

### DICOM Correction Proposal Form

Tracking Information - Administration Use Only	
Correction Proposal Number	CP-270
STATUS	Assigned
Date of Last Update	2001/06/20
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Submission date	2001/05/30

Correction Number	CP-270
Log Summary: Add modifying equipment sequence	
Type of Modification	Name of Standard
Addition	PS 3.3 2000
<p>Rationale for Correction</p> <p>It is common in the field to have certain attributes in the SOP Instance modified by the equipment other than the original producer of such SOP Instance, without changing that SOP Instance UID. Examples are QA Stations, integration “black boxes”, archives, etc.</p> <p>Unfortunately, there is no provision in the standard that would allow the equipment that makes modifications to include its identification into the object, and more often than not, it would replace information in the General Equipment Module. Thus, the knowledge of the original creator of the object is being lost.</p> <p>Significant number of applications, mostly those dealing with image distribution and workflow, will benefit greatly if there were better guidelines in the standard how equipment identification is being stored. To facilitate better handling of workflow and image distribution, it is proposed to explicitly state that the attributes in General Equipment Module shall be filled by the original object creator and include additional sequence for the descriptors of the equipment that subsequently altered the object’s attributes.</p> <p>Also, correct the descriptions of attributes in the Module to refer to the Instances rather than digital images.</p>	
Sections of documents affected	
PS 3.3 Section C.7.5	
Correction Wording:	

Amend Section C.7.5 of PS 3.3:

**C.7.5 Common Equipment IE Modules**

The following Equipment IE Module is common to all Composite **Image** IODs which reference the Equipment IE.

CP-270  
Add modifying equipment sequence

Date 2001/05/30  
Status: Assigned

#### **C.7.5.1 General Equipment Module**

Table C.7-6 specifies the Attributes which identify and describe the piece of equipment which produced a Series of **Composite Instances**~~Images~~.

**Table C.7-6  
GENERAL EQUIPMENT MODULE ATTRIBUTES**

<b>Attribute Name</b>	<b>Tag</b>	<b>Type</b>	<b>Attribute Description</b>
Manufacturer	(0008,0070)	2	Manufacturer of the equipment that <b>initially</b> produced the <b>composite instances</b> <del>digital images</del> .
Institution Name	(0008,0080)	3	Institution where the equipment is located that <b>initially</b> produced the <b>composite instances</b> <del>digital images</del> .
Institution Address	(0008,0081)	3	Mailing address of the institution where the equipment is located that <b>initially</b> produced the <b>composite instances</b> <del>digital images</del> .
Station Name	(0008,1010)	3	User defined name identifying the machine that <b>initially</b> produced the <b>composite instances</b> <del>digital images</del> .
Institutional Department Name	(0008,1040)	3	Department in the institution where the equipment is located that <b>initially</b> produced the <b>composite instances</b> <del>digital images</del> .
Manufacturer's Model Name	(0008,1090)	3	Manufacturer's model number of the equipment that <b>initially</b> produced the <b>composite instances</b> <del>digital images</del> .
Device Serial Number	(0018,1000)	3	Manufacturer's serial number of the equipment that <b>initially</b> produced the <b>composite instances</b> <del>digital images</del> .
Software Versions	(0018,1020)	3	Manufacturer's designation of software version of the equipment that <b>initially</b> produced the <b>composite instances</b> <del>digital images</del> .
Spatial Resolution	(0018,1050)	3	The inherent limiting resolution in mm of the <b>original</b> equipment for high contrast objects for the data gathering and reconstruction technique chosen. If variable across the images of the series, the value at the image center.
Date of Last Calibration	(0018,1200)	3	Date when the <b>initial</b> image acquisition device calibration was last changed in any way. Multiple entries may be used for additional calibrations at other times. See C.7.5.1.1.1 for further explanation.
Time of Last Calibration	(0018,1201)	3	Time when the <b>initial</b> image <b>acquisition</b> device was last changed in any way. Multiple entries may be used. See C.7.5.1.1.1 for further explanation.

Pixel Padding Value	(0028,0120)	3	Value of pixels added to non-rectangular image to pad to rectangular format. See C.7.5.1.1.2 for further explanation. Note: The Value Representation of this Attribute is determined by the value of Pixel Representation (0028,0103).
<b>Modifying Equipment Sequence</b>	<b>(gggg,eeee)</b>	<b>3</b>	<b>Sequence of Items containing descriptive attributes of the equipment that has modified the attributes of composite instances in the series, if such equipment is not the one that initially produced the instances.</b>
<b>&gt;Manufacturer</b>	<b>(0008,0070)</b>	<b>1</b>	<b>Manufacturer of the equipment that modified the composite instances.</b>
<b>&gt;Station Name</b>	<b>(0008,1010)</b>	<b>3</b>	<b>User defined name identifying the machine that modified the composite instances.</b>
<b>&gt;Institutional Department Name</b>	<b>(0008,1040)</b>	<b>3</b>	<b>Department in the institution where the equipment is located that modified the composite instances.</b>
<b>&gt;Manufacturer's Model Name</b>	<b>(0008,1090)</b>	<b>3</b>	<b>Manufacturer's model number of the equipment that modified the composite instances.</b>
<b>&gt;Device Serial Number</b>	<b>(0018,1000)</b>	<b>3</b>	<b>Manufacturer's serial number of the equipment that modified the composite instances.</b>
<b>&gt;Software Versions</b>	<b>(0018,1020)</b>	<b>3</b>	<b>Manufacturer's designation of software version of the equipment that modified the composite instances.</b>

**C.7.5.1.1 General Equipment Attribute Descriptions**

**C.7.5.1.1.1 Date Of Last Calibration, Time Of Last Calibration**

Date of Last Calibration (0018,1200) and Time of Last Calibration (0018,1201) are used to convey the date and time of calibration. The Attribute Date of Last Calibration (0018,1200) may be supported alone, however, Time of Last Calibration (0018,1201) Attribute has no meaning unless Attribute Date of Last Calibration (0018,1200) is also supported. The order for each Attribute shall be from the oldest date/time to the most recent date/time. When the Attributes are both supported they shall be provided as pairs.

**C.7.5.1.1.2 Pixel Padding Value**

Pixel Padding Value (0028,0120) is used to pad non-rectangular images to rectangular format. The native format of some images is not rectangular. It is common for devices with this format to pad the images to the rectangular format required by the DICOM Standard with a specific pixel value that is not contained in the native image. This attribute specifies the value of this padding value.

Notes: 1. When the relationship between pixel value and X-Ray Intensity is unknown, it is recommended that the following values be used to pad with black:

0 if Photometric Interpretation (0028,0004) is MONOCHROME2.

$2^{\text{BitsStored}} - 1$  if Photometric Interpretation (0028,0004) is MONOCHROME1.

2. When the relationship between pixel value and X-Ray Intensity is known (for example as defined by Pixel Intensity Relationship (0028,1040) and Pixel Intensity relationship Sign (0028,1041)), it is recommended that a value equivalent to air be used.

3. **When modifying equipment changes the Pixel Padding Value of the images in the series, it shall replace the value of this attribute from the one supplied by original creator equipment.**