DICOM Conformance Statement

For AlignRT Plus 8.3

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1 OVERVIEW

AlignRT is a system for monitoring the precise location and movement of a patient during setup for and treatment with radiotherapy. To support this, it acts as a file set reader (FSR) to read DICOM files, and this document explains the assumptions, limitations, and supported format of these files.

SOP Classes		User of Service (SCU)	Provider of Service (SCP)
Name	**UID**		
Varian Private RT Plan	1.2.246.352.70.1.70	Yes	No
RT Image	1.2.840.10008.5.1.4.1.1.481.1	Yes	No
RT Structure Set	1.2.840.10008.5.1.4.1.1.481.3	Yes	No
RT Plan	1.2.840.10008.5.1.4.1.1.481.5	Yes	No
RTIon Plan	1.2.840.10008.5.1.4.1.1.481.8	Yes	No

Figure 1 - Supported SOP classes

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2 TABLE OF CONTENTS

1 OVERVIEW 3

2 TABLE OF CONTENTS 4

3 INTRODUCTION 6

3.1 Revisions 6

3.2 Audience 6

3.3 Remarks 6

3.4 Definitions, Terms, and Abbreviations 6

4 NETWORKING 9

4.1 Implementation Model 9

4.1.1 Application Data Flow 9

4.1.2 Functional Definition 9

4.1.3 Sequencing of Real-World Activities 9

4.2 Specification 10

4.2.1 SOP Classes 10

4.2.2 Association Policies 10

4.2.3 Association Initiation Policy 10

4.2.4 Association Acceptance Policy 11

4.3 Network Interfaces 11

4.3.1 Physical Network Interface 11

4.3.2 Additional Protocols 11

4.3.3 IPv4 and IPv6 Support 11

4.4 Configuration 11

4.4.1 AE Title/Presentation Address Mapping 11

4.4.2 Parameters 11

5 MEDIA INTERCHANGE 12

6 TRANSFORMATION OF DICOM TO CDA 13

7 SUPPORT OF CHARACTER SETS 14

8 SECURITY 15

8.1 Security Profiles 15

8.2 Association Level Security 15

8.3 Application-Level Security 15

9 ANNEXES 16

9.1 IOD Contents 16

9.1.1 Created SOP Instance(s) 16

9.1.2 Usage of Attributes from Received IODs 16

9.1.3 Attribute Mapping 32

9.1.4 Coerced/Modified Fields 32

9.2 Data Dictionary of Private Attributes 32

9.3 Coded Terminology and Templates 32

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9.4 Grayscale Image Consistency 32
9.5 Standard Extended/Specialized/Private SOP Classes 32
9.6 Private Transfer Syntaxes 32
10 APPROVALS 33

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3 INTRODUCTION

3.1 Revisions

Date	Rev	Author	Comments
19 Jun 2026	0.0	Oscar Cousins	Initial version for AlignRT Plus 8.3 using the NEMA template at: https://dicom.nema.org/medical/dicom/current/output/chtml/part02/chapter_A.html
06 Aug 2026	1.0	Ed Mead	Updated SAD, SID to mandatory and the KVP tag to conditionally mandatory for cube calibration RT Images

3.2 Audience

The target audience are hospital IT support staff, and service and support engineers of other radiotherapy product vendors, who need to configure DICOM interoperability between AlignRT and their products.

It is assumed that the reader is familiar with the DICOM standard.

The document is structured based on the template definition in Part 2 of the DICOM standard, available for download at https://www.dicomstandard.org/current.

3.3 Remarks

It is essential that this DICOM Conformance Statement is thoroughly reviewed when using AlignRT with other DICOM capable systems.

3.4 Definitions, Terms, and Abbreviations

Informal definitions are provided for the following terms used in this Conformance Statement. The DICOM Standard is the authoritative source for formal definitions of these terms, and is available for download at https://www.dicomstandard.org/current

Abbreviation/Term	Explanation
AE	**Application Entity** An end point of a DICOM information exchange, including the DICOM network or media interface software. This may be software that sends or receives DICOM information objects or messages. A single device may have multiple AEs.
Attribute	A data element identified by a Tag in an object definition. This may itself be a complex data structure (Sequence) composed of lower-level data elements. Examples: Patient ID (0010,0020), Accession Number (0008,0050), Photometric Interpretation (0028,0004), Procedure Code Sequence (0008,1032).

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Abbreviation/Term	Explanation
CT	**Computerized Tomography** A procedure in which a narrow beam of x-rays are aimed at a patient on a couch and quickly rotated around the body, producing signals that are processed to generate a cross-sectional image, or slice. The slices are called tomographic images and give a clinician more detailed information than conventional x-rays. As the couch is moved, successive slices are collected and digitally "stacked" to form a 3D image of the patient, to allow for easier identification of basic structures as well as possible tumors or abnormalities.
DICOM	**Digital Imaging and Communications in Medicine** A standard for the management and transmission of medical images and related data used in many healthcare facilities.
FSR	**File Set Reader** An Application Entity that performs the file set reader role can means of M-READ operations access one or more existing files in a file set. A FSR shall not modify any of the files of the file-set including the DICOMDIR file.
IOD	**Information Object Definition** The specified set of Attributes that comprise a type of data object; does not represent a specific instance of the data object, but rather a class of similar data objects that have the same properties. The Attributes may be specified as Mandatory (Type 1), Required but possibly unknown (Type 2), or Optional (Type 3), and there may be conditions associated with the use of an Attribute (Types 1C and 2C). Examples: MR Image IOD, CT Image IOD, Print Job IOD.
Module	A set of Attributes that are logically related to each other within an IOD. Example: Patient Module includes Patient Name, Patient ID, Patient Birth Date, and Patient Sex.
NEMA	**National Electrical Manufacturers Association** The standards body that publishes the DICOM standard; https://www.nema.org/
PACS	**Picture Archiving and Communication System** A medical imaging technology used primarily in healthcare organizations to securely store and digitally transmit electronic images and clinically relevant reports.
RT	**Radiotherapy / Radiation Therapy** A treatment that uses high-energy x-ray or other particles to destroy cancer cells.

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Abbreviation/Term	Explanation
SCP	**Service Class Provider** The role of an Application Entity that provides a DICOM network service; typically, a server that performs operations requested by another Application Entity. Examples: Picture Archiving and Communication System (image storage SCP, and image query/retrieve SCP), Radiology Information System (modality worklist SCP).
SCU	**Service Class User** The role of an Application Entity that uses a DICOM network service; typically, a client. Examples: imaging modality (image storage SCU, and modality worklist SCU), imaging workstation (image query/retrieve SCU)
Sequence	A structure of repeated data within a DICOM file. Members of a sequence are identified using the symbol '>' before their Attribute or Module names.
SOP	**Service Object Pair** Specifies the network or media transfer (service) of a particular type of data; the fundamental unit of DICOM interoperability specification. A valid DICOM file shall have one (and only one) SOP class UID assigned to it. Examples: Ultrasound Image Storage Service, Basic Grayscale Print Management.
Tag	**Data Element Identifier** A 32-bit identifier, represented as a pair of four-digit hexadecimal numbers describing the "group" and the "element". If the "group" number is odd, the tag is for a private (manufacturer-specific) data element. Examples: (0010,0020) [Patient ID], (07FE,0010) [Pixel Data], (0019,0210) [private data element].
UID	**Unique Identifier** A globally unique "dotted decimal" string that identifies a specific object instance or a class of objects; an ISO-8824 Object Identifier. Examples: Study Instance UID, SOP Class UID such as 1.2.826.0.1.3680043.2.120.20000624
VR	**Value Representation** The format type of an individual DICOM data element, such as text, an integer, a person's name, or a code. DICOM information objects can be transmitted with either explicit identification of the type of each data element (Explicit VR), or without explicit identification (Implicit VR); with Implicit VR, the receiving application must use a DICOM data dictionary to look up the format of each data element.

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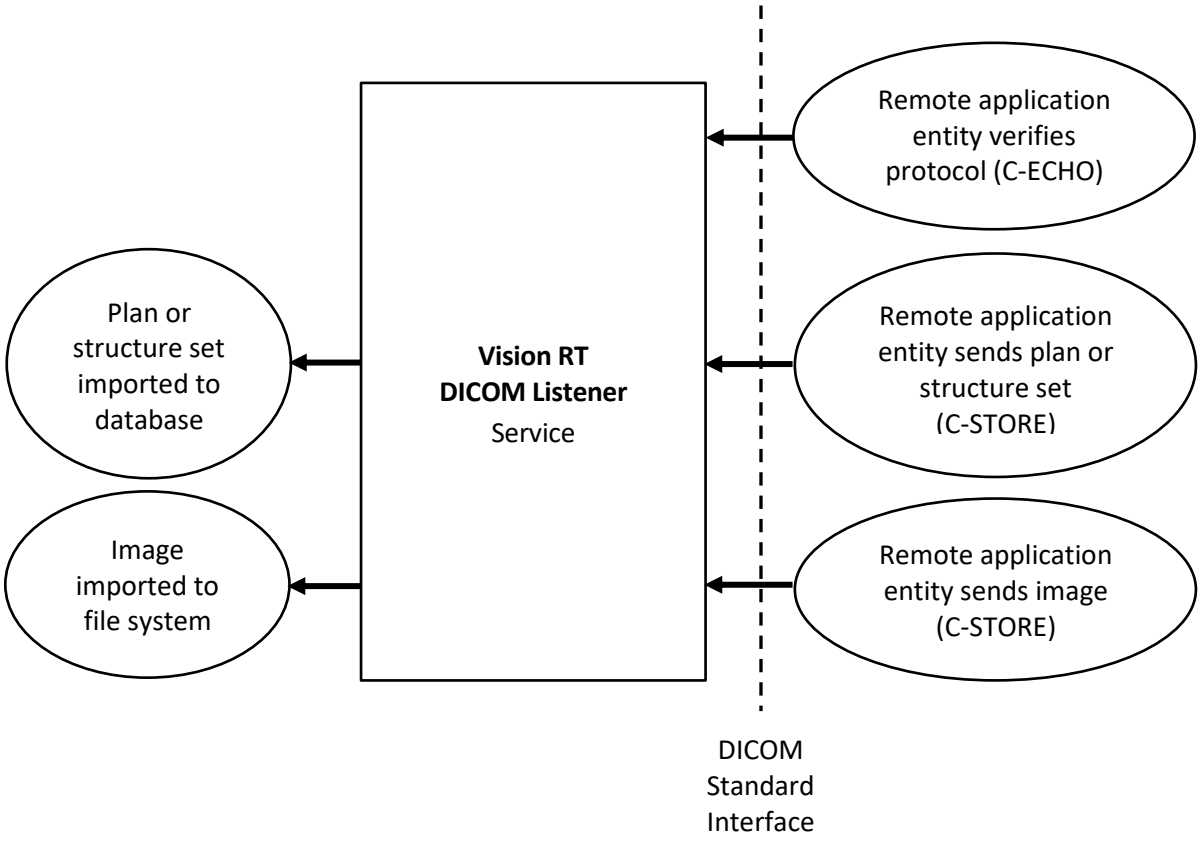
4 NETWORKING

4.1 Implementation Model

4.1.1 Application Data Flow



4.1.2 Functional Definition

The Vision RT DICOM Listener application entity is implemented as a Windows service. It is started at system start-up and accepts storage and verification requests from remote DICOM nodes. It acts as a service class provider (SCP) for C-ECHO and C-STORE requests. It only accepts an incoming connection and never initiates a new connection.

4.1.3 Sequencing of Real-World Activities

Not applicable.

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4.2 Specification

4.2.1 SOP Classes

The Vision RT DICOM Listener provides Standard Conformance to the following class(es):

SOP Classes		User of Service (SCU)	Provider of Service (SCP)
Name	**UID**		
Varian Private RT Plan	1.2.246.352.70.1.70	No	Yes
RT Image	1.2.840.10008.5.1.4.1.1.481.1	No	Yes
RT Structure Set	1.2.840.10008.5.1.4.1.1.481.3	No	Yes
RT Plan	1.2.840.10008.5.1.4.1.1.481.5	No	Yes
RTIon Plan	1.2.840.10008.5.1.4.1.1.481.8	No	Yes

4.2.2 Association Policies

4.2.2.1 General

The DICOM standard application context shall be used:

Name	UID
DICOM standard application context	1.2.840.10008.3.1.1.1

4.2.2.1 Number of Associations

The service only accepts one incoming connection.

4.2.2.2 Asynchronous Nature

The service does not support asynchronous operations and will not perform asynchronous window negotiation.

4.2.2.3 Implementation Identifying Information

The following fields will be used to identify the implementation:

Field	Value
Implementation class UID	1.2.826.0.1.3680043.10.1323.8.3
Implementation version name	VRT DICOM 8.3

4.2.3 Association Initiation Policy

The service does not initiate associations.

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4.2.4 Association Acceptance Policy

The service accepts remote association requests for the following reasons:

- Verify the DICOM protocol communication.
- Store plans and structure sets from a remote system to the AlignRT database.
- Store RT images from a remote system to the local file system.

4.3 Network Interfaces

4.3.1 Physical Network Interface

The Vision RT DICOM Listener application works over any physical medium available on the operating system and hardware it Is installed on.

4.3.2 Additional Protocols

None.

4.3.3 IPv4 and IPv6 Support

The Vision RT DICOM Listener application supports both IPv4 and IPv6.

4.4 Configuration

4.4.1 AE Title/Presentation Address Mapping

4.4.1.1 Local AE Titles.

The application entity title (AETitle) and TCP/IP port are set in the DICOM server configuration

4.4.1.2 Remote AE Title/Presentation Address Mapping

Not applicable.

4.4.2 Parameters

The following configuration parameters are set when installing the Vision RT DICOM listener:

Name	Default
AETitle	AlignRT
Port	105
DICOMEndpoint	net.tcp://localhost:8734/VisionRT/DicomDataService/
LOGEndpoint	net.tcp://localhost:8734/VisionRT/LoggingService/
SendStructsAndPlansToDatabase	True
StoreRtImagesToDisk	False
RTImagesStorageLocation	C:\MVImages

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5 MEDIA INTERCHANGE

The Vision RT DICOM Listener application does not support Media Interchange.

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6 TRANSFORMATION OF DICOM TO CDA

The Vision RT DICOM Listener does not output HL7 clinical document architecture reports.

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7 SUPPORT OF CHARACTER SETS

The Vision RT DICOM Listener application supports all character sets specified by the specific character set attribute (0008,0005) and it is recommended that all DICOM files set this to control how strings are decoded.

If not set, the Vision RT DICOM Listener application will default to the UTF7 code page to decode strings. This means that non-ASCII characters, such as accents, can be decoded against a different code page to the one used to encode them, which can result in unexpected behavior such as them being displayed incorrectly.

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8 SECURITY

8.1 Security Profiles

No Security Profiles are supported.

8.2 Association Level Security

The Vision RT DICOM Listener application will refuse association open requests arriving with an AE title different to that configured.

8.3 Application-Level Security

Local administrative credentials are required to stop, (re)start, or change the configuration of the Vision RT DICOM Listener application.

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9 ANNEXES

9.1 IOD Contents

9.1.1 Created SOP Instance(s)

No SOP instances are created.

9.1.2 Usage of Attributes from Received IODs

DICOM files stored by the Vision RT DICOM Listener can be selected in the following VisionRT product workflows:

9.1.2.1 Radiographic Isocenter Calibration (Cube calibration)

This process applies to the following SOP classes:

SOP Classes	
Name	**UID**
RT Image	1.2.840.10008.5.1.4.1.1.481.1

Applications that require enhanced accuracy such as stereotactic (and other non-coplanar) applications require cube calibration, to fine tune the AlignRT isocenter. The process uses a calibration cube containing five radiopaque spheres to perform the following steps:

1. Perform plate calibration.
2. Position the cube close to isocenter.
3. Use the MV/kV imager to save images of the cube at 0, 90, 180 and 270 degrees.

These images are selected during the process of running AlignRT cube calibration. Once selected, AlignRT performs radiographic analysis on these images to determine where the spheres are within the cube. It combines this with the cube location, measured by the AlignRT cameras, to ensure the AlignRT isocenter is coincident with the radiographic isocenter.

To perform radiographic analysis, the following tags are used:

Tag	Name	Description	Notes
(0008,0005)	Specific Character Set	Character set to expand or replace the basic set.	Optional. Required if an expanded or replacement set is used. Default assumes UTF7.
(0008,0008)	Image Type	Image identification characteristics.	Optional. Used to determine if we have a kV or MV image. Default assumes an MV image if unable to tell from other tags.

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Tag	Name	Description	Notes
(0008,0016)	SOP Class UID	Uniquely identifies the SOP class.	Mandatory. Must be RT Image (1.2.840.10008.5.1.4.1.1.481.1)
(0008,0018)	SOP Instance UID	Uniquely identifies the SOP instance.	Mandatory. Must contain a valid UID (cannot be empty).
(0008,0022)	Acquisition Date	Date the acquisition started.	Optional. Used to order the RT Image files for the user to select from. Used if the acquisition datetime (0008, 002A) is not set, and the acquisition time (0008, 0032) is set, otherwise the file creation date and time will be used.
(0008,0023)	Content Date	Date the image pixel data creation started.	Mandatory. Must contain a valid date (cannot be empty).
(0008,002A)	Acquisition Date Time	Date and time the acquisition started.	Optional. Used to order the RT Image files for the user to select from. If not set, the acquisition date (0008,0022) and time (0008, 0032) are used if both are set, otherwise the file creation date and time will be used.
(0008,0032)	Acquisition Time	Time the acquisition started.	Optional. Used to order the RT Image files for the user to select from. Used if the acquisition datetime (0008, 002A) is not set, and the acquisition date (0008, 0022) is set, otherwise the file creation date and time will be used.
(0008,0033)	Content Time	Time the image pixel data creation started.	Mandatory. Must contain a valid time (cannot be empty).
(0008,0060)	Modality	Type of equipment that originally acquired the data.	Optional. Default assumes RTIMAGE.

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Tag	Name	Description	Notes
(0020,000E)	Series Instance UID	Unique identifier of the series in the study.	Mandatory.
(0020,0013)	Instance Number	A number used to identify this image.	Optional Used to sort images for analysis when present.
(0020,0032)	Image Position Patient	The 3D coordinates (X, Y, Z) of the upper left-hand corner (center of first voxel transmitted) of the frame, in mm.	Optional. Default assumes the image upper left corner is at 0, 0, 0.
(0020,0037)	Image Orientation Patient	The direction cosines of the first row and the first column with respect to the patient.	Optional. Default assumes the image is orientated from left to right and top to bottom.
(0028,0002)	Samples Per Pixel	Number of samples (planes) in this image.	Mandatory. Must be set to 2 (monochrome image)
(0028,0010)	Rows	Number of rows in the image.	Mandatory.
(0028,0011)	Columns	Number of columns in the image.	Mandatory.
(0028,0100)	Bits Allocated	Number of bits allocated for each pixel sample. Each sample shall have the same number of bits allocated.	Mandatory. Must be 8 or 16.
(3002,000D)	X-Ray Image Receptor Translation	Translation (X, Y, Z in mm) from the gantry coordinate system to X-Ray image receptor coordinate system.	Mandatory. X or Y must be non-zero.

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Tag	Name	Description	Notes
(3002,000E)	X-Ray Image Receptor Angle	Rotation (in degrees) from the gantry coordinate system to X-Ray image receptor coordinate system.	Optional. Default assumes 0 degrees rotation if not present.
(3002,0010)	RT Image Orientation	The direction cosines of the first row and the first column with respect to the X-Ray image receptor coordinate system.	Optional. Used to determine the layout of the pixel data. Default assumes layout is left to right, and top to bottom.
(3002,0011)	Image Plane Pixel Spacing	Physical distance in mm between the center of each image pixel, specified by a numeric pair of the adjacent row spacing then adjacent column spacing values.	Mandatory.
(3002,0012)	RT Image Position	Position (X, Y) in mm of the top left corner of the image in the X-Ray image receptor coordinate system (center of the first pixel transmitted).	Optional. Default calculates this from rows, columns and pixel spacing if this tag is not present.
(3002,0022)	Radiation Machine SAD	The source axis distance (SAD) in mm from the radiation machine source to the axis of rotation of the gantry.	Mandatory.
(3002,0026)	RT Image SID	The source to image distance (SID) in mm from the radiation machine source to the image receptor, along the radiation beam axis.	Mandatory.

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Tag	Name	Description	Notes
(3002,0030)	Exposure Sequence	Sequence of exposure parameter sets, corresponding to exposures used in generating the image.	Optional. Used to determine if we have a kV or MV image. Default assumes an MV image if unable to tell from other tags.
>(0018,0060)	KVP	Peak kilo voltage output of the x-ray generator used	Conditional Mandatory. Required with valid value if Exposure Sequence is present Used to determine if we have a kV or MV image.
(300A,011E)	Gantry Angle	Gantry angle of the radiation source.	Mandatory. Must be set (within a small tolerance) to one of 0, 90, 180 or 270 degrees.
(300A,0122)	Patient Support Angle	Orientation of the patient support coordinate system (couch) with respect to the fixed reference coordinate system in degrees.	Optional. Default assumes the couch is at 0 degrees.
(7FE0,0010)	Pixel Data	A data stream of the pixel samples that comprise the Image.	Mandatory.

9.1.2.2 Adding Patients for Treatment

This process applies to the following SOP classes:

SOP Classes	
Name	**UID**
Varian Private RT Plan	1.2.246.352.70.1.70
RT Structure Set	1.2.840.10008.5.1.4.1.1.481.3
RT Plan	1.2.840.10008.5.1.4.1.1.481.5
RTIon Plan	1.2.840.10008.5.1.4.1.1.481.8

The Vision RT DICOM Listener receives RT plans and structure sets from a hospital's picture archiving and communication system (PACS). The patients these refer to will automatically be added to the AlignRT database.

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It is also possible to manually add a patient by clicking the Add Patient button on the Patient List screen and selecting a plan (or structure set) from the hard disk, or by manually entering the patient's details to proceed without DICOM files if emergency treatment is required.

When loading an RT Plan (SOP class 1.2.840.10008.5.1.4.1.1.481.5) and the Beam Guide feature is licensed, all beams will also be read. Later in the treatment screen, these can be displayed on the patient's surface to show their expected location. Beam Guide only supports the RT Plan SOP class and will be disabled for all other plans.

To load a plan the following DICOM tags are used:

Tag	Name	Description	Notes
(0008,0005)	Specific Character Set	Character set to expand or replace the basic set.	Optional. Required if an expanded or replacement set is used. Default assumes UTF7.
(0008,0016)	SOP Class UID	Uniquely identifies the SOP class.	Mandatory and one of: • 1.2.246.352.70.1.70 • 1.2.840.10008.5.1.4.1.1.481.5 • 1.2.840.10008.5.1.4.1.1.481.8
(0008,0018)	SOP Instance UID	Uniquely identifies the SOP instance.	Mandatory. Must contain a valid UID (cannot be empty).
(0008,0020)	Study Date	Date the study started.	Optional. Default sets the date the file was sent to Vision RT.
(0008,0030)	Study Time	Time the study started.	Optional. Default sets the time the file was sent to Vision RT.
(0010,0010)	Patient Name	Patient's full name.	Mandatory. At least one family name or given name must be defined. Other elements are ignored.
(0010,0020)	Patient ID	Primary identifier for the Patient.	Mandatory. Must contain a valid UID (cannot be empty).
(0010,0030)	Patient Birth Date	Birth date of the Patient.	Mandatory for new patients.

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Tag	Name	Description	Notes
(0018,5100)	Patient Position	Patient position descriptor relative to the equipment.	Mandatory. One of HFP, HFS, HFDL, HFDR, FFP, FFS, FFDL or FFDR. Used to convert from DICOM to Vision RT coordinates when later constructing 3D surface(s) from the RT struct file. Must be set HFS to use AutoROI, otherwise the feature is disabled.
(300A,0002)	RT Plan Label	User-defined label for treatment plan.	Mandatory. Can be an empty string.
(300A,0009)	Treatment Protocols	Describes the clinical protocol guiding the plan	Optional Used to identify whether a given DICOM RTPlan originated from CyberKnife. The Vision RT DICOM Listener rejects all CyberKnife DICOM RTPlans.
(300A,00B0)	Beam Sequence	Sequence of treatment beams for this RT plan.	Mandatory for the following SOP Class UIDs (0008,0016): • 1.2.246.352.70.1.70 • 1.2.840.10008.5.1.4.1.1.481.5 When set, the sequence must describe at least one beam. Ignored for other SOP classes.
(300A,03A2)	Ion Beam Sequence	Sequence of treatment beams for this RT Ion Plan.	Mandatory for the following SOP Class UIDs (0008,0016): • 1.2.840.10008.5.1.4.1.1.481.8 When set, the sequence must describe at least one beam. Ignored for other SOP classes.
>(300A,00B4)	Source-Axis Distance	Distance in mm from the radiation source to gantry rotation axis.	Optional for the following SOP Class UIDs (0008,0016): • 1.2.246.352.70.1.70 • 1.2.840.10008.5.1.4.1.1.481.5 Ignored for other SOP classes. Must be set to use Beam Guide, otherwise the feature is disabled.

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Tag	Name	Description	Notes
>(300A,00B6)	Beam Limiting Device Sequence	Sequence of beam limiting device (collimator) jaw or leaf (element) sets.	Optional for the following SOP Class UIDs (0008,0016): • 1.2.246.352.70.1.70 • 1.2.840.10008.5.1.4.1.1.481.5 Ignored for other SOP classes. Must be set to use Beam Guide, otherwise the feature is disabled.
>>(300A,00B8)	RT Beam Limiting Device Type	Type of beam limiting device (collimator).	Mandatory to define whether symmetric jaws, asymmetric jaws, or a multileaf collimator are used for X and Y directions. One of X, Y, ASYMX, ASYMY, MLCX or MLCY.
>>(300A,00BC)	Number of Leaf/Jaw Pairs	Number of leaf (element) or jaw pairs.	Mandatory. This will be set to 1 for standard beam limiting device jaws.
>>(300A,00BE)	Leaf Position Boundaries	Boundaries in mm of the beam limiting device (collimator) leaves.	Mandatory if RT Beam Limiting Device Type (300A,00B8) is set to MLCX or MLCY. When set it must contain N + 1 values, where N is the Number of Leaf/Jaw Pairs (300A,00BC). Ignored for other device types.
>(300A,00C0)	Beam Number	Identification number of the beam.	Mandatory. Must be unique in this plan.
>(300A,00C2)	Beam Name	User-defined name for beam.	Optional. Default sets an empty string.
>(300A,00C3)	Beam Description	User-defined description for beam.	Optional. Default sets an empty string. For CyberKnife DICOM RTPlans, the Beam Description contains the name of the XML file which defines the isocentre coordinates.
>(300A,00C4)	Beam Type	Whether the beam changes between control points.	Mandatory. One of STATIC or DYNAMIC.
>(300A,00C6)	Radiation	Particle type of	Mandatory.

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Tag	Name	Description	Notes
	Type	beam.	All beams must set PHOTON to use Beam Guide, otherwise the feature is disabled.
>(300A,00CE)	Treatment Delivery Type	Delivery type of treatment.	Mandatory. Only beams set to TREATMENT can be displayed in Beam Guide.
>(300A,0110)	Number of Control Points	The number of control points in this beam.	Mandatory. The value shall be greater than or equal to 2.
>(300A,0111)	Control Point Sequence	Sequence of machine configs describing this treatment beam.	Mandatory for the following SOP Class UIDs (0008,0016): • 1.2.246.352.70.1.70 • 1.2.840.10008.5.1.4.1.1.481.5 The number of items shall equal the Number of Control Points (300A,0110). Ignored for other SOP classes.
> (300A,03A8)	Ion Control Point Sequence	Sequence of machine configs describing this ion treatment beam.	Mandatory for the following SOP Class UIDs (0008,0016): • 1.2.840.10008.5.1.4.1.1.481.8 The number of items shall equal the Number of Control Points (300A,0110). Ignored for other SOP classes.
>>(300A,011A)	Beam Limiting Device Position Sequence	Sequence of beam limiting device (collimator) jaw or leaf (element) sets.	Optional. Must be set to use Beam Guide, otherwise the feature is disabled.
>>>(300A,00B8)	RT Beam Limiting Device Type	Type of beam limiting device (collimator).	Optional. Define whether symmetric jaws, asymmetric jaws, or a multileaf collimator for X and Y directions. Must be set to one of X, Y, ASYMX, ASYMY, MLCX or MLCY to use Beam Guide, otherwise the feature is disabled.
>>>(300A,011C)	Leaf/Jaw Positions	The positions of the beam limiting device (collimator)	Optional. Defines the jaw position, or a list

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Tag	Name	Description	Notes
		leaf (element) or jaw pairs, in mm, relative to the axis for the RT Beam Limiting Device Type specified.	of MLC leaf positions for each item defined in the Beam Limiting Device Sequence (300A,00B6). Each position has two values. If an unexpected number of positions/values are read, the Beam Guide feature is disabled.
>>(300A,011E)	Gantry Angle	Gantry angle in degrees relative to the fixed reference coordinate system.	Mandatory for the first item in the control sequence. Optional for subsequent items.
>>(300A,0120)	Beam Limiting Device Angle	Beam limiting device (collimator) angle of the radiation source.	Mandatory for the first item in the control sequence. Optional for subsequent items.
>>(300A,0122)	Patient Support Angle	Angle of the patient support (couch) in degrees relative to the fixed reference coordinate system.	Mandatory for the first item in the control sequence. Optional for subsequent items.
>>(300A,0123)	Patient Support Rotation Direction	Direction of the patient support (couch) rotation viewed from above	Mandatory for the first item in the control sequence. Optional for subsequent items.
>>(300A,0125)	Table Top Eccentric Angle	The table top eccentric angle in degrees relative to the patient support coordinate system.	Optional for SOP Class UIDs (0008,0016): • 1.2.246.352.70.1.70 • 1.2.840.10008.5.1.4.1.1.481.5 Ignored for other SOP classes.
>>(300A,0126)	Table Top Eccentric Rotation Direction	The table top eccentric direction when viewed from above.	Optional for SOP Class UIDs (0008,0016): • 1.2.246.352.70.1.70 • 1.2.840.10008.5.1.4.1.1.481.5 Ignored for other SOP classes.
>>(300A,0128)	Table Top Vertical Position	Vertical position of the table top in mm relative to the table top coordinate system.	Mandatory in the first Item of the control point sequence. Optional in subsequent items.

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Tag	Name	Description	Notes
>>(300A,0129)	Table Top Longitudinal Position	Longitudinal position of the table top in mm relative to the table top coordinate system.	Mandatory in the first Item of the control point sequence. Optional in subsequent items.
>>(300A,012A)	Table Top Lateral Position	Lateral position of the table top in mm relative to the table top coordinate system.	Mandatory in the first Item of the control point sequence. Optional in subsequent items.
>>(300A,012C)	Isocenter Position	The 3D co-ordinates (X, Y, Z) of the upper left-hand corner in mm.	Mandatory in the first item of the control point sequence. Optional in subsequent items. If a different value is specified, the Beam Guide feature is disabled.
>>(300A,0130)	Source To Surface Distance	Source to Patient Surface (skin) distance in mm.	Optional for SOP Class UIDs (0008,0016): • 1.2.246.352.70.1.70 • 1.2.840.10008.5.1.4.1.1.481.5 Ignored for other SOP classes.
>>(300A,0140)	Table Top Pitch Angle	Table top angle in degrees about the X axis of table top coordinate system.	Mandatory for the first item in the control sequence. Optional for subsequent items.
>>(300A,0142)	Table Top Pitch Rotation Direction	Direction of the table top when viewing the table along the positive X axis of table top coordinate system.	Mandatory for the first item in the control sequence. Optional for subsequent items.
>>(300A,0144)	Table Top Roll Angle	Angle of the table top in degrees about the Y axis of table top coordinate system.	Mandatory for the first item in the control sequence. Optional for subsequent items.
>>(300A,0146)	Table Top Roll Rotation Direction	Direction of the table top when viewing the table along the positive Y axis of table top	Mandatory for the first item in the control sequence. Optional for subsequent items.

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Tag	Name	Description	Notes
		coordinate system.	
>>(300A,014A)	Gantry Pitch Angle	The gantry rotation in degrees about the X axis relative to the gantry coordinate system.	Mandatory for the first item in the control sequence. Optional for subsequent items.
>>(300A,014C)	Gantry Pitch Rotation Direction	The gantry rotation in degrees about the X axis relative to the gantry coordinate system.	Mandatory for the first item in the control sequence. Optional for subsequent items.
>(300C,006A)	Referenced Patient Setup Number	Uniquely identifies the patient setup used for this beam.	Mandatory. Used to access patient position (0018,5100) for this beam.
(300A,0180)	Patient Setup Sequence	Sequence of patient setup data for the current plan.	Mandatory. One or more items shall be included in this Sequence. Used to access patient position (0018,5100) for this beam.
>(300A,0180)	Patient Sex	Sex of the patient	Optional. One of 'M' (male), 'F' (female), or 'O' (other). Default is 'O' other.
>(300A,0182)	Patient Setup Number	Identification number of the patient setup.	Mandatory. Must be unique within this plan. Used to access patient position (0018,5100) for this beam.
>(300A,01D2)	Table-Top Lateral Setup Displacement	Lateral offset in mm between the patient treatment (isocenter) and setup positions in an in-bore workflow.	Optional. Requires table-top longitudinal setup displacement (300A,01D4) and table-top vertical setup displacement (300A,01D6) to also be set, when all three are used. Defaults to 0 in all other cases.
>(300A,01D4)	Table-Top Longitudinal Setup Displacement	Longitudinal offset in mm between patient treatment (isocenter) and setup positions in an in-bore	Optional. Used to set the displacement from the isocenter to setup position for in-bore workflows. Requires table-top lateral setup displacement (300A,01D2) and

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Tag	Name	Description	Notes
		workflow.	table-top vertical setup displacement (300A,01D6) to also be set, when all three are used. Defaults to 0 in all other cases.
>(300A,01D6)	Table-Top Vertical Setup Displacement	Vertical offset in mm between the patient treatment (isocenter) and setup positions in an in-bore workflow.	Optional. Used to set the displacement from the isocenter to setup position for in-bore workflows. Requires table-top lateral setup displacement (300A,01D2) and table-top longitudinal setup displacement (300A,01D4) to also be set, when all three are used. Defaults to 0 in all other cases.
(300C,0060)	Referenced Structure Set Sequence	Sequence of RT structure set(s) for this plan.	Mandatory. One (and only one) item shall be included in this Sequence.
>(0008,1155)	Referenced SOP Instance UID	Identifies the RT structure set for this plan.	Mandatory.

Once a patient has been added, the Preparation screen can be accessed, from where an RT struct (and plan if missing) can be loaded, and the ROI structure(s) to monitor during treatment can be selected.

To load an RT struct file, select ROI structure(s) from within it, and create the 3D surface(s) from them, the following tags are used:

Tag	Name	Description	Notes
(0008,0005)	Specific Character Set	Character set that expands or replaces the basic set.	Optional. Required if an expanded or replacement set is used. Default assumes UTF7.
(0008,0016)	SOP Class UID	Uniquely identifies the SOP class.	Mandatory. Must be RT Structure Set Storage (1.2.840.10008.5.1.4.1.1.481.3)
(0008,0018)	SOP Instance UID	Uniquely identifies the SOP instance.	Mandatory. Must contain a valid UID (cannot be empty).

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Tag	Name	Description	Notes
(0008,0020)	Study Date	Date the study started.	Optional. Default sets the time the file was sent to Vision RT.
(0008,0030)	Study Time	Time the study started.	Optional. Default sets the time the file was sent to Vision RT.
(0010,0010)	Patient Name	Patient's full name.	Mandatory. At least one family name or given name must be defined. Other elements are ignored.
(0010,0020)	Patient ID	Primary identifier for the Patient.	Mandatory. Must contain a valid UID (cannot be empty).
(0010,0030)	Patient Birth Date	Birth date of the Patient.	Mandatory for new patients.
(300A,0180)	Patient Sex	Sex of the patient	Optional. One of 'M' (male), 'F' (female), or 'O' (other). Default is 'O' other.
(3006,0010)	Referenced frame of reference sequence	Describes the frames of reference in which ROIs are defined.	Mandatory. Must contain at least one entry.
>(0020,0052)	Frame of Reference UID	Uniquely identifies this frame of reference in the structure set.	Mandatory.
(3006,0002)	Structure Set Label	User-defined name for the structure set.	Mandatory. Can be an empty string.
(3006,0020)	Structure Set ROI Sequence	Describes the ROIs in this structure set.	Mandatory. Must contain at least one entry.
>(3006,0022)	ROI Number	Identification number of this ROI.	Mandatory. Must be unique in structure set.
>(3006,0024)	Referenced frame of Reference	Uniquely identifies the frame of reference that	Mandatory. Must be one of the frames of reference UIDs (0020,0052)

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Tag	Name	Description	Notes
	UID	defines this ROI.	within the referenced frame of reference sequence (3006,0010).
>(3006,0026)	ROI Name	User-defined name for this ROI.	Mandatory.
(3006,0039)	ROI Contour Sequence	Sequence of contour sequences defining the ROIs.	Mandatory. Must contain at least one entry.
>(3006,0040)	Contour Sequence	Sequence of contours that define this ROI.	Mandatory.
>>(3006,0042)	Contour Geometric Type	Geometric type of this contour.	Optional. If present this shall be either CLOSED_PLANAR (a closed polygon containing coplanar points) or POINT (a single point). If not set (or invalid) the contour will be ignored and unavailable to create a 3D surface from.
>>(3006,0046)	Number of Contour Points	The number of 3D points (X, Y, Z) defined in the contour data (3006,0050).	Optional. If set and contour geometric type is POINT, this shall be set to 1. If not set (or invalid) the contour will be ignored and unavailable to create a 3D surface from.
>>(3006,0050)	Contour Data	The sequence of 3D points (X, Y, Z) to define a contour in the patient-based coordinate system.	Optional. If not set (or invalid) the contour will be ignored and unavailable to create a 3D surface from.
>(3006,0084)	Referenced ROI Number	Identifies the ROI this contour describes.	Optional. Must reference an ROI number (3006,0022) in the structure set ROI sequence (3006,0020). If not set (or invalid) the contour is ignored and unavailable to create a 3D surface from.
(3006,0080)	RT ROI Observations Sequence	Sequence of observations for ROIs defined in this RT struct.	Optional.
>(3006,0084)	Referenced	Identifies the ROI this observation	Optional.

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Tag	Name	Description	Notes
	ROI Number	refers to.	Must reference an ROI number (3006,0022) in the structure set ROI sequence (3006,0020). If not set (or invalid) the ROI observation is ignored.
>(3006,00A4)	RT ROI Interpreted Type	Type of ROI ORGAN, EXTERNAL, ISOCENTER etc.	Optional. If not set (or invalid) the ROI observation is ignored.

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9.1.3 Attribute Mapping

No attribute mapping is performed.

9.1.4 Coerced/Modified Fields

No attributes are coerced or modified.

9.2 Data Dictionary of Private Attributes

Private Attributes within received files are ignored.

9.3 Coded Terminology and Templates

No Coded Terminology or Templates are supported.

9.4 Grayscale Image Consistency

No additional grayscale adjustments are made when displaying images.

9.5 Standard Extended/Specialized/Private SOP Classes

No Standard Extended, Specialized, or Private SOP Classes are supported.

9.6 Private Transfer Syntaxes

No Private Transfer Syntaxes are supported.

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10 APPROVALS

This document has been reviewed and approved electronically on eQMS. See the PDF of this document for electronic signatures. This approval also means that the document has been reviewed for appropriateness and adequacy.

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