



CALS TEST NETWORK

**CTN Test Report
93-013**

**AFCTB-ID
92-072**



**Computer Graphics Metafile
Transfer Using:**



Texas Instruments Data



MIL-D-28003 (CGM)



Quick Short Test Report

27 October 1992



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Prepared for
Electronic Systems Center

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1. Introduction

1.1 Background

The Department of Defense (DoD) Computer-aided Acquisition and Logistics Support (CALs) Test Network (CTN) is conducting tests of the military standard for the Automated Interchange of Technical Information, MIL-STD-1840A, and its companion suite of military specifications. The CTN is a DoD sponsored confederation of voluntary participants from industry and government, managed by the Electronic Systems Center (ESC).

The primary objective of the CTN is to evaluate the effectiveness of the CALs standards for technical data interchange and to demonstrate the technical capabilities and operational suitability of those standards. Two general categories of tests are performed to evaluate the standards; formal and informal.

Formal tests are large and comprehensive tests, which follow a written test plan, require specific authorization from the DoD, and may take months to prepare, execute, and report.

Informal tests are quick and shorts, used by the CTN technical staff, to broaden the testing base. They include representative samples of the many systems and applications used by CTN participants. They also allow the CTN staff to gain feedback from many industry and government interpretations of the standards, increase the base of participation in the CALs initiative, and respond to the many requests for help that come from participants. Participants take part voluntarily, benefit by receiving an evaluation of their latest implementation (interpretation) of the standards, interact with the CTN technical staff, gain experience using the standards, and develop increased confidence in them. The results of informal tests are reported in Quick Short Test Reports (QSTRs) that briefly summarize the standard(s) tested, the hardware and software used, the nature of the test, and the results.

1.2 Purpose

The purpose of the informal test, reported in this QSTR, was to analyze Texas Instruments' interpretation and use of the CALS standards in transferring Computer Graphics Metafile data. Texas Instruments used its CALS Technical Data Interchange System to produce data, in accordance with the standards, and delivered it to the CTN technical staff on a 9-track magnetic tape.

2. Test Parameters

Test Plan: AFCTB 92-072

Date of Evaluation: 27 October 1992

Evaluator: George Elwood
Air Force CALS Test Bed
HQ ESC/ENCS
4027 Colonel Glenn Hwy
Suite 200
Dayton, Ohio 45431-1601

Data Originator: Sheridan Hales
Texas Instruments
M/S 8420
6500 Chase Oaks Boulevard
P.O. Box 869305
Plano, TX 75086

Data Description: Technical Manual Test
1 Document Declaration file
1 Computer Graphics Metafile (CGM) file

Data Source System:

CGM

HARDWARE

NCD X-Terminal
Sun 4/60
Cipher M995 GCR 9-Track Tape Drive

SOFTWARE

Art&Letters UNIX V1.2

Evaluation Tools Used:

MIL-STD-1840A (TAPE)

SUN 3/280

CTN Tapetool (v1.2.8) UNIX
AGFA Compugraphics CAPS/CALS v40.4

MIL-D-28003 (CGM)

SUN SparcStation 2

ArborText *cgm2draw*

Island Graphics *IslandDraw 3.0*

Sun 3/60

Advanced Technology Center

(ATC) *CGM-View R2.0*

Cheetah Gold 486

ATC *MetaVIEW R 1.12*

ATC *MetaCHECK R 2.05*

Software Publishing Corporation

(SPC) *Harvard Graphics 3.0*

Xerox Ventura Publisher

Standards

Tested:

MIL-STD-1840A

MIL-D-28003

3. 1840A Analysis

3.1 External Packaging

The tape arrived at the Air Force CALS Test Bed (AFCTB) enclosed in a box in accordance with ASTM D 3951. The exterior of the box was marked with the magnetic tape warning label, as required by MIL-STD-1840A, para. 5.3.1.3.

The tape was enclosed in a barrier bag as required by MIL-STD-1840A, para. 5.3.1.2. Inspection of the tape reel showed the label indicating the recording density as required by MIL-STD-1840A, para. 5.3.1. Enclosed in the box was a packing list showing all files that were recorded on the tape.

3.2 Transmission Envelope

The 9-track tape received by the AFCTB contained MIL-STD-1840A files. The files were named per the standard conventions.

3.2.1 Tape Formats

The 1840A tape was run through the CTN *Tapetool v1.2.8* utility. No errors were encountered while evaluating the contents of the tape labels.

3.2.2 Declaration and Header Fields

No errors were found in the Document Declaration file or Data File Header.

4. IGES Analysis

No Initial Graphics Exchange Specification (IGES) files were included on this tape.

5. SGML Analysis

No Standard Generalized Markup Language (SGML) files were included on this tape.

6. Raster Analysis

No Raster files were included on this tape.

7. CGM Analysis

One CGM file was included on this tape. The file was evaluated using ATC's *MetaCHECK* software with CALS options. This utility reported that the file does not meet the CALS MIL-D-28003 specification, because it lacks the CALS statement. The CTN *validcgm* reported the same error. An example of the error message is shown below:

```
Error 6501: Element Class/ID: 1/2   Offset: 42 octets Element No. 3
The METAFILE DESCRIPTION string is invalid; it lacks the phrase
"MIL-D-28003/BASIC-1" required by the Profile.
```

The file also exhibited a basic CGM error but the file was reported as meeting basic CGM requirements. An example of the error message is shown below:

```
Bulletin 20027: Element Class/ID: 4/7   Offset: 366 octets Element No. 21
Warning; a foreground color has been defined and referenced by a primitive,
while the background color has not been defined.
```

The file was imported into various CGM capable utilities available in the AFCTB with differing results. The file was converted using ArborText's *cgm2draw* utility. The resulting file was then read into Island Graphics' *IslandDraw*. The resulting text was backward. The graphic image appeared to be correct.

The file was displayed and printed using ATC's *CGM-View*. No errors were reported but the file had text that was backward. It appeared that the entire image was reversed.

The file was imported into SPC's *Harvard Graphics v3.0*. One error was reported on clipping. The resulting image had text that was backward on the screen and hard copy. The entire image was reversed.

The file was imported directly into Island Graphics' *Island-Draw*. The image was correct, and the text appeared correctly on the screen and hard copy.

The file was read into ATC's *MetaVIEW* and displayed. The image appeared to be upside down. No text displayed because of the black background. No errors were reported during this procedure.

The file was imported directly into the Xerox Ventura *Publisher*. The display and hard copy appeared to be correct.

The CGM file does not meet the CALS MIL-D-28003 specification, because of the missing CALS statement.

8. Conclusions and Recommendations

In summary, the MIL-STD-1840A tape from Texas Instruments was correct. The tape could be read properly using the CTN Tapetool and AGFA CAPS without reported error.

The included CGM file does not meet the CALS MIL-D-28003 specification, because it lacks the required CALS phrase. The file was imported into various CGM tools available in the AFCTB with varying degrees of success. The most notable error was the reversing of the text.

The tape does not meet the CALS MIL-STD-1840A requirements, due to an error in the CGM file.

9. Appendix A - Tapetool Report Logs

9.1 Tape Catalog

CALS Test Network Catalog Evaluation - Version 1.2; Release Number 8

Standards referenced:

MIL-STD-1840A (1987) - Automated Interchange of Technical Information

MIL-R-28003 (1988) - Digital Representation For Communication Of
Illustration Data; CGM Application Profile

ANSI X3.27 (1987) - File Structure and Labeling of Magnetic Tapes
for Information Interchange

ANSI X3.4 (1986) - Coded Character Sets - 7 Bit ASCII

Mon Oct 26 16:28:20 1992

MIL-STD-1840A File Catalog

File Set Directory: /cals/tapetool8/Set106

Page: 1

File Name	File Type	Record Format/ Length	Block Length/Total	Selected/ Extracted
D001	Document Declaration	D/00260	02048/000001	Extracted
D001C001	CGM	F/00080	00800/000045	Extracted

Catalog Process terminated normally.

9.2 Tape Evaluation Log

CALS Test Network Tape Evaluation - Version 1.2; Release Number 8

Standards referenced:

ANSI X3.27 (1987) - File Structure and Labeling of Magnetic Tapes
for Information Interchange

ANSI X3.4 (1986) - Coded Character Sets - 7 Bit ASCII

Mon Oct 26 16:28:17 1992

ANSI Tape Import Log

Allocating tape drive /dev/rmt0...

/dev/rmt0 allocated.

VOL1CAL501 TI-TAPETOOL

4

Label Identifier: VOL1
Volume Identifier: CAL501
Volume Accessibility:
Owner Identifier:
Label Standard Version: 4

HDR1D001 CAL50100010001000000 92283 00000 000000TI-TAPETOOL

Label Identifier: HDR1
File Identifier: D001
File Set Identifier: CAL501
File Section Number: 0001
File Sequence Number: 0001
Generation Number: 0000
Generation Version Number: 00
Creation Date: 92283
Expiration Date: 00000
File Accessibility:
Block Count: 000000
Implementation Identifier: TI-TAPETOOL

HDR2D0204800260

00

Label Identifier: HDR2
Recording Format: D
Block Length: 02048
Record Length: 00260
Offset Length: 00

HDR2F0080000080

00

Label Identifier: HDR2
Recording Format: F
Block Length: 00800
Record Length: 00080
Offset Length: 00

***** Tape Mark *****

Actual Block Size Found = 800 Bytes.

Number of data blocks read = 45.

***** Tape Mark *****

EOF1D001C001 CALS0100010002000000 92283 00000 000045TI-TAPETOOL

Label Identifier: EOF1
File Identifier: D001C001
File Set Identifier: CALS01
File Section Number: 0001
File Sequence Number: 0002
Generation Number: 0000
Generation Version Number: 00
Creation Date: 92283
Expiration Date: 00000
File Accessibility:
Block Count: 000045
Implementation Identifier: TI-TAPETOOL

EOF2F0080000080

00

Label Identifier: EOF2
Recording Format: F
Block Length: 00800
Record Length: 00080
Offset Length: 00

***** Tape Mark *****

***** Tape Mark *****

End of Volume CALS01

End Of Tape File Set

Deallocating /dev/rmt0...

Tape Import Process terminated with 0 error(s), 0 warning(s),
and 0 note(s).

9.3 Tape File Set Validation Log

CALS Test Network File Set Evaluation - Version 1.2; Release Number 8

Standards referenced:

MIL-STD-1840A (1987) - Automated Interchange of Technical Information

Mon Oct 26 16:28:20 1992

MIL-STD-1840A File Set Evaluation Log

File Set: Set106

Found file: D001

Extracting Document Declaration Header Records...

Evaluating Document Declaration Header Records...

srcsys: Texas Instruments P.O.Box 869305 Plano, TX 75086

srcdocid: CALS Test Network Test Document 1

srcrelid: NONE

chglvl: ORIGINAL

dteisu: 19921009

dstsys: CALS TEST NETWORK AFLC LMSC/SJT WRIGHT-PATTERSON AFB, OHIO 44533-5001

dstdocid: TEXAS INSTRUMENTS TEST DOCUMENT 1

dstrelid: NONE

dtetrn: 19921009

dlvacc: NONE

filcnt: C1

ttlcls: UNCLASSIFIED

doccls: UNCLASSIFIED

doctyp: Product Data

docttl: NONE

Found file: D001C001

Extracting CGM Header Records...

Evaluating CGM Header Records...

srcdocid: NONE

dstdocid: NONE

txtfilid: NONE

figid: NONE

srcgph: NONE

doccls: UNCLASSIFIED

notes: NONE

Saving CGM Header File: D001C001_HDR

Saving CGM Data File: D001C001_CGM

Evaluating numbering scheme...

No errors were encountered during numbering scheme evaluation.

Numbering scheme evaluation complete.

Checking file count...

No errors were encountered during file count verification.

File Count verification complete.

No errors were encountered in Document D001.

No errors were encountered in this File Set.

MIL-STD-1840A File Set Evaluation Complete.

9.4 Other Tape Reading Logs

No errors were reported by the AGFA CAPS read1840A utility.

10. Appendix B - CGM Detail Analysis

10.1 File D001C001

10.1.1 Parser Log MetaCHECK

MetaCHECK Version 2.05 -- CGM/MIL-D-28003 Conformance Analyzer
Copyright 1988-91 CGM Technology Software
Execution Date: 10/27/92 Time: 07:54:39

Metafile Examined : \9272\d001c001.

Pictures Examined : All

Elements Examined : All

Bytes Examined : All

=====
===== Trace Report =====

Tracing not selected.

=====
===== CGM Conformance Violation Report =====

Bulletin 20027: Element Class/ID: 4/7 Offset: 366 octets Element No. 21
Warning; a foreground color has been defined and referenced by a primitive,
while the background color has not been defined.

=====
===== CALS CGM Profile (MIL-D-28003) Report =====

Error 6501: Element Class/ID: 1/2 Offset: 42 octets Element No. 3
The METAFILE DESCRIPTION string is invalid; it lacks the phrase
"MIL-D-28003/BASIC-1" required by the Profile.

=====
===== Conformance Summary Report =====

MetaCHECK Version 2.05 -- CGM/MIL-D-28003 Conformance Analyzer
Copyright 1988-91 CGM Technology Software
Execution Date: 10/27/92 Time: 07:54:47

Name of CGM under test: \9272\d001c001.

Encoding : Binary

Pictures Examined : All

Elements Examined : All

Bytes Examined : All

BEGIN METAFILE string : "CGM v1.2 A&L for direct color. "
METAFILE DESCRIPTION : "Arts & Letters Composer - (c) 1991 Computer
Support Corp. - CGM v1.2 "

Picture 1 starts at octet offset 270; string contains: "Start"

Conformance Summary : This file conforms to the CGM specification.

However, this file does not satisfy
the CALS CGM Profile (MIL-D-28003).

Summary of Testing Performed and Errors Found:

1 Pictures Tested
2951 Elements Tested
34906 Octets Tested

0 Illegal CGM Elements	1000 -	1999
0 Incorrect CGM Element Lengths	2000 -	2999
0 CGM State Errors	3000 -	3499
0 Required CGM Elements Missing or Wrong	4000 -	4499
0 CGM Parameter Values Out of Range	6000 -	6499
0 CGM Structure Errors	7000 -	7499
0 *** CGM Errors Found (total)	***	
0 Profile State Errors	3500 -	3999
0 Illegal Profile Elements	4500 -	4999
1 Profile Parameter Values Out of Range	6500 -	6999
0 Profile Data Limits Exceeded	8500 -	8999
0 Other Profile Constraints Violated	9500 -	9999
1 *** Profile Violations Found (total)	***	
1 Warnings (Advisory Remarks)	20000 -	20999

2 distinct errors and warnings were reported.

===== End of Conformance Report =====

10.1.2 validcgm Log

Analysis for file c001.cgm using table table

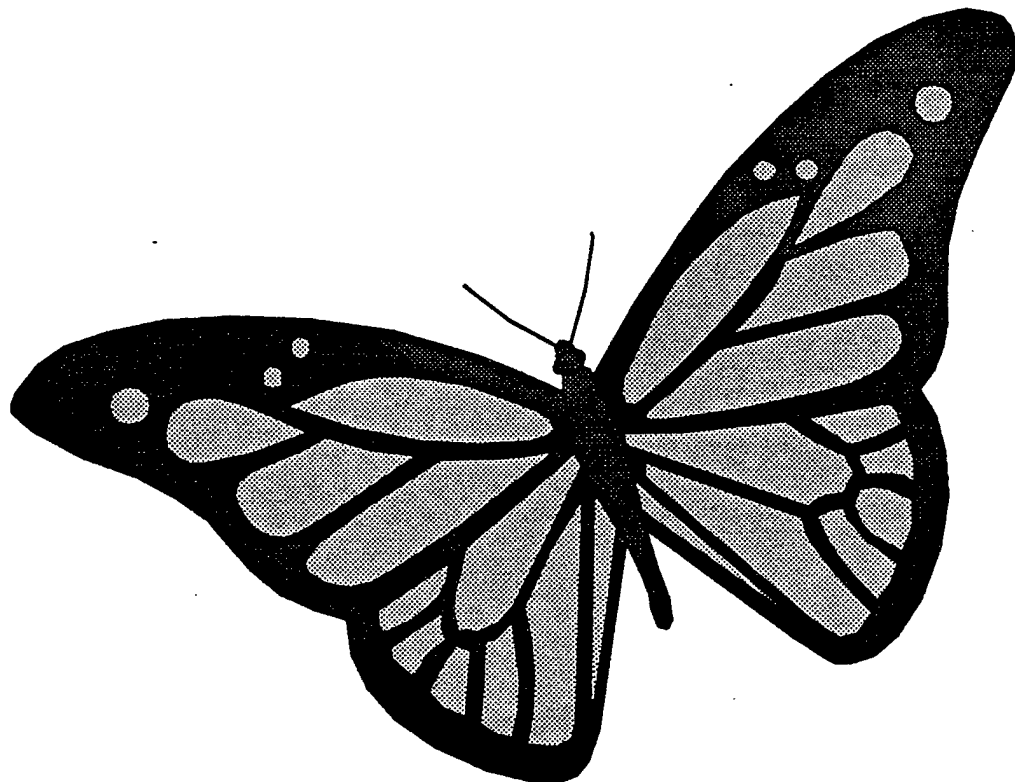
MILSPEC 28003 error: descriptor doesn't contain MIL-D-28003/BASIC-1

(3, 42) (1, 2, 72) Metafile Description "Arts & Letters Composer - (c) 19
Computer Support Corp. - CGM v1.2 "

(0, 1) occurred 1 time
(0, 2) occurred 1 time
(0, 3) occurred 1 time
(0, 4) occurred 1 time
(0, 5) occurred 1 time
(1, 1) occurred 1 time
(1, 2) occurred 1 time
(1, 3) occurred 1 time
(1, 7) occurred 1 time
(1, 8) occurred 1 time
(1, 10) occurred 1 time
(1, 11) occurred 1 time
(2, 1) occurred 1 time
(2, 2) occurred 1 time
(2, 3) occurred 1 time
(2, 6) occurred 1 time
(2, 7) never occurred, required by standard B
(3, 5) occurred 1 time
(4, 1) occurred 2226 times
(4, 7) occurred 92 times
(5, 3) occurred 61 times
(5, 4) occurred 154 times
(5, 22) occurred 154 times
(5, 23) occurred 154 times
(5, 30) occurred 92 times
(5, 35) occurred 1 time

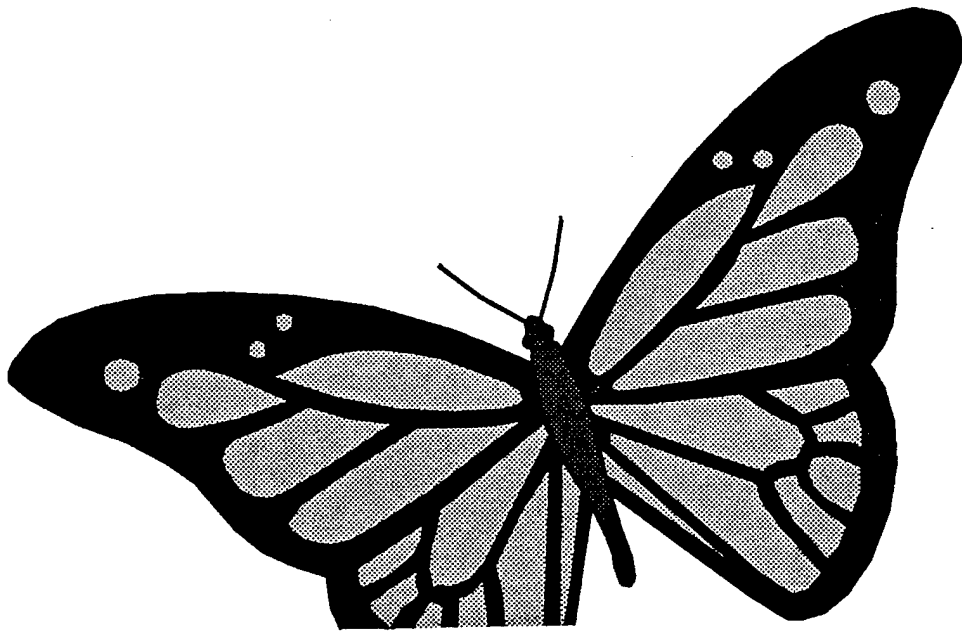
10.1.3 Output cgm2draw/IslandDraw

Arts & Letters Graphics Composer
for Sun Workstations. Version 1.2



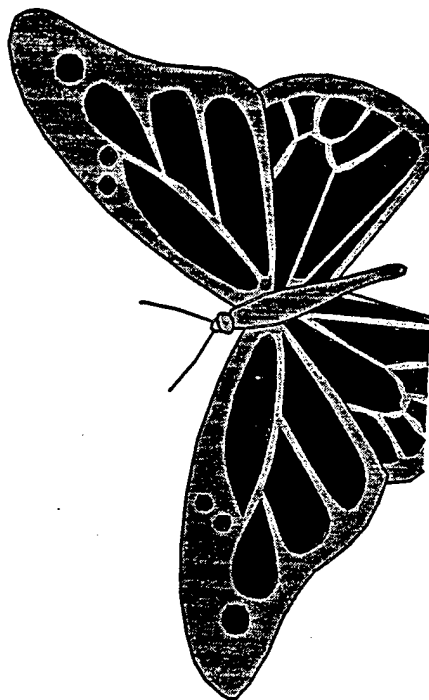
10.1.4 Output CGM-View

**Arts & Letters Graphics Composer
for Sun Workstations. Version 1.2**



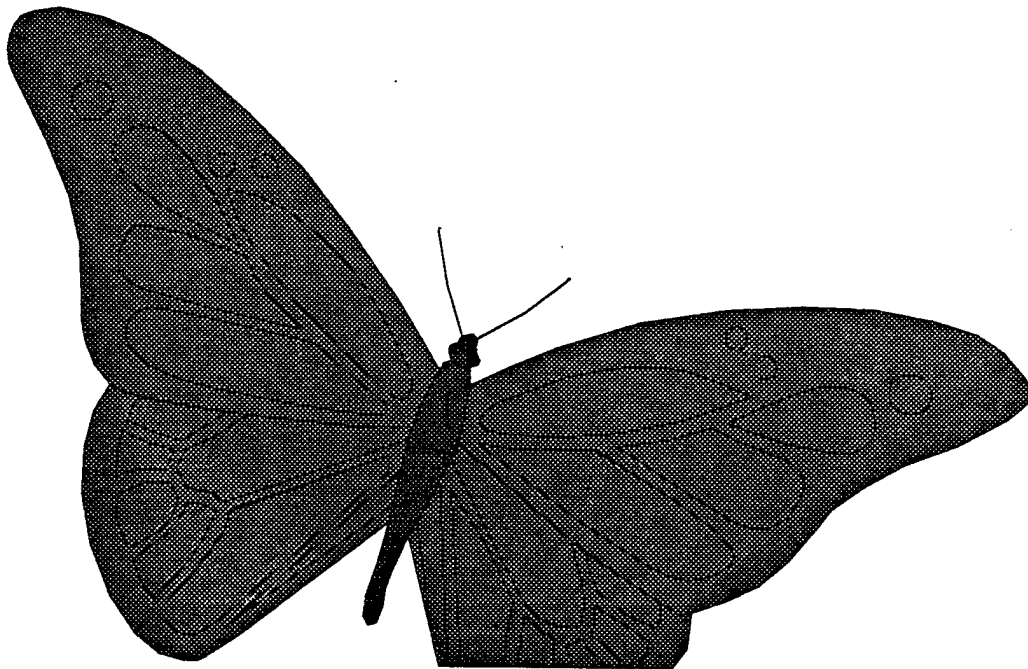
10.1.5 Output Harvard Graphics

for Sun Workstations. Version 1.5
Arts & Letters Graphics Composer.



10.1.6 Output IslandDraw

Arts & Letters Graphics Composer for Sun Workstations. Version 1.2



10.1.7 Output Ventura Publisher

Arts & Letters Graphics Composer for Sun Workstations. Version 1.2

