

Topic: N142-098

RMCI, Inc.

Universal Decoder for Airborne Generated Data

Data recording systems (including flight data recorders and health and usage monitoring systems) generate encoded digital files capturing system states, subsystem performance, structural loads, and other parameters. This information is extremely useful, but it is often stored in closed/proprietary file formats. RMCI has developed a universal data decoder technology called Intelligent Data File Interpretation™ (IDFI™). The IDFI™ software uses novel algorithms to quickly and efficiently decode these complex data files into common, usable formats. It is faster and more effective than manual format discovery, and it significantly reduces the labor required for data translation. It also eliminates the need for expensive single-format decoding tools and reduces risks associated with format changes. By increasing the accessibility of data, the IDFI™ tool will significantly improve program efficiency and performance for any organization with closed-format binary data.

Technology Category Alignment:

Fixed Wing Vehicles (includes UAS)

Rotary Wing Vehicles

Fixed Wing Vehicles (includes UAS)

Information Collection/Management

Maintainability/Sustainability

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SYSCOM: NAVAIR

Contract: N68335-16-C-0314

 Corporate Brochure: https://navystp.com/vtm/open_file?type=brochure&id=N68335-16-C-0314

Department of the Navy SBIR/STTR Transition Program

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NAVAIR 2017-681

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Universal Decoder for Airborne Generated Data

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WHO

SYSCOM: NAVAIR

Sponsoring Program: PMA 209

Transition Target: Military Flight Operations Quality Assurance (MFOQA) program

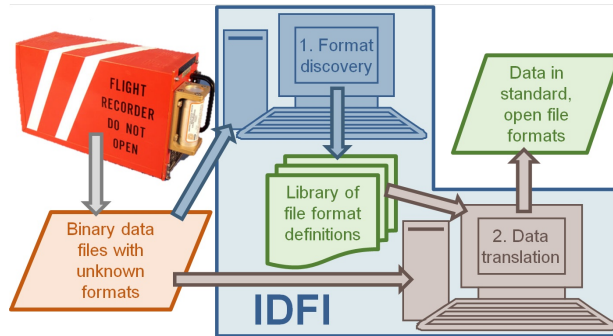
TPOC:

(301)757-0894

Other transition opportunities:

This technology is applicable to a wide variety of binary data, especially files and data streams that contain multiple values from multiple parameters. PMA-209, the NTSB, the Air Force Safety Center, the U.S. Army Combat Readiness Center, and the U.S. Army Aviation and Missile Research Development and Engineering Center are all potential users. Non-aviation organizations could also use this software to increase access to recorded data, develop specifications for replacing obsolete components, and break vendor lock for components with proprietary file formats.

Notes: DoD Instruction 6055.19 (April 11, 2017), titled "Aviation Hazard Identification and Risk Assessment Programs (AHIRAPs)," directs DoD Components to develop, implement, and maintain MFOQA programs.



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WHAT

Operational Need and Improvement: Data recording systems (including flight data recorders and health and usage monitoring systems) generate encoded digital files capturing system states, subsystem performance, structural loads, and other parameters. No standard format is currently prescribed for this type of airborne data storage, which results in limitations in reading, interpreting, and aggregating the data. Applications designed to be system (or platform) agnostic that provide off-vehicle data analysis can be extremely challenged in an environment where the input data structure is unknown or unique.

Specifications Required: The initial release of the software will decode frame-based data files, including those based on the ARINC-717 and ARINC-767 standards.

Technology Developed: RMCI has developed a universal data decoder technology called Intelligent Data File Interpretation™ (IDFI™). The IDFI software uses novel statistical analysis techniques to make inferences about the content of files that would be difficult or impossible for a human to make alone. The software's format discovery process combines these novel algorithms with human input in a cooperative approach in order to create a decoder that is robust against changes in file formats or the introduction of new formats. The IDFI translation process can be used in manual or batch mode and decodes input files to a variety of open file formats for easy analysis with existing tools.

Warfighter Value: The IDFI software reduces cost, time, and risk. It is much faster and more effective than using the current manual format discovery process, and its automated batch processing significantly reduces the labor required for data translation. Because the IDFI software is applicable to many different file formats, it eliminates the need for and cost of single-format decoding tools, and its flexibility reduces risks associated with format changes. By automatically translating data from different platforms into a common, open format, it enables the use of existing data in the optimization of operations and logistics to increase overall program efficiency.

WHEN

Contract Number: N68335-16-C-0314 **Ending on:** June 15, 2018

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Successful completion of Phase I Base effort	N/A	Demonstration of feasibility	3	April 2015
Successful completion of Phase I Option effort	N/A	Expansion of prototype functionality	4	December 2015
Successful test of prototype	N/A	Accurate translation of sample file using prototype	5	December 2016
Beta-level software tested and delivered	Low	Accurate translation of sample files	7	May 2018
Software packaged as commercial product	Med	Test and demonstration of releasable software	8	March 2019

HOW

Projected Business Model: RMCI will sell IDFI software licenses to the Government, prime contractors, and others. RMCI will work with these users to improve the software and add features as new requirements are identified. RMCI will also use this technology to offer file format discovery services.

Company Objectives: RMCI's goal is to produce a successful software product that is used in the Navy's MFOQA program and throughout the DoD aviation community. In the immediate future, RMCI is seeking aviation customers who need improved access to their data sets to expand their capability and capacity.

Potential Commercial Applications: The IDFI software can provide the same benefits to commercial aircraft operators that it provides to the military. Furthermore, any group with proprietary-formatted binary files or data streams that contain multiple values from multiple parameters can benefit from this technology. This novel capability will significantly reduce the time and effort associated with discovering file formats and performing data translations.

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