



CTN Test Report
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Technical Publication Transfer Test with Pratt & Whitney: MIL-M-28001 (SGML) and MIL-D-28000 Class I (IGES)

Quick Short Test Report

February 16, 1990

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Prepared for
Air Force Logistics Command
AITI Project



Lawrence Livermore National Laboratory

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Contents

1	Test Parameters	1
2	1840A Analysis	2
3	SGML Analysis	3
4	IGES Analysis	4
5	Conclusions and Recommendations	5

1 Test Parameters

Test Plan: CTN89-TM-02

Date of Evaluation: August 1, 1989

Evaluators: Syscon Corporation
3990 Sherman Street
San Diego, CA 92110

Lawrence Livermore National Laboratory
P.O. Box 808, L-542
Livermore, CA 94550

Data Originator: Pratt & Whitney
Government Engine Business
P.O. Box 109600
West Palm Beach, FL 33410-9600

Data Description: Work Package for the F100-PW-229 ENGINE
1 document declaration file
1 text file
27 IGES files

Data Source System:

Text/SGML Wang VS300, O/S 7.1400
Manually tagged SGML, using WP+
NIST SGML Parser, modified by Pratt & Whitney
Sun 3/160 Workstation running Unix V4.2

IGES Apollo platform running Auto-trol Series 5000

Evaluation Tools Used:

1840A CTN TAPEVAL (0.8) VAX/VMS

SGML Exoterica (Checkmark 5-30)

IGES IGES Data Analysis, Inc. Parser/Verify
Rosetta Technologies, Inc. PreVIEW

Standards Tested: MIL-STD-1840A Notice 1 (1840A)
MIL-M-28001 (28001)
MIL-D-28000 Amendment 1 (28000) Class I

2 1840A Analysis

2.1 External Packaging

All packaging and external labeling of the Pratt & Whitney tape was in conformance to the 1840A standard.

2.2 Transmission Envelope

2.2.1 Tape Formats

All of the files on the tape had the correct record formats, record lengths, and block sizes. Analysis of the ANSI header labels indicated that EOF2 did not match HDR2 for each of the file types (document declaration, text, and IGES files). This was caused by an oversight in Pratt & Whitney's ANSI tape writing software which has since been corrected.

2.2.2 Declaration Files and Header Fields

The CTN's TAPEVAL log file was analyzed for 1840A declaration file and header field errors. Three errors were reported indicating that the "dteisu:" and "dtetrn:" records of the document declaration file were incorrect. After manual examination of these record values, it was determined that they were legal but were not left justified. The TAPEVAL software was expecting the date to start immediately after the space delimiter following the record header identifiers. The third error indicated that the "txfilid:" contained an illegal value. After subsequent examination, this also was determined to be a legal value, but since it was not left justified, was misinterpreted by the TAPEVAL program.

3 SGML Analysis

A brief analysis was performed on the SGML text file. Due to the fact that no work package DTD existed, Pratt & Whitney composed its own DTD and sent it with the tape to parse the document. It was loaded and used with the parser. The DTD was missing the Notation Declaration for the IGES entities declared for the graphic board numbers. Furthermore, the instance file was found to contain a different hex representation for all occurrences of the "|" character than the test platform expected. It was determined that this hex representation was a characteristic of Pratt & Whitney's computer system, highlighting the point that even though the document was placed in a neutral data format, system characteristics can still cause problems. After correcting the Notation Declaration and the character problem, the document would parse according to the DTD sent with the document.

4 IGES Analysis

Overall, the IGES files contained nearly correct representations of the illustrations, however the files did not conform to 28000 Class I. Pratt & Whitney suspected its IGES processor would not conform before submitting the data, but felt that the testing would still be worthwhile. The areas of non-conformance were:

1. None of the files contained the CALS required Drawing and View Entities.
2. Some files contained non-Class I entities such as the Point (116) and Copious Data Coordinate Triples (106 Form 12) Entities.
3. The entities were on various layers instead of all on layer zero as 28000 Class I requires.
4. The z-depth of every entity was not zero as 28000 Class I requires.
5. Several Global Section Parameters were defaulted that should not have been.
6. The files were written to IGES Version 1.0, not 3.0 or higher as 28000 requires.

Since the files were produced from a processor writing to IGES Version 1.0 (an older version of the IGES Specification), they were large and made up of basic entities. As an example, all circles, ellipses, and most pieces of text were represented by Copious Data Entities (small, joined line segments). Furthermore, due to the non-allowed Point Entities, the test platform's viewing package displayed similar but not exact graphics to those sent by Pratt & Whitney. This dissimilarity occurred because Pratt & Whitney's CAD system did not display the point display symbol, yet the test platform's viewing package did. This is an example of why the Point Entity is not allowed in Class I; the CAD packages produce slightly different illustrations due to their differing representations of this point display symbol.

5 Conclusions and Recommendations

In summary, the Pratt & Whitney tape contained non-ANSI standard header labels. The external packaging was in conformance with the standard, and all of the 1840A headers were correct. As a general observation, it was noted that data for the 1840A header records were not left justified (they contained preceding spaces). The CTN recommends that the standard state that data start immediately after the blank that follows the record identifier (be left justified).

Furthermore, Pratt & Whitney's IGES files did not conform to 28000 Class I, yet contained nearly correct graphics. As a result, Pratt & Whitney will continue to upgrade its CAD system to the newest versions available; these releases will undoubtedly produce more advanced and 28000-compliant IGES data.

Lastly, the CTN feels that the issue of "data quality" must be addressed. An example of "good" quality would be the use of the higher order (usually more compact) Class I entities such as circles, ellipses, and splines. An example of "poor" quality would be to represent these entities as Copious Data Entities, as was demonstrated in this test. The CTN recommends that data quality should be specified in the CALS standards or that the Standards should require it to be specified in a contract.