

STANDARD

Metadata Overlay for Visualization

23 October 2019

1 Scope

This standard defines a graphical, non-destructive, metadata overlay for Motion Imagery visualization. The content display locations scale according to a display’s native spatial density.

2 References

- [1] MISB ST 0601.16 UAS Datalink Local Set, Oct 2019.
- [2] MISB ST 0604.6 Timestamps for Class 1/Class 2 Motion Imagery, Oct 2017.
- [3] MISB ST 0102.12 Security Metadata Universal and Local Sets for Motion Imagery Data, Jun 2017.
- [4] ISO 8601-1:2019 Data Elements and Interchange Formats – Information interchange – Representation of Dates and Times.

3 Revision History

Revision	Date	Summary of Changes
ST 1909	10/23/2019	<ul style="list-style-type: none"> • Initial Release

4 Acronyms

FC	Frame Center
HAE	Height Above Ellipsoid
KLV	Key Length Value
MISB	Motion Imagery Standards Board
MISP	Motion Imagery Standards Profile
MSL	Mean Sea Level
TL	True Location

5 Introduction

The practice of destructively overlaying metadata onto the pixel data of a Motion Imagery Frame prior to compression, known as “burning-in” metadata, dates to the earliest days of airborne

Motion Imagery systems. The MISB disallowed this practice because of its negative impact on downstream automated systems in the early 2000s. In addition, the “burned-in” metadata is nominally duplicative of the information carried as Key-Length-Value (KLV) items within the Motion Imagery stream.

The intent of this standard is to define a graphical overlay template for visualization of common metadata items which is non-destructive to image data. While this standard proposes a common “look and feel” for the metadata overlay, an implementer is free to create additional graphical layouts unique to their use case.

6 Metadata Layer for Visualization

The metadata layer for visualization defines the content and the location of the content within a Motion Imagery Frame. The locations are agnostic to display resolution, so they scale for any display device. All locations are relative to the origin of a Motion Imagery Frame defined as Pixel (0, 0) located at the top and left of the Frame as depicted in Figure 1.

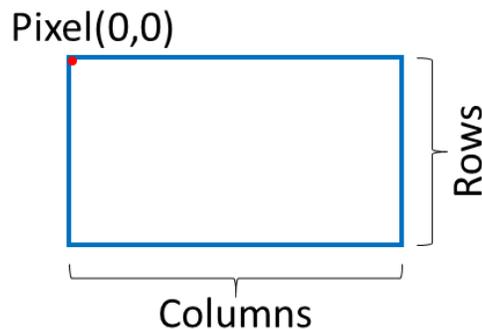


Figure 1: Motion Imagery Frame and origin Pixel(0,0)

The metadata layer for visualization allows the following:

- Freedom to choose the text size, font, and font color in consideration of the display device and scene content color diversity. However, use of data fixed-width fonts - although not required - improves the readability of data.
- Freedom to choose text background color - although a transparent background is common with overlays and recommended.

6.1 Content of Metadata Layer

Table 1 lists the metadata information for the airborne metadata layer. The columns are:

- **Name:** indicates the generalized information of the content displayed
- **Defining Document:** the MISB document defining the metadata item to satisfy the Name
- **Metadata Item:** the name of the metadata item in the Defining Document
- **Tag ID:** indicates the Tag of the metadata item in the Defining Document

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- **Rules:** indicates if the metadata item is Mandatory (M) or Optional (O). The airborne metadata overlay is to include metadata items listed as Mandatory, while those listed as Optional are at the implementer's discretion.

Table 1: Metadata Items for Overlay

Name	Defining Document	Metadata Item	Tag ID	Rules
Main Sensor Name	ST 0601 [1]	Image Source Sensor	11	M
Main Sensor Relative Azimuth Angle	ST 0601	Sensor Relative Azimuth Angle	18	M
Main Sensor Relative Elevation Angle	ST 0601	Sensor Relative Azimuth Angle	19	M
Classification & Releasabilty	ST 0601	Security Local Set	48	M
Platform Name	ST 0601	Platform Designation	10	M
Platform Latitude	ST 0601	Sensor Latitude	13	M
Platform Longitude	ST 0601	Sensor Longitude	14	M
Platform Altitude	ST 0601	Sensor True Altitude / Sensor Ellipsoid Height / Sensor Ellipsoid Height Extended	15 / 75 / 104	M
True North Arrow	ST 0601	Various	Various	M
Bounding Box of Next Zoom	N/A	Currently not an available item	-	O
Laser Sensor Name	N/A	Currently not an available item	-	O
Laser Sensor Status	ST 0601	Generic Flag Data	47	O
Laser Sensor PRF Code	ST 0601	Laser PRF Code	62	O
Motion Imagery Frame Date/Time	ST 0604 [2]	Precision Time Stamp	N/A	O
Metadata Date/Time	ST 0601	Precision Time Stamp	2	O
Slant Range	ST 0601	Slant Range	21	M
Target Width	ST 0601	Target Width / Target Width Extended	22 / 96	M
Horizontal Field of View	ST 0601	Sensor Horizontal Field of View	16	M
Vertical Field of View	ST 0601	Sensor Vertical Field of View	17	M
Target Latitude	ST 0601	Frame Center Latitude / Target Location Latitude	23 / 40	M
Target Longitude	ST 0601	Frame Center Longitude / Target Location Longitude	24 / 41	M
Target Elevation	ST 0601	Frame Center Elevation / Frame Center Height Above Ellipsoid / Target Location Elevation	25 / 78 / 42	M
Target Reticle	N/A	No item necessary	-	O

Implementers may choose which metadata items to display where multiple metadata items apply (e.g., Platform Altitude may be a value for Sensor True Altitude or Sensor Ellipsoid Height).

Figure 2 shows an exemplar layout indicating the groups of metadata items identified in this document. An example 1920x1080 pixel density image shows computed pixel locations for the groups according to scaling factors discussed in Section **Error! Reference source not found.**Figure 1



Figure 2: Metadata layer for visualization exemplar

6.2 Descriptions for Content of Metadata Layer

Groups within the metadata layer include items conveying information about the same topic and contain an anchor point. An anchor point is the row/column location expressed as a percentage for the first (top groups) and last (bottom groups) metadata item in the group. Other items in a group share the same column percentage location, but not the same row percentage location; this allows implementers latitude in the font size.

Requirement	
ST 1909-01	Unused digits/symbols in any Group's item value shall be represented as blank spaces.

6.2.1 Main Sensor Group

The anchor point for the Main Sensor Group referenced to Pixel(0,0) is:

- Row Percentage = 3.70% (e.g., row=40 for 1920x1080 pixel density)
- Column Percentage = 2.00% (e.g., column=38 for 1920x1080 pixel density)

The size of text selected may vary based on user preference; thus, there is no height or width of the text field specified. The only requirement is for the Main Sensor Group text to be oriented beginning at the row and left justified at the column stipulated for the Group.

Requirement(s)	
ST 1909-02	The anchor point for the Main Sensor Group text shall be positioned beginning at a row percentage of 3.70% of the vertical pixel density.
ST 1909-03	The anchor point for the Main Sensor Group text shall be positioned beginning at a column percentage of 2.00% of the horizontal pixel density.
ST 1909-04	The text for the Main Sensor Group shall be below the vertical anchor point and to the right of the horizontal anchor point.

6.2.1.1 Main Sensor Name

Name of sensor producing imagery. MISB recommends inclusion of sensor phenomenology for completeness (e.g., EO for electro-optical, IR for infrared, SWIR for short wave infrared, etc.).

6.2.1.2 Main Sensor Relative Azimuth Angle

Relative rotation angle of sensor to platform longitudinal axis.

Requirement(s)	
ST 1909-05	The Main Sensor Relative Azimuth Angle value shall be preceded by "REL AZ".
ST 1909-06	The Main Sensor Relative Azimuth Angle value shall be formatted as decimal degrees with five digits before the decimal point and four digits after the decimal point followed by a degree symbol.

6.2.1.3 Main Sensor Relative Elevation Angle

Relative elevation angle of sensor to platform longitudinal-transverse plane.

Requirement(s)	
ST 1909-07	The Main Sensor Relative Elevation Angle value shall be preceded by "REL EL".
ST 1909-08	The Main Sensor Relative Elevation Angle value shall be formatted as decimal degrees with five digits before the decimal point and four digits after the decimal point followed by a degree symbol.

6.2.2 Classification & Releasability Group

The anchor point for the Classification & Releasability Group referenced to Pixel(0,0) is:

- Row Percentage = 3.70% (row=40 for 1920x1080 pixel density)
- Column Percentage = 50.00% (col=960 for 1920x1080 pixel density)
- Classification & Releasability Group may be continued on multiple lines as needed

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The size of text selected may vary based on user preference; thus, there is no height or width of the text field specified. The only requirement is the text for the Classification & Releasability Group to be oriented beginning at the row and centered at the column stipulated for the Group.

Requirement(s)	
ST 1909-09	The anchor point for the Classification & Releasability Group text shall be positioned beginning at a row percentage of 3.70% of the vertical pixel density.
ST 1909-10	The anchor point for the Classification & Releasability Group text shall be centrally positioned at a column percentage of 50.00% of the horizontal pixel density.
ST 1909-11	The text for the Classification & Releasability Group shall be below the vertical anchor point and centered on the horizontal anchor point.
ST 1909-12	The Classification & Releasability Group shall be comprised of MISB ST 0601 Tag 48/1, Tag 48/3, Tag 48/4, Tag 48/5 and Tag 48/6.
ST 1909-13	The representation of the Classification & Releasability Group shall be a concatenation of MISB ST 0601 Tags in accordance with U.S. or NATO classification marking guidance.

See MISB ST 0102 [3] for definitions of the metadata items found in the Security Local Set.

6.2.2.1 Security Classification

MISB ST 0601 Tag 48/1: Security Classification metadata item represents the overall classification of the Motion Imagery Data in accordance with U.S. or NATO classification guidance.

6.2.2.2 Classifying Country

MISB ST 0601 Tag 48/3: Classifying Country metadata item contains a value for the classifying country code.

6.2.2.3 SCI/SHI Information

MISB ST 0601 Tag 48/4: Sensitive Compartmented Information (SCI) / Special Handling Instructions (SHI) metadata item contains additional handling instructions for the Motion Imagery Data.

6.2.2.4 Caveats

MISB ST 0601 Tag 48/5: Caveats metadata item represents pertinent caveats (or code words) from each category of the appropriate security entity register.

6.2.2.5 Releasing Instructions

MISB ST 0601 Tag 48/6: Releasing Instructions metadata item contains a list of country codes to indicate the countries to which the Motion Imagery Data is releasable.

6.2.3 Platform Information Group

The anchor point for the Platform Information Group referenced to Pixel(0,0) is:

- Row Percentage = 3.70% (row=40 for 1920x1080 pixel density)
- Column Percentage = 98.00% (column=1882 for 1920x1080 pixel density)

The size of text selected may vary based on user preference; thus, there is no height or width of the text field specified. The only requirement is the Platform Information Group text to be oriented beginning at the row and right justified at the column stipulated for the Group.

Requirement(s)	
ST 1909-14	The anchor point for the Platform Information Group text shall be positioned beginning at a row percentage of 3.70% of the vertical pixel density.
ST 1909-15	The anchor point for the Platform Information Group text shall be positioned beginning at a column percentage of 98.00% of the horizontal pixel density.
ST 1909-16	The text for the Platform Information Group shall be below the vertical anchor point and to the left of the horizontal anchor point.

6.2.3.1 Platform Name

Model name of the platform. MISB recommends concatenation of MISB ST 0601 Tag 10: Platform Designation and Tag 59: Platform Call Sign for completeness.

6.2.3.2 Platform Latitude

Platform latitude given as the absolute Sensor Latitude within MISB ST 0601.

Requirement(s)	
ST 1909-17	The Platform Latitude value shall be succeeded by "LAT".
ST 1909-18	The Platform Latitude value shall be formatted as decimal degrees with three digits before the decimal point and four digits after the decimal point followed by a degree symbol.
ST 1909-19	A blank space shall be inserted between the Platform Latitude degree symbol and "LAT".

6.2.3.3 Platform Longitude

Platform longitude given as the absolute Sensor Longitude within MISB ST 0601.

Requirement(s)	
ST 1909-20	The Platform Longitude value shall be succeeded by "LON".

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ST 1909-21	The Platform Longitude value shall be formatted as decimal degrees with four digits before the decimal point and four digits after the decimal point followed by a degree symbol.
ST 1909-22	A blank space shall be inserted between the Platform Longitude degree symbol and "LON".

6.2.3.4 Platform Altitude

Platform altitude given in either Mean Sea Level (MSL) or Height Above Ellipsoid (HAE) units.

Requirement(s)	
ST 1909-23	The Platform Altitude value shall be succeeded by "ALT".
ST 1909-24	The Platform Altitude value shall be formatted as integer meters with five digits followed by the unit measurement of "m".
ST 1909-25	Where MISB ST 0601 Tag 15: Sensor True Altitude is displayed, the value shall be followed by "MSL".
ST 1909-26	Where MISB ST 0601 Tag 75: Sensor Ellipsoid Height is displayed, the value shall be followed by "HAE".
ST 1909-27	A blank space shall be inserted between the Platform Altitude unit measurement and the altitude qualifier.
ST 1909-28	A blank space shall be inserted between the Platform Altitude qualifier and "ALT".

6.2.4 True North Arrow Group

The anchor point for the True North Arrow Group referenced to Pixel(0,0) is:

- Row Percentage = 50.00% (row=540 for 1920x1080 pixel density)
- Column Percentage = 2.00% (column=38 for 1920x1080 pixel density)

The True North Arrow Group is comprised of a circle with a capital N in the center and a solid triangle pointed in the direction of True North. The value for True North can be calculated via several methods depending on the metadata available in the MISB ST 0601 Local Set and the desired level of fidelity. The calculation approach, therefore, is left up to the implementer.

The size of the circle, capital N, and solid triangle may vary based on user preference; thus, there is no height or width specified. The only requirement is the True North Arrow Group circle be centered on the Row Percentage and the radius of the circle end at the Column Percentage.

Requirement(s)	
ST 1909-29	The anchor point for the True North Arrow Group shape shall be centrally positioned at a row percentage of 50.00% of the vertical pixel density.
ST 1909-30	The anchor point for the True North Arrow Group shape shall be positioned beginning at a column percentage of 2.00% of the horizontal pixel density.

ST 1909-31	The graphic for the True North Arrow Group shall be centered on the vertical anchor point and to the right of the horizontal anchor point.
ST 1909-32	The True North Arrow Group shall be a composite of a circle with a capital N in the center with a solid triangle rotated around the circle to point in the direction of True North.

6.2.5 Bounding Box of Next Zoom Group

The Bounding Box of Next Zoom Group, represented by four corner brackets, frames a footprint for the sensor’s next zoom level. As the bounding box of next zoom is variable based on sensor capabilities, the Bounding Box of Next Zoom Group does not have a defined anchor point.

Currently, a metadata item for the Bounding Box of Next Zoom Group does not exist in MISB ST 0601, but future standards may. In the interim, since other means need to supply this information this graphic is optional.

The length and width of the corner brackets are variable based on user preference.

Requirement	
ST 1909-33	Where a Bounding Box of Next Zoom Group is present, it shall be a represented at each corner by a right-angle bracket rotated to form a bounding box.

6.2.6 Laser Sensor Group

The anchor point for the Laser Sensor Group referenced to Pixel(0,0) is:

- Row Percentage = 96.30% (row=1040 for 1920x1080 pixel density)
- Column Percentage = 2.00% (column=38 for 1920x1080 pixel density)

The size of text selected may vary based on user preference; thus, there is no height or width of the text field specified. The only requirement is the Laser Sensor Group text to be oriented beginning at the row and left justified at the column stipulated for the Group.

Requirement(s)	
ST 1909-34	The anchor point for the Laser Sensor Group text shall be positioned beginning at a row percentage of 96.30% of the vertical pixel density.
ST 1909-35	The anchor point for the Laser Sensor Group text shall be positioned beginning at a column percentage of 2.00% of the horizontal pixel density.
ST 1909-36	The text for the Laser Sensor Group shall be above the vertical anchor point and to the right of the horizontal anchor point.

6.2.6.1 Laser Sensor Name

Name of laser sensor onboard the platform. Currently, MISB ST 0601 does not have a metadata item for the name of the laser sensor but future standards may. In the interim, Laser Rangefinder” is a default.

Requirement	
ST 1909-37	The default for Laser Sensor Name shall be “Laser Rangefinder”.

6.2.6.2 Laser Sensor Status

Status of the Laser Rangefinder to determine if laser is on/off.

Requirement(s)	
ST 1909-38	Laser Sensor Status shall be populated with “Laser ON” when Laser is active.
ST 1909-39	Laser Sensor Status shall be populated with “Laser OFF” when Laser is inactive.

6.2.6.3 Laser Sensor Pulse Repetition Frequency Code

A laser's Pulse Repetition Frequency (PRF) code used to mark a target.

Requirement(s)	
ST 1909-40	The Laser Sensor Pulse Repetition Frequency Code value shall be preceded by “Laser PRF Code”.
ST 1909-41	The Laser Sensor Pulse Repetition Frequency Code value shall be formatted as whole integers with six digits.
ST 1909-42	A blank space shall be inserted between “Laser PRF Code” and the Laser Sensor Pulse Repetition Frequency Code value.

6.2.7 Date/Time Group

The anchor point for the Date/Time Group referenced to Pixel(0,0) is:

- Row Percentage = 96.30% (row=1040 for 1920x1080 pixel density)
- Column Percentage = 50.00% (col=960 for 1920x1080 pixel density)
- Date/Time expressed according to ISO 8601-1 [3]

The size of text selected may vary based on user preference; thus, there is no height or width of the text field specified. The only requirement is the text for the Date/Time Group to be oriented beginning at the row and centered at the column stipulated for the Group.

Requirement(s)	
ST 1909-43	The anchor point for the Date/Time Group text shall be positioned beginning at a row percentage of 96.30% of the vertical pixel density.
ST 1909-44	The anchor point for the Date/Time Group text shall be centrally positioned at a column percentage of 50.00% of the horizontal pixel density.
ST 1909-45	The text for the Date/Time Group shall be above the vertical anchor point and centered on the horizontal anchor point.

ST 1909-46	Display of all dates and times shall use the ISO 8601-1 standard formatting of CCYY-MM-DDThh:mm:ss.SZ.
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6.2.7.1 Motion Imagery Frame Date/Time

MISP timestamp for Motion Imagery Frame found in the compressed elementary stream per MISB ST 0604 [2] to coordinate with Motion Imagery metadata.

Requirement(s)	
ST 1909-47	The Motion Imagery Date/Time value shall be preceded by "FT".
ST 1909-48	A blank space shall be inserted between "FT" and the Motion Imagery Date/Time value.

6.2.7.2 Metadata Date/Time

MISP timestamp for the Motion Imagery metadata found in MISB ST 0601 to coordinate with Motion Imagery Frames.

Requirement(s)	
ST 1909-49	The Metadata Date/Time value shall be preceded by "MT".
ST 1909-50	A blank space shall be inserted between "MT" and the Metadata Date/Time value.

6.2.8 Target Group

The anchor point for the Target Group referenced to Pixel(0,0) is:

- Row Percentage = 96.30% (row=1040 for 1920x1080 pixel density)
- Column Percentage = 98.00% (column=1882 for 1920x1080 pixel density)

The size of text selected may vary based on user preference; thus, there is no height or width of the text field specified. The only requirement is the Target Group text to be oriented beginning at the row and right justified at the column stipulated for the Group.

Requirement(s)	
ST 1909-51	The anchor point for the Target Group text shall be positioned beginning at a row percentage of 96.30% of the vertical pixel density.
ST 1909-52	The anchor point for the Target Group text shall be positioned beginning at a column percentage of 98.00% of the horizontal pixel density.
ST 1909-53	The text for the Target Group shall be above the vertical anchor point and to the left of the horizontal anchor point.

6.2.8.1 Slant Range

Slant Range is the distance between the sensor and image center as directly measured or calculated.

Requirement(s)	
ST 1909-54	The Slant Range value shall be succeeded by “SR”.
ST 1909-55	The Slant Range value shall be formatted as integer meters with six digits followed by the unit measurement of “m”.
ST 1909-56	A blank space shall be inserted between the Slant Range unit measurement and “SR”.
ST 1909-57	Unused digits in the Slant Range value shall be represented as blank spaces.

6.2.8.2 Target Width

Target width within sensor field of view.

Requirement(s)	
ST 1909-58	The Target Width value shall be succeeded by “TW”.
ST 1909-59	The Target Width value shall be formatted as integer meters with seven digits followed by the unit measurement of “m”.
ST 1909-60	A blank space shall be inserted between the Target Width unit measurement and “TW”.

6.2.8.3 Horizontal Field of View

Horizontal field of view of selected imaging sensor.

Requirement(s)	
ST 1909-61	The Horizontal Field of View value shall be succeeded by “HFOV”.
ST 1909-62	The Horizontal Field of View value shall be formatted as decimal degrees with three digits before the decimal point and four digits after the decimal point followed by a degree symbol.
ST 1909-63	A blank space shall be inserted between the Horizontal Field of View degree symbol and “HFOV”.

6.2.8.4 Vertical Field of View

Vertical field of view of selected imaging sensor.

Requirement(s)	
ST 1909-64	The Vertical Field of View value shall be succeeded by “VFOV”.
ST 1909-65	The Vertical Field of View value shall be formatted as decimal degrees with three digits before the decimal point and four digits after the decimal point followed by a degree symbol.
ST 1909-66	A blank space shall be inserted between the Vertical Field of View degree symbol and “VFOV”.

6.2.8.5 Target Location

Target may represent either Frame Center (FC) or True Location (TL) but may not be intermixed.

Requirement(s)	
ST 1909-67	Where Target Location is represented by Frame Center MISB ST 0601 metadata items Tag 23, Tag 24, Tag 25/78 shall be used.
ST 1909-68	Where Target Location is represented by True Location MISB ST 0601 metadata items Tag 40, Tag 41, and Tag 42 shall be used.

6.2.8.5.1 Target as Frame Center

6.2.8.5.1.1 Target Latitude

Terrain latitude of frame center.

Requirement(s)	
ST 1909-69	Where MISB ST 0601 Tag 23: Frame Center Latitude is displayed, the value shall be succeeded by "FC LAT".
ST 1909-70	The Frame Center Latitude value shall be formatted as decimal degrees with three digits before the decimal point and four digits after the decimal point followed by a degree symbol.
ST 1909-71	A blank space shall be inserted between the Frame Center Latitude degree symbol and "FC LAT".

6.2.8.5.1.2 Target Longitude

Terrain longitude of frame center.

Requirement(s)	
ST 1909-72	Where MISB ST 0601 Tag 24: Frame Center Longitude is displayed, the value shall be succeeded by "FC LON".
ST 1909-73	The Frame Center Longitude value shall be formatted as decimal degrees with four digits before the decimal point and four digits after the decimal point followed by a degree symbol.
ST 1909-74	A blank space shall be inserted between the Frame Center Longitude degree symbol and "FC LON".

6.2.8.5.1.3 Target Elevation

Elevation given in either Mean Sea Level (MSL) or Height Above Ellipsoid (HAE) units.

Requirement(s)	
ST 1909-75	Where MISB ST 0601 Tag 25: Frame Center Elevation or MISB ST 0601 Tag 78: Frame Center Height Above Ellipsoid is displayed, the value shall be succeeded by "FC EL".

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ST 1909-76	Where MISB ST 0601 Tag 25: Frame Center Elevation or MISB ST 0601 Tag 78: Frame Center Height Above Ellipsoid is displayed, the value shall be formatted as integer meters with five digits followed by the unit measurement of “m”.
ST 1909-77	Where MISB ST 0601 Tag 25: Frame Center Elevation is displayed, the value shall be followed by “MSL”.
ST 1909-78	Where MISB ST 0601 Tag 78: Frame Center Height Above Ellipsoid is displayed, the value shall be followed by “HAE”.
ST 1909-79	A blank space shall be inserted between the MSL or HAE unit measurement and the elevation qualifier.
ST 1909-80	A blank space shall be inserted between the MSL or HAE elevation qualifier and “FC EL”.

6.2.8.5.2 Target as True Location

6.2.8.5.2.1 Target Location Latitude

Calculated target location latitude.

Requirement(s)	
ST 1909-81	Where MISB ST 0601 Tag 40: Target Location Latitude is displayed, the value shall be succeeded by “TL LAT”.
ST 1909-82	The Target Location Latitude value shall be formatted as decimal degrees with three digits before the decimal point and four digits after the decimal point followed by a degree symbol.
ST 1909-83	A blank space shall be inserted between the Target Location Latitude degree symbol and “TL LAT”.

6.2.8.5.2.2 Target Location Longitude

Calculated target location longitude.

Requirement(s)	
ST 1909-84	Where MISB ST 0601 Tag 41: Target Location Longitude is displayed, the value shall be preceded by “TL LON”.
ST 1909-85	The Target Location Longitude value shall be formatted as decimal degrees with four digits before the decimal point and four digits after the decimal point followed by a degree symbol.
ST 1909-86	A blank space shall be inserted between the Target Location Longitude degree symbol and “TL LON”.

6.2.8.5.2.3 Target Location Elevation

Calculated target location elevation measured as height above ellipsoid.

Requirement(s)	
ST 1909-87	Where MISB ST 0601 Tag 41: Target Location Elevation is displayed, the value shall be succeeded by "TL EL".
ST 1909-88	The Target Location Elevation value shall be formatted as integer meters with five digits followed by the unit measurement of "m".
ST 1909-89	The Target Location Elevation value shall be followed by "HAE".
ST 1909-90	A blank space shall be inserted between the Target Location Elevation unit measurement and the elevation qualifier.
ST 1909-91	A blank space shall be inserted between the Target Location Elevation qualifier and "TL EL".

6.2.9 Reticle

The anchor point for the Reticle Group is the Target location which may be represented as Frame Center or True Location. The Reticle is comprised of two, equi-length perpendicular lines with the immediate sections where the lines cross omitted.

The length and width of the perpendicular lines may vary based on user preference; thus, there is no height or width specified. The only requirement is the Reticle be centered on the Frame Center or Target Location.

Requirement(s)	
ST 1909-92	Where the target is represented by the Frame Center, the graphic for the Reticle shall be centered on the Frame Center.
ST 1909-93	Where the target is represented by the Target Location, the graphic for the Reticle shall be centered on the Target Location.
ST 1909-94	The Reticle shall be a composite of two, equi-length perpendicular lines where the immediate sections where the lines cross are omitted.

6.2.10 Exemplar with Formatted Values

Figure 3 shows the visualization exemplar populated with metadata items specified for their groups.

