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DOC: M1/04-0610

Date: 20 September 2004

Ref: Project 1705-D

Technical Contribution for Review and Consideration at the
October 2004 Meeting of M1.3

**Technical Contribution for Project 1705-D, Information technology
- Conformance Testing Methodology for Finger Image Based Data Interchange
Format of ANSI INCITS 381-2004**

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This contribution contains several test assertions to be documented in Section 6 of M1/04-0398, Elements of Conformance Testing Methodology for Finger Image Based Data Interchange Format of ANSI/INCITS 381-2004. An assertion will be written in the future for each requirement of the base ANSI/INCITS 381-2004 standard.

6. Test Assertions

6.1 General

6.1.1 The assertions specified in the following clauses are based on the conformance testing methodology specified in section 5 of this standard, and can only be used in the context of that methodology.

6.1.2 The following assertions shall be used to determine whether the implementation under test satisfies the requirements specified in ANSI/INCITS 381-2004 standard.

6.1.3 All the assertions specified below shall be executed (in order) to determine conformance of an ANSI/INCITS 381-2004 conformant data file and claim a system conformance to the ANSI/INCITS 381-2004 specification to process the file(s) and decode the encoded images.

6.2 Testing the Conformance of ANSI/INCITS 381-2004 Conformant Data File

6.2.1 Testing the Conformance of General Record Header

6.2.1.1 Assertion #1 [*TBD – need to agree upon and use assertions naming convention*]

Description: This assertion checks if “Format Identifier” is claimed in general record header section of ANSI/INCITS 381-2004 conformant data file, according to the following statement from ANSI/INCITS 381-2004, 7.1.1 (Format Identifier).

Excerpt: *The Finger Image Record shall begin with the three ASCII characters “FIR” to identify the record as following this standard, followed by a zero byte as a null string terminator.*

Reference: 7.1.1 (Format Identifier)

Expected results: TO BE DONE

Reporting scenario: TO BE DONE

<Test Case: TBD>

6.2.1.2 Assertion #2 [*TBD – need to agree upon and use assertions naming convention*]

Description: This assertion checks if “Version Number” is claimed in general record header section of ANSI/INCITS 381-2004 conformant data file, according to the following statement from ANSI/INCITS 381-2004, 7.1.2 (Version number).

Excerpt: *The number for the version of this standard used for constructing the image record shall be placed in four bytes. This version number shall consist of three ASCII*

numerals followed by a zero byte as a NULL string terminator. The first and second character will represent the major version number and the third character will represent the minor revision number. Upon approval of this specification, the version number shall be “010” – Version 1 revision 0.

Reference: 7.1. 2 (Version number)

Expected results: TO BE DONE

Reporting scenario: TO BE DONE

<Test Case: TBD>

6.2.1.3 Assertion #3 [*TBD – need to agree upon and use assertions naming convention*]

Description: This assertion checks if “Record Length” is claimed in general record header section of ANSI/INCITS 381-2004 conformant data file, according to the following statement from ANSI/INCITS 381-2004, 7.1.3 (Record length).

Excerpt: *The combined length in bytes for the entire record that includes the lengths of all finger records and the views for each finger, multiple finger record, and palms shall be placed in this field.*

Reference: 7.1. 3 (Record length)

Expected results: TO BE DONE

Reporting scenario: TO BE DONE

<Test Case: TBD>

6.2.1.4 Assertion #4 [*TBD – need to agree upon and use assertions naming convention*]

Description: This assertion checks if “CBEFF Product identifier” is claimed in general record header section of ANSI/INCITS 381-2004 conformant data file, according to the following statement from ANSI/INCITS 381-2004, 7.1.4 (CBEFF Product identifier).

Excerpt: *The ‘owner’ of the encoding equipment (or transforming application) shall be uniquely identified by the two most significant bytes of the CBEEF Product ID (Owner). A value of zero shall not be used.*

Reference: 7.1. 4 (CBEFF Product identifier)

Expected results: TO BE DONE

Reporting scenario: TO BE DONE

<Test Case: TBD>

6.2.1.5 Assertion #5 *[TBD – need to agree upon and use assertions naming convention]*

Description: This assertion checks if “Capture device ID” is claimed in general record header section of ANSI/INCITS 381-2004 conformant data file, according to the following statement from ANSI/INCITS 381-2004, 7.1.5 (Capture device ID).

Excerpt: *The scanner ID shall be recorded in the low-order 12 bits of this two-byte field. A value of all zeros will be acceptable and will indicate that the scanner ID is unreported.*

Reference: 7.1. 5 (Capture device ID)

Expected results: TO BE DONE

Reporting scenario: TO BE DONE

<Test Case: TBD>

6.2.1.6 Assertion #6 *[TBD – need to agree upon and use assertions naming convention]*

Description: This assertion checks if “Image acquisition level” is claimed in general record header section of ANSI/INCITS 381-2004 conformant data file, according to the following statement from ANSI/INCITS 381-2004, 7.1.6 (Image acquisition level).

Excerpt: *This two-byte field shall specify the image acquisition setting level chosen from table 3. The value used shall indicate the level at which all of the minimum acquisition parameters were satisfied during the capture of the image.*

Reference: 7.1. 6 (Image acquisition level)

Expected results: TO BE DONE

Reporting scenario: TO BE DONE

<Test Case: TBD>

6.2.1.7 Assertion #7 *[TBD – need to agree upon and use assertions naming convention]*

Description: This assertion checks if “Number of finger/palm images” is claimed in general record header section of ANSI/INCITS 381-2004 conformant data file, according to the following statement from ANSI/INCITS 381-2004, 7.1.7 (Number of finger/palm images).

Excerpt: *The number of finger or palm images included in the record shall be recorded in one byte. The value of this field shall be greater or equal to one.*

Reference: 7.1. 7 (Number of finger/palm images)

Expected results: TO BE DONE

Reporting scenario: TO BE DONE

<Test Case: TBD>

6.2.1.8 Assertion #8 *[TBD – need to agree upon and use assertions naming convention]*

Description: This assertion checks if “Scale units” is claimed in general record header section of ANSI/INCITS 381-2004 conformant data file, according to the following statement from ANSI/INCITS 381-2004, 7.1.8 (Scale units).

Excerpt: *This field shall specify the units used to describe the scanning and image resolutions of the image. A ‘0x01’ in this field indicates pixels per inch, or a ‘0x02’ indicates pixels per centimeter.*

Reference: 7.1. 8 (Scale units)

Expected results: TO BE DONE

Reporting scenario: TO BE DONE

<Test Case: TBD>

6.2.1.9 Assertion #9 *[TBD – need to agree upon and use assertions naming convention]*

Description: This assertion checks if “Scan resolutions (horizontal and vertical)” are claimed in general record header section of ANSI/INCITS 381-2004 conformant data file, according to the following statement from ANSI/INCITS 381-2004, 7.1.9 (Scan resolution – horizontal) and 7.1.10 (Scan resolution - vertical).

Excerpt: *These 2-bytes fields shall specify the rounded scanning resolution used in the horizontal and vertical directions.*

Reference: 7.1. 9 (Scan resolution - horizontal) and 7.1.10 (Scan resolution – vertical)

Expected results: TO BE DONE

Reporting scenario: TO BE DONE

<Test Case: TBD>

6.2.1.10 Assertion #10 *[TBD – need to agree upon and use assertions naming convention]*

Description: This assertion checks if “Image resolutions (horizontal and vertical)” are claimed in general record header section of ANSI/INCITS 381-2004 conformant data file, according to the following statement from ANSI/INCITS 381-2004, 7.1.11 (Image resolution – horizontal) and 7.1.12 (Image resolution - vertical).

Excerpt: *These 2-bytes fields shall specify the rounded image resolution used in the horizontal and vertical directions. The values shall be less than or equal to scan resolutions.*

Reference: 7.1.11 (Image resolution - horizontal) and 7.1.12 (Image resolution – vertical)

Expected results: TO BE DONE

Reporting scenario: TO BE DONE

<Test Case: TBD>

6.2.1.11 Assertion #11 *[TBD – need to agree upon and use assertions naming convention]*

Description: This assertion checks if “Pixel depth” is claimed in general record header section of ANSI/INCITS 381-2004 conformant data file, according to the following statement from ANSI/INCITS 381-2004, 7.1.13 (Pixel depth).

Excerpt: *This 1-byte field shall contain the number of bits used to represent a pixel. This shall contain an entry of ‘0x1’ to ‘0x10’.*

Reference: 7.1.13 (Pixel depth)

Expected results: TO BE DONE

Reporting scenario: TO BE DONE

<Test Case: TBD>

6.2.1.12 Assertion #12 *[TBD – need to agree upon and use assertions naming convention]*

Description: This assertion checks if “Image Compression algorithm” claimed in general record header section of ANSI/INCITS 381-2004 conformant data file, according to the

following statement from ANSI/INCITS 381-2004, 7.1.14 (Image Compression algorithm).

Excerpt: *This 1-byte field shall specify the method used to record the uncompressed or compressed grayscale images. Table 4 lists the available storage options and compression algorithms that may be used*

Reference: 7.1.14 (Image Compression Algorithm)

Expected results: TO BE DONE

Reporting scenario: TO BE DONE

<Test Case: TBD>

6.2.1.13 Assertion #13 *[TBD – need to agree upon and use assertions naming convention]*

Description: This assertion checks if “Reserved” is claimed in general record header section of ANSI/INCITS 381-2004 conformant data file, according to the following statement from ANSI/INCITS 381-2004, 7.1.15 (Reserved).

Excerpt: *Two bytes are reserved for future revisions of this standard. For this version of the standard this field shall be set to all ‘0x0’.*

Reference: 7.1.15 (Reserved)

Expected results: TO BE DONE

Reporting scenario: TO BE DONE

<Test Case: TBD>

6.2.2 Testing the Conformance of Finger Record Header

6.2.2.1 Assertion #14 *[TBD – need to agree upon and use assertions naming convention]*

Description: This assertion checks if “Length of finger/palm data block” is claimed in finger record header section of ANSI/INCITS 381-2004 conformant data file, according to the following statement from ANSI/INCITS 381-2004, 7.2.1 (Length of finger/palm data block).

Excerpt: *This four-byte field shall contain the length in bytes of the finger segment. It will specify the total number of bytes including the length of the header and the size of the compressed or uncompressed image data.*

Reference: 7.2.1 (Length of finger/palm data block)

Expected results: TO BE DONE

Reporting scenario: TO BE DONE

<Test Case: TBD>

6.2.2.2 Assertion #15 *[TBD – need to agree upon and use assertions naming convention]*

Description: This assertion checks if “Finger/palm position” is claimed in finger record header section of ANSI/INCITS 381-2004 conformant data file, according to the following statement from ANSI/INCITS 381-2004, 7.2.2 (Finger/palm position).

Excerpt: *This 1-byte field shall contain the finger position. The codes for this byte as well as the maximum size of the recorded image are defined in Table5 and 6.*

Reference: 7.2.2 (Finger/palm position)

Expected results: TO BE DONE

Reporting scenario: TO BE DONE

<Test Case: TBD>

6.2.2.3 Assertion #16 *[TBD – need to agree upon and use assertions naming convention]*

Description: This assertion checks if “Count of views” is claimed in finger record header section of ANSI/INCITS 381-2004 conformant data file, according to the following statement from ANSI/INCITS 381-2004, 7.2.3 (Count of views).

Excerpt: *This one byte field shall contain the total number of specific views available for this finger.*

Reference: 7.2.3 (Count of views)

Expected results: TO BE DONE

Reporting scenario: TO BE DONE

<Test Case: TBD>

6.2.2.4 Assertion #17 *[TBD – need to agree upon and use assertions naming convention]*

Description: This assertion checks if “View number” is claimed in finger record header section of ANSI/INCITS 381-2004 conformant data file, according to the following statement from ANSI/INCITS 381-2004, 7.2.4 (View number).

Excerpt: *This one byte field shall contain the specific image view number associated with the finger or palm.*

Reference: 7.2.4 (View number)

Expected results: TO BE DONE

Reporting scenario: TO BE DONE

<Test Case: TBD>

6.2.2.5 Assertion #18 *[TBD – need to agree upon and use assertions naming convention]*

Description: This assertion checks if “Finger/palm image quality” is claimed in finger record header section of ANSI/INCITS 381-2004 conformant data file, according to the following statement from ANSI/INCITS 381-2004, 7.2.5 (Finger/palm image quality).

Excerpt: *This reserved field shall eventually contain an image quality metric for the scanned finger/palm images. Until standard methods are developed for computing a meaningful image quality metric, this field shall contain the number ‘254’ to indicate an undefined quality measure.*

Reference: 7.2.5 (Finger/palm image quality)

Expected results: TO BE DONE

Reporting scenario: TO BE DONE

<Test Case: TBD>

6.2.2.6 Assertion #19 *[TBD – need to agree upon and use assertions naming convention]*

Description: This assertion checks if “Impression type” is claimed in finger record header section of ANSI/INCITS 381-2004 conformant data file, according to the following statement from ANSI/INCITS 381-2004, 7.2.6 (Impression type).

Excerpt: *The impression type of the finger or palm image shall be recorded in this one byte field. The codes for this byte shall be as defined in Table 7.*

Reference: 7.2.6 (Impression type)

Expected results: TO BE DONE

Reporting scenario: TO BE DONE

<Test Case: TBD>

6.2.2.7 Assertion #20 *[TBD – need to agree upon and use assertions naming convention]*

Description: This assertion checks if “Horizontal line length” and “Vertical line length” are claimed in finger record header section of ANSI/INCITS 381-2004 conformant data file, according to the following statement from ANSI/INCITS 381-2004, 7.2.7 (Horizontal line length) and 7.2.8 (Vertical line length).

Excerpt: *The impression type of the finger or palm image shall be recorded in this one byte field. The codes for this byte shall be as defined in Table 7.*

Reference: 7.2.6 (Impression type)

Expected results: TO BE DONE

Reporting scenario: TO BE DONE

<Test Case: TBD>

6.2.2.8 Assertion #21 *[TBD – need to agree upon and use assertions naming convention]*

Description: This assertion checks if “Finger/palm image data” is claimed in finger record header section of ANSI/INCITS 381-2004 conformant data file, according to the following statement from ANSI/INCITS 381-2004, 7.2.9 (Finger/palm image data).

Excerpt: *This field shall contain of the grayscale image data formatted and recorded in accordance with the image compression algorithm.*

Reference: 7.2.9 (Finger/palm image data)

Expected results: TO BE DONE

Reporting scenario: TO BE DONE

<Test Case: TBD>

6.3 Testing the Systems Claimed Conformant with ANSI/INCITS 381-2004

[TBD]