CHAIRMAN OF THE JOINT CHIEFS OF STAFF INSTRUCTION

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CJCSI 3505.01C
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TARGET COORDINATE MENSURATION
CERTIFICATION AND PROGRAM ACCREDITATION

References:
a. Title 10, United States Code
b. DoDD 5100.01, 21 December 2010, "Functions of the Department of Defense and Its Major Components"
c. DoDD 5105.60, 29 July 2009, "National Geospatial-Intelligence Agency (NGA)"
d. "Concept of Operations for the National Geospatial-Intelligence Agency Target Coordinate Mensuration Program Accreditation," 1 May 2014
e. CJCSI 3370.01B Series, 6 May 2016, "Target Development Standards"

1. Purpose. This instruction establishes policy for target coordinate mensuration (TCM) certification for individuals and program accreditation for the Department of Defense (DoD), Services, Combatant Commands (CCMDs), CCMD subordinate forces headquarters (HQ), combat support agencies (CSAs), and coalition partners.

2. Superseded/Cancellation. CJCSI 3505.01B, 10 January 2013, is hereby superseded.

3. Applicability. This instruction applies to the Services, CCMDs, CCMD subordinate forces HQ, and CSAs that conduct TCM using NGA-validated mensuration tools, methods, and imagery during joint or coalition operations. Tools and systems reliant on lasers or other sensors to generate coordinates without use of NGA-validated mensuration tools, do not constitute TCM and are not subject to this instruction.

4. Policy.

a. TCM occurs at strategic, operational, and tactical levels of war, during deliberate and dynamic targeting. Mensuration refers to measurement of a feature or location to determine its exact latitude, longitude, and elevation. TCM refers to measurement of a feature or location on earth by certified

personnel using NGA-validated tools, to determine an absolute latitude, longitude, and elevation to support the employment of coordinate-seeking weapons. Any TCM program that produces mensurated target coordinates for coordinate-seeking weapons must meet the standards set forth in this instruction (see paragraphs 4.c and 4.d).

b. As the functional manager of geospatial intelligence, in accordance with reference c, the NGA establishes TCM certification standards, and accreditation criteria for Service, CCMD, CCMD subordinate forces HQ, and CSA TCM programs within DoD for the production of mensurated target coordinates. Individuals who conduct TCM to support the use of coordinate-seeking munitions require certification. This requirement maintains the integrity and reliability of:

(1) coordinate data

(2) products generated using NGA-validated tools and

(3) exact location data to support use of coordinate-seeking munitions.[1]

c. Program Accreditation. An NGA accredited TCM program is required to include certain complementary components to train and certify individuals and work centers to generate mensurated target coordinates accurately. These are:

(1) use of one or more NGA-validated tools

(2) a mensuration process

(3) a training syllabus

(4) proficiency development and maintenance procedures

(5) work center/work environment procedures

(6) access to imagery

(7) concept of operations, and

(8) certified analysts and operators

There are two types of TCM accreditation: Target Material Production (TMP) and Target Mensuration Only (TMO). NGA accredits both programs, and requires completion of all requirements in reference d. Any coordinate

[1] Examples include the Joint Direct Attack Munition, Small Diameter Bomb, 155mm Excalibur Artillery Munition, Guided Multiple Launch Rocket System, and Army Tactical Missile System.

generated outside these programs, (for example by sensors alone, targeting nodes, laser locater designators, and radars) does not constitute TCM and is not governed by this instruction.

(1) TMP is the conduct of target coordinate mensuration to generate target materials in support of deliberate or dynamic targeting. Target materials are graphic, textual, tabular, digital, video, or other presentations of target intelligence designed primarily to support operations against designated targets by one or more weapon systems. TMP ends when the derived coordinate and its associated graphic are entered into the Modernized Integrated Database (MIDB) or a local database. TMP certified personnel are listed in the joint registry of certified individuals maintained by the Joint Staff Directorate for Intelligence (J-2), Deputy Directorate for Crisis and Current Operations (J-23), Targeting Division (J-23-4), hereafter referred to as Joint Staff Targeting (see paragraph 6.d).

(2) TMO is the conduct of target coordinate mensuration during deliberate or dynamic targeting when the derived coordinate will *not* be entered into the MIDB. TMO employs NGA-validated imagery and TCM tools. TMO must be performed by a certified TMO operator. The mensuration process in a TMO program produces a mensurated target coordinate. TMO operators are trained and certified by NGA-accredited TMO programs. TMO programs will be maintained at respective Service, CCMD, CCMD subordinate forces HQ, or CSA, and may be delegated to a lower echelon.

(3) Services, CCMDs, CCMD subordinate forces HQ, and CSAs requesting accreditation for their TCM programs must submit a formal request letter to NGA. On receipt of this, NGA will provide the requesting organization with the accreditation application package electronically or by other appropriate means. The requesting organization will return the completed package to NGA within 60 days of submitting the request. For planning purposes, organizations should submit accreditation packages no later than 150 days prior to the desired accreditation date (see reference d for detailed guidance on accreditation criteria).

d. TCM Training and Certification. TCM training and certification will be based on NGA-validated tools and processes.[2] A tool will be considered validated if the outputs of the mensurated positions in latitude, longitude, elevation, and error propagation estimates are within established performance parameters. TCM training and certification requirements vary by tool and process. All accredited programs must include instruction for all TCM tools currently used by the Service in that work center, and must outline the

[2] Reference NGA website <www.geoint.nga.smil.mil/programs/validation/index.php> for current mensuration tools and processes validated by NGA.

implications of using those tools for purposes not validated by NGA. At a minimum, mensuration instruction shall address the following core topics (see reference d for details on specific training and certification requirements):

(1) Basic imagery interpretation and management, to include theory, acquisition, and analysis.

(2) Digital Point Positioning Database management, to include acquisition, storage, and maintenance.

(3) Basic geodesy.

(4) Mensuration tool capabilities, operations, and limitations.

(5) Precise point positioning process techniques and limitations.

(6) Database capabilities, requirements, and adherence to CJCSM 3370.01B standards (TMP only).

(7) Creating Joint Desired Points of Impact (JDPI) graphics according to CJCSI 3370.01B standards (TMP only).

e. MIDB Production. As applicable, the Services, CCMDs, CCMD subordinate forces HQ, and CSAs will establish procedures to ensure that only TMP certified personnel produce mensurated coordinates in certified work centers for publication in the MIDB. Services, CCMDs, CCMD subordinate forces HQ, and CSAs producing mensurated coordinates for the MIDB will enter their JDPI and mensurated reference point entries into target detail records. JDPI records older than five years will be reviewed for currency, but command directives may shorten review periods to meet mission needs.

f. Combatant Commands, in concert with Joint Staff Targeting, will publish U.S. standards, and ensure as far as possible that coalition partners use NGA-validated tools and train and certify individuals according to the same standards when conducting TCM for U.S. delivered weapons or U.S. controlled databases during combined operations. North Atlantic Treaty Organization and coalition partners may request NGA TCM accreditation through Joint Staff Targeting with endorsement by the appropriate geographic CCMD. The appropriate CCMD shall encourage coalition partners to use existing U.S. programs and training opportunities to enhance interoperability.

5. Definitions. See glossary.

6. Responsibilities.

a. NGA. The NGA has established minimum training, certification, and proficiency standards for TCM programs (see reference d), and will review and accredit Service, CCMD, CCMD subordinate forces HQ, and CSA TCM programs. The NGA will review all documentation of accredited TCM programs every two years to ensure that changes made to training, certification, and proficiency processes do not deteriorate the quality of TCM deliverables. NGA will re-accredit these programs every four years or sooner, if warranted by mensuration program changes or other circumstances. Accreditation of coalition partner programs is authorized. On a case-by-case basis, the NGA or an accredited U.S. organization operating through an established framework, such as Foreign Military Sales, may certify a foreign partner's TMP work center. The NGA, in coordination with Joint Staff Targeting, will periodically review data produced by accredited TCM programs and provide additional reviews as needed. To maintain accreditation, NGA requires TCM programs to address and resolve negative trends found during periodic reviews. Upon request from a Service, CCMD, CCMD subordinate forces HQ, or CSA, the NGA will validate an organization's geospatial intelligence-based TCM tools.

b. Services. Services will provide trained certified individuals to perform TCM (references a and b apply). Services will provide programs for training, certification, maintaining credentials, and tracking proficiency of personnel performing TCM. For TMP, Services will ensure the integrity of target coordinate data or other mensurated points transacted in the MIDB under Service auspices. Services may establish TCM training programs, standards, and certification beyond the minimum joint standards in the NGA accredited program. Services will identify for Joint Staff Targeting and NGA one or more TCM program functional managers to serve as primary points of contact (POC). Functional managers request access to the joint registry from Joint Staff Targeting, and are responsible for entering the names of certified individuals into the registry. Services shall provide the NGA, other Services, or CCMDs, access to their record of certified individuals on request.

c. Combatant Commands and CSAs. CCMDs, CSAs, and, when appropriate, CCMD subordinate forces' HQs must ensure that individuals assigned to conduct TCM receive initial training, are proficient, and certified. CCMDs will determine the number of certified personnel necessary based on operational requirements. Those requirements should be identified to Service components to ensure that sufficient personnel are trained, proficient, and certified to mensurate coordinates within their HQ and subordinate organizations.[3] CCMDs should publish local TCM policy to supplement this instruction, since they are responsible for providing training and certification in

[3] The CCMD or CSA will be required to provide retraining and recertification in instances where certified personnel were trained on Service mensuration systems that differ from those in use by the CCMD or CSA.

all local TCM policy. CCMDs and CSAs may establish local policy for grandfathering non-certified individuals. If accredited to certify individuals for TCM, CCMDs, CCMD subordinate forces HQ, and CSAs will identify to Joint Staff Targeting and the NGA one or more TCM program functional managers to serve as primary POCs. Functional managers request access to the joint registry from Joint Staff Targeting, and are responsible for entering names of certified individuals into the registry.

d. Joint Staff Targeting. Joint Staff Targeting will facilitate accreditation of TCM programs submitted by the Services, CCMDs, CCMD subordinate forces HQ, CSAs, and coalition partners, in coordination with the NGA. Joint Staff Targeting will maintain a joint registry of TMP certified individuals producing to the MIDB. The registry is available via the Secret Internet Protocol Routing Network (SIPRNET), Joint Worldwide Intelligence Communication System, and the Joint Staff Targeting STONEGHOST website for commonwealth participants, per agreements with coalition partners.

e. Shared Responsibilities for TMP Data Review Reports.

(1) The NGA will extract a random sample of TMP data to re-mensurate, and review associated data entries and graphic products for accuracy. The NGA examines random samples produced to the MIDB for adherence to joint target development standards. NGA uses the JDPI Quality Index and Geodetic Data Quality Index methodologies to conduct the MIDB JDPI quality review. A satisfactory assessment requires a minimum JDPI Quality Index of 90%. Compliance and error data are aggregated by program and producer. NGA provides detailed reports for each producer, forwarded through the accredited functional manager, for distribution throughout the organization. NGA will also provide TMP quality review results to Service HQ, CCMDs, CCMD subordinate forces HQ, and CSAs for awareness or action as appropriate.

(2) The accredited organization or certified producer verifies incongruent data and makes any necessary corrections. All target coordinate data mensurated in conjunction with discrepant data should be examined and corrected as needed. Often problems are systematic and unintentionally repeated across several points mensurated concurrently within the same assignment. Only JDPIs produced by a certified analyst using an NGA-validated tool should be entered into the MIDB. Errors identified by NGA are considered preliminary until the organization under review has opportunity to verify and, when necessary, appeal NGA's findings within 30 days via their respective program POC. Accredited program POCs with certified producers in their respective programs scoring below 90% on the JDPI Quality Index during the reporting period, are required to report to the NGA that they reviewed discrepant data and made necessary corrections. If the accredited organization or certified producer chooses not to appeal the findings, NGA will deem the

preliminary findings verified. NGA will post verified reports to its SIPRNET website to share lessons learned across the entire TMP community.

(3) The NGA provides Joint Staff Targeting with a consolidated statistical rollup of the data reviewed, and the level of compliance for the reference period, to help evaluate the effectiveness of CJCSI 3505.01C provisions. Graphic product errors are generally not reported to Joint Staff Targeting, except in cases of significant error. NGA will post this rollup report to its SIPRNET website.

7. Summary of Changes. This update revises the definition of TMO and clarifies TCM accreditation requirements.

8. Releasability. UNRESTRICTED. This directive is approved for public release; distribution is unlimited on the Non-secure Internet Protocol Router Network. DoD Components, to include CCMDs, other Federal agencies, and the public, may obtain copies of this directive through the Internet from the CJCS Directives Electronic Library <http://www.dtic.mil/cjcs_directives/>. Joint Staff activities may also obtain access via the SIPRNET Directives Electronic Library Website.

9. Effective Date. This instruction is effective upon receipt.

For the Chairman of the Joint Chiefs of Staff:

WILLIAM C. MAYVILLE, JR.
LTG, USA
Director, Joint Staff

Enclosure
GL - Glossary of Acronyms and Terms and Definitions

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GLOSSARY

PART I-ABBREVIATIONS AND ACRONYMS

Items marked with an asterisk (*) *have definitions in PART II*

CCMD	Combatant Command
CJCS	Chairman of the Joint Chiefs of Staff
CJCSI	Chairman of the Joint Chiefs of Staff Instruction
CJCSM	Chairman of the Joint Chiefs of Staff Manual
CSA	Combat Support Agency
CONOPS	Concept of Operations
DoD	Department of Defense
DoDD	Department of Defense Directive
HQ	Headquarters
J-2	Joint Staff Directorate for Intelligence
J-23	Deputy Directorate for Crisis and Current Operations
J-23-4	Joint Staff Targeting Division
JDPI*	Joint Desired Point of Impact
JP	Joint Publication
MIDB	Modernized Integrated Database
NGA	National Geospatial-Intelligence Agency
POC	Point of Contact
SIPRNET	Secret Internet Protocol Router Network
TCM*	Target Coordinate Mensuration
TMO*	Target Mensuration Only
TMP*	Target Material Production
USA	United States Army

PART II-DEFINITIONS

Accreditation – The formal declaration to operate at an acceptable level of risk based on the implementation of an approved set of technical, instructional, managerial, and procedural safeguards.

Deliberate Targeting – Targeting that prosecutes planned targets. These are targets that are known to exist in the operational environment. For this instruction, this typically includes any target planning in support of precision-guided munitions other than self-defense or fleeting targets.

Dynamic Targeting – Targeting that prosecutes targets identified too late or not selected for action in time to be included in deliberate targeting (JP 3-60). For this instruction, this typically involves individuals engaged in self-defense or prosecution of fleeting targets.

Error Propagation – The process of evaluating the accuracy of computed values as a function of accuracy in the input values. In the case of target coordinates, error propagation is seen in the assignment of accuracy estimates for ground point, based on the accuracy of the input variables. These accuracy values are carried forward or propagated into subsequent processes.

Joint Desired Point of Impact (JDPI) – A unique, alpha-numeric coded precise aim-point associated with a target to achieve an explicit weaponeering objective and identified by a three dimensional (latitude, longitude, and elevation) mensurated coordinate (JP 3-60).

Planned Target – Target that is known to exist in the operational environment upon which actions are planned using deliberate targeting, creating effects that support commanders' objectives. There are two subcategories of planned targets: scheduled and on-call. See also deliberate targeting (JP 3-60)

Target Coordinate Mensuration (TCM) – The process of measurement of a feature or location on earth by certified personnel using NGA-validated tools to determine an absolute latitude, longitude, and elevation to support the employment of coordinate-seeking munitions. TCM consists of two programs: Target Material Production and Target Mensuration Only.

Target Coordinate Mensuration Program – The combination of the following distinct separate critical components and their ability to operate as a whole to accurately produce mensurated target coordinates: a NGA validated mensuration tool, a certified mensuration process, training materials, proficiency development, maintenance procedures, work center/work environment procedures and concept of operations, and certified individuals. The program is considered to be accredited to operate with an NGA-validated

tool, and a review of the program's ability to certify and maintain proficient analysts and operators.

Target Coordinate Mensuration Tool – NGA-validated software used by an individual or work center to generate precise coordinate and elevation data.

Target Materials – Graphic, textual, tabular, digital, video, or other presentations of target intelligence, primarily designed to support operations against designated targets by one or more weapon systems (JP 3-60).

Target Material Production (TMP) – The process of conducting target coordinate mensuration to generate target materials in support of deliberate and dynamic targeting.

Target Mensuration Only (TMO) – TMO is the conduct of TCM during deliberate or dynamic targeting to generate a mensurated target coordinate where the derived coordinate will not be entered into the MIDB. TMO is conducted using NGA-validated imagery and TCM tools.

Validation – 1. A part of target development that ensures all vetted targets meet the objectives and criteria outlined in the commander's guidance and ensures compliance with the law of armed conflict and rules of engagement. (JP 3-60) 2. In computer modeling and simulation, the process of determining the degree to which a model or simulation is an accurate representation of the real world from the perspective of the intended uses of the model. It is also the process of determining that a model implementation accurately represents the developer's conceptual description and specifications (JP 3-35).

Work Center – Physical space where target material production and coordinate mensuration are performed, as typified by deliberate planning. Analysts must be certified and employ a certified mensuration process that includes imagery acquisition and management, use of a NGA-validated target coordinate mensuration tool, and product generation.

Work Environment – No one location defines a typical work environment. Particularly in the conduct of tactical operations, the work environment may represent a variety of locations, from tactical operations centers, to mobile vehicles, to individual fighting positions. Regardless of where target coordinate mensuration is performed, individuals must be certified and employ a certified mensuration process that includes imagery acquisition and management and the use of a NGA-validated target coordinate mensuration tool for coordinate generation.