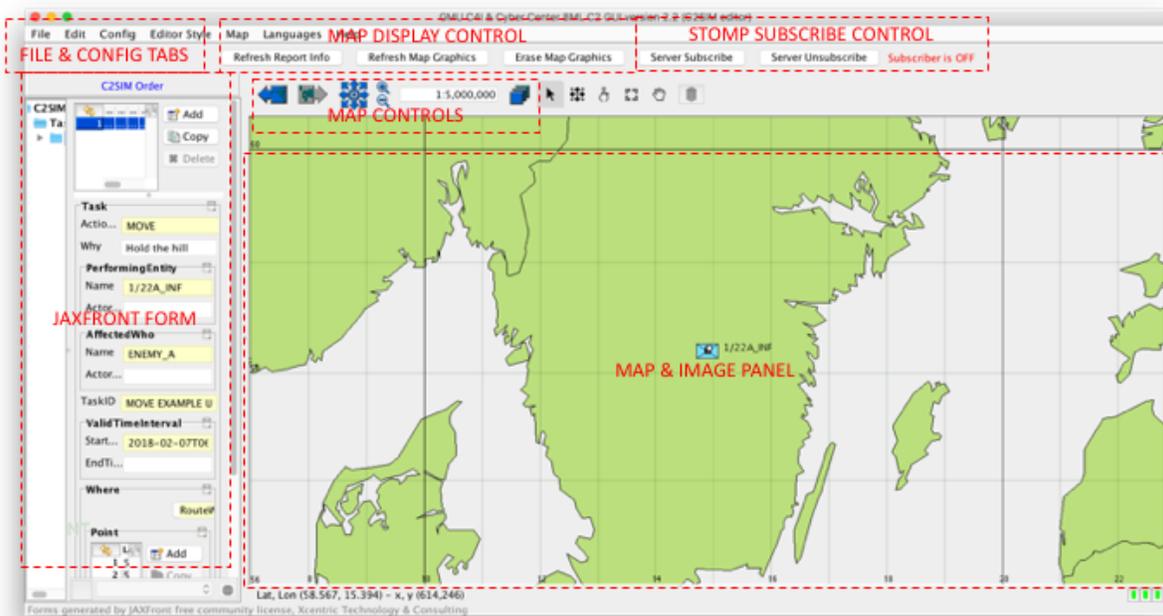# USER'S GUIDE
BML C2 GUI Version 2.2 C2SIM

The BML C2 GUI was developed in 2009-2010 by Lt Col Mohamamad Ababneh, Jordanian Air Force, as graduate student work during his PhD program an George Mason University. The GUI is written in Java for portability. It went through a major revision to version 2.0 in 2013 to include the STOMP and REST protocols for use with the WISE-SBML server in NATO MSG-085. Recently it has been upgraded to version 2.1, including the draft SISO Command and Control-Simulation (C2SIM) standard for NATO MSG-145 use in CWIX. It is expected to be further upgraded to version 2.2, incorporating the final balloted version of C2SIM, when standard drafting is complete. This document supersedes the original User's Guide by Dr. Ababneh.

Purpose of the BML C2 GUI

The GUI is open source software patterned after the C2LG GUI, similar software developed by Fraunhofer-FKIE that is not available open source. Its purpose is to be a tool that will interact with a C2SIM server by creating and/or editing XML Order and Report files, pushing such files into the server, subscribing to receive such files, and displaying their tactical graphics (unit icons and related graphical control measures) on a map.

Major Features of the GUI

The GUI is shown above with labels on its features. The features are:

File and Config tabs: these select the File and Config dropdown menus

Map Display Control: Refreshes/erases map graphics

STOMP Subscribe Control: Starts/stops/displays status for server message feed

JAXFront Form: auto-drawn form that displays and updates Order and Report data

Map Controls: pans map, displays layers and manipulates map graphics

Map and Image Panel: displays a map or image file with superimposed layers and graphics

REST and STOMP in the GUI

Representational State Transfer (REST) is the new protocol for input to Web services, replacing the less efficient Simple Object Access Protocol (SOAP). Since version 2.0, the server uses only REST for input so the GUI uses only REST to provide input to the server.

Stream Oriented Message Protocol (STOMP) listens to messages distributed by the server. The server has a capability to filter the message streams by Topic; the GUI listens to all topics. It displays on the map icons for all reports in C2SIM, IBML09, and C-BML formats. When a new report is posted for a unit, the old one is not removed; thus, the display shows the track of the unit. The map buffer holds up to 100 reports; when the buffer is full the icons are erased automatically.

File Menu of the GUI

The File dropdown menu controls input/output of Initialization messages, Orders, and Reports from between the host computer's file system and the JAXFront panel and the map. When and Order or Report is read from the file system it is automatically displayed in text on the JAXFront panel and graphically on the map. Options exist for C2SIM, IBML09 and C-BML message formats. (At present the C2SIM format deals with only the CWIX 2018 draft of C2SIM.) The options allow creation of a new Initialization message, Order or Report; reading of Initialization message, Order, or Report from the file system; pushing the last Initialization message, Order or Report read to the server via REST; and saving an Order or Report from the JAXFront Form to the file system.

JAXFront Form Use With the GUI

JAXFront provides an open source capability to draw input/output forms based on an XML Schema (XSD) file. It is used to produce a form automatically for Initialization Messages, Orders and Reports created new or read from the file system. For C2SIM format these can be edited and saved to the file system. There are two subpanels; the left one uses the top-level structure

to control what part of the message is shown in the form, while the right one provides the form itself. To reset either of these, click on the small box on the vertical border and drag the box left or right. It may be necessary to click on elements within the form or "New" to display the form that is needed. After creating or editing a form it can be saved by selecting "Save JAXFront" under the "File" dropdown.

Config Menu of the GUI

The Config dropdown menu uses JAXFront to display GUI options in a form and allow them to be updated. Use Load to display the options; after editing them use Save to persist the values. The contents of the form are set by files in the BMLC2GUI/Config folder and must be coordinated with load/save of values in module BMLC2GUI.java. Here are some of the most important options:
Map Scale: at startup
Center Unit: center on the map the first unit loaded from file system or subscription
Start Subscribed (causes GUI to subscribe to the STOMP server at startup)
CBML, IBML and C2SIMns: namespace to be used in interpreting messages of these types
Order Server: IP address of the server where the GUI will push orders
Report Server: IP address of the server will subscribe for reports
Init Map Lat and Lon: Center of the map at startup

Maps in the GUI

Zoom within the map can be achieved using the mouse wheel. Panning can be done only by using the pan icon (arrowheads at NSEW) no using mouse. Layers, if present can be turned on using the layers icon (multiple rectangles stacked). In principle the map can be replaced by .shp ("shape") files and graphics such as TIFF. (See *The Open Map Developer's Guide.*) In practice, we have not been able to do this.