

## DICOM Correction Proposal Form

Correction Number		CP-353
Log Summary: Extension of MR Echo Train Length attribute		
Type of Modification	Name of Standard	
Clarification and extension	DICOM 2003 PS 3.3 and PS 3.6	
Rationale for Correction		
The attribute Echo Train Length is poorly defined and will lead to interoperability problems. Clarified the wording and added 2 supporting attributes.		
Sections of documents affected		
Additions to PS 3.3 and PS 3.6		
Correction Wording:		

PS 3.3 Section C.8.13.5.2: Add new required attributes and descriptions

Table C.8.13-16  
 MR TIMING AND RELATED PARAMETERS MACRO ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
....			
>Echo Train Length	(0018,0091)	1C	<p>Number of lines in k-space acquired per excitation of the same volume <b>regardless of the type of echo or the number of frames derived from them. See section C.8.12.5.2.1.</b></p> <p>Required if Frame Type (0008,9007) Value□ of this frame is ORIGINAL. May be present otherwise.</p>
<u>&gt;RF Echo Train Length</u>	<u>(0018,9240)</u>	<u>1C</u>	<p><b><u>Number of RF echoes collected per RF shot (or excitation) per frame. A value of zero shall correspond to a pure gradient echo frame. Note that this value corresponds to the current frame. Several frames may be derived from the same shot. See section C.8.13.5.2.1.</u></b></p> <p><b><u>Required if Frame Type (0008,9007) Value□ of this frame is ORIGINAL. May be present otherwise.</u></b></p>
<u>&gt;Gradient Echo Train Length</u>	<u>(0018,9241)</u>	<u>1C</u>	<p><b><u>Number of gradient echoes collected per RF echo per shot (or excitation) per frame. A value of zero shall correspond to a pure RF echo frame. If RF Echo Train Length (0018,9240) is non zero and Gradient Echo Train Length is as well then only the central echo will be an RF Spin Echo, all others will be gradient echoes. See section C.8.13.5.2.1.</u></b></p> <p><b><u>Required if Frame Type (0008,9007) Value□ of this frame is ORIGINAL. May be present otherwise.</u></b></p>
....			

**Add new section C.8.13.5.2.1**

**C.8.13.5.2.1 RF Echo Train Length and Gradient Echo Train Length Attributes Usage**

The three Echo Train Length attributes all specify information related to the pulse sequence, one or more frames, and the echo type. The following examples illustrate their usage.

For a sequence with each excitation/shot producing 2 spin echoes which produce a line of k-Space for 2 different frames the following values would be used for each frame:

Echo Train Length	2
Gradient Echo Train Length	0
RF Echo Train Length	1

For a sequence with each excitation/shot producing 2 gradient echoes which produce a line of k-Space for 2 different frames the following values would be used:

Echo Train Length	2
Gradient Echo Train Length	1
RF Echo Train Length	0

For a sequence with each excitation/shot producing 8 spin echoes which produce 8 lines of k-Space for 1 frame the following values would be used:

Echo Train Length	8
Gradient Echo Train Length	0
RF Echo Train Length	8

**Add the following attributes to PS3.6, Section 6**

Tag	Name	VR	VM
....	....	....	....
<b>(0018,9240)</b>	<b><u>RF Echo Train Length</u></b>	<b><u>US</u></b>	<b><u>1</u></b>
<b>(0018,9241)</b>	<b><u>Gradient Echo Train Length</u></b>	<b><u>US</u></b>	<b><u>1</u></b>
....	....	....	....