



DEPARTMENT OF THE ARMY
US ARMY COMBAT CAPABILITIES DEVELOPMENT COMMAND
GROUND VEHICLE SYSTEMS CENTER
6501 E. 11 MILE ROAD
WARREN, MI 48397-5000

**COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENT
BETWEEN
TO THE STARS ACADEMY OF ARTS AND SCIENCE, INC.
AND
THE U.S. ARMY COMBAT CAPABILITIES DEVELOPMENT COMMAND
GROUND VEHICLE SYSTEMS CENTER**

**CRADA TITLE: NOVEL & EMERGING TECHNOLOGY EXPLOITATION (NETE)
CRADA NUMBER: 19-15**

CRADA ADMINISTRATORS:

GOVERNMENT

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COLLABORATOR

PRINCIPAL INVESTIGATOR:

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ARTICLE 1 – PREAMBLE

Under authority of the U.S. Federal Technology Transfer Act of 1986 (Public Law 99-502, October 20, 1986, as amended, and codified at 15 United States Code (U.S.C.) § 3710a), Federal Government Technical Activity, U.S. Army Combat Capabilities Development Command (CCDC) Ground Vehicle Systems Center ("**Government**") located at 6501 East 11 Mile Road, Warren, Michigan, and Non-Federal Government Collaborator, To The Stars Academy Of Arts and Science, Inc. ("**Collaborator**"), a public benefit corporation, incorporated in the State of California and having a principal place of business at 315 South Coast Hwy 101, Ste. U-38, Encinitas, CA 92024, (Government and Collaborator hereinafter referred to as "**Party**" or "**Parties**") enter into this Cooperative Research and Development Agreement ("**CRADA**") that will be binding upon each of the Parties according to the terms and conditions and for the duration set forth below.

NOW, THEREFORE, each of the Parties hereby agrees to the following:

ARTICLE 2 – DEFINITIONS

2.1 "Background Technology" is any Classified information, Controlled Unclassified information, Proprietary Information and any other Intellectual Property owned by or licensed to and brought to this CRADA by either Party. Examples of Background Technology include Technical Data, Invention Disclosures, Patent Applications, patents, Computer Databases, Computer Software Documentation, Computer Software, and trade secrets that are privileged or confidential under the meaning of section 552(b)(4) of Title 5, Freedom of Information Act.

2.2 "Classified" means all information classified in accordance with the national security laws of the U.S.

2.3 "Computer Database" means a collection of information recorded in a form capable of being processed by a computer. The term does not include Computer Software.

2.4 "Computer Program" means a set of instructions, rules, or routines recorded in a form that is capable of causing a computer to perform a specific operation or series of operations.

2.5 "Computer Software" means Computer Programs, source code, source code listings, object code listings, design details, algorithms, processes, flow charts, formulae and related material that would enable the software to be reproduced, recreated, or recompiled. Computer Software does not include Computer Databases or Computer Software Documentation.

2.6 "Computer Software Documentation" means owner's manuals, user's manuals, installation instructions, operating instructions, and other similar items,

regardless of storage medium, that explain the capabilities of the Computer Software or provide instructions for using the software.

2.7 "Controlled Unclassified" means unclassified information exempt from public disclosure according to DoD Directive 5230.25 and DoD Directive 5400.7 or that is subject to export controls according to Title 22, C.F.R., parts 120-130, International Traffic in Arms Regulations (ITAR), or 15 C.F.R. 730 et seq., Export Administration Regulations (EAR).

2.8 "Copyright" means a form of protection provided by the laws of the United States for "original works of authorship," including literary, dramatic, musical, architectural, cartographic, choreographic, pantomimic, pictorial, graphic, sculptural, and audiovisual creations.

2.9 "Created" when used in relation to any copyrightable Work means the Work is fixed in any tangible medium of expression for the first time.

2.10 "CRADA Invention" means any Invention conceived or first actually reduced to practice under this CRADA.

2.11 "CRADA Work" means a Work Created in performance of this CRADA.

2.12 "CRADA Technical Data" means Technical Data Created in performance of this CRADA.

2.13 "Foreign Person" means any natural person who is not a lawful permanent resident as defined by 8 U.S.C. § 1101(a)(20) or who is not a protected individual as defined by 8 U.S.C. § 1324b(a)(3).

2.14 "Government Purpose" means any activity in which the United States Government is a party but does not include use for commercial purposes.

2.15 "Government" refers to the Government of the United States of America or to any agency or other component of the United States federal government.

2.16 "Intellectual Property" in general terms, intellectual property is any product of the human intellect that the law protects from unauthorized use by others. The ownership of intellectual property inherently creates a limited monopoly in the protected property.

2.17 "Invention" means any Invention or discovery which is or may be patentable or otherwise protected under Title 35 of the United States Code (U.S.C.) or any novel variety of plant which is or may be patentable under the Plant Variety Protection Act (7 U.S.C. § 2321 et seq.).

2.18 "Joint Work Plan" means a proposal describing the purpose and scope of the proposed CRADA that defines rights and responsibilities among the Parties.

2.19 "Made" when used in conjunction with any Invention, means the conception or first actual reduction to practice of such invention.

2.20 "ORTA" means the Office of Research and Technology Applications as established in accordance with 15 U.S.C. §§ 3710(b) and (c) to develop, manage and execute Government's technology transfer goals and programs. The term may be used to refer to the office, the person managing that office, or both.

2.21 "Principal Investigator" (PI) is the person assigned by each Party to manage and administer the specific CRADA technical matters and day-to-day performance of the CRADA.

2.22 "Proprietary Information" means information owned by the Collaborator that embodies trade secrets created prior to or independently of this CRADA (i.e., not created in performance of this CRADA), or that is business or financial information that is privileged or business confidential under the Freedom of Information Act, 5 U.S.C. § 552(b)(4), providing that such information:

- a) Is not generally known or available from other sources without obligations concerning their confidentiality; or
- b) Has not been made available by the owners to others without obligation concerning its confidentiality; or
- c) Is not already available to the Government without obligation concerning its confidentiality.

2.23 "Technical Data" means recorded information, regardless of the form or method of the recording, of a scientific or technical nature (including Computer Software Documentation). The term does not include Computer Software or data incidental to contract administration, such as financial and/or management information.

2.24 "Work" or "Works" means anything fixed in tangible form, e.g., technical data and computer software.

ARTICLE 3 – OBJECTIVE(S)

To the Stars Academy of Arts and Science is a company with materiel and technology innovations that offer capability advancements for Army ground vehicles. These technology innovations have been acquired, designed or produced by the Collaborator, leveraging advancements in metamaterials and quantum physics to push performance gains. The Collaborator will share their discoveries with CCDC Ground Vehicle Systems Center Ground Vehicle Survivability and Protection (GVSP), who will use Government laboratories and resources to characterize the technologies and find applications on ground vehicles.

ARTICLE 4 – GENERAL PROVISIONS

4.1 Governing Law. The laws applicable to the Government of the United States of America, as interpreted and applied in the federal courts of the U.S., are to govern the procedural and substantive construction, validity, performance, and effect of this CRADA for all purposes.

4.2 Duration of CRADA. This CRADA will automatically expire sixty (60) months from the Effective Date of this CRADA, unless modified per Article 4.6.

4.3 Effective Date. This CRADA enters into force as of the date it is signed by the last authorized representative of the Parties.

4.4 Signature Execution. This CRADA and any other Modifications thereto can be executed in one or more counterparts by the signature of a person having authority to bind that Party and that Party's signature is required to be an original or digital signature, each of which when executed and delivered, by mail, or email delivery, will be an original, and all of the counterparts will constitute but one and the same CRADA.

4.5 Assignment. Neither Party to this CRADA can assign its rights and obligations in this CRADA without approval from the other Party.

4.6 Modifications and Terminations.

4.6.1 Modifications.

4.6.1.1 Outside the Scope. Any change outside the scope of the executed CRADA must be made by a Modification.

4.6.1.2 Approved Levels. The Parties will confer in good faith to determine the desirability of a Modification to include amendments. A Modification shall not be effective until a written Modification is signed. Modifications within the scope of the CRADA may be signed by both executing officials of this CRADA or their successors. Modifications to this CRADA would include any changes to the CRADA, such as expanding the scope or duration of the CRADA, and must be approved at the same signature level as the original

CRADA. Each Modification will be attached as a counterpart to this CRADA, a copy of which will be forwarded to the ORTA within thirty (30) days after each Modification is signed by all Parties.

4.6.2 Terminations.

4.6.2.1 Termination by Mutual Consent. The Parties may elect to terminate this CRADA at any time by mutual consent. Such Termination will not be effective until all Parties approve a written Termination.

4.6.2.2 Unilateral Termination. A Party may unilaterally terminate this entire CRADA at any time by giving the other Party written Notice signed at the same signature level as the original CRADA, not less than thirty (30) days prior to the desired Termination date. If a Party unilaterally terminates this CRADA, any option for an Exclusive License to a CRADA Invention and any Exclusive License to a CRADA Invention granted by or pursuant to this CRADA will simultaneously be terminated, unless the Parties mutually agree otherwise in writing.

4.6.2.3 Rights and Obligations. Termination of this CRADA will not affect the rights and obligations of the Parties accrued prior to the Effective Date of the Termination of this CRADA.

4.6.2.4 No New Commitments. The Government will make no new commitments concerning this CRADA after receipt of a written Termination Notice from the Collaborator in accordance with Article 4.7 and will, to the extent practicable, cancel all outstanding commitments by the Termination date. Should such cancellation result in any costs incurred by Government, Collaborator agrees that such costs will be chargeable against any funding that it provided to the Government.

4.7 Notices.

4.7.1 Routine Notices. All Notices pertaining to or required by this CRADA, including Modifications, Disputes or Terminations, and those pertaining solely to any Copyright, Invention, or any Patent Application, shall be in writing and will be signed by the Government (Ben Soave or Dr. Joseph Cannon) or the preferred contact for Collaborator (Luis Elizondo), and all such Notices will be addressed to those names found on the first two pages.

4.7.2 Delivery of Notices. All Notices will be delivered in a manner that ensures confirmation of receipt. Each Party will notify the other Party of a change of an address in the manner set forth above.

4.7.3 Special Notices. Notices pertaining solely to the prosecution of any jointly owned Patent Application, Copyright or Invention under this CRADA will be in writing and will be signed and sent to the other Party's Intellectual Property attorney. The

Government's Intellectual Property attorney will send a copy of these Notices to the ORTA. Notices will be sent to the points of contact specified the first two pages.

4.8 Security Obligations and Export Control

4.8.1 Host Facility. Each Party will abide by the safety, and security regulations and directives of the host facility in which the work in support of the CRADA is being performed. Copies of all applicable safety and security regulations and directives should be provided to the non-hosting Party.

4.8.2 Compliance with Export Control. This CRADA is subject to U.S. law and regulations controlling the export of Technical Data, Computer Software, laboratory prototypes and all other export controlled commodities. These laws include, but are not limited to, the Arms Export Control Act and Export Administration Act. All rights granted by this CRADA are contingent upon compliance with these laws and regulations. By granting rights in this CRADA, the U.S. Government does NOT represent that export authorization or an export license will not be unnecessary or that such authorization or export license will be granted.

4.8.3 Classified Data. The work performed under this CRADA may cover Classified national security information and unclassified Military Critical Technology (MCT). All persons working with Classified information must have the appropriate security clearance and need to know. Any exchange of Classified information with industry will comply with the National Industrial Security Program. Procedures for Government Activities Relating to Foreign Ownership, Control, or Influence (FOCI), April 17, 2014, DoD 5200.22-M, and the DD FORM 254, DoD Contract Security Classification Specification, provided as a separate removable attachment to this CRADA. If required, the Collaborator must also be certified by the Joint Certification Program (JCP) to receive MCT and Technical Data, as governed by DoD Directive 5230.25, Withholding of Unclassified Technical Data from Public Disclosure. This information must be controlled in accordance with all applicable U.S. export control laws and regulations.

4.9. Representations and Warranties.

4.9.1 Representations and Warranties of the Collaborator. Collaborator hereby represents and warrants the following:

4.9.1.1 Corporate Organization. The Collaborator, as of the date of the Effective Date of this CRADA, is a Corporation duly organized, and in good standing under the laws of the State of California.

4.9.1.2. Statement of Ownership. Collaborator is not a foreign owned entity or a subsidiary of a foreign owned entity.

4.9.1.3 Small Business. Collaborator is not a small business as defined by the U.S. Small Business Administration.

4.9.1.4 Suspension or Debarment. The Collaborator hereby represents and warrants that it is not suspended, proposed for debarment or debarred from eligibility for federal procurements (i.e., contracts, grants, cooperative agreement). The Collaborator will timely notify (seven days or less) the Government, should this status or Representation change.

4.9.2 Representation and Warranties of Government. Government hereby represents the following:

4.9.2.1 No Warranty. Each Party makes no express or implied Warranty as to any matter whatsoever, including the conditions of the research or any Invention or information exchanged by the respective Party, whether tangible or intangible, without limitation, made or developed under this CRADA, nor does either Party make any express or implied Warranty with regard to merchantability, or fitness for a particular purpose of the research or any Invention.

4.9.2.2 Mission. The performance of the work under this CRADA is consistent with the mission of the CCDC Ground Vehicle Systems Center.

4.10 Disputes.

4.10.1 Settlement. Any dispute arising under this CRADA which is not disposed of by agreement of the parties shall be submitted jointly to the signatories of this CRADA. A joint decision of the signatories or their designees shall be the disposition of such dispute.

4.10.2 Continuation of Work. Pending resolution of any Dispute or claim pursuant to this CRADA, the Parties agree that performance of all obligations will be pursued diligently and in good faith in accordance with the Joint Work Plan. However, nothing in the section shall prevent any party from pursuing any and all agency, administrative and/or judicial remedies that may be allowable.

4.11 Title to Property.

4.11.1 Title to Preexisting or Acquired Tangible Property. Each Party will retain title to all tangible property to which it had title prior to the Effective Date of this CRADA or to which it acquired or acquires title, by purchase or by fabrication, outside of the scope of this CRADA. Consumable property to be used in the performance of this CRADA will remain the property of the original owning Party until consumed.

4.11.2 Title to Developed Property. All tangible property fabricated or acquired under this CRADA with all components provided by one Party will remain the property of that Party. Tangible property having any component purchased or supplied by the Government will be the property of the U.S. Government, unless such tangible Government components can be separated from Collaborator's components without

damage to any of the individual components comprising the tangible property. After Termination of this CRADA, the Parties may, by mutual consent, separate the tangible property into its components and the separated components will remain the property of the Party who originally acquired or fabricated the same.

4.11.3 Tangible Property Operational and Disposition Costs. Unless otherwise agreed in writing by the Parties, each Party will be responsible for all costs of maintenance, removal, storage, repair, disposal and shipping of all tangible property to which it has title.

4.11.4 Disposal of Tangible Property. Unless otherwise agreed in writing, each Party will take possession of its respective tangible property within sixty (60) days of Termination of this CRADA. Each Party will cooperate with the other Party in the recovery or disposition of the other Party's property.

4.11.5 Inventory Sheet. Separate inventory sheets shall be written as required for transfer of property from one Party to the other. Government will not be responsible for damages to any property of the Collaborator except to the extent that such loss, claim, damage or liability arise from the negligence of Government or its employees, as specified in the provisions of the Federal Tort Claims Act.

4.12 Publication. Each Party that seeks to publish or publicly disclose information, including scientific articles, press releases, or in case of publication in an Request for Proposal pertaining to work performed under this CRADA, will submit to the other Party any proposed written publications not less than thirty (30) days prior to submission for publication. If the receiving Party has any objection to the publication, the Party receiving the proposed publication will, provide a written response within thirty (30) days. A proposed publication that contains information marked "Proprietary" or is considered protected and marked as such, including military critical technology, classified or Controlled Unclassified information, export controlled or other controlled or sensitive information, by either Party requires written consent by both Parties in order for the publication of the information or press release to be released. Such consent will not be unreasonably withheld or delayed. No rights in potential Patent Applications shall be jeopardized before the filing and publication of any Patent Application by any Party. By entering into this CRADA, neither Party directly nor indirectly endorses any product or service provided or to be provided by the other Party. The Collaborator will not use the Government's name or the Government's Activity's name for any type of endorsement.

4.13 Special Provisions.

4.13.1 Subcontracts and Government Support Contractors/SMEs. The Government may (and most likely does) use contractor subject matter experts (SMEs) and/or covered government support contractors to participate in performance of the Joint Work Plan. If the Collaborator has reservations about the participation of a Government's contractor SMEs or a covered support contractor, it should advise the Government, and provide appropriate restrictive language on the face of Proprietary Information to prevent

access by such contractors. Neither Party is to use outsiders to perform work under this CRADA nor any tasks and/or analysis, without first identifying the proposed contractor, and obtaining written approval of the Government, Collaborator and third-Party. Any third-party Collaborator's agreement to perform a Party's performance under the CRADA will include "flow-down" terms consistent with this CRADA.

4.13.2 Disposal of Toxic Waste or Other Waste. Each Party will be responsible for the handling, control, and disposition of any and all hazardous substances or waste in its custody during the course of this CRADA in accordance with all applicable laws and regulations.

4.13.3 Assignment of Personnel. If it is contemplated that either Party will assign personnel to the other Party's facility as part of this CRADA, such personnel assigned by the assigning Party to participate in or to observe the research to be performed under this CRADA, will not, during the period of such assignments, be considered employees of the receiving Party for any purposes.

- a) The Parties will be responsible for the pay, expenses and supervision of its own personnel.
- b) Each Party agrees to use due care while on the other's Party's premises, to comply with all security, environmental safety and health rules and regulations during all visits, and to enter only those areas previously designated by those in charge of each visit.

4.13.4 Ratification. If the Assistant Secretary of the Army (Acquisition, Logistics and Technology) exercises his/her retained authority to require modification, which must be exercised within thirty days of this CRADA being submitted for review, Collaborator shall have thirty (30) days from notification of any required modifications to ratify the modifications or terminate the CRADA.

4.13.5 Relationship of the Parties. The parties to this CRADA remain independent contractors. They are not agents of each other, joint ventures or partners.

ARTICLE 5 – INTELLECTUAL PROPERTY

5.1 Background Technology.

5.1.1 License to Background Technology. The designation of technology as Background Technology does not grant any rights in Background Technology to the receiving party, other than the right to use or reproduce the Background Technology provided for the purpose of performing work under this CRADA. Nothing in this CRADA will be construed to otherwise alter or affect any rights of either Party to any technology listed as Background Technology that exists or is modified outside this CRADA. No License, express or implied, for commercial application(s) is granted to either Party. For

commercial applications of any Background Technology, a License must be obtained from the owner.

Marking of Background Technology. All Background Technology will be identified as such with a marking. For example:

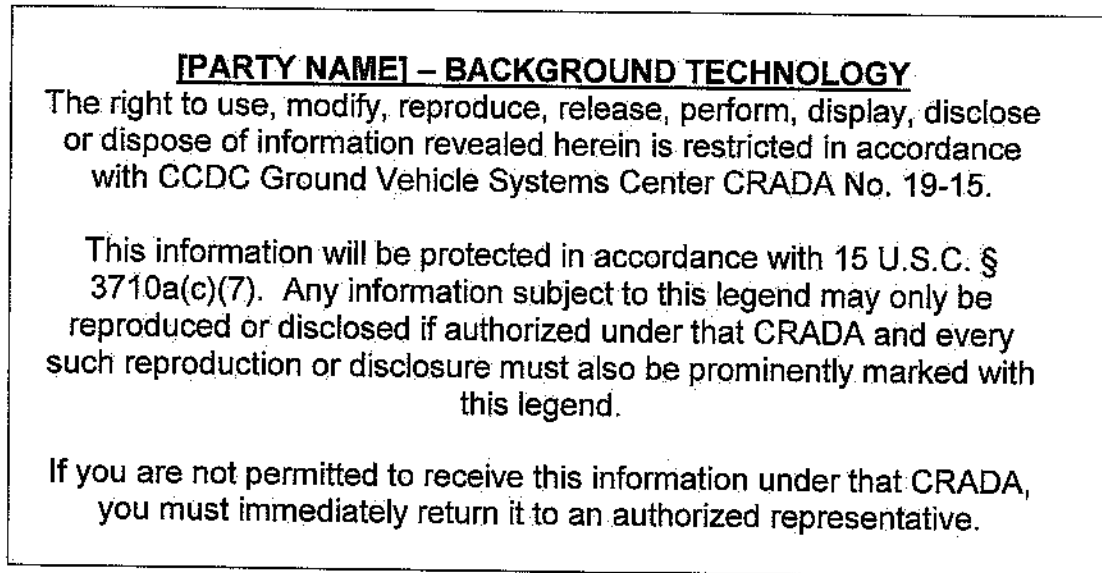


Fig 1. Marking of Background Technology

Marking of Proprietary Information. All Proprietary Information will be identified as such with a marking. For example:

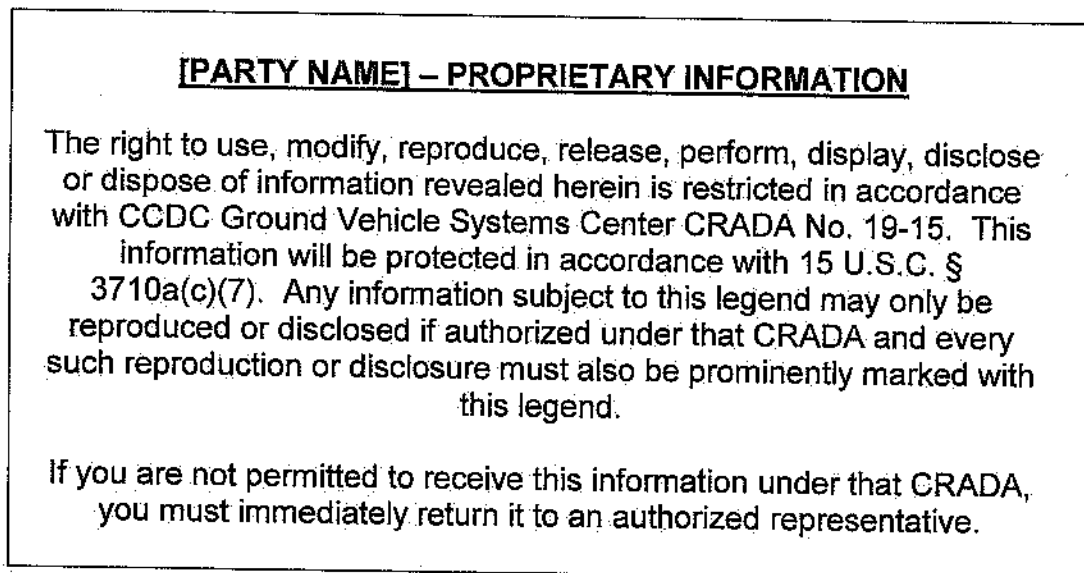


Fig 2. Marking of Proprietary Information

5.2 CRADA Technical Data.

5.2.1 Oral and Visual Information. Information imparted orally or visually will not be protected under this CRADA, unless such information is subsequently reduced to tangible form within fifteen (15) days of disclosure and a copy is furnished to the Party that received the information.

5.2.2 CRADA Technical Data Created by a CRADA Party. CRADA Technical Data Created solely by one of the Party's employees during performance under this CRADA will be owned by that Party and the other Party will have a Nonexclusive paid up, revocable License in this Technical Data to use, reproduce, modify, perform, display, release and disclose depending on the disclosure and releasability of the content as allowable.

5.2.3 CRADA Technical Data Jointly Created. All Technical Data that is jointly Created during performance of this CRADA will be jointly owned by the Parties. The Collaborator agrees and will immediately provide the Government with a written Nonexclusive, paid-up, irrevocable License to use or have used for Government Purposes the CRADA Technical Data that were jointly created. The Government must determine whether the CRADA Technical Data is classified or Controlled Unclassified information or restricted information from release by DoD Regulations, Directives or Instructions. The Collaborator must determine whether the CRADA Technical Data is releasable to the public.

5.3 CRADA Works and Inventions.

5.3.1 Solely Developed. Ownership of Works or Inventions, including CRADA Works or CRADA Inventions, developed solely by one of the Parties while performing under this CRADA belong to that Party.

5.3.2 Jointly Developed. Unless otherwise agreed to by the Parties, jointly created Works and Inventions will be jointly owned by both Parties. For copyrightable Works, the Collaborator herein provides the Government with a written Nonexclusive, paid-up, irrevocable Copyright License in order for the Government to be able to use, modify, reproduce, perform, display, release or disclose the CRADA Work, including CRADA Computer Software, for any Government Purpose. The CRADA Work will have the following marking:

"This Work was created in the performance of a Cooperative Research and Development Agreement 19-15 with the CCDC Ground Vehicle Systems Center. The Government of the United States has certain rights to use this Work."

The Collaborator can commercialize the CRADA Work, including CRADA Computer Software, if both Parties determine in writing that no patent protection will be sought and upon terms and conditions to be negotiated in writing between the Parties.

5.3.3 Title to and Ownership of CRADA Invention. Each Party will own the CRADA Inventions Made solely by its employees. Unless otherwise agreed to by the

Parties, for any CRADA Invention Made by inventors-employees of both Parties, each Party will have ownership in accordance with the laws of the country of Invention.

5.3.4 Invention Disclosure. Within sixty (60) days of an Invention being made resulting from the performance of the CRADA, and prior to disclosure of the Invention to any third-parties, unless a shorter time period is required by circumstances, the inventor(s) will submit an Invention Disclosure to his/her/their employer(s). In the case of an Invention Made jointly by inventors from both Parties, the inventors of each Party will submit an Invention Disclosure to his/her employer. Each Party will provide the other Party with a copy of each Invention Disclosure reporting the CRADA Invention within sixty (60) days of receiving the Invention Disclosure from its inventor(s).

5.4 Determination of CRADA Invention. The Parties will review each Invention Disclosure, and confer and consult with each other to determine whether an Invention Disclosure represents a CRADA Invention.

5.4.1 Filing of Patent Applications. The Parties shall identify the Party who will own the CRADA Invention and resulting patent, and that Party will file the Patent Application on any CRADA Invention. The Party responsible for filing of a Patent Application on any CRADA Invention will file the Patent Application at least sixty (60) days prior to any bar date and prior to publication, or one year from the date the Invention Disclosure was received, whichever comes first. In the case of a jointly Made CRADA Invention, if no Patent Application is filed within the specified time period by the responsible Party, the other Party may assume control of filing the Patent Application and the responsible Party will assign the responsibility to the other Party so that that other Party will then be able to take title to the jointly Made CRADA Invention on ten (10) days written notification. Each Party will cooperate with the other Party to obtain each inventor's signatures on Patent Applications, assignments or other documents required to secure Intellectual Property protection. The Party that relinquished the responsibility to file and the Party who will own the CRADA Invention will upon issuance of the patent provide a written Nonexclusive, irrevocable, paid-up License to the non-filing Party to practice the jointly Made CRADA Invention or have the jointly Made CRADA Invention practiced throughout the world by or on its behalf.

5.4.2 Patent Application Filing on CRADA Invention. The Party responsible for filing any Patent Application for a CRADA Invention will notify the other Party of all filing deadlines for prosecution of any Patent Application and maintenance of any patent on the CRADA Invention. Notwithstanding the primary responsibility set forth in Article 5.4.1, sixty (60) days prior to any filing deadline, the Parties will confer to determine if the filing Party intends to respond to the filing deadline. The non-filing Party will be permitted to respond if the filing Party declines.

5.4.3 Rights of the Government. Language that must be included in a Patent Application filed by the Collaborator follows. "This invention was made with Government support from the CDC Ground Vehicle Systems Center 19-15. The Government of the

United States has the right to practice or have practiced on behalf of the United States this subject invention throughout the world."

5.4.4 Copies and Inspection. Each Party filing a Patent Application on a CRADA Invention will provide the other Party with a copy of the Patent Application as filed and copies of all correspondence (e.g., all Patent Applications, office actions, responses between the United States Patent and Trademark Office (USPTO) and the filing Party after filing with the USPTO [and/or other relevant patent office] or from the USPTO [and/or other relevant patent office] relating to prosecution of the Patent Application) within thirty (30) days of receipt. The filing Party will give the other Party a limited power to inspect, with authorization to access the Patent Application, make copies, and, in the event that the filing Party declines continued prosecution of the Patent Application, do all that is necessary to secure patent protection for the jointly Made CRADA Invention.

5.5 Licenses to CRADA Inventions, Including Computer Software.

5.5.1 License. In accordance with 15 U.S. Code §3710a(b)(2), for CRADA Inventions Made, CRADA Technical Data, and CRADA Works Created solely or in part by an employee of the Government, the Government may grant or may agree in advance to the Collaborator to patent Licenses or assignments or options thereto, subject to section 209 of Title 35 of the United States Code. The Government may grant a License to an Invention that is federally owned, for which a Patent Application was filed before the signing of this CRADA, and directly within the scope of the work under this CRADA for reasonable compensation when appropriate. The Collaborator will have an option to choose an Exclusive License for a pre-negotiated field of use, for such Invention and a CRADA Invention. If there were more than one Collaborator than each Collaborator is offered the option to hold licensing rights that collectively encompass the rights that would be held under such Exclusive License by one Party. Unless otherwise agreed to in writing by the Parties, Collaborator's option to choose an Exclusive License must be requested within six (6) months of being notified (or by its own employee/inventor in the case of jointly Made Inventions) of the CRADA Invention. Grants of Exclusive Licenses under this paragraph will be subject to the Government retaining a Nonexclusive, transferable, irrevocable, paid-up License to practice the Invention or have the Invention practiced throughout the world by or on behalf of the Government.

5.5.2 Collaborator's CRADA Intellectual Property. The Collaborator retains title to each CRADA Invention, CRADA Technical Data and CRADA Work made solely by its employees and grants the Government a written Nonexclusive, transferable, irrevocable, paid-up License to practice the CRADA Invention or have the Invention practiced throughout the world by or on behalf of the Government for Government Purposes or use the CRADA Work or CRADA Technical Data or have them used throughout the world by or on behalf on the Government for Government Purposes.

5.6 Termination of Licenses Granted and Cancellation of License Option to CRADA Inventions. Government may cancel the Exclusive or Nonexclusive License

option and terminate any Exclusive or Nonexclusive Licenses for CRADA Inventions Made in whole or in part by Government employees in the event that:

- a) Collaborator is in default for failure to make payment as agreed to herein; or
- b) The CRADA is terminated unilaterally by Collaborator under Article; 4.6.2.2; or
- c) Collaborator fails to perform according to the Joint Work Plan; or
- d) Collaborator becomes a new or different foreign owned, controlled, or influenced (FOCI) organization that is reasonably determined by Government not to qualify under the requirements of Executive Order 12591, Section 4(a).

5.7 Use of Licensed Software. Neither Party may incorporate any Computer Software (including but not limited to Open Source Software) into a CRADA Work that is subject to License requirements which (a) creates, or purport to create, obligations on the Government (e.g. indemnification); (b) grants, or purport to grant, to any third party any rights or immunities in or to the CRADA Work or any Background Technology; (c) causes the CRADA Work or any Background Technology to be subject to any licensing terms or obligations that would require the CRADA Work or any Background Technology to be disclosed or distributed (whether or not in source code form), to be licensed for the purpose of making derivative Works, or to be redistributed free of charge; or (d) purports to modify the terms of the CRADA, unless the Party first identifies the proposed Computer Software and provides a copy of the applicable License for review and receives written approval by the other Party. This restriction applies to Collaborator's subcontractors and any others performing work under this CRADA and shall be made part of any contract with such subcontractors or third-parties.

5.8 Trademarks. All trademarks or service marks to be used by either Party in performing the obligations under the Joint Work Plan must be identified. A description of how the trademark or service mark will be used and rights of use by the other Party must be stated in the Joint Work Plan.

ARTICLE 6 – LIABILITY

6.1 Force Majeure. Neither Party will be liable for the consequences of any *force majeure* that (1) is beyond reasonable control; (2) is not caused by the fault or negligence of such Party; (3) causes such Party to be unable to perform its obligations under this CRADA; and (4) cannot be reasonably overcome by the exercise of due diligence. In the event of the occurrence of a *force majeure*, the Party unable to perform will promptly notify the other Party. The Parties will suspend performance only for such period of time as is necessary to overcome the result(s) of the *force majeure* and will use its best efforts to resume performance as quickly as possible.

6.2 Indemnification and Liability. Collaborator agrees to hold the Government harmless and to indemnify the Government for all liabilities, demands, damages, actual

out-of-pocket expenses and losses arising out of the use by Collaborator, or any party acting on its behalf or under its authorization of Government's research and technical developments or out of any use, sale or other disposition of products made by the use of Government's research and technical developments, for any purpose of the CRADA unless due to the negligence or willful misconduct of the Government, or Government's employees. Each Party otherwise will be liable for any claims or damages it incurs in connection with this CRADA, except the Government, as an agency of the U.S. Government, assumes liability only to the extent provided under the Federal Tort Claims Act, 28 U.S.C. Chapter 171.

6.3 Collaborator's Employees. Collaborator hereby indemnifies and holds harmless the Government for any loss, claim, damage, or liability of any kind involving an employee of Collaborator, arising in connection with Collaborator's performance under this CRADA, except to the extent that such loss, claim, damage or liability arising from the negligence of the Government or its employees, as specified in the provisions of the Federal Tort Claims Act.

ARTICLE 7 – FINANCIAL OBLIGATIONS

7.1 Parties Payment of Costs/Fees. Except as otherwise stated in the Joint Work Plan, each Party will bear its own expenses and costs, including but not limited to costs of labor, supplies, materials, Patent Applications, prosecutions and maintenance, equipment, overhead, and other expenses (hereafter "costs/fees"), direct and indirect, in the performance of work under this CRADA.

7.2 Government. Government will not provide any federal or other funds to the Collaborator under this CRADA.

7.3 Payment of Costs/Fees. In the event the Parties mutually agree in the Joint Work Plan that Collaborator will pay to the Government costs/fees, the purpose of such funds shall be described in and payment made as described in Articles 7.4 and 7.5. The Government will acknowledge to the Collaborator deposit of funds, and work under this CRADA can begin once funds have been deposited.

7.4 Payment Schedule. Collaborator agrees to pay Government the following costs/fees in accordance with the payment schedule as described below or as set forth in the Joint Work Plan.

None.

Payments made by check by the Collaborator to the Government under this Article will be made payable to CCDC Ground Vehicle Systems Center and include CRADA number on the check and mailed to the following address:

**Office of Research Technology Applications
CCDC Ground Vehicle Systems Center**

6501 E. 11 Mile Road, MS 221
Warren, MI 48397-5000

7.5 Insufficient and Excess Funds.

7.5.1 Insufficient Funds. Government may discontinue performance under this CRADA if the funds provided by the Collaborator for performance by the Government are insufficient or are not provided as specified in Article 7.4. In the event the Collaborator fails to tender to the Government the required payment within fifteen (15) days after its respective due date, the Collaborator will be in default under this CRADA for failure to make payments. If the Collaborator is in default for this reason, the Government will notify Collaborator. If Collaborator does not cure the default within fifteen (15) days of mailing date of the Notice, the Government may proceed to terminate this CRADA in accordance with Article 4.6.2., may cancel any option for an Exclusive License to a CRADA Invention, and may terminate any Exclusive License granted pursuant to this CRADA.

7.5.2 Excess Funds. In accordance with agency policy, funds that Collaborator paid under Article 7.4 and that the Government has not obligated or expended at the time of completion, expiration, or termination of this CRADA will be returned to the Collaborator.

7.6 Accounting Records. The Government will maintain current accounts, records, and other evidence supporting all its expenditures against funding provided by Collaborator under this CRADA and will retain the records for at least twelve (12) months after the completion, expiration, or termination of this CRADA.

SECTION II – JOINT WORK PLAN

NOVEL & EMERGING TECHNOLOGY EXPLOITATION (NETE)

ARTICLE A - PROJECT DESCRIPTION

To the Stars Academy of Arts and Science is a company with materiel and technology innovations that offer capability advancements for Army ground vehicles. These technology innovations have been acquired, designed, and produced by the Collaborator, leveraging advancements in metamaterials and quantum physics to push performance gains. The Collaborator will share their innovations with the Government, who will use its laboratories and resources to characterize the technologies and determine if they have appropriate applications on ground vehicles.

ARTICLE B - OBJECTIVES

B.1. CRADA Objective.

The Collaborator has access to advanced materiel solutions. The Government would like to assess, test, and characterize the products from the Collaborator at Government facilities to compare the capabilities of these advancements to known commodities, understand what facilities would be required to reproduce the advancements, and determine their applications for ground vehicle platforms.

B.2. Benefit to Government.

If the Government can verify materiel solutions claims by the Collaborator, then significant advancements can be made in the capabilities of Army ground vehicle platforms in terms of security, force protection and weight reduction.

B.3. Benefit to Collaborator.

The collaboration described within this document enables the Collaborator to understand the performance of their materiel innovations in Army ground vehicle environments and benchmark that capability against existing technology capabilities. This CRADA will benefit the Collaborator by providing guidance, recommendations, additional data and results collected from Government testing.

ARTICLE C - PARTIES AND OTHER PARTICIPANTS

C.1. Relationship of Parties.

The Collaborator contacted Government about the innovations within their hold and proposed joint research. The Collaborator is a public benefit company with limited resources. Collaborator leaders are prior Government employees who understand the value that materiel solutions can provide for the Warfighter. Government personnel recognize the value of the technologies described and can provide Government facilities to asses, test, and characterize the technologies for better understanding the performance described and compare them against accepted standards.

C.2. Other Participants

The other contributors for this effort are:

- 1) The Office of the Secretary of Defense (OSD) can share historical reports of findings and origin of materiel solutions in the possession of the Collaborator.

ARTICLE D - TECHNICAL TASKS AND ASSOCIATED RESOURCES

D.1. Government Activity.

Government shall:

1. Perform assessments, testing, and characterization of Collaborator-provided technologies. The Government is interested in a variety of the Collaborator's technologies, such as, but not limited to inertial mass reduction, mechanical/structural metamaterials, electromagnetic metamaterial wave guides, quantum physics, quantum communications, and beamed energy propulsion.
2. Provide Subject Matter Expertise technical support, guidance, evaluation, and temporary duty, as required and at the discretion of the Government.
3. Share all unclassified test results pertaining to Collaborator technologies in compliance with applicable SCGs.
4. Author report(s) to document the testing conducted and the performance achieved during those tests.
 - a) The Government will share the reports with the Collaborator at the conclusion of this effort.
5. Sponsor all appropriate security clearances necessary for work under this effort.
 - a) Provide necessary clearance to appropriate classified material(s) through a DD254.
6. Return Collaborator-provided materials at the conclusion of testing and evaluation.
7. The total value of anticipated USG resources, including personnel, services provided, Intellectual Property, facilities, equipment, and reporting through the course of this effort is estimated at \$750k.
8. Secure storage of technology and artifacts of sensitive nature.

D.2. Collaborator Activity.

Collaborator shall:

1. Provide SMEs in the designated areas of study, including physics, material science, and field collections.
2. Share knowledge, exploratory research, pertinent internal reports, and results (reports) of prior testing with respect to material, material science, and advanced technologies with USG personnel.
3. Provide the agreed upon materiel technologies for USG testing and evaluation.
 - a) Metamaterial: Samples of mechanical and EM sensitive metamaterial collected, obtained, or developed as part of its Field Operations
 - b) Material Analysis: Written data, information, and analysis related to tested materials
 - c) Quantum Communication:
 - 1) Related research to-date on theories, studies, mathematical formulas, and prototypes

- 2) Future developments, prototypes, and hardware associated with the specific quantum product
- d) Beamed Energy Propulsion
 - 1) Launch vehicles, vehicle prototypes, and systems obtained or possessed
 - 2) Data associated with testing, developing, and improving persistence and stability of launch vehicles or launch systems
 - 3) Proposed application of these systems
- e) Active Camouflage and Directed Photon Projection
 - 1) Projection systems
 - 2) Technology associated with these systems
 - 3) Material projection surfaces
 - 4) Proposed applications of these systems
4. Provide secure shipping of Collaborator technologies to the Government.
5. The total value of the Collaborator's participation (personnel, services, Intellectual Property, facilities, equipment or other resources) is estimated at \$1M, but will be determined by business needs and funding availability.

D.3. Joint Activity.

Both Parties shall jointly:

1. Share current knowledge on existing material and available data (if any).
2. Use available resources to design and prepare samples testing/evaluation where appropriate
3. Develop test and evaluation plans for material or equipment under evaluation.
4. Consolidate testing/evaluation results and include in a jointly developed report that will be provided to both the Collaborator and Government. This reporting shall summarize testing conducted, characterizations of the technology performance, and suggested next steps or opportunities for the technologies.

D.4. Property and Equipment.

Unless specified in paragraphs D.1 and D.2, no property nor equipment will be furnished by either party under this CRADA.

ARTICLE E - INTELLECTUAL PROPERTY

E.1. Background Technology.

E.1.1. Collaborator's Background Technology.

Collaborator's prior research, discoveries, and proprietary designs for the materiel solutions provided to Government are exclusive property of the Collaborator. That information shall remain owned by the proprietor with the rights by the U.S. Government for the testing described within this document.

E.1.2. Government's Background Technology.

None.

E.2. Marking of Background Technology.

All Background Technology will be identified as such with a marking. For example:

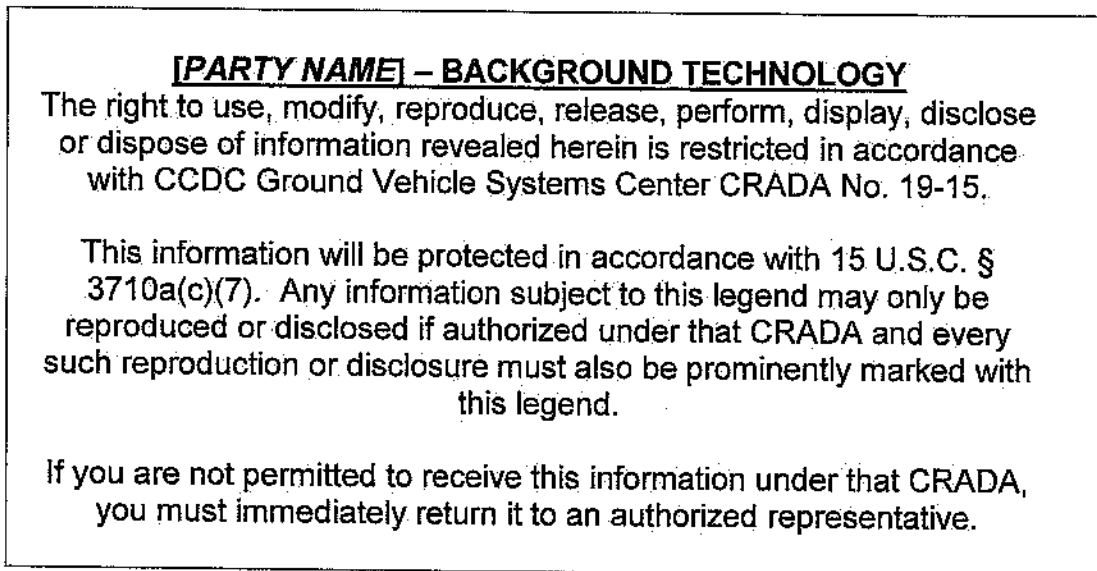


Fig 1. Marking of Background Technology

E.3. Marking of Proprietary Information.

All Proprietary Information will be identified as such with a marking. For example:

[PARTY NAME] – PROPRIETARY INFORMATION

The right to use, modify, reproduce, release, perform, display, disclose or dispose of information revealed herein is restricted in accordance with CCDC Ground Vehicle Systems Center CRADA No. 19-15. This information will be protected in accordance with 15 U.S.C. § 3710a(c)(7). Any information subject to this legend may only be reproduced or disclosed if authorized under that CRADA and every such reproduction or disclosure must also be prominently marked with this legend.

If you are not permitted to receive this information under that CRADA, you must immediately return it to an authorized representative.

Fig 2. Marking of Proprietary Information

ARTICLE F - DELIVERABLES

F.1. Reports.

At the conclusion of each fiscal year, the Government shall complete reporting of testing conducted, inclusive of characterization of the technologies, findings, observations, and recommendations. The Collaborator shall contribute to the reports with their scientist analysis. Any CRADA Inventions Made and other Intellectual Property developed or Created, including Works, and their respective owners and licensees, shall be identified and agreed to by all parties involved. Government and Collaborator have the opportunity to request additional detail from the Report preparer, if it is deemed necessary to better understand the technical progress made, identify problems encountered, and establish goals and objectives requiring further effort. The reports shall be authored in Microsoft Word in a Government format. Final drafts shall be converted to PDF. All reports delivered under this CRADA shall be shared with all parties involved, subject to appropriate class guides.

F.2. Other Deliverables.

No additional deliverables are anticipated within the scope of this CRADA.

ARTICLE G - MILESTONES

Activity	Start	End	Reference to Joint Work Plan	Notes
Technical Work	10/1/2019	30 Sep 2023	D.1.1, D.1.6	
Milestone/Review FY20	9/1/2020	9/30/2020	D.1.1	
IP Review FY20	9/1/2020	9/30/2020	D.1.6	
Milestone/Review FY21	9/1/2021	9/30/2021	D.1.1	
IP Review FY21	9/1/2021	9/30/2021	D.1.6	
Milestone/Review FY22	9/1/2022	9/30/2022	D.1.1	
IP Review FY22	9/1/2022	9/30/2022	D.1.6	
Milestone/Review FY23	9/4/2023	9/29/2023	D.1.1	
IP Review FY23	9/4/2023	9/29/2023	D.1.6	
CRADA Closeout	9/4/2023	9/29/2023		
Other Activities				
- Monthly communications				
- Tests				
- Status Reports				

SECTION III - SIGNATURES

I. Expiration. This CRADA expires sixty (60) months from the Effective Date unless duly modified in accordance with paragraph 4.6 and attached hereto.

II. Survivability of Rights and Responsibilities. All rights and responsibilities of the Parties under this CRADA, including any Modifications, shall survive the completion, expiration or Termination of this CRADA. In the event that one or more provisions of this CRADA are determined by a federal Court not to be valid, the remaining rights and responsibilities of the Parties will survive and be enforced. At least the Articles for Reports, Indemnification, Title to Property and Publications will survive.

III. Entire CRADA. This CRADA and its counterparts constitute the entire agreement between the Parties concerning the subject matter of this CRADA and supersede any prior understanding or written or oral agreement relative to said matter.


IV. IN WITNESS WHEREOF, the Parties have executed this CRADA in duplicate through their duly authorized representatives having authority to execute this CRADA as follows:

For Government:

For Collaborator:



Jeffrey L. Langhout
Director, Combat Capabilities
Development Command
Ground Vehicle Systems Center



Kari DeLonge, Officer
To The Stars Academy of Arts and
Science, Inc.

Date 10 OCT 2019

Date 10/10/19