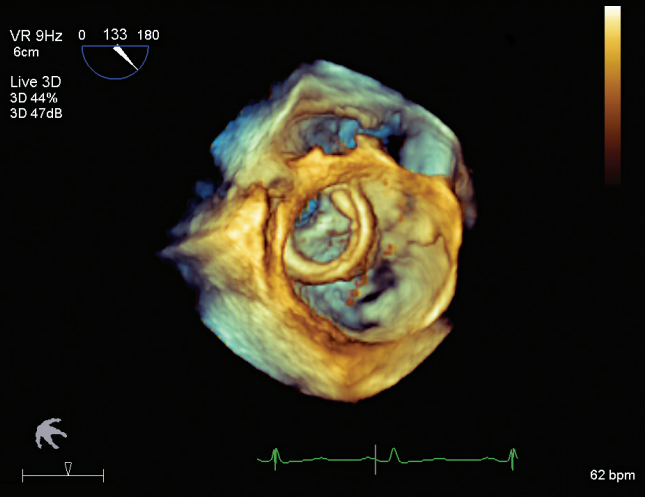

Quick Guide
CX50 xMATRIX – Live 3D TEE imaging

PHILIPS

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Getting started

- Connect the X7-2t transducer directly into the side port of the system or the multiport adaptor on the CX50 cart.
- To begin an exam, press **Patient** on the keyboard and do one of the following:
  - Select a patient name from the modality work list (if available)
  - Manually enter patient data
  - Select **Temporary ID**.
- Press **Transducer** on the top row of the keyboard, to activate the X7-2t

3D controls

- **Quick Keys:** Use the multifunction knobs located at the top of the control panel to adjust the two rows of corresponding imaging function labels displayed at the bottom of the screen. Available functions depend on the application, preset and transducer. Turn the knob to select options in the bottom row and press the knob to select options in the top row. The **Next** key scrolls to the 2nd page of labels.
- **3D** and **xPlane Controls:** The **3D Zoom/Preview, Live 3D,** and **xPlane** controls (lower left control panel) are multifunctional controls used to activate 3D modes and rotate the X, Y and Z planes.
  - **3D Zoom/Preview:** Press to toggle between Preview and 3D Zoom. Turn to rotate on Z axis.
  - **Live 3D:** Press to activate Live 3D and turn to rotate on the Y axis.
  - **xPlane:** Press to activate xPlane and turn to rotate on the X axis
- To change angles for Live 3D or xPlane, rotate the **Seek Angle** quick key or manipulate controls on the X7-2t transducer. The Seek Angle icon and temperature information is displayed at the top of the monitor.

Imaging modes

- **xPlane** provides simultaneous imaging of 2 orthogonal planes in grayscale and with color Doppler. Users can simultaneously tilt and rotate the right image which is helpful during interventional procedures.
  - Press the **xPlane** dual function rotary knob to activate.
  - Use the quick key controls to adjust the xPlane imaging controls displayed at the bottom of the screen.
    - Press the **Tilt** quick key to toggle between Lateral and Elevation.
    - Turn the **Tilt Angle** quick key or move the trackball to change the lateral or elevation tilt angle.
  - Press the **Color** control panel key to activate color Doppler.
- **Live 3D** is optimized for evaluating small areas and specific structures (valvular and congenital evaluations, and interventional guidance).
  - Press **Live 3D** dual function rotary knob to activate.
  - Default display format is **"Volume Only"**.
  - Use the quick keys to adjust the Live 3D imaging controls displayed at the bottom of the screen. (See the "Image Optimization" and "Image Manipulation" sections for more detailed information.)
  - Measurements are available in all 3D modes and include Area, Length, and Circumference.
- **Live 3D Color** is optimized for valvular and ASD/VSD evaluations.
  - Activate **Live 3D** and press **Color**.
  - Target Volume Rate works well for achieving optimal volume rates when using color Doppler. (See "Image Optimization" section for more information.)
  - Activating color in Live 3D reduces the region of interest (ROI).

Tip: To achieve the best volume rate, optimize image in 2D and then enter 3D

- **Live 3D Zoom** is optimized for valvular, congenital, and ASD/VSD evaluations. **Preview** allows the user to optimize the ROI box for size and position before entering Zoom.
  - Press **3D Zoom/Preview** to enter Preview. Adjust ROI using the trackball; and then press again to activate **3D Zoom**. (3D Zoom will orient to view from top of volume.)
  - Turn the **Elevation Width** quick key to adjust, if desired.
  - Use the quick keys to adjust the 3D Zoom/Preview imaging controls displayed at the bottom of the screen. (See the "Image Optimization" and "Image Manipulation" sections for more detailed information.)

Note: 3D Zoom will re-orient to view from the top of the volume

- **Full Volume** is optimized to encompass the entire heart within the volume.
  - Activate **Live 3D**, and then press **Full Volume** quick key.
  - Use the quick keys to adjust the Full Volume imaging controls displayed at the bottom of the screen. (See the "Image Optimization" and "Image Manipulation" sections for more detailed information.)

iSCAN

- **iSCAN** provides one-time optimization of imaging parameters in 2D, 3D and Doppler acquisition.
  - Press **iSCAN** to activate.
  - Turn the **iSCAN Gain** quick key to adjust gain brightness.
  - **iSCAN** remains on when switching to other modes.

Note: AutoSCAN is defaulted OFF for 3D TEE

Target Volume Rate

- **Target Volume Rate (Target VR** quick key**)** allows the user to "dial in" the volume rate for greater control of image quality versus frame rate needs. Target VR determines image resolution independent of the size of the volume by increasing or decreasing the rate.
  - Increased Volume Rate = *decreased* spacial resolution and *increased* line spacing for better field of view during device placement
  - Decreased Volume Rate = *increased* spacial resolution and *decreased* line spacing for more detailed resolution.
  - Target VR is available with all 3D imaging modes except xPlane.
  - Activate desired imaging mode and adjust the **Target VR** by turning the quick key.

Tip: To maximize and increase the frame rate: Adjust **Target VR** quick key, decrease **Sector Width** and reduce **Depth**.

Elevation and Rotation controls

- **Elevation Position** and **Elevation Width** quick keys allow adjustment in both dimensions: depth and width.
  - **Elevation Width** brings dimension "in and out" of the screen and expands the image.
  - **Elevation Position** moves "in and out" of the image.
- **Rotation Style** quick key is located on the 2nd page. Choose **Absolute** or **Relative** setting. **Rotate Z** quick key is located on the 1st page.
  - **Absolute** setting rotates the image relative to the acquisition axes of the image.
  - **Relative** setting rotates the image relative to the display screen.
  - **Rotate-Z** setting rotates the volume view on the Z Axis.

3D cropping tools

- **Cropping** quick key launches the traditional red, green, and blue cropping tools.
- **Auto Crop** quick key automatically crops half of the volume to expose structures of interest.
- **Crop Side** settings are Front, Back, Left, Right, Top, and Bottom. The default side for Auto Crop is **Front**.
  - Crops the volume using the crop plane selected with **Crop Side** quick key.
- **Crop Adjust** quick key is adjustable by turning the quick key knob.
  - Available settings are 1% to 100%.
- **Lock View to Volume** quick key prevents the volume and crop plane from rotating independently. Control is available when the **Cropping** quick key is activated. This is the default setting.
- **Unlock View from Volume** quick key allows the 3D volume and the crop plane to be rotated individually.

- **Undo Crop** quick key is used to undo the last plane crop adjustment and move the crop plane back one step at a time.
- **Redo Crop** quick key will restore the crop plane back one step.
- **Reset Cropping** quick key is used to reset all cropping adjustments and set Crop Adjust to "0".

Save/Restore features

- **Save View** quick key is used to store the current orientation, size and position of the 3D Volume (unless 3D Home is invoked).
  - Press **Save View** quick key to save all settings. User must rotate Save View control to enable and see Restore View quick key.
- **Restore View** quick key returns to the view selected as the preferred view for Save view.
- **3D Home** quick key is used to reset the orientation of the image views to their **original** 3D orientations.
  This control does not affect cropping.
- **Flip View** quick key is used to rotate the 3D Volume 180 degrees about the Y axis.
- **Swivel** quick key is located on the 2nd page.
  - Swivel function is available with a frozen image or cine-loop.
  - Quick keys available with Swivel: **Speed, Direction, Min Angle,** and **Max Angle**.
  - Swivel images can be acquired and exported.
  - The **Live 3D Export Volume Datasets** and **Swivel Loops** options must be checked in **Export Options**.

Basic 2D Measurements

- **Basic 2D Measurements** available on 3D images include: Length, Area, and Circumference.
- Measurements only available on the reference images when using the **Format Vol + Ref.**

3D Orientation Marker

- **3D Orientation Marker** or **"Silver Man"** displays the anatomical position and is synched with trackball rotation of the X, Y, and Z planes.
  - The orientation marker also appears on the Philips Allura EchoNavigator system.
  - The system display assumes the TEE transducer is in the mid esophageal position, even though in practice the transducer may be in another position.

3D Depth Markers

- **3D Markers** help locate structures within a volume and pinpoint targets for interventions. They can be activated in **Live 3D**, **3D Zoom**, and **3D Zoom Preview**. The user can crop or rotate the volume to visualize markers.

1. Activate **Live 3D, 3D Zoom** or **3D Zoom Preview,** and then press the **3D Marker** quick key.
   - Use the trackball to position the marker on the image.
   - Up to three markers can be placed on a volume and each marker has a unique shape: Circle, Square and Diamond.
2. The active marker is green and can be acquired as part of an image.
   - Adjust the 3D Marker depth or elevation within the volume using the **Marker Depth** quick key.
   - Turn clockwise to move the marker away from the screen (marker appears smaller).
3. Turn counter clockwise to move the marker towards the screen (marker appears larger).
4. Press **Enter** to anchor the marker and place another marker.
5. Locate the last marker placed using the **Find Marker** quick key. A line appears between the left side of the display and the marker.
6. Erase markers one at a time using the **Erase** quick key; or erase all markers using **Erase All Markers** quick key.
7. Select an existing marker by turning the **Select Marker** quick key rotary.
8. Press **Next** to exit the marker mode. (Next key is located in middle of rotary knobs.)

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