SISO-GUIDE-004

Guide for
Coalition Battle Management
Language (C-BML) Phase 1

Version 1.0

20 March 2017

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Simulation Systems Interoperation
Product Development Group
## Revision History

<table>
<thead>
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<th>Version</th>
<th>Section</th>
<th>Date (MM/DD/YYYY)</th>
<th>Description</th>
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<tr>
<td>V1.0</td>
<td>All</td>
<td>06/27/2016</td>
<td>For Circulation Package</td>
</tr>
<tr>
<td>V2.0</td>
<td>All</td>
<td>03/13/2017</td>
<td>All ballot comments incorporated, with approval from balloters.</td>
</tr>
<tr>
<td>V3.0</td>
<td>All</td>
<td>08/07/2017</td>
<td>Editorial corrections from SAC review.</td>
</tr>
<tr>
<td>V4.0</td>
<td>All</td>
<td>08/24/2017</td>
<td>Copyright statement updated. Relabeled from Draft to Final.</td>
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Guide for Coalition Battle Management Language (C-BML) Phase 1

1 Overview

The Coalition Battle Management Language (C-BML) is a standard representation for expressing and exchanging plans, orders, reports, and requests among command and control (C2) systems, live, virtual and constructive modeling and simulation (M&S) systems, and robotic and autonomous systems (RAS) participating in Coalition operations.

There is a continuing need for improving interoperability across all of these systems. The development of digitized C2 systems and the opportunity to utilize M&S tools for Course of Action Analysis (COAA) and Mission Rehearsal, as well as emerging work on robotic and autonomous systems, has created an increased requirement for interoperability across these systems. In addition, the move to net-centric and network-enabled operations creates new opportunities and context within which M&S supports the warfighter and civilian command posts. Major military and civilian operations are no longer conducted by single services, agencies, or organizations from a single country. Rather, they are increasingly multinational, multi-service, and multi-agency and likely to be conducted within a coalition or collaboration of organizations. This drives the requirements for multinational interoperability and the development of standards for inter-system information exchange.

In September 2004, the SISO Standards Activity Committee (SAC) approved the establishment of a Study Group (SG) on the Coalition Battle Management Language (C-BML). The C-BML SG was formed under the following premise [5]:

In order to improve simulation interoperability and better support the military user with M&S-based capabilities, an open standards-based framework is needed that establishes operational and technical coherence among C2 and M&S systems. The objective capability will enable automatic and rapid unambiguous initialization and control of one by the other.

The foundation for such a capability is a Battle Management Language (BML), a concept that has been discussed during several SISO workshops and prototyped in numerous technology demonstrations. The BML concept began in the 1990s in the US Army Eagle BML and the Command and Control Simulation Interface Language (CCSIL) from the Synthetic Theatre of War (STOW) program. In the international C2 community there is a history of complementary efforts to achieve nation- and system-independent technical and semantic standards for conveying information relevant to C2, such as the Joint Consultation, Command, and Control Information Exchange Data Model (JC3IEDM) [11-25].

The C-BML standardization effort is being conducted in phases, providing incremental capability and specificity in each phase. For all phases and versions, the C-BML SG recommended using the JC3IEDM as the basis for C-BML reference implementations and standards. Each version of the C-BML standard was expected to include:

- identification of an underlying data model,
- specification of information exchange content and structure,
- specification of an information exchange mechanism, and
- guidelines for adoption and application of the standard (the present document).

The following three development phases were identified:

- **Phase 1, Data Model**: The Phase 1 C-BML Standard [7] describes a sufficient data model to unambiguously define a set of military plans, orders, requests, and reports using JC3IEDM as a
starting point and extending it as necessary so that the orders can be interpreted by C2, M&S, and ultimately robotic and autonomous systems (RAS). The C-BML Standard: (1) identifies a data model as a subset of JC3IEDM and (2) specifies information exchange content and structure in the form of an Extensible Markup Language (XML) schema [26]. Specification of an information exchange mechanism was deferred to Phase 2.

- Phase 2, Formal Structure (Grammar): Phase 2 will introduce a grammar (syntax, semantics, and vocabulary) as part of the information exchange content and structure specification, as well as specification of an information exchange mechanism. The objective is to formalize the definition of tasks such that they are rigorous, well documented, and parseable. The need for a grammar for tasking and reporting is seen as a common requirement for both the C-BML and Military Scenario Definition Language (MSDL) [6] standardization efforts.

- Phase 3, Formal Semantics (Ontology): Phase 3 will include development of a battle management ontology to enable conceptual interoperability across systems.

1.1 Scope

This Guide supports the Phase 1 C-BML Standard by providing detailed examples of the application of the Standard to aid in its adoption across the M&S and C2 communities. The Guide contains the following:

- Reference Architecture: Discussion of a reference architecture for Phase 1 C-BML, as envisioned during the Phase 1 C-BML standardization effort, to include a C-BML infrastructure and guidelines for exchanging C-BML expressions.

- C-BML Data Model: Diagrams depicting primary concepts in the Phase 1 C-BML data model.

- Specific-Use XML Schema and Example XML Data Files: Example uses of the Phase 1 C-BML Standard to illustrate how specific user information exchange requirements can be achieved through generation of orders, reports, and requests. The examples vary in complexity and operational relevance and are meant to highlight the expressiveness of C-BML Phase 1, without being prescriptive or normative. Sample XML files are provided for each example as external files supporting the content of this guide.

1.2 Purpose

This “SISO Guide for: Coalition Battle Management Language (C-BML) Phase 1” provides examples of the use of the Phase 1 C-BML Standard and additional descriptive material to serve as an aid to adopters of the Phase 1 C-BML Standard.

1.3 Objectives

The objectives of this document are to:

- Provide adopters of the Phase 1 C-BML Standard with examples and other guidance to facilitate use of the standard.

- Provide information to assist in creating implementations that comply with provisions of the standard.

1.4 Intended Audience

The Phase 1 C-BML Standard and Guide are intended for use by software developers (specification, design, implementation, and test) in the C2, M&S, and RAS domains. The Guide document is a means
for familiarizing developers with the structure and use of the language. There are no trademark or patent issues associated with the C-BML Standard or this guide.
2 References

2.1 SISO References

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<td>SISO Product Data Files associated with SISO-STD-011-2014 schema files. Users are encouraged to download and unzip the SISO-STD-011-2014 schema files to use with the SISO-GUIDE-004 example schemas and XML instance documents described in this guide. Refer to 2.3 for more information, as well as the guidance in Section 6 for using the standard schemas with the guide examples.</td>
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*SISO-STD-011-2014 describes a set of XML schemas defining the Phase 1 Coalition Battle Management Language. Users are encouraged to download and unzip the SISO-STD-011-2014 schema files[8] to use with the SISO-GUIDE-004 example schemas and XML instance documents described in this guide[9]. Refer to 2.3 for more information, as well as the guidance in Section 6 for using the standard schemas with the guide examples.

2.2 Other References

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<td>18 JC3IEDM – Annex F – DMWG 20090514 Edition 3.0.2</td>
<td>JC3IEDM Annex F Other Domains</td>
</tr>
</tbody>
</table>
2.3 Using SISO Product Data Files

The example XML schemas and XML instance documents described in this guide are provided in a SISO Product Data File named SISO-GUIDE-004-DRAFTexamples.zip [9]. Users are encouraged to download and unzip the file to obtain the examples described in this guide. The file will unzip into a folder structure that organizes the examples into separate subfolders to make it easy to find the files corresponding to the file references given in Section 7 of this guide.

While users are free to manipulate the files in any way desired, an initial use is to open the guide examples in an XML editor and verify the files validate against the XML schema files from the standard (see the note in 2.1 above regarding the SISO Product Data File [8] associated with SISO-STD-011-2014). Other example uses include: (1) loading example XML content into the reader’s own C-BML application to examine how the application reads the XML content; (2) comparing output of the reader’s C-BML application with the provided example to examine differences in usage of the standard. As users begin to employ the C-BML Standard for their own purposes, many other uses will emerge.

The examples are written using relative addresses to locations on the local drive where the SISO-STD-011-2014 XML schemas are located. The SISO-GUIDE-004-DRAFTexamples.zip file has a folder structure that will correctly place the example files from this guide. Additionally, there are references in the example XML schemas to relative addresses to the SISO-STD-011-2014 schemas. When downloading and unzipping the standard’s schemas either locate the files in accordance with the paths found in the example schema files or modify the paths to align with the location of the standard schemas on your local file system.
3 Definitions, Acronyms, and Abbreviations

3.1 Definitions

Refer to the respective section of the C-BML Standard [7].

3.2 Acronyms and Abbreviations

ACO  Airspace Control Order
BML  Battle Management Language
C2   Command and Control
C2SIM Command and Control Systems – Simulation Systems Interoperation
C4I  Command, Control, Communications, Computers, and Intelligence
C-BML Coalition Battle Management Language
CCSIL Command and Control Simulation Interface Language
COAA Course of Action Analysis
CSL  Condensed Scripting Language
CSS  C-BML Services Specification
DDS  Data Distribution Service
DDMS DoD Discovery Metadata Specification
DEM  Data Exchange Mechanism
DoD  Department of Defense
DSEEP Distributed Simulation Engineering and Execution Process
FOM  Federation Object Model
HLA  High Level Architecture
HTML Hypertext Markup Language
HTTP Hypertext Transfer Protocol
IC-ISM Intelligence Community Information Security Markings
IDF  Integration Definition
IEM  Information Exchange Mechanism
IECS Information Exchange Structure and Content Specification
JC3IEDM Joint Consultation, Command, and Control Information Exchange Data Model
M&S Modeling and Simulation
MEDEVAC Medical Evacuation
MIP  Multilateral Interoperability Programme
MSDL Military Scenario Definition Language
OID  Object Identifier
OMG  Object Management Group
OSI  Open Systems Interconnection
PDG  Product Development Group
PSG  Product Support Group
RAS  Robotic and Autonomous Systems
REST Representational State Transfer
RID  Reference Implementation Description
SAC  Standards Activity Committee
SALUTE Size, Activities, Location, Unit, Time, Equipment
SBML Scripted Battle Management Language
SG  Study Group
SISO Simulation Interoperability Standards Organization
SMTP Simple Mail Transfer Protocol
SOAP Simple Object Access Protocol
SPOT Situation, Position, Observation, and Task
SQL  Structured Query Language
STOW Synthetic Theater of War
TAI  Targeted Area of Interest
TCP/IP Transmission Control Protocol / Internet Protocol
<table>
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<tr>
<th>Acronym</th>
<th>Definition</th>
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<tr>
<td>UAV</td>
<td>Unmanned Aerial Vehicle</td>
</tr>
<tr>
<td>UML</td>
<td>Unified Modeling Language</td>
</tr>
<tr>
<td>W3C</td>
<td>World Wide Web Consortium</td>
</tr>
<tr>
<td>XML</td>
<td>Extensible Markup Language</td>
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4 C-BML Reference Architecture

4.1 Overview

Figure 1 identifies the set of normative and informative products associated with the C-BML Standard, as envisioned during the Phase 1 standardization effort. The normative specification has two components: (1) the Information Exchange Structure and Content Specification (IESCS, provided in Phase 1 C-BML Standard [7]) and the C-BML Services Specification (CSS, to be developed in future C-BML standardization efforts). The IESCS is essentially comprised of a data model in the form of XML schemas and their description.

The CSS provides a textual description of services in terms of profiles that specify increasing levels of functionality related to the exchange of information using C-BML. However, the normative specification does not specify or impose any particular architecture or information exchange mechanism (IEM). Adopters of the Phase 1 C-BML Standard are encouraged to use existing standards and tools that best suit their particular needs. However, it is possible to define a set of rules that, if followed, can increase the level of interoperability of systems that exchange C-BML-compliant expressions.

The informative part of the standard would include a Guide product and a Reference Implementation Description (RID), the latter to be developed in later versions of the C-BML standard. The Guide provides examples illustrating how to create valid C-BML expressions while the RID describes the elements required to construct and validate a C-BML reference implementation. The present document is the descriptive portion of the Phase 1 C-BML Guide. Example XML schemas and instance documents provide supporting material accompanying the Guide.
4.2 Potential Interface Exchange Mechanism to Exchange C-BML Messages

A system that produces and/or consumes valid C-BML expressions can send and/or receive these expressions using many different architectures or IEM. The exchange of C-BML expressions across systems that produce and consume valid C-BML expressions is not limited to a specific IEM. For example, a Simple Mail Transfer Protocol (SMTP) email-based exchange mechanism is perhaps the simplest IEM that can accomplish this objective. Other possible IEMs include but are not limited to: High-Level Architecture (HLA), the Object Management Group (OMG) specified Data Distribution Service (DDS), the Multilateral Interoperability Programme (MIP) Data Exchange Mechanism (DEM), World Wide Web Consortium (W3C) Web Services using Simple Object Access Protocol (SOAP), and Representational State Transfer (REST) over Hypertext Transfer Protocol (HTTP) Web Services.

C-BML expressions can be exchanged either synchronously or asynchronously. Orchestration and execution of systems using C-BML constructs is beyond the scope of the Phase 1 C-BML Standard and this guide.

4.3 Reference Architecture Description

While a normative architectural description is not within the scope of the Phase 1 C-BML Standard, it is useful in this guide product to provide a depiction for a possible generic C-BML message exchange architecture or “Reference Architecture” in order to establish a common terminology and framework for C-BML implementation and use. Based on this description and terminology, a set of rules can be defined such that independent C-BML messaging infrastructures that choose to use them will be able to interoperate with minimal integration efforts.

4.3.1 C-BML Messaging Infrastructure Definition

illustrates the various elements and relevant specifications involved in the exchange of C-BML expressions through the use of a C-BML messaging infrastructure. System A is a C-BML producer; whereas System B is a C-BML consumer. In this depiction, an “expression” is the IESCS-compliant payload of a C-BML message specific to the messaging infrastructure. Note that the future (beyond Phase 1) C-BML messaging infrastructure interface may be required to comply with a CSS specification that will dictate high-level functionality such as validation, error handling, message receipt acknowledgement, etc.
4.3.2 C-BML Messaging Infrastructure Definition

provides a layered-architecture representation loosely based on the Open Systems Interconnection (OSI) model and more specifically the TCP/IP (Transmission Control Protocol / Internet Protocol) model that identifies the following layers: (1) Network Access; (2) Internet; (3) Transport; and (4) Application.
In the case of C-BML, the figure illustrates that the C-BML messaging service will ultimately expose an interface that is compliant with the CSS. The C-BML message includes a payload that is comprised of one or more C-BML expressions that must conform to (i.e., validate against) the IESCS.

Although the IEM that is used to exchange C-BML expressions is independent of the normative specification that dictates how to construct valid C-BML expressions, it is still useful to recommend a set of rules in order to ensure that C-BML expression producers and consumers can exchange expressions effectively.

4.4 Guidelines for Exchange of XML Expressions

The following guidelines are provided for consideration in the implementation of interchange capabilities across systems using the Phase 1 C-BML Standard. At this stage in the standardization of C-BML, these are given as informative guidance, not normative requirements.

4.4.1 Expression Immutability

The exchange of C-BML expressions should not change, modify or otherwise alter the content and structure of said expressions. Any additional elements required to exchange C-BML expressions that are specific to a given implementation and/or a given IEM are not considered to be normative and therefore should be able to be removed and/or ignored when processed by other systems and/or disseminated using another IEM. For example, in the United States, information exchange may need to conform to Intelligence Community Information Security Markings (IC-ISM) and Department of Defense Discovery Metadata Specification (DDMS) standards for packaging and marking up C-BML messages. These are not normative with respect to use of the Phase 1 C-BML Standard.
4.4.2 Independence from Information Exchange Mechanism

C-BML expressions should be independent from the IEM or the architecture in which they are used. For example, HLA Time Management or Data Distribution Management data elements should not be included as part of the C-BML expression since the elements are not specified in the IESCS, they are not present in all IEMs, and they cannot be generalized to all architectures.

4.4.3 Lossless Exchange

The exchange of C-BML expressions should be lossless. C-BML expressions that are sent by a system should be received in their entirety without modification.

4.4.4 Expression Validity

All C-BML expressions must be valid (in the XML sense) with respect to the Phase 1 C-BML Standard schemas in accordance with [7].

4.5 Complementary Use of MSDL with C-BML

There have been many demonstrations and evaluations of the complementary use of the C-BML and MSDL standards. MSDL is generally used to describe the starting conditions of a scenario—the sides, force structures, weapon systems, materiel, control measures, location, environment, and other features (see [6] for a full description of the language). In many cases, objects referenced in C-BML expressions will have first been defined in MSDL expressions. In a system or federation implementing C-BML and MSDL, force structures would generally be defined in MSDL documents, loaded into some system, and then be referenced in C-BML expressions of plans, orders, reports, or requests. In some cases, both C-BML and MSDL permit the definition of certain aspects of the military situation, such as the definition of control measures (e.g., routes, phase lines, etc.). MSDL would often be used to define such measures that are known or established at the start of an operation, while C-BML would be used to define such objects during execution of the operation, but these are not hard-and-fast rules. As application of the two standards grows over time, developers will determine uses that facilitate implementation and execution drawing from the best features of both languages. Future standardization efforts may combine the two into a single standard that can meet the requirements of scenario initialization as well as the expression of commands, orders, reports, and requests.
5 C-BML Data Model

The Phase 1 C-BML Standard [7] provides a complete description of the base C-BML XML schemas and underlying data model. A portion of the C-BML logical data model is shown in Figure 4, identifying the foundational 5Ws (Who, What, When, Where, Why), as well as principal abstract types (green boxes) and concrete types. Due to the extent of the model, it is difficult to make available for easy readability in document format. The diagram is broken out into quadrants in Appendix D to try to make it more readable using the zoom feature of programs like Adobe Acrobat. The diagram is also provided as a graphic image in the SISO Digital Library in the Command and Control System to Simulation System Interoperation (C2SIM) PDG/PSG file space.

Figure 5 illustrates the structure of the logical data model for the C-BML Light portion of the Standard schemas (see Section 6) of the standard. These diagrams are intended to provide interested readers with a quick way to see the primary concepts on which the Phase 1 C-BML XML schemas are based.
Figure 4: C-BML composites logical data model
Figure 5: C-BML Light logical data model
6 Employment of the C-BML Standard XML Schemas

A principal way to use the Phase 1 C-BML Standard is to create special-purpose XML schemas using the XML schemas provided in the Phase 1 Standard. Adopters of the Phase 1 C-BML standard will create schemas for their specific purposes based on the XML structures provided in the standard. Application of the C-BML Standard will involve coordination similar to the development of a Federation Object Model (FOM) in application of the High Level Architecture (HLA), as laid out in processes such as the Distributed Simulation Engineering and Execution Process (DSEEP). It is anticipated that XML schemas for specific applications of C-BML across selected C2, simulation, and RAS will emerge from the community over time, just as specific-use FOMs (e.g., Real-time Platform Reference FOM) have emerged in the HLA community. Such schemas are also expected to be future products of the SISO Command and Control Systems – Simulation Systems Interoperation (C2SIM) Product Development Group (PDG) (e.g., C-BML representations of United States Message Text Format messages for interactions across selected C2 and simulation systems).

6.1 Considerations regarding the Full and Light Portions of the Phase 1 C-BML Standard Schemas

The Full portion of the Standard schemas seeks to provide the full expressive power of the JC3IEDM, whereas the Light seeks to provide adequate expressive power in a format that is easier to understand and use.

The two portions of the Standard schemas were not intended to work together; only to provide two options within the overall BML context.

An implementer makes an either-or decision for a particular instance of implementation. Early adopters who have implemented the complete Phase 1 C-BML specification report the ability to translate all information in the Light portion of the Standard schemas into information using the Full portion of the Standard schemas when needed.

6.2 Example Usages of the C-BML XML Schemas

As an initial illustration of potential uses of the Phase 1 C-BML Standard, we introduce below two XML schemas and several example XML files that have been developed and employed by the North Atlantic Treaty Organization (NATO) Modeling and Simulation Group 085 (MSG-085) for examination and demonstration of use of the Phase 1 C-BML Standard. These examples also serve to compare and contrast use of the Full portion of the Standard schemas (makes substantial use of XML abstract data types) and Light portion of the Standard schemas (employs concrete data types) from the Phase 1 C-BML Standard.

6.2.1 Example Usage: Full Portion of the Standard Schemas

Consider the XML schema file “cbml-example-expression-types.xsd” provided in Annex A. The schema file defines specific XML data structures for use in creating a set of orders and reports. The example schema references the C-BML Standard XML schema files, and achieves conformance to the Phase 1 C-BML standard by validating (in the XML sense) against the base schemas in the Standard. It is important to note that the example schema and the XML instance documents based on that schema are provided here purely for illustrative purposes, and are neither prescriptive nor normative.

An example XML data structure for an Order constructed in accordance with the cbml-example-expression-types.xsd schema is provided below and in the DraftGuideExampleFiles\cbml-example-expressions\example-expressions\FullOrder\C-BMLFull-Order.xml file from [9].
<OrderIssuedWhen>20140401103600.024</OrderIssuedWhen>
<OrderID>bb6e6082-5775-11e3-94d4-000c2975e2e5</OrderID>
<TaskersIntent>Recon enemy forces</TaskersIntent>

<Task>
    <Where>
        <SpecificLocation xsi:type="GeographicPoint">
            <Location>
                <OID>L00001</OID>
                <LatitudeCoordinate>58.587169</LatitudeCoordinate>
                <LongitudeCoordinate>15.285854</LongitudeCoordinate>
            </Location>
        </SpecificLocation>
    </Where>
    <TaskWhat>
        <ActionTask xsi:type="OtherActionTask">
            <OID>SPARTAN31 Phase 1</OID>
            <ActivityCode>MOVE</ActivityCode>
        </ActionTask>
    </TaskWhat>
    <TaskWhen>
        <TaskStartWhen>
            <StartAbsoluteTime>
                <StartUnspecifiedTime>
                    <StartQualifierCode>ASAP</StartQualifierCode>
                </StartUnspecifiedTime>
            </StartAbsoluteTime>
        </TaskStartWhen>
        <TaskWhen>
            <TaskerWho>
                <OrganisationRef xsi:type="UnitRef">
                    <OID>TG 401.01</OID>
                    <OrganisationRef/>
                </TaskerWho>
                <TaskeeWho>
                    <OrganisationRef xsi:type="UnitRef">
                        <OID>1-223</OID>
                        <OrganisationRef/>
                    </TaskeeWho>
                </TaskerWho>
            </TaskWhen>
        </TaskWhen>
    </TaskWhen>
</Task>

<Task>
    <Where>
        <SpecificLocation>
            <Location xsi:type="GeographicPoint">
                <OID>L00002</OID>
                <LatitudeCoordinate>58.546390</LatitudeCoordinate>
                <LongitudeCoordinate>15.088100</LongitudeCoordinate>
            </Location>
        </SpecificLocation>
    </Where>
    <TaskWhat>
        <ActionTask xsi:type="OtherActionTask">
            <OID>SPARTAN31 Phase 1</OID>
            <ActivityCode>MOVE</ActivityCode>
        </ActionTask>
    </TaskWhat>
    <TaskWhen>
        <TaskStartWhen>
            <StartAbsoluteTime>
                <StartUnspecifiedTime>
                    <StartQualifierCode>ASAP</StartQualifierCode>
                </StartUnspecifiedTime>
            </StartAbsoluteTime>
        </TaskStartWhen>
        <TaskWhen>
            <TaskerWho>
                <OrganisationRef xsi:type="UnitRef">
                    <OID>TG 401.01</OID>
                    <OrganisationRef/>
                </TaskerWho>
                <TaskeeWho>
                    <OrganisationRef xsi:type="UnitRef">
                        <OID>1-223</OID>
                        <OrganisationRef/>
                    </TaskeeWho>
                </TaskerWho>
            </TaskWhen>
        </TaskWhen>
    </TaskWhen>
</Task>

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This example XML document references (in the top-level CBMLOrder element) the example XML schema cbml-example-expression-types.xsd. All file references are given as "relative addresses" relating to the folder structure for the files provided with the distribution of this guide.

Note the use of the xsi:type designations for several of the information elements in this example; such as xsi:type="UnitRef" for an OrganisationRef element, xsi:type="OtherActionTask" for an ActionTask element, and xsi:type="GeographicPoint" for a Location element. These XML attributes and attribute values are typical when using the Full portion of the Standard schemas in order to assign concrete types for the abstract data types declared in the special-purpose schema.

As an example of a Report structure using XML data structures from the Full portion of the Standard schemas, a position status report is given below and in the DraftGuideExampleFiles\cbml-example-expressions\FullPositionStatusReport\CBMLOrderFiles\FullPositionStatusReport.xml from [9].
The above XML instance documents illustrating the use of the Full portion of the Standard schemas and the example XML schemas against which they validate are provided in the distribution package for this guide [9].

6.2.2 Example Usage: Light Portion of the Standard Schemas

Consider XML schema cbml-example-expression-light-types provided in Annex B and in the DraftGuideExampleFiles\cbml-example-expressions\example-expressions-schema\cbml-example-expression-light-types.xsd from [9]. As above, the schema file defines specific XML data structures for use in creating a set of orders and reports. The example schema references the C-BML Standard XML schemas, and achieves conformance to the Phase 1 C-BML standard by validating (in the XML sense) against the base schemas in the Standard. It is important to note that the example schema and the XML instance documents based on that schema are provided here purely for illustrative purposes, and are neither prescriptive nor normative.

The same information content as shown in the example in 6.2.1 is expressed below using the cbml-example-expression-light-types.xsd schema.
This example CBML Light Order was drawn from GMU C4I Center work in NATO MSG-085. It is provided as an example only and is not intended to represent any sort of standard for an Order. The content is as follows:

```xml
  <cbml:Execution>
    <cbml:TaskersIntent> Recon enemy forces </cbml:TaskersIntent>
    <cbml:Tasks>
      <cbml:Task>
        <cbml:TaskID> 1-223 Phase 1 </cbml:TaskID>
        <cbml:TaskerWho通常是Ref> 1-223 </cbml:TaskerWho通常是Ref>
        <cbml:ActivityCode> MOVE </cbml:ActivityCode>
        <cbml:TaskWhenLight>
          <cbml:TaskStartWhenLight>
            <cbml:StartAbsoluteTime>
              <cbml:StartUnspecifiedTime>
                <cbml:StartQualifierCode>AASAP</cbml:StartQualifierCode>
              </cbml:StartUnspecifiedTime>
              <cbml:StartAbsoluteTime/>
            </cbml:StartAbsoluteTime>
          </cbml:TaskStartWhenLight>
          <cbml:TaskWhenLight>
            <cbml:AtWhere>
              <cbml:LocationLight>
                <cbml:PointLight>
                  <cbml:GDC>
                    <cbml:SpecificPoint>
                      <cbml:LatitudeLight>58.587169</cbml:LatitudeLight>
                      <cbml:LatitudePrecisionCode>DEGREE</cbml:LatitudePrecisionCode>
                      <cbml:LongitudeLight>15.285854</cbml:LongitudeLight>
                      <cbml:LongitudePrecisionCode>DEGREE</cbml:LongitudePrecisionCode>
                      <cbml:SpecificPoint/>
                    </cbml:GDC>
                  </cbml:PointLight>
                  <cbml:LocationLight/>
                  <cbml:AtWhere/>
                </cbml:PointLight>
              </cbml:LocationLight>
              <cbml:AtWhere/>
            </cbml:AtWhere>
          </cbml:TaskWhenLight>
        </cbml:TaskStartWhenLight>
      </cbml:Task>
      <cbml:Task>
        <cbml:TaskID> SPARTAN31 Phase 1 </cbml:TaskID>
        <cbml:TaskerWho通常是Ref> SPARTAN31 </cbml:TaskerWho通常是Ref>
        <cbml:ActivityCode> MOVE </cbml:ActivityCode>
        <cbml:TaskWhenLight>
          <cbml:TaskStartWhenLight>
            <cbml:StartAbsoluteTime>
              <cbml:StartUnspecifiedTime>
                <cbml:StartQualifierCode>AASAP</cbml:StartQualifierCode>
              </cbml:StartUnspecifiedTime>
              <cbml:StartAbsoluteTime/>
            </cbml:StartAbsoluteTime>
          </cbml:TaskStartWhenLight>
          <cbml:TaskWhenLight>
            <cbml:AtWhere>
              <cbml:LocationLight>
                <cbml:PointLight>
                  <cbml:GDC>
                    <cbml:SpecificPoint>
                      <cbml:LatitudeLight>58.546390</cbml:LatitudeLight>
                      <cbml:LatitudePrecisionCode>DEGREE</cbml:LatitudePrecisionCode>
                      <cbml:LongitudeLight>15.088100</cbml:LongitudeLight>
                      <cbml:LongitudePrecisionCode>DEGREE</cbml:LongitudePrecisionCode>
                      <cbml:SpecificPoint/>
                    </cbml:GDC>
                  </cbml:PointLight>
                  <cbml:LocationLight/>
                  <cbml:AtWhere/>
                </cbml:PointLight>
              </cbml:LocationLight>
              <cbml:AtWhere/>
            </cbml:AtWhere>
          </cbml:TaskWhenLight>
        </cbml:TaskStartWhenLight>
      </cbml:Task>
    </cbml:Tasks>
  </cbml:Execution>
</cbml:CBMLOrder>
```

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This example XML document references (in the top-level CBMLOrder element) the example XML schema cbml-example-expression-light-types.xsd. All file references are given as "relative addresses" relating to the folder structure for the files provided with the distribution of this guide.

As an example of a Report structure using XML data structures from the Light portion of the Standard schemas, a position status report is given in the following XML instance document.
The above schema and XML instance documents illustrating the use of the Light portion of the Standard schemas are provided in the distribution package for this guide.

Section 7 describes a number of additional example uses of a C-BML conformant XML schema to generate a variety of C-BML expressions for various purposes (XML files associated with the examples are provided in the material distributed with this guide).
7 Additional C-BML Specific-Use Examples

As introduced in the previous section, a principal way to use the Phase 1 C-BML Standard is to create XML schemas using the building blocks provided in the Phase 1 Standard. For example, an XML schema file named cbml-example-expressions.xsd is provided with this guide (Annex C and available in the set of materials distributed with this guide) to serve as a foundation for the examples described in this section. As shown in Figure 6, the schema describes the structure of a C-BML expression as a selection of one of three principal substructures: Order, Report and Request.

![Image of CBML expressions schema](image)

Figure 6: Simplified top-level structure of C-BML expressions schema for Guide examples.

As before, this example schema references the C-BML Standard XML schemas, and achieves conformance to the Phase 1 C-BML standard, by validating (in the XML sense) against the base schemas in the Standard. Example XML files encoding Phase 1 C-BML expressions corresponding to the descriptions in this section are provided in material accompanying this guide. These XML files conform to (i.e., validate against) the cbml-example-expressions.xsd schema.

In this section, we describe a number of example uses of the cbml-example-expressions.xsd schema to generate a variety of C-BML expressions for various purposes (XML files associated with the examples are provided in the material distributed with this guide). We emphasize again that this schema and the examples (descriptions and XML files) are provided purely for illustrative purposes, and are neither prescriptive nor normative, and are considered notional, being suggestive of possible uses rather than being strictly compliant with any specific military service or country’s doctrine. Unlike the presentation in Section 6, here we provide a description of the usage; refer to the XML schema file (Annex C) and the separate XML files (accompanying this guide) to view the XML representation of the examples.

In the context of these examples, it is useful to consider the relationship between C-BML and MSDL discussed earlier in Section 4. As stated, MSDL is used to describe the starting conditions of a scenario—the sides, force structures, weapon systems, materiel, control measures, location, environment, and other features (see [6] for a full description of the language). In many cases, objects referenced in C-BML expressions will have first been defined in MSDL expressions. For example, the Unmanned Aerial Vehicle mission example presented in 7.2 in the following subsections references several units involved in the operation (1st Battalion, Company A, and UAV Platoon). In a system implementing C-BML and MSDL, these units would generally be defined in MSDL documents, loaded into some system, and then be referenced (as in example 7.2) in C-BML expressions. In some cases, as in the RouteWhere example in 7.1 below, both C-BML and MSDL permit the definition of what are commonly referred to as control measures (e.g., routes, phase lines, etc.). MSDL would often be used to define such measures that are known or established at the start of an operation, while C-BML would be used to define such objects during execution of the operation, but these are not hard-and-fast rules. Greater clarity and separation of concerns will evolve as application of the two standards grows over time.

7.1 RouteWhere

Defining routes and various kinds of control measures is a common aspect of many C2 messages. In C-BML, a RouteWhere is defined as three elements: a mandatory StartWhere, an unlimited number of optional Via elements, and a mandatory EndWhere. All these elements are of type Where. Figures 7-11 illustrate examples of possible RouteWhere constructs.

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Figure 7: Point, from example file RouteWhere_Point.xml

Figure 8: Line, from example file RouteWhere_Line.xml
Figure 9: Corridor, from example file RouteWhere_CorridorArea.xml

Figure 10: Volume, from example file RouteWhere_SurfaceVolumeCorridorArea.xml
7.2 Unmanned Aerial Vehicle (UAV) Mission

Here, we present an example UAV mission and show how tasks and reports can be specified in the C-BML language. The C-BML expressions for each task and report are found in XML documents accompanying the example. The intent is to provide technical users a pattern for constructing their own tasks and reports. This example has the following considerations:

a) Unused object identifiers (OIDs) are filled with 0.

b) Who Affiliation Use Cases: An ObjectType can be associated with an Affiliation. An ObjectItem can be associated with an Affiliation with a given certainty (i.e., ReportingData). However, WhoAffiliationType is intended to record exceptions to affiliations identified in ObjectType. Consequently, the native, normal, or expected affiliation is identified by associating the ObjectItem with an appropriate ObjectType via WhoTypeType. For the purpose of this example, WhoAffiliationType is used to report all entities’ affiliation.

Table 1: Step-by-step overview of a sample UAV mission, with related XML files

<table>
<thead>
<tr>
<th>Seq#</th>
<th>C-BML Expression</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1st Battalion reports its own existence. 1st Battalion reports Company A. Company A reports UAV Platoon. See WhoTypeType_3.xml.</td>
</tr>
<tr>
<td>2.</td>
<td>1st Battalion reports a UAV of type RQ-1A Predator. 1st Battalion reports that UAV Platoon controls this UAV. See WhoTypeType_5.xml.</td>
</tr>
<tr>
<td>3.</td>
<td>UAV Platoon continuously reports the location of the UAV (airborne platform) at a given reporting rate. See WhoLocationType_1.xml. Following is possible variation of this report:</td>
</tr>
<tr>
<td>a.</td>
<td>UAV Platoon continuously reports UAV location, orientation and velocity at a given reporting rate. See WhoLocationType_1a.xml.</td>
</tr>
<tr>
<td>Seq#</td>
<td>C-BML Expression</td>
</tr>
<tr>
<td>------</td>
<td>------------------</td>
</tr>
<tr>
<td>4.</td>
<td>UAV Platoon continuously reports UAV status at a given reporting rate. See WhoStatusType_1.xml.</td>
</tr>
<tr>
<td>5.</td>
<td>UAV Platoon continuously reports UAV fuel level at a given reporting rate. See WhoHoldingType_3.xml.</td>
</tr>
<tr>
<td>6.</td>
<td>1st Battalion reports itself being in command and control of Company A and Company A being in command and control of UAV Platoon. See WhoAssociationType_1.xml.</td>
</tr>
<tr>
<td>7.</td>
<td>1st Battalion defines an Organisation Structure based on associations defined in WhoAssociationType_1.xml. See OrganisationStructureType_1.xml.</td>
</tr>
<tr>
<td>8.</td>
<td>1st Battalion reports Vehicle 1032 and Vehicle 1026 of type Unknown (999). See WhoTypeType_4.xml.</td>
</tr>
<tr>
<td>9.</td>
<td>1st Battalion adds Vehicle 1032 and Vehicle 1026 in a candidate target list for observation. See CandidateTargetListType_1.xml.</td>
</tr>
<tr>
<td>10.</td>
<td>Company A orders UAV Platoon to do a Tactical Air Reconnaissance Task at given location. See 9.3.</td>
</tr>
<tr>
<td>11.</td>
<td>UAV Platoon reports Tactical Air Reconnaissance Task (1004) been assigned, but the execution has not started. See TaskWhatStatusType_1.xml.</td>
</tr>
<tr>
<td>12.</td>
<td>UAV Platoon reports Tactical Air Reconnaissance Task (1004) is in progress with a completion ratio of 0%. See TaskWhatStatusType_2.xml.</td>
</tr>
</tbody>
</table>
| 13.  | UAV Platoon reports Vehicle 1032 and Vehicle 1026 of type Vehicle Truck 4X4 (1025). See WhoTypeType_2.xml.  
(The UAV has acquired imagery of the two vehicles. The UAV ground station operator is monitoring the truck's location.) |
| 14.  | 1st Battalion reports existence of 2 Terrorist Organisations: Organisation 1002 and Organisation 1003 of type 1000. See WhoTypeType_1.xml.  
(The battalion has received intelligence from an external source.) |
| 15.  | 1st Battalion reports Organisation 1002 using Truck 4x4 1032 and Organisation 1003 using Truck 4x4 1026. See WhoAssociationType_2.xml. |
| 16.  | UAV Platoon continuously reports location of Vehicle 1032 and Vehicle 1026 at a given rate. See WhoLocationType_2.xml. |
| 17.  | UAV Platoon continuously reports status (Operational) of Vehicle 1032 and Vehicle 1026 at a given reporting rate. See WhoStatusType_2.xml. |
| 18.  | UAV Platoon reports Tactical Air Reconnaissance Task (1004) is in progress with a completion ratio of 50%. See TaskWhatStatusType_3.xml.  
(Completion ratio is based on dwell time for the mission which is a function of fuel and/or airspace coordinating measures in the Airspace Control Order.) |
| 19.  | UAV Platoon reports itself observing Vehicle 1032 and Vehicle 1026. See EventWhatLocationType_1.xml. |
Seq# | C-BML Expression
--- | ---
20. | UAV Platoon reports Vehicle 1032 and Vehicle 1026 as Stopped. See WhoLocationType_3.xml.
21. | UAV Platoon reports Vehicle 1032 and Vehicle 1026 as Suspect. See WhoHostilityType_1.xml.
22. | UAV Platoon reports Organisation 1002 doing an Arms Trade involving 50 RPGs (ObjectType 1012) with Organisation 1003 (Event 1011). See EventWhatLocationType_2.xml.
23. | UAV Platoon reports Vehicle 1026 holding 50 RPGs (ObjectType 1012). See WhoHoldingType_1.xml.
24. | UAV Platoon reports a transfer of 50 RPGs between Vehicle 1026 and Vehicle 1032. See HoldingTransferType_1.xml.
25. | UAV Platoon reports entities’ holding: Vehicle 1026 holding 0 RPG and Vehicle 1032 holding 50 RPGs. See WhoHoldingType_2.xml.
26. | UAV Platoon reports arms trading between Organisation 1002 and Organisation 1003 (Event 1011) completed at 100%. See EventWhatStatusType_1.xml.
27. | 1st Battalion reports Organisation 1002 and Organisation 1003 being affiliated with a terrorist group called Black Scorpions. See WhoAffiliationType_1.xml.
28. | UAV Platoon reports an Explosion (Event 1260) affecting Vehicle 1032. See EventWhatLocationType_3.xml.
29. | UAV Platoon reports the Vehicle 1032 burning because of the Explosion (Event 1260). UAV Platoon reports that Vehicle 1026 is showing light damage because of the Explosion (Event 1260). See WhatEffectType_1.xml.
30. | UAV Platoon reports Tactical Air Reconnaissance Task (1004) is completed with a completion ratio of 100%. See TaskWhatStatusType_6.xml.

7.3 **UAV Mission and Airspace Control Order (ACO)**

This example describes a UAV Mission consisting of the following phases (as could be defined in an Air Tasking Order):

- Takeoff and ingress to an operational area
- Activity on station in the operational area
- Egress from area and landing

An Airspace Control Order (ACO) captures the partitioning in space and time of the airspace. It may include, among other things, the following elements:

- Ingress/Egress Route
- Takeoff/Landing Point
Reconnaissance Area

The following table provides a step-by-step decomposition of a sample mission. Refer to example file ACO_1.xml.

<table>
<thead>
<tr>
<th>ReportingData OID</th>
<th>C-BML Expression</th>
<th>ACO Element</th>
</tr>
</thead>
<tbody>
<tr>
<td>1165</td>
<td>1st Battalion reports the Takeoff Point.</td>
<td>Takeoff Point</td>
</tr>
<tr>
<td>1175</td>
<td>1st Battalion reports the location of the Takeoff Point.</td>
<td></td>
</tr>
<tr>
<td>1163</td>
<td>1st Battalion reports an Ingress Route’s Entry Point.</td>
<td>Ingress Route (OID: 1132)</td>
</tr>
<tr>
<td>1172</td>
<td>1st Battalion reports the location of the Ingress Route’s Entry Point.</td>
<td></td>
</tr>
<tr>
<td>1167</td>
<td>1st Battalion reports an Ingress Route. This Ingress Route’s effective period is bounded by ReportedWhen.EffectiveStartDatetime and ReportedWhen.EffectiveEndDatetime.</td>
<td></td>
</tr>
<tr>
<td>1169</td>
<td>1st Battalion reports the location of Ingress Route.</td>
<td></td>
</tr>
<tr>
<td>1161</td>
<td>1st Battalion reports the Reconnaissance Area.</td>
<td>Reconnaissance Area</td>
</tr>
<tr>
<td></td>
<td>(Visual Reconnaissance box)</td>
<td></td>
</tr>
<tr>
<td>1177</td>
<td>1st Battalion reports the location of the Reconnaissance Area.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Visual Reconnaissance box)</td>
<td></td>
</tr>
<tr>
<td>1162</td>
<td>1st Battalion reports an Egress Route’s Entry Point.</td>
<td>Egress Route (OID: 1133)</td>
</tr>
<tr>
<td>1173</td>
<td>1st Battalion reports the location of the Egress Route’s Entry Point.</td>
<td></td>
</tr>
<tr>
<td>1168</td>
<td>1st Battalion reports an Egress Route. This Egress Route’s effective period is bounded by ReportedWhen.EffectiveStartDatetime and ReportedWhen.EffectiveEndDatetime.</td>
<td></td>
</tr>
<tr>
<td>1170</td>
<td>1st Battalion reports the location of Egress Route.</td>
<td></td>
</tr>
<tr>
<td>1166</td>
<td>1st Battalion reports the Landing Point.</td>
<td>Landing Point</td>
</tr>
<tr>
<td>1176</td>
<td>1st Battalion reports the location of the Landing Point.</td>
<td></td>
</tr>
</tbody>
</table>

Following are details of a UAV mission example. Refer to example file UAV_Mission_1.xml and the following structural diagrams (Figures 12 and 13).
Figure 2: UAV Mission's ActionTask 1046
Figure 3: UAV Mission's ActionTask 1048

Table 3: UAV Mission Example

<table>
<thead>
<tr>
<th>OID</th>
<th>C-BML Expression</th>
<th>UAV Mission's Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>ActionTask 1046</td>
<td>Company A orders UAV Platoon to fly a mission from a Takeoff Point (StartWhere) to an Exit Point (EndWhere) via an Ingress Route (OID: 1132) starting ASAP.</td>
<td>Takeoff and Ingress</td>
</tr>
<tr>
<td>ReportingData 1180</td>
<td>Company A reports a Target Area of Interest (TAI 1148). (The TAI is established in an operations order and passed to Co A).</td>
<td>On Station Activity</td>
</tr>
<tr>
<td>ReportingData 1181</td>
<td>Company A reports the location of TAI 1148.</td>
<td></td>
</tr>
<tr>
<td>ActionTask 1004</td>
<td>Company A orders UAV Platoon to do a 30-minute Tactical Air Reconnaissance on TAI 1148 as soon as Ingress is completed</td>
<td></td>
</tr>
</tbody>
</table>
7.4 SPOT Report

A SPOT report (or, SPOTREP) is a common military report providing information regarding situation, position, observation, and task. In this section, we focus on a SPOT report in order to show how to put multiple types of reported facts in a single report, rather than to mimic any particular military’s report structure. We use the UAV example as way to showcase how to build such a report. However, the SPOT report can come from any organization or unit. A SPOT report’s content is often described by the mnemonic “SALUTE”: Size of enemy unit, Activities of the enemy (if moving, always give speed and direction of movement), Location, Unit markings (signs or symbols, uniform worn, vehicle identification), Time of sighting, and Equipment carried by the enemy/personnel/reported subject, including their weapons.

Following are details of a SPOT report example. Refer to example file SPOTReport_1.xml.

Table 4: Example of a SPOT Report

<table>
<thead>
<tr>
<th>ReportingData OID</th>
<th>C-BML Expression</th>
<th>SPOT Report mnemonic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1049</td>
<td>UAV Platoon reports an unknown organisation moving using a Cross Country Truck (Vehicle 1026).</td>
<td>Activity</td>
</tr>
<tr>
<td>1048</td>
<td>UAV Platoon reports the location, heading, and speed of a Cross Country Truck (Vehicle 1026).</td>
<td>Location, Activity</td>
</tr>
<tr>
<td>1044</td>
<td>UAV Platoon reports a Cross Country Truck (Vehicle 1026) with registration (license) Hull Number 2A3AWR.</td>
<td>Size, Unit</td>
</tr>
<tr>
<td>1045</td>
<td>UAV Platoon reports a Cross Country Truck (Vehicle 1026) as operational.</td>
<td>Unit</td>
</tr>
<tr>
<td>All OIDs</td>
<td>UAV Platoon always report facts with a ReportedWhen element.</td>
<td>Time</td>
</tr>
<tr>
<td>1047</td>
<td>UAV Platoon reports Vehicle 1026 holding 50 Light Rockets.</td>
<td>Equipment</td>
</tr>
<tr>
<td>N/A</td>
<td>UAV Platoon reports that a Cross Country Truck (Vehicle 1026) has a black scorpion painted on the door. (unknown or unidentifed unit).</td>
<td>Unit</td>
</tr>
</tbody>
</table>
7.5 Ground Operations Order

A graphical depiction of a ground operations order is shown in Figure 14 below. Figure 15 provides a synchronization matrix for elements of the order. Content indicated in red font is not mapped to C-BML expressions in this example (i.e., in the accompanying example XML files), but the descriptions are provided in the table for overall context.
Figure 4: Ground Operation Overlay
### Phase I Capture Hill 456

<table>
<thead>
<tr>
<th>Unit</th>
<th>H-2</th>
<th>H-1</th>
<th>H Hour</th>
<th>H+1</th>
<th>H+2</th>
<th>H+3</th>
<th>H+4</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Co CP</td>
<td></td>
<td>H-10</td>
<td>Cross PL Gold H+10 minutes</td>
<td>Attack</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st Plt</td>
<td>Move to PL Gold</td>
<td>At PL Gold</td>
<td>Attack</td>
<td>Move to Hill 456</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd Plt</td>
<td>Move to PL Silver</td>
<td>In position at PL Silver</td>
<td>Attack on order</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd Plt</td>
<td>Move to PL Silver</td>
<td>In position at PL Silver</td>
<td>Attack on order</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co Mort</td>
<td>on call</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FA</td>
<td></td>
<td>H-8 minutes</td>
<td>Fire Target Group A1F</td>
<td>Shift Fire to Target Group A2F</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Phase II Prepare to follow Co B**

---

#### Figure 5: Synchronization Matrix

Following are details of a Ground Operations Order example. Refer to example file Order_5.xml (note: items in red font are not included in the example content but provided for context).

**Table 5: Operations Order Decomposition**

<table>
<thead>
<tr>
<th>OID</th>
<th>C-BML Expression</th>
<th>Operations Order Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Context 1194</td>
<td>A context holds all reported facts that belong to Situation Enemy Forces.</td>
<td>Situation Enemy Forces</td>
</tr>
<tr>
<td>ReportingData 1195</td>
<td>Company A reports a Small Enemy Position 1039 of Platoon size.</td>
<td>Enemy forces are in this area and are establishing defensive positions. Our area has about a platoon sized force. Their strength may be down and their supplies may be low. They have an observation post on Hill 456.</td>
</tr>
<tr>
<td>ReportingData 1196</td>
<td>Company A reports location of Small Enemy Position 1039.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1200</td>
<td>Company A reports Small Enemy Position 1039 as Hostile.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1198</td>
<td>Company A reports an Observation Post 1197.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1199</td>
<td>Company A reports location of Observation Post 1197.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1201</td>
<td>Company A reports Small Enemy Position 1039 using Observation Post 1197.</td>
<td></td>
</tr>
<tr>
<td>Context 1202</td>
<td>A context holds all reported facts that belong to Situation Friendly Forces.</td>
<td>Situation Friendly Forces</td>
</tr>
<tr>
<td>OID</td>
<td>C-BML Expression</td>
<td>Operations Order Section</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>ReportingData 2220</td>
<td>1st Battalion reports an Organisation Boundary named B Co - A Co.</td>
<td>5th Battalion Royal Canadians are on the right.</td>
</tr>
<tr>
<td>ReportingData 2221</td>
<td>1st Battalion reports location of Organisation Boundary named B Co - A Co.</td>
<td>Company B is on the left flank.</td>
</tr>
<tr>
<td>ReportingData 2222</td>
<td>1st Battalion reports an Organisation Boundary named 1st Bn PPLI = 5d Bn RCR.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 2223</td>
<td>1st Battalion reports location Organisation Boundary named 1st Bn PPLI = 5d Bn RCR.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 2131</td>
<td>1st Battalion reports that Company B is to the left of Organisation Boundary named B Co - A Co.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 2132</td>
<td>1st Battalion reports that 5th Battalion Royal Canadians is to the right of Organisation Boundary named 1st Bn PPLI = 5th Bn RCR.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1203</td>
<td>1st Battalion reports 5th Battalion Royal Canadians.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1205</td>
<td>1st Battalion reports the location of 5th Battalion Royal Canadians.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1204</td>
<td>1st Battalion reports Company B.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1206</td>
<td>1st Battalion reports the location of Company B.</td>
<td></td>
</tr>
<tr>
<td>Context 1207</td>
<td>A context holds all reported facts that belong to Situation Environment Weather.</td>
<td>Situation Environment: Weather, Civil (Terrain is omitted).</td>
</tr>
<tr>
<td>ActionTask 1212, 1033, 1075, 1076, 1213,</td>
<td>In C-BML this is represented as an action objective with a category code “do not attack” part of the AffectedWho. Because livestock can’t be represented by C-BML, the instruction was modified to be “Don’t kill any civilians.”</td>
<td>Civil: Don’t kill any livestock.</td>
</tr>
<tr>
<td>ReportingData 1210</td>
<td>1st Battalion reports a Rain Cell 1209.</td>
<td>Weather: May have rain showers tonight; don’t expect any moonlight.</td>
</tr>
<tr>
<td>OID</td>
<td>C-BML Expression</td>
<td>Operations Order Section</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>ReportingData 1211</td>
<td>1st Battalion reports the location of the Rain Cell 1209.</td>
<td></td>
</tr>
<tr>
<td>ActionTask 1212</td>
<td>1st Battalion orders Company A to assault Hill 456 in order that capture Observation Post 1197 (see ActionTask with OID 1213) can be accomplished.</td>
<td>Mission: Company A assaults Hill 456 to capture enemy observation post.</td>
</tr>
<tr>
<td>ActionTask 1213</td>
<td>1st Battalion orders Company A to capture Observation Post 1197 in order that Company B advances to Phaseline PLATINUM (see ActionTask with OID 1214).</td>
<td></td>
</tr>
<tr>
<td>Context 1215</td>
<td>A context holds all reported facts that belong to Execution.</td>
<td>Execution</td>
</tr>
<tr>
<td>ReportingData 1216</td>
<td>Company A reports Hill 123.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1217</td>
<td>Company A reports the location of Hill 123.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1218</td>
<td>Company A reports Hill 456.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1219</td>
<td>Company A reports the location of Hill 456.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1220</td>
<td>Company A reports Phaseline GOLD.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1221</td>
<td>Company A reports the location of Phaseline GOLD.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1122</td>
<td>Company A reports Phaseline SILVER.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1123</td>
<td>Company A reports the location of Phaseline SILVER.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1124</td>
<td>Company A reports Phaseline PLATINUM.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1125</td>
<td>Company A reports the location of Phaseline PLATINUM.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1126</td>
<td>1st Battalion reports its own existence.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1127</td>
<td>1st Battalion reports Company A.</td>
<td></td>
</tr>
<tr>
<td>OID</td>
<td>C-BML Expression</td>
<td>Operations Order Section</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>ReportingData 1128</td>
<td>Company A reports 1st Platoon.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1129</td>
<td>Company A reports 2nd Platoon.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1130</td>
<td>Company A reports 3rd Platoon.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1131</td>
<td>1st Battalion reports itself in command and control of Company A.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1132</td>
<td>1st Battalion reports itself in command and control of Company B.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1133</td>
<td>Company A reports itself in command and control of 1st Platoon.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1134</td>
<td>Company A reports itself in command and control of 2nd Platoon.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1135</td>
<td>Company A reports itself in command and control of 3rd Platoon.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1136</td>
<td>1st Battalion reports an organization structure.</td>
<td></td>
</tr>
</tbody>
</table>
| ActionTask 1213 and 1214 | 1st Battalion orders Company B to advance to Phaseline PLATINUM as soon as Company A captures Observation Post 1197 (see ActionTask with OID 1213). | Execution:  
1. **Intent:** Make a coordinated attack on Hill 456 to shut down the enemy OP so that B Company can advance to PL Platinum and not get hit with artillery fire.  
a. **Maneuver:** A Company will assault 456 as its main objective using two platoons abreast. A third platoon will make an initial assault on Hill 123 to provide an over-watch position covering the main assault. The main |
<table>
<thead>
<tr>
<th>OID</th>
<th>C-BML Expression</th>
<th>Operations Order Section</th>
</tr>
</thead>
</table>
| ActionTask 1033 | Company A orders 1st Platoon to attack Hill 123 1 hour after it reaches Phaseline GOLD (see ActionTask with OID 1041) in order that 2nd and 3rd Platoon attack Hill 456 (see ActionTask with OID 1075 and 1076). The expected end state of this task is to have a friendly observation post used by 1st Platoon 1 hour after the start of the attack. | assault will not commence until Hill 123 is secured.  
- **Fires:** Use company mortars as first priority for indirect fire support. Use battalion mortars as a secondary fire support asset if company mortars are not available. The artillery observer has plotted targets to support the main attack. Close air support is not likely, but still possible. |
| ActionTask 1140 | Company A orders 1st Platoon to move to Hill 456 4 hours after it reaches Phaseline GOLD (see ActionTask with OID 1041). |                                                                                                               |
| ActionTask 1073 | Company A orders 2nd Platoon to move from Phaseline GOLD (StartWhere) to Phaseline SILVER (EndWhere) starting at 8h00 and ending no later than at 10h00. |                                                                                                               |
| ActionTask 1075 | Company A orders 2nd Platoon to attack Hill 456 as soon as 1st Platoon finishes the attack on Hill 123 (see ActionTask with OID 1033) in order that Company A captures Observation Post 1197 (see ActionTask with OID 1213). |                                                                                                               |
| ActionTask 1074 | Company A orders 3rd Platoon to move from Phaseline GOLD (StartWhere) to Phaseline SILVER (EndWhere) starting at 8h00 and ending no later than at 10h00. |                                                                                                               |
| ActionTask 1076 | Company A orders 3rd Platoon to attack Hill 456 as soon as 1st Platoon finishes the attack on Hill 123 (see ActionTask with OID 1033) in order that Company A captures Observation Post 1197 (see ActionTask with OID 1213). |                                                                                                               |

**Service support:**
<table>
<thead>
<tr>
<th>OID</th>
<th>C-BML Expression</th>
<th>Operations Order Section</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1. Company sergeant major and second-in-command will transport ammo, water and food. Priority is to the main assault.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Medevac landing zone is at grid 12345678.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Command and signal:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Company CP will be at grid 12455689 until 1000 hours and moving after that.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Signal: Current signal operating instruction in force. If radio is inoperable, main attack signal to commence will be a green star cluster.</td>
</tr>
</tbody>
</table>
7.6 Medical Evacuation

In this example, we use a medical evacuation request to show how to make a request and report facts about electronic and network services. Medical evacuation, often termed MEDEVAC or medevac, is the timely and efficient movement and in-route care provided by medical personnel to the wounded being evacuated from the battlefield or to injured patients being evacuated from the scene of an accident to receiving medical facilities using medically equipped ground vehicles (ambulances) or aircraft (air ambulances).

Table 6: MEDEVAC mission decomposition

<table>
<thead>
<tr>
<th>Seq#</th>
<th>Time</th>
<th>C-BML Expression</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>20100525193000.000</td>
<td>1st Platoon requests a Medical Evacuation to Company A. See Request_2.xml.</td>
</tr>
<tr>
<td>2.</td>
<td>20100525193000.000</td>
<td>1st Platoon reports its Voice Service 1103 as inactive. See NetworkServiceStatusType_1.xml.</td>
</tr>
<tr>
<td>3.</td>
<td>20100525193000.000</td>
<td>1st Platoon reports its new electronic address using another Voice Service 1104. See WhoAddressType_1.xml.</td>
</tr>
<tr>
<td>4.</td>
<td>20100525193000.000</td>
<td>1st Platoon reports its new Voice Service 1104 as active. See NetworkServiceStatusType_2.xml.</td>
</tr>
</tbody>
</table>

A MEDEVAC's content can be formatted to follow a "Nine Line" format:

a) Location of casualties
b) Frequency, call sign, and suffix
c) Casualties by precedence
d) Special equipment
e) Number of casualties by type
f) Security of pick-up site
g) Method of marking the site
h) Nationality and status of casualties
i) Contamination (biological, radiation, chemical)

Following are details of a Medical Evacuation example. Refer to example file Request_2.xml.
### Table 7: MEDEVAC decomposition

<table>
<thead>
<tr>
<th>OID</th>
<th>C-BML Expression</th>
<th>MEDEVAC 9-Line Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>ReportingData 1084</td>
<td>1st Platoon reports a Landing Zone 1078.</td>
<td>• Location of casualties</td>
</tr>
<tr>
<td>ReportingData 1085</td>
<td>1st Platoon reports the location of Landing Zone 1078.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1086</td>
<td>1st Platoon reports a Medical Facility 1081.</td>
<td>• Casualties by precedence</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Number of casualties by type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Nationality and status of casualties</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Security of pick-up site</td>
</tr>
<tr>
<td>ReportingData 1087</td>
<td>1st Platoon reports the location of Medical Facility 1081.</td>
<td></td>
</tr>
<tr>
<td>ReportingData 1088</td>
<td>1st Platoon reports the status of Medical Facility 1081: No enemy activity around it, 2 wounded in action (WIA) and 1 killed in action (KIA); 3 moderately wounded non-ambulatory civilians waiting for evacuation.</td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>1st Platoon reports no enemy activity at Landing Zone 1078.</td>
<td></td>
</tr>
</tbody>
</table>

Note: In C-BML this could be translated by:

- 1st Platoon reports that the answer to the intelligence request (detect action of organisation Alpha at Landing Zone 1078) is “No.” Meaning, no action related to organisation Alpha has been detected at Landing Zone 1078. If organisation Alpha’s hostility status is set to hostile, then having no action related to it means no enemy activity.

- 1st Platoon reports that the answer to the intelligence request (detect presence of organisation Alpha at Landing Zone 1078) is “No.” Meaning, the presence organisation Alpha hasn’t been detected at Landing Zone 1078. If organisation Alpha’s hostility status is set to hostile, then having no presence of organisation Alpha implies no enemy activity.

- 1st Platoon reports that Landing Zone 1078 holds 0 instance of a given Type. If the enemies are associated with a given type (M1A1 for instance) then having 0 M1A1 in Landing Zone 1078 could mean no enemy activity.
### 7.7 Request for Intelligence Information

In this section we use a request for intelligence to show how a request and answer conversation can take place between two organizations using C-BML expressions. A request for intelligence information serves primarily for intelligence and reconnaissance. Intelligence requests are grouped into the following categories:

- **Unitary ObjectItem Request of the form:**
  - Request (Action, Association, Capability, Holding, Hostility, Location, Status, or Type) of a given ObjectItem

- **Binary ObjectItem/ObjectType Request of the form:**
  - Request if ObjectItem is (Holding) ObjectType
  - Request if ObjectItem contains (Presence) of ObjectType
  - Request if ObjectItem is of (Type) ObjectType

- **Binary ObjectItem1/ObjectItem2 Request of the form:**
  - Request if ObjectItem1 contains (Presence) of ObjectItem2
The following table breaks out the request for intelligence information.

**Table 8: Request for intelligence information example**

<table>
<thead>
<tr>
<th>Request</th>
<th>Request's Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company A requests UAV Platoon to answer the following request ASAP:</td>
<td>UAV Platoon replies:</td>
</tr>
<tr>
<td>What's the type of Vehicle 1026?</td>
<td>Vehicle 1026 is of type Truck 4x4.</td>
</tr>
<tr>
<td>See UnitaryTypeRequest.xml.</td>
<td>See UnitaryTypeRequestAnswer.xml.</td>
</tr>
<tr>
<td>Company A requests UAV Platoon to answer the following request ASAP:</td>
<td>UAV Platoon replies: Yes.</td>
</tr>
<tr>
<td>Does Vehicle 1026 have a holding of Light Rocket?</td>
<td>See BinaryHoldingRequestAnswer.xml.</td>
</tr>
<tr>
<td>See BinaryHoldingRequest.xml.</td>
<td></td>
</tr>
<tr>
<td>Company A requests UAV Platoon to answer the following request ASAP:</td>
<td>UAV Platoon replies: No.</td>
</tr>
<tr>
<td>Are there any ObjectItems of type Truck 4x4 at location Where?</td>
<td>See BinaryTypePresenceRequestAnswer.xml.</td>
</tr>
<tr>
<td>See BinaryTypePresenceRequest.xml.</td>
<td></td>
</tr>
<tr>
<td>Company A requests UAV Platoon to answer the following request ASAP:</td>
<td>UAV Platoon replies: Yes.</td>
</tr>
<tr>
<td>Is Vehicle 1026 of type Truck 4x4?</td>
<td>See BinaryTypeRequestAnswer.xml.</td>
</tr>
<tr>
<td>See BinaryTypeRequest.xml.</td>
<td></td>
</tr>
<tr>
<td>Company A requests UAV Platoon to answer the following request ASAP:</td>
<td>UAV Platoon replies: Unknown</td>
</tr>
<tr>
<td>Is Vehicle 1026 at Pickup Zone 1078?</td>
<td>Meaning the potential presence of the specified Vehicle 1026 at Pickup Zone 1078 could not be determined.</td>
</tr>
<tr>
<td>See BinaryItemPresenceRequest.xml.</td>
<td>See BinaryItemPresenceRequestAnswer.xml.</td>
</tr>
<tr>
<td>Company A requests UAV Platoon to answer the following request ASAP:</td>
<td>UAV Platoon replies:</td>
</tr>
<tr>
<td>What are the associations between Vehicle 1026 and Terrorist Group 1003?</td>
<td>Terrorist Group 1003 employs Vehicle 1026.</td>
</tr>
<tr>
<td>See BinaryAssociationRequest.xml.</td>
<td>See BinaryAssociationRequestAnswer.xml.</td>
</tr>
</tbody>
</table>

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<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns:jc3iedm="urn:int:nato:standard:mip:jc3iedm:3.0.2:oo:2.2" xmlns:cbml="http://www.sisostds.org/schemas/c-bml/1.0" targetNamespace="http://www.sisostds.org/schemas/c-bml/1.0" elementFormDefault="qualified" attributeFormDefault="unqualified">
  <xs:annotation>
    <xs:documentation xml:lang="en">XML schema for C-BML guidance examples only J.M. Pullen 6 Mar 2015</xs:documentation>
  </xs:annotation>
  <xs:import namespace="urn:int:nato:standard:mip:jc3iedm:3.0.2:oo:2.2"
schemaLocation="../../../Schemas/composites/1.0/composites.xsd"/>
  <xs:include schemaLocation="../../../Schemas/cbml/1.0/cbml-action-types/1.0/cbml-action-types.xsd"/>
  <xs:include schemaLocation="../../../Schemas/cbml/1.0/cbml-composites/1.0/cbml-composites.xsd"/>
  <xs:include schemaLocation="../../../Schemas/cbml/1.0/cbml-organisation-types/1.0/cbml-organisation-types.xsd"/>
  <xs:include schemaLocation="../../../Schemas/cbml-1.0/cbml/cbml-location-types/1.0/cbml-location-types.xsd"/>
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  <xs:element name="CBMLReport" type="cbml:BMLReportType"/>
  <xs:complexType name="OrderType">
    <xs:annotation>
      <xs:documentation xml:lang="en">Describes an Order, loosely patterned after NATO OPORD</xs:documentation>
    </xs:annotation>
    <xs:sequence>
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      <xs:element name="OrderID" type="xs:string" />
      <xs:element name="Execution" minOccurs="1" maxOccurs="1" type="cbml:TasksType">
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      </xs:element>
    </xs:sequence>
  </xs:complexType>
</xs:element>
</xs:complexType>
</xs:element>
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</xs:complexType>
</xs:element>
</xs:complexType>

Describes some Reports used by MSG-085
<xs:annotation>
  <xs:documentation>
    This is an approved SISO Guideline.
  </xs:documentation>
</xs:annotation>

<xs:sequence>
  <xs:element name="Report" maxOccurs="unbounded">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="CategoryOfReport" type="cbml:CategoryOfReportType"/>
        <xs:element name="TypeOfReport" type="cbml:TypeOfReportType"/>
        <xs:element name="ReportHeader" type="cbml:ReportHeaderType"/>
        <xs:choice>
          <xs:element name="StatusReport" type="cbml:StatusReportsType"/>
          <xs:element name="SpotReport" type="cbml:SpotReportType"/>
        </xs:choice>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:sequence>

<xs:complexType name="ReportHeaderType">
  <xs:sequence>
    <xs:element name="ReporterWho" type="cbml:ReporterWhoType"/>
    <xs:element name="ReportingData" type="cbml:ReportingData"/>
    <xs:element name="ReportedWhen" type="cbml:ReportedWhenType"/>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="StatusReportsType">
  <xs:choice>
    <xs:element name="GeneralStatusReport"/>
    <xs:element name="PositionStatusReport"/>
  </xs:choice>
</xs:complexType>

<xs:complexType name="SpotReportType">
  <xs:sequence>
    <xs:element name="Hostility" type="jc3iedm:ObjectItemHostilityStatusCode" minOccurs="0"/>
    <xs:element name="Executer" type="jc3iedm:OIDType" minOccurs="0"/>
    <xs:element name="AtWhere" type="cbml:WhereType" minOccurs="0"/>
    <xs:element name="Context" type="jc3iedm:TextTypeVar80" minOccurs="0"/>
    <xs:element name="Parameters">
      <xs:complexType>
        <xs:sequence>
          <xs:element name="Size" type="xs:string" minOccurs="0"/>
          <xs:element name="Activity" type="xs:string" minOccurs="0"/>
          <xs:element name="Location" type="cbml:WhereType"/>
          <xs:element name="Unit" type="jc3iedm:OIDType" minOccurs="0"/>
          <xs:element name="Equipment" type="jc3iedm:VehicleTypeCategoryCode" minOccurs="0"/>
          <xs:element name="SendersAssesment" type="xs:string" minOccurs="0"/>
          <xs:element name="Narrative" type="xs:string" minOccurs="0"/>
          <xs:element name="Authentication" type="xs:string" minOccurs="0"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
</xs:complexType>
<xs:complexType>
  <xs:element name="Name" type="xs:string"/>
  <xs:element name="Context" type="xs:string" minOccurs="0"/>
  <xs:element name="ReporterWho" type="cbml:WhoType"/>
  <xs:element name="AtWhere" type="cbml:WhereType"/>
  <xs:element name="JobStatus" type="jc3iedm:OrganisationStatusOperationalStatusCode"/>
  <xs:element name="WhoHoldingStatusReport" type="jc3iedm:WhoHoldingStatusReportType"/>
  <xs:element name="ObservedWhoType" type="cbml:ObservedWhoType"/>
  <xs:element name="Credibility" type="cbml:CredibilityType"/>
  <xs:element name="When" type="xs:string"/>
  <xs:element name="TypeOfReportType" type="xs:string"/>
  <xs:element name="FacilityStatusReport" type="jc3iedm:FacilityStatusReportType"/>
  <xs:element name="PositionStatusReport" type="jc3iedm:PositionStatusReportType"/>
  <xs:element name="ControlFeatureReport" type="jc3iedm:ControlFeatureType"/>
  <xs:element name="TaskStatusReport" type="jc3iedm:TaskStatusReportType"/>
  <xs:element name="ControlTaskReport" type="jc3iedm:ControlTaskReportType"/>
  <xs:element name="OpStatus" type="jc3iedm:OpStatusType"/>
  <xs:element name="ReportID" type="xs:string"/>
  <xs:element name="VelocityVector" type="cbml:VelocityVectorType"/>
</xs:complexType>

<xs:simpleType name="TypeOfReportType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="GeneralStatusReport"/>
    <xs:enumeration value="PositionStatusReport"/>
    <xs:enumeration value="TaskStatusReport"/>
    <xs:enumeration value="ControlFeatureReport"/>
    <xs:enumeration value="ControlTaskReport"/>
    <xs:enumeration value="FacilityStatusReport"/>
    <xs:enumeration value="WhoHoldingStatusReport"/>
    <xs:enumeration value="ReportingWhoReport"/>
    <xs:enumeration value="ReportID"/>
    <xs:enumeration value="OpStatus"/>
    <xs:enumeration value="AtWhere"/>
    <xs:enumeration value="DeviceLocation"/>
    <xs:enumeration value="hereLocation"/>
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    <xs:enumeration value="hereLocation"/>
    <xs:enumeration value="hereLocation"/>
    <xs:enumeration value="hereLocation"/>
<xs:complexType name="CredibilityType">
    <xs:all>
        <xs:element name="Source" type="jc3iedm:ReportingDataSourceTypeCode"/>
        <xs:element name="Reliability" type="jc3iedm:ReportingDataReliabilityCode"/>
        <xs:element name="Certainty" type="jc3iedm:ReportingDataCredibilityCode"/>
    </xs:all>
</xs:complexType>

```xml
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
    xmlns:jc3iedm="urn:int:nato:standard:mip:jc3iedm:3.0.2:oo:2.2"
    xmlns:cbml="http://www.sisostds.org/schemas/c-bml/1.0"
    targetNamespace="http://www.sisostds.org/schemas/c-bml/1.0" elementFormDefault="qualified"
    attributeFormDefault="unqualified">
    <xs:annotation>
        <xs:documentation xml:lang="en"/>
    </xs:annotation>
    <xs:import namespace="urn:int:nato:standard:mip:jc3iedm:3.0.2:oo:2.2"
        schemaLocation="../../../Schemas/cbml-1.0/cbml/jc3iedm-simple-types/3.0.2/jc3iedm-simple-types.xsd"/>
    <xs:include schemaLocation="../../../Schemas/cbml-1.0/cbml/cbml-composites-light/1.0/cbml-composites-light.xsd"/>
    <xs:complexType name="CBMLOrder">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                Describes an Order, loosely patterned after NATO OPORD
            </xs:documentation>
        </xs:annotation>
        <xs:sequence>
            <xs:element name="OrderIssuedWhen" type="xs:string"/>
            <xs:element name="OrderID" type="xs:string"/>
            <xs:element name="TaskerWho" type="xs:string"/>
            <xs:element name="Execution" minOccurs="1" maxOccurs="1">
                <xs:complexType>
                    <xs:sequence>
                        <xs:element name="TaskersIntent" type="xs:string" minOccurs="0"/>
                        <xs:element name="Tasks" type="cbml:TasksLightType"/>
                    </xs:sequence>
                </xs:complexType>
            </xs:element>
        </xs:sequence>
    </xs:complexType>
    <xs:complexType name="TasksLightType">
        <xs:sequence>
            <xs:element name="Task" type="cbml:TaskLightType" minOccurs="1" maxOccurs="unbounded"/>
        </xs:sequence>
    </xs:complexType>
    <xs:complexType name="CBMLReport">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                Describes some Reports used by MSG-085
            </xs:documentation>
        </xs:annotation>
        <xs:sequence>
            <xs:element name="Report" maxOccurs="unbounded">
                <xs:complexType>
                    <xs:sequence>
                        <xs:element name="CategoryOfReport" type="cbml:CategoryOfReportType"/>
                        <xs:element name="TypeOfReport" type="cbml:TypeOfReportType"/>
                        <xs:element name="ReportHeader" type="cbml:ReportHeaderLightType"/>
                    </xs:sequence>
                </xs:complexType>
            </xs:element>
        </xs:sequence>
    </xs:complexType>
    <xs:complexType name="BMLReportType">
        <xs:sequence>
            <xs:element name="ReportHeader" type="cbml:ReportHeaderLightType"/>
        </xs:sequence>
    </xs:complexType>
</xs:schema>
```

<xs:choice>
  <xs:element name="StatusReport" type="cbml:StatusReportsType"/>
  <xs:element name="SpotReport" type="cbml:SpotReportType"/>
</xs:choice>
</xs:sequence>
</xs:complexType>
</xs:element>
<xs:complexType>
  <xs:sequence>
    <xs:element name="Hostility" type="jc3iedm:ObjectItemHostilityStatusCode"/>
    <xs:element name="Executer" type="jc3iedm:OIDType"/>
    <xs:element name="AtWhere" type="cbml:PointLightType"/>
    <xs:element name="Context" type="jc3iedm:TextTypeVar80" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>

<xs:element name="GeneralStatusReport">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="ReporterWho" type="cbml:WhoType"/>
      <xs:element name="Context" type="xs:string" minOccurs="0"/>
      <xs:element name="Hostility" type="jc3iedm:ObjectItemHostilityStatusCode"/>
      <xs:element name="Executer" type="cbml:ObservedWhoType"/>
      <xs:element name="OpStatus" type="jc3iedm:OrganisationStatusOperationalStatusCode"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>

<xs:complexType name="ObservedWhoType">
  <xs:choice>
    <xs:element name="UnitID" type="xs:string"/>
    <xs:element name="UnitDescription">
      <xs:complexType>
        <xs:sequence>
          <xs:element name="Hostility" type="jc3iedm:ObjectItemHostilityStatusCode"/>
          <xs:element name="Size" type="jc3iedm:EchelonSizeCode"/>
          <xs:element name="ArmCategory" type="jc3iedm:UnitTypeArmCategoryCode"/>
          <xs:element name="Qualifier" type="jc3iedm:UnitTypeQualifierCode" minOccurs="0"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
  </xs:choice>
</xs:complexType>

<xs:complexType name="CredibilityType">
  <xs:all>
    <xs:element name="Source" type="jc3iedm:ReportingDataSourceTypeCode"/>
    <xs:element name="Reliability" type="jc3iedm:ReportingDataReliabilityCode"/>
    <xs:element name="Certainty" type="jc3iedm:ReportingDataCredibilityCode"/>
  </xs:all>
</xs:complexType>
</xs:schema>
Annex C  Phase 1 C-BML Guide Example Expressions XML Schema: Multiple Specific-Use Examples

Note: The following shows how the normative standard might be used; it is illustrative only and not a part of the Phase 1 C-BML normative specification. This schema is used as the basis for the example XML files representing the various uses described in Section 7.

```xml
<?xml version="1.0" encoding="UTF-8"?>
<!-- edited with XMLSpy v2010 rel. 3 (http://www.altova.com) by Sidney Chartrand (CAE Inc.) -->
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
 xmlns:jc3iedm="urn:int:nato:standard:mip:jc3iedm:3.0.2:oo:2.2"
 xmlns:cbml="http://www.sisostds.org/schemas/c-bml/1.0"
 targetNamespace="http://www.sisostds.org/schemas/c-bml/1.0" elementFormDefault="qualified"
 attributeFormDefault="unqualified">
  <xs:documentation xml:lang="en">Coalition Battle Management Language (C-BML) information components defined for the Simulation Interoperability Standards Organization (SISO) Phase 1 C-BML Standard (Saikou Diallo VMASC sdiollo@odu.edu, Marc St-Onge Canadian Signals Inc, Sidney Chartrand CAE Inc, Curt Blais NPS Co-editors, C-BML Drafting Group). References the Joint Consultation, Command, and Control Information Exchange Data Model (JC3IEDM) XML schema defined by the Multilateral Interoperability Programme (MIP) - Editor: Dr. Michael Gerz, gerz@fgan.de, FGAN FKIE, Germany - Tue Dec 06 18:35:09 CET 2005 - </xs:documentation>
  <xs:include schemaLocation="../../../Schemas/cbml/1.0/cbml-action-types/1.0/cbml-action-types.xsd"/>
  <xs:include schemaLocation="../../../Schemas/cbml/1.0/cbml-organisation-types/1.0/cbml-organisation-types.xsd"/>
  <xs:include schemaLocation="../../../Schemas/cbml/1.0/cbml-location-types/1.0/cbml-location-types.xsd"/>
  <xs:include schemaLocation="../../../Schemas/cbml/1.0/cbml-materiel-types/1.0/cbml-materiel-types.xsd"/>
  <xs:include schemaLocation="../../../Schemas/cbml/1.0/cbml-feature-types/1.0/cbml-feature-types.xsd"/>
  <xs:include schemaLocation="../../../Schemas/cbml/1.0/cbml-facility-types/1.0/cbml-facility-types.xsd"/>
  <xs:include schemaLocation="../../../Schemas/cbml/1.0/cbml-affiliation-types/1.0/cbml-affiliation-types.xsd"/>
  <xs:include schemaLocation="../../../Schemas/cbml/1.0/cbml-person-types/1.0/cbml-person-types.xsd"/>
  <xs:include schemaLocation="../../../Schemas/cbml/1.0/cbml-composites/1.0/cbml-composites.xsd"/>
</xs:schema>
```

---

**cbml Expressions Elements**

```xml
<xs:element name="CBML">
  <xs:complexType>
    <xs:annotation>
      <xs:documentation xml:lang="en">This element MUST be conveyed as the root element in any instance document based on this schema expression.</xs:documentation>
    </xs:annotation>
    <xs:choice>
      <xs:element name="Order" type="cbml:OrderType"/>
      <xs:element name="Report" type="cbml:ReportType"/>
      <xs:element name="Request" type="cbml:RequestType"/>
    </xs:choice>
  </xs:complexType>
</xs:element>
```

---

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This is an approved SISO Guideline.
<xs:complexType name="OrderType">
  <xs:annotation>
    <xs:documentation xml:lang="en">Specifies a C-BML Expression that is an order.</xs:documentation>
  </xs:annotation>
  <xs:complexContent base="cbml:AbstractExpressionType">
    <xs:sequence>
      <xs:element name="Task" type="cbml:OrderTaskType" maxOccurs="unbounded"/>
      <xs:element name="CurrentState" type="cbml:CurrentStateType" minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
  </xs:complexContent>
</xs:complexType>

<xs:complexType name="OrderRefType">
  <xs:annotation>
    <xs:documentation xml:lang="en">A reference to some OrderType - Specifies a C-BML Expression that is an order.</xs:documentation>
  </xs:annotation>
  <xs:complexContent base="cbml:AbstractExpressionRefType"/>
</xs:complexType>

<xs:complexType name="ReportType">
  <xs:annotation>
    <xs:documentation xml:lang="en">Specifies a C-BML Expression that is a report.</xs:documentation>
  </xs:annotation>
  <xs:complexContent base="cbml:AbstractExpressionType">
    <xs:sequence>
      <xs:element name="Report" type="cbml:AbstractReportType" maxOccurs="unbounded"/>
    </xs:sequence>
  </xs:complexContent>
</xs:complexType>

<xs:complexType name="ReportData">
  <xs:sequence>
    <xs:element name="WhatEffectType"/>
    <xs:element name="EventWhatStatusType"/>
    <xs:element name="WhoHostilityType"/>
    <xs:element name="WhoGroupAccountType"/>
    <xs:element name="WhoAddressType"/>
    <xs:element name="WhoAffiliationType"/>
    <xs:element name="WhoAssociationType"/>
  </xs:sequence>
</xs:complexType>
WhoLocationType, WhoStatusType, WhoTypeType, EventWhatLocationType, TaskWhatStatusType, WhoHoldingType, WhoHoldingTransferType, CandidateTargetListType, NetworkServiceStatusType, TargetPersonnelProtectionType, RequestWhatAnswerType, OrganisationStructureType>

A reference to some ReportType - Specifies a C-BML Expression that is a report.

A reference to some RequestType - Specifies a C-BML Expression that is a request.

A requested task.

Current state (situation awareness) of a request.

A reference to some RequestType - Specifies a C-BML Expression that is a request.
<xs:documentation xml:lang="en">Specifies a state described as a set of reports.</xs:documentation>
</xs:annotation>
<xs:choice>
  <xs:element name="Report" type="cbml:ReportType">
    <xs:annotation>
      <xs:documentation xml:lang="en">A C-BML Expression that is a report.</xs:documentation>
    </xs:annotation>
  </xs:element>
  <xs:element name="ReportRef" type="cbml:ReportRefType">
    <xs:annotation>
      <xs:documentation xml:lang="en">A reference to some ReportType - A C-BML Expression that is a report.</xs:documentation>
    </xs:annotation>
  </xs:element>
</xs:choice>
</xs:complexType>
Annex D  C-BML Composites Logical Data Model

The following pages show a graphical depiction of the C-BML Composites Logical Data Model. The full diagram was generated from a data modeling tool and has font sizes that are difficult to read in this document format. The diagram is broken into four quadrants to attempt to improve the readability in Microsoft Word or in Adobe Acrobat using zoom controls in those software tools. The diagram is also posted to the C2SIM PDG/PSG SISO digital library at http://www.sisostds.org/DigitalLibrary.aspx (Development Groups / C2SIM PDG PSG / SISO-GUIDE-004) in graphical format for use in other tools. The C2SIM PDG is creating a new logical data model that will replace this version generated from the C-BML standard.
Figure D.1. Full C-BML Composites Logical Data Model
Figure D.2. Logical Data Model Diagram Quadrants
Figure D.3. Logical Data Model Diagram: Upper Left Quadrant
Figure D.4. Logical Data Model Diagram: Upper Right Quadrant
Figure D.5. Logical Data Model Diagram: Lower Left Quadrant
Figure D.5. Logical Data Model Diagram: Lower Right Quadrant
Annex E   Bibliography
