DICOM Conformance Statement
For Side Station Rev02.00

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KYOTO   JAPAN

MEDICAL SYSTEMS DIVISION

Overview:

This conformance statement details the Side Station's compliance to DICOM 3.0.

NETWORK SERVICES

SOP Classes	Role
Transfer	
XRF Image Storage	SCU
XA Image Storage	SCU
SC Image Storage	SCU
Multi-Frame Grayscase Word SC Image Storage	SCU
Study Root Query/Retrieve -FIND	SCU
Study Root Query/Retrieve - MOVE	SCU
Print Management	
Basic Grayscale Print Management	SCU

TABLE OF CONTENTS:

1. INTRODUCTION

1.1. REVISION HISTORY

Revision	Date	Description
First Edition	2007/04/17	New Release
A	2008/06/11	Modified for Rev.02.00.00 Added Query and Retrieve service

1.2. AUDIENCE

Hospital officials and administrator of network devices connected to this device.

1.3. REMARKS

(Any important remarks, disclaimers, and general information are specified.)

1.4. DEFINITIONS, TERMS AND ABBREVIATIONS

AE – Application Entity

IOD – Information Object Definition

SCU – Service Class User

SCP – Service Class Provider

SOP – Service Object Pair

UID – Unique Identifier

1.5. REFERENCES

DICOM PS 3.2 Conformance

DICOM PS 3.3 Information Object Definitions

DICOM PS 3.4 Service Class Specifications

DICOM PS 3.5 Data Structures and Encoding

DICOM PS 3.6 Data Dictionary

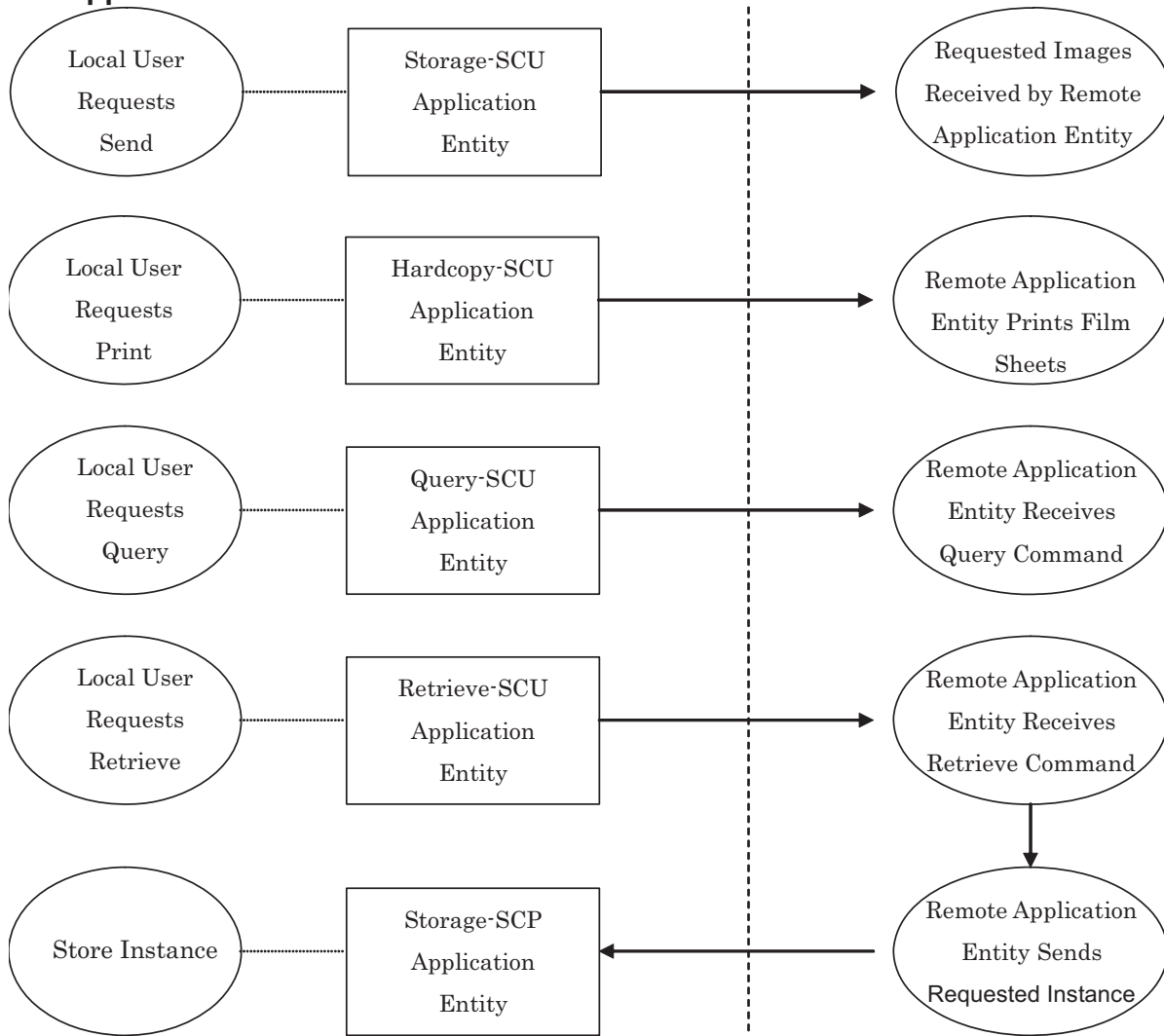DICOM PS 3.7 Message Exchange

DICOM PS 3.8 Network Communication Support for Message Exchange

2. NETWORKING

2.1. IMPLEMENTATION MODEL

2.1.1. Application Data Flow

DICOM Standard Interface

Figure 2-1 APPLICATION DATA FLOW DIAGRAM

DICOM capabilities of the Side Station include:

The Side Station can send images to a remote AE by initiating the DICOM C-STORE request as a SCU.

The Side Station can send images to a DICOM Print Server AE by utilizing the services of the Basic Grayscale Print Management Meta SOP Class as a SCU.

The Side Station can receive images from a remote AE by using the DICOM Query and Retrieve service as a SCU.

2.1.2. Functional Definitions of AE's
2.1.2.1. Storage-SCU Application Entity
STORAGE-SCU is activated through the user interface when a user selects instances from the local database, and requests that they be sent to a remote AE (selected from a pre-configured list).

2.1.2.2. Hardcopy-SCU Application Entity
The existence of a print-job in the print queue will activate the Hardcopy AE. An association is established with the printer and the printer's status determined. If the printer is operating normally, the film sheets described within the print-job will be printed. Changes in printer status will be detected (e.g. out of film) and reported to the user. If the printer is not operating normally, the print-job will set to an error state and can be restarted by the user via the job control interface.

2.1.2.3. Query and Retrieve-SCU Application Entity
Query-SCU is activated through the user interface when a user configures the parameters to query to user selected remote AE.

Retrieve-SCU is activated through the list of records that match a user configured query parameters. The user can select the records to retrieve from the list.

2.1.3. Sequencing of Real-World Activities
All SCP activities are performed asynchronously in the background and not dependent on any sequencing.

2.2. AE SPECIFICATIONS
2.2.1. STORAGE-SCU
2.2.1.1. SOP Classes
STORAGE-SCU provide Standard Conformance to the following SOP Classes:

Table 2-1

SOP CLASSES SUPPORTED BY STORAGE-SCU

SOP Class Name	SOP Class UID	Role
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	SCU
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	SCU
Secondary Capture Image Store	1.2.840.10008.5.1.4.1.1.7	SCU
Multi-Frame Grayscale Word SC Image Store	1.2.840.10008.5.1.4.1.1.7.3	SCU

2.2.1.2. Association Policies
2.2.1.2.1. General
STORAGE-SCU initiates but never accepts associations.

Table 2-2

MAXIMUM PDU SIZE RECEIVED AS A SCP FOR STORAGE-SCU

Maximum PDU size received	Unlimited

2.2.1.2.2. Number of Associations
Table 2-3

NUMBER OF ASSOCIATIONS AS A SCP FOR STORAGE-SCU

Maximum number of simultaneous associations	1

2.2.1.2.3. Asynchronous Nature
STORAGE-SCU will only allow a single outstanding operation on an Association. Therefore,

STORAGE-SCU will not perform asynchronous operations window negotiation.

2.2.1.2.4. Implementation Identifying Information
Table 2-4

DICOM IMPLEMENTATION CLASS AND VERSION FOR STORAGE-SCU

Implementation Class UID	1.2.392.200036.9110.1.0.6711.2001002
Implementation Version Name	SPF XX (XX : version number)

2.2.1.3. Association Initiation Policy
2.2.1.3.1. Activity – Send Storage Request
2.2.1.3.1.1. Description and Sequencing of Activities

For each instance selected from the user interface to be transferred, a single attempt will be made to

transmit it to the selected remote AE. If the send fails, for whatever reason, no retry will be performed,

and an attempt will be made to send the next instance.

2.2.1.3.1.2. Proposed Presentation Contexts

Table 2-5

PROPOSED PRESENTATION CONTEXTS FOR STORAGE-SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	**UID**	**Name**	**UID**		**Negotiation**
X-Ray Angiographic Image Store	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
X-Ray RF Image Store	1.2.840.10008.5.1.4.1.1.12.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Secondary Capture Image Store	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Multi-Frame Grayscale Word SC Image Store	1.2.840.10008.5.1.4.1.1.7.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

2.2.1.3.1.2.1. Extended Negotiation

No extended negotiation is performed.

2.2.1.3.1.3. SOP Specific Conformance
2.2.1.3.1.3.1. SOP Specific Conformance to Storage SOP Classes

STORAGE-SCU provides standard conformance to the Storage Service Class.

2.2.1.3.1.3.2. Presentation Context Acceptance Criterion
STORAGE-SCU does not accept associations.

2.2.1.4. Association Acceptance Policy
STORAGE-SCU does not accept associations.

2.2.2. HARDCOPY-SCU
2.2.2.1. SOP Classes

The Side Station provides Standard Conformance to the following SOP Classes:

Table 2-6

SOP CLASSES SUPPORTED BY PRINT -SCU

SOP Class Name	SOP Class UID	Role
Basic Grayscale Print Management Meta	1.2.840.10008.5.1.1.9	SCU
Basic Film Session	1.2.840.10008.5.1.1.1	SCU
Basic Film Box	1.2.840.10008.5.1.1.2	SCU
Basic Grayscale Image Box	1.2.840.10008.5.1.1.4	SCU
Printer	1.2.840.10008.5.1.1.16	SCU
Print Job	1.2.840.10008.5.1.1.14	SCU

2.2.2.2. Association Policies
2.2.2.2.1. General

HARDCOPY-SCU initiates but never accepts associations.

Table 2-7

DICOM APPLICATION CONTEXT FOR AE HARDCOPY

Application Context Name	1.2.840.10008.3.1.1.1

2.2.2.2.2. Number of Associations

Table 2-8

NUMBER OF ASSOCIATIONS AS A SCP FOR HARDCOPY-SCU

Maximum number of simultaneous associations	1

2.2.2.2.3. Asynchronous Nature

PRINT -SCU will only allow a single outstanding operation on an Association. Therefore, PRINT -SCU will not perform asynchronous operations window negotiation.

2.2.2.2.4. Implementation Identifying Information

Table 2-9

DICOM IMPLEMENTATION CLASS AND VERSION FOR HARDCOPY-SCU

Implementation Class UID	1.2.392.200036.9110.1.0.6711.2001002
Implementation Version Name	SPF XX (XX : version number)

2.2.2.3. Association Initiation Policy
2.2.2.3.1. Activity – Print Images
2.2.2.3.1.1. Description and Sequencing of Activities

For each instance selected from the user interface to be printed, a single attempt will be made to

transmit it to the selected remote AE. If the print fails, for whatever reason, no retry will be performed,

and an attempt will be made to send the next instance.

2.2.2.3.1.2. Proposed Presentation Contexts

Table 2-10

PROPOSED PRESENTATION CONTEXTS FOR HARDCOPY-SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name	UID		Negotiation
Basic Grayscale Print Management (META)	1.2.840.10008.5.1.1.9	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Print Job	1.2.840.10008.5.1.1.14	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

2.2.2.3.1.2.1. Extended Negotiation

No extended negotiation is performed.

2.2.2.3.1.3. SOP Specific Conformance
2.2.2.3.1.3.1. SOP Specific Conformance to Print SOP Classes

HARDCOPY-SCU provides standard conformance to the Storage Service Class.

2.2.2.3.1.3.2. Presentation Context Acceptance Criterion

HARDCOPY-SCU does not accept associations.

2.2.2.4. Association Acceptance Policy

HARDCOPY-SCU does not accept associations.

2.2.3. Query and Retrieve-SCU
2.2.3.1. SOP Classes

Query and Retrieve-SCU provide Standard Conformance to the following SOP Classes:

Table 2-11

SOP CLASSES SUPPORTED BY Query and Retrieve-SCU

SOP Class Name	SOP Class UID	Role
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	SCU
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	SCU
Verification SOP Class	1.2.840.10008.1.1	SCU

2.2.3.2. Association Policies
2.2.3.2.1. General

Query and Retrieve-SCU initiates but never accepts associations.

Table 2-12

MAXIMUM PDU SIZE RECEIVED AS A SCP FOR STORAGE-SCU

Maximum PDU size received	Unlimited

2.2.3.2.2. Number of Associations

Table 2-13

NUMBER OF ASSOCIATIONS AS A SCP FOR STORAGE-SCU

Maximum number of simultaneous associations	1

2.2.3.2.3. Asynchronous Nature

Query and Retrieve-SCU will only allow a single outstanding operation on an Association. Therefore,

Query and Retrieve-SCU will not perform asynchronous operations window negotiation.

2.2.3.2.4. Implementation Identifying Information

Table 2-14

DICOM IMPLEMENTATION CLASS AND VERSION FOR STORAGE-SCU

Implementation Class UID	1.2.392.200036.9110.1.0.6711.2001002
Implementation Version Name	SPF XX (XX : version number)

2.2.3.3. Association Initiation Policy
2.2.3.3.1. Activity – Send Query and Retrieve Request
2.2.3.3.1.1. Description and Sequencing of Activities

For each query selected from the user interface to be transferred, a single attempt will be made to transmit it to the selected remote AE. If the request failes, for whatever reason, no retry will be performed.

The Query and Retrieve AE will use same association to retrieve images from a remote AE when the user initiates the image query.

2.2.3.3.1.2. Proposed Presentation Contexts

Table 2-15

PROPOSED PRESENTATION CONTEXTS FOR QUERY AND RETRIEVE-SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name	UID		Negotiation
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Verification SOP Class	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

2.2.3.3.1.2.1. Extended Negotiation

No extended negotiation is performed.

2.2.3.3.1.3. SOP Specific Conformance
2.2.3.3.1.3.1. SOP Specific Conformance to Query and Retrieve SOP Classes

Query and Retrieve-SCU provides standard conformance to the Query and Retrieve Service Class.

2.2.3.3.1.3.2. Presentation Context Acceptance Criterion

Query and Retrieve-SCU does not accept associations.

2.2.3.4. Association Acceptance Policy

Query and Retrieve-SCU does not accept associations.

2.3. NETWORK INTERFACES
2.3.1. Physical Network Interface
The application is indifferent to the physical medium over which TCP/IP executes; which is dependent

on the underlying operating system and hardware.

2.3.2. Additional Protocols
When host names rather than IP addresses are used in the configuration properties to specify

presentation addresses for remote AEs, the application is dependent on the name resolution mechanism

of the underlying operating system.

2.4. CONFIGURATION
2.4.1. AE Title/Presentation Address Mapping
AE Title can be changed using the service tool, which can be started by a user on the maintenance

account.

This system uses IP address directly, not Host name.

2.4.2. Parameters

Table 2-16

CONFIGURATION PARAMETERS TABLE

Parameter	Configurable	Default Value
General Parameters		
PDU Size	Yes	16kB
Time-out waiting for acceptance or rejection Response to an Association Open Request. (Application Level timeout)	No	None
General DIMSE level time-out values	No	None
Time-out waiting for response to TCP/IP connect request. (Low-level timeout)	No	None
Time-out waiting for acceptance of a TCP/IP message over the network. (Low-level timeout)	No	None
Time-out for waiting for data between TCP/IP packets. (Low-level timeout)	No	None
Any changes to default TCP/IP settings, such as configurable stack parameters.	No	None

3. SUPPORT OF CHARACTER SETS

3.1. OVERVIEW
The Side Station supports the ISO_IR 100 Character set and ISO_IR 87 Character set.

3.2. CHARACTER SETS

Table 3-1

SUPPORTED SPECIFIC CHARACTER SET DEFINED TERMS

Character Set Description	Defined Term
Latin alphabet No. 1	ISO_IR 100
Japanese	ISO 2022 IR 87

3.3. CHARACTER SET CONFIGURATION
The English mode employ ISO_IR 100 as standard, and the Japanese mode employ ISO 2022 IR 87 as standard. In both mode the image specified character set is given priority. If the unsupported character set is supported by WindowsXP, they might be displayed. In this case its proper operation is not guaranteed.

4. SECURITY

4.1. SECURITY PROFILES

None supported.

4.2. ASSOCIATION LEVEL SECURITY

Only the combination of the registered AE Titles and IP address can open the Association.

4.3. APPLICATION LEVEL SECURITY

None supported.

Appendix A. DICOM Attributes

A.1 Query (C-FIND)

Attribute Name	Tag	Level	Matching	Remarks
Specific Character Set	0008,0005	Study/ Image	Single Value	In Japanese mode, always set as "ISO 2022 IR 6\ISO 2022 IR 87". In English mode, always set as "ISO 2022 IR 100".
SOP Instance UID	0008,0018	Image	Universal	
Study Date	0008,0020	Study	Single Value/ Range	
Study Time	0008,0030	Study	Universal	
Modality	0008,0060	Image	Universal	The Side Station can receive the following modality images; RF/XA Otherwise, the Side Station will not save the images into local system.
Patient's Name	0010,0010	Study	Single Value/ Wild Card	
Patient ID	0010,0020	Study	Single Value/ Wild Card	
Study Instance UID	0020,000D	Study	Universal	
		Image	Single Value	
Series Number	0020,0011	Image	Universal	
Instance Number	0020,0013	Image	Universal	

A.2 Private Attributes (C-STORE)

Here is the tables of DICOM private attributes which are set by this system.

For other attributes than described in the following table, the system will keep the same information as sent by other system.

Attribute Name	Tag	Type	VR	VM	Description
Creater Data Element	6911,0010	1C	LO	1	Set "SHRF1110.0".
Image Information					
Pixel Spacing	6911,1020	2C	DS	2	Set same information as (0028,0030).
Image Specifying Code	6911,102A	3	UL	1	Set the image type.
Acquisition Information					
Acquisition Rate	6911,1030	2C	DS	1-n	Set acquisition rate in [FPS] unit.
Acquisition Equipment Information					
Table Unit Code	6911,1050	2C	IS	1	Set device type information.
Base Position Rate	6911,1051	2C	IS		Set base position rate.
Acquisition Positioner Information					
Oblique Angle	6911,1060	2C	IS	1	Set oblique angle value.
Sagital Angle	6911,1061	2C	IS	1	Set sagital angle value.
C-Arm Tilting Angle	6911,1063	2C	IS	1	Set tilting angle value of the C-Arm.
Ceiling Travel Longitudinal Position	6911,1064	2C	IS	1	Set ceiling travel longitudinal position value.
Ceiling Travel Transversal Position	6911,1065	2C	IS	1	Set ceiling travel transversal position value.
ISO Center Height	6911,1066	2C	IS	1	Set ISO center height value.
Table Height	6911,1067	2C	IS	1	Set table height value.
Table Longitudinal Position	6911,1068	2C	IS	1	Set table longitudinal position value.
Table Transversal Position	6911,1069	2C	IS	1	Set table transversal position value.
Subdivisional Acquisition Information					
Subdivisional Format	6911,1070	2C	CS	1	Set the number of frames in a Subdivisional image.
TOMO Information					
Scan Direction	6911,1080	2C	IS	1	Set TOMO scan direction.
Layer Pitch	6911,1081	2C	DS	1	Set TOMO layer pitch value.
Layer Range	6911,1082	2C	DS	1	Set TOMO layer range value.
Layer Height	6911,1083	2C	DS	1	Set TOMO Layer height value.
Reconstruction Start Position	6911,1085	2C	DS	1	Set TOMOS reconstruction start position value.
Reconstruction Step	6911,1086	2C	DS	1	Set TOMOS reconstruction step value.
Post-Processing Information					
Dual Energy Subtraction	6911,10B0	3	LO	1	Set Dual Energy Subtraction process information.
Dynamic Range Compression	6911,10B1	3	LO	1	Set Dynamic Range Compression process information.

Attribute Name	Tag	Type	VR	VM	Description
Creater Data Element	6911,0011	1C	LO	1	Set "SHRF1111.0".
Image Optimization Information					
Zoom Rate	6911,1100	3	IS	1	Set zoom rate for display.
Display Center (X)	6911,1101	3	IS	1	Set center position (X) for display.
Display Center (Y)	6911,1102	3	IS	1	Set center position (Y) for display.
Gamma Type Number	6911,1103	3	IS	1	Set number of gamma type for display.
Gamma Type Name	6911,1104	3	LO	1	Set a name of the gamma type.
H/V Reverse	6911,1105	3	IS	1	Set image H/V reverse information for display.
Nega/Posi	6911,1106	3	IS	1	Set image Nega/Posi information for display.
Edge Type Number	6911,1107	1	IS	1	Set number of edge type for display.
Edge Type Name	6911,1108	1	LO	1	Set a name of the edge type.
Image Base Height	6911,1109	1	DS	1	Set image base height value.
Combined Image Derived Information	6911,1110	3	LO	1	Set derivation information for combined image.
Combined Image Original Image Information Sequence	6911,1111	3	SQ	1	Set original image information of combined image.
> Shutter Shape	0018,1600	3	CS	1-n	Set shape of the shutter.
> Shutter Left Vertical Edge	0018,1602	3	IS	1	Set left edge value of RECTANGULAR shutter.
> Shutter Right Vertical Edge	0018,1604	3	IS	1	Set right edge value of RECTANGULAR shutter.
> Shutter Upper Horizontal Edge	0018,1606	3	IS	1	Set upper edge value of RECTANGULAR shutter.
> Shutter Lower Horizontal Edge	0018,1608	3	IS	1	Set lower edge value of RECTANGULAR shutter.
> Center of Circular Shutter	0018,1610	3	IS	2	Set center value of CIRCULAR shutter.
> Radius of Circular Shutter	0018,1612	3	IS	1	Set radius value of CIRCULAR shutter.
> Flip	6911,1105	3	IS	1	Set image flip information.
> Rotation Angle	6911,1112	3	IS	1	Set image rotation angle information.
Rotation Angle	6911,1112	3	IS	1	Set image rotation angle information for display.
Trimming Flag	6911,1113	3	IS	1	Set trimming flag.
Trimming Left Vertical Edge	6911,1114	3	IS	1	Set left edge value of trimming for display.
Trimming Right Vertical Edge	6911,1115	3	IS	1	Set right edge value of trimming for display.
Trimming Upper Horizontal Edge	6911,1116	3	IS	1	Set upper edge value of trimming for display.
Trimming Lower Horizontal Edge	6911,1117	3	IS	1	Set lower edge value of trimming for display.

(Continued)

Attribute Name	Tag	Type	VR	VM	Description
Number of Overlay Objects	6911,1120	3	IS	1	Set number of overlay objects.
Calibration Value	6911,1121	3	IS	1	Set calibration value for measurement.
Overlay Object	6911,1122	1C	OB	1	Set overlay objects information.
Calibration Unit	6911,1123	3	IS	1	Set calibration unit for measurement.
DSA Process Type	6911,1124	3	IS	1	Set type of DSA process.
Remask Frame Number	6911,1125	3	IS	1-n	Set frame numbers for remask process.
Reregi Pixel Shift Value	6911,1126	3	FL	2	Set image shift value (X) and (Y) for reregistration.
RSM-DSA Filter Type	6911,1127	3	IS	1	Set type of RSM-DSA fileter.
Gamma Class Key	6911,1130	3	CS	1	Set key information of gamma for display.
Edge Class Key	6911,1131	3	CS	1	Set key information of edge for display.
DSA Landmarking ID	6911,1132	3	IS	1	Set ID of landmarking for display.

Attribute Name	Tag	Type	VR	VM	Description
Creater Data Element	6B07,0030	1C	LO	1	Set "SHPF0730.0".
Last Modifier	6B07,3000	1	UI	1	Set the UID of the system which made the last modification to this image.
Last Modify Date	6B07,3001	1	DA	1	Set the last date when this image is modified.
Last Modify Time	6B07,3002	1	TM	1	Set the last time when this image is modified.

[No Text]