shepard M, Richards V, Berkowitz R, Warsof S, Hobbins J. An Evaluation of Two Equations for Predicting Fetal Weight by Ultrasound. American Journal of f Obstetrics and Gynecology January 142 (1): 47-54, 1982.

Fetal Growth Chart Using the Ultrasonotomographic Technique, Keiichi Kurachi, Mineo Aoki, Department of Obstetrics and Gynecology, Osaka University Medical School Revision 3 (September 1983)

Studies on Fetal Growth and Functional Developments, Takashi Okai, Department of Obstetrics and Gynecology, Faculty of Medicine, University of Tokyo

A3.13: FBP Criterion

FBP is a method to estimate fetus physiological condition through fetus response experiment, placental level and indexes such as amniotic fluid.

The score criterion provided by the system is based on Vintzileos formula, as shown in the following table.

Fetus Index		0	1	2	Observation Time	Note
FHR	FHR	FHR≤1 time	FHR≥15 times/m ，time≥15S ，1~4 times	FHR≥15 times/m ，time≥15S，≥5 times	20m	Scores obtained through fetus response experiment can be input into the system on report interface.
Fetal Movement	FM	No FM	1~2 times FM	FM≥3 times	30m	
Fetal Breath Movement	FBM	No FBM，or time≤30S	FBM≥1 time，time 30-60S	FBM≥1 time ，time≥60S	30m	
Fetal Tonicity	FT	Limbs stretched, no bending, fingers loose	Limbs or spine stretch-bend >=1 time	Limbs or spine stretch-bend >=1 time	30m	
Amniotic Fluid	AF	AF＜1cm	1cm≤AF≤2cm	AF＞2cm	Obtained by image measurement	
Placental Level	PL	Placental grade is 3.	Placental on posterior wall, no grade	Placental grade is 2.	Placental level includes 0, 1, 2 and 3 according to the fetal acoustic image.	

FBP criterion is as follows:

Total Score	Condition
7-12	Normal, Chronic asphyxia risk low
3-6	Chronic asphyxia suspicious
0-2	Chronic asphyxia risk high

Appendix IV: Measurement Accuracy

Parameter	Range	Accuracy
Image depth range	C363UA: 19 mm ~ 245 mm; L743UA: 29 mm ~ 108 mm	<±4% of full scale
M mode time range	C363UA: 3.99 s~ 48.1 s; L743UA: 1.24 s~36.3 s	<±0.3% of full scale
TI	\	< ± 10%
Two-dimension Measurement		
Distance/depth	up to 250 mm	< ±4% or < 2 mm, if below 40 mm
Area (Trace)	up to 720 cm^2	< ±8% or < 130 mm^2, if below 1600 mm^2
Area (Ellipse)	up to 720 cm^2	< ±8% or < 130 mm^2, if below 1600 mm^2
Angle	0º to 180º	< ±3% on 1/2 segment
Ratio (A>B)		
-Result B/A and (A-B)/A -Result A/B	up to 1.0 1.0 to 99.9	< ±10% of A < ±10% of A
Time Motion (TM) Measurement		
Depth	up to 250 mm	< ±4% or < 2 mm, if below 40 mm
Time	up to 12.8 sec	< ± 5%
Heart rate	15 to 999 bpm	< ±5%
Velocity (ratio)	up to 999 mm/sec	< ±5%
Volume Measurement		
Volume (area, length, diameter)	up to 999 cm^3	< ±12% or <8000 mm^3, if below 64000 mm^3
Thyroid gland volume	up to 999 cm^3	< ±12% or <8000 mm^3, if below 64000 mm^3
Residual urine volume	up to 999 mL	< ±12% or <8000 mm^3, if below 64000 mm^3
Prostate volume	up to 999 cm^3	< ±12% or <8000 mm^3, if below 64000 mm^3
PW measurement		
Velocity	5 ~ 480 cm/s	< ±10%

Appendix V: EMC Information-Guidance and Manufacture's Declaration

Guidance and manufacture's declaration-electromagnetic emissions-
For all EQUIPMENT and SYSTEMS

NOTE:

To protect from EMI, please leave the DUS 60 system away from the EMI sources. For the technical reasons, electromagnetic immunity is limited to 1 Vrms, otherwise, the interfaced images may affect the diagnosis and measurements.

Guidance and manufacture's declaration-electromagnetic emission		
The DUS 60 is intended for use in the electromagnetic environment specified below; The customer or the user of the DUS 60 should assure that it is used in such and environment.		
Emission test	Compliance	Electromagnetic environment-guidance
RF emissions CISPR 11	Group 1	The DUS 60 uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class A	The DUS 60 is suitable for use in all establishments, other than domestic and those directly connected to the public low-voltage power supply network that supplies building used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/flicker emissions IEC 61000-3-3	Complies	

Guidance and manufacture's declaration – electromagnetic immunity –
for all EQUIPMENT and SYSTEMS

Guidance and manufacture's declaration – electromagnetic immunity			
The DUS 60 is intended for use in the electromagnetic environment specified below. The customer or the user of DUS 60 should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment -guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete or ceramic tile. If floor are covered with synthetic material, the relative humidity should be at least 30%.

Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines	±2KV for power supply lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV line to line ±2 kV line to ground	±1 kV line to line ±2 kV line to ground	Mains power quality should be that of a typical commercial or hospital environment.
Power frequency (50/60Hz) magnetic field IEC 61000-4-8	3A/m	3A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5% UT (>95% dip in UT) for 0.5 cycle 40% UT (60% dip in UT) for 5 cycles 70% UT (30% dip in UT) for 25 cycles <5% UT (>95% dip in UT) for 5 sec	<5% UT (>95% dip in UT) for 0.5 cycle 40% UT (60% dip in UT) for 5 cycles 70% UT (30% dip in UT) for 25 cycles <5% UT (>95% dip in UT) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the DUS 60 requires continued operation during power mains interruptions, it is recommended that the DUS 60 be powered from an uninterruptible power supply or a battery.
NOTE UT is the a.c. mains voltage prior to application of the test level.			

Guidance and manufacture's declaration – electromagnetic immunity – for EQUIPMENT and SYSTEMS that are not LIFE-SUPPORTING

Guidance and manufacture's declaration – electromagnetic immunity			
The DUS 60 is intended for use in the electromagnetic environment specified below. The customer or the user of the DUS 60 should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment -guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	1Vrms	Portable and mobile RF communications equipment should be used no closer to any part of the DUS 60, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = \left[\frac{3.5}{V_1}\right]\sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	1 V/m	$d = \left[\frac{3.5}{E_1}\right]\sqrt{P}$ 80 MHz to 800 MHz $d = \left[\frac{7}{E_1}\right]\sqrt{P}$ 800 MHz to 2.5 GHz Where *P* is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and *d* is the recommended separation distance in metres (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,[a] should be less than the compliance level in each frequency range.[b] Interference may occur in the vicinity of equipment marked with the following symbol: 
NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applies. **NOTE 2:** These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			
[a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the DUS 60 is used exceeds the applicable RF compliance level above, the DUS 60 should be observed to verify normal operation. If abnormal performance is			

observed, additional measures may be necessary, such as reorienting or relocating the DUS 60

[b] Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 1 *V/m*.

Recommended separation distances between portable and mobile RF communication equipment and the EQUIPMENT or SYSTEM- For EQUIPMENT or SYSTEM that are not LIFE-SUPPORTING

Recommended separation distances between portable and mobile RF communications equipment and the DUS 60

The DUS 60 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the DUS 60 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the DUS 60 as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter (W)	Separation distance according to frequency of transmitter (m)		
	150 kHz to 80 MHz $d = \left[\frac{3.5}{V_1}\right]\sqrt{P}$	80 MHz to 800 MHz $d = \left[\frac{3.5}{E_1}\right]\sqrt{P}$	800 MHz to 2.5 GHz $d = \left[\frac{7}{E_1}\right]\sqrt{P}$
0.01	0.35	0.35	0.7
0.1	1.1	1.11	2.21
1	3.5	3.5	7
10	11	11.1	22.1
100	35	35	70

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

Appendix VI: Order List

The following accessories are recommended to be used on the DUS 60.

WARNING

Probes and other accessories used on the DUS 60 must be provided or recommended by EDAN. Otherwise, the device may be damaged.

Part Name	Part Number
Probe C363UA	12.01.116212
Probe L743UA	12.01.116214
Probe L742UA	12.01.116220
Probe L763UA	12.01.116222
Probe C343UA	12.01.116213
Probe C362UA	12.01.116217
Probe C321UA	12.01.116221
Probe C613UA	12.01.116215
Probe E613UA	12.01.116216
Probe E743UA	12.01.116223
Rechargeable Lithium-Ion battery	01.21.064135
Coupling gel	11.57.78001
Freeze footswitch	11.10.102414
Mobile trolley	03.28.328004
Hand carried bag	01.56.465013
Video printer (SONY UP-897MD)	11.18.520146
Video printer (MITSUBISHI P93W)	11.18.52147

U Disk / Netac, U180 (2G)	11.18.052245-10
Cable Holder	01.52.113229
Probe holder	21.51.113150, 01.51.113140
Coupling gel holder	21.51.113131
Screw (M3×12)	11.19.057154

Appendix VII: Glossary

Abbreviated	Description
Obstetrics	
EDC	Estimated Date of Confinement
MA	Menstrual Age
LMP	Last Menstrual Period
BBT	Basal Body Temperature
EFW	Estimated Fetal Weight
GS	Gestational Sac Diameter
CRL	Crown Rump Length
BPD	Biparietal Diameter
HC	Head Circumference
AC	Abdominal Circumference
FL	Femur Length
AFI	Amniotic Fluid Index
TAD	Transverse Abdominal Diameter/Transverse Trunk Diameter
APAD	Antero Posterior Abdominal Diameter
CER	Cerebellum Diameter
FTA	Fetus Trunk cross section Area
HUM	Humerus Length
OFD	Occipital Frontal Diameter
THD	Thorax Diameter
Umb A	Umbilical Artery
MCA	Middle Cerebral Artery
Fetal AO	Fetal Aorta
Desc.AO	Descending Aorta
Placent A	Placent Aorta
Ductus V	Ductus Venosus
FBP	Fetal Biophysical Profile
Cardiology	
LVIDd	Left Ventricle Internal Diameter (end diastolic)
LVIDs	Left Ventricle Internal Diameter (end systolic)
HR	Heart Rate
ESV	End Systolic Volume
SV	Stroke volume
CO	Cardiac Output
EF	Ejection fraction (M mode)
FS	Fractional Shortening
SI	Stroke Index
CI	Cardiac Index

MVCF	Mean Velocity Circumferential Fiber Shortening
BSA	Body Surface Area
AOD	Aortic root Diameter
LAD	Left Atrium Diameter
LAD/AOD	Left Atrium Diameter / Aortic root Diameter
CA	Cardiac cycle apex A
CE	Cardiac cycle apex E
CA/CE	The ratio of CA to CE
EF SLP	Ejection Fraction Slope
ACV	AC Decreasing Velocity
DEV	Deceleration Velocity
DCT	Deceleration Time
MAVO1	Aortic Valve Volume Opened, beginning
MAVO2	Aortic Valve Volume Opened, ending
AA	Aortic Amplitude
LVMW	Left Ventricular Muscle Weight
AVSV	Aortic Valve Stoma Valve flow
QMV	Mitral Valve Flow
LVLd	Left Ventricle Long-axle Diameter (end diastolic)
LVALd	Left Ventricle Area of Long-axle (end diastolic)
LVLs	Left Ventricle Long-axle Diameter (end systolic)
LVALs	Left Ventricle Area of Long-axle (end systolic)
LVET	Left Ventricular Ejection Time
Gynecology	
UT	Uterus
UT-L	Uterus Length
UT-W	Uterus width
UT-H	Uterus Height
Endo	Uterus Endo-membrane Thickness / Endometrium
L. OV-Vol	Left Ovary Volume
L. OV-L	Left Ovary Length
L. OV-W	Left Ovary Width
L. OV-H	Left Ovary Height
R. OV-Vol	Right Ovary Volume
R. OV-L	Right Ovary Length
R. OV-W	Right Ovary Width
R. OV-H	Right Ovary Height
L. FO-L	Left Follicle Length
L. FO-W	Left Follicle Width
R. FO-L	Right Follicle Length
R. FO-W	Right Follicle Width
CX-L	Cervix Length
UT-L/CX-L	Uterus Length / Cervix Length

L UT A	Left Uterus Aorta
R UT A	Right Uterus Aorta
L OV A	Left Ovary Aorta
R OV A	Right Ovary Aorta
Small Parts	
THY	Thyroid Gland
L. THY-V	Left Thyroid Gland Volume
L. THY-L	Left Thyroid Gland Length
L. THY-W	Left Thyroid Gland Width
L. THY-H	Left Thyroid Gland Height
R. THY-V	Right Thyroid Gland Volume
R. THY-L	Right Thyroid Gland Length
R. THY-W	Right Thyroid Gland Width
R. THY-H	Right Thyroid Gland Height
Urology	
RUV	Residual Urine Volume (mL or L)
RUV-L	Residual Urine Length
RUV-W	Residual Urine Width
RUV-H	Residual Urine Height
PV	Prostate Volume (mm3, cm3, or dm3)
PV-L	Prostate Length
PV-W	Prostate Width
PV-H	Prostate Height
SPSA	Serum of Prostate Specific Antigen
PPSA	Predicted Prostate Specific Antigen Density
PSAD	Prostate Specific Antigen Density
Orthopedics	
HIP	Hip joint
Vascular	
CCA	Common Cartid Artery
ICA	Internal Cartid Artery
ECA	External Cartid Artery
Vert A	Vertebral Artery
Others	
TI	Thermal Index
MI	Mechanical Index
TIS	Soft-tissue thermal index
TIB	Bone thermal index
TIC	Cranial-bone thermal index

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