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DICOM Correction Proposal Form

Tracking Information - Administration Use Only	
Correction Proposal Number	CP-402
STATUS	Assigned
Date of Last Update	2003/11/11
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Submission date	2003/4/4

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Correction Number	CP-402
Log Summary: Add attributes for ultrasound scan geometry	
Type of Modification Correct Value	Name of Standard PS 3 2003
Rationale for Correction: There is no way to specify details of the scan geometry in ultrasound regions. This CP proposes new region attributes that facilitate quantitative image analysis.	
Sections of documents affected: PS3.3 PS3.6	
Correction Wording:	

Add the following attributes to the Sequence of Ultrasond Regions (0018,6011) in Table C.8-17 of Section C.8.5.5.1 US Region Calibration Attribute Definitions

Table C.8-17
US IMAGE REGION CALIBRATION MODULE ATTRIBUTES

Scan Geometry Sequence	(gggg,0400)	3	A quantitiatve scan geometry description. Only one item shall be present.
>Geometry Type	(gggg,0401)	1	Defined terms: PARALLEL = parallel scan lines from linear transducer *steering angle* RADIAL = radiating scan lines from curvilinear or sector transducer
			Add steering angle? Relevant to parallel.
>Transducer Origin	(gggg,e422)	1C	Transducer Origin – the location of the apex. See C.8.5.5.1.15. Required if Geometry Type (gggg,0401) is RADIAL.
>Transducer Normal	(gggg,e424)	1	The unit vector perpendicular to the face (lens) of the transducer. See C.8.5.5.1.15.
>Lateral Linear Range	(gggg,e427)	1C	The width in mm at the skinline. Required if Geometry Type (gggg,0401) is PARALLEL.
>Lateral Range	(gggg,e414)	1C	The angular scan width in radians. See C.8.5.5.1.15. Required if Geometry Type (gggg,0401) is RADIAL.
>Apex to Skinline	(gggg,e416)	1C	The distance in mm between the apex and the skin line at the Transducer Normal. See C.8.5.5.1.15. Required if Geometry Type (gggg,0401) is RADIAL.
>Lateral Offset Angle	(gggg,e426)	1	Angular offset of the mid scan line relative to the Transducer Normal (gggg,e424). The angle direction is positive for counter clockwise rotation angles. See C.8.5.5.1.15
>Start Depth	(gggg,e417)	1	Depth in mm relative to skinline where acquisition begins. See C.8.5.5.1.15
>Stop Depth	(gggg,e418)	3	Depth in mm relative to skinline where acquisition stops. See C.8.5.5.1.15

C.8.5.5.1.15 Scan Geometry Attributes

This section describes attributes that specify the acoustic scan geometry of the region . This information is useful for quantitative image analysis. Figure Figure C.8-7 illustrates the scan geometry within the region window. Transducer Origin (gggg,e422) specifies the location as the column and row as the first and second value respectively. For transducers with divergent scan geometries—RADIAL—the origin is the apex. For linear transducers, this position is the center of transducer face.

The Transducer Normal (gggg,e424) is the unit vector of the transducer (see C.10.5.1.2). The first and second value correspond to the direction of increasing columns (right) and rows (down) respectively. The Transducer Normal most typically points downward and has a value of 0.\1.0 to specify that the direction is in the direction of row values.

Lateral Range (gggg,e414) and Lateral Offset Angle (gggg,e426) specify the lateral outline of the scanned area for sector and curvilinear transducer types. The Apex to Skinline (gggg,e416) is the radius of curvature for curvilinear transducers. For other transducer types,

this the Apex to Skinline is at the center of the transducer. For linear transducers the Lateral Linear Range (gggg,e416) specifies the width of the the scan. The Start Depth (gggg,e417) and Stop Depth (gggg,e418) specify a radial range limits of the scan. The Start Depth and Stop Depth are relative to the Skinline.

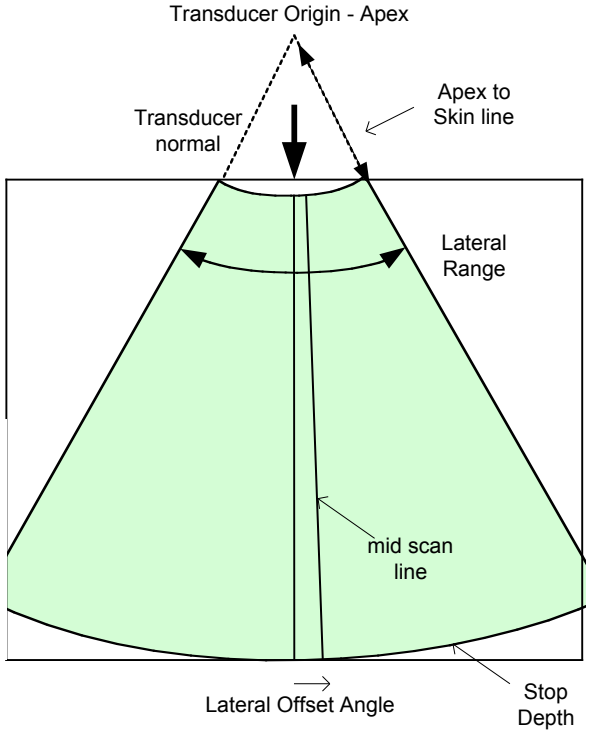

Figure C.8-8
2D Scan Geometry

Add attributes to Part 6

Tag	Name	VR	VM
….			
(gggg,e400)	**Scan Geometry Sequence**	**SQ**	**1**
(gggg,e401)	**Geometry Type**	**CS**	**1**
(gggg,e410)	**Transducer Origin**	**FL**	**2**
(gggg,e411)	**Transducer Normal**	**FL**	**2**
(gggg,e414)	**Lateral Range**	**FL**	**1**
(gggg,e427)	**Lateral Linear Range**	**FL**	**1**
(gggg,e415)	**Lateral Perpendicular Range**	**FL**	**1**
(gggg,e416)	**Apex to Skinline**	**FL**	**1**
(gggg,e417)	**Start Depth**	**FL**	**1**
(gggg,e418)	**Stop Depth**	**FL**	**1**