Quick Card

Freehand 3D for Obstetrics

ACUSON Sequoia Ultrasound System
3.5 (VB30)

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Getting Started

The 3D volume data set is a series of 2D images gathered manually over a timed acquisition. Measurements can not be performed on the MPR's.

- The 5C1, 9C2, 9EC4, 10EV3, 10L4, 11M2, 11M3, 15L4, 18H6, 18L6, and HLX transducers are available to perform acquisitions of Freehand 3D volume data sets.


Step 1

- Select the appropriate curved transducer for scanning

- Press **3D/4D control**

- The set up Touch Screen corresponding to the transducer selected will be displayed, showing the first scan direction and Rocked, highlighted in orange

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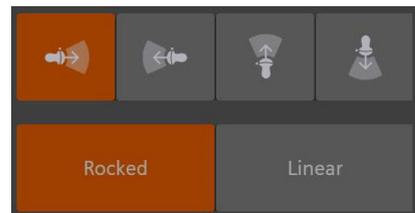
Step 2

- If desired, place the Volume of Interest (VOI) to include the anatomy desired. The VOI can be curved by selecting the Curve option on the Trackball Set key

- The Volume of Interest box may be deactivated by selecting the VOI key on the Touch Screen. When disabled, the entire field of view will be acquired in the volume. The VOI can also be selected after the acquisition is complete.
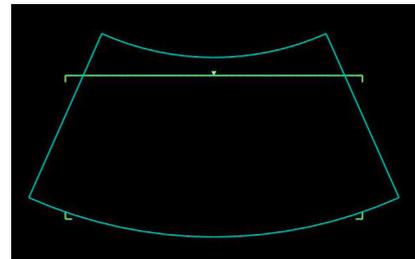
3D

- Adjust Touch Screen parameters

- Find the middle of the target anatomy

- Angle the transducer to the patient's right of or inferior to the target

- Press Update above the Trackball to Start and perform a single sweep in the short axis with a paint brush motion

- Sweep right to left or inferior to superior

- Follow the timing of the progress bar

Step 3

3D

- Press **Image** to store the volume

Render Modes

There are four render modes available that can be selected on the Touch Screen before (page 1) or after acquisition (page 2):

- **Surface:** Smooths the image contours, creating a soft-sculptured appearance for highlighting surface features of soft tissue

- **Vascular (Minimum Intensity Projection/Min IP):** Best for visualizing hypo-echoic lesions and vascular structures

- **Skeletal (Maximum Intensity Projection/Max IP):** Best for intrauterine devices and bony structures

- **Light Source:** Helps increase depth perception, reveals surface details, provides an element of texture, and can provide a deeper understanding of relational anatomy. The adjustable light source direction is automatically activated in a 1:1 layout, but may be activated/deactivated in any layout by selecting the **Light** key on page 1 of the Touch Screen.
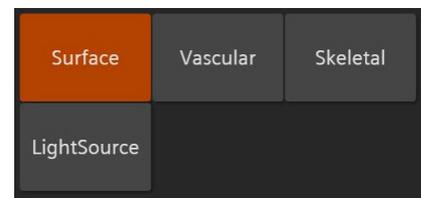
Use the Trackball to adjust the direction of the light.

FlexPlane

The FlexPlane tool allows the user to obtain and visualize anatomy of any shape along any plane. This is especially useful when imaging complex or irregularly shaped structures.

The user can choose from:

• **Line** – A straight line in any direction

• **Trace** – A freehand line traced in any direction

• **Spline** – An open spline controlled by selecting the Set key along the path of the spline
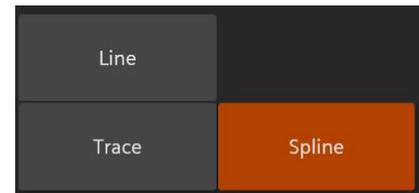
Once the desired option is chosen:

• Press either **Set** key to begin the line

• Press either **Set** key again to end the Line/Trace tools or to change the direction of the Spline tool (double-click either **Set** key to end the Spline)

• To redraw the slice, press the **Update** key

• Use the rotary soft keys to adjust the volume thickness as well as line or slice orientation.
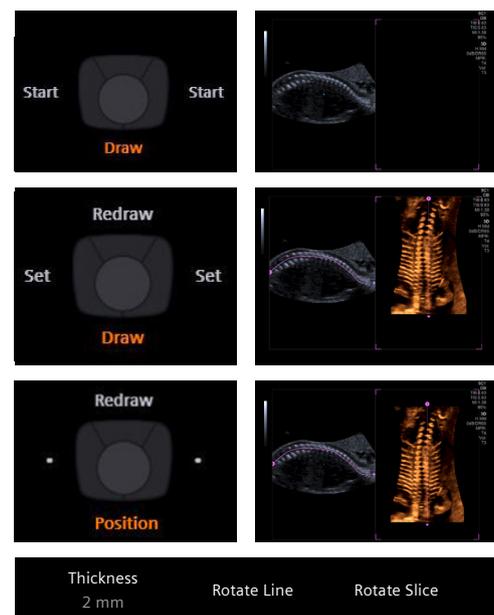
MPR & VR Orientation

Adjust the Multiplanar Renderings (MPR) and the volume using the rotation tools on the control panel.

• Select the desired quadrant from the Touch Screen

• The MPR slicing function is manipulated using the 3D/4D control

• The X axis is manipulated using the M-mode control

• The Y axis is manipulated using the PW Doppler control

• The Z axis is manipulated using the Color Doppler control

Use the rotation tools on the Touch Screen to quickly rotate the volume rendering by set degrees.
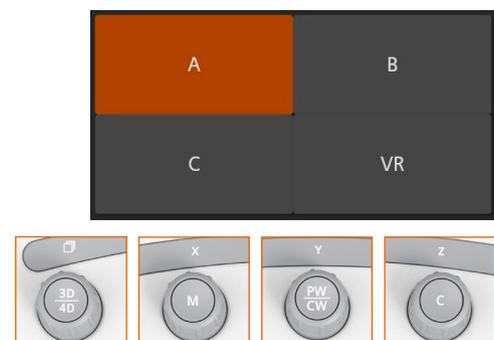
Multislice

The Multislice tab contains options for viewing multiple slices of the selected MPR plane at the same time. It is often referred to as a CT or MRI view.

- Select the desired plane using the A, B, and C keys

- Select the desired layout from the Touch Screen

- Use the rotary soft keys to adjust the number of slices, distance between slices, and the position of the slices

| Slices	Distance	Position of Slices
5	2 mm	0 mm
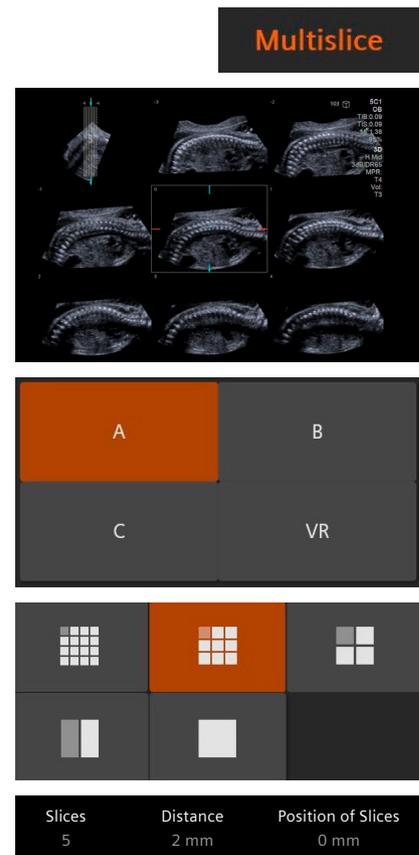
Editing

The editing tab contains options for removing unnecessary structures.

- Select the desired tool from the Touch Screen
- Using the Trackball and **Set** keys to delineate the area for removal
- Place the scissor icon in the area to be removed and press the **Set** key to finalize
- Edits may be reversed using the Touch Screen options
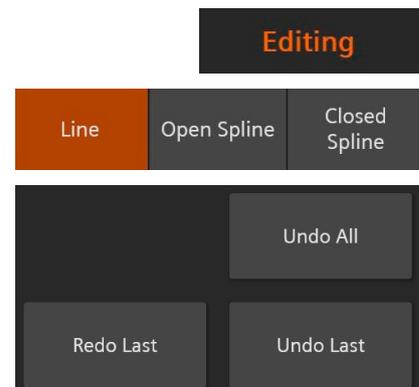
Animation

- The volume can be animated to rotate up to 360 degrees

- Animations are located under the Editing tab

- Curved arrows will continuously rotate the volume up to 360 degrees after using the Trackball to select the First image to start with and the Last image to end with; the image will appear to rotate 360 degrees

- Double-straight arrows will animate the volume to rotate from the **First** selected image to the **Last** selected image in one direction; then go back in the opposite direction from the Last to the First and repeat

- Select the play icon to start the animation

- X, Y, and Z controls can be used on the volume before animation

- The speed can be adjusted using the Rotary Control as Slow, Medium, and Fast

- Animations can be saved using the on-board DVR
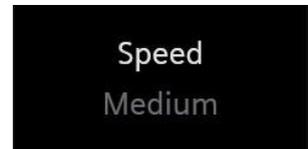
Speed
Medium

Additional Optimization – Acquisition

Quality

- Adjusts the resolution and sweep speed between Low, Mid, and High

Additional Optimization – VR (choose VR on the Touch Screen)

Threshold

- Decreasing the threshold removes low-level echoes while increasing the threshold adds low-level echoes

Opacity

- Adjusts the transparency of the voxel

Smooth

- Averages the edges of the voxels with adjacent voxels to smooth the volume image appearance

Brightness

- Changes the voxel saturation

Contrast

- Raises or lowers the percentage of contrast to enhance differences in tissue

Tint

- Applies assigned color shades to the gray scale

Additional Optimization – MPR (choose MPR on the Touch Screen)

Dynamic Range

- Decreasing the threshold removes low-level echoes while increasing the threshold adds low-level echoes

**Map**

- Adjusts the transparency of the voxel

Tint

- Applies assigned color shades to the gray scale

Review

- Select **Review** from the Touch Screen with the pointer, select the image for review

- Select the **3D/4D** tab on the Touch Screen to activate the volume manipulation tools if desired

- Any additional images stored while the volume is active in the **3D/4D** tab will be stored as volumes. Additional images stored while in the **Review** tab will be stored as still images.

Patient

Imaging

Review

Report

3D/4D

Review
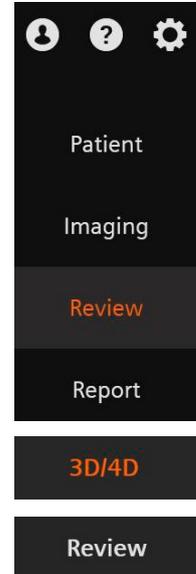
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Our portfolio, spanning in vitro and in vivo diagnostics to image-guided therapy and cancer care, is crucial for clinical decision-making and treatment pathways. With the unique combination of our strengths in patient twinning[1], precision therapy, as well as digital, data, and artificial intelligence (AI), we are well positioned to take on the greatest challenges in healthcare. We will continue to build on these strengths to help overcome the world's most threatening diseases, enable efficient operations, and expand access to care.

We are a team of more than 71,000 Healthineers in over 70 countries passionately pushing the boundaries of what is possible in healthcare to help improve the lives of people around the world.

[1] *Personalization of diagnosis, therapy selection and monitoring, aftercare, and managing health.*