LOGIQ™ 400

Quick Start Guide   2237879–100

A Training in Partnership Program

TiP™

GE Medical Systems

Technical Publications

Direction 2237879−100
Revision 0

LOGIQ™ 400 Quick Start Guide

CE 0459

Operating Documentation

Regulatory Requirement

This product complies with regulatory requirements of the following European Directive 93/42/EEC concerning medical devices

$C\epsilon$ **0459**

This Quick Start Guide is a reference for LOGIQ ™ 400 MD MR3 and LOGIQ™ 400CL. It applies to all versions of 4.01 software for the LOGIQ ™ 400. It applies to all versions of 4.02 software for the LOGIQ™ 400CL.

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REV	DATE	REASON FOR CHANGE
0	April 27, 1999	Initial Release

LIST OF EFFECTIVE PAGES

PAGE NUMBER	REVISION NUMBER	PAGE NUMBER	REVISION NUMBER
TiP Cover Page	N/A	Revision History A and B	0
Title Page	0	Quick Start 1 thru Quick Start 40	0

Please verify that you are using the latest revision of this document. Information pertaining to this document is maintained on GPC (GE Medical Systems Global Product Configuration). If you need to know the latest revision, contact your distributor, local GE Sales Representative or in the USA call the GE Ultrasound Clinical Answer Center at 1-800-682-5327 or 414-524-5698.

Introduction

The Quick Start Guide (TRANSLATED) provides a step-by-step description of the basic features and operation of the LOGIQ™ 400. It is intended to be used in conjunction with the Basic User Manual in order to provide the information necessary to operate the system safely.

The Quick Start Guide takes the user from system familiarization through power on, patient data entry, exam category/preset selection, scan modes/adjustments, basic measurements, report pages, recording images and power off.

The LOGIQ™ 400 manuals are written for users who are familiar with basic ultrasound principals and techniques. They do not include sonography training or clinical procedures.

Prescription Device (for USA only)

CAUTION: United States law restricts this device to sale or use by or on the order of a physician.

Front View

The following are major features of the LOGIQ™ 400 system console. Most features come with the standard configuration, while other features are options to the standard console.
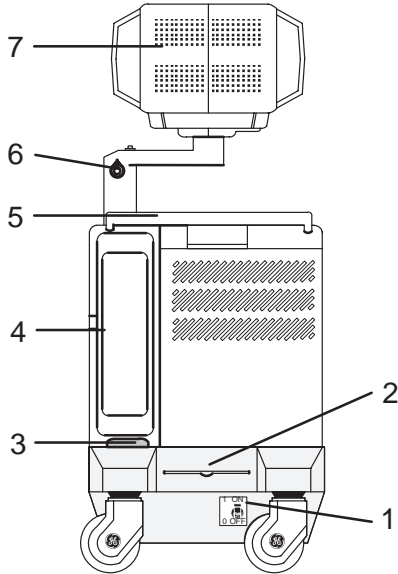
1. VCR Microphone
2. Probe Holder
3. MOD Drive
4. Physio Panel *
5. Probe Connectors (Port #2 and #3)
6. Power Supply Filter
7. Air Filter
8. Probe Parking Port (Port #1)
9. On/Off Switch
10. B/W Page Printer *
11. Keyboard
12. Keyboard Task Light
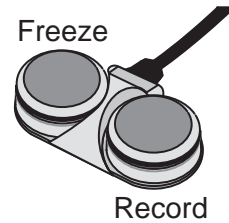13. Task Light Switch

   * = optional feature or accessory

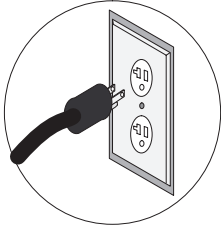Quick Start 2

Back View

7

6

5

4

3

2

1
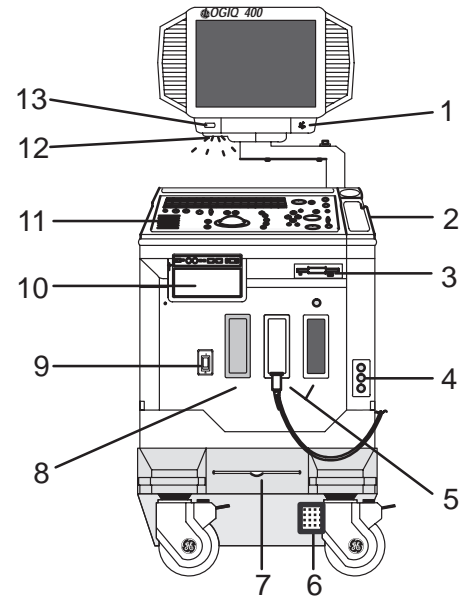
1. Circuit Breaker
2. Air Filter
3. Cable Access
4. Peripheral Cable Access Door
5. Handle for Pushing
6. Monitor Arm Swivel Lock
7. Color Monitor

Optional Freeze/Record Foot Switch

Freeze

Record

Power On

To connect the system to the electrical supply:

- Ensure that the wall outlet is a minimum 15 amp dedicated circuit for 120 VAC (USA) or 7.5 amp dedicated circuit for 220–240 VAC (Europe).

- Make sure that the power switch is turned off.

- Unwrap the power cable. Make sure to allow sufficient slack in the cable so that the plug is not pulled out of the wall if the system is moved slightly.

- Push the power plug securely into the wall outlet.

To power on the system, ensure that the Circuit Breaker, located on the back of the power supply near the bottom of the unit, is turned on.
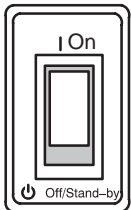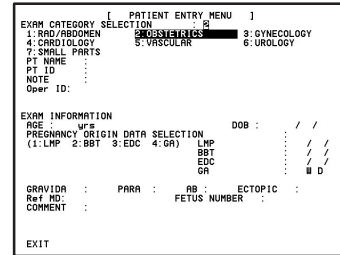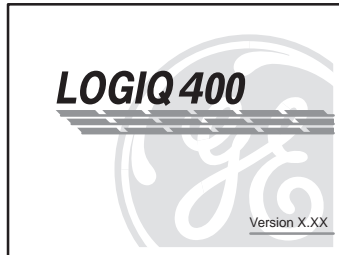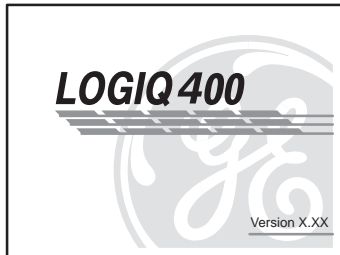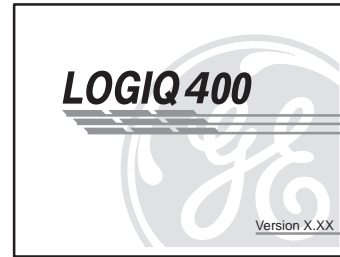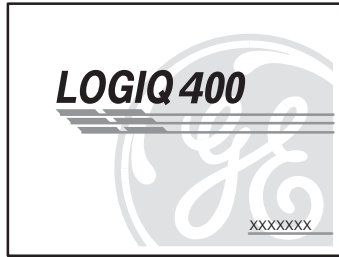
Press the Power On Power Off/Stand-by switch, located to the left of the probe connectors, to the on position.

1   ON

0   OFF

On

⏻ Off/Stand–by

Quick Start 4

Power On (cont'd)

During power up, the screen display changes as the system runs its self diagnostics.

Start of
diagnostic

LOGIQ 400

XXXXXXX

LOGIQ 400

XXXXXXX

LOGIQ 400

Version X.XX

LOGIQ 400

Version X.XX

LOGIQ 400

Version X.XX

End of
diagnostic


```
              [   PATIENT ENTRY MENU   ]
EXAM CATEGORY SELECTION          :  2
  1:RAD/ABDOMEN      2:OBSTETRICS      3:GYNECOLOGY
  4:CARDIOLOGY       5:VASCULAR        6:UROLOGY
  7:SMALL PARTS
  PT NAME   :
  PT ID     :
  NOTE      :
  Oper ID:


EXAM INFORMATION
AGE  :     W S                    DOB :      /  /
PREGNANCY ORIGIN DATA SELECTION
(1:LMP  2:BBT  3:EDC  4:GA)   LMP          :     /  /
                             BBT          :     /  /
                             EDC          :     /  /
                             GA           :     W D

GRAVIDA  :      PARA  :      AB  :    ECTOPIC  :
Ref MD:                    FETUS NUMBER   :
COMMENT  :


EXIT
```

Control Panel Layout

Keyboard

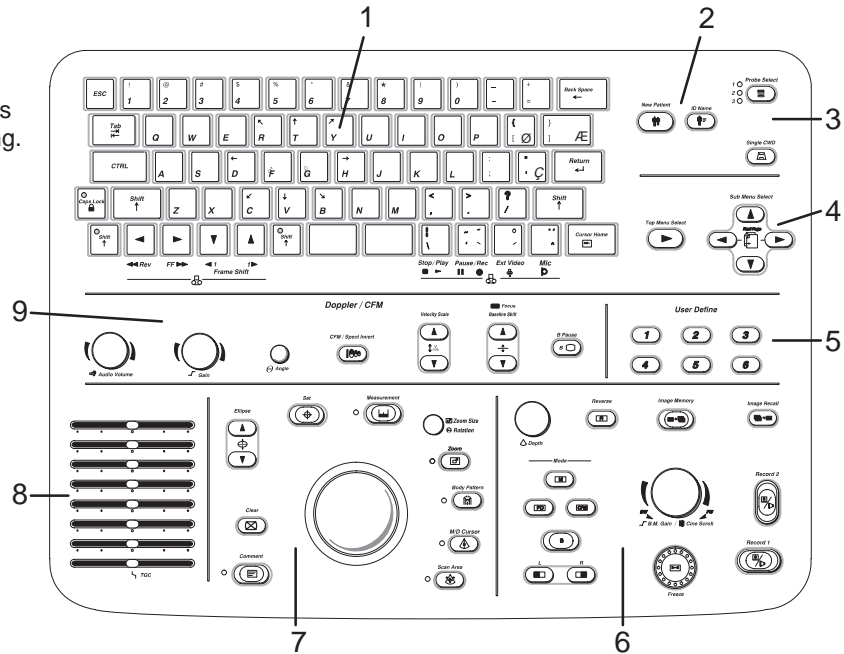Keyboard controls have been arranged according to function and usage. This helps minimize operator movement while scanning.

1. Alphanumeric Keys

2. New Patient

3. Probe Select

4. Soft Menu Controls

5. User Define

6. Mode, Display and Record

7. Measurement and Annotation

8. TGC

9. Doppler and CFM

Soft Menu Control Panel

The Soft Menu Display has 8 Top Menu selections (Mode, Preset, Set Up, ECG, Archive, DICOM, AutoSeq and Cine) and 8 Sub Menu selections (varies depending on choice of Top Menu selection) available.

The Top Menu Select key toggles the soft menu display on/off or returns to the top menu display from a sub menu.

The Sub Menu Select keys turn on a sub menu, move through the sub menu selections and pages, change sub menu values or turn on/off sub menu selections.

The up/down arrow keys turn on the sub menu.

The left/right arrow keys move through the menu selections and pages.

▼ + ▶
or ⎫ Previous Page
▼ + ◀ ⎭

▲ + ▶
or
▲ + ◀ ⎫ Next Page
or ⎭
◀ + ▶

The up/down arrow keys change the highlighted selection value or turn the sub menu selection on/off.
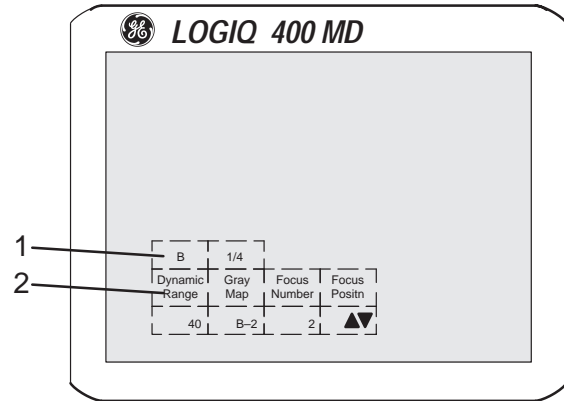
1. Top Menu Selections

2. Sub Menu Selections

Sub Menu Select

Top Menu Select

Next Page

Probe Controls

1 ○ **Probe Select**
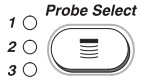*2* ○
3 ○

Single CWD
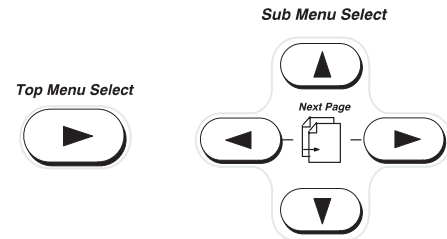
A probe is activated by pressing the **Probe Select** key. The appropriate port's LED (light emitting diode) to the left of the key is lit.

The second key is used to select (activate) the dedicated continuous wave Doppler (CWD) probe.

Probe Ports

All imaging probes can be plugged into either the number two or number three probe port positions. Probe port position number one is inactive (probe parking port). It can be activated by purchasing the third probe port option.

NOTE: Ensure that the probe port is deactivated and the image is frozen before disconnecting the probe.

Single CWD Probe Connection

lock

unlock

Probe Port Position 1
(Standard Version Inactive—Parking Port)
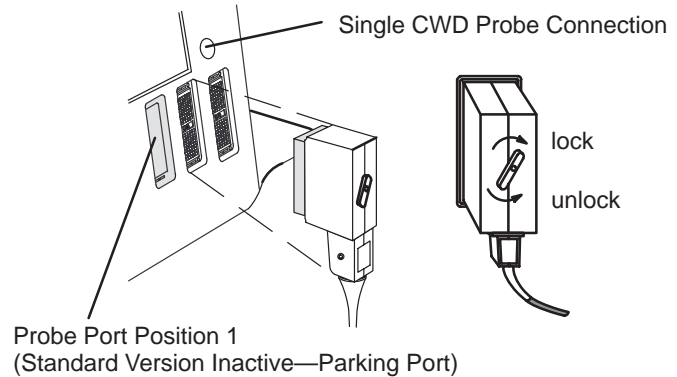
Starting an Exam

Patient Entry Menu

New Patient

Press the **New Patient** key at the beginning of each study to reset the system and enter new patient data. When the **New Patient** key is pressed, the Patient Entry menu appears.

Ensure that the Blue Shift key is not active.

Use the **Trackball** to move the highlight cursor to the Exam Category Selection line. Enter the desired exam number and fill in the appropriate patient data.

Highlight EXIT and press **Return** or press **New Patient** again when the patient entry menu data has been completed.

The system takes a few seconds to load new exam category parameters and calibrate the attached transducers before entering the scan mode.

```
[    PATIENT ENTRY MENU    ]
EXAM CATEGORY SELECTION        : 2
 1:RAD/ABDOMEN        2:OBSTETRICS        3:GYNECOLOGY
 4:CARDIOLOGY         5:VASCULAR          6:UROLOGY
 7:SMALL PARTS
 PT NAME   :
 PT ID     :
 NOTE      :
 Oper ID:


EXAM INFORMATION
 AGE :    yrs                        DOB :      /  /
 PREGNANCY ORIGIN DATA SELECTION               :
 (1:LMP  2:BBT  3:EDC  4:GA)    LMP            :    /  /
                               BBT            :    /  /
                               EDC            :    /  /
                               GA             :    W  D

 GRAVIDA   :     PARA :     AB :      ECTOPIC  :
 Ref MD:                      FETUS NUMBER  :
 COMMENT   :



 EXIT
```

Application Presets

Select the exam category application preset, that best describes the desired study to be performed, from the factory default preset selections displayed on the monitor.
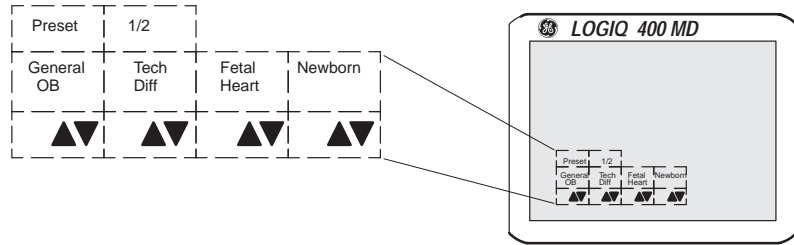
Select the desired probe.

Scan Mode Controls
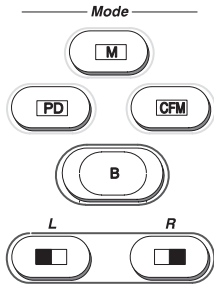
Select the desired display mode or combination of display modes (**B**-Mode, **P**ulsed **D**oppler, **C**olor **F**low **M**ode, **M**-Mode or **C**ontinuous **W**ave **D**oppler Mode).

To select CWD Mode, press **Blue Shift** and **X**. CWD Mode is available for sector probe only.

If the dual display mode (split screen) is desired, the **L** and **R** keys activate the Left or Right displayed image.

Scan the desired anatomy. Change modes as desired. Use the mode controls to adjust the image as necessary.

B-Mode Controls

There are four Soft-Menu pages for B-Mode imaging adjustments.

B	1/4	
Dynamic Range	Gray Map	Focus Number
42	B–2	2

B	2/4			
Frame Average	Imaging Freq	Image Softner	Color	3D Mode
OFF	3.5MHz	▲▼	▲▼	▲▼

B	3/4	
Focus Positn	Color Tag	Tag Positn
▲▼	▲▼	▲▼

Dynamic Range—Controls how echo intensities are converted to shades of gray, thereby creating a range of gray scale that can be adjusted.

Gray Map—Determines how the echo intensity levels received are presented as shades of gray.

Focus Number—Changes the number of focal zones so that the beam can be tightened or expanded for a specific area.

Frame Average—Averages previous frames of image data with the current frame.

Imaging Freq—Allows more echoes to pass through.

Image Softner—Adjust for the amount of smoothing applied.

Color—Allows for enabling B-Mode image colorization.

3D Mode—Allows for 3D Mode option activation.

Color Tag—Enables the colorization of a specific gray scale level range.

Tag Position—Allows for the movement of the specified color tag range throughout the gray scale displayed.

Focus Positn—Changes the depth at which the selected number of focal zones are optimized.

Quick Start 12

B-Mode Controls (cont'd)

B	4/4		
Biopsy Zone	Image Rotatn	Rejectn	Edge Enhance
SGL	0 DEG	30	MID

**Biopsy Zone**—Enables the electronic guidezone(s) available for the active probe.

Image Rotate—Rotates the single real-time or zoomed B-Mode image in 90° increments.

Rejectn—Allows for the elimination of low level echoes from the display.

B Edge Enhance—Brings out subtle tissue differences and boundaries by enhancing the gray scale differences corresponding to the edges of structures.

B-Mode Controls (cont'd)

The keyboard controls that effect B-Mode are as follows:
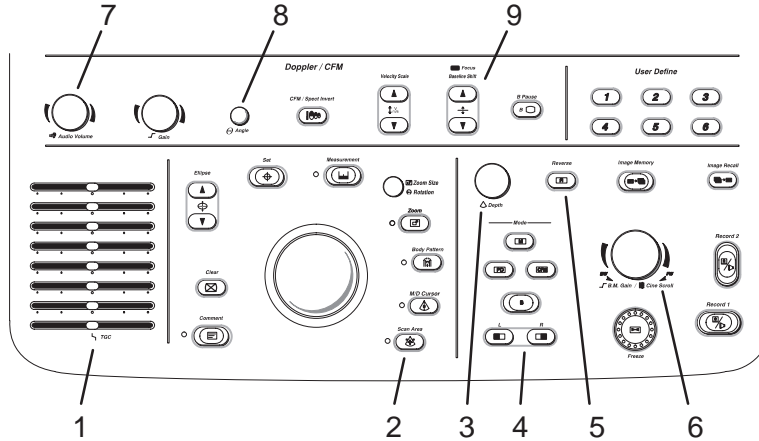
1. **TGC**—Balances the image so brightness is consistent throughout the image. Move the slide pot to the right to increase or the left to decrease.

2. **Scan Area**—Used to assign trackball control to adjust size/position B-Mode sector display, CFM window, and horizontal size/position of the real-time zoom window.

3. **Depth**—To reduce depth (look at a shallower image), turn the Depth rotary encoder clockwise. To increase depth (look at a deeper image), turn the Depth rotary encoder counterclockwise.

B-Mode Controls (cont'd)

4. **Display Format (Dual)**— Left/Right split screen display.

5. **Reverse**—The GE logo at the top of the sector wedge corresponds to the orientation mark on the probe body. When Reverse is active, the image flips and the GE logo switches to correspond to the probe mark.

6. **B/M Gain**—Controls the gain of the displayed echoes. To increase/decrease, turn the control clockwise/counterclockwise.

7. **Audio Volume**—In B-, B/M- and M-Modes, Acoustic Output can be adjusted with this knob.

8. **σ Angle**—Controls the gain in B/M and CFM-B/M Mode.

9. **Focus Position**—While in B-Mode only, Baseline Shift can be used to change Focus Position.

B-Mode Controls (cont'd)

B-Mode Optimization			
Adjustments for...	**Do the Following...**	**Adjustments for...**	**Do the Following...**
Image too grainy	1. Increase **Dynamic Range**. 2. Increase **Frame Average**. 3. Decrease **Edge Enhance**. 4. Change **Gray Map**.	Image too soft	1. Decrease **Dynamic Range**. 2. Increase **Edge Enhance**. 3. Decrease **Frame Average**. 4. Change **Gray Map**.
Image too noisy	1. Decrease **B/M GAIN**. 2. Decrease **Dynamic Range**. 3. Increase **Frame Average**. 4. Increase **Edge Enhance**.	Improve Uniformity	1. Increase the number of focal zones. 2. Decrease **SCAN AREA SIZE**. 3. Adjust **TGC** to compensate for attenuation.
Cystic Imaging	1. Decrease the **B/M GAIN**. 2. Decrease **Dynamic Range**. 3. Use **SCAN AREA SIZE** to reduce image width. 4. Change **Focus Number** to increase number of focal zones. 5. Optimize focal zone placement.	Technically Difficult Patients	1. Select the proper probe or change **Imaging Freq.** for the exam (larger patient, lower frequency). 2. Increase **ACOUSTIC OUTPUT**, if necessary. 3. Maintain a lower **Dynamic Range** (45 to 48). 4. Decrease **SCAN AREA SIZE** for faster frame rates.

Color Flow Mode (CFM) Controls

There are four Soft-Menu pages for Color Flow Mode imaging adjustments.

CFM	1/4		
CFM Map	Slant Scan	Diag Mode	MTI Filter
VT–1	+	MAP	LOW

CFM	2/4			
Frame Average	Penet	High Resoltn	Display Thrshld	Capture
MID	▲▼	▲▼	32	OFF

CFM Map—Allows for the selection of how Doppler velocities are mapped as color over the gray scale.

Slant Scan—Used to control the position of the CFM window for linear probes only.

Diag Mode—Allows for the selection of the best color flow display format.

MTI Filter—Filters out low flow velocity color.

Frame Average—Averages color information from previous frames with the current frame.

Penet—Penetration can be increased by lowering the operating frequency of the active probe.

High Resoltn—Provides a quick way to maximize resolution for the CFM display.

Display Thrshld—Gray scale level at which the overlay of color information stops.

Capture—Displays the highest mean velocity (average velocity) detected over a specific time interval.

Color Flow Mode (CFM) Controls (cont'd)

CFM	3/4			
Packet Size	Spatial Filter	W.E. Cancel	Color Tag	Tag Positn
SMALL	OFF	▲▼	▲▼	▲▼

CFM	4/4	
ACE	Noise Blanker	Persist ence
OFF	OFF	OFF

Packet Size—Controls the number of samples gathered for a single color flow vector.

Spatial Filter—Smooths color information so that it is less grainy. Averages the color information out over time.

W. E. Cancel—Eliminates the low velocity echoes caused by the motion of vessel walls.

Color Tag—Allows for the assignment of a single color to a range of velocities.

Tag Positn—Allows for the movement of the specified color tag range throughout the gray scale displayed.

ACE—Reduces "color artifact noise".

Noise Blanker—Reduces the random noise generated due to the increase in Color Gain.

Persistence—Retains the largest pixel color value until a larger value is detected or preset time has elapsed.
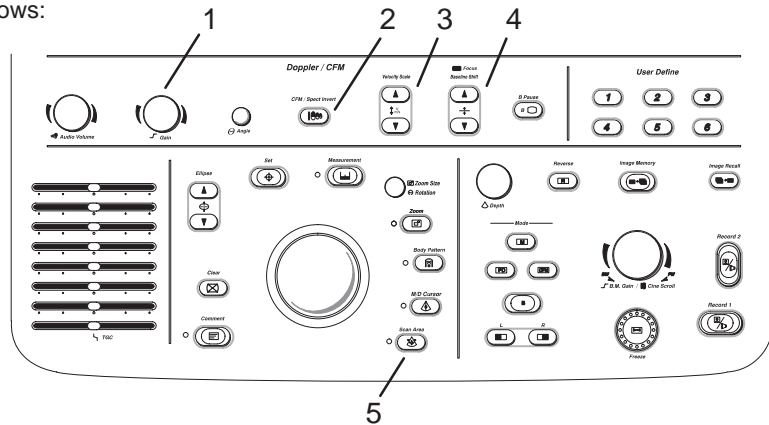
Color Flow Mode (CFM) Controls (cont'd)

Acoustic output affects the transmit power for both B-Mode and CFM signals.

TGC and B/M Gain function only on the B-Mode image displayed.

The Dual Format keys work the same as in dual B-Mode, but both B-Mode and CFM are displayed on the left and right sides of the screen.

The keyboard controls that effect CFM are as follows:

1. **Color Doppler Gain**—Adjusted overall received echo gain for CFM. To increase/decrease, turn the control clockwise/counterclockwise.

2. **CFM/Spectrum Invert**—Inverts Color Flow Map assignments.

3. **Velocity Scale**—Adjusts velocity scale to accommodate faster/slower blood flow velocities. To increase/decrease, press the **Velocity Scale** up/down arrow key.

4. **Baseline Shift**—Minimize aliasing by assigning more of the overall displayed velocity scale to forward or reverse flow. To shift the baseline up/down, press the **Baseline Shift** up/down arrow key.

5. **Color Flow Window Size (Scan Area)**—Used to assign trackball control to adjust size/position of the CFM window.

Color Flow Mode (CFM) Controls (cont'd)

Color Flow Mode Optimization			
Adjustments for...	**Do the Following...**	**Adjustments for...**	**Do the Following...**
Decrease Motion Artifact	1. Increase the **VELOCITY SCALE**. 2. Increase **W.E. Cancel**.	Eliminate Aliasing	1. Increase **VELOCITY SCALE**. 2. Lower **BASELINE SHIFT**.
Improve Sensitivity	1. Increase **GAIN**. 2. Decrease **VELOCITY SCALE**. 3. Increase **ACOUSTIC OUTPUT**. 4. Switch **Penet.** on and **High Resoltn** on. 5. Decrease **W.E. Cancel**. 6. Increase **Frame Average** (this allows gain to increase). 7. Increase **Packet Size**. 8. Reduce **SCAN AREA SIZE** to smallest size reasonable. 9. Optimize focal zone position.	Improve Frame Rate/Flow Dynamics	1. Decrease color window using **SCAN AREA SIZE** width. 2. Exit **COLOR FLOW** to reduce B-Mode image width (use **SCAN AREA SIZE**). 3. Decrease **DEPTH**. 4. Increase **VELOCITY SCALE** (if flow state allows it). 5. Decrease **Frame Average**.
Decrease Color Flow Bleeding	1. Decrease **GAIN**. 2. increase **VELOCITY SCALE**. 3. Decrease **Display Thrshld**.		

Doppler Controls

There are three Soft-Menu pages for Pulsed Wave Doppler (PWD) imaging adjustments.

PWD	1/4		
Dynamic Range	Slant Scan	Wall Filter	S.V. Length
40	+	20.2	5

PWD	2/4			
Sweep Speed	Penet	Color	Color Tag	Tag Positn
MID	OFF	OFF	▲▼	▲▼

Dynamic Range—Controls how echo intensities are converted to shades of gray, thereby creating a range of gray scale that can be adjusted.

Slant Scan—Controls the position of the Doppler cursor for linear probes only.

Wall Filter—Removes the low level, low frequency Doppler signal caused by movement of the vessel walls.

S. V. Length—Changes the size of the sample volume gate length.

Sweep Speed—Changes the speed at which the timeline updates across the display.

Penet—Penetration can be increased by lowering the operating frequency of the active probe.

Color—Allows for enabling PWD or CWD Mode image colorization.

Color Tag—Enables the colorization of a specific gray scale level range.

Tag Positn—Allows for the movement of the specified color tag range throughout the gray scale displayed.

Doppler Controls (cont'd)

PWD	3/4	
Rejectn	CFM/PWD Ratio	CFM Shrink
OFF	1/2	▲▼

PWD	4/4	
Realtim Trace	Calc Dir.	Trace Method
OFF	Compo	PEAK

Rejectn—Allows for the elimination of low level echoes from the display.

CFM/PWD Ratio—Used to set the velocity ratio between PWD and CFM. Active in triplex mode.

CFM Shrink—Reduces the CFM window to specified size.

Realtim Trace—Automatically traces in real-time.

Calc Dir.—Choose which part of the Doppler Trace is used for automatic measurements/calculations.

Trace Method—Choose the method used to trace the Doppler waveform in real-time (Peak, Floor, Mean or Mode).

There are 3 Soft-Menu pages for Continuous Wave Doppler (CWD) imaging adjustments.

CWD	1/4		
Dynamic Range	Slant Scan	Wall Filter	Auto Trace
40	+	20.2	▲▼

CWD	2/4		
Sweep Speed	Color	Color Tag	Tag Positn
MID	OFF	OFF	▲▼

CWD	3/4	
Rejectn		
OFF		

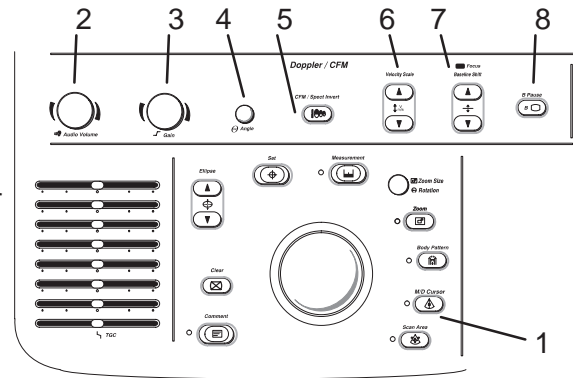| PWD	4/4	
Realtim Trace	Calc Dir.	Trace Method
OFF	Compo	PEAK

Doppler Controls (cont'd)

Several controls affect the B-Mode portion of the display and not the echoes in the Doppler spectrum. These are TGC, Depth, B/M Gain, Scan Area and Reverse keys. See *Quick Start 12* for comments on these controls.

The keyboard controls that affect Doppler are as follows:

1. **M/D Cursor**—Assigns trackball control to the Doppler cursor.

2. **Audio Volume**—Used to adjust Doppler audio volume output. To increase/decrease, turn the control clockwise/counterclockwise.

3. **Doppler Spectral Gain**—Adjusts overall received echo gain for Doppler. To increase/decrease, turn the control clockwise/counterclockwise.

4. **Theta Angle Correction**—Adjusts angle correction for flow velocity calculation. To adjust the angle clockwise/counterclockwise relative to the probe face, turn the control clockwise/counterclockwise.

5. **CFM/Spectrum Invert**—Inverts Doppler spectrum assignments.

6. **Velocity Scale**—Adjusts velocity scale to accommodate faster/slower blood flow velocities. To increase/decrease, press the **Velocity Scale** up/down arrow key.

7. **Baseline Shift**—Minimize aliasing by assigning more of the overall displayed velocity scale to forward or reverse flow. To shift the baseline up/down, press the **Baseline Shift** up/down arrow key.

8. **B Pause**—Freezes the B-Mode image while keeping the Doppler spectrum display active. Press to view CW Doppler.

Doppler Controls (cont'd)

Doppler Mode Optimization			
Adjustments for...	**Do the Following...**	**Adjustments for...**	**Do the Following...**
Increase Sensitivity	1. Increase **GAIN**. 2. Increase **ACOUSTIC OUTPUT**. 3. Decrease **VELOCITY SCALE** (if flow state allows it). 4. Increase **S.V. Length**. 5. Use lower frequency probe or use lower Doppler frequency on some applications. 6. Activate **B-PAUSE** to freeze B-Mode image. *Scan angle is critical to Doppler sensitivity.*	Improve Display Aesthetics	1. Activate **B PAUSE** to freeze B-Mode image. 2. Decrease **GAIN**. 3. Increase **ACOUSTIC OUTPUT**. 4. Use smaller sample volume size, whenever possible. 5. Increase/decrease **Dynamic Range**. 6. Adjust **BASELINE SHIFT** and **VELOCITY SCALE** to adjust spectral size. 7. Lower Doppler **Sweep Speed**.
Increase Spectral Clarity	1. Activate **B PAUSE** to freeze B-Mode image. 2. Increase **ACOUSTIC OUTPUT**. 3. Decrease **S.V. Length**. 4. Decrease **GAIN**. 5. Decrease **Dynamic Range**.		

M-Mode Controls

There are two Soft-Menu pages for M-Mode imaging adjustments.

M	1/2		
Dynamic Range	Gray Map	Rejectn	Edge Enhance
40	M–2	30	MID

Dynamic Range—Controls how echo intensities are converted to shades of gray, thereby creating a range of gray scale that can be adjusted.

Gray Map—Determines how the echo intensity levels received are presented as shades of gray.

Rejectn—Allows for the elimination of low level echoes from the display.

Edge Enhance—Brings out subtle tissue differences and boundaries by enhancing the gray scale differences corresponding to the edges of structures.

M	2/2		
Sweep Speed	Color	Color Tag	Tag Positn
MID	OFF	▲▼	▲▼

Sweep Speed—Changes the speed at which the timeline updates across the display.

Color—Allows for enabling M-Mode image colorization.

Color Tag—Enables the colorization of a specific gray scale level range.

Tag Positn—Allows for the movement of the specified color tag range throughout the gray scale displayed.

M-Mode Controls (cont'd)

Since M-Mode is basically a single B-Mode scan vector displayed over time, basic controls that affect the B-Mode display also affect the M-Mode display. See *Quick Start 12* for comments on these controls.
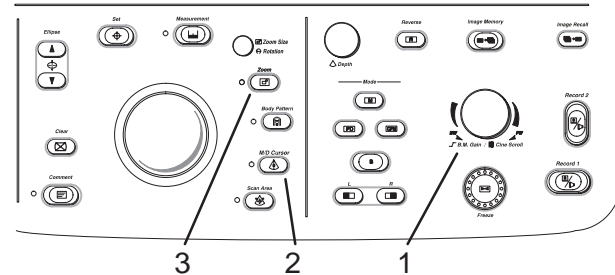
TGC and Depth affect both the M-Mode and B-Mode displays.

If the scan area size is reduced and the position changed, the M-Mode cursor will follow the position change to stay within the displayed scan area.

The Dual Format keys work the same as in dual B-Mode, but both B-Mode and M-Mode are displayed on the left and right sides of the screen.

The keyboard controls that effect M-Mode are as follows:

1. **B/M Gain**—Controls the gain of the displayed timeline echoes. To increase/decrease, turn the control clockwise/counterclockwise.

2. **M/D Cursor**—Assigns trackball control to the M-Mode cursor.

3. **Zoom**—Enables real-time or freeze zoom function.

M-Mode Optimization			
Adjustments for...	Do the Following...	Adjustments for...	Do the Following...
Improve M-Mode	1. Increase/decrease **B/M GAIN**. 2. Increase **Dynamic Range**.	Increase Size of Area of Interest	1. Use M-Mode **ZOOM**.

Reviewing Cine Images

Press **Freeze** to stop image data acquisition.

When Freeze is activated, rotate the Cine Scroll control to display individual image frames which were stored by the system.

NOTE: Cine frame number 0 is the most current image. The higher the Cine frame number, the older the image.

The depth, dynamic range, and gain parameters displayed on the screen are valid for Cine frame number zero only.
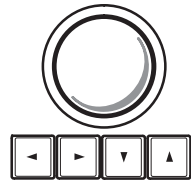
Image Annotation

Keyboard Annotation

The annotation keyboard is always active. Upon power up or starting a new patient, the underscore cursor appears in the mode's home position.   Comments may be typed in at the non-blinking cursor.

Pressing the **Comment** key assigns the trackball function to controlling the cursor.

The Trackball and Keyboard Arrow keys are used to move the cursor to the desired position on the image.

When the blinking cursor is in the desired position, comments may be typed in. Annotations are entered in the type-over, not insert, mode. Be careful not to write over text when editing.

Special Keys—Symbols
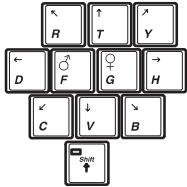
Blue Shift: Some special annotation symbols can be used by activating the Blue Shift key. Those keys have special symbols shown in blue on the keyboard.

Activating Blue Shift causes the arrow, female and male symbols to be printed on the screen during the comment function when the keys shown are pressed.

The Blue Shift key acts as a lock function (similar to Caps Lock key). Press again to exit the Blue Shift function.

Special Keys—Language Symbols
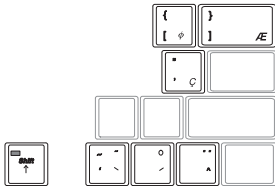
The **Red Shift** key enables the special symbols shown in red on the keyboard. The red symbols shown in the lower right portion of a key print when the **Red Shift** is active and that key is pressed.

To print the red symbols shown in the upper right half of a key, type the desired letter that uses the symbol, activate **Red Shift**, hold down the normal **Shift** key and press the desired symbol key. Red symbols can be used in any language but can only be used with the proper designated letters.

The Red Shift key acts as a lock function (similar to Caps Lock key). Press again to exit the Red Shift function.

Body Patterns
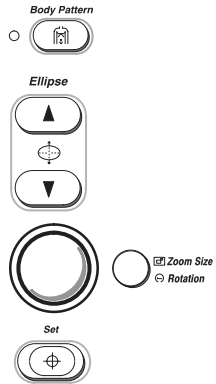
Body Pattern

Body patterns are a simple graphic of a portion of the anatomy that is frequently scanned. Press the **Body Pattern** key to activate Body Patterns.

Ellipse

A body pattern, generally displayed in the lower left corner of the screen, appears.

Cycle through the body patterns by pressing the **Ellipse** up or down arrow keys.

Zoom Size ⊖ Rotation

A Probe Orientation Marker is used to illustrate the probe position. This marker can be placed with the **Trackball** and rotated with the **Zoom Size/Rotation** control.

Set

Press **Set** to complete the body pattern selection.

Probe
Orientation
Marker
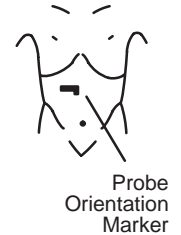
Performing Basic Measurements

Basic measurements are displayed on the monitor and not automatically entered into a report page unless a specific measurement/calculation is selected from the sub-menu. The specific measurement/calculation can be chosen before or after the basic measurement has been performed.

Scan the desired anatomy and press **Freeze.**

Freeze

| Key Pressed (while frozen)	MODE			
	B	**Spectral Doppler (with B)**	**M (with B)**	**CFM (with B)**
Once	Distance Ellipse/Circle	Peak Velocity	Tissue Depth (Distance)	Distance Ellipse/Circle
Twice	Trace/Circle	TAMAX/TAMIN/ TAMEAN/TAMODE	Time Interval	Trace/Circle
Three Times	Gray Scale Echo Level	2 Velocities Slope/Time Interval	Depth Difference Slope/Time Interval	Point Velocity
Four Times	Arrow Mark *	Time Interval	Arrow Mark *	Gray Scale Echo Level
Five Times		Arrow Mark *		Arrow Mark *

* Assuming the "Arrow Mark Display" preset is set to on.
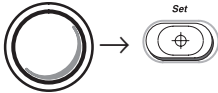
Distance (B-Mode) **and Tissue Depth** (M-Mode)

Perform a distance measurement for calculations such as BPD, FL, CRL, LVIDd and LVPWs.
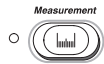
Measurement

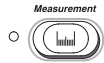Press **Measurement** once.

Set
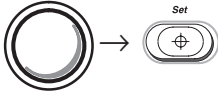
Use the **Trackball** to move the "✕" cursor to the measurement start point. Press **Set** to fix the measurement start point cursor and to display a second cursor.

Set

Use the **Trackball** to move the second "✕" cursor to the measurement end point. Press **Set** to complete the measurement and fix the Distance value displayed on the bottom part of the screen.
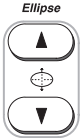
Circumference/Area - Ellipse (B-Mode)

Perform a circumference/area using the ellipse method for calculations such as AC, HC, LVAMd, LVAd and Volume.

Measurement

Press **Measurement** once.

Set

Use the **Trackball** to move the "×" cursor to either end of the major axis of the area to measure. Press **Set** to fix the start point cursor.
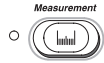
Ellipse

Use the **Trackball** to move the second cursor to the major axis measurement end point. Press the **Ellipse** up arrow key. An ellipse having an initial circle shape appears.

Set

Use the **Trackball** to position the ellipse, as necessary, and to size the measured axis. Press **Set** to complete the ellipse measurement and record the circumference and area.

Circumference/Area - Ellipse (B-Mode) (continued)

Prior to completing the ellipse measurement, the following keys can be used to fine tune the measurement.

Measurement

Press the **Measurement** key to toggle the activation of the measurement cursors.
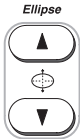
Ellipse

Press the **Ellipse** up arrow key to increase the size of the minor axis.

Press the **Ellipse** down arrow key to decrease the size of the minor axis.

Clear

Press **Clear** once to erase the ellipse and the current data measured. The original cursor is displayed to restart the measurement. Pressing **Clear** a second time exits the measurement function without completing the measurement.
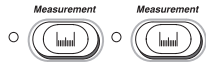
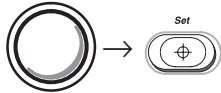**Set**

Press **Set** to complete the ellipse measurement.
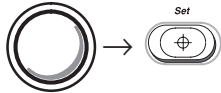
Circumference/Area - Trace (B-Mode)

Perform a circumference/area using the trace method for calculations such as AC, HC, LVAMd, LVAd and % Stenosis.

Press **Measurement** twice to display a dot "⊙" cursor on the screen.

Use the **Trackball** to move the dot "⊙" cursor to the measurement start point. Press **Set** to change the dot "⊙" cursor to a "×" cursor.

Use the **Trackball** to trace the measurement area. Press **Set** to fix the Circumference value displayed on the bottom of the screen and calculate the area.

*NOTE: When using the trace method, the **Zoom Size/Rotation** knob can be used to edit the trace line. Turn it clockwise or counterclockwise to erase the line (bit by bit) back from its current point. The erase function is limited to a small portion of the most recent trace.*

Peak Velocity (Doppler)

Perform a peak velocity measurement for calculations such as RI, PI, S/D Ratio, Max PG and Mean PG.
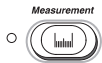
Press **Measurement**. The "×" cursor with a vertical dotted line appears.
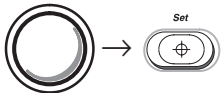
Use the **Trackball** to move the cursor to the desired point of measurement in the Doppler Spectrum.

Press **Set** to fix the velocity cursor. The velocity measurement in m/s or cm/s will be displayed at the bottom of the screen.

NOTE: The "Display MaxPG with Velocity" preset, located on Preset Program page 4, allows MaxPG to be displayed with the Peak Velocity measurement.

Time Interval (M-Mode and Doppler)

Perform a time interval measurement for calculations such as HR, PHT and ET.

Press **Measurement** twice in M-Mode and four times in Doppler. A "$\times$" cursor with vertical dotted lines appears when the cursor is in the M-Mode timeline/Doppler spectrum.
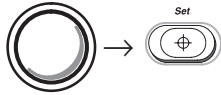
Use the **Trackball** to move the cursor to the measurement start point. Press **Set** to fix the first cursor.
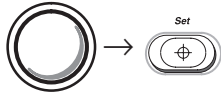
Use the **Trackball** to move the second cursor to the measurement end point. Press **Set** to complete the measurement.

The time interval between the two cursors is displayed.

Erasing Measurements

Pressing **Clear** or unfreezing the image erases all measurements and calculations on the display. Measurements and calculations, however, remain on the report pages.

Pressing **New Patient** erases all measurements and calculations on the display and clears the report pages.
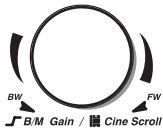
Rotating the **Cine Scroll** control erases measurements.

Adding a new measurement that exceeds the maximum number of allowable measurements erases the first or oldest measurement.

Report Pages

Specific diagnostic exam categories have report pages to summarize measurements and calculations performed while in that exam category. These categories are Obstetrics, Gynecology, Cardiology and Vascular.

A report page can be displayed by pressing **Measurement** and selecting it from the measurement sub-menu.

```
HOSPITAL NAME                        Oper ID:        98/05/09
ID:                  NAME:                            AGE:0
LMP(OPE)       GA(LMP)         EDD(LMP)         G0 P0 A0 E0
Ref MD:                       NOTE:
          POS:             PLAC:                    ← 1/2 ▣
MEASUREMENTS CUA  LAST    1    2    3    AGE        GP
BPD(HADLOCK)    y        (                 )
HC(HADLOCK)     y        (                 )
OFD(HC)                  (                 )
AC(HADLOCK)     y        (                 )
FL(HADLOCK)     y        (                 )
CRL(HADLOCK)    y        (                 )
GS(HELLMAN)     y        (                 )


  CALCULATIONS
CI          (70-86)        EFW     g±    g (  lb   oz)
FL/BPD      (71-87)        Based On:(                 )
FL/AC       (20-24)        AFI(cm)        HR(BPM)
FL/HC       (??.?-??.?)    LMP:(OPE)
HC/AC       (?.??-?.??)    AGE: LMP           CUA
                          EDD: LMP           CUA
  COMMENTS:
```

```
HOSPITAL NAME                        Oper ID:        05/09/98
ID:                  NAME:                            AGE:
LMP:                          G0 P0 A0 E0
Ref MD:                       NOTE:
  MEASUREMENTS            AVE           1    2    3
Uterus Length                         (               )
Uterus Width                          (               )
Uterus Height                         (               )

Right Ovary Length                    (               )
Right Ovary Width                     (               )
Right Ovary Height                    (               )

Left Ovary Length                     (               )
Left Ovary Width                      (               )
Left Ovary Height                     (               )

Endometrium Thickness                 (               )

  CALCULATIONS            AVE           1    2    3
Uterus RI
Right Ovary RI
Left Ovary RI

COMMENTS:
```

```
HOSPITAL NAME                        Oper ID:        05/09/98
ID:                  NAME:                            AGE:
SEX:  HEIGHT:      WEIGHT:        BSA:
Ref MD:                       NOTE:
  METHOD: Cubed
  MEASUREMENTS              AVE          1    2    3
          LVIDd                        (            )
          LVIDs                        (            )
          IVSd                         (            )
          IVSs                         (            )
          LVPWd                        (            )
          LVPWs                        (            )

  CALCULATIONS
          HR
          EdV
          EsV
          SV
          CO
          EF
          FS

  CHANGE METHOD

COMMENTS:
```

```
HOSPITAL NAME                        Oper ID:        05/09/98
ID:                  NAME:                            AGE:
SEX:  HEIGHT:      WEIGHT:        BSA:
Ref MD:                       NOTE:
  MEASUREMENTS             AVE           1    2    3
Left ICA                              (             )
Left ECA                              (             )
Left BIFURC                           (             )
Left CCA                              (             )
Left ICA/CCA                          (             )

Right ICA                             (             )
Right ECA                             (             )
Right BIFURC                          (             )
Right CCA                             (             )
Right ICA/CCA                         (             )

  CALCULATIONS
S/D Ratio                             (             )
A/B Ratio                             (             )
% Stenosis                            (             )
Pulsatility Index                     (             )
Resistivity Index                     (             )

COMMENTS:
```

Recording Images

Image Memory

Image Memory

Press **Image Memory** to temporarily store the maximum of 8 images in system memory.

The images are erased when the **New Patient** key is pressed or power is turned off.

Image Recall

Press **Image Recall** to display the last image stored in system memory.

Press **Top Menu Select** to display a sub-menu of all images stored in system memory. Use the **Sub-Menu Select** left/right arrow keys to highlight the desired image. Press the **Sub-Menu Select** down arrow key to display the image.

After recall, comments, measurements and body patterns can be added to the image. The image is then available for printing or archival.
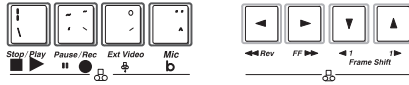
Printing

Record 1   **Record 2**

Use the **Record 1** or **Record 2** keys to print the image/report page on a black/white or color (option) video page printer.

The function of these keys was established during installation.

VCR Functions

Press the **Blue Shift** key to activate the keyboard/VCR controls.

Use with the Sony SVO–9500MD VCR. If a different model VCR is installed on the system, use the controls on the VCR.
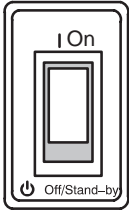
Probe Cleaning/Disinfection

Probes should be cleaned and disinfected after each use. The Probe Immersion Levels are provided with the probe but are also pictured in the *Probes* chapter of the User Manual.

NOTE: Special instructions for the E721 probe are found in the Probes chapter of the User Manual.

Power Off

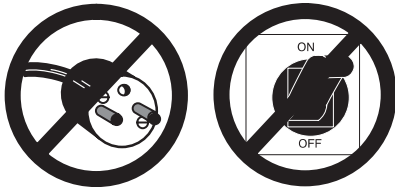To power down the system, press down on the Power On Power Off/Stand-by switch.

After turning the power off, the system takes a few seconds to update certain parameters to the hard drive before the power is disconnected.

NOTE: During this time the message
 "Do not pull Power Cable."
 "Do not turn off Breaker."
flashes on the monitor. The message "WARNING: NOW START THE POWER OFF PROCESS." is also displayed at the bottom of the screen.

While the system is running during this power down process, do **NOT** turn off the circuit breaker in the back of the machine and do **NOT** unplug the system from the wall outlet.

If the system has not turned off five minutes after pressing the power switch off, listen for hard drive activity. If there is no hard disk drive activity, the circuit breaker on the bottom of the power supply can be used to turn off the system. Do NOT turn off the circuit breaker while the hard disk is working.