JCATS – What’s New in JCATS 15.0

AS OF: 21 Nov 2019
Enhancements & Improvements

Simulation & Client
- (I) Passive radars now detect Jammers & Counter Fire Radars
- (I) Passive radar display LOS/FoR
- (I) Define flight path of Harpy & Cruise Missiles
- (NF) Aircraft automatically Chase enemy
- (NF) Added a Position control panel
- (NF) Browser-Based client prototype
- (NF) Added the System Vs System Report to Clients
- (I) Added a Duplicate Route button
- (I) Improved Agg Hover Tip info
- (I) Improved Org Tree Hover Tip

Vista
- (I) Added new Acquire TAS model for sensors
- (I) Munition Propulsion & Guidance types
- (I) Moved AutoDirect Data to each weapon load (Sim & Client)
- (I) Added a “Ph&Pk Legend” to Vista Ph&Pk editor
- (I) System Instance search
- (I) Munition Group name changes to multiple fchars
- (I) Added RF Signature to Counter Fire Radars

CSL Toolbox
- (I) Added Event Batch Analyzer fields and Time Range feature
- (NF) Created the Param Differencer
Operating Systems for v15.0
  ▪ RHEL 7.6 & 7.7

Required for Web Client
  ▪ Java OpenJDK v1.8
Simulation & Client
Passive Radar Improvement

Passive Radars can now detect Jammers as well as Active Radars
Passive Radar Display LOS/FoR

Systems with only Passive Radars display Field of Regard lines in purple
Define Harpy & Cruise Missile Flight

STEP-1 SELECT & PLAN LAUNCH

STEP-2 SELECT "DIRECT TO TARGET" BUTTON & MODIFY

STEP-3 SELECT ISSUE LAUNCH BUTTON
Chase After Enemy

- When set, JCATS aircraft automatically deviate from their assigned movement order to pursue observed enemy combatants.

- Pursuit stops when the target is destroyed, acquisition is lost, or the operator cancels pursuit.
Chase After Enemy

- Chase can also be set from the Ctrl+Right Button menu.
- The Chase Distance & Offset cannot be defined from here – it uses fixed default values of “Infinite” chase distance & 500m behind.
Position Controls

Added this menu for quick positioning of multiple entities for setup

Select Entities Using Lasso

Position Entities

Define parameters before using
Browser-Based Client Prototype

The JCATS 15.0 Browser-based Client is a beta version, currently with display-only capabilities.

Standard JCATS Client

Browser-Based Client
System vs System Report

From the Client, an operator can perform hypothetical engagements between two systems.
Route Duplication

A Duplicate button has been added to the Route tab to allow workstation operators to copy existing routes.
Select the Route to be duplicated. A copy is tethered to the cursor. Place the duplicate route as desired.
Improved Agg Hover Tip Info

In addition to the hover tip, placing the cursor over an aggregate shows the current orientation and formation (only the first level)

- INF BN
- 369 dismounts
- 14 wheeled vehicles
- Total aggregated: 383
- All 369 Dismounts standing
- Tactical Missions are Off
- Movement: No Orders
- Speed: 0 kph (0 mph)
The hover tip in the Organizational Tree offers greater information about that unit.
Vista
Added an Optional New Sensor Table

TAS: ACQUIRE-Target Angular Size was developed for combat simulations to model the dependency of contrast sensitivity on target angular size. JCATS users can now select between TTPM or one of two types of TAS algorithms for each sensor. Each sensor can use only one algorithm, but a scenario can use any combination of algorithms.
AMSAA: In order to implement target size dependency in combat simulations, ACQUIRE-Target Angular Size (TAS) was developed.
Given identical setups in each test case, the following slides demonstrate the differences in detection results of the existing TTPM method and the two new TAS methods.
TTPM performs a scan of the entire FoR and displays all acquisitions at once. Over time, additional targets may be acquired or acquired at a higher level.
TAS WW (Windshield Wiper) sweeps the FoR from left to right and back, acquiring only those entities in the current sector.

Search sectors sweep back and forth continuously

(The next search sector will cover the remaining area and overlap with this sector)
TAS JCATS is a mix of TTPM & TAS WW functionality. It sweeps the FoR from left to right and back like TAS WW, but acquisitions persist like TTPM.

Search sectors sweep back and forth continuously.

(Notice the search sector at the end overlaps the previous search sector)
New Munition Propulsion & Guidance Types

- To allow JCATS to more completely capture the capabilities of modern munitions, a fundamental revision was required
- The old Guidance Type has been separated into Guidance Type and Propulsion Type
- A detailed description of the conversion process is provided following the Questions slide [Here](#)
Vista – Stations Tab – AutoDirect Data

Moved the AutoDirect Data to Each Weapon Load
Each Ph & Pk curve editor has a legend, which can be displayed or hidden, explaining the abbreviations used in the headings of each column.
Search System & Force Org

- A new Search function allows users to find System Instances that use the selected object
- This Search applies to Sensors, Munitions, Weapons & CBRN Sensors
- The window that opens is selectable – Clicking on a system opens its instance editor window
Updating Munition Group Names

Allows updating of Vista Munition Group name changes to propagate to .fchar files other than the one currently loaded in Vista
Counter Fire Radar RF Signature

- Counter Fire radars can be detected by Passive Sensors
- To enable this, an RF Signature must be added to the CF Radar
  - The RF Signature field has been added to the CF Radar tab
Toolbox
Time Range feature - generate reports over a specific time range only
Added a CSV Export under File menu
Added StdDev to Casualty report
Added Non KKill sum & StdDev to Casualty report
Added total kills to direct & indirect fire reports
Added Mounted Kills to Kill report
Parameter Differencer

- The Parameter (Param) Differencer compares two .param files to each other and reports the differences.
- The Differencer works best with .param files that are related with only minimal differences.
- Launch the Param Differencer from the Toolbox or by typing `paramsDiff` in a terminal window.
Additional Improvements

- The Look Around movement activity node uses the sensor scan interval as the time to complete the activity
- JCATS exports ACE/ACS data, in XML format
- When creating IADS nets, eligible radars are marked with white octagons
- HLA Bridge processes ACS aggregate combat attrition
- Blacklisted items can be cleared from the DIS bridge
- Added STL, JTM, and LatLon elevation exporters to TerEdit
- Vista checks domain of Active radars against domains of Detection Signatures for consistency
- Munition class Consistency Checker looks at changes to munitions that have not yet been Applied
Additional Improvements

- Added CSV Exporter to Event Batch analyzer
- Added GridFloat importer capability to TerEdit
- Improved the APS Flyout Munition intercept fidelity
- Improved OBS file importing & handling position data
- Improved Chem/Bio play by now importing HPAC Surface Dosage Output Files (NATO Request)
- New Scenario Generator Tool created in support of multinational scenario creation (NATO Request)
- Overland and Road Pathers added to RoboPucker
- Added a PGM option to the FO Target Strength Data
- Custom Reports now has an Edit button to specifically enable/restrict changes to the loaded report
Questions?

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Guidance and Propulsion Data Conversion To JCATS v15.0

(9 slides)
Background

- JCATS began development in 1997
  - The methods & assumptions at the foundation of the munitions model have not advanced with technology
  - The Guidance Type has become a catchall for both guidance and propulsion
- To allow JCATS to more completely capture the capabilities of modern munitions, a fundamental revision was required
- The existing Guidance Type has been separated into Guidance Type and Propulsion Type
**Conversion**

- JCATS automatically converts munition data when a v14 fchar is opened in Vista v15
- Only a limited set of Propulsion/Guidance pairings are currently simulated
  - Additional pairings will be simulated in future versions as funding allows and technological advancements require
  - A Help button on the munition’s Conventional tab displays the following table of valid pairings

![Table showing guidance and propulsion pairings]
Conversion Method

- JCATS converts munitions according to the table at right
  - RBTT = Rocket burn to target

<table>
<thead>
<tr>
<th>V14 Guidance</th>
<th>V15 Propulsion</th>
<th>V15 Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ballistic</td>
<td>Ballistic</td>
<td>Unguided</td>
</tr>
<tr>
<td>Crew Guided</td>
<td>RBTT</td>
<td>Crew Guided</td>
</tr>
<tr>
<td>Cruise Missile</td>
<td>Powered</td>
<td>GPS and inertial guidance</td>
</tr>
<tr>
<td>GPS Guided</td>
<td>Ballistic</td>
<td>GPS guided</td>
</tr>
<tr>
<td>Harpy Guided</td>
<td>Powered</td>
<td>Harpy guided</td>
</tr>
<tr>
<td>Laser Guided</td>
<td>Ballistic</td>
<td>Laser guided</td>
</tr>
<tr>
<td>Laser Guided</td>
<td>RBTT</td>
<td>Laser guided</td>
</tr>
<tr>
<td>Remote Guided</td>
<td>RBTT</td>
<td>Remote guided</td>
</tr>
<tr>
<td>Rocket</td>
<td>(see next slide)</td>
<td>Unguided</td>
</tr>
<tr>
<td>Self Guided</td>
<td>RBTT</td>
<td>Self guided</td>
</tr>
<tr>
<td>TBM</td>
<td>TBM</td>
<td>Unguided</td>
</tr>
</tbody>
</table>
Rockets

‘Rocket’ type munitions are converted to Guidance Type ‘Unguided’. The Propulsion Type varies

- If either or both Fire Modes Auto Direct and Planned Direct are checked, Propulsion Type = RBTT
- If neither are checked, Propulsion Type = Rocket burn and coast
Gravity Bombs

- To distinguish a gravity bomb from other ballistic munitions (bullets), the converter checks the following AFTER running the initial conversion:
  - Propulsion Type = Ballistic
  - Guidance Type = Unguided or GPS guided
  - Munition Type ≠ Ball, PhPk HE, Energy, or Smart
  - Fire Modes: Must have Planned Indirect checked; cannot have either Auto Direct or Planned Direct checked
  - Maximum Range < 16 km

- If the above criteria are met, the munition’s Propulsion Type is altered to Gravity Bomb
Mines

- The **Not propelled** Propulsion Type is intended for use with mines.

- This conversion process only converts the munitions listed on the Barriers – Mines tab to **Not propelled**.

- All other munitions are converted according to the procedures above.
  - This normally results in munitions being assigned **Ballistic** propulsion.
Additional Settings

- By default, munitions are defined as Lock On Before Launch (LOBL) EXCEPT:
  - Laser Guided/RBTT/Planned Indirect = Lock On After Launch (LOAL)
  - Self Guided/Planned Indirect = LOAL
  - Harpy/Powered = LOAL
  - Laser Guided/Ballistic = LOAL
Complete the Conversion

- We estimate the automatic conversion process gives about a 90% solution.

- If the initial munition’s data is incorrect, the conversion will be incorrect.

- If a munition is defined to function a specific way for a specialized effect, it may not convert properly.

- Some munitions may be incorrectly converted to Gravity Bombs.
  - A popup window at the end of the conversion displays munitions that were upgraded to “Gravity Bombs”.
  - This list can be dismissed or kept open.

A popup window at the end of the conversion displays munitions that were upgraded to “Gravity Bombs”. Some of these upgrades may be incorrect and will require that you manually correct the Propulsion Type, Guidance Type, Fire Modes, and/or other munition data.

- BOMB 250LB
- 105mm HE M1
- 105mm
- 105mm HE
- BOMB 500LB GBU-12 Mk82
- BOMB Mk82
- ROCKEYE II MK 20
- BOMB GBU-31A JDAM
- BOMB Mk83 x2
- BOMB Mk82 LOW DRAG
- JSOW-C
- BOMB CBU-89
- AGM-154B (w/BLU-108 SFW) JSM
- BOMB Mk84
- BOMB Mk82 x4
- BOMB CBU-103
- BOMB CBU AP
- BOMB CBU AT
- BOMB 1600LB LGB Mk83
- BOMB GBU-32 JDAM
- BOMB PAVEWAY III BLU-113/B
- BOMB Mk84 x2
- BOMB GBU-16 x2
- BOMB 2400LB PAVEWAY III Mk84
- BOMB BLU-109/B GBU-31B JDAM
- BOMB Mk83 x4
- AGFT ILLUM FLARE
- TOMAHAWK
Final Check

- The guidance and propulsion type conversion is based on assumptions and may not be correct for all instances.
- It is important that the database manager verify all munitions in the FChar before using the data in a scenario.
- Save the changes – The fchar file does NOT turn red when the changes are made.