JOINT TARGETING SYSTEM – THE SUPPORT TOOL FOR JOINT TARGETING CYCLE AND ITS APLICABILITY IN COMPUTER ASSISSTED EXERCISES

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Abstract: *In the military system, simulation represents the most important tool that supports training because it can be efficiently used from the tactical level to the strategic one. For individual training the costs of using real or virtual simulation systems are not justified, but when it comes to the headquarters training running a live exercise is extremely expensive. Nevertheless, the units, headquarters, general staff and Multinational Division South-East headquarters need to be trained in both national and NATO exercises. Taking all those facts into consideration, the computer assisted exercises proved to be the best solution for training all the cycles within a headquarters that support the decision making process. In the last years, among all those processes, a particular interest was shown for Joint Targeting Cycle during NATO computer assisted exercises.*

Keywords: *training; training through simulation; constructive simulation; Joint Targeting System; Joint Targeting Cycle.*

In a military environment that is continuously changing, the power of information becomes critical for mission accomplishment. Military forces must be ready to act in different kind of situations, and the commanders need to be trained to shorten the decision making time. The link between the guidance given from strategic level and mission accomplishment at tactical level is based on different types of processes, very well structured which lead to objectives achievement.

All those processes are supported by systems, especially designed to streamline the decision-making process. Those are the basics tools to compute and manage the databases in order to provide the commander all the information needed about the blue forces and the enemy's capabilities after every phase of the battle.

The accuracy and timeframe of reporting are closely linked with the performance and the efficiency of each system used during the process. This is the reason why, within an organization, a constant upgrade of software products is needed. For organization's proper functioning, besides systems performance, the users' level of training must also be taken into consideration, which lead us to another discussion about the significance of training process. The motto "train as you fight" is the basic stone of training through simulation, being well known that this type of training is mostly used in the military environment. It provides the staff the chance to develop their knowledge and to optimize the decision-making process by taking part to different types of computer assisted exercises and war-gaming actions. Whether we are talking about testing upgraded versions of the systems, the users' training or the military staff integration in the headquarters processes, the computer assisted exercises are the most efficient way to achieve those objectives. Those types of exercises are mostly used for training NATO units, giving them the chance not only to collective training among the echelons, but also to train the processes that are running within their own headquarters. This way the performance of every structure and their integration within the organization can also be assessed. You can take as an example the growing interest shown by NATO for optimizing the Joint Targeting process. Analyzing NATO's past two years exercises, we have noticed that every single time, Joint Targeting process was part of the training objectives. Somewhere in the lines below you will find a brief presentation of Joint Targeting Cycle

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used in NATO and some interesting information regarding the software tool Joint Targeting System which supports every single stage of this process.

1. Brief description of Joint Targeting

The new Theater of Operations proved that military forces need to be trained to conduct various types of activities during a mission. Whether we talk about military operations that involve the use of force in order to deter or constrain the enemy, or about humanitarian missions, peace support operations or other different types of missions, the military forces need to be able to engage the fight by using lethal or non-lethal capabilities against different types of actors, in an operation theater labeled by a various amount of threats.

In order to successfully conduct all those types of operations, at NATO level a flexible process - Joint Targeting - was developed, meant to be applied on different kind of missions in order to generate a large spectrum of physical or psychological effects on the enemy forces. The starting point for targeting process is the strategic guidance, followed by the operational level where it has the role to determine the effects needed to achieve commander's guidance by using either lethal or non-lethal capabilities. At the tactical level, the targets proposed to be engaged are in accordance with higher targeting directives and the Rules of Engagement (ROE).

JOINT TARGETING is a flexible process which can be adjusted to any operation and offers a useful methodology in decision making process. Its purpose is to link the objectives to their effects by following the objectives' prioritization and the assessment of each generated effect.

The complexity of Joint Targeting Cycle is given by the roles it needs to play. This cycle can be seen as a command function used at the tactical and operational level, with the purpose of establishing the requested effects to be accomplished in order to achieve commander's guidance. Other roles played by this process are to identify available capabilities and use them in proper actions, to select and prioritize the targets and nevertheless to help synchronizing all the capabilities by assessing their cumulative efficacy.

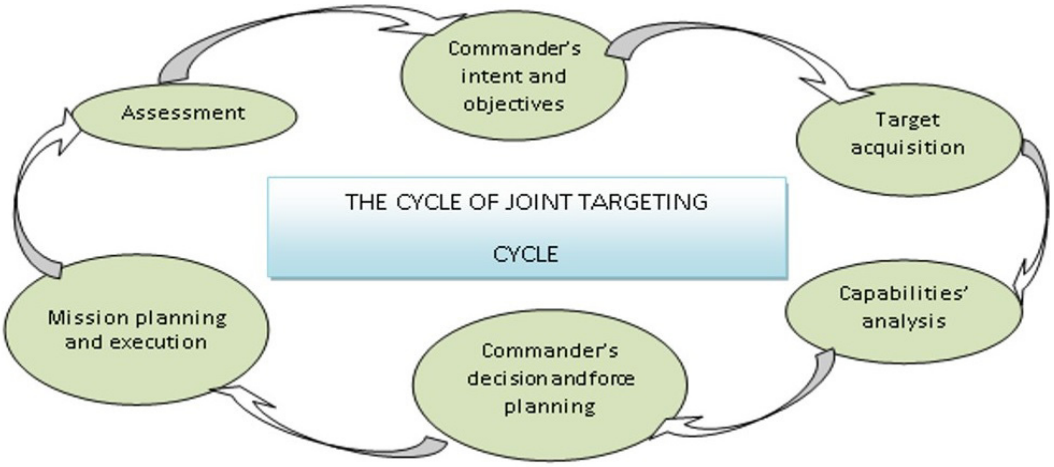

Figure no. 1. JOINT TARGETING CYCLE[1]

The Joint Targeting cycle is structured on six phases and it proved to be efficient for both planning process and the dynamic engagement of targets. Within the military organization it cannot be played alone. This process is linked with Intelligence Cycle, both of them providing inputs for the headquarters planning process. In figure number 1 you can see the NATO model of Joint Targeting Cycle, structured on its six phases. Moving on in this article the attention will be focused on Joint Targeting System tool, the software program that supports every single step of Joint Targeting Process.

Joint Targeting is an extensive process which contains land, maritime, air and special forces' targeting cycles. It prioritizes, selects and establishes

[1] Source: *Allied Joint Doctrine for Joint Targeting* (AJP-3.9), Edition A, Version 1, 2016, p.2-2.

the requested effect on targets, taking into account both the environment and the capabilities. The extent of this process is given by the organization that conducts it. North Atlantic Council (NAC) runs this cycle, guided by Allied Command Operations (ACO) plans, while the execution phase takes part at Joint Force Command level, following also the international laws of every country.

Being led by NAC, among the most important inputs brought to Joint Targeting cycle from **strategic level** perspective, we could mention the framework for strategic communications, operation plan (OPLAN), targeting annex development where both the objectives and the operation purpose are defined, the target sets that Joint Force Command is allowed to engage and last but not least, a common and integrated database for targets management is included. As I mentioned before, Joint Targeting System is used in NATO in order to create and manage this data-base.

At the **operational level,** Joint Targeting Cycle is established and directed, for both the planning process and the dynamic engagement one. At this point the two processes are coordinated and conducted in a joint operation. From targets perspective, at this level the target sets proposals are sent for approval at ACO and NAC, including Time Sensitive Targets (TST), the rules of engagement directed by ACO are implemented, the targets to lower echelons are allocated, directions regarding target prioritization and the way of engagement (lethal or non-lethal) are given and the Joint Prioritized Target List (JPTL) is developed.

The units from the **tactical level** will nominate the targets from their Area of Operation and Area of Responsibility and will prioritize the targets based on their engagement capabilities and the approved JPTL. In other words, at this point Target Nomination Lists (TNL) will be developed, which will be presented during the Joint Coordination Board (JCB). This working group establishes responsibilities for execution, prioritization and synchronization of all targets related activities, making sure that the engagement by lethal or non-lethal efforts will be focused on accomplishing commander's objectives. At this point, the results of Joint Targeting Cycle are changed into tasks for the lower units' echelons.

We need to highlight the fact that the targeting process does not run alone, it can either be the information source that triggers other processes or it can receive data from other cycles that are simultaneously played within the headquarters. Bottom line is that all those processes and cycles follow the same rule: to support commander's objectives. As you already saw in figure number 1, the reiteration of targeting process is triggered by the assessment results of the previous cycle. The information from the process' evaluation turns out to be input data for the next cycle. All the targets data are stored in a system, very easy to be accessed or to be updated by any structure in real time. Joint Targeting System has a complex, multi-level and reachable database. This NATO system will be presented in the next chapter of this article.

2. Joint Targeting System (JTS)

Joint Targeting System was developed in 2002 by NC3A (the current NATO Communication and Information Agency – NCIA) and since then it has been the standard system for targeting used all over NATO. The system analysis started with understanding the studies which identify the targeting system requirements, such as ACE (Analysis Control Element) Integrated Imagery, Targeting and Battle Damage Assessment (BDA) Architecture Study, the existing national targeting systems in the field and many ICC user requests which demand improvements on the current ICC targeting modules. Starting with those premises, NCIA developed in 2001 the first version of JTS (called ICC 2.6.1) and in 2002 the program started to be used in NATO. This software suffered a lot of changes in time because it needs to support new requests from the organization. The most upgraded version of the system at this time being is JTS 4.0.

Joint Targeting system is a program created in accordance with C2 (Command and Control) structure and NATO joint targeting doctrine. Because it is the program that stores all the information about the targets, the battle damage assessment reports, and creates the campaign objectives as well as the target lists, JTS becomes the only standardization tool capable of supporting NATO Joint Targeting Process.

JTS supports every step and phase of targeting cycle, being also able to integrate in other C2 processes. JTS modules are applications which support mission planning and decision making processes by providing information about targets.

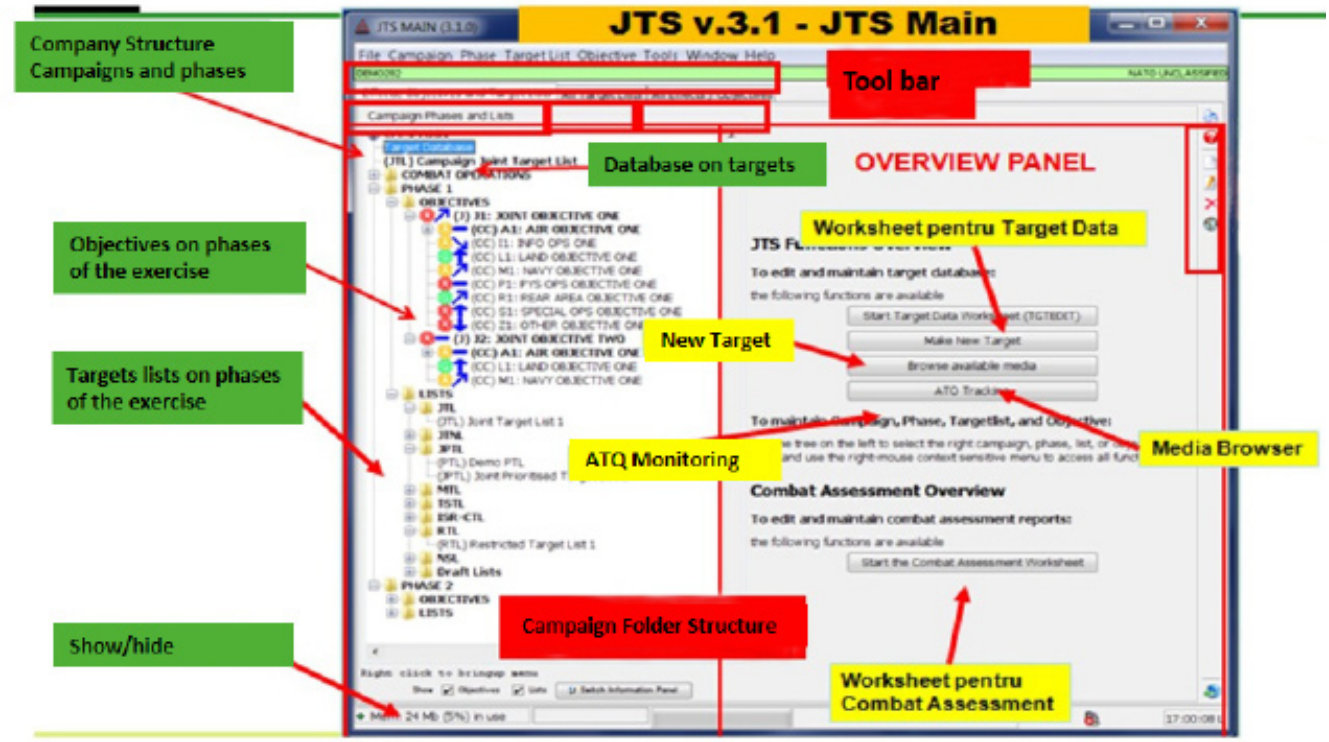

Figure no. 2. JTSMain interface JTS v.3.1

There are five JTS modules, each one with an important role in the targeting cycle and the system integration in C2 process:

JTSMain (see figure number 2) is the hub module of JTS. It maintains the campaign and phase structure, allows tracking the existing objectives

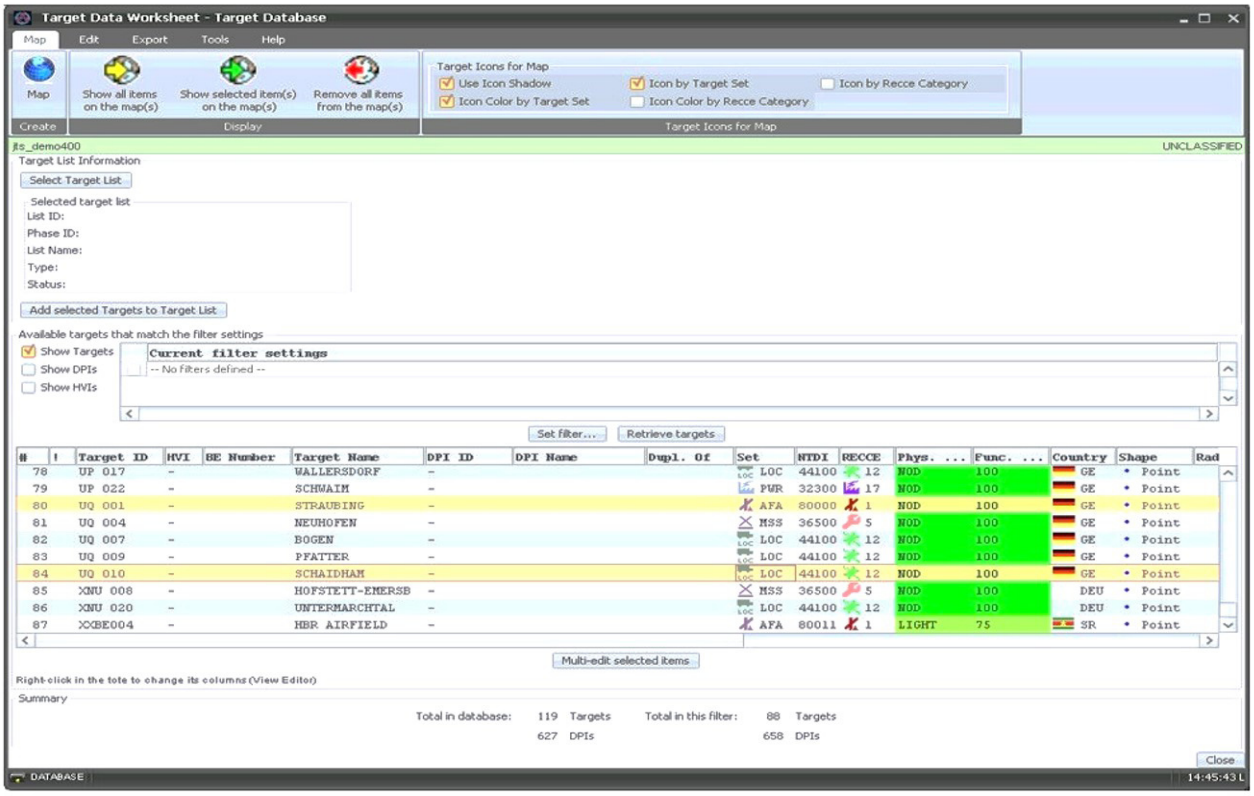

Figure no. 3. Target Data Worksheet Interface for JTS v.4.0

and the prioritized target lists by accessing other modules like JOE (Joint Objective Editor) and TGTLIST (Target List management module). Using this module, the Joint Target List of the campaign can be seen, as well as combat assessment reports for every single target.

TGTLIST, as its name states, is the target list management module where the target data is managed (entered, deleted, updated) into target database. The module offers the possibility of filtering the database in order to enlist a new target, two or more target lists can be merged, and it also gives the possibility for the targets to be accessed on map view. Being linked with other modules like TGTEDIT, it allows the user to edit a list or to add or delete from the database DMP (Designated Mean Point of Impact).

All the information about the targets (lethal or non-lethal) can be reached by accessing **Target Data Management Modules (**see figure no 3**)**. This module is actually designed to use a large number of different applications (TGTEDIT, DMPIEDIT, WSEDIT, TGTWS, TGTFILTER), all of them allowing the user to modify the target database. All that information stored in this module form the target folder, a folder that can be imported or exported to other units. In this way the cross-functional data exchange for information is realized.

JOE (Objective Management Module**)** is the application where objectives on different levels are entered, updated, maintained and linked with targets for each phase of the targeting cycle. Being given the possibility to link a target with an objective, a prioritized target list can be developed based on the level of importance of each objective/ stage/ campaign.

Combat Assessment module comprises two applications: CAEDIT (Combat Assessment Editor) and CAREP (Combat Assessment Reporting). Those help develop phase I, II and III assessment reports of a mission. Reports as battle damage assessment are stored and can be filtered by different criteria.

Targeting cycle starts with commander's intent, objectives and guidance, replicated in JTS program by JOE module. For the second phase of targeting process, the target development stage, TGTEDIT and DMPIEDIT modules are used in JTS in order to fulfill the information about the given targets. The Intel targeting personnel uses TGTEDIT module in order to update the most recent information about the targets. Then, in the third stage of targeting cycle, after the capabilities' analysis, the targeting nomination list (TNL) and PTL are created by using JTS TGTLIST module. In the next two phases of force planning, mission planning and execution, the JTS modules that are mostly used are TGTEDIT and TGTLIST in order to establish and update the system with the weaponeering solutions to engage the targets. TGTLIST module also allows the lower echelons units to pull out from the system their PTL for the area of operation. Combat Assessment module is the main application used during the last phase of joint targeting cycle. This module linked with TGTEDIT module allows the user to update the system database after the target was engaged, assessing the damaged produced and supporting the re-engagement of a target decision, when it is needed. As you can see, Joint Targeting System was designed to support NATO targeting cycle at every stage, storing and tracking essential information regarding targets.

3. Joint Targeting System in computer assisted exercises

Being developed as a support tool for joint targeting and C2 processes, JTS has the capability to interconnect with other NATO systems and FASs (Functional area Service) as: INTEL-FS, NCOP or JChat. During exercises based on constructive simulation, JTS runs on a separate network than the other NATO systems. Even if the overall classification of the exercise and the exercise databases is NATO UNCLASSIFIED, JTS runs only in NATO SECRET network. Nevertheless, it can be linked with other FASs by using different bridges or interfaces. The end state of interoperability that can be reached by JTS is shown in figure no.4.

Those bridges between the systems have not been fully developed yet. In order to be used, they need first to be upgraded and tested during computer assisted exercises. As you can see, computer assisted exercises are not only just a good opportunity for personnel training, but they were also successfully used in testing new systems or their upgraded version. Take as an example the 4.0 version of JTS. It was tested for the first time in November 2017, during NATO exercise TRIDENT JAVELIN 2017 and few months later, in March 2018 during CREVAL exercise of Multinational Division South-east Headquarters, DACIAN LANCER 2018. The training audience had access

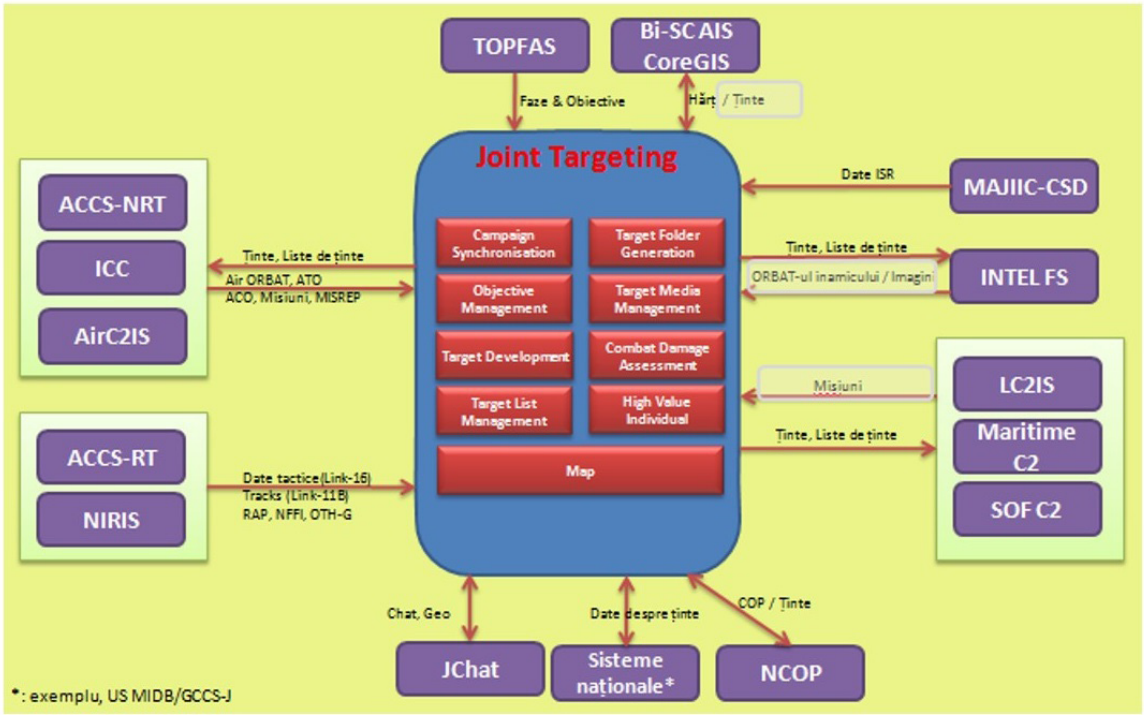

Figure no. 4. System interoperability for JTS v.4.0[2]

to the 4.0 version of the system during the exercise planning process in order to develop their database for the exercise and during the execution stage all the attending personnel had the chance to work with it. The upgrades brought to the system were very well received by the users and during those exercises a slight attempt to use the system more efficiently could be seen at the tactical level. JTS supports very well the joint targeting process at strategic and operational level, but in order to be 100% efficient at tactical level also, it needs some more improvements to be added.

In conclusion, JTS offers real solutions for collecting and tracking data about the targets, being a friendly-user system for network environment. All the data stored in the system can be reached anytime by anyone allowed to work with the tool. JTS architecture was especially designed in order to allow the program to link with other C2 systems, supporting the decision-making process. This system, as I stated before, is used also by the Multinational Division South-East Headquarters and the version 4.0 was one of the FASs used during DACIAN LANCER 2018 exercise. As feedback regarding the system, JTS was efficient, but splitting the database might be a good solution in order for the system to be more efficiently used at the tactical level.

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[2] Source: OF-4, Xogiannis Dimitrios, "Advanced FAST FAS & Dynamic Targeting Training Course JTS-FAST Evolution", chief of J. TARGETING section, from NATO Rapid Deployable Corps-Greece, 2017, p.7.