2D System Overview - Release 3.0

ACUSON S2000 Ultrasound System

Quick Reference Guide

www.siemens.com/S2000

Introduction

This Quick Reference Guide contains brief descriptions and instructions for the functions most commonly used to perform 2D and Doppler exams. This supplement contains both standard and optional features but is not a substitute for the system User Manual.

Image Disclaimer

Images used in this guide are for educational purposes only. They have been modified or compressed, and may not reflect the actual image quality of the system.

Note: This guide shows multiple workflow options (keyboard and mouse) for Release 3.0. UI refers to the Control Panel and is noted UI.

Contents

- Exam Basics
- 2D Controls
- Color & Spectral Doppler Optimization
- Measurements & Calculations
- Text & Pictograms
- Data & Image Management
- Siemens Exclusive Technologies

Exam Basics

Press the **Power On/Off Switch** on the upper left side of the UI to turn the system on and off. A green blinking light indicates the power is on. The **Standby** option will quickly turn on, *or* shut down the system, within 30 seconds.

Patient Registration
Button

Patient Registration
Icon

Begin an Exam

1. Press the **Patient Registration** button on the UI *or* click the **Patient Registration** icon on the toolbar
2. Enter the patient name, ID and other exam information
3. Press the **TAB** key *or* roll the trackball to move to the next data field
4. Select the proper **Transducer** and **Study** type from the drop-down menus
5. Select a Workflow Protocol from the **Protocol** list (optional)
6. Click **OK** *or* press the **Store** button on the UI to start the exam

Optional if Using the Patient Scheduler (Modality Work List)

1. Press **Patient Browser (F2)** to open the **Patient Browser**

2. Double-click on the **Patient Scheduler** icon to view an updated Work List
3. Highlight the patient name (press the first letter of the last name to quickly scroll the list)
4. Click on the Patient drop-down menu and select Register
5. Select the appropriate transducer and Study Type on the Patient Demographic page

6. Click **OK** or press the **Store** button on the UI to start the exam

Note: If the patient name does not appear in the Work List:

a. Click on View at the top of the page

b. Select **Patient based work list query**

c. Enter the patient last name

d. Click on **Get Work List**

Store and Review Images

1. Press the **Store** button to save a static image on the local database
2. Press **Clip Store** to acquire and save a clip to the local database
3. The saved data displays in the thumbnail panel at the bottom of the screen

Print an Image

- Press the **Print** button to print the onscreen image

Note: Use the system configuration menu to assign print and/or store functions to the **Print** button.

Review an Image

- Press the **Review** button during an active exam to view and delete images

Note: The system must be preset to transfer images at end of exam, in order to delete images from Review mode.

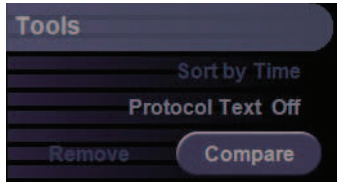
- Press the **Review** button *or* double-click a thumbnail image to activate Review mode during an active exam

Activate Review on a Previous Exam

1. Press **Patient Browser (F2)** to open the Patient Browser
2. Click on the Patient Folder
3. Double-click the **Image** icon to load the patient exam into Review

Use Compare Mode

- Available on the **Review** screen under **Tools** →



1. Press the **Review** button
2. Click on two images from the thumbnails
3. Click on **Compare** to display the images side-by-side

2D Controls

Basic System Optimization

- The chart below identifies presets that can be customized and saved to the **Image** knob.

Items in the table below are arranged alphabetically.

To Adjust / Control	Do This	Image Knob
2D Sector Width *Increase line density/ frame rate*	▪ Press the **Priority** key to select **2D FOV** ▪ Roll the trackball to sector in the width of the image ▪ Press the **Next** key to go between **Size** and **Position** of **2D FOV** ▪ Press the **Select** key to lock the image size **Note**: Manually re-size the image to return to full screen.	No
Depth	▪ Rotate the **Depth** control	No

Dynamic Range *Adjust grayscale levels within an image*	▪ Toggle the **Dynamic Range** key up or down to add or remove the amount of grayscale levels **Note**: Can be used on live or frozen images.	Yes
Dynamic TCE *Provides speckle reduction and contrast enhancement*	▪ Rotate the second LED control on the left side of the UI **Note**: Settings include **Off**, **Low**, **Medium** and **High**. As the level is increased, both Dynamic TCE speckle reduction and contrast enhancement are increased.	Yes
Edge	▪ Rotate the third LED control on the left side of the UI **Note**: Range is **0** – **4**; **4** applies the most edge enhancement.	Yes
Focal Zones *Control position and number of focal zones*	▪ Rotate the **Focus** control for position ▪ Press the **Focus** control to select the number of focal zones	No
Frequency	▪ Toggle the **MultiHz** key up or down on the UI to adjust the frequency	Yes
HD RES (Write) Zoom	▪ Press the **Zoom** control to initialize **HD RES** ▪ Rotate the **Zoom** control to adjust the size of ROI box ▪ Press **Zoom** again to activate **RES** **Note**: When **RES** is activated, HDZ appears on the lower right corner of the screen.	No

Image Presets	▪ Rotate the **Image** control on the UI to change the image preset ▪ Press the **Image** control to see a list of currently available image presets	Yes
Overall Gain	▪ Press the **TEQ** button ▪ Rotate the **2D** control ▪ Rotate the **Gain Freeze / Cine** wheel ▪ Adjust the **DGCs** **Note**: Adjust according to user preference.	No
Persistence *Weighted average of frames over time*	▪ Select the Persistence option located on the 2D tab of the onscreen Image Menu ▪ Rotate the **Menu** control to change the level (**0**-**4**) **Note**: Can only be adjusted when using SieClear 2, and not when using Advanced SieClear Spatial Compounding (ASSC). Increased persistence averages more frames over time, creating a smoother image. Decreased persistence, averages fewer frames over time, creating a grainier image.	Yes
Post Processing Maps *Selects a processing curve that assigns echo amplitudes to grayscale levels*	▪ Rotate the second LED control on the right side of the UI to select and apply **Note**: Maps range from **A**-**F** and can be adjusted on live or frozen images and in M-mode and PW Doppler.	Yes

SieClear Spatial Compounding and Advanced SieClear Spatial Compounding *Utilizes multiple lines of sight to provide improvements in contrast resolution and border detection*	▪ Rotate the first LED on the left side of the UI to change the compounding level **Note**: The selected transducer determines how many levels of compounding are available.	Yes
Space/Time *Spatial resolution vs. temporal resolution*	▪ Rotate the first LED control on the right side of the UI **Note**: Increase for better spatial resolution and decrease for better temporal resolution.	Yes
Tints *Colorizes the grayscale image*	▪ Rotate the third LED control on the right side of the UI **Note**: Tints range from **0**-**15** and can be adjusted on live or frozen images and in M-mode and PW Doppler.	Yes
Tissue Harmonic Imaging (THI) *Reduces noise clutter with better contrast enhancement and improved axial resolution over fundamental imaging*	▪ Press the soft key on the home base to turn on or off ▪ Toggle the **MultiHz** key up or down	Yes

Zoom	▪ Rotate the **Zoom** control to increase or decrease image magnification ▪ Roll the trackball to pan the image **Note**: Zoom magnifies from the center of the onscreen image; use pan to bring in the area of interest. Available on live or frozen images and in M-mode and PW Doppler.	No

2D Imaging Features

Items in the table below are arranged alphabetically.

Feature	To Use Feature
ASC Dual *Display two live images side-by-side with and without compounding*	▪ Click on the **ASC Dual** option in the 2D tab of the onscreen Image menu to display **Note**: The left side displays the image without spatial compounding and the right displays with spatial compounding. Can only be used when a level of ASSC 3 or higher is selected.
Dual *Side-by-side imaging*	▪ Press the **Dual** key to activate dual screen display ▪ Toggle the **Update** key to go between left and right images **Note**: Color must be activated before entering Dual mode.

Live Dual *Display two live images side-by-side*	▪ Select the "Live Dual" option in the 2D tab of the onscreen Image menu **Note**: Can be used with color at any time.
SieScape Panoramic Imaging	▪ Select **SieScape** from the Feature menu on the left side of the screen ▪ Press the **Update** key to start acquiring image ▪ Scan through area of interest in a long axis of the transducer ▪ Press **Gain Freeze/Cine** to stop the acquisition **Note**: Once an image is frozen, roll the trackball to rotate the image. Use the **Scroll wheel** *or* **Zoom** control to zoom. Use **Restore** to bring the image back to original size. Press the **Calcs** key to measure on a SieScape image. Use the **Gain Freeze/Cine** wheel to Cine through the SieScape image.
Steer Image *Linear transducers only* *Improve the angle of insonance between anatomy and the ultrasound beam*	▪ Press the **Priority** key to activate Steer ▪ Roll the trackball to steer the FOV left or right **Note**: ASC must be off *or* set to SC2.
Trapezoid *Linear transducers only* *Allows more visualization of tissue on the screen*	▪ Press the soft key to activate Trapezoid image format ▪ Press the **Next** key to go between position and size of the image

Color Doppler & Spectral Doppler Optimization

Color Doppler Imaging

Items in the table below are arranged alphabetically.

To Adjust / Control	Do This	Image Knob
Baseline	▪ Toggle the **Baseline** key up or down	Yes
Color Doppler Energy and Color Doppler Velocity	▪ Press the **soft key** to cycle between **(CDE)** and velocity color **(CDV)**	No
Color Gain	▪ Rotate the **C** control	No
Engage Color Doppler	▪ Press the **C** control	No
Exit Color Doppler	▪ Press the **PW** control *or* press the **2D** control to return to imaging	No
Frequency	▪ Toggle the **MultiHz** key up or down	Yes
Image Presets	▪ Rotate the **Image** knob to change image presets ▪ Press the **Image** knob to view a list of all available image presets	Yes

Invert *Change the orientation of the Color Doppler velocity display*	▪ Press the **Invert** button	Yes
ROI Size and Position	▪ With color active, press the **Next** key to alternate between **Size** and **Position** ▪ Roll the trackball to adjust size and position	No
Scale *Pulsed Repetition Frequency (PRF)*	▪ Toggle the **Scale** key up or down to increase or decrease	Yes
Spatial Resolution and Speed	▪ Rotate the first LCD control on the left side of the UI **Note:** Spatial resolution is inversely proportional to temporal resolution.	Yes
Steer	▪ Press the **Priority** key to activate **C ROI** ▪ Press **Next** and select **Steer** ▪ Roll the trackball to get to the proper angle	No

PW Doppler

Items in the table below are arranged alphabetically.

To Adjust / Control	Do This	Image Knob
Angle Correct	▪ Press the **0/60°** control to cycle through angle correction ▪ Rotate the **0/60°** control to fine tune the angle	Yes
Baseline	▪ Toggle the **Baseline** key up or down	Yes
Frequency	▪ Toggle the **MultiHz** key up or down	Yes
Gate Size	▪ Roll the **Scroll wheel** up or down	Yes
Overall Doppler Gain	▪ Rotate the **Doppler (PW)** control	No
PW Doppler	▪ Press the **PW** control to engage PW Doppler ▪ Roll the trackball to position the cursor ▪ Press **PW** again to start spectral waveform *or* press **Update** **Note**: Press **Next** to go between **Position** and **Steer**. ▪ Press the **PW** control *or* press the **2D** control to exit PW Doppler and return to imaging	No
Scale *Pulsed Repetition Frequency (PRF)*	▪ Toggle the **Scale** key up or down to increase or decrease	Yes

Steer	▪ Press the **Priority** key ▪ Select the **PW** gate ▪ Press **Next** to steer ▪ Roll the trackball to adjust the steer angle ▪ Press **Select** to lock in the angle	Yes
Sweep Speed	▪ Rotate the LCD control on the right side of the UI **Note:** Sweep speed can be adjusted during real-time *or* on a frozen M-mode Doppler strip.	Yes
TEQ	▪ Press the **TEQ** button	No

M-mode

Items in the table below are arranged alphabetically.

To Adjust / Control	Do This
M-mode	▪ Press the **M** control to engage M-mode ▪ Roll the trackball to adjust the position of the M-mode cursor ▪ Press the **M** control again to activate spectral waveform ▪ Press the **M** control to exit, *or* ▪ Press the **2D** control to exit and return to 2D imaging

M-mode Cursor	▪ Press **Next** to select **Size** or **Position** ▪ Roll the trackball to make adjustments **Note**: The active function is displayed in green. Sweep speed can be adjusted during real-time or on a frozen M-mode Doppler strip.
Overall Gain	▪ Rotate the **M** control

Measurements & Calculations

General Measurement Tools

Activate Calculations (one of two methods):

- Press the **Calcs** button to activate the measurement function on real-time or frozen images

or

- Press the **Gain Freeze/Cine** button to automatically go to Calcs (must be preset in the Setup menu)

Perform an Unlabeled Measurement

1. Roll the trackball to place the first caliper in the area of interest
2. Press **Next** for the second distance caliper *or* ellipse control
3. Press **Select** to anchor a caliper *or* enter a measurement
4. Press **Next** to go between the active calipers
5. Press **Priority** to reactivate locked caliper sets *or* scroll through different caliper sets

Tip: To delete the caliper set, press the **Delete** soft key or **Cine** back one position.

Perform a Labeled Measurement and Add it to the Report Package

Note: Application-specific measurements are particular to one study type.

- The measurement tools and labels are organized by the active imaging mode and application (e.g., abdomen)
- Only labeled measurements are copied to a patient report

1. Press the **Gain Freeze/Cine** button
2. Click on a measurement label (e.g., Liver)

Note: A measurement label can also be selected after calipers are placed.

3. Roll the trackball to place the first caliper in the area of interest
4. Press **Next** to activate the second caliper
5. Press **Select** *or* **Store** to complete a measurement and send the value(s) to the Report
6. Press **Priority** to reactivate locked caliper sets or scroll through different caliper sets

Additional Measurements

1. Activate the Report page
2. Click on the Page 1 drop-down menu on the imaging screen
3. Scroll down to the desired page
4. Press **Select** to activate page

Perform Advanced Measurements, e.g, Volume Measurement

1. Select the Compound drop-down menu from the top left-hand side of the screen when Calcs are active
2. Select the appropriate measurement from the drop down list: **Stenosis**, **Volume**, **Area Ratio**, **Distance Ratio** *or* **Volume Flow**

Calculation Reports

- Calculation worksheets and reports are offered for each preset when labeled measurements are entered

1. Press **Report (F1)** to activate Reports

2. Scroll to view the Report pages
3. Click on **Store Report** to capture the entire formalized worksheet
4. Click **End Exam** to close the patient study

Note: **Transfer Report** will send DICOM measurements to structured reporting in PACS (customers must have structured reporting capabilities).

Import Images into the Report

1. If necessary, press **Report (F1)** to activate Reports
2. Scroll down to the bottom of the Report screen and click on an image in the thumbnails
3. Roll the trackball to drag the image into appropriate square
4. Press **Select** to anchor the image

Note: Click on the **Format** icon to display up to 16 images on the Report page.

Text & Pictograms

Enter Text

1. Press the **Text** key to activate the cursor

2. Roll the trackball to place the cursor in the appropriate place in the image
3. Type the text and press **Select**, *or*, if configured, press the appropriate **Text** button

Note: **Text A**, **B**, **C**, and **D** can be customized and reordered for each exam preset.

- The system can be preset to automatically enter the Text Menu by pressing the **Gain Freeze/Cine** button

Tip: When typing, press **Tab** to auto-complete the annotation.

- The annotation can be configured to be on or off

Move Text

1. If necessary, press the **Text** key to activate the cursor
2. Roll the trackball to place the cursor within the text
3. Double-click **Select** to highlight (text is highlighted in green)
4. Roll the trackball to the new location and press **Select**

Drag and Drop Text

1. If necessary, press the **Text** key to activate the cursor
2. Position the cursor in the text to move
3. Double-click **Select** to highlight (text is highlighted in green)
4. Roll the trackball to move the selection over the text to be replaced and press **Select**

Delete Text

1. If Calcs is active, press the soft key, and select either **Clear Screen**, **Delete Word** or **Delete Line**

Tip: If Calcs is not active, press and hold the **Text** key until the screen is cleared.

Place an Arrow(s)

1. Press the **Arrow Up** button on the bottom right side of the keyboard

2. If necessary, press **Next** to rotate the direction of the arrow
3. Roll the trackball to position the arrow and press **Select**

Note: Use the steps above to place additional arrows.

Delete an Arrow(s)

1. Press the **Delete Arrow** *or* the **Clear Screen** soft key

Note: The **Delete Arrow** soft key deletes one arrow at a time, starting with the last arrow placed onscreen.

Add a Pictogram(s)

1. Press the **Body Marker** key on the bottom right side of the keyboard

2. Rotate the **Scroll wheel** to cycle through pictograms
3. Press **Next** to go between **Position** and **Rotation** of the marker
4. Roll the trackball to position the marker on the pictogram and press **Select**

Delete a Pictogram

1. Press the **Delete Body Marker** *or* **Clear Screen** soft key

Data & Image Management

Restart an Exam

1. Press **Patient Browser (F2)** to open the Patient Browser
2. Select the patient name and click on the middle yellow folder
3. Click on the Patient drop-down menu and select **Register**
4. Select the transducer and operator initials
5. Click **OK**

Note: Restart is available at all times. New images can be added to the existing patient exam.

End an Exam

1. Press the **Review** button
2. Click on **End Exam**

Note: Starting a new patient also ends a current exam.

Send Patient Exam to PACS

1. Press **Patient Browser (F2)** to open the Patient Browser
2. Select the **Archive To** icon
3. Select **Destination**
4. Select **Archive To**

Note: This can be done before closing the study.

Tip: Closing a study will automatically send to PACS if the system is preset to "Send on study close".

Delete Images from an Active Case

1. Click on an image from the thumbnail
2. Click on the **Delete** icon located on the lower right of the screen

Note: The system must be preset to "Send at the End of Exam" or the image will not be deleted.

Delete Images from Review During an Active Exam

1. Press **Review**
2. Click and highlight the image to delete
3. Press the **Delete** soft key

Transfer an Exam from the Hard Drive to CD-R/DVD

1. Insert the CD-R/DVD
2. Press **Patient Browser (F2)** to open the Patient Browser and Local Database
3. Select the patient name/s

Tip: Hold **CTRL** to select more than one patient name.

4. Use one of the following transfer methods below

Transfer in DICOM Format

1. With patient/s selected, select the Transfer drop-down menu
2. Select **Archive to CD-R**

Note: *syngo* fastView and Showcase DICOM viewers will be burned onto the CD-R/ or DVD.

Transfer in PC Format (AVI or JPEG)

1. With the patient(s) selected, select the Transfer drop-down menu
2. Select **Export to CD in PC Format**

Transfer to a USB Drive in PC Format

1. With the patient(s) selected, select the Transfer drop-down menu
2. Select **Export to USB** in **PC format**

Note: The USB must have an export folder on it to accept images.

Import All Images from a CD to the Local Database

1. Insert the CD-R/DVD
2. Press **Patient Browser (F2)** to open the Patient Browser

3. Click on **CD**
4. Click on the Transfer drop-down menu
5. Click on **Import from Off-line**

Note: Image(s) will be removed when the exam is closed.

Resend an Exam to PACS

1. Press **Patient Browser (F2)** to open the Patient Browser
2. Click on **Local Database**
3. Click on the patient name
4. Click the **Archive to** icon or select **Archive to** from the drop-down menu
5. Select the destination
6. Select **Archive to**

De-Identify a Patient (Teaching Files, Name Changes)

1. Press **Patient Browser (F2)** to open the Patient Browser
2. Click on **Local Database**
3. Click the patient name
4. Click on the image folder
5. Click on **Patient** drop-down menu and select **De-Identify**
6. Rename the exam
7. Click **OK**

Note: The new case will be added to the Local Database within minutes. 3D/4D volumes will not be transferred for re-manipulation.

Siemens Exclusive Technologies

Clarify Vascular Enhancement Technology (purchasable option)

1. During 2D imaging, press the **Clarify** soft key
2. Roll the trackball to place the ROI box
3. Press **Next** to go between **Size** and **Position**
4. Roll the **Scroll wheel** to adjust the level of sensitivity:
   1 = least sensitive, **7** = most sensitive

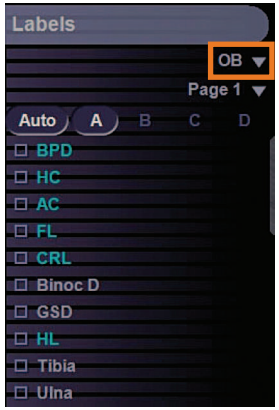
syngo Auto OB (purchasable option)

1. Ensure the **OB** exam type is selected →
2. Press the **Calcs** button

Note: Available Auto OB measurements are highlighted in green.

3. Click on the desired measurement (semi-automated measurements are live onscreen)
4. Press **Next** to go between the cursors (active and available)
5. Press **Select** to lock in the measurement and transfer it to the Report page

Tip: Press **Store** to transfer the measurement.



syngo eSieCalcs Native Tracing Software (purchasable option)

1. During 2D imaging, press the **Gain Freeze/ Cine** button
2. Press the **Calcs** button
3. Select the eSieCalcs menu option
4. Roll the trackball to move the cursor into the image
5. Press the **Next** key to activate ROI box

Note: **Next** toggles between the two active calipers allowing movement of the ROI box and a change in size.

6. Press **Select** to calculate and display the measurement

Adjust an eSieCalc Measurement

1. Press **Next** to reactivate calipers
2. Roll the trackball to trace a new area of interest
3. Press **Select** to recalculate measurement

Tip: When placing the ROI box over the area of interest, do not make the box too big.

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