

JTLS-GO

Version Description Document

November 2022



DEPARTMENT OF DEFENSE
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JOINT THEATER LEVEL SIMULATION - GLOBAL OPERATIONS
(JTLS-GO 6.1.8.0)

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ABSTRACT

The Joint Theater Level Simulation - Global Operations (JTLS-GO[®]) is an interactive, computer-based, multi-sided wargaming system that models air, land, naval, and Non-Governmental Organization (NGO) functions within a combine joint and coalition environment.

This *JTLS-GO Version Description Document (VDD)* describes the new features of the Version 6.1.8.0 delivery of the configuration-managed JTLS-GO software suite.

JTLS-GO 6.1.8.0 is a Maintenance release of the JTLS-GO 6.1 series that includes an updated repository of standard data, a demonstration scenario based in the western Pacific, as well as a major model functionality improvement implemented as Engineering Change Proposals (ECPs). This ECP is summarized in Chapter 2. Code modifications that represent corrections to known Software Trouble Reports (STRs) are described in Chapter 3. Remaining and outstanding STRs are described in Chapter 4.

This publication is updated and revised as required for each Major or Maintenance version release of the JTLS-GO model. Corrections, additions, or recommendations for improvement must reference specific sections, pages, and paragraphs with appropriate justification and be forwarded to:

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1.0 INTRODUCTION

1.1 SCOPE

This *JTLS-GO Version Description Document (VDD)* describes Version 6.1.8.0 of the configuration managed Joint Theater Level Simulation - Global Operations (JTLS-GO[®]) software suite. JTLS-GO 6.1.8.0 is a Maintenance delivery for the JTLS-GO 6.1 series of releases.

JTLS-GO 6.1.8.0 includes the entire JTLS-GO suite of software, a repository of engineering level data, and a realistic demonstration scenario based on the Western Pacific theater of operations called “wespac61”. There were no database format changes made to support this maintenance release. Database modifications that were accomplished to upgrade the previous JTLS-GO database format to the JTLS-GO 6.1 series format were summarized in the VDD for Version 6.1.0.0 delivered in the documents directory.

This release is being provided as part of the normal JTLS-GO maintenance program, in which new maintenance release versions are closely coordinated with Java security patch releases. In addition, the NATO Communications and Information (NCI) Agency requested system corrections to potential cyber-security issues. The corrections to these problems are discussed in [Chapter 3.0](#), along with other Software Trouble Reports (STRs) identified during testing and operational exercises. A minor improvement to the model is summarized in [Chapter 2.0](#).

JTLS-GO 6.1.8.0 executes on the Red Hat Enterprise Linux Version 8.4 64-bit operating systems. The Web-Hosted Interface Program (WHIP[®]) user workstation interface can be executed on any operating system from any Java-compatible Web browser.

1.2 INVENTORY OF MATERIALS

This section lists documents and software that are relevant to JTLS-GO. All JTLS-GO documents included in this delivery are provided in PDF format within the documents subdirectory.

1.2.1 Obsolete/Outdated Documents

No documents have been deleted or become outdated as a result of this release.

1.2.2 Unchanged Documents

- *JTLS-GO Analyst Guide* (JTLS-GO Document 01, Version 6.1.2.0)
- *JTLS-GO Executive Overview* (JTLS-GO Document 02, Version 6.1.7.0)
- *JTLS-GO Configuration Management Plan* (JTLS-GO Document 03, Version 6.1.0.0)
- *JTLS-GO Data Requirements Manual* (JTLS-GO Document 05, Version 6.1.7.0)

- *JTLS-GO Director Guide* (JTLS-GO Document 07, Version 6.1.0.0)
- *JTLS-GO WHIP Training Manual* (JTLS-GO Document 10, Version 6.1.4.0)
- *JTLS-GO Player Guide* (JTLS-GO Document 12, Version 6.1.2.0)
- *JTLS-GO Repository Description* (JTLS-GO Document 14, Version 6.1.0.0)
- *JTLS-GO Software Maintenance Manual* (JTLS-GO Document 15, Version 6.1.0.0)
- *JTLS-GO Technical Coordinator Guide* (JTLS-GO Document 16, Version 6.1.7.0)
- *JTLS-GO Entity Level Server User Guide* (JTLS-GO Document 19, Version 6.1.0.0)
- *JTLS-GO Federation User Guide* (JTLS-GO Document 20, Version 6.1.2.0)
- *JTLS-GO C4I Interface Manual* (JTLS-GO Document 21, Version 6.1.7.0)
- *JTLS-GO DoD Architecture Framework* (JTLS-GO Document 22, Version 6.1.0.0)
- *JTLS-GO DDS Training Manual* (JTLS-GO Document 23, Version 6.1.7.0)

1.2.3 Updated Documents

- *JTLS-GO Controller Guide* (JTLS-GO Document 04, Version 6.1.8.0)
- *JTLS-GO DDS User Guide* (JTLS-GO Document 06, Version 6.1.8.0)
- *JTLS-GO Installation Manual* (JTLS-GO Document 09, Version 6.1.8.0)
- *JTLS-GO Version Description Document* (JTLS-GO Document 17, Version 6.1.8.0)
- *JTLS-GO ATO Services User Guide* (JTLS-GO Document 24, Version 6.1.8.0)

1.2.4 New Documents

No new documents were produced for this version of the software.

1.2.5 Delivered Software Components

JTLS-GO 6.1.8.0 may be delivered either on a CD or as a set of compressed TAR files to be downloaded. Either method includes the complete suite of software executable code and command procedures. The following software components are included with this release:

- Combat Events Program (CEP)
- Scenario Initialization Program (SIP)

- Interface Configuration Program (ICP)
- Reformat Spreadsheet Program (RSP)
- JTLS Symbols Application (JSYMS)
- Database Development System (DDS)
 - Database Configuration Program (DCP)
 - DDS Client User Interface (DDSC)
 - Glassfish Version 5.1.0
- ATO Translator Service (ATOT)
- ATO Generator Service (ATOG)
- ATO Retrieval Program (ATORET)
- JTLS Convert Location Program (JCONVERT)
- Count Critical Order Program (CCO)
- JTLS HLA Interface Program (JHIP)
- After Action Review Client (AARC)
- Scenario Data Client (SDC)
- Order Entry Client (OEC)
- Order Verification Tool (OVT)
- JTLS Object Distribution Authority (JODA)
 - The current JODA build number is 173.
- Web Services Manager (WSM)
- Web-Hosted Interface Program (WHIP) and its component programs:
 - Apache Server (APACHE) Version 2.4.54
 - JTLS XML Serial Repository (JXSR)
 - Order Management Authority (OMA)
 - Synchronized Authentication and Preferences Service (SYNAPSE)

XML Message Service (XMS)

Total Recall Interactive Playback Program (TRIPP)

- Entity Level Server (ELS)
- JTLS Operational Interface (JOI) for both OTH-Gold and Link-16 generation
- Tactical Electronic Intelligence (TACELINT) Message Service
- Keyhole Markup Language (KML) Operational Interface (KOI)
- JTLS Transaction Interface Program (JTOI)
- JTLS Interface Network Navigator (JINN)
- JTLS Order of Battle Editor (JOBEB)
- JTLS Geographic Information System (GIS) Terrain Building Program
- JTLS Master Integrated Database (MIDB) Tool
- JTLS Version Conversion Program (VCP)

VCP60 - Converts a JTLS-GO 5.1 database to a JTLS-GO 6.0 formatted database.

VCP61 - Converts a JTLS-GO 6.0 database to a JTLS-GO 6.1 formatted database.

Instructions for installing JTLS-GO 6.1.8.0 are provided in the *JTLS-GO Installation Manual*. Installing a previous version of JTLS prior to installing JTLS-GO 6.1.8.0 is not necessary. No other upgrade beyond installation of the compressed TAR files or CD is required. The software provided with this delivery is a complete release that includes all files and code required to execute JTLS-GO.

1.2.6 Released Databases

This release includes the following sample unclassified databases:

- The scenario that serves as a repository of engineering level data called “repository61”. Although not useful as a scenario, it does follow all of the database requirements for a scenario, and should be loaded into your PostgreSQL scenario table-space.
- The scenario “wespac61”, which is suitable for training and demonstrations.

1.3 INTERFACE COMPATIBILITY

1.3.1 Support Software

JTLS-GO 6.1.8.0 requires the following versions of support software, including operating systems, compilers, scripting utilities, database tools, transfer protocols, and display managers.

- Operating system for the model: Red Hat Linux Enterprise Server (ES) Edition Version 8.4 or higher, 64-bit architecture.

JTLS-GO 6.1 has been tested with the following versions of Linux 8:

RedHat Linux 8.6 - this operating system license must be purchased.

Oracle Linux 8.4 and 8.6 - This operating system is free to download, use, and distribute, and is provided in a variety of installation and deployment methods. It has been approved by DISA for use by U.S. Government Agencies.

CentOS 8.4 - a free version of Linux 8 that has not been approved by DISA for use by U.S. Government agencies.

- There are no restrictions on the operating system for client workstations, except that the operating system must have a Java-enabled web browser. JTLS-GO 6.1.8.0 has been tested on the following operating systems:

Red Hat Linux Enterprise Edition Version 7.9, 8.4, and 8.6

Oracle Linux 8.4 and 8.6

CentOS Linux Version 7.9 and 8.4

Windows 10, which can be used only if the workstation is an external HTTP client of the simulation network.

- JTLS-GO 6.1.8.0 is delivered with the Adoptium project Temurin Java Development Kit (JDK) 1.8 Update 352 package, which is equivalent to the current version of OpenJDK. This delivered version of the JDK has changed since the last release of JTLS-GO. The Temurin JDK is optimized for speed, while AdoptOpenJDK that was delivered with all previous versions in the JTLS-GO 6.1 series, was optimized for memory. All tests indicate that there is an increase in the amount of memory needed by our Java applications, but the increase is not significant. Both the ICP and DCP have the option for an organization to increase the maximum memory heap for the WHIP and DDSC. For large scenarios and databases, an organization should consider increasing the maximum heap size.
- JTLS-GO uses IcedTea to provide the Java Web Start capability that implements the web-enabled JTLS-GO functionality. JTLS-GO supports IcedTea version 1.8.8.

- JTLS-GO database tools require a certified PostgreSQL 11.13 database server and the full PostgreSQL installation. A containerized solution, that fulfills this specification, is provided as part of the JTLS-GO download. It is not necessary to use the delivered containerized solution, but it is the easiest method to meet the requirements of JTLS-GO 6.1.8.0. There are several alternative methods available for obtaining the PostgreSQL 11.13 software. Refer to Chapter 6 of the *JTLS-GO Installation Manual* for additional installation details.

Please note that the instructions for installing PostgreSQL, detailed in Chapter 6 of the JTLS-GO Installation Manual, have been extensively reorganized in this version of JTLS-GO.

- Windows software, X11R5 server, Motif 1.2 Library, Motif Window Manager: These items are included as part of the supported versions of Red Hat Linux ES.
- TCP/IP is required for inter-process communication between the JODA data server and all user interface programs. The version of TCP/IP included with the supported versions of Red Hat Linux ES is sufficient.
- The Perl script language is used by the JTLS-GO system and game setup scripts. The version of Perl included with the supported versions of Red Hat Linux ES is sufficient. The Perl program is typically located in the /usr/bin directory. If Perl is installed in a another location, a link should be created from the /usr/bin directory to this program.
- SIMSCRIPT III (SIMSCRIPT to C) translator/compiler: SIMSCRIPT is required for recompiling JTLS-GO code. It is not necessary to have a SIMSCRIPT compiler to execute JTLS-GO, because all JTLS-GO software executables are statically linked with the SIMSCRIPT libraries. The compiler is needed only if you are a U.S. Government organization that can obtain source code and plan to re-compile JTLS-GO SIMSCRIPT code. The code was compiled using Simscript III Version 5.3.
- ANSI C Compiler: It is not necessary to use a C compiler to execute JTLS-GO. This compiler is used only by U.S. Government organizations that can obtain source code and intend to re-compile any of the JTLS-GO component programs. The C Compiler version delivered with the supported versions of Red Hat Linux ES is sufficient.
- C++ Compiler: It is not necessary to use a C++ compiler to execute JTLS-GO. This compiler is used only by U.S. Government organizations that can obtain source code and intend to re-compile any of the JTLS-GO HLA component programs. The C++ Compiler version delivered with the supported versions of Red Hat Linux ES is sufficient.
- The JTLS-GO DDS application uses these open source libraries:

JFreeChart, licensed under a GNU Lesser General Public License (LGPL) by Object Refinery Limited, <http://www.object-refinery.com>

JCommon, licensed under LGPL2.1 (GNU Lesser General Public License version 2.1 or later) by Object Refinery Limited, <http://www.object-refinery.com>

Commons-math3-3.0.jar, licensed under Apache Software Foundation (Apache License, Version 2.0) <http://www.apache.org/licenses/LICENSE-2.0> OHLA Compliance

- KML Operational Interface (KOI)

The Keyhole Markup Language (KML) Operational Interface (KOI) server utility enables the model to feed operational simulation data to any version of Google Earth™. The display capabilities and data transfer features of this terrain viewer are sufficiently robust to be used as a base-level operational interface. Operational Players who may be restricted from using an operational Command, Control, Communication, Computer Information (C4I) systems may be able to install and use Google Earth and configure the KOI to provide a capability that resembles C4I for observing perception Force Side data.

Chapter 3 of the *JTLS-GO C4I Interface Manual* describes requirements and procedures for using the KOI capabilities.

1.3.2 JTLS-GO Cybersecurity Compliance

Because of recent incidents of intrusions into software systems, the United States Department of Defense (DoD) has implemented a strong and strictly enforced Cybersecurity program. JTLS-GO, as software that executes on DoD systems, must comply to the mandates of the program, along with all of the third party software used by JTLS-GO, such as PostgreSQL and Java.

One of the DoD requirements is that the software must implement a methodology that ensures that the end user keep the software up-to-date and all security patches are properly installed. In order to fulfill this DoD Cybersecurity requirement, JTLS-GO has moved to Adoptium™ JDK, a full OpenJDK Java environment with a licensing paradigm allowing an application to deliver the software. The following procedure has been established and approved by the JS/J7 Cybersecurity branch:

- Within days of an Oracle Java security release, Adoptium produces an equivalent version using infrastructure, build and test scripts to produce pre-built binaries of the OpenJDK class libraries. All Adoptium binaries and scripts are open source licensed and available for free.
- Within two-weeks of the Adoptium JDK release, JTLS-GO provides a bug release version (JTLS-GO 6.1.n.0) including a full Version Description Document (VDD) for download to all authorized agencies. All DoD agencies using JTLS-GO will be in full compliance with this specific Cybersecurity mandate as long as they download and use the bug released versions when distributed.

The completed Cybersecurity paperwork and a current Gate completion certificate can be obtained by contacting Ms. Jessica Camacho, the U.S. Government Program Manager, at jessica.l.camacho.civ@mail.mil.

1.3.3 JTLS-GO High Level Architecture Compliance

The JTLS-GO 6.1.8.0 release is fully High Level Architecture (HLA) compliant, and includes all the programs required to run JTLS-GO in an HLA mode. JTLS-GO currently belongs to one federation known as GlobalSim. GlobalSim is a comprehensive constructive simulation solution for joint training and wargaming that helps commanders and all levels of staff prepare for a range of operational scenarios.

The solution combines JTLS-GO with CAE's GESI constructive tactical entity-level simulation system. CAE's GESI constructive simulation system is designed to run complex and comprehensive exercises from the company level up to division level. The GESI system is used to represent a virtual battlefield, including weapons, vehicles, aircrafts, ground forces and more.

Combining JTLS-GO and GESI brings together operational and tactical level constructive simulations to prepare commanders and staff to make timely, informed and intelligent decisions across the full spectrum of operations, including conventional combat, disaster relief, and operations other than war.

From the JTLS-GO perspective, all software needed to run GlobalSim is included in this delivery. JTLS-GO uses the Federation Object Model (FOM) located in the \$JGAME/data/hla directory, Federation testing of JTLS-GO with CAE's GESI model have been accomplished. Future plans include expanding the capabilities of the GlobalSim federation.

The HLA RTI (Run Time Infrastructure) executive program (rtiexec) recommended for use with this release is Pitch pRTI Evolved 4.4.2.0. However, this program is not included in the JTLS-GO 6.1.8.0 delivery. Users may obtain a full installation package of the RTI software from Pitch Corporation (www.pitch.se). For information about executing the HLA RTI Executive and other HLA-related software, refer to the appropriate HLA documentation and user guides.

1.4 DATABASE MODIFICATIONS

Significant database structure differences exist between the JTLS-GO 6.1 series of the software and the previous JTLS-GO 6.0 series database structure. There are no database format changes between JTLS-GO 6.1.8.0 and the initial JTLS-GO 6.1.0.0 version of the software.

To upgrade your JTLS-GO 6.0 scenario to JTLS-GO 6.1 compatibility, see instructions listed in the *JTLS-GO DDS User Guide*, Chapter 3.1.

STR JTLS-2022-15607 Grid Lower-Left Location Not Exact On Restart was included in JTLS-GO 6.1.2.0, released in March 2022. This STR required a change to the ASCII checkpoint format. Any saved checkpoints from JTLS-GO 6.1.0.0 and JTLS-GO 6.1.1.0 will not work with JTLS-GO 6.1.3.0 and above.

STRs JTLS-2022-15810 and JTLS-2022-15839, delivered with JTLS-GO 6.1.7.0, required changes to the checkpoint format. Any saved checkpoints from any previous JTLS-GO 6.1.0.0 versions will not work with JTLS-GO 6.1.7.0 and above.

1.4.1 JTLS-GO Using Legacy Default Symbol Set

If a user organization is still using the pre-JTLS-GO 5.0.0.0 legacy default symbol set, prior to unloading your JTLS-GO 6.1.0.0 formatted data from your PostgreSQL database server into the JTLS-GO 6.1.0.0 scenario American Standard Code for Information Interchange (ASCII) text files, you must execute the JSYMS program using the procedure outlined in the *JTLS-GO DDS User Guide*, Appendix B.11. This procedure will reorganize the structure of the <scenario_name>.gs and databases symbol.scf file.

1.4.2 JTLS-GO Using New Default Symbol Set

No new symbols have been added to the JTLS-GO Default Symbol Set. The JTLS-GO Development Team suggests not making any modifications to the delivered Default Symbol Set, End-user organizations are free to use the Default Symbol Set in their scenarios and alter the scenario symbol set to meet specific organizational needs. If in the future, the JTLS-GO Default Symbol Set is changed, a procedure to make these symbols available to all your scenarios will be delivered as part of the release. Such a procedure will not work if the end-user organization alters the official JTLS-GO Default Symbol Set.

1.4.3 Standard Repository Changes

R&A has continued to improve and expand the unclassified data repository, which has been renamed to “repository61.” The DDS comparison and synchronization function can be used to determine if any of the changes delivered are of use to a JTLS-GO user organization.

1.5 INSTALLATION

The *JTLS-GO Installation Manual*, a Portable Document Format (pdf) file available for direct download, is part of this JTLS-GO delivery, It provides detailed instructions for installing the new version of JTLS-GO and the installation of PostgreSQL 11.13 required to operate JTLS-GO 6.1.8.0.

2.0 ENGINEERING CHANGE PROPOSALS

This section describes the new capabilities, known as an Engineering Change Proposal (ECP), that are delivered with this release.

2.1 JTLS-2022-15907 Sunrise/Sunset Times For Location Weather Report

Summary of Model Change Request

The Location Weather Report should be enhanced to include sunrise and sunset times and light conditions.

Design Summary

The sunrise and sunset times (if any) for the next 24-hour period were added to the top of the Location Weather Report. Also, the light condition (Day or Night) was added to each prediction date time group in the report. Column headings were also added.

3.0 SOFTWARE TROUBLE REPORTS

Software Trouble Reports (STRs) describe software code errors that have been discovered by JTLS-GO users or developers and have been corrected.

3.1 JTLS-2022-15854 Convoys Stopped By Enemy Units

When the Rules of Engagement (ROE) between enemy units is set to a very large distances, convoys prematurely stopped along their routes due to a perceived threat by enemy units. These convoys were within the allowed ROE firing distance, but well beyond the range of any units which could cause damage.

While moving, convoys previously used the ROE distances to determine if there was trouble along the path of movement. Convoys are only automatically damaged if the convoy moves within the unit radius of an enemy unit with a positive ROE. The logic was changed so that convoys only stop if they are going to move within the unit radius of an enemy unit.

3.2 JTLS-2022-15856 ATOT Tasking Units - Generic Side Assignment

The ATO Translator (ATOT) GUI allows assets to be assigned to tasking units. Assets may be one of three types: squadron, naval, or side. When a side type was chosen, users were able to pick a side from the scenario. The actual side was not used, so it was confusing and only served to create more work for the user.

The side assignment function of the Tasking Unit page now automatically fills in a side value of "OTHER" that cannot be edited. This reduces a user's workload and quickly communicates that this Tasking Unit belongs to another ATO side.

3.3 JTLS-2022-15857 Warning 1426 Corrections Nonfunctional

Some SVPR corrections for Warning 1426 do not work.

Warning 1426 identifies units that have an initial support unit, but the unit TUP/SUP does not have enough of a supply category to fulfill the requirements for its combat systems. The code was set up to either insert a new record for a supply category if one does not exist, or update an existing record. Depending on whether the record existed, some SVPR corrections would work and some would not.

Warning 1426 was renamed to Warning 1478 for updating existing record. Warning 1479 was added if the prototype does not contain a record for the supply category. The corrective actions for each were modified so only those that apply to the specific warning were displayed.

Error 405 was found to have the same problem. The actions taken to resolve it were the same as those for Warning 1426. Error 405 was split into Error 458 when a record exists and Error 459 if no supply record exists. The SVPR corrections for these were also updated.

3.4 JTLS-2022-15859 SVP Warning 1410 Needs Improvement

Warning 1410 corrections do not always work and are hard to understand.

Warning 1410 was used to identify 4 different problems with an aircraft load assignment:

1. If there is a problem with supplies for a Default Load, Targetable Weapon.
2. If there is a problem with supplies for a Default Load, Supply Load.
3. If there is a problem with supplies for a Primary Load, Targetable Weapon.
4. If there is a problem with supplies for a Primary Load, Supply Load.

Warning 1410 was not clear as to which of those four potential issues was the actual problem.

Warning 1410 was split into Warnings 1480 through 1487. Each Warning clearly describes a problem and each set of corrective actions has been modified for that instance. The first four (1480-1483) are specifically for supply and weapon problems where the squadron has a home base, and the second four (1484-1487) are when the squadron has no home base.

3.5 JTLS-2022-15860 Change Combat System Maintenance Order

The Controller order to change the number of combat systems (CS) in maintenance did not always function correctly for non-aircraft combat systems. The resulting counts of CS in maintenance did not always agree with the ordered changes.

The model treats aircraft and non-aircraft combat systems in different ways. Maintenance of aircraft CS appeared to work as intended. The non-aircraft CS were correctly placed or removed from maintenance per the values in the order. However, the new CS counts were not immediately published on the JODA. The ordered changes were only updated when the model finalized the next event in the simulation. This could be delayed for some time, and the CS counts might have changed in the meantime.

To correct this inconsistency, code was added to immediately publish the CS counts as the order was being processed.

3.6 JTLS-2022-15861 Warning 1211 Delete SUP Option

Warning 1211 required an option to delete a SUP.

Warning 1211 identifies SUPs that do not have enough lifeboat space for the assigned crew. Along with the existing options to increase lifeboat capacity, a new option was added to delete the SUP. This will only work if the SUP is not used by any unit.

3.7 JTLS-2022-15862 Clarify Weapons Data in Logistics Report

The logistics report contains large amounts of data on the combat systems, supplies, weapons, and other unit assets. The section of this report for ammunition also contained supply amounts corresponding to weapons. These data need to be more clearly presented as counts of on-hand weapons rather than as supply amounts.

The ammunition section of the logistics report was broken into two smaller sections:

- A table of the available weapons at the unit, with the current number and the number of unavailable weapons. Unavailable weapons are those used in air missions or by other subordinate objects in the game.
- A list of only those classes of supplies which were used as ammunition, but were not directly associated with an individual targetable weapon. These changes were made to clarify the weapons data.

3.8 JTLS-2022-15863 Ship Detections Code Logic Error

The CEP generated a logic error while processing the detection of ships by a satellite. The logic error was internally corrected by the model, but this STR reports on the solution to this problem.

While processing a ship detection, the model was comparing the type of the unit in the detection data with the selected type needed for a summary report. The checks used in the code did not produce the intended results. The code was corrected to properly handle the intended cases of object type.

3.9 JTLS-2022-15864 Attacked Convoy Excessive Supplies Lost

A ground combat unit moved to the location of a foreign convoy (supply run), consisting of three cargo trucks and six tanker trucks. The ground unit's surface ROE was set to Fire at 5 km range. The unit was not in combat with any foreign units, but the unit's Force Side viewed the foreign Side as Suspect. The convoy was within the unit's radius.

As the unit left the area, it detected and attacked the foreign convoy. One of the six tanker trucks, and none of the cargo trucks, were destroyed. The model correctly determined that 5000 gallons of fuel had been lost, but incorrectly determined that all of the dry goods carried on the cargo trucks were also lost.

A logic flaw was found in the routine that determines the amount of supplies lost when convoy assets are destroyed. The logic failed to process all the supplies carried by a transportation class in the convoy. As a result, the amounts lost were not set to zero for those supplies that did not experience any losses in the transportation class. That oversight caused all of the supplies that were bypassed to be removed from the convoy.

The logic flaw was corrected to process all the supplies for each transportation class when applicable.

3.10 JTLS-2022-15865 OPM Organization Chart - Missing Icons

The Online Player Manual (OPM) features an organizational chart for each Side's order of battle. This chart includes each unit's icon, child units, and small pieces of information about each unit when available. The chart was created using an incorrect directory locations for the icons, so they were not displaying.

The Scenario Initialization Program (SIP), which writes the chart data, has been updated to write the correct icon directory locations.

3.11 JTLS-2022-15866 Destroyed More Missiles Than Airborne

A Controller Kill Aircraft order was sent to perform a Stochastic Surface-Air draw of four Patriot PAC-3 missiles against a single Theater Ballistic Missile (TBM). The draw was successful for all four intercepts, resulting in the loss of four TBMs, even though only a single TBM was targeted. The resultant message listed the loss of the four TBMs, and that “-3” TBMs were remaining.

The code was modified so that the number of destroyed missiles is limited by how many are actually in flight. This error only applied to missiles, because the code already limited aircraft losses to the number in the mission when an air mission, rather than a missile, was targeted.

3.12 JTLS-2022-15868 Detected HRU Not In Mission Recce Report

A non-covert foreign Side HRU was detected by a Recce air mission and appeared on the WHIP map. However, when the mission returned to base, the HRU did not appear in the general Mission Recce Report.

The incorrect data type reference (.OBJECT.HIGHRES.UNIT) was used by the Simscript routine that generates the Mission Recce Report to select HRUs from the air mission's set of update data entities (i.e. the list of detected objects) to include in the report. Consequently, all detected HRUs were not recognized and excluded from the report. The data type reference was corrected to.HRU.DATA. After these corrections, the Mission Recce Report message failed to generate because of a typographical error in the Simscript code that writes the HRU section of the report. That error was also corrected.

3.13 JTLS-2022-15870 Reformat Aircraft Class OPM Page

The Aircraft Class OPM page needed to be reformatted to group relevant items together.

Over time, new items have been added to the OPM Aircraft Characteristics page, and, in most cases, were simply appended to the end. This has made it harder to find a particular item without scanning the whole page. The page has been reformatted to group relevant items in a manner that makes more sense.

3.14 JTLS-2022-15871 Warning 1234 Corrections Nonfunctional

The second correction for SVP Warning 1234, to update a record by setting the value to 1, does not work.

Warning 1234 is reported when a INDIRECT or LONG-INDIRECT Combat System's Combat Arms Type has the number of Counter Fire Responses set to zero. This can be caused by one of two issues:

- The record that holds the data in the Fire Lethality Prototype, Combat System Prototype, Combat Arms Type (flp_csp_cat) table exists but the value of the number of responses is set to zero.
- There is no record in the flp_csp_cat table for the Combat System's Combat Arms Type.

A new Warning was needed to differentiate between a zero in an existing record and the situation in which no record exists. To keep the two warnings together in the warning numbering scheme, Warning 1235 was moved to 1236 and a new Warning 1235 was added. Warning 1234 is now reported when a record exists but the number of responses is set to zero, and Warning 1235 is reported when a record needs to be inserted.

Additionally, a flaw was found in the formatting of the FLP/CSP responses OPM page. The title and description extended across a single line making it hard to read without a lot of scrolling to the right. This was also fixed.

3.15 JTLS-2022-15873 OPM Time Between Displays Incorrect

The value displayed for TIME.BETWEEN.DISPLAYS in the OPM is incorrect.

The computations performed on the database value when it was read in were incorrect. The computations were corrected.

3.16 JTLS-2022-15874 Minor SVP Changes

Several minor modifications were made to the SVPR correction options:

- 1. Error 717 - Add unit type to the Error message.**
- 2. Error 618 - Add option to set target location to owning unit location.**
- 3. Warning 1452 - Add SUP.TYPE to Message.**
- 4. Warning 1457 - Add options to display the entire supply category table and Add option to display unit record to change prototype.**

The following changes were applied:

1. Error 717 is displayed when there is more than one unit on a side with no higher HQ. The unit type reference may be useful to quickly identify what should be fixed.
2. Error 618 is displayed when a stationary target with an owning unit is not within the owning unit's radius. The option to set the target location to the unit location will help in reducing errors when entering lat/long information.
3. Warning 1452 is displayed when a unit uses a SUP that is air-capable, but the unit does not have an ICAO. Adding the ICAO to the initial message provides immediate feedback to the user.
4. Warning 1457 is displayed when a unit arrives with less than their basic load of a supply, and does not have an initial support unit to draw the needed supplies from. An option to display the entire table gives the user a better picture of the overall supply status. A new option to display the unit table in order to change the unit prototype also makes sense and was added.

3.17 JTLS-2022-15875 Synapse Disallows Files In Report Browser Directory

The Synapse service was modified recently to allow WHIPs to access specific files and directories. Anything outside of the access allowed for the WHIPs is rejected by the Synapse. The capability "PUT", used for writing files to the reportbrowser directory, was left out of the set allowed by the Synapse. Whenever the WHIP tries to PUT a file in the reportbrowser directory, the Synapse denied the PUT and the file is not written.

Several other missed locations were uncovered during internal testing. The Synapse is now allowing:

- Report files of type ".strm" to be PUT to the reportbrowser directory.
- The JTLS-GO Operational Interface (JOI) supported filter files save into the designated directory.
- The WHIP to put the "imt_orders" file into the imt_ordersspreadsheet directory.

3.18 JTLS-2022-15876 Combat System Aircraft No TOE

A non-squadron unit is given an aircraft type and has combat system AIRCRAFT, but the TOE value for AIRCRAFT is zero.

Warning 1426 has been added to inform the user of this problem.

3.19 JTLS-2022-15877 Modify Warning 1234 Wording

Modify the wording of Warning 1234 so it can be sorted on the description column.

Warning 1234 is created by a loop of FLPs, CSPs and Combats Arms Types. The output warnings also come out in the same order. The common item of these is the Combat Arms type. By rewording the SVP Message, the user can sort the messages so the Combat Arms Types sorted alphabetically together.

3.20 JTLS-2022-15878 Minor SVP Changes

Several minor modifications were made to the SVPR correction options:

1. **Error 446 - Add capability to change unit prototype.**
2. **Warning 1212 - Add option to delete the POT target.**
3. **Warning 1324 - Add word Unused for the aircraft type.**

The following changes were applied:

1. Error 446 is report when a naval unit has an assigned squadron but the naval unit is not air capable. The option to change the prototype for the naval unit was added to the list of possible corrective actions.
2. Warning 1212 is reported when a TUP does not have the supplies to fire at least one of the targetable weapons in the SSM weapon list. An option to display the SUP or TUP pot table was added along with the requested action to delete the POT target from the TUP or SUP POT table.
3. Warning 1324 is reported when the combined PK of Default Load and Primary load against a target is zero. Adding the word Unused immediately tells the user the aircraft type is not used in the scenario and makes it easier for the user to make a decision whether to worry about the warning at this time. If the aircraft type is used, Error 310 should be corrected to provide better result, so the word Used was added to Error 310.

3.21 JTLS-2022-15879 SSL Medium Strength Cipher Suites Supported

The Nesus security vulnerability scanner detected the availability of the 3DES encryption suite, which is vulnerable to a “Sweet32” attack. When investigated, it was determined that the Apache service internal to JTLS-GO was allowing access to the 3DES encryption suite. Nesus recommends disabling medium strength ciphers.

JTLS-GO default for SSL Cipher security strength has been changed to “high” security strength ciphers only. Medium and low security strength ciphers have been blocked. This was done by editing the “~game/web_active/apache/default/conf/ssl-part2.conf” file and changing the “SSLCipherSuite” entry to “SSLCipherSuite HIGH:!MEDIUM:!LOW”.

3.22 JTLS-2022-15880 Fill Request With Unknown Other Objects JXSR Crash

The JXSR may crash when a fill request from an Order panel contains an Other Filter field that resolves to an unknown object. This can happen when the order is left filled in between restarts of the CEP, such as batch mode running.

The JXSR's routine for processing a fill request always gathers a list of the Other Filter objects as provided by the WHIP. The Other Filter objects are used to refine the list of objects that satisfy the filter request. While gathering the objects, the JXSR stores each of them in an array. Typically, it would always find each one in the JXSR's internal database, because the WHIP would only be able to use an object if it received the object from the JXSR. However, in rare cases, the JXSR may not find an object for the WHIP's request.

For example, consider the time gap between the WHIP knowing about an object and sending the fill request, and the JXSR receiving a delete for the object while not having yet received the fill request. In this case, the JXSR frees the array but continues to fill the array with the following Other Filter objects. This is a rare condition, but would cause the JXSR to crash.

The JXSR was modified to stop processing the fill request when no Other Filter objects are found. This keeps the JXSR from crashing and the requesting WHIP receives an "Object Not Found" error. The WHIP is able to adjust the request when receiving this error.

3.23 JTLS-2022-15881 Error 416 Correction Nonfunctional

The Error 416 corrective option to delete the combat system does not work.

There was a typo in the SVP Template preventing the Standard Query Language (SQL) command to delete the record. This was corrected.

3.24 JTLS-2022-15882 LOGFAS Service Crashes On Null Equipment

The LOGFAS service was processing a delete for an inventory item. The inventory item did not currently exist in LOGFAS service's local database, but the service attempted the delete regardless. This caused the service to crash.

Before processing a deletion of inventory items, the LOGFAS service now checks if the inventory item is valid.

3.25 JTLS-2022-15884 Java Errors Populating AAR Vocabulary Data

At the end of Scenario Data Repository (SDR) initialization, when populating the AAR vocabulary data, Java errors were thrown for a Force Side that has a name longer than 15 characters.

The independent AAR control SQL file is used to create specific database tables for holding the vocabulary data including the names of scenario Force Side. The Force Side Name field was defined at the old 15 characters length. This caused Java errors when executing the Vocabulary

Parser for Force Side names longer than 15 characters. The definition of the Force Side name fields was changed to new maximum name length of 25 characters. A complete review of the script was accomplished. No other name length issues were found.

3.26 JTLS-2022-15885 DDSC Values Differ From Database Value

The supply basic load column for a Tactical Unit Prototype supply category showed a value of 49627.977, but the actual value in the database was 49627.97619.

The issue was caused by the DDSC's method of placing the floating point for the number in the data downloaded from the database, and then formatting those data for display. This issue was corrected. The download now includes the data in the database and the DDSC Graphic User Interface (GUI) file indicates the number of decimal places to view.

In addition, to avoid possible round-off issues, the code was modified to skip the Unit of Measure (UOM) conversion when the conversion multiplier is 1.0 and the additive factor is 0.0.

3.27 JTLS-2022-15886 Cannot Set Max Sorties Per Day To Zero

In the DDSC's Ground Unit Table, users could not set the Max Sorties Per Day value to zero, even though zero is a valid value in the database.

The new value of zero could not pass the Ground Unit Table's validating process for this column. The validator was using a "greater than zero" check, rather than the "greater than or equal to zero" check. The same issue existed for the FARP, Naval, Squadron, and Support units. The validators specified in these tables' screen definition files are now updated using the correct validation.

3.28 JTLS-2022-15887 New Simscript Compiler

The CACI Products Company released a new version of the Simscript compiler for 64-bit Linux. The latest version is III-5.3.0.

All of the JTLS-GO Simscript programs were recompiled and tested using the new compiler. All programs functioned normally. The new compiler was accepted for use in all future releases of JTLS-GO.

3.29 JTLS-2022-15889 SUP Auto Engage Verbiage

There is inconsistent use of the terms used for the SUP parameter AUTO PRECISION GUIDED.

The Data Requirements Manual (DRM), Online Player Manual (OPM) and Ship Unit Prototype (SUP) parameter order panels all use slightly different words when describing the SUP parameter for AUTO PRECISION GUIDED. To improve the consistency, the SUP parameter order panel and OPM page were changed to use the words "Auto Precision Guided Engagement".

3.30 JTLS-2022-15891 Air Mission Fire Weapon Inappropriate AIR.HOLD

After firing its last weapon, an OAS attack mission is always put in AIR.HOLD status for no reason.

The logic always added an AIR.HOLD after firing a weapon. This is not appropriate, unless the mission is going to fire another weapon of the same type and needs to prepare and reload.

The code was modified to add a check to see if the next task was also a fire weapon task, and it was firing the same type weapon before scheduling the AIR.HOLD. If a different weapon is being fired or the next task is not a fire weapon, the AIR.HOLD is not appropriate.

3.31 JTLS-2022-15895 Manage TPFDD Order Changes

A user attempted to submit a Time Phased Force Deployment Data (TPFDD) Order to move a naval unit and its subordinates out of the theater of operations. This naval unit was also the home base to several squadrons, which were not a part of the naval unit's command hierarchy. The results did not cause a crash but were unexpected. Similarly, if attempting to TPFDD a naval unit and its subordinates into the game under the same circumstances cause different and inconsistent results.

New rules have been outlined in the *JTLS-GO Controller Guide*, as part of the Manage TPFDD Order, detailing how naval units, airbases, and Forward Arm and Refuel Points (FARPs) should be TPFDDed in and out of the game when subordinates are included or not included. The model was fixed to match the logic outlined within the Controller's Guide.

3.32 JTLS-2022-15897 Enhance ROE Order Acknowledgment Message

A submitted ROE order may generate a Ground Order Received compliance message that just stated that the receiving unit accepted the ROE, but nothing else. Similarly, if the ROE order was applied to an Operations Area (OPAREA), the Operations Area Order Received compliance message just stated that the ROE assignments for the OPAREA were complete and nothing else. The messages need to include information about the ROEs that were changed.

A review of the messages generated by the ROE order revealed the following deficiencies:

1. Unit ROE: Only changes pertaining to boundary overrides and auto Aircraft Target Class (ATC) auto-intercepts were produced. Changes to the following were not produced: Ground-Surface ROE, Air-Air ROE, Surface-Air ROE, Shadow Distance and Enhanced ROE Criteria.
2. Air Mission ROE: Only changes pertaining to boundary overrides and auto ATC auto-intercepts were produced. Changes to the following were not produced: Ground-Surface ROE, Air-Air ROE and Shadow Distance.
3. HRU ROE: Only changes pertaining to boundary overrides were produced. Changes to the following were not produced: Ground-Surface ROE and Surface-Air ROE.

4. OPAREA ROE: No information produced. Missing changes to Surface ROE, Air-Air ROE, Surface-Air ROE and Air-Surface ROE.
5. Target ROE: All information produced.
6. National Boundary ROE: All information produced.

The missing information for the Unit, Air Mission and HRU ROEs are now included in the Ground Order Received compliance message. The missing information for the OPAREA ROE is now included in the Operations Area Order Received compliance message. No enhancements were needed for the compliance messages for the Target and National Boundary ROEs.

3.33 JTLS-2022-15899 Transport Mission Airdrop Supplies Issue

An Air Transport mission was ordered to airdrop supplies to a ground unit. However, the Mission Task List IMT displayed a Land task immediately before the Offload Supplies task. When the mission arrived at the specified airborne point, it attempted to execute the Land task, which it could not do because there was no runway. A “Mission Has No Suitable Landing Place” alert symbol was generated on the WHIP. The mission delivered the supplies anyway and continued normally.

In the logic that processes the Player Air Mobility order and creates the mission's tasks, a code error did not properly take into account the supplies were to be delivered while airborne. Instead, the logic assumed the supplies were to be delivered on the ground and assigned a Land task just before the Offload Supplies task. The error was corrected by first confirming the Offload Supplies task location was not an airborne point before assigning a Land task.

The mission's carried supplies displayed on the mission's Unit Supply Data IMT did not update when a partial delivery of supplies occurred. The IMT updated only when the mission was initially loaded or when all supplies were delivered. In the logic that computes the amount of supplies delivered, there was no code to update the JDS in the partial delivery situation. The missing code was added.

If a mission loaded with a supply category that was already on the plane, the Unit Supply IMT did not show the new increased total for that supply category. The old amount remained in the IMT. Only supply categories that were not on the plane were added as a new row to the mission's Unit Supply IMT. The code error was corrected to update the JDS to show the increased total.

Note that the model properly tracked and adjusted the supplies carried by the mission itself, but simply did not update the JDS for WHIP display purposes.

3.34 JTLS-2022-15900 Ship Moving Through Minefield Crash

The CEP crashed while a ship was moving through a minefield. The movement included a route point at the same location as the ship's current location.

The crash occurred because the model attempted to perform a calculation which involved division by zero. This was caused by the movement to the same destination as the current location. A check was added to the routine to simply exit if the location did not change while the ship was near a minefield.

3.35 JTLS-2022-15902 ATOT Global Mission Type Definition Parameters

There were several parameter errors in the globally accessed definition file when translating an Air Tasking Order for several air mission type:

1. The Mission Type GSA should be configured as an alert mission rather than be tasked to orbit.
2. The Mission Type CINT should be a RECCE Mission Type rather than an EC Mission Type.
3. The Mission Type ELECT should be a RECCE Mission Type rather than an EC Mission Type.
4. The Mission Type GSUP should be SEAD to match the SUP Mission Type.
5. The Mission Type XSUP should be SEAD to match the SUP Mission Type.
6. The Mission Types GSA, SA, and XSA should each have a Target Type of JHQ rather than UNK. This insures a Strategic Attack rather than a generic type.

The described changes were made to this ATOT global definition file.

3.36 JTLS-2022-15904 SVPR Error And Warning Report Same Target

Error 663 and Warning 1628 both report that the same target has no political country assigned.

The first criteria that is checked is if a target has no political country assigned. If that is true, then there are two additional checks to determine if a warning or error should be generated. if the target is unowned and if the target is stationary. The code was written so that both could be true and the target would appear as a warning and an error. This has been corrected.

3.37 JTLS-2022-15905 OPM POT Target Long Name Field Too Small

The column for the POT Long Name in the printed TUP/SUP Pot table in the OPM is too small to read the whole name.

The program was only printing the first 14 characters of the Prototype Owned Target (POT) Long Name. The print command was changed to print the maximum field size for the POT Long Name of 30 characters.

3.38 JTLS-2022-15909 ATO Parser Not Ignoring AMPN Record

Whenever the ATO Parser reads an ACO message that was generated by the ICC, the Parser complains about a GENTEXT record among all the header records of the message. The ICC places an extra Air Mission Pilot Notification (AMPN) record, which is essentially a comment, in the set of header records. The syntax of this record is correct, but the ATO Parser rejects the placement of this record within the header records and terminates.

The ATO Parser was changed to allow AMPN records among the set of header records in an ACO message. Whenever an AMPN is reached during the read phase of an ACO message header, the Parser will allow the extra record and continue.

3.39 JTLS-2022-15910 ATO Parser Missing Refuel Missions Warning Report

When the ATO contains a refuel mission and one or more fuel receiving missions, listed in the 5REFUEL record, the Parser reports that all refuel missions are missing from the ATO.

The ATO Parser stores all the mission names from the names listed in a 5REFUEL record of a refueling mission. Just after the Parser finishes reading all missions in the ATO, it performs a check to compare the mission names listed in each 5REFUEL, record with the names of the missions from the complete ATO. If any are missing, the Parser gives a warning report that the refueler is expecting to refuel a mission that is not in the ATO.

The cause of the problem was in the comparison of mission names in the Parser. This comparison code was modified to properly compare the mission names.

3.40 JTLS-2022-15911 ATO Parser Replaces GDALT Mission Types

The ICC ATO Parser detects a mission having a generic mission type of ground alert (GDALT); therefore, it is impossible for the ATOT to submit a reasonable alert order. To solve this problem, the Parser obtains the role type for the mission from an ICC unique record, named AMSNDATX. Using a predefined list of role types, the Parser changes the mission type to a ground alert version of the specified role.

During a recent exercise, the ICC generated ATOs containing unrecognized role types and so the mission type conversion was not possible. Instead of a hard-coded list of possible roles, the Parser should treat the role as a mission type and then attempt to implement the mission type conversion.

The ATO Parser was changed to use the role specified for any mission that is provided as a GDALT type. If a conversion is not possible, the mission is left as a generic GDALT type which currently converts to a JTLS-GO Mobility mission, and a warning is reported by the Parser.

3.41 JTLS-2022-15912 Proper Separator Required For CSV Header

The JXSR has the capability to output requests in a Character Separated Value (CSV) format. Recently, the separator character was changed from a comma to a forward slash because some fields in the JODA may contain a comma (unit long names for example). Although the separator between fields was changed, the separator on the header line was not. In addition, on a Windows machine the slash is not automatically recognized as a separator, so everything is included in the first column.

The separator on the header line was modified from a comma to a forward slash. Before the header is printed, a line specifying “sep=/" was added, which instructs Excel what the separator slash (/) character will be.

3.42 JTLS-2022-15913 MDP File Attachments Surrounded By Single Quote

The MDP is sending messages with an attachment name surrounded by single quotes when delivering by e-mail address. The single quote is being treated as a literal part of the filename, which prevents the message from being forwarded.

The Sendmail library code was modified to remove the single quote around the attachment name in the context data. The library code ensures there are no spaces in the attachment name,

3.43 JTLS-2022-15914 Same Side Units With Same ICAO

Problems were encountered processing the ATO when an ICAO was added to a unit, and the ICAO was already in use by another unit on the same side. This caused the mission to be assigned to the wrong unit.

The only time an ICAO can be duplicated is if the other unit is on a different Side. This is how JTLS-GO represents tenant units or the sharing of runways by multiple Sides. When two units on the same side were given the same ICAO the DDS creates a warning. Warnings in the DDS means there is something wrong with the data, but nothing that will cause a crash or have bad impact on the simulation.

In this case, the duplicate ICAO was caused by an order input to the CEP. The CEP allowed the order through and created the problem.

To fix this for the future, the DDS has been changed to make duplicate ICAOs on the same Side an ERROR. All Errors in the DDS should be fixed prior to running the simulation.

The CEP code was also modified to not allow the Controller to enter an order which would create the situation of one Side having two units with the same ICAO.

3.44 JTLS-2022-15915 ATOT COMAO Chit Order Groups In Wrong Order

When the ATOT option to “Generate Orders by COMAO” is selected, all the ATO orders are generated and organized into specific order groups. The order groups are listed by the name of the COMAO to which each air mission belongs. However, the order group holding the refuel chits for their corresponding air missions are listed before the group holding the air mission. The user is not able to sequentially send the order groups as they are listed in the Order Group Editor. Doing so would cause the chit orders to fail.

The ATOT was modified present the COMAO order groups in a way that ensures the chit order groups are listed after the mission order groups for the missions named by the chits. The user can now send the order groups in the presented order.

3.45 JTLS-2022-15916 SVP Crash Processing New SAR Sensor Mode

The SVP crashed while reading the sensor collection mode name for a Synthetic Aperture Radar (SAR) sensor target type.

When the new SAR sensor mode was added to the JTLS-GO scenario database, related changes were necessary in the JTLS-GO software. The changes were implemented in the CEP, but the new SAR enumeration was not added to the Preamble in the SIP. Also, the number of sensor modes was not changed from 7 to 8, and SAR was not added to the sensor mode name array in the SIP Initialize Constants routine. The missing information caused the SIP to enter simdebug when it encountered the unrecognized SAR sensor mode for a sensor target type whether verifying the data or generating an OPM. This has been corrected.

Since this error did not present itself prior to delivery, the conclusion is that no SAR sensors were included in the data repository. A complete review of the data repository sensors was conducted and several sensors were properly changed to SAR sensors allowing them to detect over land.

3.46 JTLS-2022-15917 Alert Missions Report Inconsistent Information

When an alert mission completed without ever taking off, the resulting mission report contained some inconsistent data. The report included a section on the route the mission flew and stated that the mission returned with some number of aircraft. The actual landing time was also reported to C4I systems, even though the mission never landed because it was never launched.

The content of the mission report was modified to reflect the status of unlaunched alert missions. The report was made to better match the history of the alert missions. Publication of the actual landing time for the missions was stopped in cases where no launch occurred.

3.47 JTLS-2022-15918 HRU Urgent Report Missing TST Information

The HRU Intelligence Report prints out only the first 17 characters of owned target names. This is not enough to uniquely identify many targets, because the target name can be up to 40 characters long.

For unowned targets there is no Time of Detection provided, making it infeasible to use the information for Time Sensitive Targeting.

The code was modified to provide the detection time for unowned targets. The message format files were modified to include the information for unowned targets.

The English version of the message format file was modified to print owned target names with 40 characters. The MTF version of the file was not modified because it already printed more than 17 characters, although not the entire 40, and has restrictions for the length of lines.

3.48 JTLS-2022-15920 Quick Send Assign C4 Special Interest Flag

JTLS-GO requires a quick capability to turn on or clear the sending of the Special Interest Flag in Link 16 messages. An order exists to do this, but the desire is to turn the flag on or off by groups of missions. The order also includes spreadsheets to permit this type of usage, but no IMT screen currently utilizes the spreadsheets.

The existing spreadsheet orders were added to the IMT Air Mission screen for friendly missions and the Foreign Air Mission Intel screen for Friendly and Suspect relationship missions.

3.49 JTLS-2022-15921 Checkpoint Restart Leaflet Crash

Artillery was fired that used a Targetable Weapon designated for leaflets. This resulted in Leaflet Piles being created in the game, which is a method the game uses to track the fact leaflets have been dispersed and may affect morale. Eventually these Leaflet Piles are removed because the effect of the leaflets has decreased over time. These removal events are saved with the checkpoint and part of the data includes the Targetable Weapon that created the Leaflet Piles.

The model was saving and reading in the pointer for the weapon instead of the weapon name. On a restart there is no guarantee the pointer still points at a Targetable Weapon, let alone the correct weapon. When it does not point at a weapon, a crash will occur when the pointer is used to access the weapon, which happens shortly after the data is read.

Instead of saving the pointer, the checkpoint was modified to save the Targetable Weapon name and to translate the name back to a pointer on a restart.

3.50 JTLS-2022-15925 Aircraft Type Not Available On Foreign Unit Intel IMT

A WHIP operator had a request from his Response Cell to provide a list of all enemy squadrons and the type of aircraft they operated. The operator can click on a foreign unit, and the Sitrep window of the WHIP will inform them what type of aircraft, if any, is used by the foreign unit. This information is not available on the IMT Foreign Unit Intel screen, which would be a more efficient way to provide the requested information.

A new column was added to the IMT screen to provide the information.

3.51 JTLS-2022-15926 Fire Missile Order Showing Wrong Route

A WHIP operator was creating a Fire Missile order for a Cruise Missile and needed to avoid neutral country airspace. The order was created with a launch unit, a route, and a final target. On the map, the Order preview graphic display connected the firing unit, the final target, and then the designated route. The operator incorrectly believe this was the route that would be flown.

The data file that defines the order and specifies how to display the fields was changed so that the order of fields is now correct. The order will connect the firing unit, to the optional way-point, then to the optional route, and finally to the designated target location.

3.52 JTLS-2022-15929 Printing Reports Premature Close Of Input Stream

When attempting to print a report from the Report Browser, the report would not print. The input stream that passed the print content was being prematurely closed before the print job could be created.

The input stream was changed so that it is closed after the report print job has the complete print content.

3.53 JTLS-2022-15930 Printed Reports Did Not Fit To Page

When printing a report from the Report Browser, the resulting print was truncated and did not fit on a standard page, even if the printer was set to print in landscape.

The object that holds the print content was extended to fit the report to a page in portrait and landscape orientation. This may result in the font being smaller than usual. If any JTLS-GO Report results in an unreasonably small font, please contact the Help Desk so the format of the report can be changed to result in a better printed product.

3.54 JTLS-2022-15931 Message Error, Manage Aircraft Loads

When the name of an Air Mission Load already exists when submitting an order to create a new load, the rejection message text does not contain the name of the desired load.

The routine was using the wrong variable when creating the rejection message. The rejection message has been corrected and now properly indicates which weapon load creation order was rejected.

3.55 JTLS-2022-15933 ATO Parser Altitude Band Values In Record

The ATO Parser reads the altitude field of a PTRCPLOT record for a mission, and properly writes the altitude in the ATO XML file for the ATOT. However, when a value representing an altitude band is used, the ATO Parser incorrectly writes the altitude band, rather than the single altitude in the XML. This causes an unrecoverable error in the resulting Task Utility order for the associated mission.

The ATO Parser code was modified to consider both single altitude and band altitude ranges for the altitude field of the PTRCPLOT record. Whenever the altitude band option is used, the Parser is now able to compute the proper altitude for the altitude field of the ATO XML.

3.56 JTLS-2022-15934 ATO Parser Cannot Quit When Bad Files Read

The ATO Parser provides a menu for the user when a bad ACO or ATO message is discovered. This is useful because the user may decide to edit the bad message and resubmit the filename from this menu, or the user may decide to skip this message file during the parsing process. The options give the user an opportunity to provide the filename of a good message or a special key word "none", for skipping the message and proceeding with the parse.

If the user would like to simply terminate the Parser from this menu, they must press the Control-C key pair to kill the process, and there is nothing displayed in the menu to inform the user of this.

Entering a Control-C key pair is not a user friendly way to stop the ATO Parser. The ATO Parser has been modified to allow the user a termination option when a bad message file is discovered.

3.57 JTLS-2022-15935 ATO Parser Bad Location Point Crash

The ATO Parser reads each field of the ROUTE record for each mission in the ATO. It then processes the time, location and route type data. When the data in the location field is a single dash ("-"), the Parser crashes.

The ATO Parser extracts each location value from the ROUTE record, but if the location is a string of very few characters, such as a single dash, it tries to access beyond the last character of the string and crashes.

This code has been modified to first check the length of the location value string before processing. Error PE-218 is generated when the string does not contain a valid location.

3.58 JTLS-2022-15936 ATOT Alert Package With Unreasonable Timing Error

The ATOT computes the Time On Target (TOT) for all mission packages. When an air mission package is on alert, the ATOT gives an error that the Time On Target is unreasonably long, which should only be checked for assigned Packages. This check should not be done for Alert packages.

The ATOT code for this check was modified to ensure this check would only be done for assigned packages.

3.59 JTLS-2022-15937 ATOT Alert Package Has No Tasked Targets Error

The ATOT checks the attack missions of each mission package and determines if they have a proper target task. If the attack mission does not have any target tasks, the ATOT reports this as

an error, whether the mission is part of an assigned package or alert package. This should only be reported when the attack mission is part of an assigned package.

The ATOT code for checking target assignments was changed to exclude any attack mission that is part of an alert package.

3.60 JTLS-2022-15938 ATOT Empty Target Type List For OAS Missions

The ATOT sometimes does not enter any target types in the Target Type List (TTL) for an OAS mission order. The TTL is required for the order, and without one it fails.

For an OAS mission, the ATOT uses a default ordered list of target types as specified in the Linking data for this mission type. When the records for a mission include a GTGTLOC record, the ATOT uses the target type specified in the type field of the GTGTLOC record. However, when the target type field is empty, the ATOT used the blank value and concluded that no simulation Target Types applied to the mission.

The ATOT logic has been changed to first check and make sure any specified value in the type field of the GTGTLOC record exists. Only if the type does not exist, does the ATOT use the default TTL for the mission type.

3.61 JTLS-2022-15939 Modified Check SVP Script

When the user tried to use an SVP automatic correction option and the name of the object being corrected contained a comma (","), the correction failed and nothing happened. The user had no indication that there was a problem.

The comma character was also used as the delimiter that separates multiple values within the automatic correction specification. To allow a comma in the name, the SVP delimiter needed to be changed.

Because slash ("/") is a common illegal character, it is used instead of the comma as the delimiter in the SVP-generated error file. This change required:

- Modification of the java code to process the new delimiter;
- Replacing the commas with slashes for all of the select attributes of the action elements in the SVP-Template.xml file; and
- Changing the verify_svp.xsl that checks the validity of the SVP-Template XML file to expect slash as the delimiter for the select attribute.

3.62 JTLS-2022-15940 Mine Laying Mission On Alert Cancellation

A mine-laying mission was ordered to start on alert status. The mission was from a squadron on a naval vessel which was located in deep water. The ship carried supplies of mines which were

only legal for a shallower depth. The alert mission was later canceled by the model. The resulting message reported that it had an undefined mission load. However, the selected aircraft type had at least one legal load defined for laying water mines, and those mines were available as supplies.

The alert mission was never made launch capable because it failed the depth check for all of the possible minefield types. Because the mission was on alert, this check was done using the current location of the mission rather than at the location where the mines were to be placed. The logic for the legality of the mission load was reorganized to allow missions to be created on alert. The minefield checks have been delayed until a valid emplacement location is specified for the minefield. When the alert mission is actually tasked to lay mines, the mission repeats the resource task to verify the suitability of the selected mine type.

3.63 JTLS-2022-15942 Inconsistent Reading Of Satellite Data Files

The initialization process for satellite data in the model was not consistent with the actions used for other objects and data structures. This made debugging more challenging and led to software maintenance concerns.

The reading of satellite data was reorganized. Satellite data from the database is accessed at an earlier place in code which initializes the scenario data. This allowed the code to be streamlined when the model is restored from a checkpoint.

3.64 JTLS-2022-15943 Error 424 Corrections Nonfunctional

The correction options for Error 424 do not always work.

Error 424 is reported when a unit's TUP does not have any of the supplies necessary for a combat system's daily usage. This can happen if there is no supply record, or the supply record does not have enough of the supply category needed. The code always assumed there was a supply record, and it would only need updated, which was not always the case.

Error 460 was added. It will be reported when the record exists but in insufficient quantities. Error 424 will still be reported when the needed supply record does not exist.

3.65 JTLS-2022-15944 OMA Contains Benign Buffer Overflow Potential

The OMA service must verify a list of checks that it will perform on an order request. When any of the checks are found to be invalid, the OMA executes an insecure command, `strcpy()`, to fill a string buffer with a description of the invalid check.

The string buffer overflow can occur when the first part of the string is copied to the buffer. It is a constant string of known length, but the command used to copy this string to the buffer, `strcat()`, can cause a buffer overflow under certain conditions. This overflow issue was corrected.

3.66 JTLS-2022-15946 Orders Allow Inactive Formations

The Amphibious Operations order crashed when it was sent for a formation that had no ships.

The formation was an inactive formation, and the order should not have allowed the user to enter an order for an inactive formation to conduct an amphibious operation. This problem was a similar problem to a previous crash with the Patrol Formation order. When the Patrol Formation order was fixed, a thorough check of all allowable formation orders was not properly conducted.

All orders that order a formation to do something have been checked and corrected to ensure that a user cannot give an order to an inactive formation.

3.67 JTLS-2022-15956 Large Unit Detachments Not Assigned Higher HQ

During an amphibious assault, units may be broken into detachments that are delivered onshore and then reformed back into the original unit. The higher headquarters of the detached unit should be the original unit from which it was detached. This is done properly when the original unit is small and can be delivered in a single wave. However, for larger units that require multiple waves to accomplish the delivery, the detached unit is not assigned a higher headquarters. This was seen in the WHIP's Command Hierarchy panel and the IMT screen.

This problem was easily replicated. It was observed that for large units, the higher headquarters initially assigned to the detached unit was not the original unit itself, but the original unit's higher HQ. After the last wave, the detached unit's higher HQ was cleared completely. During this time it was discovered that the problem also occurred during amphibious pickup.

The amphibious assault and pickup logic calls the routine CHANGE HIGHER HQ to change a unit's higher headquarters. The routine accepts two parameters: a pointer to the unit that will be assigned the new higher HQ, and a pointer to the higher HQ unit. The second parameter can be NONE if the objective is to clear the unit's higher HQ field.

The initial calls to CHANGE HIGHER HQ were changed so that the pointer to the original unit is now passed for the higher headquarters, instead of the original unit's higher HQ. The call to CHANGE HIGHER HQ that cleared the higher headquarters was removed.

3.68 JTLS-2022-15957 GIS Tool: Disappearing Arcs

When the maximum arc constraint is executed, and the network's arcs have been subdivided into shorter arcs, some of these arcs do not appear on the screen of the GIS Tool.

The GIS Tool treats networks as a group of polylines that meet at junctions. Each polyline consists of one or more arcs linked end-to-end by a node. Each end of the polyline forms either a junction (where it connects to two or more polylines) or a terminating point (where it is not connected to any other polyline). The maximum arc constraint works on each polyline of the network.

The reported problem occurred on polylines consisting of two or more arcs. If an arc in the polyline was subdivided, the new arcs would be put in a list. This list was used to reconstruct the polyline using the new arcs. If an arc was not subdivided (because the specified maximum length exceeded that arc's length), the arc was not added to the list. As a result, when the polyline was reconstructed it was missing that arc. This problem has been corrected so that arcs that are not subdivided are also put into the list.

3.69 JTLS-2022-15958 Add Flight Path Validation

A process to check the connection of flight paths between bases needed to be added to the SIP User Code Routines

A new routine was added to the User Code Routines under the Alter Data function of the SIP. The user will have two options:

1. The Basic Base to Base check. This check is performed for each Force Side with checking to see if there is a flight path connection from each base on a Side to every other base on the Side.
2. The Mission type check goes a little further. For every squadron on a Force Side whose home base is not NAVAL, check every mission type for the aircraft type used by the squadron. If the aircraft has a mission load during DAY conditions, then check to see if a flight path exists between the homebase of the squadron and every other airbase in the same Side.

The output file for either option is may be found in the `./data/scenario/scenario_name/reports` directory. The output consists of 4 basic messages:

1. A Flight Path node cannot be found in the vicinity of the starting base
2. A Flight Path node cannot be found in the vicinity of the ending base
3. A Flight Path node cannot be found in the vicinity of the neither the starting base nor ending base.
4. The starting and ending bases share a single flight path node.

Further information on the messages can be found in the *JTLS-GO DDS User Guide*.

3.70 JTLS-2022-15960 PostgreSQL Installation Instructions Updated

The JTLS-GO Installation Manual explains the installation of PostgreSQL, which is distributed with JTLS-GO. The PostgreSQL installation instructions were confusing to users.

We have reorganized the *JTLS-GO Installation Manual* to make it easier for users to follow the installation and configuration instructions for PostgreSQL.

3.71 JTLS-2022-15961 Confusing Scenario Loading Process Error Message

The error message resulting from there being more than one connection to the database, which is interfering with the scenario loading process, was not clear.

The error message was modified to warn users that they might have the Glassfish server running for that scenario, or there are other applications connected to the database for that particular scenario.

3.72 JTLS-2022-15962 JTLS-GO Documentation Updated

The JTLS-GO documentation suite needed to be updated, to account for the changes that have been made to the system since the previous maintenance release (JTLS-GO 6.1.7.0).

The JTLS-GO documentation has been updated.

4.0 REMAINING ERRORS

Every effort has been made to correct known model errors. All reproducible errors that resulted in CEP catastrophic software failures (crashes) have been corrected. Other corrections were prioritized and completed according to their resource cost-to-benefit relationship.

As JTLS-GO 6.1.0.0 represents a major release of new functionality, all outstanding errors have been reviewed. If the error could not be reproduced, it was considered obsolete and no longer relevant to JTLS-GO. These errors have been removed from consideration for correction at this time. This chapter contains the remaining errors that could be reproduced. As development team assets become available, these remaining known issues will be corrected.

In future maintenance releases, newly uncovered outstanding errors related to JTLS-GO will be listed in this chapter, along with information regarding the extent of the error, as well as suggestions to avoid or minimize the effects of the problem.

4.1 DDSC – TMU Line Mode Changes Multiple Grids

When using the line mode in the TMU, more grids than the ones the line passes through are changed. This can also cause a warning about trying to change multiple layers to appear.

4.2 DDSC – Multiple Types In DDS History Table

If records for more than one table type are selected in the DDS History table, “History Details” will display details for only one type.

4.3 WHIP - Pipeline Not Shown On IMT

A pipeline being operated by a non-detected unit is not shown in the pipeline IMT.

4.4 DDSC/WHIP/JOBE - CADRG Map Zoom

When using the CADRG map projection, if the width of the map is less than the height, the zoom tool does not work correctly.

4.5 Manage TPFDD Order Recall May Cause Exception

When recalling an Manage TPFDD Order, there can be as many as 17 requests to the JXSR to fill in the various order fields. Some of these requests may fail and cause a WHIP exception. The order can still be used and corrected by fixing any reported errors. The cause of this problem has been identified, but could not be fixed in time to meet the release date requirements. Expect the problem to be solved in the next JTLS-GO 6.1 maintenance release.

4.6 Database Target Owning And Associated Units

Inserting or updating the owning and associated unit of a target to the same unit in the scenario database fails, due to a database trigger foreign key violation. If the owning unit or associated unit of a target are different, or if one of them is null, the trigger failure issue does not exist and inserting or updating the related record in the database is successful.

APPENDIX A. ABBREVIATIONS AND ACRONYMS

Terms are included in this Appendix to define their usage in JTLS-GO design, functionality, and documentation.

AAA	Anti-Aircraft Artillery
AADC	Area Air Defense Commander
AAL	Air-to-Air Lethality
A/C	Aircraft
ACP	Air Control Prototype
ADA	Air Defense Artillery
AEW	Airborne Early Warning
AFB	Air Force Base
AG	Air-Ground (Air-to-Ground)
AI	Air Interdiction
AIM	Air Intercept Missile
AIREF	Air Refueling
AKL	Area Kill Lethality
AMMO	Ammunition
AO	Area of Operations
AOC	Air Operations Center
APC	Armored Personnel Carrier
ARECCE	Armed Reconnaissance
ARTE	Air Route
ARTY	Artillery
ASC	Automatic Supply Calculation
ASCII	American Standard Code for Information Interchange
ASW	Anti-Submarine Warfare
ATC	Aircraft Target Category
ATGM	Anti-Tank Guided Missile
ATK	Attack
ATO	Air Tasking Order
ATORET	Air Tasking Order Retrieve Program
ATOT	Air Tasking Order Translator
AWACS	Airborne Warning And Control System
AZ	Altitude Zone

BADGE	Bilateral Air Defense Ground Environment (used by Japan Defense Agency)
BAI	Battlefield Air Interdiction
BDA	Battle Damage Assessment
BDE	Brigade
BN	Battalion
C3	Command, Control, and Communications
C3I	Command, Control, Communications, and Intelligence
C4I	Command, Control, Communications, Computers, and Intelligence
CA	Civil Affairs
CADRG	Compressed ARC Digitized Raster Graphics
CAP	Combat Air Patrol
CAS	Close Air Support
CAT	Category
CCF	Central Control Facility
CCP	Command Control Prototype
CCU	Controller Change Unit
CEP	Combat Events Program
CMDR	Commander
COP	Common Operational Picture
CP	Combat Power
CS	Combat System
CSP	Combat System Prototype
CTAPS	Contingency Tactical Air Planning System
CTG	Commander Task Group
CTRL	Control keyboard command
DCA	Defense Counter Air
DCL	Digital Command Language
DDS	Database Development System
DEMSDB	Demonstration Standard Database
DISA	Defense Information Systems Agency
DIV	Division
DMA	Defense Mapping Agency
DoD	Department of Defense
DOS	Days of Supply

DPICM	Dual Purpose Improved Conventional Munitions
DS	Direct Support
DSA	Directed Search Area
DTG	Date Time Group
EC	Electronic Combat
ECM	Electronic Counter Measure
ECP	Engineering Change Proposal
EEI	Essential Elements of Information
ELINT	Electronic Intelligence
ELS	Entity Level Server
EODA	Entity Level JTLS Object Data Authority
ETA	Estimated Time of Arrival
FARP	Forward Arming and Refueling Point
FLP	Fire Lethality Prototype
FLOT	Forward Location of Troops
FOL	Forward Operating Location
FWL	Frederick W. Lanchester (originated a differential equation model of attrition)
GAL	Gallon
GCCS	Global Command and Control System
GRTE	Ground Route
GS	General Support
GSR	General Support Reinforcing
GUI	Graphical User Interface
HARM	High-speed Anti-radiation Missile
HE	High Explosive
HELO	Helicopter
HET	Heavy Equipment Transporter
HMMWV	High Mobility Multipurpose Wheeled Vehicle
HQ	Headquarters
HRU	High Resolution Unit
HTML	Hypertext Markup Language
HTT	High resolution unit Target Type
HUP	High resolution Unit Prototype
ICM	Improved Conventional Munitions

ICP	Interface Configuration Program
ICPLogin	Interface Login Program
ID	Identifier
IFF	Identification Friend or Foe
IIP	Intelligence Information Prototype
IMT	Information Management Tool
INFO	Information
INTEL	Intelligence
JCATS	Joint Conflict And Tactical Simulation
JDA	Japan Defense Agency
JDPI	Joint Desired Point of Impact (formerly DMPI: Desired Mean Point of Impact)
JDS	JTLS Data System
JDSP	JTLS Data System Protocol
JEDI	JODA Entity Data Identifier
JMCIS	Joint Maritime Combat Information System
JMEM	Joint Munitions Effectiveness Manuals
JODA	JTLS Object Distribution Authority
JOI	JTLS Operational Interface
JPL	Jet Propulsion Laboratory
JRSG	Joint Rapid Scenario Generation (formerly JIDPS: Joint Integrated Database Preparation System)
JSDF	Japanese Self-Defense Force
JTLS	Joint Theater Level Simulation
JTLS-GO	Joint Theater Level Simulation - Global Operations
JTOI	JTLS Transaction Operational Interface
JXSR	JTLS XML Serial Repository
KIA	Killed In Action
KM	Kilometer
KNOTS	Nautical miles per hour
LA	Lethal Area
LAN	Local Area Network
LAT	Latitude
LB	Login Build (JTLS order type)
LDAP	Lightweight Directory Access Protocol
LDT	Lanchester coefficient Development Tool

LOG	Logistics
LOGIN	Logistics Input
LOGREP	Logistics Report
LONG	Longitude
LOTS	Logistics Over The Shore
LR	Long Range
M&S	Modeling and Simulation
MAPP	Modern Aids to Planning Program
MB	Megabyte
MCP	Mobility Counter-mobility Prototype
MCR	Model Change Request
MG	Machine Gun
MHE	Material Handling Equipment
MIP	Model Interface Program
MOGAS	Motor Gasoline
MOPP	Mission-Oriented Protective Posture
MOSAIC	NCSA user interface software
MOTIF	X Window System graphical interface
MP	Maneuver Prototype
MPP	Message Processor Program
MSC	Major Subordinate Command
MSG	Message
MTF	Message Text Formats
MUREP	Munitions Report
MUSE	Multiple Unified Simulation Environment
NCSA	National Center for Supercomputing Applications (University of Illinois)
NEO	Noncombatant Evacuation Operations
NFS	Network File Server
NGO	Non-Governmental Organization
NIS	Network Information Service or Network Information System
NM	Nautical Mile
NTSC	Naval Telecommunications System Center
OAS	Offensive Air Support
OBS	Order of Battle Service (formerly UGU: Unit Generation Utility)

OCA	Offensive Counter-Air
OJCS	Organization of the Joint Chiefs of Staff
OMA	Order Management Authority
ONC	Operational Navigation Chart
OPM	Online Player Manual
OPP	Order Preprocessing Program
OTH	Over The Horizon
OTH Gold	Over The Horizon message specification
OTH-T	Over The Horizon-Targeting
OVT	Order Verification Tool
pD	Probability of Detection
pE	Probability of Engage
pH	Probability of Hit
pK	Probability of Kill
PKL	Point Kill Lethality
POL	Petroleum, Oil, and Lubricants
POSIX	International operating system standard based on System V and BSD
PPS	Postprocessor System
PSYOPS	Psychological Operations
RAM	Random Access Memory
RDMS	Relational Database Management System
RECCE	Reconnaissance (air missions)
RECON	Reconnaissance (ground missions)
REGT	Regiment
RNS	Random Number Seed
ROE	Rules Of Engagement
RPT	Report
RSP	Reformat Spreadsheet Program
SAL	Surface-to-Air Lethality
SAM	Surface-to-Air Missile
SAM/AAA	Surface-to-Air Missile/Anti-Aircraft Artillery
SC	Supply Category
SCP	Simulation Control Plan
SDB	Standard Database

SEAD	Suppression of Enemy Air Defense
SIMSCRIPT	Simulation programming language (product of CACI, Inc.)
SIP	Scenario Initialization Program
SITREP	Situation Report
SLP	Sustainment Log Prototype
SOF	Special Operations Forces
SP	Survivability Prototype
SQL	Structured Query Language
SR	Short Range
SRP	Start/Restart Program (a JTLS component)
SRTE	Sea Route
SSM	Surface-to-Surface Missile
STR	Software Trouble Report
SUP	Ship Unit Prototype
SVP	Scenario Verification Program
SYNAPSE	Synchronized Authentication and Preferences Service
TADIL	Tactical Digital Interface Link
TCP/IP	Transmission Control Protocol/Internet Protocol
TEL	Transporter Erector Launcher
TG	Target entity attribute prefix
TGS	Terrain Generation Service (formerly TPS:Terrain Preparation System)
TGT	Target
TMU	Terrain Modification Utility
TOE	Table of Organization and Equipment
TOT	Time Over Target
TOW	Tube-launched Optically-tracked Wire-guided missile
TPFDD	Time-Phased Force Deployment Data
TTG	Target Type Group
TTL	Target Types List
TUP	Tactical Unit Prototype
TW	Targetable Weapon
UBL	Unit Basic Load
UIM/X	GUI builder tool
UNIX	POSIX-compliant operating system

UNK	Unknown
UOM	Unit Of Measure
USA	United States Army (U.S. and U.S.A. refer to United States and United States of America)
USAF	United States Air Force
USCG	United States Coast Guard
USMC	United States Marine Corps
USMTF	United States Message Text Format
USN	United States Navy
UT	Unit entity attribute prefix
UTM	Universal Transverse Mercator
VIFRED	Visual Forms Editor
VMS	Virtual Memory System
VTOL	Vertical Take-Off and Landing aircraft
WAN	Wide Area Network
WDRAW	Withdraw
WEJ	Web Enabled JTLS
WHIP	Web Hosted Interface Program
WIA	Wounded In Action
WPC	Warrior Preparation Center
WPN	Weapon
WT	Weight
WW	Wild Weasel
XMS	XML Message Service

APPENDIX B. VERSION 6.1.0.0 DATABASE CHANGES

No changes were made to the JTLS-GO 6.1 database.

APPENDIX C. VERSION 6.1.0.0 REPOSITORY CHANGES

No significant changes were made to the JTLS-GO 6.1 repository.