



BVI V0.9.4 RELEASE NOTES

CM ID: 23360803-183
24 MARCH 2023

TABLE OF CONTENTS

1.	Product Description	1
2.	Revision History	2
3.	Special Instructions	6
4.	Known Issues.....	6
5.	Known Limitations	6
6.	Contacts	7

1. PRODUCT DESCRIPTION

Battlespace Visualization and Interaction (BVI) is a research project investigating different methods for visualizing and interacting with complex battlespace information. It is being developed as an effective low-cost distributed training platform that integrates a traditional sand table with commercially available off-the-shelf (COTS) technologies in image projection, virtual reality (VR), augmented reality (AR), and machine vision. These technologies improve the interactive nature of the sand table by projecting information onto the sand/floor and providing the ability to interact with the display using tracked controllers, mobile devices, AR/VR devices and sand movement. With BVI, multiple users can coordinate virtually over a network using a range of supported devices from tablets to AR headsets. The BVI platform incorporates the best aspects of the traditional sand table and enables new possibilities in scaling, collaboration, and simulation.

2. REVISION HISTORY

The table below lists the additions/fixes/changes made in the software.

Version	Fixes/Changes
v0.9.4 (Release Date: 3/24/2023)	<ul style="list-style-type: none"> • Azure Kinect support - Provides support for the newer Azure Kinect hardware connected to the Sandtable. • Scenario Phases - Provides a phase capability which allows users to apply different state data (ex. location) to scenario objects such that scenarios can quickly transition to different phases of an exercise. MTP and WTP both provide UIs for creating, deleting, and transition to phases. All clients will transition. • Rotatable Text - Provides rotatable text. All clients will display rotatable text, but only MTP provides a UI for rotating text. This allows text to be placed along routes for better readability. • XR Client Tethering - Provides the ability for XR clients to tether to a Unit such that the user's view will remain relative to the associated unit as the unit moves. • AR Floor Projection - Provides the ability for AR clients (ex. HL2) to display a 3D terrain and scenario above a BVI Floor Projection. • Cones & Spheres - Provides the ability to draw cones and spheres within a BVI scenario. • Custom Symbols - Provides the ability to customize 2525 symbology via MTP. (Ex. modify contained text, or changed centered drawing) • Quest Pro Support - Provides support for the VR Quest Pro as an XR client. • Scenario/Terrain Template Folders - Provides the ability to create, delete, and rename folders via the BVI Table Manager as well as move scenarios/terrain templates into/out of them. This allows users to better organize terrain templates and scenarios. • Bing Terrain Import on XR - Provides the ability to import Bing terrain for display in XR clients. • Bing Imagery import on WTP/MTP - Provides the ability to import Bing imagery in WTP and MTP for dynamic display of areas outside or instead of loaded terrain templates. • MTP Layer Management UI - Provides the ability to manage layers from MTP via a new UI. Previously only available in BVI Table Manager. • Scenario Save-As in WTP/MTP - Provides the ability to "save-as" a scenario from MTP or WTP. This allows the user to quickly generate a new scenario based on the loaded one with any new updates without overwriting the original. • Lock Edit on MTP - Provides the ability to toggle lock editing on MTP. This allows the user to pan/zoom more easily with a "crowded" scenario, i.e. prevents the user from accidentally moving scenario objects when trying to pan/zoom.

	<ul style="list-style-type: none"> • Arced Lines on XR/WTP - Provides the ability to create arced lines in XR. They are displayed in both WTP and XR, but only editable within XR. • Lighting Toggle on WTP - Provides the ability to toggle lighting on WTP. This is useful in areas of the world and time of day that darkens the natural light for an area on the map.
Pre-v0.9.4 (Release Date: 1/27/2023)	<ul style="list-style-type: none"> • Added Bing Map Data • Added HoloLens 2 Augmented Floor capability • Added Layer UI for the MTP • Added Cone Tactical Geometry type • Added Scenario Phases in WTP • Added Scenario Phases in MTP • Added Arced Line Geometry • Added Sphere Tactical Geometry • Added text rotation/scale through MTP • Added Scenario/Terrain Folders • Added feature to display WTP on the floor • Added Save As feature in WTP • Added Save As feature in MTP • Added capability to lock edit functionality in MTP • Added terrain drape feature for graphics and geometries • Fixed DHS icons being removed when trails enable • Fixed Routes not showing in XR • Fixed aircraft not clamping to OWT terrains • Fixed wind vectors not displaying at a layer altitude of 2m
v0.9.3 (Release Date: 10/25/2022)	<ul style="list-style-type: none"> • TAK Integration • Lock MTP pan/zoom • MTP Fullscreen for experiments • SDK (windows, python 3.8) • AIS interop • xTSP interop • Draped graphics in WTP & XR (UI in MTP) • Import and display forecasted weather
v0.9.2 (Release Date: 8/22/2022)	<ul style="list-style-type: none"> • Added Drag and drop functionality for GLB models • Added Export and Import capability for layers • Added MTP feature Allowing Range rings for any tactical symbol • Added Capabilitiy to enter SIDC in MTP manually • Added Ability to remove all scenario objects • Added Dome toggle for circles in MTP • Added STP websocket URL configurable • Added Ability to display and retrieve line distance • Fixed 3D models appearing in high resolution zoom levels • Fixed Trails appearing in both eyes in Vive headset • Fixed POV feature for DIS units in XR • Fixed Share Scenario button

<p>v0.9.1 (Release Date: 3/2/2022)</p>	<ul style="list-style-type: none"> • Fixed WTP clamping issues with symbols, graphics, and geometry • CyberBOSS v1.0.20 integration • Added Table Manager scenario renaming and recloning capabilities • Added ability to customize text in 2525C symbology • Added ability to apply modifiers to DIS mappings • Updated splash screens from Ares to BVI • Added Cyber information to WTP entity pop-up dialog • Added ability to set Line color and width for data visualization • Added Hololens 2 capability for multiple users wearing AR HMDs to see and interact with the same COP in a spatially anchored physical location • Added Hololens 2 capability to rotate table • Added WTP capabilities to clone objects • Added Table Manager KLM & GeoJSON export capabilities • Added Table Manager crime heatmap generation capability
<p>v0.9.0 (Release Date: 9/30/2021)</p>	<ul style="list-style-type: none"> • Data Visualization <ul style="list-style-type: none"> ○ Added a user interface to import and visualize different types of data. Data can be displayed in BVI 2D and 3D modalities using different visualization types (e.g., color maps, circles, pie charts, regions, stacked columns, etc.) that best support the user's needs for understanding the data and decision making. • Visualization and Planning Layers <ul style="list-style-type: none"> ○ Developed layers to visualize data on separate layers. Added a user interface on the BVI Table Manager (BVI Server) and the WTP to manage layers including toggling layers on and off and setting layer opacity. During mission planning activities, users in collaboration mode can work separately on different layers for the same scenario. Enables additional information to be displayed and configured to support decision making and planning. • Weather Visualization <ul style="list-style-type: none"> ○ Developed capability to visualize weather information in BVI. Added a user interface to import weather data from different weather sources including ARL Battlefield Environment Directorate and the National Oceanic and Atmospheric Administration (NOAA) and visualize in BVI. Examples of weather data displayed include temperature, humidity, wind vectors, hurricane force wind rings, etc. The BVI 3D modalities also support dynamic wind vectors. • MSDDL Import/Export <ul style="list-style-type: none"> ○ Added capability to import and export MSDDL version 1.0 scenario data and display the MSDDL data in all BVI modalities. • Speech and Sketch Interface

	<ul style="list-style-type: none"> ○ Developed a prototype capability in the Web Tactical Planner (WTP) to allow users to place tactical graphics and symbols using natural language and freehand sketches. WTP is required to be displayed on a touch screen monitor and use a microphone for the voice/speech interface. • KML/KMZ and GeoJSON Exercise Planning Data <ul style="list-style-type: none"> ○ Added capability in BVI to ingest and display exercise planning data or scenario information in KML/KMZ or GeoJSON format. • DHS Emergency Response Symbols <ul style="list-style-type: none"> ○ Integrated the National Alliance for Public Safety (GIS) (NAPSG) symbols. BVI users can use MIL-STD 2525 or the NAPSG symbols for mission planning. • Live Video Streaming <ul style="list-style-type: none"> ○ Added capability to stream live Motion JPEG video in BVI XR. • BVI Containerization <ul style="list-style-type: none"> ○ Provided BVI in a Docker container to facilitate installation. The BVI subsystems that are containerized include the Table Manager (BVI Server), messaging services, symbol server, and the WTP and terrain servers.
v0.8.2 (Release Date: 8/27/2021)	<ul style="list-style-type: none"> • Department of Homeland Security (DHS) symbol library • WTP display of 2D terrain image overlay capability
v0.8.1 (Release Date: 10/23/2020)	<ul style="list-style-type: none"> • Import and display of KML/GeoJSON data in BVI • Support for up to 8 controllers in collaboration (2 per table) • Stability improvements to Web Tactical Planner (WTP) • XR support for HoloLens 2
v0.8.0 (Release Date: 8/17/2020)	<ul style="list-style-type: none"> • Updated controller functionality to support additional collaborators • Added Benning LTF for line of sight (LOS) and routing • Ability to visualize data from CyberBOSS <ul style="list-style-type: none"> ○ Icon decorators showing status of cyber attached devices ○ Visual alerts to alert the user of a cyber device state change ○ Message streams to visualize cyber operations • Web Tactical Planner Scenario management <ul style="list-style-type: none"> ○ Create/Save/Share/Unload/Reload Scenario • Stability and performance fixes
v0.7.0-Preview-2 (Release Date: 7/21/2020)	<ul style="list-style-type: none"> • Oculus Quest support • Added Border Patrol 2525C symbol heirarchy filter to the tablet

3. SPECIAL INSTRUCTIONS

N/A

4. KNOWN ISSUES

This is a list of known issues and features for future releases. If you would like to provide feedback regarding this application, please email one of the contacts listed in Section 7.

- [XR] Mortar request in BVIXR detonates in incorrect location
- Appearance of some tactical graphics may not match across modalities
- [XR] HL2 Mortar Request feature sometimes requires reassigning the 3D model to the unit before working
- A small set of single-point tactical graphics is known to be rendering as an upside-down question mark (suppress, pick-up point, entry control point, emergency distress call)
- When using the sand table with the Dockerized Table Manager, after capturing sand heights, clicking the Terrain or Scenario menu items will clear the map
- [XR] LOS feature is not working in BVI XR
- Font and styling of text boxes do not match between WTP and the Viewer
- [MTP] Some DIS logs that include direct fire can cause MTP to freeze after several iterations
- [WTP] Symbol chooser menu for DHS symbols loads slowly in WTP
- [Viewer] Viewer does not visualize message links
- Inconsistent font styles across some modalities
- [Viewer] Does not render line vertices.
- [Viewer] Rotated text causes text size to become too large
- [WTP] Unable to set height of text boxes

5. KNOWN LIMITATIONS

- The user is unable to create entities/units or tactical graphics within an BVI scenario using the VR and AR modalities, this must be done from the BVI Mobile Tactical Planner or the Web Tactical Planner.
- BVI scenarios within the Table Manager are ordered alphabetically, therefore the easiest way to prepare a planning or briefing session that utilizes more than one scenario is to edit the name of each scenario to place numbers at the front of each scenario name.
- Note that when using the KML/JSON import feature, BVI XR is not optimized to visualize the KML/JSON file.
- KML, KMZ, or GeoJSON files may not always import successfully.
- Imported KML, KMZ, or GeoJSON files may not display correctly.

6. CONTACTS

PROGRAM PM:

Charles R. Amburn charles.r.amburn.civ@army.mil

TECH SUPPORT:

Bryan Long bryan.a.long10.civ@army.mil