EICKE MEYER MAGIC 3000
Veterinary Ultrasound System

Operating Manual
# Table of contents

## Section

**Content**

1-1

## Chapter 1 General Description

1.1 Purpose of use 

1.2 Features

1.3 Main functions

1.4 Major technical specifications

1.5 Operating conditions

1.6 Packing list

1.7 Optional extras

## Chapter 2 Safety Precautions

2.1 Safety classification

2.2 Safety note

2.3 Symbol and Meaning

2.4 Requirements for environment

2.5 Attentions for operation

2.5.1 Main unit

2.5.2 Probe

2.5.3 Replacement of the fuse

## Chapter 3 Installation

3.1 Struction

3.2 Main unit overall dimensions

3.3 Name of each part

3.4 Control panel

3.5 Installation

3.5.1 Installing the main units

3.5.2 Connecting the probe

3.5.3 Installing the video printer (optional extras)

3.5.4 Installing the foot switch (optional extras)

3.5.5 Connecting the electric power

## Chapter 4 Operation

4-1
4.1 Introduction.................................................................................4-1
4.2 Power ON..................................................................................4-2
4.3 Selection of probe types ...........................................................4-2
4.4 Mode selection..........................................................................4-3
  4.4.1 B mode................................................................................4-3
  4.4.2 B/B mode.............................................................................4-4
  4.4.3 B/M mode.............................................................................4-4
  4.4.4 M mode................................................................................4-4
4.5 Adjustment of image..................................................................4-6
  4.5.1 Contrast and brightness of image..........................................4-6
  4.5.2 Gain control..........................................................................4-6
  4.5.3 Linear averaging....................................................................4-7
  4.5.4 Frame averaging....................................................................4-7
  4.5.5 Selection of gray scale curve...............................................4-8
  4.5.6 Histogram.............................................................................4-8
  4.5.7 Shortcut key for adjust parameters.......................................4-8
4.6 Control of image size and depth..................................................4-9
  4.6.1 Zooming..............................................................................4-9
  4.6.2 Depth change........................................................................4-10
4.7 Focus selection..........................................................................4-10
4.8 Printing the displayed image and text........................................4-11

Chapter 5 Basic measurement..........................................................5-1
5.1 Introduction................................................................................5-1
5.2 Distance measurement..............................................................5-2
5.3 Measurement of circumference and area (tracing method)........5-3
5.4 Measurement of circumference and area (elliptical method).......5-4
5.5 Volume measurement (three-axis method)................................5-5
5.6 Measurement of heart rate........................................................5-6
5.7 Measurement of slope...............................................................5-7
5.8 Measurement of angle...............................................................5-8

Chapter 6 Reproduction measurement for animal gestation age ........6-1
6.1 Introduction..............................................................................6-1
6.2 Measure canine gestation age....................................................6-1
6.3 Measure feline gestation age......................................................6-1

Chapter 7 Input of annotation..........................................................7-1
7.1 Edit and deletion of characters..................................................7-1
7.2 Entry of new patient ID..............................................................7-2
7.3 Comment in image area.............................................................7-2
7.4 Input of body mark....................................................................7-3
Chapter 8 Usage of cine-memory

8.1 Function of cine-memory
8.2 Function of image memory
  8.2.1 Store the images in the system
  8.2.2 Store the images in USB flash memory disk

Chapter 9 Presetting

9.1 Presetting and retrieving of parameters
  9.1.1 Saving the parameters
  9.1.2 Retrieving the parameters
  9.2 Setting the system

Chapter 10 Troubleshooting & maintenance

10.1 System maintenance
  10.1.1 Clearing the system
  10.1.2 Moving the system
  10.1.3 Safety check
  10.2 Troubleshooting

Chapter 11 Warranty

Chapter 2 Safety Precautions

2.1 Safety Classification

- According to the type of protection against electric shock: CLASS I EQUIPMENT
  - CLASS I EQUIPMENT means that it can not only have the basic insulation function, but also be grounded for protection against electric shock. Show as the left symbol.

- According to the degree of protection against electric shock: TYPE-BF EQUIPMENT
  - TYPE-BF EQUIPMENT means that it is the TYPE B equipment with Type F applied parts (connecting different kinds of hanging probe). Show as the left symbol.

- According to the degree of protection against harmful ingress of water:
  - IPX 0 (enclosed EQUIPMENT without protection against ingress of water)
According to the degree of safety of application in the presence of FLAMMABLE ANAESTHETIC MIXTURE WITH AIR or WITH NITROGEN OR or NITROUS OXIDE:

- Equipment not suitable for use in the presence of FLAMMABLE ANAESTHETIC MIXTURE WITH AIR or WITH NITROGEN or NITROUS OXIDE

According to the mode of operation: Continuous operation device

2.2 Safety note

- Please do not put the probe on one same part of the animal for long time, especially the fetus that is growing bones and tissues, so that unnecessary absorption of radiation can be avoided.
- The system should be operated by qualified operator or under the qualified operator’s instructions. Do not let the animal touch the system.
- Choose the specific power cord acknowledged by the manufacture. The system should be plugged into a fixed power socket with protective grounding. Any plugboard is not allowed to be use.
- Any device that is not acknowledged by the manufacture is not allowed to use, which includes the probes and accessories not provided by the manufacture.
- Never open the plastic case or panel when the system is power on. If you need to open it, please let the qualified operator do it after the system is power off.

2.3 Symbol and Meaning

- Note
- Caution
- Warning
- Dangerous voltage
- Protective earth (ground)
2.4 Requirements for environment

- The ultrasound system should be operated, preserved and transported under the following conditions: See Table 2

Table 2

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Operation</th>
<th>Preservation</th>
<th>Transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>5 40</td>
<td>-5 40</td>
<td>-30 55</td>
</tr>
<tr>
<td>Humidity</td>
<td>30% 80% no condensation</td>
<td>Less than 80% no condensation</td>
<td>Less than 95% no condensation</td>
</tr>
<tr>
<td>Atmospheric pressure</td>
<td>86kPa 106kPa</td>
<td>86kPa 106kPa</td>
<td>50kPa 106kPa</td>
</tr>
</tbody>
</table>
**Caution** When moved into a room from outside, the ultrasound system might be still too cold or too warm comparing to the indoor temperature. Because of the temperature difference, water may condense inside the machine. So before turning on the power, the system should be put inside the room for a while to adapt to the environment. If the outside temperature is below 10°C or above 40°C, the system need to be put for half an hour for adapting. And the adapting time need to be prolonged for 1 hour for each additional temperature difference of 2.5°C.

- **Never let the system operate under the following environments**

  1. Environment which is flammable, explosive or with poisonous gas;
  2. Environment might be spilled by water or with mist
  3. Environment with direct sunshine
  4. Environment with strong impact or shaking
  5. Environment with large fluctuation of AC power
  6. Environment with strong electromagnetic field nearby, such as transformer.
  7. Environment with high-frequency radioactive device nearby, such as mobile phone

**Note** The ultrasound system should be used far away from the electricity generator, X-ray machine, ultrasonic atomization machine, ultracision harmonic scalpel, physiotherapy instrument, broadcasting station, TV station, computer and transmission cable to avoid interference to the image.

A working room with air conditioner is preferred.

**2.5 Attentions for operation**

**2.5.1 Main unit**

1. When the system operates, please make sure the fans on the rear panel keeps working (with slight sound). If the fans stop working, the system should be stopped operating. Never cover the window of the fans so that the heat can be radiated.
2. Please wait at least 1 minute to restart the system after it is turned off.
3. If there is any thing abnormal during scanning, please stop scanning at once and turn off the system.
4. Please do not over press the keyboard panel, in case the lifespan of the system will be shortened.
5. After the use of the system, please turn off it and put a dustproof cover on the system.
6. Please regularly turn on the system for check if it is not used for long time.

2.5.2 Probe

1. The probe must be connected or disconnected only when the system is powered off.
2. Do not knock the probe or let the probe fall down to the ground, as it may damage the expensive probe completely.
3. Never heat the probe. If the surface temperature of the probe is below 10°C, please let it get warmed gradually.
4. Never curve or pluck the power cord of the probe.
5. Never touch the probe and its power cord by lubricant, lotion or any other oil liquid.
6. Only the ultrasonic gel without any oil and acknowledged by the manufacture can be used on the front surface of the probe. In order to keep the front surface of the probe being dry, please clean the gel by soft paper or cotton after using the probe. Please note that the rough paper or rough cloth is not allowed to clean the probe as it may shorten the lifespan of the probe. Please use alcoholic cotton to clean the surface of the probe for disinfections everyday.
7. Please put the probe in the probe case when it is not used.
8. Never put the probe or its power cord soaked in any liquid.

2.5.3 Replacement of the fuse

1. Screw off the fuse holder on the rear panel.
2. Take out the burned fuse and replace it with a new one. (Type of fuse: BGXP-20-1.6). Screw on the cover of the fuse holder tightly.

Chapter 3 Installation

3.1 Structure
Fig. 3-1 The outlook of the system

3.2 Main unit overall dimensions

930mm (Depth) × 400mm Width × 1280mm Height

3.3 Name of each part
3.4 Control panel

![Control panel diagram](image-url)

Fig 3 6 Control panel
Introduction of image control keys

Press NEW ANIMAL key to enter into status of inputting new animal information.

Press ID (animal’s name and ID number) key to input animal’s name and ID number in the position that the curse “_” appears.

Press POSTURE body mark key to select body mark from present body marks graph.

Press COMMENT key to input comment in any display area of the system.

Press MEMORY STORE/RECALL key to open the main menu of STORE/RECALL 1 STORE 2. RECALL. Move the cursor “_” for select STORE or RECALL function.

Press CINE cine-memory key to enter into the manual playback operating state. By moving the trackball, stored images can be observed one by one. Press CINE key again to exit from the manual playback state.

Press OB obstetric measurement key to open the obstetric measurement menu and enter into the obstetric measurement state.

Press MEASUREMENT key to open the measurement menu and enter into the basic measurement state.

Press MENU main menu key to open the main menu, then select your desired function such as setting the parameters, automatic playback of cine-memory, image processing, puncture guide etc.

Press PRINT key to print the screen image by video printer.
Press SET key to start an operation.

Press END key to end or exit an operation.

Press ZOOM key to enter into image zoom adjustment state.

Press FOCUS key to enter into the focus selection state.

Press SCROLL key to enter into the image vertically moving state.

Press PROBE key to shift the probe among the three probes.

Press FREQ key to select the operating frequency for the present probe.

TRACKBALL is used for selecting and positioning when it is cooperated to use with other keys. When the system is under different state, the trackball will have different function; normally it is used for positioning the cursor.

Up/down reversing key is used for reversing image in B mode from up to down or from down to up;

Left/right reversing key is used for reversing image in B mode from left to right or from right to left.

The scanning direction arrow in the screen can mark the direction of left/right or up/down reversing.

There are four MODE mode shift keys: Press B key to display single B-mode image; Press M key to display single M-mode image; Press B/B key to display B/B mode image; Press B/M key to display one B-mode image and one M-mode image.
Press FREEZE key to freeze the image and stop the collecting image; Press FREEZE key again to recover the image and continue collecting images.

GAIN knob is used for adjusting gain of obtained image.

Multi-function knob is used for adjusting page scroll, focus selection and zoom setting when combined to use with SCROLL, ZOOM and FOCUS key;

When any of Scan Density, Scan Width, Scan Center, Frame Average, Dynamic Range, Edge Enhance, Gray Map Biopsy, Posture status is selected, the multi-function knob can be used for adjust the corresponding parameter value and body mark arrow orientation.

STC slide control can be used for adjusting depth gain compensation curve.

Press CAPS LOCK key to shift the capital and small English letters.

Press BACKSPACE key to delete the single character on the left of the cursor, when inputting characters or numbers.

CTRL key is used as control key when combining with other key.

CLEAR key is used for clearing the content in the area.

Press RETURN key to move the cursor to next line.

Press SPACE key to insert a space between two characters.
3.5 Installation

3.5.1 Installing the main units

1. Open the packing box of main unit, take out the main unit. Place the main unit steadily on a flat place. Pay attention to the mark outside the packing box and keep the main unit in an upright direction.

2. Open the monitor box and take out of the monitor. Take out of a round seal and put it on the axile hole on the monitor base of the main unit. Then aim at the axile hole and slightly insert the monitor into it. Take out of the long bolt from the monitor box, and screw tightly into the back screw hole of the monitor. Then the monitor is fixed.

Don’t forget to put the seal on the axil hole before insert the monitor!

3. Take out a wire hanger and fix it into a threaded hole at the right side of main unit plate.

4. Insert the monitor cable into the socket- DC 14V 1A OUT at the rear panel of the main unit. Then connect the video cable on the rear panel of the monitor to the VGA OUT (Normal port) on the rear panel of main unit. (see Fig 3-4)

Note Please keep at least 20 to 30 cm space away from the back of the system to ensure well ventilation. Otherwise with the increasing of the temperature inside the unit, malfunction may be caused easily.

3.5.2 Connecting the probe

1. Put the probe cable through the concave part of the wire hanger, and lay the probe in the probe holder. As the probe cable is hanging on the wire hanger, it can prevent the probe falling down to the ground.

2. In the condition that the main unit is powered off, vertically insert the plug of probe cord to the probe connectors socket of the main unit (see Fig.3-3), and then clockwise turn the handle key for 90° to the “Tight” position.

3. When disconnecting the probe, firstly anti-clockwise turn the handle key for 90° to the “Loose” position, then slightly take the plug out of the socket. Do not push in or pull out the plug by force.
Probe connecting is shown as below:

![Connect and Disconnect Diagram]

**Caution**  Probe should be connected or disconnected only in the power-off state.

**Warning**  Before connecting the probe, careful inspection to the probe, cable and connectors should be taken to check whether there is anything abnormal, such as cracks, shelling off. Once use any abnormal probe, there is possibility of electricity shock.

3.5.3 Installing the video printer (optional extras)

1. Put the video printer steadily on the upper plate of the main unit, and turn the side that print out the paper to left.

2. Connect one terminal of the video cable to the VIDEO IN socket at the rear panel of the video printer, and connect the other terminal of the video cable to the VIDEO OUT socket at the rear panel of the system. (see Fig.3 4)

3. If the printer has the remote control cable, connect one terminal of the printer control cord to the REMOTE socket at the rear panel of the video printer, and connect the other terminal of the printer control cord to the REMOTE socket at the rear panel of the system. (see Fig.3 4)
Caution When use the remote control cable, please turn on the printer before the ultrasound system is turned on.

Warning It is strictly prohibited to use any power cable other than the ones provided by the manufacture. Otherwise there is possibility of electricity shock.

3.5.4 Installing the foot switch (optional extras)

Connect the cable plug of the Footswitch to the FOOT SW socket at the rear panel of the system. (see Fig.3 4)

Caution When disconnecting the cable plug, please hold the topside plastic cover of the plug to pull the plug out. Never pull the cable directly as it may make the cable shelled off.

3.5.5 Connecting the electric power

1. After making certain that the AC power in hospital is in normal state, connect one terminal of the power cord to the AC 220V 1A IN socket at the rear panel of the system(see Fig.3 4), and connect the other terminal to the AC power socket in hospital.

2. Turn on the power switch (see Fig.3 4) at the upper left part of the main unit, and the system will start working normally.

Caution The AC power plug of the system is three-pin grounded plug, which cannot be replaced or transformed by two-pin plug that is not grounded. The ultrasound system must be connected to the isolated electric power or devices, otherwise it may cause the leaked current exceed the safe lever.

Warning: The ultrasound system must use the power cord provided by the manufacturer, and the power cord cannot be replaced freely. Meanwhile reliable grounded protection must be assured.
Chapter 4 Operation

4.1 Introduction

Main content of this chapter

- Process of turning power on
- Select or change the present probe
- Select display mode
- Adjust the image contrast and brightness
- Adjust the image gain
- Adjust the linear averaging, image averaging and gray scale curve
- Zooming and depth change
- Select focus
- Printing the displayed image and text

Process of scanning the animal by this system

1. Let the animal lie down, and smear the gel on the emitting surface of the probe.

2. Scan the animal.

3. Control and adjust the image to get the real image in the monitor.

4. Press [FREEZE] key to stop collecting image, then begin to do measurement.

5. Look up “Basic measurement” and “Obstetrical measurement” for details of measurement.

6. Add annotation to the image if necessary.

7. Print image and report page.
4.2 Power ON

**Preparation for turning on the power**
- Check all electric power and connected cable, and ensure there is no abnormal phenomenon such as scratch or cracks.
- Check the probe and its connection part, and ensure there is no abnormal phenomenon such as scratch or shell off.

**Turn on the power**
- Connect one terminal of the power cord to the AC 220V 1A IN socket at the rear panel of the system, and connect the other terminal to the AC power socket.
- Please make sure that the AC power is in normal state-220V/50Hz.
- After turning on the power switch of the system, the Power On interface and the initialized information will be displayed, and then the menu and image will be displayed. Please check whether the system is starting normally.
- Check the image and control panel to ensure there is nothing abnormal.
- When there is nothing abnormal, smear the gel on the emitting surface of the probe and prepare to scan the animal.

**Note** To ensure a long-time stable and reliable operation, the system cannot be switched on immediately after being powered off. Please kindly wait for at least 1 minute before restarting it.

**Warning** If there is anything abnormal appear, please stop operating and switch off the system immediately. Then refer to Chapter 11 of this manual for troubleshooting or contact with your distributor for help.

4.3 Selection of probe types
- EICKEMEYER MAGIC3000 has triple connectors, which allow simultaneously connection of 3 probes.
- After the system is switched on, it will automatically search for the probe and display the current probe type and probe frequency on the upper part of the screen. (see Fig 4 1) If no probe is detected, a corresponding message will be displayed on the screen and all the
parameters will be set as default values (corresponding to the parameters of the 5.0 MHz micro-convex).

- In the real-time state, press [PROBE] key to choose the desired probe and the result will be displayed on the upper part of the screen.
- In the real-time state, press [FREQ] key to choose the work frequency for the current probe (Low frequencies are suitable for fatter animals and high frequencies for thinner animals) and the result will be displayed on the upper part of the screen.

### 4.4 Mode selection

EICKEMEYER MAGIC3000 has four scanning modes - B/B B/M and M. In the real-time state, press mode shift key to select mode.

Taking convex array probe for example, a description of all the scanning modes is given below.

#### 4.4.1 B mode

- B mode is the basic operating mode for two-dimensional scanning and diagnosis. Press [B] mode shift key to display single B mode image.
- Press [FREEZE] key to freeze the image; press [FREEZE] key again, the current image will be activated and come back to the real-time state.
- In the real-time state, press [B/B] or [B/M] or [M] mode shift key, and the system will exit from B mode to the pressed mode.

![Image of B mode display](image.png)
4.4.2 B/B mode

- Press \( \text{B/B} \) mode shift key to display double B mode images side by side. One image is in real-time state; the other is in frozen state. The real-time image is marked by “▼”.
- Press \( \text{B/B} \) mode shift key in B/B mode, the original active image is frozen and the other image is activated.
- Press \( \text{FREEZE} \) key to freeze the image; press \( \text{FREEZE} \) key again, the current image will be activated and come back to the real-time state.
- In the real-time state, press \( \text{B} \) or \( \text{B/M} \) or \( \text{M} \) mode shift key, and the system will exit from B/B mode to the pressed mode.
- If there is a sound-“BEE…” produced from the system during operation, it means that the user has done a wrong or void operation.

![Scanning direction and Mark of present image](image)

Fig 4 2 Display of B/B mode image

4.4.3 B/M mode

- Press \( \text{B/M} \) mode shift key to display both B-mode image and B-mode image simultaneously. And a dotted line- sampling line will appear in the B-mode image area; move the sampling line by trackball to an obvious area of heartbeat in the B mode image area, a corresponding M-mode image is presented in the M–mode image area.
- In the B-mode image, press \( \text{FREEZE} \) key to freeze the image; press \( \text{FREEZE} \) key again, the frozen image will be activated.
- The system has four scanning speeds: 2s 4s 6s 8s. Press \( \text{B/M} \) mode shift key in B/M mode to select the desired scanning speed. And the present scanning speed is displayed in
the screen. (See Fig 4-3)

- In the real-time state, press B or B/B or M mode shift key, and the system will exit from B/M mode to the pressed mode.

**4.4.4 M mode**

- Press M mode shift key to display single M mode image. M mode image reflects movement of tissues at the points on the sampling line. The M mode image display varies with time, so it is suitable for heart examination.
- In the M mode, press M mode shift key to select scanning speed.
- In the real-time state, press B or B/B or B/M mode shift key, and the system will exit from M mode to the pressed mode.
4.5 Adjustment of image

4.5.1 Contrast and brightness of image

Contrast control

The black-and-white contrast can be adjusted by pressing the contrast button on the monitor. Normally sharp contrast will enhance the edge of image and help to make the image’s profile more definite, and lower contrast will be good for the analysis of the targeted object’s property, as it enhances the gradation of the image.

Brightness control

The brightness can be adjusted by pressing the brightness button on the monitor. Brightness should be adjusted in association with the contrast. The contrast will decrease if the brightness is set too high, while the gradation will decrease if the brightness is set too low.

Note

Normally, it’s suggested to set the contrast and brightness to the extent that the lower gray scale area at the left portion of screen is well displayed. In that setting, a clear image with good gradation will be displayed.

4.5.2 Gain control

In the real-time state, total gain and STC curve can be adjusted through directly adjusting the corresponding knob and slide control in the keyboard.

- **Total gain**

  Turn the GAIN knob to control the total gain of the image until a satisfactory image is obtained. The adjusting range is 0 – 100db. The value of adjusted total gain will be displayed directly at the upper part of the screen, such as G 69.( See Fig 4 1)

- **STC curve**

  1. STC means the gain compensation curve according to the depth. In the real-time state of B mode, move the STC control in the upper right part of the keyboard to adjust the corresponding gain compensation curve according to depth.
2. When adjusting STC, the STC curve will automatically appear in the left part of the screen and will change according to the moving of STC slide control.

3. The display status of STC curve can be set according to the user’s preference. It can be either keep displaying in the screen or disappear automatically after it displayed for a short while.

4.5.3 Linear averaging

- Linear averaging is to control smoothness of image and decrease image noise by taking percentage of previous and present picture-elements (pixel) at the same specified beam.
- Linear averaging is merely applied in B- or B/B- mode operation. The percentage displayed means the related value of the previous pixel and the current pixel.
- Operate as follows:

In the frozen state, press **MENU** key to display the main menu at the lower area of the screen:


Turn the trackball to move the cursor to “2. IMAGE” and press **SET** key to select “2. IMAGE” in the main menu then a submenu appears:

1. LR 2. FR 3. IP 4. HISTOGRAM 5. EXIT

Use the trackball to move the cursor to the option-1. LR and press **SET** key to change the parameter value in the sequence of “0%, 25%, 50%, 75%”.

After the adjustment is finished, press **END** key to exit and the main menu disappears.

**Note** Linear average 0% or 25% is recommended for use.
4.5.4 Frame averaging

- Frame averaging is to control smoothness of image by taking percentage of previous and present frame images specified at the screen. It can be used for decreasing noise and light stains.
- Frame averaging is merely applied in B- or B/B- mode operation. The percentage displayed means the related value of the previous frame image and the current image.
- Take “4.5.3 Linear averaging” as reference to its operation that is to press MENU key in the frozen state, and select the “2.FR” in “2.IMAGE”. Press SET key to change the parameter value. After the adjustment is finished, press END key to exit and the main menu disappears.

4.5.5 Selection of gray scale curve

- Image processing is to select different gray scale curve for enhancing or lessening some gray scales so as to get more definite image for observation and analysis.
- The system has four gray scale curves, which can be displayed in the menu option “3. IP” in “2.IMAGE”.
- Take “4.5.3 Linear averaging” as reference to its operation that is to press MENU key in the frozen state, and select the “3. IP” in “2.IMAGE”. Press SET key to change the parameter value. After the adjustment is finished, press END key to exit and the main menu disappears.
- Different IP value for different function as follows:
  - IP: 0 represents selection of linear curves, which won’t intensify structure of image.
  - IP: 1 represents intensification of brightness of image with high gray scale. The image becomes gentle and surrounding tissue is intensified. (Used for diagnosis of soft tissue)
  - IP: 2 means that amplitude of intensifying brightness of image with high gray scale is further increased relative to curve 1 (Used for diagnosis of soft tissue).
  - IP: 3 means that middle-bright gray scales are intensified to get a higher contrast. As a result a clearer image is obtained for diagnosis of structure with low echoes.
4.5.6 Histogram

- Histogram can provide statistic information of the distribution of gray for the doctor’s reference.
- Histogram Measurement can be performed by pressing [MENU] key and choosing “4.HISTOGRAM” in “2.IMAGE” (See the detail menu in 4.5.3.)
- Then a square frame will appear in the center of the image. Move this square frame to the center of the area that need to be measured, and press [SET] key to locate its position.
- Move the trackball or arrow keys to change the square frame to a suitable size. Press [SET] key to display the measurement result at the right of the screen. (The horizontal coordinate represents gray scale; the vertical coordinate represents the percentage of the number on the scale to the total number of data.

4.5.7 Shortcut key for adjust parameters

At **real time status**, press 4 key, and the OTHER KEYS is lit. At this moment, turn the multi-function knob to adjust Scan Density;

At **real time status**, press 1 key, and the OTHER KEYS is lit. At this moment, turn the multi-function knob to adjust Scan Width;

At **real time status**, press 2 key, and the OTHER KEYS is lit. At this moment, turn the multi-function knob to adjust Scan Center;

At **real time status**, press 3 key, and the OTHER KEYS is lit. At this moment, turn the multi-function knob to adjust Frame Average;

At **real time status**, press 4 key, and the OTHER KEYS is lit. At this moment, turn the multi-function knob to adjust Dynamic Range;

At **real time status**, press 5 key, and the OTHER KEYS is lit. At this moment, turn the multi-function knob to adjust Edge Enhancement;

At **real time status**, press 6 key, and the OTHER KEYS is lit. At this moment, turn the multi-function knob to adjust Gray Map;

At **real time status**, press 7 key, and the OTHER KEYS is lit. At this moment, turn the multi-function knob to adjust Biopsy.

At **body mark input status**, OTHER KEYS is lit. At this moment, turn the multi-function knob to adjust the arrow direction of body mark..
Note: When adjust the above parameters, the adjusted parameter value will be displayed at the same time at the upper right part of the screen.

4.6 Control of image size and depth

4.6.1 Zooming
By using ZOOM key and multi-function knob, the image zooming function can be performed.

In the convex array display mode, the image has 8 grades of magnification:

0.8  0.9  1.0  1.1  1.2  1.3  1.4  1.5.

In the linear array display mode, the image has 4 grades of magnification: 0.8  1.0  1.2  1.5.

The image zoom operation is as follows:
1. In the real-time state, press ZOOM key to enter into image zoom status, and the ZOOM key will be lighted.
2. Turn the multi-function knob to zoom in or zoom out the image grade by grade.
3. Press ZOOM key again to exit the image zoom status.

4.6.2 Depth change
The image depth change function can be performed by using SCROLL key and multi-function knob.

Press SCROLL key to move the whole image vertically, and image in different depth can be obtained.
The image depth change operation is as follows:

1. In the real-time state, press **SCROLL** key to enter into image depth change status, and the **SCROLL** key will be lighted.
2. Turn the multi-function knob to move the whole image vertically.
3. Press **SCROLL** key again to exit the image depth change status.

### 4.7 Focus selection

The focus selection function can be performed by using **FOCUS** key and multi-function knob.

- By properly adjusting focus a clear image can be displayed in a certain target area during real-time image display of any mode.
- Focus can be selected among several fixed combinations: $1 2 3 4 12 23 34 123 234 1234$
- To increase the visual effect, the focus will be displayed by the symbol '<' at the left of the vertical scale in the screen, and the displayed focus position is corresponding to the real focus position.

The operation of image focus selection is as follows:

1. In the real-time state, press **FOCUS** key to enter into image focus selection status, and the **FOCUS** key will be lighted.
2. Turn the multi-function knob to select the present desired focus.
3. Press **FOCUS** key again to exit the image focus selection status.

### 4.8 Printing the displayed image and text

The VIDEO OUT at the rear panel is used for connecting video printer. See 3.5.3 Installing the video printer for details.

Press **PRINT** key to print valuable images in the screen.
Chapter 5 Basic measurement

5.1 Introduction

Main content of this chapter

- Measurement of distance
- Measurement of circumference and area
- Measurement of volume
- Measurement of heart rate

Note In the B-mode the measurement of distance, area and circumference can be operated, while in the M-mode the measurement of distance and heart rate can be operated.

The measurement result is displayed at the right part of the screen. For one image, 4 distance results, 2 groups of area and circumference results and 1 volume result is the maximum to be displayed simultaneously.
5.2 Distance measurement

Typically distance can be measured in B-mode; while in M-mode distance can also be measured.

The measurement operation is as follows:

1. Press **FREEZE** key to freeze the image.

2. Press **MEASUREMENT** key to open the measurement menu:
   
   1. DISTANCE  
   2. TRACE  
   3. ELLIPSE  
   4. VOLUME  
   5. EXIT

   At the same time, a square cursor appears for selecting the optional menu.

3. Turn the trackball to move the cursor to “1.DISTANCE”, and press **SET** key to select it, then a corresponding marker “+” appears in the image area.

4. Use the trackball or mark-moving keys to move the mark “+” to the measurement start point.

5. Press the **SET** key to fix the start point,

6. Turn the trackball or use mark-moving keys to move the second appeared marker “+”,

7. Press **SET** key to fix the end point, and the measurement result will be displayed in measurement result area. Repeat the above steps to make more measurements, and 4 distance results is the maximum that can be displayed simultaneously in the screen.
Exit the measurement

1. Press **END** key to exit from the measurement state, and the measurement result is recorded.

2. Press **CLEAR** to exit from the measurement state, and the measurement result is cleared.

3. Press **FREEZE** key to exit from the measurement state, and the image will enter the real-time state with the measurement result cleared.
5.3 Measurement of circumference and area (tracing method)

Tracing method is used for measuring the circumference and area of body organ.

The measurement operation is as follows:

1. Press **FREEZE** key to freeze the image.
2. Press **MEASUREMENT** key to open the measurement menu:
   - 1. DISTANCE
   - 2. TRACE
   - 3. ELLIPSE
   - 4. VOLUME
   - 5. EXIT.
3. At the same time, a square cursor appears for selecting the optional menu.
4. Turn the trackball to move the cursor to “2. TRACE”, and press **SET** key to select it, then a corresponding marker “+” appears in the image area.
5. Use the trackball or mark-moving keys to move the mark “+” to the measurement start point.
6. Press the **SET** key to fix the start point.
7. Turn the trackball or use mark-moving keys to move to the second appeared marker “+” to the end point with a trace drawing in the screen.
8. Press **SET** key to fix the end point key when the trace is looped. The area and circumference result are displayed in the measurement result area. Repeat the above steps to make more measurements, and 2 groups of measurement results is the maximum that can be displayed simultaneously in the screen. Each group includes one circumference result and one area result.
Exit the measurement

1. Press [END] key to exit from the measurement state, and the measurement result is recorded.
2. Press [CLEAR] to exit from the measurement state, and the measurement result is cleared.
3. Press [FREEZE] key to exit from the measurement state and the image will enter the real-time state with the measurement result cleared.

5.4 Measurement of circumference and area (elliptical method)

Elliptical method is used for measuring the circumference and area of body organ.
The measurement operation is as follows:

Press **FREEZE** key to freeze the image.

Press **MEASUREMENT** key to open the measurement menu:

1. DISTANCE 2. TRACE 3. ELLIPSE 4. VOLUME 5. EXIT.

At the same time, a square cursor appears for selecting the optional menu.

Turn the trackball to move the cursor to “3. ELLIPSE”, and press **SET** key to select it, then a corresponding marker “+” appears in the image area.

Use the trackball or mark-moving keys [↑] , [↓] , [←] , [→] to move the mark “+” to the measurement start point.

Press the **SET** key to fix the start point.

Turn the trackball or use the mark-moving keys to move the second appeared marker “+” to draw an elliptical trace in the screen until the long axis of ellipse is fixed. Press [N] key to increase the length of the short axis of ellipse, or press [M] key to decrease the length of the short axis of ellipse.

Press **SET** key to fix the ellipse after its long axis and short axis is fixed. The area and circumference results are displayed in the measurement result area.

Repeat the above steps to make more measurements, and 2 groups of measurement results is the maximum that can be displayed simultaneously in the screen. Each group includes one circumference result and one area result.

**Exit the measurement**

1. Press **END** key to exit from the measurement state, and the measurement result is recorded.
2. Press **CLEAR** to exit from the measurement state, and the measurement result is cleared.
3. Press **FREEZE** key to exit from the measurement state, and the image will enter the real-time state with the measurement result cleared.
5.5 Volume measurement (three-axis method)

Volume can be calculated through measuring three distances.

The measurement operation is as follows:

1. Press the [FREEZE] key to freeze the first longitudinal section image.

2. Press the [MEASUREMENT] key to open the measurement menu:

   1. DISTANCE   2. TRACE   3. ELLIPSE   4. VOLUME   5. EXIT.

   At the same time, a square cursor appears for selecting the optional menu.

3. Turn the trackball to move the cursor to “4. VOLUME”, and press the [SET] key to select it. A junior menu will appear: 1. Normal, 2. Bladder, 3. Thyroid. Choose one, then a corresponding marker “+” appears in the image area.

4. Use the trackball or mark-moving keys to move the mark “+” to the measurement start point.

5. Press the [SET] key to fix the start point.

6. Turn the trackball or use the mark-moving keys to move the second appeared marker “+” to the measurement end point.

7. Press the [SET] key to fix the end point, and the first distance value (D1: diameter from top to bottom) will be displayed in the measurement result area.

8. Repeat the above steps to measure the second distance value (D2: diameter from front to back).

9. Acquire the second image (cross section) and repeat the above steps to measure the third distance value (D3: diameter from left to right).

10. When the three distance values are obtained, the volume value will appear in the
measurement result area at the right portion of the image.

- To measure more volume values, just repeat the above steps. Please note that each time only one volume value can be displayed in the screen.

**Exit the measurement**

1. Press END key to exit from the measurement state, and the measurement result is recorded
2. Press CLEAR to exit from the measurement state, and the measurement result is cleared.
3. Press FREEZE key to exit from the measurement state, and the image will enter the real-time state with the measurement result cleared.

**Additional explanation**

- When use three-axis method to measure the volume, three distances (width, depth, length) need to be measured. The system will calculate the volume value according to the following calculating formula: (elliptical approximation)

  There are three volume calculating formula available as follows:

1. NORMAL: Volume=$(distance1 \times distance2 \times distance3 \times \pi)/6000000$
2. Bladder: Volume=$(distance1 \times distance2 \times distance3 \times 0.5233)/1000$
3. Thyroid: Volume=$(distance1 \times distance2 \times distance3 \times 0.2083)/1000$

- The volume unit is: cm³.

**Caution** To perform the volume calculation function, one logitudinal section image and one cross section image need to be measured. A deviation may be produced between the calculated result and the real volume value as the system takes ellipse to simulate human’s organ.
5.6 Measurement of heart rate

- In M mode heart rate can be measured.
- Heart rate is the number of heartbeat per minute. To make sure a correct measurement, please locate both the start point and the end point at the same status of the heart circulation, for example, both at the peak of one heart circulation, or both at the trough of one heart circulation, so that the most accurate measurement value can be obtained.

The measurement operation is as follows:

1. Press [FREEZE] key to freeze the heart image in M mode, then press [MEASUREMENT] key to open the measurement menu.
2. Turn the trackball or press mark-moving keys $\uparrow$, $\downarrow$, $\leftarrow$, $\rightarrow$ to move the cursor to “H-RATE”, then press [SET] key to select it.
3. To measure the heart rate is to measure the distance between the start point and the end point at the same status of one heart circulation. Please take “5.2 Distance measurement” as reference for the measurement operation.
4. The result of heart rate measurement is displayed in the measurement result area. When the distance between the start point and the end point is two heart cycles, the actual heart rate should be the displayed rate value multiplied by 2, and the rest may be deduced by analogy.

Repeat the above steps to measure the next heart rate. For each time 4 heart rate values are the maximum to be displayed simultaneously in the screen.

Exit the measurement

1. Press [END] key to exit from the measurement state and the measurement result is recorded
2. Press [CLEAR] key to exit from the measurement state, and the measurement result is cleared.
3. Press [FREEZE] key to exit from the measurement state, and the image will enter the real-time state with the measurement result cleared.
5.7 Measurement of slope

- In M mode slope can be measured

The measurement operation is as follows:

1. Press **FREEZE** key to freeze the image in M mode, then press **MEASUREMENT** key to open the measurement menu.
2. Turn the trackball or press mark-moving keys ▲, △, ▼, ◄ to move the cursor to “SLOPE”, then press **SET** key to select it.
3. Draw a sloping line according to your need just as measure a distance;
4. Repeat the above steps to measure the next slope.

Exit the measurement

1. Press **END** key to exit from the measurement state and the measurement result is recorded
2. Press **CLEAR** key to exit from the measurement state, and the measurement result is cleared.
3. Press **FREEZE** key to exit from the measurement state, and the image will enter the real-time state with the measurement result cleared.

5.8 Measurement of angle

- In B mode angle can be measured.

The measurement operation is as follows:

1. Press **FREEZE** key to freeze the image in B mode, then press **MEASUREMENT** key to open the measurement menu;
2. Turn the trackball or press mark-moving keys ▲, △, ▼, ◄ to move the cursor to “ANGLE”, then press **SET** key to select it;
3. Draw one line of the angle to be measured just as measuring distance;
4. Draw the other line of the angle to be measured just as measuring distance; then the angle result will be displayed on the screen;
5. Repeat the above steps to measure the next angle.
Exit the measurement

1. Press [END] key to exit from the measurement state and the measurement result is recorded.
2. Press [CLEAR] key to exit from the measurement state, and the measurement result is cleared.
3. Press [FREEZE] key to exit from the measurement state, and the image will enter the real-time state with the measurement result cleared.
Chapter 6  Reproduction measurement for animal gestation age and EDD

The system can do reproduction measurement for canine and feline.

Operating steps are as blow:
- Select B- or B/B-mode operating state;
- After scanning with probe, press the FREEZE key to freeze the displayed image;
- Press the key to open the animal menu to select desired animal species:
  - CAN ………………… Canine
  - FEL ……………..…… Feline

6.1 Measure canine gestation age and EDD

The system can measure canine GS, CRL, HD, BD and automatically calculate canine gestation age and EDD according to measurement result.

Operating steps are as blow:
- After enter into animal menu, press the direction arrow key mark-moving keys × , to move the cursor to “CAN”, then press SET key to select it;
- Then a secondary menu will appear: 1. GS  2. CRL  3. HD  4. BD
Select one and Press SET to open the reproduction measurement function, and the measurement items will be displayed on the right side of the screen as below:
  - GS……………………..GS-(Name of measurement item)
  - .. W.. D …………… W for week and D for day;
  - EDD:…………………. Expected date of delivery
  - ../.. ……………….Month/ date

Select other measurement item;
- Measure the item just as measuring distance or measuring area by Ellipse method.
- The result will be displayed at the right portion of the screen.
- Press CRL key to clear current measurement result, and can do new measurement;
- Press END key to quit.
6.5 Measure feline gestation age
The system can measure feline HD, BD and automatically calculate feline gestation age and EDD according to measurement result.

Operating steps are as blow:

After enter into animal menu, press the direction arrow key mark-moving keys ↘, ↗, ↘, ↗ to move the cursor to “FEL”, then press SET key to select it;
Then a secondary menu will appear: 1. HD 2. BD
Select one and press SET to open the reproduction measurement function, and the measurement items will be displayed on the right side of the screen as below:

HD……………………..HD-(Name of measurement item)
.. W.. D …………. W for week and D for day;
EDD:…………………. Expected date of delivery
../.. …….Month/ date

Select other measurement item;
Measure the item just as measuring distance or measuring area by Ellipse method. The result will be displayed at the right portion of the screen.
Press CRL key to clear current measurement result, and can do new measurement;
Press END key to quit.
Chapter 7 Input of annotation

7.1 Edit and deletion of characters

- The upper left part of the control panel is mainly used for entering characters for annotation. Press the character keys to input various information, including animal name, animal’s ID No., annotation, body mark etc.

- Function keys for editing characters:
  1. Press SHIFT key to shift small English letter and the symbol at the upper part of the character key.
  2. Press CAPS LOCK key to shift the capital and small English letters.
  3. When having entered a wrong character, press BACKSPACE key to delete the left character beside the cursor.
  4. Press CLEAR key to clear all information inputted.

- See the characters input area as follows:

   ![Character Input Area]

Fig 7 1 Annotation

Note Image annotation function can be performed in image frozen state. The annotation content may be cleared by any operation as changing mode, defreezing and moving the image.
7.2 Entry of new animal ID

In the image frozen status, new animal ID can be inputted. For animal name, up to 16 characters can be inputted, and for animal ID No., up to 10 characters can be inputted.

The operation of inputting new animal information is as follows:

Press [NEW ANIMAL] key to clear all of the previous animal’s examination information, and start a new animal examination.

Press [ID] key to input the animal name and animal ID No., and the cursor will automatically appear in the animal name column at the upper right part of the screen. Press [RETURN] key to shift the cursor to animal ID No. column.

By turning the trackball, the cursor can also be quickly moved to the position that need to input character in the animal name column or ID column.

After the characters are inputted, press [END] key or [RETURN] key or [ID] key to return to the scanning operation mode.

7.3 Comment in image area

The operation of writing comment in image area is as follows:

Press [COMMENT] key and the cursor “_” will appear at the upper left part of the image area.

Turn the trackball to move the cursor to the position that need to input comment, and then write characters or measurement result as inputting animal ID.

After the comment is inputted, press [END] key or press [COMMENT] key again to return to the scanning operation mode.

Caution  Inputting the comment in the image area need to be done in the image frozen state.
7.4 Input of body mark

- There are 15 kinds of animal body marks to be selected.

- The operation of inputting body mark is as follows:

1. Press [POSTURE] key and 35 kind of body marks will appear in the screen.

2. Turn the trackball to move the cursor to desired body mark.

3. Press [SET] key, and the selected body mark will be moved to the lower left part of the screen, meanwhile other body marks will disappear.

4. Use the trackball to move probe position arrow to a suitable position.

5. Use the multi-function knob to adjust the probe direction, at the same time the ROTATION indicator will be lighted.

6. Press [SET] key to confirm the above operation.

- Caution: Press [END] key to exit without any modification being saved. Normally the body mark will be displayed at the lower left part of the image.
Chapter 8 Usage of cine-memory

8.1 Function of cine-memory

- **EICKEMEYER MAGIC3000** can provide 64 frames cine-memory.
- In the real time state, images in B-mode can be stored in the cine-memory at the unit of frame in time sequence. If the system can provide 16 frames of images in one second, the capacity of cine-memory would be 4 second.
- Cine-memory is very helpful for capturing valuable image that might disappear instantaneously. It can store 64 frames of previous images of the frozen image. Users can turn the trackball to search valuable image or let the system back-play all stored images automatically.
- The displayed interface of using cine-memory is as follows:

![Frame No. in memory](image)

Fig 8 1 Display of frame No. in the memory
The operation is as follows:

1. **Manual playback**

   In real-time status, press **CINE** key to start saving images in cine memory.

   Press **FREEZE** key to freeze the image;

   Press **CINE** key, and the system will enter into manual playback state;

   Turn the trackball to observe the stored image one by one.

   Press **END** key to exit from manual playback status and return to frozen status.

2. **Automatic reproduction**

   In real-time status, press **CINE** key to start saving images in cine memory.

   Press **FREEZE** key to freeze the image;

   Press **MENU** key to open the main menu:


   At the same time, a square cursor appears for selecting the optional menu;

   Use the trackball to move the cursor to “1.CINE-A”;

   Press **SET** key select the menu option-“1.CINE-A”, and the system can back play the stored images automatically;
Press **END** key to stop back playing and return to the frozen state.

### Caution

1. When the **FREEZE** key is pressed, the system will stop collecting and importing images.
2. Cine-memory can store up to 64 frames of continuous images circularly. When the 64th image is stored, the system will continue to store new images and cover the old images from the 1st old image.

### 8.2 Function of image memory

#### 8.2.1 Store the images in the system

- By using the function of image memory, users can store 8 permanent images additionally.
- These images are stored in the FLASH memory and will not be lost even when the system is power off. So the doctor can save some valuable images in the system for references in the future.

The operation is as follows:

1. Store the image permanently

   - Press **FREEZE** key to freeze the image;
   - Press **MEMORY** key to open the main menu of memory
     - 1 LOCAL; 2 USB; 3 EXIT
   - Move the cursor or direction key and press **SET** key to select menu option
     - “1.LOCAL” and then the submenu will appear as
     - “1.STORE; 2.RECALL; 3.EXIT”
   - Move the cursor or direction key and press **SET** key to select the menu option
     - “1 STORE” and begin to store the image. Then input the desired frame No. by entering number key 0~9 according to the note displayed in the screen. Press **SET** key again to confirm storing the image.
Note

- When the SET key is pressed, the following message will appear in the screen:
  
The number of memory: ____
  
If Cancel “Press End”

Then input the desired frame No. of the FLASH memory, and the system will store the present image into the appointed position in the FLASH memory. If need to cancel this operation, just press END key at this moment.

2. Recall the image

Press FREEZE key to freeze the image;

Press MEMORY key to open the main menu of memory

1 LOCAL; 2. USB; 3. EXIT

Move the cursor or direction key and press SET key to select menu option “1.LOCAL” and then the submenu will appear as “1. STORE; 2. RECALL; 3. EXIT”

Press SET key to select the menu option “2. RECALL” and begin to recall the image.

Use the trackball to turn frame No. forwardly or backwardly.

Press END key to exit from image recall state, and the system will return to frozen state.

Caution: When an image is recalled, the screen will display the image and its relative information, such as the date of image being stored, parameters measurement result and annotation etc. Please note that this information can only be recalled and cannot be reedited.
8.2.2 Store the images in USB flash memory disk

By using the USB function, users can store valuable images in the external USB disk, then copy the images from USB disk to computer. Please note the images should be saved and read in the format of .BMP or other standard image format.

The operation is as follows:

1. Store the image in USB

   Press **FREEZE** key to freeze the image;

   - Press **MEMORY** key to open the main menu of memory
     
     1 LOCAL; 2 USB; 3 EXIT

   - Move the cursor or direction key and press **SET** key to select menu option
     
     “2. USB“ and then the submenu will appear as
     
     “1. STORE; 2. RECALL; 3. DELETE 4.EXIT”

   - Move the cursor or direction key and press **SET** key to select the menu option
     
     “1 STORE” and begin to store the image.

   **Note:** 1. During reading the images, the indicator lamp of **MEMORY** key will keep flicking. When the reading operation is finished, it will stop flickering.

   2. The above operation steps can be repeated.

   3. When operate the Step 3 of the above steps, “NO USB-DISK” will appear in the screen if the system does not detect the USB disk.

   4. The stored file name will be given automatically by system time, which consists of 8 numbers. E.g. If the current time is 17:35:20 of February 24, 2004, the file will be named as “24173520”.

2. Read the image

   Press **FREEZE** key to freeze the image;

   - Press **MEMORY** key to open the main menu of memory
     
     1 LOCAL; 2 USB; 3 EXIT
Move the cursor or direction key and press SET key to select menu option
“2. USB “ and then the submenu will appear as
“1. STORE;  2. RECALL; 3. DELETE 4.EXIT”

Move the cursor or direction key and press SET key to select the menu option
“2. RECALL” and the file list of USB disk will appear in the screen. Input the No. of file to be read;

Press SET key to read the selected file in USB disk

When the indicator lamp of MEMORY key stops flickering, press END key to exit from the reading status.

Note: 1. During reading the images, the indicator lamp of MEMORY key will keep flickering. When the reading operation is finished, it will stop flickering. Press END key again to quit back to operation interface.
2. The above operation steps can be repeated.
3. When operate the Step 3 of the above steps, “NO USB-DISK” will appear in the screen if the system does not detect the USB disk.

3. Delete the image

Press FREEZE key to freeze the image;

Press MEMORY key to open the main menu of memory

1 LOCAL;  2. USB;  3. EXIT

Move the cursor or direction key and press SET key to select menu option
“2. USB “ and then the submenu will appear as
“1. STORE;  2. RECALL; 3. DELETE 4.EXIT”
Move the cursor or direction key and press SET key to select the menu option “3. DELETE” and the file list of USB disk will appear in the screen. Input the No. of file to be deleted;

Press SET key to delete the selected file in USB disk

Press END key to exit from the deleting status.

Note: 1. During deleting the images, the indicator lamp of MEMORY key will keep flickering. When the reading operation is finished, it will stop flickering. Press END key to quit back to operation interface.

2. The above operation steps can be repeated.

3. When operate the Step 3 of the above steps, “NO USB-DISK” will appear in the screen if the system does not detect the USB disk.
Chapter 9 Presetting

9.1 Presetting and retrieving of parameters

- EICKEMEYER MAGIC3000 system has the function of presetting parameters so that it can simplify the operation for users.
- There are totally 3 groups of parameters can be saved in the system, each group of parameters includes total gain, IP, line correlation, frame correlation, the calculation formula of fetal weight and selection of GA table etc.
- Once being set, the parameters will not be lost even when the system is power interrupted. And they can be retrieved automatically when the system is restarted.

9.1.1 Saving the parameters

The operation is as follows:

a) Press [MENU] key to open the main menu:
b) Select the menu option “4.PRESET-W”, and a submenu will appear as follows:
   1.USER-1  2.USER-2  3. USER-3
c) Select one of the above options as position to save parameters, and the current system setting will be saved in the selected position.

9.1.2 Retrieving the parameters

The operation is as follows:

a) Press [MENU] key to open the main menu:
b) Select the menu option “3.PRESET-R”, and a submenu will appear as follows:
   1.USER-1  2.USER-2  3. USER-3
c) Select one of the above options that is the position to retrieve parameters, and the parameters saved in the selected position will be set in the current system

9.2 Setting the system

- The following parameters can be set in the system by users: hospital name, the format of time, the display of time, the object to be saved, the selection of calculation formula for OB/GYN, the input of OB/GYN table by users.
  
  - Total gain can be adjusted in real-time status by turning GAIN knob.
  - LR Linear averaging, FR (Frame correlation).IP can be set in menu. (See detail in 4.5.3)
  - Hospital name, display time, time format, display mode of STC curve, calculation formula of fetal weight, GA table (system, user) can be set in the menu. See detail operation as below.
9.2.1 Setting the system parameter

1. Select the menu option “1.GENERAL”, and a dialog frame of setting system will appear in the screen; (Fig 11-1)
2. Move the cursor to corresponding item and set parameters by inputting characters or numbers;
3. Press END key to exit directly and the modification will be saved at the same time.

<table>
<thead>
<tr>
<th>Figure 11-1 Set system parameters</th>
</tr>
</thead>
</table>

9.2.2 Revising the GA-USER

- **EICKEMEYER MAGIC3000** can provide 7 kinds of GA-SYS tables that have been set in the system. In addition, it can provide 7 kinds of GA-USER tables that can be revised by users. Before the GA-USER tables are revised, they are as same as the GA-SYS tables.
- The operation is as follows:

Press MENU key and the main menu will appear as follows:


Use the trackball or direction keys to move the cursor to “5.SETUP”.

Press SET key to select “5.SETUP” and the submenu will appear as follows:

1.GENERAL  2.GA-USER

Press SET key to select “2.GA-USER”, the first GA table (BPD GA table) will appear as “Fig 11 1 GA-SYS 2 GA-USER”

Press END key or S key to save the modification and exit the USER GA. TABLE.
**Note**

1. Users need to set “Start Distance”, “Internal”, “Total items” first. Please use direction keys to select input data in the three items. Please note the maximum value of Total items is 75. If the value of “Total value” is inputted more than 75, the system will automatically set it as 75.

2. Press $M$ key (MODIFICATION), the cursor will be jumped to the upper WEEKS value input area from the lower “Start Distance” input area. Users can modify the week value (GA value) by pressing number keys and moving the cursor with direction keys.

3. Press $R$ key (RULE SETTING), the cursor will be jumped from the lower “Start Distance” input area to the upper WEEKS value input area. And the user can modify value in the three items—“Start Distance”, “Internal”, “Total items”. Cursor can be moved by direction keys.

4. Press $P$ key (PREVIOUS PAGE) to turn to previous page of G.A. TABLE; press $N$ key to turn to next page of G.A. TABLE.

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<table>
<thead>
<tr>
<th>BPD (mm)</th>
<th>WEEKS (w/d)</th>
<th>BPD (mm)</th>
<th>WEEKS (w/d)</th>
<th>USER (mm)</th>
<th>BPD (mm)</th>
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<th>WEK (w/d)</th>
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<td>44</td>
<td>19/2</td>
<td>74</td>
<td>29/5</td>
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<td></td>
</tr>
<tr>
<td>16</td>
<td>12/2</td>
<td>46</td>
<td>19/6</td>
<td>76</td>
<td>30/4</td>
<td></td>
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<td>18</td>
<td>12/6</td>
<td>48</td>
<td>11/3</td>
<td>78</td>
<td>31/2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>13/1</td>
<td>50</td>
<td>20/4</td>
<td>80</td>
<td>32/1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>13/4</td>
<td>52</td>
<td>21/1</td>
<td>82</td>
<td>33/0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>14/1</td>
<td>54</td>
<td>21/6</td>
<td>84</td>
<td>33/6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>14/4</td>
<td>56</td>
<td>22/3</td>
<td>86</td>
<td>34/5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Start Distance (mm) 14
Internal (mm): 2
Total items max 75 : 44
P: PREVIOUS PAGE N: NEXT PAGE M: MODIFICATION S: SAVE & EXIT R: RULE SETTING

---

Fig 11 2 GA-USER
Chapter 10 Function of puncture guide

When puncture guide is selected, the operator can move the probe to an appropriate position with puncture guide line aiming at an ideal piecing point.

- The function of puncture guide can be only applied in real-time state.
- The operation is as follows:
  a) Press **MENU** key and see the main menu as below:
  b) Select menu option “6. BIOSPY” of the main menu, and the beam sampling line will be displayed in the screen.
  c) Use the trackball to move the beam sampling line within definite range.
Chapter 11 Troubleshooting & maintenance

11.1 System maintenance

11.1.1 Clearing the system
It is very necessary to maintain the system regularly, as it can ensure the system being operated under safe state by eliminating possible trouble, and it can also shorten the checking and repair period, lower the service costs and reduce the operation danger.

To clear the system one time per week is recommended by the manufacturer:

- **Monitor** Please use a piece of soft and moist cloth to clear the monitor; if the monitor looks relatively dirty, add some detergent into the cloth, then use the cloth to clear the monitor. Please never splash any liquid directly into the system and please make sure that the monitor not being scratched.

- **Control panel**: Please use a piece of soft and moist cloth to clear the keyboard control panel; and use a piece of toothpick to clear the solid dust around the GAIN knob.

- **Surface** Please use a piece of soft and dry cloth to clear the surface of the system, and use a piece of soft cloth with some detergent to clear dirty spot in the surface.

11.1.2 Moving the system
When moving or transporting the system, please make sure that the following precautionary measures have been taken to ensure the safety of the user and the security of the system to the largest extent.

1. Switch off the system.
2. Disconnect all cables that connect to external equipments.
3. Make sure that there isn’t anything unstable on the control panel.
4. Put the probe into the probe case.
5. Put the ultrasonic gel into the gel holder at the side of the system.
6. Hold the handle at the back of the system to move the system.

11.1.3 Safety check

**Check every time before using the system**

- Check the probe that whether being damaged or not
- Check the cables and power cord that whether being broken, scratched or not.

**Check every month regularly:**
Check the main unit that whether has mechanism problems or not.
Check the equipment that whether lost or lack hardware.
Check the trackball, and clear it if necessary.

11.2 Troubleshooting

The most frequently occurred errors, system messages, their possible causes and solving methods are listed below:

<table>
<thead>
<tr>
<th>Errors &amp; Messages</th>
<th>Possible Cause</th>
<th>Solving Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>When starting the system, power-indicating lamp is not lit.</td>
<td>1) Power cord might not be well connected to the electricity power socket; 2) Power fuse might be already burned.</td>
<td>1) Reconnect the power cord; 2) Replace the fuse.</td>
</tr>
<tr>
<td>When starting the system, power indicating lamp is lit, but monitor is dark.</td>
<td>Improperly adjusting brightness and contrast of monitor.</td>
<td>Appropriately re-adjust brightness and contrast of monitor.</td>
</tr>
<tr>
<td>When starting the system, monitor has formulated output but no ultrasonic image appears. There’s a message on the screen indicating the probe is not connected.</td>
<td>Probe is not connected or not well connected.</td>
<td>Switch off power and reconnect the probe.</td>
</tr>
<tr>
<td>Ultrasonic image is not clear.</td>
<td>Gain is improperly set, or the brightness and contrast are not well adjusted.</td>
<td>Appropriately set brightness, contrast and gain.</td>
</tr>
<tr>
<td>Image is interfered and distorted, or its lower portion in the far field is not clear.</td>
<td>There are electric motors, ultrasonic nebulizers, cars, computers, radio sets and other interference sources nearby; power supply is not grounded or is unstable.</td>
<td>Move or keep away from interference source; Use a separate 230V±10% power supply; The grounding terminal at the rear of main unit is well grounded.</td>
</tr>
<tr>
<td>The gray scale is S-twisted in the image area</td>
<td>Power supply voltage is too low.</td>
<td>Adjust supply voltage or use a voltage stabilizer.</td>
</tr>
</tbody>
</table>

If you need some help, please contact our authorized agent in your country or contact us directly at the following address:
Chapter 12 Warranty

The main system and probe are covered by 24 months warranty after dispatched from Eickemeyer.

To maintain our excellent service and for warranty purposes it is necessary to register your system. Please use the web www.eickemeyer.de/Magic3000 within 1 week after purchasing this unit. This will ensure that you are covered by our international warranty.

Please kindly note that the warranty services are ONLY provided to those who have registered.
Please also kindly note that the free warranty services are ONLY available if the operators have been fully followed the instructions listed in this user manual and the warranty card, otherwise the manufacturer will charge related costs according to the goods situation.