DICOM
CONFORMANCE STATEMENT
FOR
DIAGNOSTIC ULTRASOUND SYSTEM
APLIO MODEL SSA-770A
(DICOM KIT USDI-770A)

TOSHIBA CORPORATION

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1 INTRODUCTION

This document is a DICOM Conformance Statement for Toshiba's Diagnostic Ultrasound System APLIO MODEL SSA-770A (DICOM KIT: USDI-770A). It is intended to provide the reader with the knowledge of how to integrate this product within a DICOM compliant hospital network. It details the DICOM Service Classes, Information Objects, and Communication Protocols which are supported by this product as follows:

- Verification Service Class (SCU/SCP)
- Storage Service Class (SCU)
- Print Management Service Class (SCU)

If the reader is unfamiliar with DICOM, it is recommended that they read the DICOM Specification prior to reading this conformance statement. Also note that this document is formatted according to the DICOM Specification, Part 2: Conformance.

1.1 REFERENCE

ACR-NEMA Digital Imaging and Communications in Medicine, DICOM V3.0.

1.2 DEFINITIONS

- **Association Establishment** - An Association Establishment is the first phase of communication between two DICOM Application Entities (AEs). The AEs use the Association Establishment to negotiate how data will be encoded and the type of data to be exchanged.
- **Called Application Entity Title** - The Called AE Title defines the intended receiver of an Association.
- **Calling Application Entity Title** - The Calling AE Title defines the requestor of an Association.
- **DICOM Message Service Element (DIMSE)** - A DIMSE defines the services and protocols utilized by an Application Entity to exchange messages.
- **Information Object Definition (IOD)** - An IOD is a data model which is an abstraction of real-world information. This data model defines the nature and attributes relevant to the class of real-world objects represented.
- **Service Class Provider (SCP)** - A Service Class Provider plays the "server" role to

perform operations and invoke notifications during an Association. An example of a Storage Service Class Provider would be an image storage device. In this case, the image storage device is storing the image that was sent by a Service Class User.

- **Service Class User (SCU)** - A Service Class User plays the "client" role to invoke operations and perform notifications during an Association. An example of a Storage Service Class User would be an image acquisition device. In this case, the image acquisition device will create and send a DICOM image by requesting that a Service Class Provider store that image.
- **Service/Object Pair (SOP) Class** - A SOP Class is defined by the union of an Information Object Definition and a set of DIMSE Services. A DICOM Application Entity may support one or more SOP Classes. Each SOP Class is uniquely identified by a SOP Class UID.
- **SOP Instance** - A specific occurrence of a Information Object.
- **Transfer Syntax** - The Transfer Syntax is a set of encoding rules that allow DICOM Application Entities to negotiate the encoding techniques (e.g. data element structure, byte ordering, compression) they are able to support. The Transfer Syntax is negotiated during Association Negotiation.
- **Unique Identifier (UID)** - A Unique Identifier is a globally unique, ISO compliant, ASCII-numeric string. It guarantees uniqueness across multiple countries, sites, vendors and equipment.

1.3 ACRONYMS, ABBREVIATIONS AND SYMBOLS

The following acronyms and abbreviations are used in this document.

- ACC — American College of Cardiology
- ACR — American College of Radiology
- ASCII — American Standard Code for Information Interchange
- AE — Application Entity
- ANSI — American National Standards Institute
- CEN TC251 — Comite Europeen de Normalisation - Technical Committee 251 - Medical Informatics
- DICOM — Digital Imaging and COmmunications in Medicine
- DIMSE — DICOM Message Service Element
- DIMSE-C — DICOM Message Service Element-Composite
- DIMSE-N — DICOM Message Service Element-Normalized
- HIS — Hospital Information System

- HL7 Health Level 7
- IE Information Entity
- IOD Information Object Definition
- ISO International Standard Organization
- JIRA Japan Industries Association of Radiological Systems
- NEMA National Electrical Manufacturers Association
- PDU Protocol Data Unit
- RIS Radiology Information System
- SCP Service Class Provider
- SCU Service Class User
- SOP Service Object Pair
- TCP/IP Transmission Control Protocol/Internet Protocol
- UID Unique Identifier

2 IMPLEMENTATION MODEL

2.1 VERIFICATION

The Verification service class defines an application level class of service which allows the operator to verify the ability of an application on a remote node to respond to DICOM messages. The DICOM Service Tool application supports the Verification service and acts as the SCU and SCP. The response to Verification requests from remote applications is handled by the Storage SCP application.

2.1.1 APPLICATION DATA FLOW DIAGRAM

The Network AE implementation acts as the SCU and SCP for the Verification service.

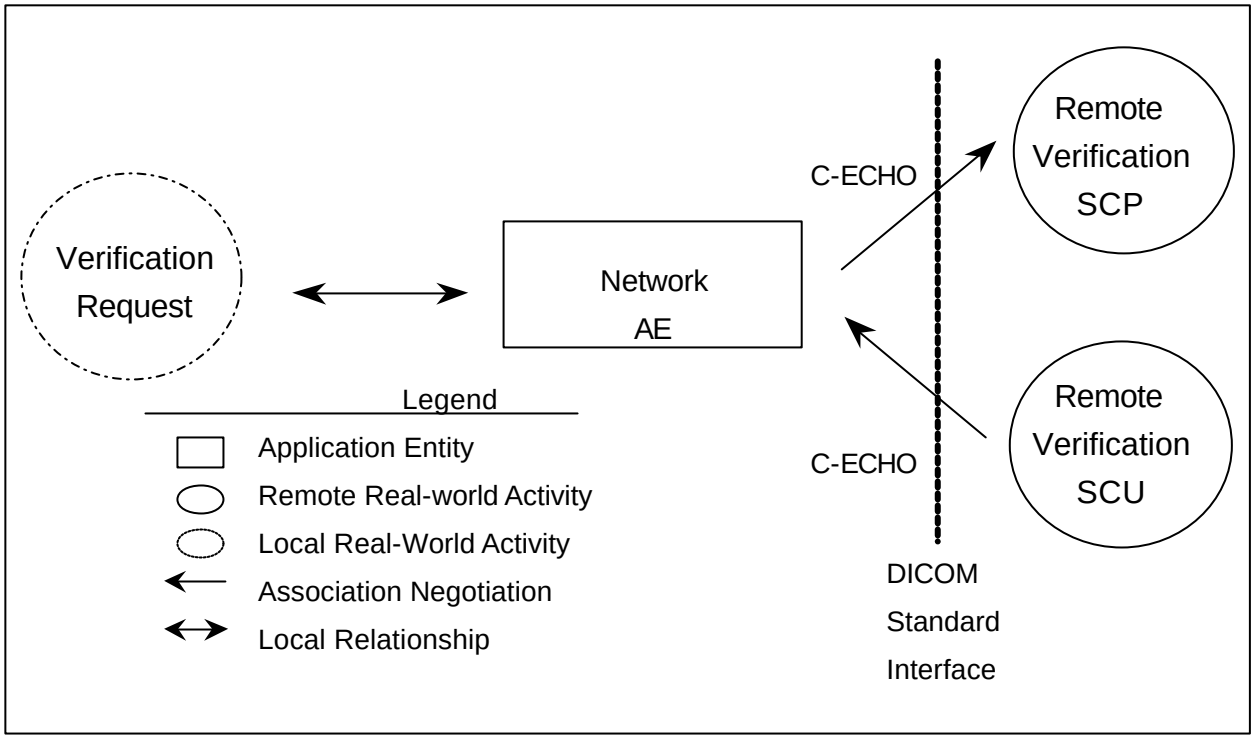

Figure 1

2.1.2 FUNCTIONAL DEFINITIONS OF APPLICATION ENTITIES

Network AE is used to verify that remote DICOM devices are active on the network and

allows remote DICOM devices to verify that the Network AE of the system is active on the network. It therefore performs the following tasks:

- Establishes DICOM Associations with remote DICOM devices.
- Performs Verification of the presence of remote DICOM devices on the network.
- Accept establishment of DICOM Association from remote DICOM devices.
- Accepts Verification on the network from remote DICOM devices.

2.1.3 SEQUENCE OF REAL WORLD ACTIVITIES

2.1.3.1 FEATURES

- Operator requests verification of activation of the Remote activity.
- Network AE accepts verification of activation from the Remote activity.
- Network AE is the service class user (SCU) and provider (SCP) for VERIFICATION.

2.1.3.2 OPERATION

Operation-1

Step-1 : Select the Remote activity

Step-2 : Request verification of activation of the Remote activity

Operation-2

Verification SCP is performed automatically when the Remote activity requests the verification of Network AEs presence.

2.2 STORAGE

The DICOM Application Entity establishes associations for Storage of DICOM Composite Information Objects in Remote Application Entities.

2.2.1 APPLICATION DATA FLOW DIAGRAM

The Network AE implementation acts as the SCU for the Storage service.

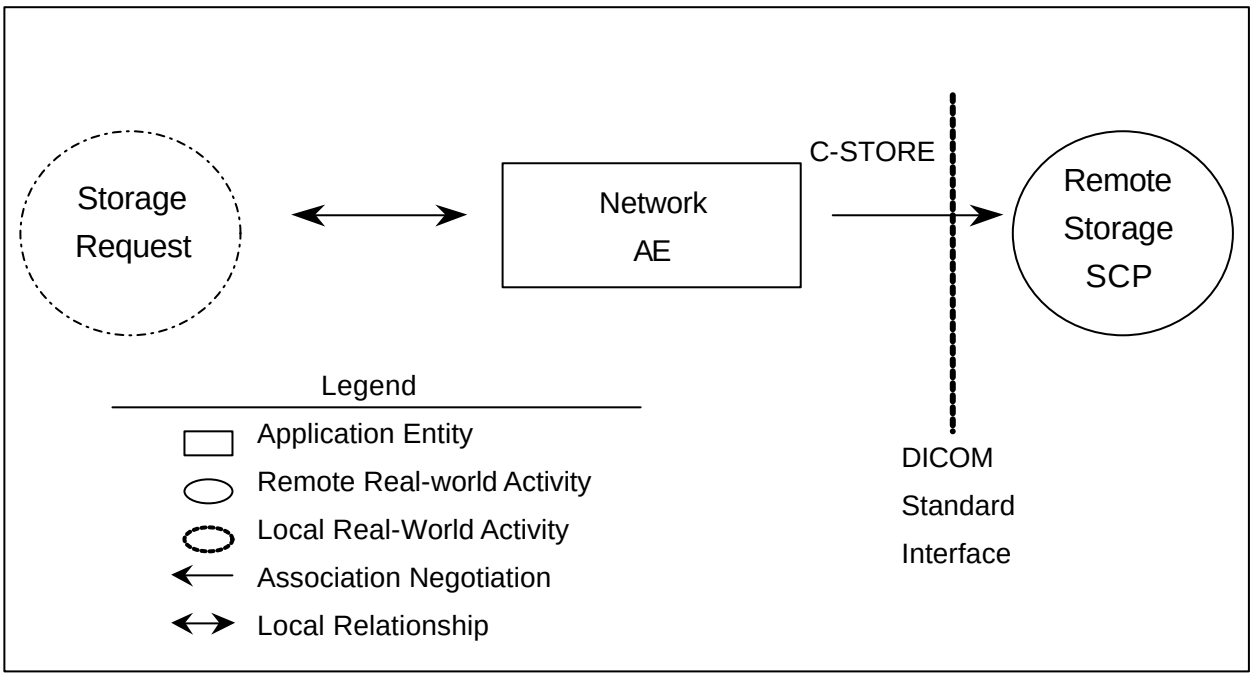

Figure 2

2.2.2 FUNCTIONAL DEFINITIONS OF APPLICATION ENTITIES

Network AE is used to transmit images to a remote DICOM device. It therefore performs the following tasks:

- Builds DICOM SC and US Image Information Objects
- Establishes DICOM Associations with remote DICOM devices
- Stores DICOM SC and US Information Objects on remote DICOM devices

2.2.3 SEQUENCE OF REAL WORLD ACTIVITIES

2.2.3.1 FEATURES

- Operator requests transfer of study/images to multiple servers after

selecting the target studies from the Study/Image List.

- Operator requests immediate and automatic transfer of images after capture.
- Storage requests are placed in a queue and are executed in the background.
- Network AE acts as the SCU for STORAGE.

2.2.3.2 OPERATION

The operations for manual image transfer are described below:

Operation-1

Step-1: Display the image to be transferred.

Step-2: Request transfer.

Operation-2

Step-1: Select the study to be transferred.

Step-2: Request transfer.

Operation-3

An image is transferred to the Remote Activity automatically when the feature is set up in advance.

2.3 PRINT

The Print Management Service Classes are an application level class of services which facilitate the printing of images on a hardcopy medium. The print management SCU and print management SCP are peer DICOM print management application entities. The DICOM print application supports the print management DIMSE services and acts as the SCU.

2.3.1 APPLICATION DATA FLOW DIAGRAM

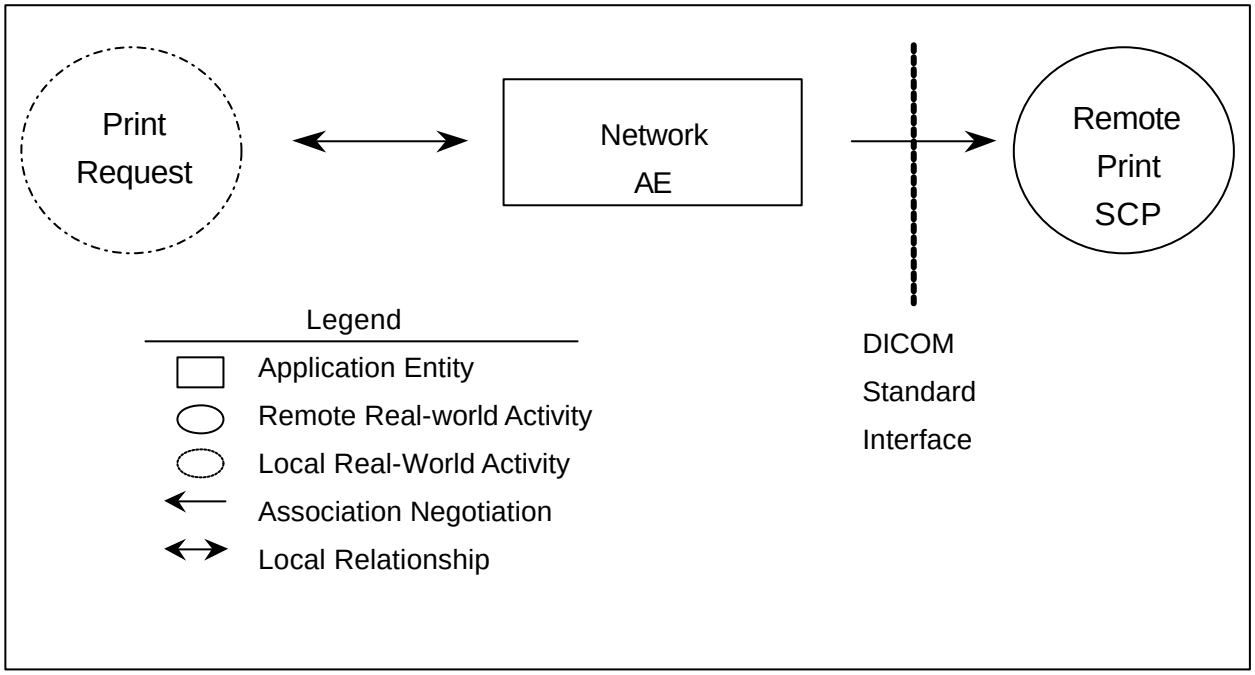

Figure 3

2.3.2 FUNCTIONAL DEFINITIONS OF APPLICATION ENTITIES

Network AE is used to transmit image Print requests to a remote DICOM device. It therefore performs the following tasks:

- Builds DICOM Basic Grayscale and Color Print Objects
- Establishes DICOM Associations with remote DICOM devices
- Transmits DICOM Basic Grayscale and Color Print Objects to remote DICOM devices

2.3.3 SEQUENCE OF REAL WORLD ACTIVITIES

2.3.3.1 FEATURES

- Operator requests printing of images after selecting the target images

from the Image List.

- The number of frames in the rows and columns on each film can be specified as desired.
- Print requests are placed in a queue and are executed in the background.
- Network AE acts as the SCU for PRINT.

2.3.3.2 OPERATION

The operations for printing are described below:

Operation-1

Step-1: Display the image to be printed.

Step-2: Request printing.

Operation-2

An image is transferred to the DICOM printer automatically when the feature is set up in advance.

3 AE SPECIFICATIONS

3.1 NETWORK AE SPECIFICATIONS

Network AE (initiation) provides Standard Conformance to the following DICOM SOP Classes as an SCU:

Table 1

SOP Class Name	SOP Class UID
Verification	1.2.840.10008.1.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Basic Grayscale Print Management	1.2.840.10008.5.1.1.9
Basic Color Print Management	1.2.840.10008.5.1.1.18

Network AE (acceptance) provides Standard Conformance to the following DICOM SOP Classes as an SCP:

Table 2

SOP Class Name	SOP Class UID
Verification	1.2.840.10008.1.1

3.1.1 ASSOCIATION ESTABLISHMENT POLICIES

3.1.1.1 GENERAL

The configuration of the DICOM application defines the Application Entity Titles, the port numbers and of course the host name and net address.
The Application Entity will utilize the following Application Context Name:

Table 3

DICOM V3.0 Application Context	**1.2.840.10008.3.1.1.1**

3.1.1.2 NUMBER OF ASSOCIATIONS

The DICOM application initiates several associations at a time, one for each transfer request being processed.

3.1.1.3 ASYNCHRONOUS NATURE

The DICOM software does not support asynchronous communication (multiple out standing transactions over a single association).

3.1.1.4 IMPLEMENTATION IDENTIFYING INFORMATION

Network AE will specify the following Implementation Identifying Information

Table 4

System	Implementation Class UID	Implementation Version Name
APLIO SSA-770A	1.2.392.200036.9116.7.8.10.46.6.1.1	TM_APLIO_1.0

3.1.2 ASSOCIATION INITIATION BY REAL-WORLD ACTIVITY

Network AE initiates an association when the following activity is chosen by the operator:

- Verification
  Verify that a remote DICOM device is present on the network
- Storage
  Creates and stores an SC or US image on a remote DICOM device.
- Print
  Requests printing of an image on a remote DICOM device.

3.1.2.1 REAL-WORLD ACTIVITY - VERIFICATION SCU

3.1.2.1.1 ASSOCIATED REAL-WORLD ACTIVITY - VERIFICATION SCU

The associated Real-World activity is a C-ECHO request initiated by the DICOM Service Tool application. If the process successfully establishes an association with a remote Application Entity, it will send the C-ECHO-Request via the open association to verify that the remote Application Entity is responding to DICOM messages.

3.1.2.1.2 PROPOSED PRESENTATION CONTEXTS - VERIFICATION SCU

The DICOM application will propose Presentation Contexts as shown in the following table:

Table 5

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

3.1.2.1.2.1 SOP SPECIFIC CONFORMANCE STATEMENT –VERIFICATION SCU

The Application conforms to the definition of a Verification SCU in accordance with the DICOM Standard.

3.1.2.2 REAL-WORLD ACTIVITY - STORAGE SCU

3.1.2.2.1 ASSOCIATED REAL-WORLD ACTIVITY - STORAGE SCU

The associated Real-World activity is a C-STORE request initiated by an internal daemon process. If the process successfully establishes an association with a remote Application Entity, it will transfer images one after another via the open association. If the C-STORE Response from the remote Application contains an error status, the association is aborted.

3.1.2.2.2 PROPOSED PRESENTATION CONTEXTS – STORAGE SCU

The DICOM application will propose Presentation Contexts as shown in the following table:

Table 6

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	**UID**	**Name List**	**UID List**		
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None

3.1.2.2.2.1 SOP SPECIFICATION CONFORMANCE STATEMENT –STORAGE SCU

DIMSE and attributes are described in chapter 9, 10.

3.1.2.3 REAL WORLD ACTIVITY – PRINT SCU

The print management SCU invokes print management DIMSE services to transfer images from the local AE to the remote SCP AE and to print the images with the defined film format and size on a selected network DICOM hardcopy printer (see DICOM part 4, annex H). It provides Standard Conformance to the DICOM V3.0 Basic Grayscale Print Management Meta SOP Class, the Basic Color Print Management Meta SOP Class, and the optional Print Job SOP Class as an SCU:

Basic Gray Scale Print Management Meta SOP-Classes

Table 7

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

Basic Color Print Management Meta SOP-Classes

Table 8

SOP Class Name	SOP Class UID
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2
Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1
Printer SOP Class	1.2.840.10008.5.1.1.16
Print Job SOP Class	1.2.840.10008.5.1.1.14

3.1.2.3.1 ASSOCIATED REAL-WORLD ACTIVITY – PRINT SCU

The associated Real-World activity is to print over a network one or more copies of a set of images on a film sheet . The images are converted to Standard¥1-1. If the response from the remote application contains a status other than Success or Warning, the association is aborted.

3.1.2.3.2 PROPOSED PRESENTATION CONTEXTS – PRINT SCU

Network AE supports the following Presentation Contexts for **Print**.

Table 9

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended
Name	**UID**	**Name List**	**UID List**		**Negotiation**
Basic Grayscale Print Management Meta SOP	1.2.840.10008.5.1.1.9	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Film Session SOP	1.2.840.10008.5.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Film Box SOP	1.2.840.10008.5.1.1.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Grayscale Image Box SOP	1.2.840.10008.5.1.1.4	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Printer SOP	1.2.840.10008.5.1.1.16	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Print Job SOP	1.2.840.10008.5.1.1.14	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little	1.2.840.10008.1.2	SCU	None

		Endian			

Table 10

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	**UID**	**Name List**	**UID List**		
Basic Color Print Management Meta SOP	1.2.840.10008.5.1.1.18	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Film Session SOP	1.2.840.10008.5.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Film Box SOP	1.2.840.10008.5.1.1.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Color Image Box SOP	1.2.840.10008.5.1.1.4.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Print SOP	1.2.840.10008.5.1.1.16	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Print Job SOP	1.2.840.10008.5.1.1.14	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

3.1.2.3.2.1 SOP SPECIFIC CONFORMANCE STATEMENT –PRINT SCU

The PRINT SCU conforms to the DICOM Basic Grayscale Print Management Meta SOP Class and Basic Color Print Management Meta SOP Class.

Printing is suspended only in the case of a failure return status of the SCP.

DIMSE and attributes are described in chapter 11.

3.1.3 ASSOCIATION ACCEPTANCE POLICY

Network AE accepts passive association at any activated time.

3.1.3.1 ACCEPTANCE REAL WORLD ACTIVITY – VERIFICATION SCP

3.1.3.1.1 ASSOCIATED REAL-WORLD ACTIVITY - VERIFICATION SCP

The associated Real-World activity is acceptance to initiate a C-ECHO request from a remote DICOM device.

If the process successfully establishes an association from a remote DICOM device, the C-ECHO-Response will be sent to it via the open association to verify the Network AE.

3.1.3.1.2 PRESENTATION CONTEXT TABLE - VERIFICATION SCP

The DICOM application allows establishment of Presentation Contexts as shown in the following table:

Table 11

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	**UID**	**Name List**	**UID List**		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

4 COMMUNICATION PROFILES

4.1 SUPPORTED COMMUNICATION STACKS

This system provides DICOM V3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard.

4.2 OSI STACK

Not applicable to this product

4.3 TCP/IP STACK

This application uses the TCP/IP stack from the computer system on which it is executed.

4.3.1 API

Not applicable to this product.

4.3.2 PHYSICAL MEDIA SUPPORT

This application is independent of the physical medium over which TCP/IP executes; it inherits this from the computer system on which it is executed.

4.3.3 POINT-TO-POINT STACK

No applicable to this product.

5 EXTENSIONS/SPECIALIZATIONS/PRIVATIZATIONS

5.1 STANDARD EXTENDED/SPECIALIZED/PRIVATE SOPS

5.1.1 PRIVATE ELEMENTS FOR STORAGE SOP CLASSES

The following private attributes are defined by COMAPL based DICOM applications.

5.1.1.1 REGISTRY OF DICOM DATA ELEMENTS

Table 12

Tag	Private Owner Code	Name	VR	VM
(0029,xx08)	TOSHIBA MDW HEADER	Image Header Type	CS	1
(0029,xx09)	TOSHIBA MDW HEADER	Image Header Version	LO	1
(0029,xx10)	TOSHIBA MDW HEADER	Image Header Info	OB	1
(0029,xx18)	TOSHIBA MDW HEADER	Series Header Type	CS	1
(0029,xx19)	TOSHIBA MDW HEADER	Series Header Version	LO	1
(0029,xx20)	TOSHIBA MDW HEADER	Series Header Info	OB	1
(0029,xx08)	TOSHIBA COMAPL HEADER	COMAPL Header Type	CS	1
(0029,xx09)	TOSHIBA COMAPL HEADER	COMAPL Header Version	LO	1
(0029,xx10)	TOSHIBA COMAPL HEADER	COMAPL Header Info	OB	1
(0029,xx20)	TOSHIBA COMAPL HEADER	COMAPL History Information	OB	1
(0029,xx31)	PMTF INFORMATION DATA	PMTF Information 1	LO	1
(0029,xx32)	PMTF INFORMATION DATA	PMTF Information 2	UL	1
(0029,xx33)	PMTF INFORMATION DATA	PMTF Information 3	UL	1
(0029,xx34)	PMTF INFORMATION DATA	PMTF Information 4	CS	1
(0029,xx08)	TOSHIBA COMAPL OOG	COMAPL OOG Type	CS	1
(0029,xx09)	TOSHIBA COMAPL OOG	COMAPL OOG Version	LO	1
(0029,xx10)	TOSHIBA COMAPL OOG	COMAPL OOG Info	OB	1

5.1.1.2 ALL COMAPL SUPPORTED IMAGE SOP CLASSES

5.1.1.2.1 EXTENDED IMAGE IOD MODULE TABLE

Table 13

IE	Module	Reference	Usage[*1]	Notes
Patient	Patient	Part 3 C.7.1.1	M	
Study	General Study	Part 3 C.7.2.1	M	
	Patient Study	Part 3 C.7.2.2	U	
Series	General Series	Part 3 C.7.3.1	M	
Equipment	General Equipment	Part 3 C.7.5.1	U	
Image	General Image	Part 3 C.7.6.1	M	
	Image Pixel	Part 3 C.7.6.3	M	
	IOD specific modules	Part 3 C.8.<module>	M/U	Depends on the IOD
	Image Header	5.1.1.2.2	U	
	Series Header	5.1.1.2.3	U	
	COMAPL Header	5.1.1.2.4	U	Private History information
	COMAPL OOG	5.1.1.2.5	U	If object graphics is attached to image
	SOP Common	Part 3 C.12.1	M	

[1] M=Mandatory, C=Conditional, U=User option

5.1.1.2.2 IMAGE HEADER MODULE

The table in this section contains private IOD Attributes that describe the Image Header.

Table 14

Attribute Name	Tag	Private Creator	Type	Notes
Image Header Type	(0029,xx08)	TOSHIBA MDW HEADER	1	Image Header identification characteristics.
Image Header Version	(0029,xx09)	TOSHIBA MDW HEADER	3	Version of Image Header Info (0029,xx10) format.
Image Header Info	(0029,xx10)	TOSHIBA MDW HEADER	3	Product dependent information.

5.1.1.2.3 SERIES HEADER MODULE

The table in this section contains private IOD Attributes that describe the Series Header.

Table 15

Attribute Name	Tag	Private Creator	Type	Notes
Series Header Type	(0029,xx18)	TOSHIBA MDW HEADER	1	Series Header identification characteristics. Defined Terms: <NUM 4 = NUMARIS/4 > <SOM 5 = SOMARIS/5 >
Series Header Version	(0029,xx19)	TOSHIBA MDW HEADER	3	Version of Series Header Info (0029,xx20) format.
Series Header Info	(0029,xx20)	TOSHIBA MDW HEADER	3	Product dependent information.

5.1.1.2.4 COMAPL HEADER MODULE

The table in this section contains private IOD Attributes that describe the TOSHIBA COMAPL HEADER.

Table 16

Attribute Name	Tag	Private Creator	Type	Notes
COMAPL Header Type	(0029,xx08)	TOSHIBA COMAPL HEADER	1C	COMAPL Header identification characteristics. Defined Terms: COMAPL 1 Required if COMAPL Header Info (0029,xx10) present.
COMAPL Header Version	(0029,xx09)	TOSHIBA COMAPL HEADER	2C	Version of COMAPL Header Info (0029,xx10) format. Required if COMAPL Header Info (0029,xx10) present.
COMAPL Header Info	(0029,xx10)	TOSHIBA COMAPL HEADER	3	Manufacturer model dependent information. The value of the attribute COMAPL Header Info (0029,xx10) can be included in each user defined format.
COMAPL History Information	(0029,xx20)	TOSHIBA COMAPL HEADER	3	COMAPL defined Patient Registration history information. See 5.1.1.2.4.1
PMTF Information 1	(0029,xx31)	PMTF INFORMATION DATA	3	Transformation Information
PMTF Information 2	(0029,xx32)	PMTF INFORMATION DATA	3	Transformation Information

PMTF Information 3	(0029,xx33)	PMTF INFORMATION DATA	3	Transformation Information
PMTF Information 4	(0029,xx34)	PMTF INFORMATION DATA	3	Transformation Information

5.1.1.2.4.1 COMAPL HISTORY INFORMATION

The value of the attribute COMAPL History Information (0029,xx20) is defined as follows:

Table 17

Part	Name	Type	Bytes	Notes
Header	Identifier	String	32	Always "HISTORY"
	Version	String	32	e.g. "V1.10"
> n items	Class Name	String	64	
	Modification String	String	1024	

5.1.1.2.5 COMAPL OOG MODULE

The table in this section contains private IOD Attributes that describe COMAPL Object Oriented Graphics (OOG). This module is used when object graphics are drawn on the image. The module stores the properties of the graphics objects (Line, Circle, Rectangle, Arrow, and so on). Thus the graphics objects retain their relationships with the image even if the image is transferred via the DICOM C-Store SOP class.

Table 18

Attribute Name	Tag	Private Creator	Type	Notes
COMAPL OOG Type	(0029,xx08)	TOSHIBA COMAPL OOG	1	COMAPL Object Oriented Graphics (OOG) identification characteristics. Defined Terms: COMAPL OOG 1
COMAPL OOG Version	(0029,xx09)	TOSHIBA COMAPL OOG	3	Version of COMAPL OOG Info (0029,xx10) format
COMAPL OOG Info	(0029,xx10)	TOSHIBA COMAPL OOG	3	COMAPL Object Oriented Graphics (OOG) data.

The graphics objects are stored in an Image overlay plane for compatibility with products that do not support the COMAPL OOG module. Any system which does not support this COMAPL OOG module has to remove these private attributes when modifying the image overlay data.

6 CONFIGURATION

6.1 CONFIGURABLE PARAMETER

The user can set and maintain the following configuration parameters for local and remote DICOM application entities. The parameters are as follows:

Table 19

Parameter			Default
Local	AE Title		
	Port Number		104
Remote	AE Title		
	Host Name		
	Port Number		
	IP Address		
	Print	Hold printed film jobs	10
		Pixel Size [1/1000mm]	Depending on the printer
		Film Sheet Formats	Depending on the printer
		Number of Pixels [Rows, Columns]	Depending on the printer
		Medium type	Depending on the printer
		Film Destination	Depending on the printer
		Magnification Type	Replicate

7 SUPPORT OF EXTENDED CHARACTER SETS

ISO-IR 100 (Latin alphabet No.1) Supplementary set of ISO8859

8 DIMSE, ATTRIBUTES, AND CRITERION - VERIFICATION SCU/SCP

8.1 DIMSE - VERIFICATION SCU/SCP

Table 20

SOP Class	DIMSE Service Element	Usage SCU *1	Usage
Verification	C-ECHO	M	Used

*1 : M = Mandatory, C=Conditional, U=User option

9 DIMSE AND ATTRIBUTES – SECONDARY CAPTURE IMAGE STORAGE SCU

9.1 DIMSE - SECONDARY CAPTURE IMAGE STORAGE SCU

Table 21

SOP Class	DIMSE Service Element	Usage SCU *1	Usage
Secondary Capture Image Storage	C-STORE	M	Used

*1 : M = Mandatory, C=Conditional, U=User option

9.2 ENTITY MODULE DEFINITIONS

The information modules for the Ultrasound Workstation are defined below.

Table 22

Information Entity	Module	Reference	Usage[1]
Patient	Patient Module	9.3.1	M
Study	General Study Module	9.3.2	M
	Patient Study Module	9.3.3	U
Series	General Series Module	9.3.4	M
Equipment	General Equipment Module	9.3.5	U
	SC Equipment Module	9.3.6	M
Image	General Image Module	9.3.7	M
	Image Pixel Module	9.3.8	M

SC Image Module	9.3.9	M
Overlay Plane Module	Not Used	U
Modality LUT Module	Not Used	U
VOI LUT Module	9.3.10	U
SOP Common Module	9.3.11	M

[1] M=Mandatory, C=Conditional, U=User option

9.3 ATTRIBUTES - SECONDARY CAPTURE IMAGE STORAGE SCU

9.3.1 PATIENT MODULE

Table 23

Attribute Name	Tag	Type	Attribute Description
Patient's Name	(0010, 0010)	2	Length=0 when no entry is made
Patient ID	(0010, 0020)	2	Always set
Patient's Birth Date	(0010, 0030)	2	Length=0 when no entry is made
Patient's Sex	(0010, 0040)	2	Length=0 when no entry is made
Patient Comments	(0010,4000)	3	Length=0 when no entry is made “Insurance=” Health Insurance Information <LINE FEED> Additional Patient Information

9.3.2 GENERAL STUDY MODULE

Table 24

Attribute Name	Tag	Type	Attribute Description
Study Instance UID	(0020, 000D)	1	Always set
Study Date	(0008, 0020)	2	Length=0 when no entry is made
Study Time	(0008, 0030)	2	Length=0 when no entry is made
Referring Physician's Name	(0008, 0090)	2	Length=0 when no entry is made
Study ID	(0020, 0010)	2	Always set

Accession Number	(0008, 0050)	2	Length=0 when no entry is made
Study Description	(0008,1030)	3	Always set (Examination Type)
Name of Physician(s) Reading Study	(0008,1060)	3	Not set when no entry is made

9.3.3 PATIENT STUDY MODULE

Table 25

Attribute Name	Tag	Type	Attribute Description
Admitting Diagnosis Description	(0008,1080)	3	Not set when no entry is made
Patient's Age	(0010, 1010)	3	Not set when no entry is made
Patient's Size	(0010,1020)	3	Not set when no entry is made
Patient's Weight	(0010,1030)	3	Not set when no entry is made
Additional Patient's History	(0010,21B0)	3	Not set when no entry is made

9.3.4 GENERAL SERIES MODULE

Table 26

Attribute Name	Tag	Type	Attribute Description
Modality	(0008, 0060)	1	Always set (“US”)
Series Instance UID	(0020, 000E)	1	Always set
Series Number	(0020, 0011)	2	Length=0 when no entry is made
Series Date	(0008,0021)	3	Not set when no entry is made
Series Time	(0008,0031)	3	Not set when no entry is made
Performing Physician’s Name	(0008,1050)	3	Not set when no entry is made
Operator’s Name	(0008,1070)	3	Not set when no entry is made

9.3.5 GENERAL EQUIPMENT MODULE

Table 27

Attribute Name	Tag	Type	Attribute Description

Manufacturer	(0008, 0070)	2	Always set (“TOSHIBA_MEC”)
Institution Name	(0008, 0080)	3	Always set
Device Serial Number	(0018,1000)	3	Always set
Manufacture’s Model Name	(0008,1090)	3	Always set (“SSA-770A”)
Software Versions	(0018,1020)	3	Always set (“V1.00”)

9.3.6 SC IMAGE EQUIPMENT MODULE

Table 28

Attribute Name	Tag	Type	Attribute Description
Conversion Type	(0008, 0064)	1	Always set “DV” Digitized Video “DI” Digital Interface “DF” Digitized Film “WSD” Workstation

9.3.7 GENERAL IMAGE MODULE

Table 29

Attribute Name	Tag	Type	Attribute Description
Instance Number	(0020, 0013)	2	Always set
Patient Orientation	(0020, 0020)	2C	Always set (Length=0)
Image Date	(0008, 0023)	2C	Always set
Image Time	(0008, 0033)	2C	Always set
Image Type	(0008, 0008)	3	Always set : Value 1 : Pixel Data Characteristics “ORIGINAL”, or “DERIVED” Value 2 : Patient Exam Characteristics “PRIMARY”, or

			“SECONDARY” Value 3 : System Defined Term: “US IMAGE” “US 3D IMAGE” (Set when the Secondary Capture image is 3D Screen Shot)
Acquisition Date	(0008, 0022)	3	Always set
Acquisition Time	(0008, 0032)	3	Always set
Image Comments	(0020, 4000)	3	Not set when no entry is made
Lossy Image Compression	(0028, 2110)	3	Not set when no entry is made
Lossy Image Compression Ratio	(0028,2112)	3	Not set when no entry is made

9.3.8 IMAGE PIXEL MODULE

Table 30

Attribute Name	Tag	Type	Attribute Description
Samples per Pixel	(0028, 0002)	1	Always set (3)
Photometric Interpretation	(0028, 0004)	1	Always set (“RGB”)
Rows	(0028, 0010)	1	Always set (600)
Columns	(0028, 0011)	1	Always set (800)
Bits Allocated	(0028, 0100)	1	Always set (8)
Bits Stored	(0028, 0101)	1	Always set (8)
High Bit	(0028, 0102)	1	Always set (7)
Pixel Representation	(0028, 0103)	1	Always set : (0000H:Unsigned integer)
Pixel Data	(7FE0, 0010)	1	Always set
Planar Configuration	(0028, 0006)	1C	Always set (0)

9.3.9 SC IMAGE MODULE

Table 31

Attribute Name	Tag	Type	Attribute Description
Date of Secondary Capture	(0018, 1012)	3	Not set
Time of Secondary Capture	(0018, 1014)	3	Not set

9.3.10 VOI LUT MODULE

Table 32

Attribute Name	Tag	Type	Attribute Description
Window Center	(0028, 1050)	3	Always set
Window Width	(0028, 1051)	1C	Always set

9.3.11 SOP COMMON MODULE

Table 33

Attribute Name	Tag	Type	Attribute Description
SOP Class UID	(0008, 0016)	1	Always set
SOP Instance UID	(0008, 0018)	1	Always set
Specific Character Set	(0008, 0005)	1C	Always set (“ISO_IR 100”)
Instance Number	(0020,0013)	3	Not set when no entry is made

10 DIMSE AND ATTRIBUTES - ULTRASOUND IMAGE STORAGE SCU

10.1 DIMSE - ULTRASOUND IMAGE STORAGE SCU

Table 34

SOP Class	DIMSE Service Element	Usage SCU *1	Usage
Ultrasound Image Storage	C-STORE	M	Used

*1 : M = Mandatory

10.2 ENTITY MODULE DEFINITIONS - ULTRASOUND IMAGE STORAGE SCU

The information modules for the Ultrasound Workstation are defined below.

Table 35

Information Entity	Module	Reference	Usage[1]
Patient	Patient Module	10.3.1	M
Study	General Study Module	10.3.2	M
Study	Patient Study Module	10.3.3	U
Series	General Series Module	10.3.4	M
Frame of Reference	Frame of Reference Module	Not Used	U
Frame of Reference	US Frame of Reference Module	Not Used	C
Equipment	General Equipment Module	10.3.5	M
Image	General Image Module	10.3.6	M
	Image Pixel Module	10.3.7	M
	Palette Color Lookup Table	Not Used	C
	Contrast / bolus Module	Not Used	C
	US Region Calibration Module	10.3.8	U
	US Image Module	10.3.9	M

	Overlay Plane Module	Not Used	U
	VOI LUT Module	10.3.10	U
	SOP Common Module	10.3.11	M
Curve	Curve Identification Module	Not Used	M
	Curve Module	Not Used	M
	Audio Module	Not Used	U
	SOP Common	Not Used	M

[1] M=Mandatory, C=Conditional, U=User option

[2] The Image and Curve IE's are mutually exclusive

10.3 ATTRIBUTES - ULTRASOUND IMAGE STORAGE SCU

10.3.1 PATIENT MODULE

Table 36

Attribute Name	Tag	Type	Attribute Description
Patient's Name	(0010, 0010)	2	Length=0 when no entry is made
Patient ID	(0010, 0020)	2	Always set
Patient's Birth Date	(0010, 0030)	2	Length=0 when no entry is made
Patient's Sex	(0010, 0040)	2	Length=0 when no entry is made
Patient Comments	(0010,4000)	3	Length=0 when no entry is made (“Insurance=” Health Insurance Information<LINE FEED> Additional Patient Information)

10.3.2 GENERAL STUDY MODULE

Table 37

Attribute Name	Tag	Type	Attribute Description
Study Instance UID	(0020, 000D)	1	Always set
Study Date	(0008, 0020)	2	Always set
Study Time	(0008, 0030)	2	Always set
Referring Physician's Name	(0008, 0090)	2	Length=0 when no entry is made
Study ID	(0020, 0010)	2	Always set
Accession Number	(0008, 0050)	2	Length=0 when no entry is made
Study Description	(0008,1030)	3	Length=0 when no entry is made (Examination Type)
Name of Physician(s) Reading Study	(0008,1060)	3	Not set when no entry is made

10.3.3 PATIENT STUDY MODULE

Table 38

Attribute Name	Tag	Type	Attribute Description
Admitting Diagnoses Description	(0008,1080)	3	Not set when no entry is made
Patient's Age	(0010, 1010)	3	Not set when no entry is made
Patient's Size	(0010,1020)	3	Not set when no entry is made
Patient's Weight	(0010,1030)	3	Not set when no entry is made
Additional Patient's History	(0010,21B0)	3	Not set when no entry is made

10.3.4 GENERAL SERIES MODULE

Table 39

Attribute Name	Tag	Type	Attribute Description
Modality	(0008, 0060)	1	Always set (“US”)
Series Instance UID	(0020, 000E)	1	Always set
Series Number	(0020, 0011)	2	Always set
Series Date	(0008,0021)	3	Not set when no entry is made
Series Time	(0008,0031)	3	Not set when no entry is made
Performing Physician’s Name	(0008,1050)	3	Not set when no entry is made
Operator’s Name	(0008,1070)	3	Not set when no entry is made

10.3.5 GENERAL EQUIPMENT MODULE

Table 40

Attribute Name	Tag	Type	Attribute Description
Manufacturer	(0008, 0070)	2	Always set (“TOSHIBA_MEC”)
Institution Name	(0008, 0080)	3	Always set
Device Serial Number	(0018,1000)	3	Always set
Manufacture’s Model Name	(0008,1090)	3	Always set (“SSA-770A”)

Software Versions	(0018,1020)	3	Always set (“V1.00”)

10.3.6 GENERAL IMAGE MODULE

Table 41

Attribute Name	Tag	Type	Attribute Description
Instance Number	(0020, 0013)	2	Always set
Patient Orientation	(0020,0020)	2C	Always set (Length=0)
Image Date	(0008, 0023)	2C	Always set
Image Time	(0008, 0033)	2C	Always set
Image Type	(0008,0008)	3	Always set : Value 1 : Pixel Data Characteristics “ORIGINAL”, or “DERIVED” Value 2 : Patient Exam Characteristics “PRIMARY”, or “SECONDARY” Value 3 : System Defined Term: “US IMAGE” Value 4 : Standard Defined Terms : 0001 = 2D Imaging 0002 = M-Mode 0004 = CW Doppler 0008 = PW Doppler 0010 = Color Doppler 0020 = Color M-Mode 0040 = 3D Rendering
Acquisition Date	(0008,0022)	3	Always set
Acquisition Time	(0008,0032)	3	Always set
Image Comments	(0020,4000)	3	Not set when no entry is made

Lossy Image Compression	(0028,2110)	3	Always set (0) Uncompressed
Lossy Image Compression Ratio	(0028,2112)	3	Not set when no entry is made

10.3.7 IMAGE PIXEL MODULE

Table 42

Attribute Name	Tag	Type	Attribute Description
Samples per Pixel	(0028, 0002)	1	Always set (3)
Photometric Interpretation	(0028, 0004)	1	Always set (“RGB”)
Rows	(0028, 0010)	1	Always set (537)
Columns	(0028, 0011)	1	Always set (716)
Bits Allocated	(0028, 0100)	1	Always set (8)
Bits Stored	(0028, 0101)	1	Always set (8)
High Bit	(0028, 0102)	1	Always set (7)
Pixel Representation	(0028, 0103)	1	Always set (0) : Unsigned Integer
Pixel Data	(7FE0, 0010)	1	Always set
Planar Configuration	(0028, 0006)	1C	Always set (0)

10.3.8 US REGION CALIBRATION MODULE

10.3.8.1 US REGION CALIBRATION MODULE B-MODE

Table 43

Attribute Name	Tag	Type	Attribute Description
Sequence of Ultrasound Regions	(0018,6011)	1	Always set
>Region Location Min x0	(0018,6018)	1	Always set
>Region Location Min y0	(0018,601A)	1	Always set
>Region Location Max x1	(0018,601C)	1	Always set
>Region Location Max y1	(0018,601E)	1	Always set
>Physical Units X Direction	(0018,6024)	1	Always set

>Physical Units Y Direction	(0018,6026)	1	Always set
>Physical Delta X	(0018,602C)	1	Always set
>Physical Delta Y	(0018,602E)	1	Always set
>Region Spatial Format	(0018,6012)	1	Always set
>Region Data Type	(0018,6014)	1	Always set
>Region Flags	(0018,6016)	1	Always set
>Transducer Frequency	(0018,6030)	3	Always set

10.3.8.2 US REGION CALIBRATION MODULE BC-MODE

Table 44

Attribute Name	Tag	Type	Attribute Description
Sequence of Ultrasound Regions	(0018,6011)	1	Always set
>Region Location Min x0	(0018,6018)	1	Always set
>Region Location Min y0	(0018,601A)	1	Always set
>Region Location Max x1	(0018,601C)	1	Always set
>Region Location Max y1	(0018,601E)	1	Always set
>Physical Units X Direction	(0018,6024)	1	Always set
>Physical Units Y Direction	(0018,6026)	1	Always set
>Physical Delta X	(0018,602C)	1	Always set
>Physical Delta Y	(0018,602E)	1	Always set
>Region Spatial Format	(0018,6012)	1	Always set
>Region Data Type	(0018,6014)	1	Always set
>Region Flags	(0018,6016)	1	Always set
>Transducer Frequency	(0018,6030)	3	Always set

>Pulse Repetition Frequency	(0018,6032)	3	Always set

10.3.8.3 US REGION CALIBRATION MODULE D-MODE

Table 45

Attribute Name	Tag	Type	Attribute Description
Sequence of Ultrasound Regions	(0018,6011)	1	Always set
>Region Location Min x0	(0018,6018)	1	Always set
>Region Location Min y0	(0018,601A)	1	Always set
>Region Location Max x1	(0018,601C)	1	Always set
>Region Location Max y1	(0018,601E)	1	Always set
>Physical Units X Direction	(0018,6024)	1	Always set
>Physical Units Y Direction	(0018,6026)	1	Always set
>Physical Delta X	(0018,602C)	1	Always set
>Physical Delta Y	(0018,602E)	1	Always set
>Region Spatial Format	(0018,6012)	1	Always set
>Region Data Type	(0018,6014)	1	Always set
>Region Flags	(0018,6016)	1	Always set
>Transducer Frequency	(0018,6030)	3	Always set
>Pulse Repetition Frequency	(0018,6032)	3	Always set
>Doppler Correction Angle	(0018,6034)	3	Always set
>Steering Angle	(0018,6036)	3	Always set

10.3.8.4 US REGION CALIBRATION MODULE M-MODE

Table 46

Attribute Name	Tag	Type	Attribute Description

Sequence of Ultrasound Regions	(0018,6011)	1	Always set
>Region Location Min x0	(0018,6018)	1	Always set
>Region Location Min y0	(0018,601A)	1	Always set
>Region Location Max x1	(0018,601C)	1	Always set
>Region Location Max y1	(0018,601E)	1	Always set
>Physical Units X Direction	(0018,6024)	1	Always set
>Physical Units Y Direction	(0018,6026)	1	Always set
>Physical Delta X	(0018,602C)	1	Always set
>Physical Delta Y	(0018,602E)	1	Always set
>Region Spatial Format	(0018,6012)	1	Always set
>Region Data Type	(0018,6014)	1	Always set
>Region Flags	(0018,6016)	1	Always set
>Transducer Frequency	(0018,6030)	3	Always set

10.3.9 US IMAGE MODULE

Table 47

Attribute Name	Tag	Type	Attribute Description
Sample Per Pixel	(0028, 0002)	1	Always set (3)
Photometric Interpretation	(0028, 0004)	1	“RGB”
Bits Allocated	(0028,0100)	1	Always set (8)
Bits Stored	(0028, 0101)	1	Always set (8)
High Bit	(0028, 0102)	1	Always set (7)
Planar Configuration	(0028, 0006)	1	Always set (0)
Pixel Representation	(0028, 0103)	1	Always set (0)
Image Type	(0008, 0008)	2	Always set :

			Value 1 : Pixel Data Characteristics “ORIGINAL”, or “DERIVED” Value 2 : Patient Exam Characteristics “PRIMARY”, or “SECONDARY” Value 3 : System Defined Term: “US IMAGE” Value 4 : Standard Defined Terms : 0001 = 2D Imaging 0002 = M-Mode 0004 = CW Doppler 0008 = PW Doppler 0010 = Color Doppler 0020 = Color M-Mode 0040 = 3D Rendering
Lossy Image Compression	(0028, 2110)	1C	Always set (0) Uncompressed
Ultrasound Color Data Present	(0028, 0014)	3	Always set (1)
Heart Rate	(0018,1088)	3	Beat per minutes. Not set when no entry is made.
Transducer Type	(0018,6031)	3	Defined Terms: “SECTOR_PHASED” “LINEAR” “CURVED LINEAR” “VECTOR_PHASED”

10.3.10 VOI LUT MODULE

Table 48

Attribute Name	Tag	Type	Attribute Description
Window Center	(0028, 1050)	1C	Always set

Window Width	(0028, 1051)	1C	Always set

10.3.11 SOP COMMON MODULE

Table 49

Attribute Name	Tag	Type	Attribute Description
SOP Class UID	(0008, 0016)	1	Always set
SOP Instance UID	(0008, 0018)	1	Always set
Specific Character Set	(0008, 0005)	1C	Always set (“ISO_IR 100”)
Instance Number	(0020,0013)	3	Not set when no entry is made

11 DIMSE AND ATTRIBUTES – PRINT SCU

11.1 DIMSE - PRINT SCU

Table 50

SOP Class	DIMSE Service Element	Usage SCU *1	Usage
Basic Film Session SOP Class	N-CREATE	M	Used
	N-DELETE	U	Used
Basic Film Box SOP Class	N-CREATE	M	Used
	N-ACTION	M	Used
	N-DELETE	U	Used
Basic Grayscale Image Box SOP Class	N-SET	M	Used
Basic Color Image Box SOP Class	N-SET	M	Used
Printer SOP Class	N-EVENT-REPORT	M	Used
	N-GET	U	Used
Print Job SOP Class	N-EVENT-REPORT	M	Used

*1 : M = Mandatory, C=Conditional, U=User option

11.2 ATTRIBUTES- PRINT SCU

11.2.1 ATTRIBUTES - BASIC FILM SESSION SOP CLASS

11.2.1.1 ATTRIBUTES - N-CREATE

Table 51

Attribute Name	Tag	Usage	Attribute Description
Number of Copies	(2000,0010)	U	Always set
Medium Type	(2000,0030)	U	Always set “BLUE FILM”, “CLEAR FILM”, or

			“PAPER”
Film Destination	(2000,0040)	U	Always set “MAGAZINE”, or “PROCESSOR”

11.2.1.2 ATTRIBUTES - N-DELETE

Table 52

Attribute Name	Tag	Source of Information
Requested SOP Instance UID	(0008,0018)	Affected SOP Instance UID of N-CREATE-RSP on Basic Film Session

11.2.2 ATTRIBUTES - BASIC FILM BOX SOP CLASS

11.2.2.1 ATTRIBUTES – N-CREATE

Table 53

Attribute Name	Tag	Usage	Attribute Description
Image Display Format	(2010,0010)	M	Always set (“STANDARD¥1-1”)
Film Orientation	(2010,0040)	U	Always set (“PORTRAIT”)
Film Size ID	(2010,0050)	U	Always set (“8INX10IN”, “10INX12IN”, “10INX14IN”, “11INX14IN”, “14INX14IN”, “14INX17IN”, “24CMX24CM”, or “24CMX30CM”)
Magnification Type	(2010,0060)	U	Always set
Min Density	(2010,0120)	U	Always set
Max Density	(2010,0130)	U	Always set
Referenced Film Session	(2010,0500)	M	

Sequence			
>Referenced SOP Class UID	(0008,1150)	M	1.2.840.10008.5.1.1.1
>Referenced SOP Instance UID	(0008,1155)	M	

11.2.2.2 ATTRIBUTES – N-DELETE

Table 54

Attribute name	Tag	Source of information
Requested SOP Instance UID	(0008,0018)	Affected SOP Instance UID of N_CREATE_RSP on Basic Film Box

11.2.3 ATTRIBUTES - BASIC GRAYSCALE IMAGE BOX SOP CLASS

Table 55

Attribute Name	Tag	Usage	Attribute Description
Image Position	(2020,0010)	M	Always set(1)
Basic Grayscale Image Sequence	(2020,0110)	M	
>Samples Per Pixel	(0028,0002)	M	Always set (1)
>Photometric Interpretation	(0028,0004)	M	Always set (“MONOCHROME2”)
>Rows	(0028,0010)	M	
>Columns	(0028,0011)	M	
>Pixel Aspect Ratio	(0028,0034)	M	
>Bits Allocated	(0028,0100)	M	Always set (8)
>Bits Stored	(0028,0101)	M	Always set (8)
>High Bit	(0028,0102)	M	Always set (7)
>Pixel Representation	(0028,0103)	M	Always set (0)
>Pixel Data	(7FE0,0010)	M	

11.2.4 ATTRIBUTES - BASIC COLOR IMAGE BOX SOP CLASS

Table 56

Attribute Name	Tag	Usage	Attribute Description
Image Position	(2020,0010)	M	Always set (1)
Basic Color Image Sequence	(2020,0111)	M	
>Samples Per Pixel	(0028,0002)	M	Always set (3)
>Photometric Interpretation	(0028,0004)	M	Always set (“RGB”)
>Planar Configuration	(0028,0006)	M	Always set (0)
>Rows	(0028,0010)	M	
>Columns	(0028,0011)	M	
>Pixel Aspect Ratio	(0028,0034)	M	
>Bits Allocated	(0028,0100)	M	Always set (8)
>Bits Stored	(0028,0101)	M	Always set (8)
>High Bit	(0028,0102)	M	Always set (7)
>Pixel Representation	(0028,0103)	M	Always set (0)
>Pixel Data	(7FE0,0010)	M	

11.2.5 ATTRIBUTES - PRINTER SOP CLASS

11.2.5.1 ATTRIBUTES - N-EVENT REPORT

Table 57

Event Type Name	Event	Attributes	Tag	Usage
Normal	1			
Warning	2	Printer Status Info	(2110,0020)	U
Failure	3	Printer Status Info	(2110,0020)	U

11.2.5.2 ATTRIBUTES - N-GET-RSP / N-EVENT-REPORT-RQ

Table 58

Attribute name	Tag	Usage	Attribute Descriptions
Printer Status	(2110,0010)	M	“NORMAL”, “FAILURE”, or

			“WARNING”
Printer Status Info	(2110,0020)	M	“SUPPLY EMPTY [a]”, “SUPPLY LOW”, “RECEIVER FULL”, “NO RECEIVE MAGAZINE”, or “FILM JAM”

a. Only valid in case of Printer Status WARNING.

11.2.6 ATTRIBUTES - PRINT JOB SOP CLASS

Table 59

Event Type Name	Event	Attribute Name	Tag	Usage
Normal	1	Execution Status Info	(2100,0030)	U
		Print Job ID	(2100,0010)	(Print Queue Management SOP Class not supported)
		Film Session Label	(2000,0050)	U
		Printer Name	(2110,0030)	U
Printing	2	Execution Status Info	(2100,0030)	U
		Print Job ID	(2100,0010)	(Print Queue Management SOP Class not supported)
		Film Session Label	(2000,0050)	U
		Printer Name	(2110,0030)	U
Done	3	Execution Status Info	(2100,0030)	U
		Print Job ID	(2100,0010)	(Print Queue Management SOP Class not supported)
		Film Session Label	(2000,0050)	U
		Printer Name	(2110,0030)	U
Failure	4	Execution Status Info	(2100,0030)	U

		Print Job ID	(2100,0010)	Print Queue Management SOP Class not supported)
		Film Session Label	(2000,0050)	U
		Printer Name	(2110,0030)	U

11.3 RETURN STATUS CRITERION – PRINT SCU

The time out values for each DIMSE are as follows:

Table 60

DIMSE	Time Out Values
N-CREATE	60sec
N-DELETE	60sec
N-ACTION	240sec
N-SET	240sec

11.4 RETURN STATUS CRITERION - BASIC FILM SESSION SOP CLASS

The Basic Film Session SOP class interprets the following status codes (from N-CREATE-RSP, and N-DELETE-RSP messages):

Table 61

Criterion	Meaning	Return status
Failure	Film session SOP instances hierarchy does not contain film box SOP instances.	C600
	Unable to create print job; print queue is full.	C601
	Image size is larger than images box size.	C603
Warning	Memory allocation not supported.	B600
	Film session printing is not supported.	B601
	Film box does not contain image box (empty page).	B602
Success	Films belonging to the film session are	0000

	accepted for printing.	

11.4.1 RETURN STATUS CRITERION - BASIC FILM BOX SOP CLASS

The Basic Film Box SOP class interprets the following status codes from the N-CREATE-RSP, N-DELETE-RSP, and N-ACTION-RSP messages:

Table 62

Criterion	Meaning	Return status
Failure	Unable to create print job; print queue is full.	C602
	Image size is larger than image box size.	C603
Warning	Film box does not contain image box (empty page).	B603
	Requested Minimum Density or Max Density is outside printer operating range.	B605
Success	Film accepted for printing.	0000

11.4.2 RETURN STATUS CRITERION - BASIC GRAYSCALE IMAGE BOX

The Grayscale Image Box SOP class interprets the following status codes (from N-SET-RSP):

Table 63

Criterion	Meaning	Return status
Warning	Requested Min Density or Max Density is outside printer operating range	B605
Failure	Image contains more pixel than printer can print in Image box	C603
	Insufficient printer memory for storing image	C605
Success		0000

11.5 RETURN STATUS CRITERION - BASIC COLOR IMAGE BOX

The Color Image Box SOP class interprets the following status codes (from N-SET-RSP):

Table 64

Criterion	Meaning	Return status
Warning	Requested Min Density or Max Density is outside printer operating range	B604
Failure	Image contains more pixels than printer can print in image box	C603
	Insufficient printer memory for storing the image	C605
Success		0000