Release Notes

v2.0.2 (22 November 2023)

Improvements

- Servicing Dashboard Live Camera Calibration workflow overhauled to allow manual placement of corner points and improved centering of image based on motion stage bounds
- Servicing Dashboard has a button for exporting the latest configuration and calibration files to a selected directory
- Servicing Dashboard Quality Control protocol can be stopped by closing the progress dialog
- Servicing Dashboard Quality Control protocol contains more detailed instructions about test setups
- Servicing Dashboard Quality Control has a load button in the failed results table to quickly load the data for more in depth inspection
- Servicing Dashboard Quality Control automates turning off heated imaging bays for relevant tests
- Servicing Dashboard Quality Control ultrasound stream test ROI is shorter to avoid artifacts near the edge of the imaging membrane
- Servicing Dashboard Quality Control options are simplified when not in Research Imaging Mode

Fixes

- Acquisition was disabled when Nvidia driver >=530 was installed
- The wobbler frame rate was incorrect upon entering Acoustic Angiography imaging mode resulting in scans taking longer than expected
- Some volumes failed to load if they were located in a custom created folder hierarchy
- Certain 3D Scan ROI length values were unable to be set due to length enforcement processing on each individually typed digit
- Shear Wave Elastography 2D range gate was not updated when a 3D Scan ROI was manipulated on a loaded 3D SWE volume
- Add (Auto) for 3D SWE volumes incorrectly included empty frames at the volume bounds
- Volumes with missing data files (.raw) were incorrectly allowed to be added to reprocessing windows such as Volume Reconstructor, Phase Gating and SWE Processing
- Servicing Dashboard Quality Control window obscured the view of the ultrasound live streams
- Servicing Dashboard Quality Control results were sometimes unnecessarily displayed in scientific notation
- Servicing Dashboard Quality Control encoder tests would fail for continuous scan mode types
- Servicing Dashboard Quality Control requested Shear Wave Elastography phantom serial number even though test was not a visible option
- Servicing Dashboard Quality Control loaded QC Report cells could be edited by the user
- Servicing Dashboard Quality Control live streams could not be seen during instructional messages when loaded volumes were displayed

v2.0.1 (25 August 2023)

Improvements

- SonoEQ and related dependencies are now all installed into "C:/Program Files/Revvity"

- Splash screen contains a light border for better visibility on dark backgrounds

Fixes

- Shear Wave Elastography acquisitions had drop out in far field regions
- Remember ROI size and position setting did not restore the remembered info when switching between imaging modes
- Sometimes there were missing B-Mode frames from a 3D Shear Wave Elastography acquisition
- Right-click restore view layout option to restore the layout from a maximized state did not do anything
- Image metadata incorrectly reported the Slicer version as being the same as the SonoEQ version
- Stage motion range file sometimes was unable to be written or read
- Shear Wave Elastography transmit and tracking frequency was incorrectly recorded as 17 MHz instead of 15 MHz
- Heated Imaging Bays Controller could be flashed firmware with invalid configuration bits
- M-Mode live stream was not active after turning off Collect RF mode
- Servicing Dashboard Quality Control drive shaft coupling test scan did not run a 3D scan with the correct number of passes
- Servicing Dashboard configuration files did not maintain metadata (e.g. creation time) when copied during migration to new Revvity location

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v1.14.3 (27 July 2023)

Improvements

- Delays are processed between individual Shear Wave Elastography 2D frames for a more optimal transducer temperature

Fixes

- Non-optimized Window/Level presets were being shown in volume display options
- Minor memory management leaks

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v2.0.0 (16 June 2023)

New Features

- An all new application icon and splash screen corresponding to the PerkinElmer Life Sciences and Diagnostics transformation to Revvity
- Official support for the new Revvity branded Vega device now available for sale globally
- Screenshots of the live streams are automatically saved at the start of scans for reviewing animal orientation
- Shear Wave Elastography has a new load option for setting the color scalar bar min and max
- Quantum uCT volumes (*.vox) can be loaded for visualizing and segmentation
- IVIS 3D CT volumes can be loaded for visualizing and segmentation
- IVIS 2D optical (BLI/FLI), 2D X-ray and 3D DLIT volumes can be loaded for basic visualizing

Improvements

- 3D Scan plan ROI length is snapped to a frame spacing increment to guarantee data is acquired everywhere inside the bounds
- 3D Scan plan ROI width can be adjusted by changing the value for the passes spinbox
- Any volume can now be set as a secondary volume for comparing volumes across timepoints or comparing different animals
- Reworked hardware device communication for faster and more reliable behavior
- Users may now decide to keep data from a stopped scan
- Tuned default 3D Shear Wave Elastography ROI size based on typical usage
- Shear Wave Elastography reprocessing has a two part progress bar for more frequent updates about progress
- Volume Reconstructor remains open upon pressing fuse for easier reprocessing at different breath correction levels
- Colormap settings have been simplified by removing infrequently used settings
- Servicing Dashboard quality control widget specifies in results when criteria for success has been modified

Fixes

- 3D volumes sometimes had a blurry frame at the ends of the volume
- Toggling between B-Mode and Shear Wave Elastography after about 25 times would result in corrupted Shear Wave Elastography data
- Shear Wave Elastography acquisitions sometimes resulted in transducer damage due to an insufficient cool down period
- Wobbler frame rate was incorrectly set after switching from Acoustic Angiography to B-Mode
- 3D B-Mode scans taken during a 3D Shear Wave Elastography acquisition were unable to be fused when using process later option
- Segmenting data with the draw effect would sometimes stop suddenly
- Non-optimized Window/Level presets were being shown in volume display options
- Changing the active curve in a Cardiac Curves markup with less than 2 control points prevented further editing of curves
- Invalid cardiac curves still reported statistics in the quantify table
- Changing Window/Level for 2D Shear Wave Elastography volumes sometimes did not work when using the Window/Level mouse mode
- Raw data files were not maintained when breath correction failed
- Minor memory management leaks

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v1.14.2 (30 March 2023)

Improvements

- Servicing Dashboard quality control widget has an improved linear array dead element test
- Servicing Dashboard quality control widget supports running tests on an individual imaging bay
- Servicing Dashboard quality control widget shows test axial bounds over the live streams
- Servicing Dashboard quality control widget includes a step to save notes about what was modified since the last run
- Servicing Dashboard quality control widget supports quicker selection of groups of tests
- Servicing Dashboard quality control widget can load reports from specified CSV file

- Servicing Dashboard enables viewing of raw data for easier debugging of quality control acquisitions
- Servicing Dashboard requires the dialog to be closed to be able to interact with widgets in the main window

Fixes

- Shear Wave Elastography acquisitions sometimes resulted in transducer damage due to an insufficient cool down period
- Updated markup names did not save if the field was still active
- Remember ROI size and position setting did not restore the axial range gate for 3D Shear Wave Elastography volumes
- Restore default settings did not restore Shear Wave Elastography default confidence floor value
- Acquisition would sometimes not re-enable at the end of a scan or stopping of a scan early
- Shear Wave Elastography reprocessing failed if the original volume info details were updated and the volume was resaved
- Shear Wave Elastography reprocessing failed when applying a frame per position value that was not valid for all volumes in the dialog
- 3D Shear Wave Elastography volumes were missing some scan plan settings in the header
- Servicing Dashboard had missing icon images for skew directions
- Servicing Dashboard tab order was not in order from top to bottom
- Servicing Dashboard did not appropriately end running acquisitions when there was an application restart

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v1.14.1 (27 January 2023)

Fixes

- Applying preset settings or starting a Shear Wave Elastography acquisition would sometimes cause SonoEQ to freeze and require it to be restarted
- The motion stage would sometimes incorrectly shift at the end of a calibration process
- Volume Projection did not update upon pressing Fit ROI to Volume Bounds button
- Volume Projection ROI disappeared when moved outside of volume bounds and difficult to move back
- A failed hardware connection due to the Live Camera being used by another application incorrectly reported as a failed Linear Array connection
- Some imaging mode presets outside of the current imaging mode in Edit->Settings were incorrectly hidden
- Acquisition live stream volumes were visible in the analysis tab when no volumes were loaded
- Slice view layout would unexpectedly change upon clicking an acquisition preset with a loaded volume being shown
- Servicing Dashboard allowed the Linear Array to be set as both Transducer 1 and 2
- Servicing Dashboard quality control tests did not appropriately stop right after for a severely failed test
- Servicing Dashboard unnecessarily requested restart when LiveCamera calibration file was auto-generated
- Servicing Dashboard failed to enter individual transducer only mode if not the selected transducer in settings

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v1.14.0 (09 January 2023)

New Features

- SonoEQ has a splash screen to better indicate the startup progress of the application
- An overall TGC slider for the linear array transducer allows for easily adjusting all the different set TGC points at the same time
- Servicing Dashboard provides a graphical interface for technicians to update device configurations and calibrations (Servicing technicians only)
- Servicing Dashboard provides an all new widget to run quality control tests to make sure devices are running to specification (Servicing technicians only)

Improvements

- Volume projections can be created for all 3 major plane views (Axial, Sagittal, Coronal)
- A new style of Calipers displays the current measurement while in the progress of placing the second control point
- Calipers are displayed and editable in the 3D view and can be positioned in 3D across 2D slice views
- Enter add caliper mode with keyboard shortcut that is the "c" key
- Slice intersections now have an interactive option to support click-and-dragging the intersection directly to update the offset
- Clearing volumes performance is up to 2x faster
- Checkbox added to answer overwrite file question when batch re-processing volumes
- Export Data dialog remains open upon pressing the export button to easily allow a second export
- Segment effects have a white border around the cursor icon image to avoid confusion regarding the real cursor position
- Renamed "Fuse Now/"Fuse Later" to "Process Now"/"Process Later" to provide a general term for all the processing methods
- Scan plan artwork takes up less space in the Settings area
- Markups can be added and deleted with keyboard shortcuts that are the insert and delete keys
- Hardware related options in the menu bar are organized in the "Instrument" menu instead of in the "Tools" menu
- Breath correction smoothing kernel now based on frame rate for better defined replacement zone of frames
- Firmware updater includes wobbler support in addition to linear array support
- Valid wobbler firmware version is enforced for acquisition similar to Linear Array firmware version
- Wobbler drivers install process is skipped if current drivers are already present
- SonoEQ extensions are all pre-installed into the application to avoid a previously required update step after installing a new version of SonoEQ

Fixes

- Holes were still present in fused 3D static volume due to hole filling not running
- Breath correction declined to fix some real breath corrupted frames
- Failed study report was not alerted to user when " - " delimiter was present in file path
- Analysis settings restored to default even when confirmation dialog was cancelled

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v1.13.3 (14 October 2022)

Fixes

- 3D SWE volumes failed to process if a % character was present in the output volume filepath
- Small regions in the coronal plane were not filled in for 3D static volumes
- Disabling the Intel Processor Power Management driver for improved wobbler streaming would fail resulting in acquisition connections not starting
- Hardware would fail to connect when Windows has problems with Windows Management Instrumentation
- Device Specific tuned Acoustic Angiography voltage value was not used with cleared out user settings

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v1.13.2 (19 April 2022)

Fixes

- Scan duration estimate would increase inaccurately in frame spacing values near the minimum bound
- Stepped scans with a large number of positions (>100) accumulated an error resulting in data being collected beyond the ROI
- Stepped scans did not respect the "minimum time between stepped positions" setting between the first and second stepped position
- A non-multi-stream secondary volume could be visible upon re-loading a volume while in the acquisition tab
- A B-Mode/Shear Wave Elastography multi-stream acquisition could have frames from different positions in space

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v1.13.1 (21 March 2022)

Improvements

- Phase Gating jitter is reduced using additional filtering
- Phase Gating dialog includes bandpass filter range for greater flexibility during reprocessing
- Remember 3D scan plan ROI Size and Position setting is turned off by default — To re-enable go to Scan Protocol settings of the desired imaging mode

Fixes

- Some fused volumes had holes due to an incorrect scan speed after switching between scan presets
- Acquisition interface enabled/disabled frequently during a 3D Shear Wave Elastography scan
- Shear Wave Elastography images included velocities below the minimum detectable velocity (0.5 m/s)
- 3D View was looking at the wrong location when there was a 3Dt and M-Mode volume as the active selections
- Wobbler live stream settings were able to be changed from non-active imaging modes
- Wobbler live stream may become jittery in Acoustic Angiography if jitter compensation suddenly started to use a value of 0
- Heart Finder was unable to be started for different active imaging bay if the current active bay animal ID was not defined
- Threshold bounds were not correct upon changing BLI representations
- BLI and Bright sequences may appear to show the same image frame at two different time indices

- Acquiring BLI would finish immediately without acquiring if CCD Camera temperature had drifted at some point in the session
- Delete all active volume calipers action for live stream volumes resulted in nothing happening
- Calipers on B-Mode 2Dt volumes would not load
- Volume Reconstructor progress dialog did not close after a failed processing event
- SonoEQ would sometimes freeze or crash upon freezing/unfreezing a wobbler probe
- M-Mode live stream window/level may be incorrect if SonoEQ was started with collect RF setting on
- Disabling the Intel Processor Power Management driver for improved wobbler streaming would result in acquisition connections not starting

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v1.13.0 (11 Feb 2022)

New Features

- Shear Wave Elastography supports 3D data acquisition and analysis
- Segmentation markup types with multiple effect options have a setting for the preferred effect to use
- Exporting statistics can be generated without loading volumes into SonoEQ
- 3D scan plan ROI size and position can be remembered for specific imaging modes
- Cardiac 3Dt (4D) volumes can be reprocessed with the latest processing techniques
- Shear Wave Elastography volumes can be reprocessed with the latest processing techniques
- Jitter compensation value is a Wobbler transducer advanced setting that can be tuned
- Double left-click to quickly maximize/minimize a slice view
- Right-click on a slice view to quickly copy the image to paste elsewhere

Improvements

- Linear array images have better focusing for improved image quality
- Shear Wave Elastography raw data collection and processing is much faster
- Shear Wave Elastography raw data is smaller in size to not take up as much storage space
- Shear Wave Elastography range gate size and position is manipulated directly in the slice view instead of from settings
- Shear Wave Elastography supports frames per position of 1 to 5 for averaging
- BLI Radiance representations have options of values reported in units of p/s/mm^2/sr or p/s/cm^2/sr
- 3D scan plan ROIs are displayed above the transducer indicator point
- 3D scan plan ROIs are colored green to improve visibility over a bright image
- Wobbler optimized preset uses 20 MHz frequency instead of 35 MHz for a brighter image
- Loaded volumes are maintained in view when switching between imaging modes and scan dimensionalities in acquisition
- Live camera view in acquisition zoomed to a level where the entire animal bed platform is in view
- Loading a large number of volumes into analysis is up to twice as fast
- Directory selection, such as when loading volumes, remembers last selected location to speed up navigation to the same general storage location
- The load volumes dialog includes a file count label to quickly know how many volumes are selected to be loaded
- Creating a new segmentation is snappier due to no longer taking automatic screenshots after every edit
- Progress dialogs are displayed when saving, clearing, or exporting volumes
- Mean filtered volumes support thresholding

- Volume window/level and thresholding widgets have easier to use spinboxes for updating slider bounds
- CCD calibration (optical imaging) has an extended expiration from 14 to 60 days
- Study report generation better detects issues with mismatching statistic representations
- Markup statistics are included on study report pages

Fixes

- Cardiac 3Dt volumes and generated M-Mode 360 volumes in 1.12.x had possible incorrect Heart Rate and Cardiac Output statistics
- BLI radiance statistics in 1.12.x were reported with units of p/s/cm^2/sr when actually they were p/s/mm^2/sr
- Linear array volumes included duplicate frames when using high frame rates (>70 FPS)
- 3D view was zoomed in very far at startup

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v1.12.7 (15 Nov 2021)

Fixes

- Shear Wave Elastography volumes failed to process if processing was started before the original data had fully saved

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v1.12.6 (01 Nov 2021)

Improvements

- Optimized push offset value for Shear Wave Elastography to 0.8mm

Fixes

- Screenshot toolbar button did not successfully save an image
- Text after a new line character in the general comment animal details widget was not saved
- Active focal depth value was changed if it was deeper than newly set imaging depth

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v1.12.5 (13 Oct 2021)

Improvements

- SonoVol-Package installer has simpler install type options to make it more obvious the desired install type
- Shear Wave Elastography processing utilizes more repetitions to remove artifacts through averaging

Fixes

- 2D B-Mode volumes acquired during a SWE acquisition were saved with SWE headers instead of B-Mode details resulting in a shifted depth scale bar on load
- Pre-1.12.0 breath corrected volumes were loaded using incorrect header information resulting in a shifted depth scale bar on load

- 3D Scan ROIs did not maintain visibility when switching to a different imaging mode
- Phase Gating of Cardiac acquisitions typically failed when using higher frame rate acquisitions (>70 FPS) where duplicate frames are an issue
- Heart finder scans failed for certain ROI widths
- Frames per position detail was not saving as a header for 2D static acquisitions
- Frame spacing information was missing from the Volume Info tab
- Screenshots generated with volume details for 2D BLI volumes were missing some details
- Markups were not centered in the 3D view if visibility turned on with slice intersections off
- Saved markups were not removed from the Create table if they were already manually deleted from disk
- Fill between slices preview did not automatically apply upon switching to a new markup or volume
- Cardiac Curve visibility became out-of-sync with visibility button state if crop ROI was added while the cardiac curve was hidden
- Cardiac curve crop ROI was still visible if a new markup was created while the ROI was being shown
- A drag-and-dropped volume from a multi-stream dataset was not always set as the primary volume
- A drag-and-dropped non-phase gated volume when a phase gated volume was to be loaded did not set the phase gated volume as the primary volume
- Hot-linked volumes in side-by-side view failed to unlink when a new primary volume was selected resulting in the new volume appearing the same in all slice views
- Compressing pre-1.12.0 volumes lost frame spacing details resulting in an incorrectly re-fused Z dimension
- Segmentation effect options were cutoff when viewing lots of details on smaller screens

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v1.12.4 (09 June 2021)

Fixes

- The Wobbler would not initialize with the correct frame rate if SonoEQ was started with a Linear Array using v1.12.3
- Linear array frame rate would sometimes be alerted as being too low for phase gating even though scan parameters were not for a phase gated acquisition

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v1.12.3 (03 June 2021)

Fixes

- New M-Mode 360 volumes failed to save when the phase gated volume was originally acquired with SonoEQ 1.12.0 or newer
- The imaging depth scale bar and focal indicator for loaded wobbler volumes was incorrectly shifted upwards
- Wobbler frame rate would become out-of-sync with the current setting if frame rate was set lower than max and a 2D/2Dt acquisition was acquired
- Loading of SWE volumes with invalid confidence-map volumes halted the load process
- UnfusedRF.mhd files were not included when "Include raw files" was unchecked in the Export Data dialog

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v1.12.2 (06 May 2021)

Improvements

- Made it faster to add a large number of files to the Load Volumes dialog
- Made it faster to select/deselect a large number of files in the Load Volumes dialog
- Made it faster to change primary volume with completed markups

Fixes

- Focal depth indicators did not show on loaded sequence volumes
- Stopped 3Dt acquisitions were not populating in the load buttons under animal IDs in the acquisition tab
- 3Dt acquisitions with only two scanned positions were not fused into a final phase gated volume
- Entering BLI imaging mode failed if had previously selected Ultrasound Only in the initialization selection dialog
- BLI Segmentation statistics were disappearing on threshold change in the radiance representation
- BLI 2Dt segmentations that were cleared out and then applied again did not show statistics in the quantify table
- The statistic shown in the table for BLI 2Dt segmentations was not updating on applying threshold to statistics
- Changing the selected transducer using a Linear Array preset that had to process a first TGC zone value resulted in the Linear Array remaining frozen
- Multi-stream datasets (M-Mode/B-Mode, SWE/B-Mode or BLI/Bright) were inconsistently sorted in the load buttons in acquisition
- Stepped acquisitions would sometimes not get the requested number of frames per position
- A 3D Linear Array scan would sometimes fail to run if a settings preset was applied followed by quickly pressing an acquire button
- Ultrasound freeze button could be clicked multiple times while processing the initial action
- 3D View was zoomed in really far in on startup

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v1.12.1 (31 March 2021)

Fixes

- SWE and AA volumes acquired with 1.12.0 were not loaded as the expected imaging mode due to the volume details containing the full name instead of the abbreviated name
- Focal indicators did not show on loaded volumes that contained the new volume details in 1.12.0
- Focal indicators did not immediately propagate on the M-Mode live stream
- Exporting all 3D Segmentation statistics would result in duplicate empty rows in the saved file
- Sequence Segmentations would quietly save or load unsuccessfully if it had a long filepath
- Slice intersections in 3D view appeared clipped on startup

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v1.12.0 (09 March 2021)

New Features

- Introduced SonoEQ support for an optical imaging mode, bioluminescence imaging (BLI) which is only supported by SonoVol Strata devices.
- BLI processed images can be displayed in representations of Counts or Radiance (p/s/cm^2/sr)
- Additional details are now saved in the volume file including Animal, Transducer parameters, Scan parameters, Software version used to acquire, etc.
- Acquisition has a new dialog to add extra Animal details including animal model, strain, group, and others
- A new "Info" tab in Analysis provides the ability to review all new additional details saved with a volume from within SonoEQ
- TGC values can be reset all back to default using a new button next to TGC sliders in settings

Improvements

- Markup statistics are exported with all representation types instead of just the current representation
- Time to initialize acquisition has been reduced
- Minimum computer hardware requirements are now lower to allow running of SonoEQ on lower spec machines
- Unnecessary surface statistics are no longer included for markups on 2D volumes

Fixes

- Wobbler pulse output was not as expected across various frequency options
- Study Report Generator showed a redundant warning about no markups upon selecting a Study Name Folder
- A warning about frame rate being too low for phase gating was showing while using the Wobbler transducer
- Toolbar area changed height if the sequence player was shown or hidden

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v1.11.0 (24 November 2020)

New Features

- Create Study Report can generate a report detailing changes of a markup statistic of interest during a longitudinal study
- A screenshot of a markup shown on top of the image data and also a screenshot of the same position with the markup hidden is saved to the corresponding markup directory
- Reset Slice View Orientations actions in the View menu allows for easily resetting orientations after rotating slice intersections

Improvements

- M-Mode line is displayed on the corresponding 2Dt B-Mode volume when viewing with the 2Dt M-Mode volume
- Application performance has improved when using SonoEQ for long period of times where many volumes are loaded and cleared
- Slice view zoom/pan/offset/orientation is maintained when primary and secondary volumes are swapped

- 2D Static SWE and 3D Sequence volumes now support additional segmentation effects such as Draw, Paint, Erase, Fill between slices and Smoothing
- Reset volume view resets slice views to same state as when loaded and also resets the primary and secondary volume display states
- Clear Volumes redundant confirmation dialog was replaced with a dialog indicating if the save button is still enabled due to modifications of loaded items

Fixes

- Confidence floor value was not included in stats csv if the value was not changed from the default in the session
- Time scale bar was not displaying in the slice view for M-Mode Live volumes
- The load buttons in acquisition could get in an invalid enabled/disabled state after using clear animal ID actions
- Wobbler pulse voltage was not set to the intended value on acquisition initialization
- Canceling a 3D Segmentation Sequence deletion from the Create Tab table deleted the corresponding markup statistics
- Secondary image stats did not update if the primary volume segmentation was edited when no secondary volume was selected, but then reselected
- Focal depth and selected transducer custom header fields were lost upon running volume compression/uncompression
- Swapping primary and secondary volumes when the old primary volume was no longer a valid secondary valid led to an invalid secondary volume selection

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v1.10.0 (09 October 2020)

New Features

- 2D and 3D Static volumes now support additional segmentation effects such as Draw, Paint, Erase, Fill between slices and Smoothing
- A clear all button to clear animal ID comboboxes and associated volumes has been added to the right of the animal ID comboboxes
- Added a Data Probe to the Utilities tab in Analysis for reviewing specific intensity values at the current mouse position
- GoToPosition has a new button to place a GoTo fiducial at the current stage position

Improvements

- Load buttons in acquisition dimensionality tabs have been moved to under Animal ID comboboxes and support loading any dimension
- Individual clear animal ID buttons have been replaced by a Clear action within the load buttons under the animal ID comboboxes
- Filled in markups are hidden when editing the markup to improve visibility when the intention is to replace the completed markup
- Disconnecting hardware now shows a progress dialog to better indicate that something is happening
- Tables in the Create Tab automatically scroll to the bottom when adding a new segmentation
- Wobbler volumes have a new default lower threshold of 1 to remove area out of wobbler fan shape
- General logging improvements make it easier to review the log and follow user actions

- GoToPosition fiducials are hidden automatically upon loading a volume
- GoToPosition fiducials are no longer shown in the display projection mode to reduce confusion about where fiducials are positioned in a loaded volume
- Selected GoToPosition fiducials are shown with a different color
- The green slice view has been moved to under the red slice in Four-Up layouts where left/right of each image is directly above each other

Fixes

- The auto generate maximum intensity projection as part of the post-scan process incorrectly ran for 2D static volumes
- Freezing/unfreezing a transducer many times (~60) during a long SonoEQ session resulted in a pop-up displaying errors and could then lead to an application crash
- Some acquisitions would begin recording while the transducer was still processing a parameter update leading to no data/less data acquired than intended
- A custom preset name that contained the name of a SonoVol factory preset was not displayed with the custom preset name

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v1.9.2 (21 September 2020)

Fixes

- 2D static acquisitions were not loaded in the originally acquired world space position
- Applying a Shear Wave Elastography (SWE) preset or restoring defaults (SWE users only) would incorrectly set Linear Array B-Mode focal zones
- Switching volumes while actively editing a CardiacCurve markup did not update the quantify table correctly
- SWE colormaps were not applied before the volume was initially displayed
- Drag and dropping a volume from a multi-stream dataset did not always set the dropped volume as the primary volume

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v1.9.1 (17 August 2020)

Fixes

- Changing certain Linear Array settings no longer results in an observed shift in image data from its real world location
- M-Mode stream is visible in the slice viewers after running a Heart Finder scan in the M-Mode scan tab
- Multi-stream datasets that are overlaid in Acquisition are equally visible instead of potentially one volume being hidden

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v1.9.0 (10 August 2020)

New Features

- Introduced a new imaging mode, Shear Wave Elastography (SWE), that is designed for quantifying liver stiffness

- Shear Wave Elastography processed images can be displayed in representations of Shear Wave Velocity (m/s), Shear Modulus (kPa) or Young's Modulus (kPa)
- Define a square region to acquire SWE data with the ability to also use the Surface Draw segment effect to narrow down a region to be used for statistics.

Improvements

- Analysis volume selection combobox entries are sorted by imaging mode, then dimensionality and then timestamp
- A directory can be drag and dropped onto the main window for quick loading of all volumes in that directory
- Maximum voltage for the linear array has been adjusted from 70V to 50V to reduce potential damage to the transducer
- MHD files are included when exporting data without RAW files to maintain information about focal depth used in analysis
- Fuse later option shows a single total progress dialog for 2D and 3D volumes when processing upon close of SonoEQ
- Simplified volume names used in analysis volume selection comboboxes are also used in stats.csv files
- TGC sliders show the specific value next to it

Fixes

- Drawing M-Mode line outside volume bounds with specified secondary volume does not result in application crash
- Multi-focal zones and indicators are correctly applied when using a custom user preset
- Editing a 3D segmentation updates image statistics
- Phase Gated volumes are processed with the respiration present flag
- Imaging depth scale bar remains correct for the current transducer when not in B-Mode
- Link/Unlink button visible in slice controller in Three Over Three layout following volume swap actions
- Cursor type set to forbidden type for correct slice views where interaction is disabled
- Custom header fields are maintained when compressing/uncompressing 2D static volumes
- Volumes originally acquired with versions of SonoEQ prior to 1.5.0 can be loaded again

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v1.8.0 (10 June 2020)

New Features

- Image Analysis has been redesigned to allow simultaneously displaying multiple volumes, either in overlay or side-by-side manner
- Multi focal zone support has been added for linear array transducers (up to 4 foci).
- 2D static acquisition is available and for all imaging modes
- Segmentation of cardiac 3Dt (4D) volumes is available with the 3D Segmentation Sequence markup type
- A color scale bar, that indicates colormap range and units of displayed voxels, can be shown in the slice viewers
- Many more slice view layouts have been added
- 6 more colormaps have been added
- User manual is accessible through the Help menu

Improvements

- Custom user presets, for the given imaging mode, saves all settings instead of just a subset
- Volume name display has been beautified to display more details
- Image stats are always calculated and shown for the primary volume with a segmentation
- Auto M-Mode is supported for M-Mode 360 generated volumes
- Phase Gated 2Dt sequences support M-Mode 360 volume generation tool
- Automatic selection to load multi-stream datasets (ie B-Mode 2Dt and M-Mode 2Dt)
- Automatically load volume files drag and dropped on the slice views
- SonoEQ launches immediately into Analysis mode
- Layout can be changed through a toolbar option
- Erase Inside can be used to completely remove completed state of segmentation
- Show Live View button has an option for showing only Ultrasound live streams
- The Control panel (left side area) is resizable
- Threshold slider in Quantify tab has an upper threshold option
- Jump to center of segmentation on apply has been removed to maintain slice offset of recently placed points

Fixes

- Acquisition connects to hardware successfully when running SonoEQ using multiple Windows user accounts
- Auto mean filtering is correctly supported only for static volumes
- Linear Array is frozen when selected transducer is switched going into Acoustic Angiography mode
- Heart Finder scans do not fail when ROI length is less than 10mm
- Phase Gating parameters were adjusted for higher rate of scan success
- Phase gated 2Dt volumes appear in only the 2D scan tab load buttons instead of also in the 3D scan tab
- Auto-generate MIP setting successfully creates MIP projection when enabled as post-scan setting

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v1.7.4 (18 March 2020)

Improvements

- Report a Bug dialog includes a button to "Open log file location" for quicker access
- Current session log is copied over to the SonoEQ log location after opening Report a Bug dialog

Fixes

- Cardiac curves with names saved different from the original name load and clear from the scene successfully
- Fix SonoEQ crash when switching between volumes in Four Up on M-Mode layout with a generated M-Mode visible
- Completed status shown correctly for cardiac curve segment when any curve is applied
- Cardiac curves load with colors specified in settings instead of originally saved color

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v1.7.3 (26 February 2020)

Improvements

- Volume Reconstructor dialog has improved text for consistency

Fixes

- Acoustic Angiography voltage remains set correctly following freeze/unfreeze
- Acoustic Angiography transmit frequency correctly set instead of being 1/2 the expected value
- Crop model widget correctly disabled when at max number of cardiac curve groups
- Prevent freezing of the application due to moving the motion stage while changing imaging mode
- Fix 3D segmentation not shown in 3D view when created with slice intersections turned off
- Improved warning to user when loading a volume fails due to it not being downloaded locally

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v1.7.2 (07 February 2020)

Improvements

- Wobbler frame rate can be changed directly across imaging modes

Fixes

- M-Mode scan dimensionality tab remains disabled while in Acoustic Angiography mode
- Timepoint field no longer cleared accidentally after running a new scan
- Prevent duplicate entries in timepoint combobox

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v1.7.1 (29 January 2020)

Improvements

- Report A Bug dialog can be maximized/minimized
- Updated Acoustic Angiography initialization message to be less technical

Fixes

- Disabling the Intel Processor Power Management driver succeeds for versions of SonoEQ installed from an installer package
- Stats saved correctly for each volume when saving multiple M-Mode volumes
- 3D sequence (4D) volumes no longer frequently fail phase gating
- Prevent volumes from being dropped in slice views while scanning
- Avoid invalid automated M-Mode results on M-Mode volumes generated from 3D sequence (4D) volumes by disabling functionality

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v1.7.0 (16 January 2020)

New Features

- Automated M-Mode markup for analysis
- Custom user presets based on settings currently controlled by presets
- Brightness/Contrast interaction mode button added to ToolBar area

- Heart Finder scans can be loaded again after acquisition
- Option to switch to a different imaging mode and have the transducer be in a frozen/unfrozen state

Improvements

- Show Live View and Freeze/Unfreeze buttons are now always visible in acquisition
- Freeze/Unfreeze button appearance changes based on current state
- Number of markups allowed per volume has increased from 5 to 20
- Acquisition input fields now accept any character that can be used in Windows file path
- Better breathing correction for linear array volumes
- Load buttons in acquisition now contain volumes of all imaging types relative to the current dimensionality tab
- Improved display text of volumes in acquisition load buttons
- Volume Reconstructor uses the number of physical CPU cores
- Reduced number of SonoEQ dependencies to install

Fixes

- Replaced invalid wobbler frequency with correct value to stop failed hardware connection

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v1.6.2 (02 December 2019)

Fixes

- Acoustic Angiography started scans can be stopped with the acquire button
- Timepoint field automatically gets populated if study name is new
- 3D Scan ROI does not get stuck at imaging range boundary

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v1.6.1 (20 November 2019)

Improvements

- Faster switching between loaded volumes
- Faster toggling of slice intersections visibility
- Brightness/Contrast keyboard shortcut changed to toggle state instead of requiring to hold key
- 3D ROI visibility states maintained after switching dimensionality tab
- Estimated scan duration is more accurate
- Added a setting for 3D rendering technique
- Hole Filling is turned on for fusing 3D static volumes
- 3D Segmentation outline opacity is separate from filled opacity
- Slice intersections automatically hidden in 3D view when showing volume rendering
- Clarify extension install progress might take a few minutes

Fixes

- GoToPosition action cancelled if acquire button pressed before placing GoTo point
- Stages that calibrate with less than expected distances will throw a hardware error

- Invalid characters and whitespace problems in acquisition directory paths are prevented or safely handled
- Control points used in markups are not hidden under the generated model
- Changing transparency of foreground volume renders immediately in 3D view
- ROIs are locked while actively scanning
- Go To Position table refreshed when using Delete All positions
- Calipers placed on live stream volumes are hidden in Analysis
- Analysis create tab Add/Delete buttons are correctly disabled when volumes are cleared
- All advanced timing settings are used in scan duration calculation
- Large amount of loaded calipers no longer randomly render with white label
- Single 3D segmentation radio button cannot be unselected
- Colormap correctly applied to rendered 3D view
- Heart Finder ROI appropriately hidden after loading volumes
- Toggling scale bars when viewing M-Mode renders immediately
- Changing wobbler frame rate slider updates live stream appropriately
- Settings tray updated after switching into AA mode

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v1.6.0 (11 October 2019)

New Features

- Scan presets for imaging modes including "Optimized" and "Fast Scan" options
- 3Dt(4D) and 2Dt Cardiac phase gating capture support
- 3Dt(4D) Cardiac analysis method to generate arbitrary M-Mode sequence volumes
- Initial RF capture support for Linear Array

Improvements

- Individual acquire buttons for static or sequence acquisitions.
- Return to first ROI at the end of a multi-ROI acquisition
- Breathing correction thresholds improved for linear array acquired volumes
- All scale bars can be toggled off/on
- Horizontal scale bars added to more slice viewers
- Depth scale bars include labels for major tick values
- Acquisition progress bar updates more frequently (per pass or per step)
- Log file directories have a limit to the number of files to keep
- Calipers can be placed on all volumes
- Progress bar added during installation of required SonoEQ extensions
- Acquisition-only extensions are no longer required for analysis-only installs
- Heart Finder buttons now found in M-Mode/2D Scan/3D Scan tabs
- Icons added to Heart Finder buttons
- Y Offset specified in DeviceSpecificSettings
- Volume Rendering display option widget is available for use on analysis-only installs
- More colormap options have been added

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v1.5.2 (30 April 2019)

Improvements

- Better window/level set values for linear array volumes
- Secondary volume can be overlaid without thresholding during segmentation
- User controlled TGC now includes the region closest to the linear array transducer face
- Heart Finder limited to 13mm scan depths to work better with algorithm
- Displayed volume is centered when opening/closing settings tray

Fixes

- Secondary volume thresholded is correctly reset when volume becomes the active volume
- Left/right orientation of loaded 2D Scan sequence is correctly shown
- Correct cursor type is used when hovering and grabbing slice intersections
- Slice intersections hidden for "Red on M-Mode" slice layout
- Fixed launch of acquisition mode when device only has a wobbler transducer
- Spacing updated for linear array when depth changed when transducer is in frozen state
- Cardiac curves correctly parented to volume when 3D fused volume loaded immediately after
- Focal indicator is shown in correct position after mean filtering is applied to volume
- Set window/level for volumes without corresponding MHDs
- Screenshot of M-Mode related layouts captures the views without shifting volumes.

v1.5.1 (09 April 2019)

Fixes

- Prevent linear array tracebacks when unfreezing linear array
- Linear array volumes can now be aligned in space relative to wobbler.
- Typing in study name combobox is no longer laggy when in M-Mode tab.
- Prevent incorrect movements while changing active transducers

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v1.5 (08 April 2019)

New Features

- M-Mode acquisition has been added for devices with linear array transducers.
- Added new markup type "Cardiac Curves" for M-Mode analysis.
- Heart Finder helps determine appropriate stage position for cardiac M-Mode acquisition.

Improvements

- Markup opacity and surface model opacities can be linked/unlinked.
- Scientific notation is used for large statistic values.
- Statistic shown in Create table is user selectable.
- Sequence player index values are displayed relative to first index value.
- An "All" file types has been added to filter option when using "Select Files" in load dialog.
- Export All Statistics exports all available segmentation, cardiac and caliper statistics into their own respective CSV files.
- Individual export statistics options added to File->Export Statistics
- Statistics in CSVs are no longer rounded values.

- Image statistics threshold value is included in segmentation statistics CSV.
- Loading sequences method was optimized to decrease loading times.
- Slice intersections toolbar now has an icon and more available options.
- Breathing correction algorithm works for linear array acquired volumes and acoustic angiography volumes.
- Save structure includes dimensionality at imaging mode + timestamp level directory.
- Various linear array acquisition performance improvements.

Fixes

- SonoEQ uses correct extension version for installed extensions.
- Element spacing for linear array volumes is now consistent between header and per frame entry.
- Volume fuser dialog only allows acquisitions for static volumes to be added.
- Resolved various memory leaks.

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v1.4.1 (06 February 2019)

Fixes

- Opacity of surface line models and fiducials are correctly linked to 3D segmentation opacity.
- Delete all calipers successfully removes objects when there are only unsaved calipers.

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v1.4 (24 January 2019)

New Features

- Acquisition supports 2D Sequence recording.
- Settings Tray opens out of the main left area with relevant settings panel shown.
- Go To Position motion control widget allows for multiple positions to be defined in a table.
- Focal indicator functionality has been restored for loaded in volumes.
- Error log widget added with multiple filters for easier debugging.

Improvements

- 3D Segmentation opacities can be updated directly in the the "Create 3D Segmentations" table.
- 3D Segmentation surface draw boundary and points are included in segmentation opacity changes.
- Changed transducer settings propagate to the live stream immediately.
- Main window toolbar is now dynamic and rearrangeable.
- Reorganized "Ultrasound Acquisition" GUI for multiple imaging dimensionalities.
- New load icons indicate either "static volumes" or "sequence volumes".
- Data can be exported from SonoEQ directly into a zip folder.
- Focal depth information is added to volume header files.
- Volume Rendering performance is faster due to backend transition to VTK8.
- Auto-window/level algorithm for volume projections has been refined for better images.
- Exposed more wobbler transducer settings in the GUI.

Fixes

- Positivity % in image stats section is calculated correctly (Incorrect values since v1.3)
- Reference geometry set correctly for segmentations saved from earlier versions of SonoEQ (v1.1 and earlier).

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v1.3.1 (15 November 2018)

Improvements

- Surface draw markups points scale size can be customized by the user.
- Surface draw boundary line width can be customized by the user.
- Surface draw markup points and boundary line are included in the segmentation visibility toggle.

Fixes

- Remove unnecessary Y dimension shift in transform for reconstructed volumes.
- Go to position executes after a stopped scan acquisition.

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v1.3 (05 October 2018)

New Features

- Linear Array support has been added to acquisition.
- Motion correction volumes can be acquired in acquisition based on post-scan setting to minimize breathing artifacts.
- Motion correction can also be run on already acquired volumes using Volume Fuser.
- Timing delays can be set in the settings dialog for increased flexibility of a scan protocol.
- Number of scan passes for a given ROI is now displayed in the ROI table.
- Batch compression/uncompression of RAW data is now supported in the "Volume Compressor" dialog.
- Center button for Motion Control now goes to position clicked on the camera stream instead of center of ROI.
- Load behavior has changed in MultiROI table to only indicate volumes to load and not load status.
- Focal indicator next to loaded volumes has been removed due to the newly added multiple transducer support.
- MHD raw data loading support has been removed.

Improvements

- Major overhaul of the code framework to improve support for multiple imaging modes.
- Overhauled Settings dialog and backend framework with support for numerous new user settings.
- Eliminated requirement of device specific settings files for Analysis-Only computers.
- Study Name, Timepoint and Animal ID combo box items are now sorted alpha-numerically.
- ROI objects remain inside imaging bounds for better indication of the scan area.
- Live streams are started with saved user settings.
- Current imaging mode in acquisition is now selected by push buttons instead of a combo box.
- "Next" button icon has been flipped to better represent that the action clears the table.
- Calculation time is faster for positivity % in image stats section.

Fixes

- XZRangeOfMotion.txt can be created if directory hasn't been created yet
- ROI table load button icon is correctly updated if volume is cleared through Clear Volumes Dialog

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v1.2 (28 June 2018)

New Features

- Motion stage returns to middle of single ROI scans
- Completely overhauled segmentation method for new Surface Draw method
- Backwards compatibility available for loading old segmentations and viewing statistics
- Enabled unidirectional frame acquisition
- Mean filter display option for volumes and setting for automatic filtering on load of volumes
- Live probe position displayed on loaded volumes in acquisition mode for scout scan workflow
- Drag and drop volume files on slice views for loading volumes
- Additional slice layout views "Yellow Only" and "3D Only"

Improvements

- Live view automatically selected when scan is started
- Stepped mode acquisition now defined if frames per position is >1
- "Next" button in acquisition ROI table clears all associated fused volumes
- Completed scan checkmarks populated based on selected directory and animal ID
- Find unfused volumes based on selected directory in volume fuser dialog
- Cleaned up acquisition GUI by removing buttons with redundant functionality
- Volumes displayed in yellow slice are now rotated 90 degrees
- Minimum frame rate has a lower value
- Quantification 3D Segmentations tab has improved design for surface and image stats
- Each ROI has a default ROI size button
- Focal indicator positioned based on volume depth
- Camera zoom level snaps to probe bounds
- Window/Level/Colormap are located in each scan mode settings tab
- Perfusion settings has a maximum time that can be defined for a pass
- Better handling of device specific settings

Fixes

- Calipers placed on MHDs display correct spacing
- Image stats are included in statistics CSV
- Use correct Window/Level/Colormap for AA volumes
- Segmentations in quantification table maintain order as they appear in segmentation table
- Fixed colors in "Two-up" layout view icon

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v1.1 (19 April 2018)

New Features

- Gaussian smoothing option for 3D Segmentations
- Enable/Disable smoothing of 3D Segmentations

- Screenshot button for saving current slice views
- Fast/Slow Jog speed option
- Create 3D Segmentation for an individual segmentation
- Export Data dialog with option to ignore RAW data files
- Active volume centers at segmentation center
- Study Name, Timepoint, Animal ID, Scan Mode, and volume path are new columns in Stats CSV
- Drag slice intersections with mouse grab in cursor mode
- Stepped acquisition scan mode movement

Improvements

- Auto rotation of volume in 3D view for easier viewing
- Recent log files can be selected in the Report A Bug dialog
- Dynamic smoothing based on 3D Segmentation size
- Individual calipers can be deleted
- Caliper objects can have their visibility toggled on/off
- Caliper objects are included in save session action
- Calipers are now associated with volumes
- Delete calipers button is limited to the active volume
- 3D Segmentations can extend past the volume bounds
- Less restrictive Create 3D Segmentation requirements (Segments are ignored in slice views that have less than 3 segments)
- ROI scan duration now updates on ROI visibility changed
- Minimized save path for filtered volumes
- Computer system spec check when SonoEQ starts
- Load volume progress includes saved segmentation loading time
- Better 4K monitor resolution support
- Improved Create 3D Segmentation error message if segmentation has no segments
- Updated Warning, Error, Info, Progress, etc. dialogs
- Overhauled Settings framework

Fixes

- Fiducials can no longer be separated from their segment when multiple mouse buttons are pressed
- Scanning ROI is correctly positioned in the axial view when volume is loaded
- 3D view correctly centers when slice intersections is toggled on
- Cancelling SonoEQ exit while scanning will no longer close the main window.
- Pressing Undo/Redo/Create 3D Segmenation(s) no longer makes all segmentations visible
- Fiducials that move on mouse hover will no longer call item modified
- Scrolling is no longer locked after pressing "Undo" on an incomplete segment
- Additional dialog if volume is unable to load due to missing RAW file
- Disabled analysis actions that are not compatible for MHDs

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v1.0.1 (02 March 2018)

New Features

Improvements

- Initial 4K resolution support
- Updated cursor icon in analysis section
- Research mode credentials can be submitted by pressing enter key
- Non-specific OS method of joining file paths

Fixes

- App no longer crashes on close for Windows 7
- Resolved numerous VTK memory leaks
- Volume projection fiducials no longer disappear if active volume switched after loading new volume
- Removing a segmentation no longer makes all other segmentations visible