MISB MOTION IMAGERY STANDARDS BOARD	MISB ST 0805.1
STANDARD **KLV to Cursor-on-Target (CoT) Conversions**	**27 February 2014**

1 Scope

This Standard (ST) defines the Motion Imagery Standards Board (MISB) metadata items used for fields in Cursor on Target (CoT) Situational Awareness (SI) messages. Two CoT message conversions from MISB-standard Key Length Value (KLV) metadata sets are described in this document – Platform Position and Sensor Point of Interest (SPI).

Conversions from both MISB ST 0601 UAS Datalink Local Data Set and MISB EG 0104.5 Predator Universal Metadata Set are included here. The intent of this Standard is to provide a method of generating CoT messages either in real time or at a later date from motion imagery files and the results should be the same in either case. While other MISB standards encourage the use of UUIDs, a UUID generated after the fact would differ from one created at the same time as the motion imagery stream, and are therefore not recommended in this document.

Only a listing of the KLV items used in the CoT fields are presented here. CoT fields not having an equivalent KLV representation have a value defined here to complete the CoT messages. More details on the formatting of CoT XML messages can be obtained from http://cot.mitre.org and the DISR.

2 References

2.1 Normative References

The following references and the references contained therein are normative.

[1] MISB EG 0104.5 Predator UAV Universal Metadata Set, Dec 2006
[2] MISB ST 0601.7 UAS Datalink Local Metadata Set, Feb 2014
[3] MISB ST 0603.2 Common Time Reference for Digital Motion Imagery Using Coordinated Universal Time (UTC), Feb 2014
[4] ISO 8601:2004, Data elements and interchange formats -- Information interchange -- Representation of dates and times

2.2 Informative References

[5] MIL-STD 2525 Common Warfighter Symbology
[6] The Developer's Guide to Cursor on Target, August 2005.

3 Revision History

Revision	Date	Summary of Changes
ST 0805.1	2/27/2014	• Promoted to Standard; name changed

4 Acronyms

CoT Cursor on Target
KLV Key Length Value
SPOI Sensor Point of Interest
XML Extensible Markup Language
UUID Universally Unique Identifier

5 Introduction

Cursor on Target (CoT) is a communication method to pass time sensitive position data. The CoT messages provide a description of an object (what), the time an event occurs (when), and the position of an event (where).

6 KLV to CoT Translation

Cursor on Target (CoT) is a simple messaging format for situational awareness and command-and-control functions. In order to facilitate future interoperability, recommended conversions from EG 0104[1] and ST 0601[2] KLV metadata tags to two basic CoT schema messages (Platform Position and Sensor Point-of-Interest (SPOI)) are presented in this document.

CoT attempts to create an object hierarchy consistent with Object Oriented Programming (OOP). In large part, the object hierarchy is consistent with MIL STD 2525[5]. Currently, CoT is implemented only in XML, although future versions of CoT might use other instantiations. CoT does take some liberties with "normal" and/or "best practice" XML coding with respect to objects and inheritance to achieve its OOP goals. *The Developer's Guide to Cursor on Target* [6] goes into the motivation and limitations of the XML implementation in some detail.

Table 1 provides the Platform Position Message in the CoT schema for converting MISB KLV to CoT. Table 2 provides the Sensor Point of Interest (SPI) in Cursor on Target (CoT) Schema for converting MISB KLV to CoT.

Table 1: Platform Position Message (CoT Scheme) for converting MISB KLV to CoT

CoT Key	ST 0601 LS Tag # and Name or Notes	EG 0104 US Key # and Name or Notes	Notes
point/lat	13 Sensor Latitude	Device Latitude 06 0E 2B 34 01 01 01 03 07 01 02 01 02 04 02 00 (CRC 8663)	CoT requires WGS-84 decimal degrees with North positive
point/lon	14 Sensor Longitude	Device Longitude 06 0E 2B 34 01 01 01 03 07 01 02 01 02 06 02 00 (CRC 20407)	CoT requires WGS-84 decimal degrees with East positive
point/hae	15 Sensor True Altitude	Device Altitude 06 0E 2B 34 01 01 01 03 07 01 02 01 02 02 00 00 (CRC 62741)	The KLV key is altitude; it must be converted to Ellipsoid Height; given in meters
point/ce	9999999		This represents “no value given”
point/le	9999999		This represents “no value given”
version	2.0		CoT Version Number
type	a-f-A-M-F (as an example)		Atom-friendly-Air AOB- Military-Fixed Wing (Reference CoT definitions in Event.xsd v 1.4 2007/02/27 for other “types” as applicable to other platforms)
uid	10 Device Designation 3 Mission ID	Device Designation 06 0E 2B 34 01 01 01 01 01 01 20 01 00 00 00 00 (CRC 36601) Episode Number 06 0E 2B 34 01 01 01 01 01 05 05 00 00 00 00 00 (CRC 37735)	For EG 0104.5 implementations, Concatenate Device Designation and Episode Number with the two values separated by an underscore (“_”) character; for 0601.1 implementations, concatenate Tags 10 and 3 separated by an underscore (“_”) character.
time	2 Precision Time Stamp (POSIX Time Stamp) (see MISB ST 0603 [3])	User Defined Time Stamp 06 0E 2B 34 01 01 01 03 07 02 01 01 01 05 00 00 (CRC 64827)	Convert to ISO 8601[4] YYYY-MM-DDThh:mm:ss.ssZ (Fractional seconds are optional and number of decimal places unbounded); this is the time the message is generated
start	2 Precision Time Stamp (POSIX Time Stamp) (see MISB ST 0603[3])	User Defined Time Stamp 06 0E 2B 34 01 01 01 03 07 02 01 01 01 05 00 00 (CRC 64827)	Convert to ISO 8601 YYYY-MM-DDThh:mm:ss.ssZ (Fractional seconds are optional and number of decimal places unbounded); this is the time the message becomes valid (should be the same as Time)
stale	Time of next CoT platform position message		This is the time at which the position message is no longer valid; use ISO 8601[4]
how	m-p		How the position was obtained (machine-passed). Reference CoT definitions in Event.xsd v 1.4 2007/02/27 for further explanation and other possible values.

detail/ _flow-tags_	Current Time		Indicates that system "touched" the event and at what time. Format as ST 0601 CoT or EG0104.5CoT = 'YYYY-MM-DDThh:mm:ss.ssZ' with the current time.
sensor/ azimuth	5 Platform Heading Angle 18 Sensor Relative Azimuth Angle	Angle to North 06 0E 2B 34 01 01 01 01 07 01 10 01 02 00 00 00 (CRC 52438)	Sensor absolute azimuth obtained by adding platform heading angle and sensor relative azimuth angles together; CoT requires decimal degrees
sensor/fov	16 Sensor Horizontal Field of View	Field of View (Horizontal) 06 0E 2B 34 01 01 01 02 04 20 02 01 01 08 00 00 (CRC 23753)	Sensor Horizontal Field of View; CoT requires decimal degrees
sensor/vfov	17 Sensor Vertical Field of View	Field of View (Vertical) 06 0E 2B 34 01 01 01 07 04 20 02 01 01 0A 01 00 (CRC 30292)	Sensor Vertical Field of View; CoT requires decimal degrees
sensor/model	11 Image Source Sensor	Image Source Device 06 0E 2B 34 01 01 01 01 04 20 01 02 01 01 00 00 (CRC 53038)	Image Source Device
sensor/range	21 Slant Range	Slant Rage 06 0E 2B 34 01 01 01 01 07 01 08 01 01 00 00 00 (CRC 16588)	CoT requires this be in meters

Table 2: Sensor SPI in CoT Scheme for Converting MISB KLV to CoT

CoT Key	ST 0601 LS Tag ID and Name or Notes	EG 0104 US Key # and Name or Notes	Notes
point/lat	23 Frame Center Latitude 40 Target Location Latitude (if available)	Frame Center Latitude 06 0E 2B 34 01 01 01 01 07 01 02 01 03 02 00 00 (CRC 17862)	ST 0601[2] uses WGS84, so no co-ordinate system transformation necessary; Integer to decimal degrees mapping necessary.
point/lon	24 Frame Center Longitude 41 Target Location Longitude (if available)	Frame Center Longitude 06 0E 2B 34 01 01 01 01 07 01 02 01 03 04 00 00 (CRC 63334)	ST 0601[2] uses WGS84, so no co-ordinate system transformation necessary; Integer to decimal degrees mapping necessary.
point/hae	25 Frame Center Elevation 42 Target Location Elevation (if available)	Frame Center Elevation 06 0E 2B 34 01 01 01 0A 07 01 02 01 03 16 00 00 (CRC 57054)	MSL to HAE transformation required here; both use meters
point/ce	45 Target Error Estimate – CE90	9999999	Conversion from 2.146 σ (CE90) to 1 σ (CoT standard) necessary; Point/CE also includes target size. If key is not available, replace with 9999999.
point/le	46 Target Error Estimate – LE90	9999999	Conversion from 1.645 σ (LE90) to 1 σ (CoT standard) necessary; Point/CE also includes target height. If key is not available, replace with 9999999.
version	2.0		CoT Version Number
type	b-m-p-s-p-i		Bits-mapping-point-sensor-point-interest (Note that this will not change, unlike platform type)
uid	10 Device Designation 3 Mission ID 11 Image Source Sensor	Device Designation 06 0E 2B 34 01 01 01 01 01 01 20 01 00 00 00 00 (CRC 36601) Episode Number 06 0E 2B 34 01 01 01 01 01 05 05 00 00 00 00 00 (CRC 37735) Image Source Device 06 0E 2B 34 01 01 01 01 04 20 01 02 01 01 00 00 (CRC 53038)	For EG 0104.5 implementations, Concatenate Device Designation, Episode Number, and Image Source Device separated by an underscore ("_") character before and after the Episode Number. For ST 0601 implementations, concatenate Tags 10, 3, and 11 with an underscore character ("_") before and after Tag 3.
time	2 Precision Time Stamp (POSIX Time Stamp) (see MISB ST 0603[3])	User Defined Time Stamp 06 0E 2B 34 01 01 01 03 07 02 01 01 01 05 00 00 (CRC 64827)	Convert to ISO 8601[4] YYYY-MM-DDThh:mm:ss.ssZ (Fractional seconds are optional and number of decimal places unbounded); this is the time the message is generated
start	2 Precision Time Stamp (POSIX Time Stamp) (see MISB ST 0603[3])	User Defined Time Stamp 06 0E 2B 34 01 01 01 03 07 02 01 01 01 05 00 00 (CRC 64827)	Convert to ISO 8601[4] YYYY-MM-DDThh:mm:ss.ssZ (Fractional seconds are optional and number of decimal places unbounded); this is the time the SPOI message becomes valid (should be the same as Time)
stale	Time of next CoT SPOI message		This is the time at which the position message is no longer valid; use ISO 8601

how	m-p	How the position was obtained (machine-passed). Reference CoT definitions in Event.xsd v 1.4 2007/02/27 for further explanation and other possible values.
detail/ _flow-tags_	Current Time	Indicates that system "touched" the event and at what time. Format as ST 0601 CoT or EG0104.5CoT = 'YYYY-MM-DDThh:mm:ss.ssZ' with the current time.
detail/link/ relation	p-p	p-p (parent producer)
detail/link /type	a-f-A-M-F (as an example)	Type of the event this message is linked to. (Reference CoT definitions for other "types" as applicable to other platforms)
detail/link /uid	UID of the Platform that the SPOI is linked to	Specific UID of parent event.