

AFCTN Test Report 94-056

AFCTB-ID
93-110



Technical Graphics Transfer

Using:



Auto-trol Technology's Data

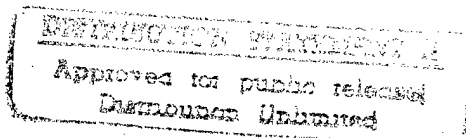


MIL-D-28003A (CGM)



Quick Short Test Report

15 December 1993



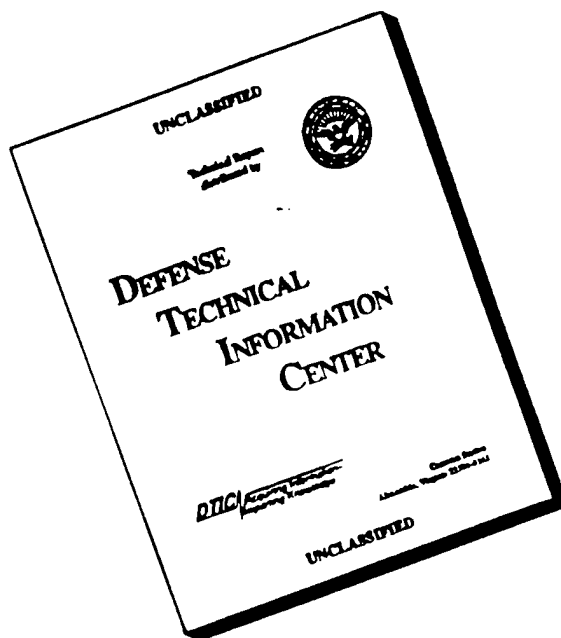
19960822 173



Prepared for
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**Technical Graphics Transfer
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Auto-trol Technology 's Data**

MIL-D-28003A (CGM)

Quick Short Test Report

15 December 1993

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1. Introduction

1.1 Background

The Department of Defense (DoD) Air Force Continuous Acquisition and Life-cycle Support (CALs) Test Network (AFCTN) 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 AFCTN is a DoD sponsored confederation of voluntary participants from industry and government managed by the Electronic Systems Center (ESC).

The primary objective of the AFCTN 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, 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 short, used by the AFCTN technical staff, to broaden the testing base. They include representative samples of the many systems and applications used by AFCTN participants. They also allow the AFCTN staff to gain feedback from many industry and government interpretations of the standards, to 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 AFCTN 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 Auto-trol Technology's interpretation and use of the CALS standards in transferring technical graphics data. Auto-trol used its CALS Technical Data Interchange System, which consist of Sun Sparcstation/SunOS hardware and Auto-trol Series 5000 v9.1 software, to produce data in accordance with the standards, and delivered it to the AFCTN technical staff using an electronic transfer via internet. The stated purpose of the test was to evaluate the data only. The CALS MIL-STD-1840A format data was not included.

2. Test Parameters

Test Plan: AFCTB 93-110

Date of
Evaluation: 15 December 1993

Evaluator: George Elwood
Air Force CALS Test Bed
DET 2 HQ ESC/AV-2P
4027 Colonel Glenn Hwy
Suite 300
Dayton OH 45431-1672

Data
Originator: Clayton Spears / Jeff Courtney
Auto-trol Technology
12500 North Washington Street
Denver CO 80241-2400
(303) 252-2604

Data
Description: Technical Manual Test
2 Computer Graphics Metafile (CGM) files

Data
Source System:

CGM

HARDWARE

Sun Sparcstation/SunOS

SOFTWARE

Auto-trol Series 5000 v9.1

Evaluation Tools Used:

MIL-D-28003 (CGM)

SUN SparcStation 2

AFCTN validcgm (B)

Carberry CADLeaf Plus v3.1

Island Graphics IslandDraw v3.0

Island Graphics IslandDraw v4.0

PC 486/50

Advance Technology Center
(ATC) *MetaCheck R 2.10*
Software Publishing Corporation
(SPC) *Harvard Graphics v3.05*
Inset Systems *HiJaak Pro*
Lotus *Freelance v2.01*
Micrografx *Designer v4.0*
Corel *Ventura Publisher*

Standards

Tested:

MIL-D-28003
MIL-D-28003A

3. 1840A Analysis

3.1 External Packaging

The files were sent electronically to the Air Force CALS Test Bed (AFCTB) using internet.

3.2 Transmission Envelope

Per agreement between Auto-trol and the AFCTB, the files were submitted via an electronic transfer instead of a full CALS submission. Hence, the file was not named in accordance with the MIL-STD-1840A requirements.

3.2.1 Tape Formats

Not evaluated.

3.2.2 Declaration and Header Fields

The MIL-STD-1840A header and Document Declaration files were not included in this test.

4. IGES Analysis

No Initial Graphics Exchange Specification (IGES) files were included in this test.

5. SGML Analysis

No Standard Generalized Markup Language (SGML) files were included in this test.

6. Raster Analysis

No Raster files were included in this test.

7. CGM Analysis

The electronic transfer consisted of two CGM files. The files were generated using both MIL-D-28003 and MIL-D-28003A specifications. The files were evaluated using ATC's *MetaCheck* with CALS options. File *ATTC_28003*, which is the MIL-D-28003 file, had no reported errors.

ATC's *MetaCheck* reported that the file *ATTC-28003A* did not meet the specification defined in MIL-D-28003. However, inspecting the log file it was noted that the file was written to the MIL-D-28003A specification. The AFCTB currently does not have a parser available to evaluate the "A" specification, as none is available commercially. The errors listed in the parser log were checked against the "A" specification and were noted as being acceptable.

MIL-D-28003A permits 32 simultaneous fonts. The permitted fonts are listed in para.3.2.4.4. The fonts reported in the files are defined in the specification.

The CGM file *ATTC_28003A* was evaluated using the beta AFCTN *validcgm* utility. This utility also reported that the file did not meet specification of MIL-D-28003. File *ATTC_28003* had no reported error from the AFCTN *validcgm* utility.

The AFCTB has several tools for viewing CGM files. These tools are not used to generate a pass/fail but to report how commercially available software can handle the files. Many of these products are used in the development of technical publications and are good indicators of usability. The use of these products is not an endorsement nor an indication of CALS capability. All operations were performed using the default settings.

The CGM files were converted using a utility available within the AFCTB, without a reported error. The resulting files were read into Island Graphics' *IslandDraw v3.1*, displayed and printed. Text overflow was noted in the restricted text block. The cell array displayed and printed some of the individual blocks. This was due to the output

set for black and white used in publications. Both files displayed the same results.

The files were read into Carberry's *CADLeaf* software, displayed and printed. The displays were in color for both files. Errors in the restricted text block were noted. Text overflow was also noted in two block definitions (13 & 14). When displayed on the screen the cell array appeared correct. Both files displayed the same results.

Both files were read into another software available within the AFCTB, without a reported error. When viewed random lines were displayed. File *ATTC_28003* displayed and printed only part of the file. File *ATTC_28003A* also imported without a reported error. When it was viewed only two lines were displayed.

Both files were read into Inset Systems' *HiJaak Pro* without a reported error. The images displayed in color on a blue background. All entities with the exception of the cell array were displayed. The text in the restricted block was not displayed inside the boxes. The font appears to be the same for all three lines of text.

The files were imported directly into Island Graphics' *IslandDraw v4.0* without a reported error. The image was displayed in color. Errors were noted in the restricted text block where all text appears to be the same size. The cell array displayed correctly but printed as a black block. Block definitions did not exhibit text overflow.

The files were imported into the *Micrografx Designer v4.0* with 14 reported errors. The displayed image was in black and white. Text overflow was noted in the restricted text block where all text appears to be the same size. The polygon set consisted of vertical lines with the triangle shapes missing. The cell array did not display. The text in the text block did not print on an upward line, and it displayed with each letter having a slant. The elliptical arc was displaced into the circle block. All shaded entities were displayed and printed in black.

According to Michael Harrison of Micrografx, "The version of Micrografx Designer used with this report has been replaced with Designer version 4.0 which reads and prints these files successfully."

The files were imported into SPC's *Harvard Graphics v3.05* with a non-CGM entity reported error. Errors were noted in the restricted text block and polygon set. Font changes were noted between the two files in the restricted text block. The cell array did not display. Some text overflow was note in the block definitions.

The files were read into Lotus' *Freelance* without a reported error. Errors were noted in the restricted text block where all text was the same size. In the polygon set the triangle shapes were missing. The cell array displayed correctly in color on the screen but printed as black blocks.

The files were converted using Corel's *Ventura Publisher* without a reported error. The images were displayed in black and white. The restricted text overflowed the defined area with all text the same size. The Polygon set was not displayed correctly. The cell array did not display.

File ATTC_28003 meets the specification defined in the CALS MIL-D-28003.

The CGM file ATTC_28003A was submitted as a MIL-D-28003A file; not a MIL-D-28003 file. The AFCTB is currently unable to evaluate the "A" file type.

8. Conclusions and Recommendations

The file submitted by Auto-trol was a data only submission. The MIL-STD-1840A requirements were not evaluated per agreement between Auto-trol and the AFCTB.

The electronically submitted CGM file ATTC_28003 meets the CALS MIL-D-28003 specification.

The electronically submitted CGM file ATTC_28003A does not meet the CALS MIL-D-28003 specification. However, the submitted file appears to meet the specification defined in CALS MIL-D-28003A. No commercial CGM parser is available for the "A" specification at this time.

9. Appendix A - Detailed CGM Analysis

9.1 File ATTC_28003

9.1.1 Parser Log - MetaCheck

MetaCheck Version 2.10 -- CGM/MIL-D-28003 Conformance Analyzer
Copyright 1988-93 CGM Technology Software
Execution Date: 12/15/93 Time: 09:05:32

Metafile Examined : \93110\at28003.cgm

Pictures Examined : All
Elements Examined : All
Bytes Examined : All

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

Tracing not selected.

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

No Errors Detected

=====
CAL S CGM Profile (MIL-D-28003) Report
=====

No profile discrepancies detected.

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

MetaCheck Version 2.10 -- CGM/MIL-D-28003 Conformance Analyzer
Copyright 1988-93 CGM Technology Software
Execution Date: 12/15/93 Time: 09:05:35

Name of CGM under test: \93110\at28003.cgm
Encoding : Binary

Pictures Examined : All
Elements Examined : All
Bytes Examined : All

BEGIN METAFILE string : >attc-ctn01<
METAFILE DESCRIPTION : >Auto-trol/REL-2.0 MIL-D-28003/BASIC-<
>1<

Picture 1 starts at octet offset 172: >attc-ctn01<

Conformance Summary : This file conforms to the CGM specification.
This file meets the CALS CGM Profile (MIL-D-28003).

Summary of Testing Performed and Errors Found:

1 Pictures Tested
351 Elements Tested
8424 Octets Tested

```
=====
|   No Errors Were Detected   |
=====
```

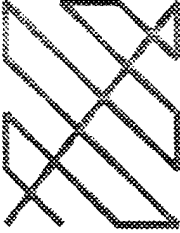
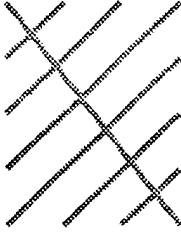
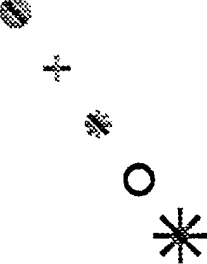
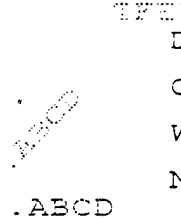
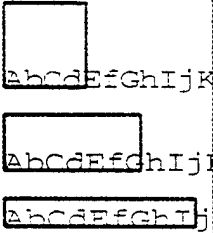
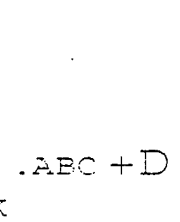
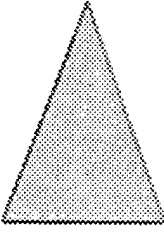
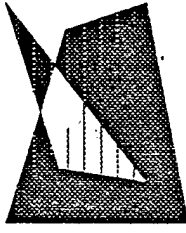
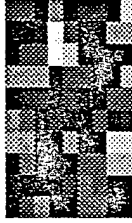
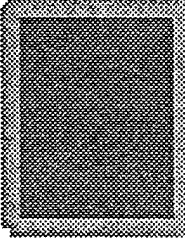
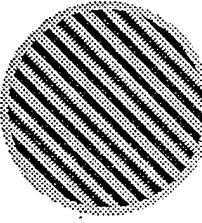
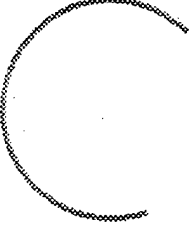
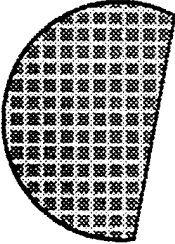
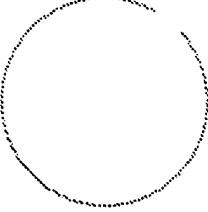
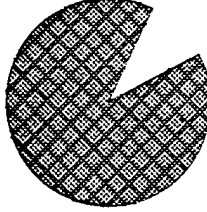


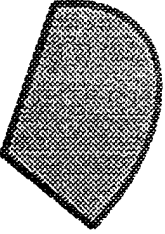
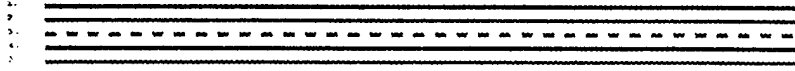
===== End of Conformance Report =====

9.1.2 validcgm Log



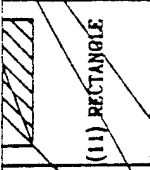
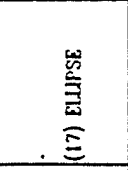

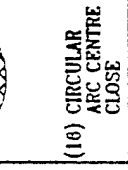
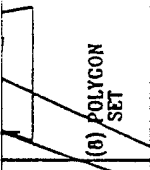
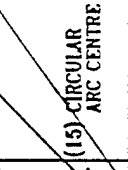
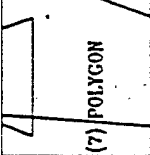


Analysis for file attc_28003.cgm using table table

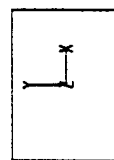
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(4, 8) occurred 1 time
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(5, 13) occurred 6 times
(5, 14) occurred 7 times
(5, 15) occurred 8 times
(5, 16) occurred 2 times
(5, 18) occurred 1 time
(5, 22) occurred 8 times
(5, 23) occurred 12 times
(5, 28) occurred 2 times
(5, 29) occurred 9 times
(5, 30) occurred 1 time

9.1.3 Output Cadleaf

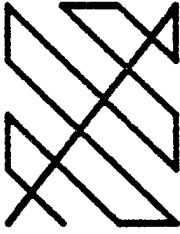
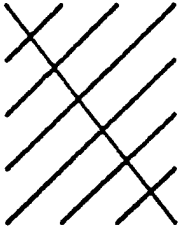
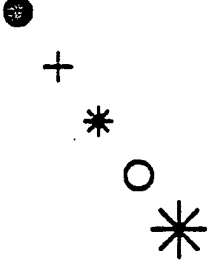
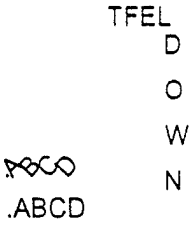
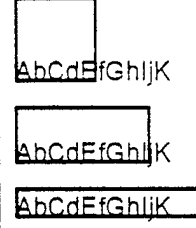

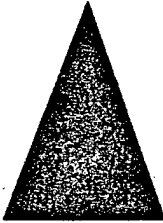

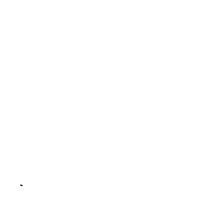
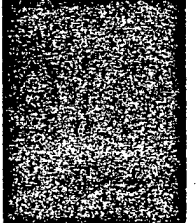
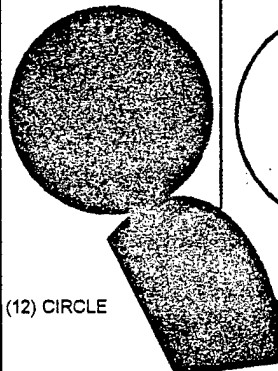
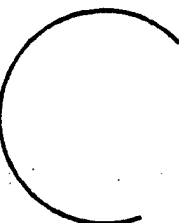
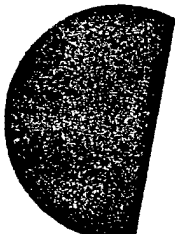
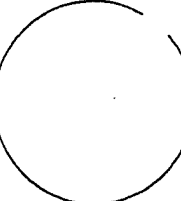

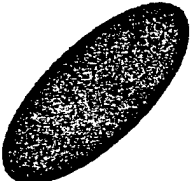

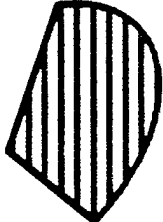
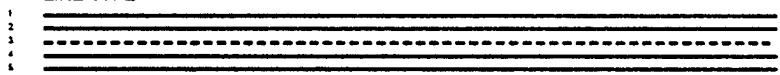
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 <p>(7) POLYGON</p>	 <p>(8) POLYGON SET</p>	 <p>(9) CELL ARRAY</p>	 <p>(11) RECTANGLE</p>	 <p>(12) CIRCLE</p>	 <p>(13) CIRCULAR ARC 3 POINT</p>
 <p>(14) CIRCULAR ARC 3 POINT CLOSE</p>	 <p>(15) CIRCULAR ARC CENTRE</p>	 <p>(16) CIRCULAR ARC CENTRE CLOSE</p>	 <p>(17) ELLIPSE</p>	 <p>(18) ELLIPTICAL ARC</p>	 <p>(19) ELLIPTICAL ARC CLOSE</p>
<p>LINE TYPE</p> 				<p>CALS TEST NETWORK MIL-D-28003 Computer Graphics Metafile File: CUN-0116, Draft 91-10-93</p>	

9.1.4 Output Generic

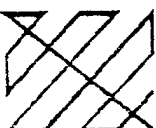


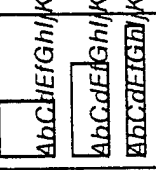
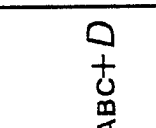
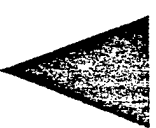
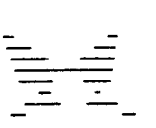

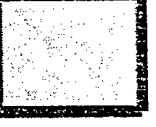
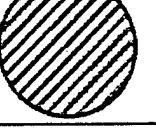

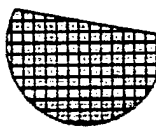
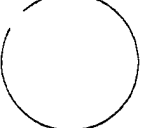



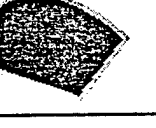
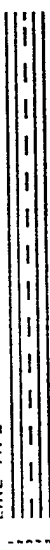
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	(11) RECTANGLE		(17) ELLIPSE	
	(9) CELL ARRAY		(16) CIRCULAR ARC CENTRE CLOSE	
	(8) POLYGON SET		(15) CIRCULAR ARC CENTRE	
	(7) POLYGON		(14) CIRCULAR ARC 3 POINT CLOSE	
LINE TYPE				



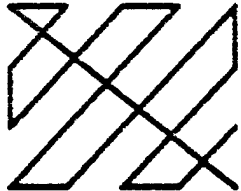
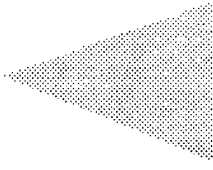
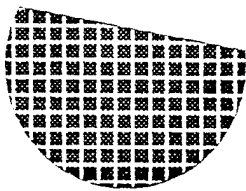
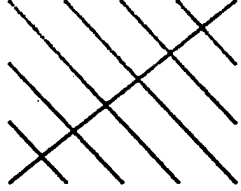
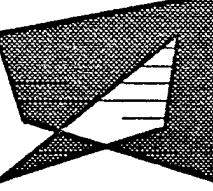
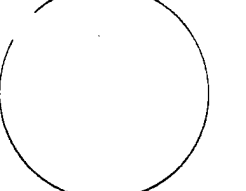
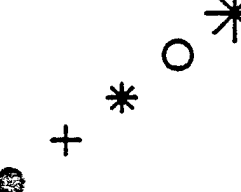


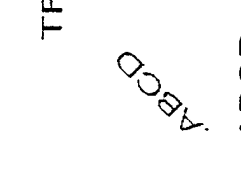
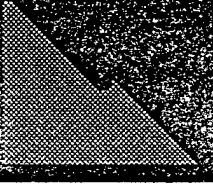
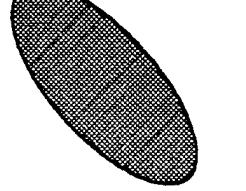
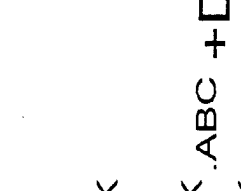
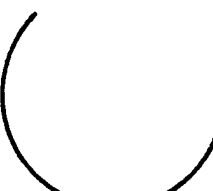
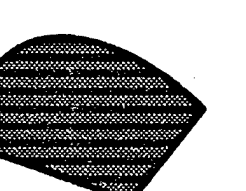
9.1.5 Output Designer

 <p>(1) POLYLINE</p>	 <p>(2) DISJOINT POLYLINE</p>	 <p>(3) POLYMARKER</p>	 <p>(4) TEXT</p>	 <p>(5) RESTRICTED TEXT</p>	 <p>(6) APPEND TEXT</p>
 <p>(7) POLYGON</p>	 <p>(8) POLYGON SET</p>	 <p>(9) CELL ARRAY</p>	 <p>(11) RECTANGLE</p>	 <p>(12) CIRCLE</p>	 <p>(13) CIRCULAR ARC 3 POINT</p>
 <p>(14) CIRCULAR ARC 3 POINT CLOSE</p>	 <p>(15) CIRCULAR ARC CENTRE</p>	 <p>(16) CIRCULAR ARC CENTRE CLOSE</p>	 <p>(17) ELLIPSE</p>	 <p>(18) ELLIPTICAL ARC</p>	 <p>(19) ELLIPTICAL ARC CLOSE</p>
<p>LINE TYPE</p> 				<p>CALS TEST NETWORK MIL-D-28003 Computer Graphics Metafile File: CTN-01Id, Draft 91-10-03</p>	

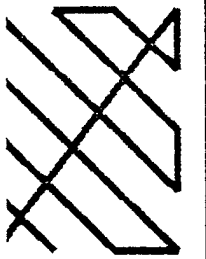
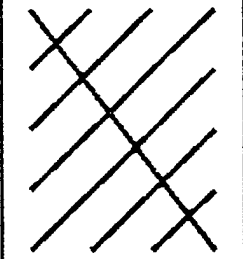
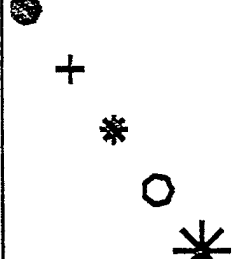
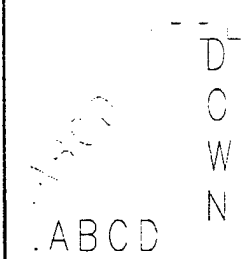
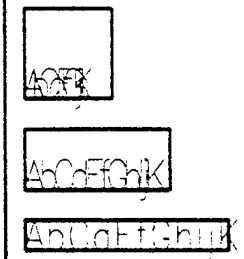
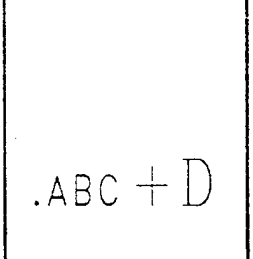
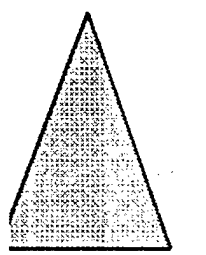
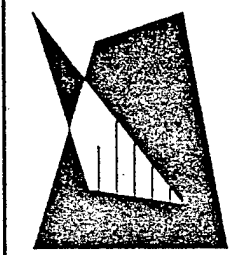
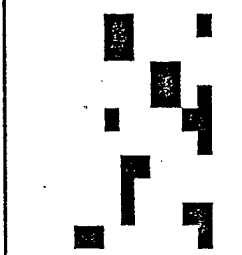
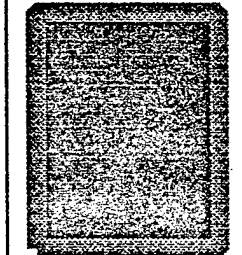
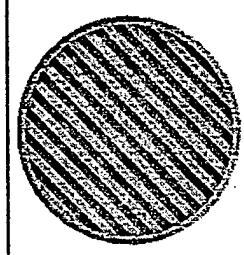
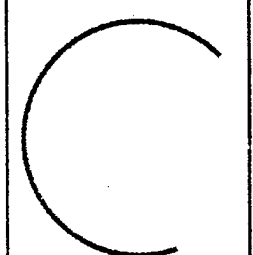
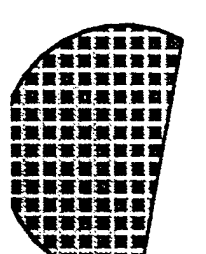
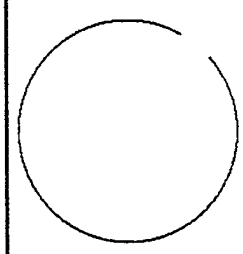
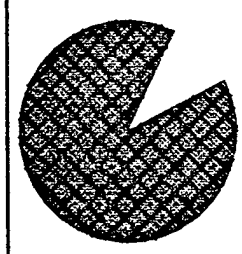
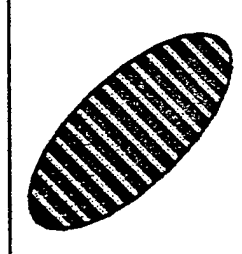
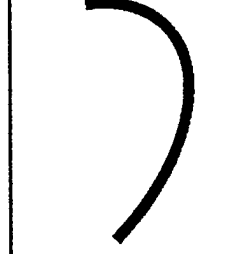
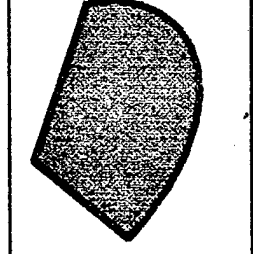
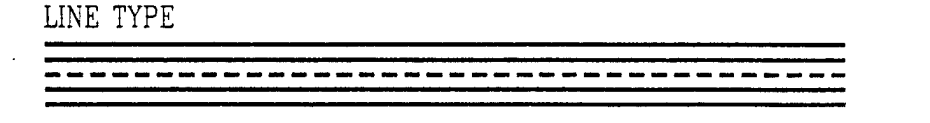
9.1.7 Output Harvard Graphics

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	(7) POLYGON		(8) POLYGON SET		(9) CELL ARRAY		(11) RECTANGLE		(12) CIRCLE		(13) CIRCULAR ARC 3 POINT
	(14) CIRCULAR ARC 3 POINT CLOSE		(15) CIRCULAR ARC CENTRE CLOSE		(16) CIRCULAR ARC CENTRE CLOSE		(17) ELLIPSE		(18) ELLIPTICAL ARC		(19) ELLIPTICAL ARC CLOSE
LINE TYPE 											
CALS TEST NETWORK MIL-D-28003 Computer Graphics Metafile File: CTN-01d, Draft 91-10-03											

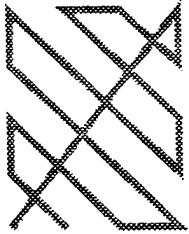
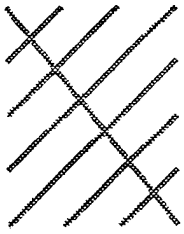
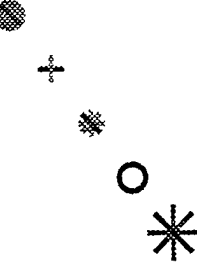
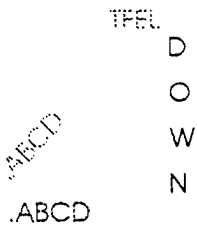
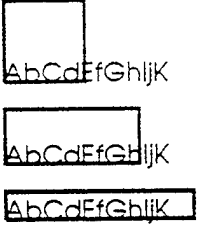
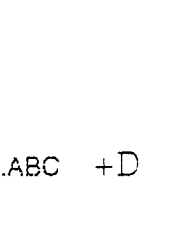
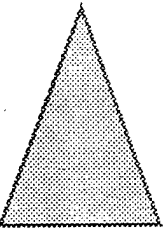
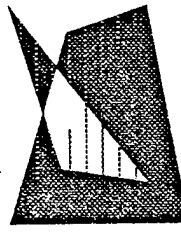

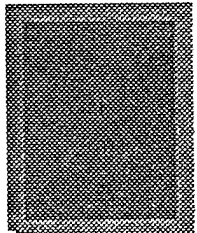
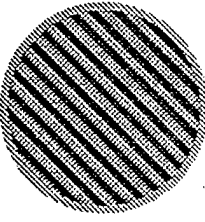
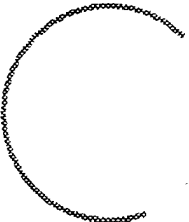
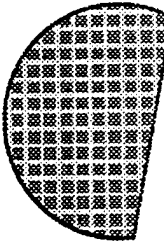
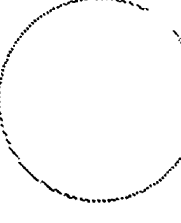
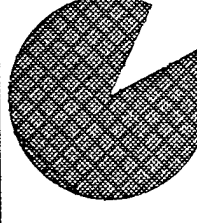
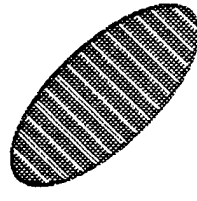

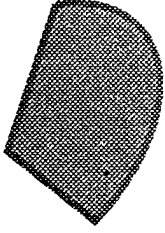
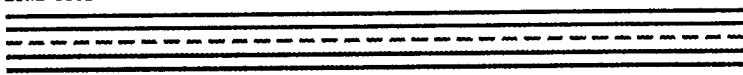
9.1.8 Output Hijaak for Windows

 <p>(1) POLYLINE</p>	 <p>(7) POLYGON</p>	 <p>(14) CIRCULAR ARC 3 POINT CLOSE</p>	<p>LINE TYPE</p> <hr/> <hr/> <hr/> <hr/>
 <p>(2) DISJOINT POLYLINE</p>	 <p>(8) POLYGON SET</p>	 <p>(16) CIRCULAR ARC CENTRE CLOSE</p>	<p>(15) CIRCULAR ARC CENTRE CLOSE</p>
 <p>(3) POLYMARKER (4) TEXT</p>	 <p>(11) RECTANGLE</p>	 <p>(17) ELLIPSE</p>	<p>(18) ELLIPTICAL ARC</p>
 <p>(5) RESTRICTED TEXT</p>	 <p>(12) CIRCLE</p>	 <p>(19) ELLIPTICAL ARC CLOSE</p>	<p>(6) APPEND TEXT</p>
 <p>(13) CIRCULAR ARC 3 POINT</p>	 <p>(7) POLYGON</p>	 <p>(16) CIRCULAR ARC CENTRE CLOSE</p>	<p>(15) CIRCULAR ARC CENTRE CLOSE</p>

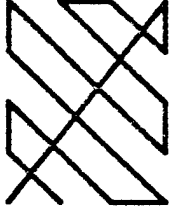
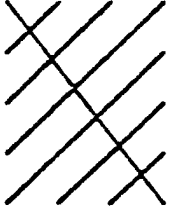
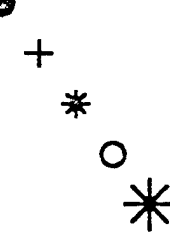
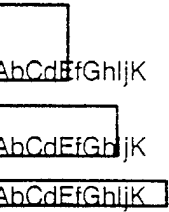
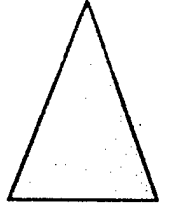



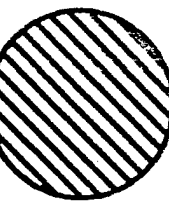

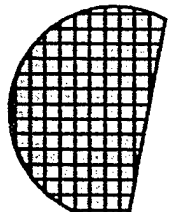
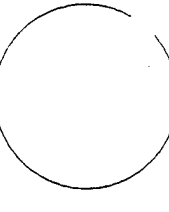
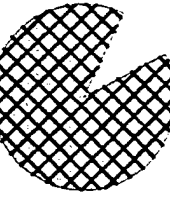



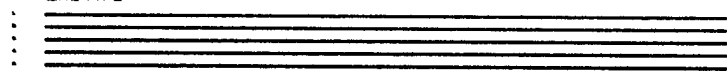
9.1.9 Output IslandDraw

 <p>POLYLINE</p>	 <p>(2) DISJOINT POLYLINE</p>	 <p>(3) POLYMARKER</p>	 <p>(4) TEXT</p>	 <p>(5) RESTRICTED TEXT</p>	 <p>(6) APPEND TEXT</p>
 <p>POLYGON</p>	 <p>(8) POLYGON SET</p>	 <p>(9) CELL ARRAY</p>	 <p>(11) RECTANGLE</p>	 <p>(12) CIRCLE</p>	 <p>(13) CIRCULAR ARC 3 POINT</p>
 <p>(4) CIRCULAR ARC 3 POINT CLOSE</p>	 <p>(15) CIRCULAR ARC CENTRE</p>	 <p>(16) CIRCULAR ARC CENTRE CLOSE</p>	 <p>(17) ELLIPSE</p>	 <p>(18) ELLIPTICAL ARC</p>	 <p>(19) ELLIPTICAL ARC CLOSE</p>
<p>LINE TYPE</p> 				<p>CALS TEST NETWORK MIL-D-28003 Computer Graphics Metafile File: CTN-01Id, Draft 91-10-03</p>	

9.1.10 Output IslandDraw v4.0

 <p>(1) POLYLINE</p>	 <p>(2) DISJOINT POLYLINE</p>	 <p>(3) POLYMARKER</p>	 <p>(4) TEXT</p>	 <p>(5) RESTRICTED TEXT</p>	 <p>(6) APPEND TEXT</p>
 <p>(7) POLYGON</p>	 <p>(8) POLYGON SET</p>	 <p>(9) CELL ARRAY</p>	 <p>(10) RECTANGLE</p>	 <p>(11) CIRCLE</p>	 <p>(12) CIRCULAR ARC 3 POINT</p>
 <p>(13) CIRCULAR ARC 3 POINT CLOSE</p>	 <p>(14) CIRCULAR ARC CENTRE</p>	 <p>(15) CIRCULAR ARC CENTRE CLOSE</p>	 <p>(16) ELLIPSE</p>	 <p>(17) ELLIPTICAL ARC</p>	 <p>(18) ELLIPTICAL ARC CLOSE</p>
<p>LINE TYPE</p> 				<p>CALS TEST NETWORK MIL-D-26003 Computer Graphics Metafile File: CTH-011d, Draft 91-10-03</p>	

9.1.11 Output Ventura Publisher

 (1) POLYLINE	 (2) DISJOINT POLYLINE	 (3) POLYMARKER	TFEL D O W N .ABCD (4) TEXT	 (5) RESTRICTED TEXT	.ABC + D (6) APPEND TEXT
 (7) POLYGON	 (8) POLYGON SET	 (9) CELL ARRAY	 (11) RECTANGLE	 (12) CIRCLE	 (13) CIRCULAR ARC 3 POINT
 (14) CIRCULAR ARC 3 POINT CLOSE	 (15) CIRCULAR ARC CENTRE	 (16) CIRCULAR ARC CENTRE CLOSE	 (17) ELLIPSE	 (18) ELLIPTICAL ARC	 (19) ELLIPTICAL ARC CLOSE
LINE TYPE 			CALS TEST NETWORK MIL-D-28003 Computer Graphics Metafile File: CTN-011d, Draft 81-10-03		

9.2 File ATTC_28003A

9.2.1 Parser Log MetaCheck

MetaCheck Version 2.10 -- CGM/MIL-D-28003 Conformance Analyzer
Copyright 1988-93 CGM Technology Software
Execution Date: 12/15/93 Time: 09:05:47

Metafile Examined : \93110\at28003a.cgm

Pictures Examined : All

Elements Examined : All

Bytes Examined : All

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

Tracing not selected.

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

No Errors Detected

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

Error 6501: Element Class/ID: 1/2 Offset: 26 octets Element No. 4
The METAFILE DESCRIPTION string is invalid; it lacks the phrase
"MIL-D-28003/BASIC-1" required by the Profile.

Error 6508: Element Class/ID: 1/13 Offset: 82 octets Element No. 8
The FONT LIST element is invalid; it may not contain
more than 4 font names.

Error 6509: Element Class/ID: 1/13 Offset: 82 octets Element No. 8
Invalid list parameters; each of the Font Names in the FONT LIST element
must be among the Font Names allowed by the Profile.

Error 6521: Element Class/ID: 5/10 Offset: 1392 octets Element No. 69
The Text Font Index value is invalid; it must not exceed 4.

Error 6521: Element Class/ID: 5/10 Offset: 1710 octets Element No. 99
The Text Font Index value is invalid; it must not exceed 4.

Error 6521: Element Class/ID: 5/10 Offset: 1746 octets Element No. 104
The Text Font Index value is invalid; it must not exceed 4.

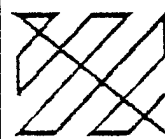
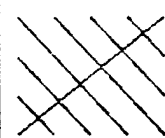
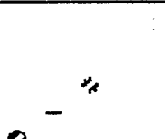
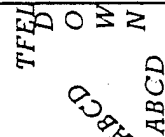
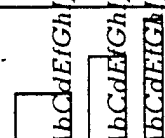
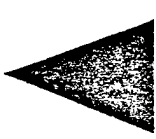


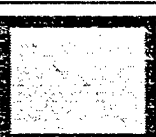
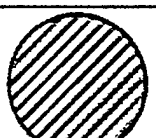
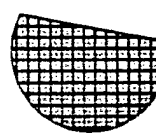
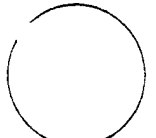
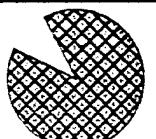
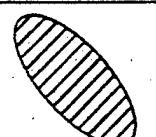

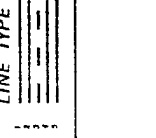
=====
===== Conformance Summary Report =====

9.2.2 validcgm Log

Analysis for file attc_28003a.cgm using table table
MILSPEC 28003 error: descriptor doesn't contain MIL-D-28003/BASIC-1
(4, 26) (1, 2, 40) Metafile Description "Auto-trol/REL-2.0
MIL-D-28003A/BASIC-1"
MILSPEC 28003 error: more than 4 fonts
MILSPEC 28003 error: illegal font name TIMES_ROMAN
MILSPEC 28003 error: illegal font name TIMES_ITALIC
MILSPEC 28003 error: illegal font name TIMES_BOLD
MILSPEC 28003 error: illegal font name TIMES_BOLD_ITALIC
MILSPEC 28003 error: illegal font name HELVETICA
MILSPEC 28003 error: illegal font name HELVETICA_OBLIQUE
MILSPEC 28003 error: illegal font name HELVETICA_BOLD
MILSPEC 28003 error: illegal font name HELVETICA_BOLD_OBLIQUE
MILSPEC 28003 error: illegal font name COURIER
MILSPEC 28003 error: illegal font name COURIER_BOLD
(8, 82) (1, 13, 430) Font List
"TIMES_ROMAN"
"TIMES_ITALIC"
"TIMES_BOLD"
"TIMES_BOLD_ITALIC"
"HELVETICA"
"HELVETICA_OBLIQUE"
"HELVETICA_BOLD"
"HELVETICA_BOLD_OBLIQUE"
"COURIER"
"COURIER_BOLD"
MILSPEC 28003 error: illegal text font index
(69, 1392) (5, 10, 2) Text Font Index 14
MILSPEC 28003 error: illegal text font index
(99, 1710) (5, 10, 2) Text Font Index 21
MILSPEC 28003 error: illegal text font index
(104, 1746) (5, 10, 2) Text Font Index 17
(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, 7) occurred 1 time
(1, 8) occurred 1 time
(1, 9) occurred 1 time
(1, 11) occurred 1 time
(1, 13) occurred 1 time
(2, 2) occurred 1 time

(2, 3) occurred 1 time
(2, 4) occurred 1 time
(2, 5) occurred 1 time
(2, 6) occurred 1 time
(2, 7) occurred 1 time
(4, 1) occurred 163 times
(4, 4) occurred 53 times
(4, 7) occurred 7 times
(4, 8) occurred 1 time
(4, 9) occurred 1 time
(4, 12) occurred 3 times
(4, 15) occurred 2 times
(4, 18) occurred 1 time
(5, 2) occurred 2 times
(5, 3) occurred 21 times
(5, 4) occurred 20 times
(5, 10) occurred 3 times
(5, 12) occurred 1 time
(5, 13) occurred 6 times
(5, 14) occurred 7 times
(5, 15) occurred 8 times
(5, 16) occurred 2 times
(5, 18) occurred 1 time
(5, 22) occurred 8 times
(5, 23) occurred 12 times
(5, 28) occurred 2 times
(5, 29) occurred 9 times
(5, 30) occurred 1 time

9.2.3 Output Havard Graphics

	(1) POLYLINE		(2) DISJOINT POLYLINE		(3) POLYMARKER		(4) TEXT		(5) RESTRICTED (6) APPEND TEXT
	(7) POLYGON		(8) POLYGON SET		(9) CELL ARRAY		(11) RECTANGLE		(12) CIRCLE
	(14) CIRCULAR ARC 3 POINT CLOSE		(15) CIRCULAR ARC CENTRE CLOSE		(16) CIRCULAR ARC CENTRE CLOSE		(17) ELLIPSE		(18) ELLIPTICAL ARC
	(19) ELLIPTICAL ARC CLOSE	<p>CALS TEST NETWORK MIL-D-28003 Computer Graphics Metafile File: CTN-01d, Draft 91-10-03</p>							