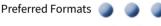


Appendix A: Tables of File Formats

Quick Links

Computer Aided Design Digital Audio **Digital Moving Images** Digital Cinema Digital Video Born-Digital Photographs Digitized Paper and Photographic **Born-Digital Posters Geospatial Formats Prints Presentation Formats** Born-Digital Textual Data Structured Data Formats Email Web Records Calendars **Navigational Charts**

Symbol Key



Acceptable Formats





Computer Aided Design (CAD)

Computer aided design (CAD) - CAD formats are vector graphics files that rely on mathematical expressions to create multidimensional computer graphics intended for use in engineering and manufacturing design. CAD programs can generate representations and animations of two and three-dimensional surface projections of objects.









Preferred Formats	Format Version	Format Specifications
Extensible 3D (X3D)		ISO/IEC 19775-1:2008: (http://www.web3d.org/files/specifications/19775- 1/V3.2/index.html ご)
Standard for the Exchange of Product Model Data (STEP)		ISO 10303-21:2016: (https://www.iso.org/standard/63141.html ぱ)
ASTM E57 3D file format (E57)	1.0	ASTM E2807-11(2019): (https://www.astm.org/e2807-11r19.html ☑)

OpenDocument

Graphics Format All versions

(ODG)

ISO/IEC 26300-1:2015

Information technology — Open Document Format for Office Applications (OpenDocument) v1.2 —

Part 1: OpenDocument Schema:

(https://www.iso.org/standard/66363.html ☑)





Acceptable Formats

Acceptable Formats	Format Specifications
Portable Document Format/Engineering (PDF/E)	ISO 24517-1:2008 Document management — Engineering document format using PDF Part 1: Use of PDF 1.6 (PDF/E-1): (http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm? csnumber=42274 27)
Universal 3D (U3D)	Universal 3D (U3D) format family. ECMA-363, Editions 1-4: (https://www.ecma-international.org/wp-content/uploads/ECMA-363_4th_edition_june_2007.pdf 🗷)
Product Representation Compact (PRC)	ISO 14739-1:2014 Document management — 3D use of Product Representation Compact (PRC) format — Part 1: PRC 10001:(https://www.iso.org/standard/54948.html 🗷)

Digital Audio

The Digital audio category encompasses formats used to encode recorded sound as machine readable files by converting acoustic sound waves into digital signals. Digital audio formats are generally composed of both a wrapper format, usually the common name associated with the file extension, and an encoding method or codec.

General requirements for digital audio records:

- Digitize to standards appropriate for the accurate preservation of the original audio, when converting analog material (e.g., audio cassettes, record albums, and reel-to-reel audio tapes). Examples of appropriate methods and formats are available on NARA's Digitization Services Products and Services page;
- Transfer digital audio at a minimum of 16 bits per sample, but 24 bits per sample is encouraged; and
- Transfer digital audio at a minimum sample rate of at least 44.1 KHz, but sampling at 96 KHz is encouraged.









Preferred Formats

Preferred Formats	Format Version	Codecs	Format Specifications
Broadcast Wave (BWF)	0,1&2	Linear Pulse Code Modulated Audio (LPCM)	European Broadcast Union (EBU). Tech Specification of the Broadcast Wave Format (BWF) – Version 1: (http://web.archive.org/web/20091229093941/http://tech.ebu.ch/docs/tech/tech3285.pdf () Specification of the Broadcast Wave Format (BWF) - Version 2: (https://tech.ebu.ch/docs/tech/tech3285.pdf ()
Free Lossless Audio Codec (FLAC)	1.21	FLAC	FLAC Format Specification version 1.21: (http://flac.sourceforge.net/format.html 🗷)



Acceptable Formats	Format Version	Codecs	Format Specifications
Audio Interchange Format (AIFF)	1.3	Linear Pulse Code Modulated Audio (LPCM)	Audio Interchange File Format: "AIFF" A Standard for Sampled Sound Files Version 1.3 Apple Computer, Inc.: (https://www.mmsp.ece.mcgill.ca/Documents/AudioFormats/AIFF/AIFF.html 🗗)
MPEG Audio Layer III (MP3)		MP3enc, Lame	ISO/IEC-11172-3 Information technology – Coding of moving pictures and associated audio for digital storage media at up to about 1.5 Mbit/s – Part 3: Audio: (http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=22412 (2)) ISO/IEC 13818-3:1995 Information technology – Generic coding of moving pictures and associated audio information – Part 3: Audio: (http://www.iso.org/iso/home/store/catalogue_ics/catalogue_detail_ics.htm?csnumber=26797 (2))
Wave Waveform Audio File Format (Wave)		Linear Pulse Code Modulated Audio (LPCM)	Multimedia Programming Interface and Data Specifications 1.0: (https://www.mmsp.ece.mcgill.ca/Documents/AudioFormats/WAVE/WAVE.html

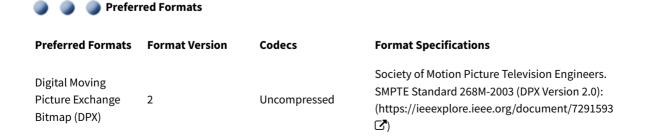
Digital Moving Images

Digital moving images consist of bitmap digital images or "frames" displayed in rapid succession at a constant rate, giving the appearance of movement. This category includes two subcategories: digital cinema which encompasses digitized film; and digital video (including both video digitized from analogue sources and born digital video).

General requirements for digital moving image records:

- Agencies must digitize to standards appropriate for accurate preservation of the original video and audio components, when converting analog material. Examples of appropriate methods and formats are available on NARA's Digitization Services Products and Services page; and
- For reformatted video, 8-bit is acceptable but 10-bit is preferred.

Digital Cinema



Digital Video



Acceptable Formats	Format Versions	Codecs	Format Specifications
Audio Video Interleaved Format (AVI)		Uncompressed 4:2:2	Multimedia Programming Interface and Data Specifications 1.0: (http://www.kk.iij4u.or.jp/~kondo/wave/mpidata.txt ☑)
QuickTime File Format (MOV)		Uncompressed 4:2:2	Apple QuickTime File Format Specification (ISO/IEC 14496-14:2003): (https://developer.apple.com/library/mac/documentation/QuickTime/QTFF/QTFFPreface/qtffPreface.html#//apple_ref/doc/uid/TP40000939)
Windows Media Video 9 File Format (WMV)	9	VC-1	Advanced Systems Format (ASF) Specification Revision 01.20.03 Microsoft Corporation December 2004: (https://download.microsoft.com/download/7/9/0/790fecaa-f64a-4a5e-a430-0bccdab3f1b4/ASF_Specification.doc) Windows Media Video 9 encoder: (http://msdn.microsoft.com/en-us/library/windows/desktop/ff819505 (v=vs.85).aspx)
MPEG 4		H.264	ISO/IEC 14496-10:2022 Information technology — Coding of audiovisual objects — Part 10: Advanced video coding: (https://www.iso.org/standard/83529.html ご)
MPEG-2 Video (MPEG2)			ISO/IEC 13818-2:2000 Information technology Generic coding of moving pictures and associated audio information: Video: (https://www.iso.org/standard/61152.html ☑)
Material Exchange Format (MXF)		J2K-losslessly- compressed	ST 377-1:2011 Material Exchange Format (MXF) — File Format Specification: (http://standards.smpte.org/content/978-1-61482-517-3/st-377-1-2011/ SEC1.abstract?sid=63bac43b-e0e1-40a3-8019-d379a103987e) ISO/IEC 15444-1:2004Information technology JPEG 2000 image coding system: Core coding system: (https://www.iso.org/standard/78321.html)

Born-Digital Photographs

Born-digital photographs are raster images of natural, real-world scenes or subjects captured by digital cameras. Additional special requirements for digital photographs are described in 36 CFR 1237.28.



Preferred Formats Format Format Specifications

TIFF Revision 6.0 Final — June 3, 1992 Adobe Systems Incorporated: (https://www.adobe.io/content/dam/udp/en/open/standards/tiff/TIFF6.pdf **7**)





Acceptable Formats

Acceptable Formats	Format Versions	Format Specifications
JPEG File Interchange Format (JFIF) with	1.02	ISO/IEC 10918-5 Information technology – Digital Compression and coding of continuous-tone still images: JPEG Interchange File Format: (http://www.iso.org/iso/home/store/catalogue_tc/catalogue_detail.htm? csnumber=54989 3
Joint Photographic Experts Group (JPEG) compression	1.02	ISO/IEC 10918-1:1994 Information technology – Digital Compression and coding of continuous-tone still images: Requirements and guidelines: (http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm? csnumber=18902 (3)
Digital Negative (DNG)	1.6.0.0	Adobe Digital Negative (DNG) Specification Version 1.6.0.0: (https://helpx.adobe.com/content/dam/help/en/photoshop/pdf/dng_spec_1_6_0_0.pdf 2)
Portable Network Graphics (PNG)	1.2	ISO/IEC 15948:2004 Information technology Computer graphics and image processing Portable Network Graphics (PNG): Functional specification: (http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=29581 🗷)
Jpeg2000 (JP2)	JP2 – Part 1	ISO/IEC 15444-1:2004 Information technology – JPEG 2000 image coding system: Core coding system: (https://www.iso.org/standard/78321.html ☑)

Digitized Paper and Photographic Prints

Digitized paper and photographic prints are digital records created according to the requirements in 36 CFR 1236 E— Digitizing Permanent Federal Records by converting paper or other paper-based formats using reflective techniques to a digital form that is of sufficient authenticity, reliability, usability, and integrity to serve in place of the source record.

The format and compression codec requirements are in § 1236.48-File format requirements. Specifically, the regulation requires agencies to:

- (a) Encode, retain, and transfer digitized records in one of the following file formats, either uncompressed or using one of the specified compression codecs in the tables below.
- (1) Agencies that combine multiple uncompressed TIFF images into PDF/A files using JPEG2000 compression must perform the quality inspection step specified in 1236.46(d) against the resulting PDF/A files.
- (2) When using JPEG 2000 visually lossless compression, agencies must determine the amount of compression to apply, not to exceed 20:1, by performing tests and visually evaluating for compression artifacts that obscure or alter the information content.





Acceptable Formats for Digitized Paper Records

Acceptable	Format	Acceptable	
•	Versions	Compression	Format Specifications
Formats		Codecs	•
		Couecs	

Tagged Image File Format (TIFF)	6	Uncompressed, Deflate (ZIP)	TIFF Revision 6.0 Final — June 3, 1992 Adobe Systems Incorporated: (https://www.adobe.io/content/dam/udp/en/open/standards/tiff/TIFF6.pdf 7
JPEG2000 part 1 (ISO/IEC 15444- 1:2019)		JPEG 2000 part 1 core coding system lossless compression. Agencies may use up to 20:1 visually lossless compression	ISO/IEC 15444-1:2004 Information technology – JPEG 2000 image coding system: Core coding system: (https://www.iso.org/standard/78321.html ☑)
Portable network graphics (PNG)	1.2	Deflate (ZIP)	ISO/IEC 15948:2004 Information technology Computer graphics and image processing Portable Network Graphics (PNG): Functional specification: (http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=29581 7)
PDF/A	Select any version of PDF/A that meets project requirements. However, do not use the attachments feature in PDF/A-3 or PDF/A-4.	Deflate (ZIP), JPEG 2000 part 1 core coding system lossless compression. Agencies may use up to 20:1 visually lossless compression.	PDF/A - Electronic document file format for long-term preservation: (https://www.pdfa.org/resource/iso-19005-pdfa/ ご)

Requirements for digitized permanent photographic print records include the following:

- The agency must encode, retain, and transfer digitized photographic print records in one of the following file formats, either uncompressed or with one of the compression codecs specified in the table below.
- For a series of predominantly textual records with interspersed photographic prints, use the formats in the table for paper records. For a series of predominantly printed photographs, including those with paper records interspersed, use the file formats in the table below for photographic print records.





Acceptable Formats for Digitized Permanent Photographic Print Records

Acceptable Formats	Format Versions	Acceptable Compression Codecs	Format Specifications
Tagged Image File Format (TIFF)	6	Uncompressed, Deflate (ZIP)	TIFF Revision 6.0 Final — June 3, 1992 Adobe Systems Incorporated: (https://www.adobe.io/content/dam/udp/en/open/standards/tiff/TIFF6.pdf

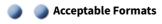
JPEG2000 part 1 (ISO/IEC 15444- 1:2019)		JPEG 2000 part 1 core coding system lossless compression. Agencies may use up to 20:1 visually lossless compression	(https://www.iso.org/standard/78321.html)
Portable network graphics (PNG)	1.2	Deflate (ZIP)	ISO/IEC 15948:2004 Information technology Computer graphics and image processing Portable Network Graphics (PNG): Functional specification: (http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=29581 7)

Born-Digital Posters

Born-Digital posters are posters created on a computer using graphics software. Posters are generally large in format and usually printed and displayed for advertising and publicizing purposes. Paper posters must be digitized according to the requirements in 36 CFR 1236 E.



Preferred Formats	Format Versions	Format Specifications
Tagged Image File Format (TIFF)	4,5&6	TIFF Revision 6.0 Final — June 3, 1992 Adobe Systems Incorporated: (https://www.adobe.io/content/dam/udp/en/open/standards/tiff/TIFF6.pdf \Box)
Jpeg2000 (JP2)	Part 1 (JP2)	ISO/IEC 15444-1:2004 Information technology – JPEG 2000 image coding system: Core coding system: (https://www.iso.org/standard/78321.html 🗷)
Portable Network Graphics (PNG)	1.2	tableISO/IEC 15948:2004 Information technology Computer graphics and image processing Portable Network Graphics (PNG): Functional specification: (http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=29581 7)
Portable Document Format/Archival (PDF/A)	PDF/A-1	ISO 19005-1:2005 Electronic document file format for long-term preservation – Part 1: Use of PDF 1.4 (PDF/A-1): (http://www.iso.org/iso/catalogue_detail?csnumber=38920 🗗)
OpenDocument Graphics Format (ODG)	All versions	ISO/IEC 26300-1:2015 Information technology — Open Document Format for Office Applications (OpenDocument) v1.2 — Part 1: OpenDocument Schema: (https://www.iso.org/standard/66363.html)



Acceptable	Format Versions	Format Specifications
Formats		

ISO/IEC 10918-5 Information technology - Digital Compression and coding JPEG File of continuous-tone still images: JPEG Interchange File Format: Interchange (http://www.iso.org/iso/home/store/ Format (JFIF) with catalogue_tc/catalogue_detail.htm?csnumber=54989 2) Joint 1.02 Photographic ISO/IEC 10918-1:1994 Information technology – Digital Compression and **Experts Group** coding of continuous-tone still images: Requirements and guidelines: (JPEG) (http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm? compression csnumber=18902 **△***) Graphics Graphics Interchange Format (sm) Version 89a: Interchange 87a & 89a (http://www.w3.org/Graphics/GIF/spec-gif89a.txt ☑) Format (GIF)

Geospatial Formats

Geospatial records include digital cartographic data files and aerial photography that are created and processed in Geographic Information Systems (GIS) or other software applications for spatial analysis.







Preferred Formats

Preferred Formats	Format Versions	Format Specifications
Geospatial Tagged Image File Format	1.8.2	Geo TIFF Format Specification: (http://geotiff.maptools.org/spec/geotiffhome.html ♂)
Geographic Markup Language	2.0 through 3.2	ISO 19136:2007 & Version 3.2, OGC document 07-036: (http://www.opengeospatial.org/standards/is ☑)
Topologically Integrated Geographic Encoding and Referencing Files	2006 Second Edition	2006 Second Edition TIGER/Line®: (https://www.census.gov/programs-surveys/geography/technical-documentation/complete-technical-documentation.html)
Keyhole Markup Language	2.2	Open Geospatial Consortium OGC 07-147r2: (http://www.opengeospatial.org/standards/kml/ 🗷)
Geopackage Encoding Standard	1.3.1	Open Geospatial Consortium OGC 12-128r18: (https://www.geopackage.org/spec131/index.html 🗷)





Acceptable Formats

Acceptable Formats	Format Versions	Format Specifications
Vector Product Format		MIL-STD-2407: (https://apps.dtic.mil/sti/pdfs/AD1110765.pdf ぱ)
ESRI ARC/INFO Interchange File Format		Reverse engineered specification: (http://avce00.maptools.org/docs/v7_e00_cover.html 🛂)
TerraGo Geospatial PDF	GeoPDF Encoding Best PracticeVersion 2.2	Open Geospatial Consortium Inc. OGC 08-139r2: (http://www.opengeospatial.org/standards/is 🗗)

ESRI Shapefile (Compound)

ESRI Shapefile Technical Description:

(http://www.esri.com/library/whitepapers/pdfs/shapefile.pdf

)

Acceptable for Imminent Transfer Formats

Acceptable for Imminent Transfer Formats	Format Versions	Format Specifications
Spatial Data Transfer Standard (SDTS)	All versions	ANSI NCITS 320-1998: (https://pubs.usgs.gov/fs/1999/0077/report.pdf)

Presentation Formats

Presentation formats are used to convey graphical information to audiences in the form of a slide show. Presentation formats are not acceptable for use as transfer containers for permanent digital still images.



Preferred Formats	Format Versions	Format Specifications
OpenDocument Presentation Format (ODP)	All versions	ISO/IEC 26300-1:2015 Information technology — Open Document Format for Office Applications (OpenDocument) v1.2 — Part 1: OpenDocument Schema: (https://www.iso.org/standard/66363.html ☑)
Portable Document Format Archival (PDF/A-1)	PDF/A-1	ISO 19005-1:2005 Electronic document file format for long-term preservation - Part 1: Use of PDF 1.4 (PDF/A-1): (http://www.iso.org/iso/catalogue_detail?csnumber=38920 🛂)

Acceptable Formats

Acceptable Formats	Format Versions	Format Specifications
Microsoft Powerpoint 1997- 2007 Binary Format (PPT)	8.0	[MS-PPT]: PowerPoint (.ppt) Binary File Format: (http://msdn.microsoft.com/en-us/library/cc313106(v=office.12).aspx 🗷)
Microsoft Powerpoint Office Open XML Format (PPTX)		[MS-OI29500]: Office Implementation Information for ISO/IEC 29500 Standards Support: (http://msdn.microsoft.com/en-us/library/ee908652%28v=office.12%29
PDF/A-2	PDF/A-2	ISO 19005-2:2011 Document management Electronic document file format for long-term preservation Part 2: Use of ISO 32000-1 (PDF/A-2): (http://www.iso.org/iso/home/store/catalogue_tc/catalogue_detail.htm? csnumber=50655 (3)

Born-Digital Textual Data

The born-digital textual data category refers to two general content types: unformatted (plain text) or formatted. Unformatted plain text (defined in MIME as text/plain) contains basic character information and control or non-printing characters but lacks styling information. Formatted text files include all of the attributes of plain text files but have extended formatting capabilities, for "stylized" or "rich" text features including italics, bold, colors, hyper-linking, etc.

Agencies must identify the character encoding method used with each text file.







Preferred Formats

Preferred Formats	Format Versions	Format Specifications
ASCII Text	7 bit	ISO/IEC 646:1991 Information technology ISO 7-bit coded character set for information interchange: (http://www.iso.org/iso/catalogue_detail.htm?csnumber=4777 🗷)
Unicode Text	UTF-8	RTF 3629: UTF-8, A Transformation Format of ISO 10646: (http://tools.ietf.org/html/rfc3629 🗷)
	UTF-16	RFC 2781 UTF-16: An Encoding of ISO 10646: (http://www.ietf.org/rfc/rfc2781.txt 🗷)
OpenDocument Text Format (ODT)	All versions	ISO/IEC 26300-1:2015 Information technology — Open Document Format for Office Applications (OpenDocument) v1.2 — Part 1: OpenDocument Schema: (https://www.iso.org/standard/66363.html 🗷)
PDF/A-1	PDF/A-1	ISO 19005-1:2005 Document management Electronic document file format for long-term preservation Part 1: Use of PDF 1.4 (PDF/A-1): (http://www.iso.org/iso/catalogue_detail?csnumber=38920 🕜)
PDF/A-2	PDF/A-2	ISO 19005-2:2011 Document management Electronic document file format for long-term preservation Part 2: Use of ISO 32000-1 (PDF/A-2): (http://www.iso.org/iso/home/store/catalogue_tc/catalogue_detail.htm? csnumber=50655 🗗)





Acceptable Formats

Acceptable Formats	Format Versions	Format Specifications
PDF	PDF 1.7	ISO 32000-1:2008 Document management Portable document format Part 1: PDF 1.7: (http://www.iso.org/iso/catalogue_detail.htm?csnumber=51502
	PDF 1.0-1.6	Adobe® Portable Document Format Version 1.6: (https://opensource.adobe.com/dc-acrobat-sdk-docs/pdfstandards/pdfreference1.6.pdf 🗗)
Microsoft Word (DOCX) Office Open XML	OOXML Microsoft Word for Windows, version 2007-2010	[MS-OI29500]: Office Implementation Information for ISO/IEC 29500 Standards Support: (http://msdn.microsoft.com/en-us/library/ee908652%28v=office.12%29 才)
Microsoft Word 97 Binary Document Format (DOC)	8.0	[MS-DOC]: Word (.doc) Binary File Format: (http://msdn.microsoft.com/en-us/library/cc313153%28v=office.12%29.aspx ☑)

Structured Data Formats

Structured data comprises the broad category of data that is stored in defined fields. Categories for structured data are as follows:

- Database formats are organized collections of associated data that conform to a logical structure. Database formats are determined by "data models" that describe specific data structures used to model an application and generally include navigational, relational, and hybrid models;
- Spreadsheets are tables made up of columns and rows and which contain cells of data. Relationships between cells can be pre-defined as mathematical formulas:
- Statistical data is the result of quantitative research and analysis. Statistical data formats contain collections of data presented in both tabular and non-tabular form; and
- Scientific data refers to research data collected by instrumentation tools during the scientific process. Scientific data formats are either domain specific within a single field of study, or are multi-domain formats used for transfer of scientific data between domains.

General requirements for structured data include the following:

- Agencies must transfer structured data that is both well-formed according to the syntactical conventions of the format, and valid according to the structural rules defined in any associated schemas or document type definitions (DTDs);
- Value Separated Files, e.g. CSV or comma separated value files, may use a character other than the comma. The pipe or
 caret are recommended delimiters because they are not commonly found in free text fields. Alternatively, text files
 encoded with ASCII characters and where each field is a fixed width, is also an acceptable transfer format for use with
 structured data, even though ASCII is technically a data encoding type. ASCII text files must be accompanied by complete
 documentation of the record lengths and field widths;
- Data files and databases shall be transferred as flat files or as rectangular tables, that is, as two-dimensional arrays, lists
 or tables. All records in a database, or rows (tuples) in a relational database, should have the same logical format. Each
 data element within a record should contain only one data value. A record should not contain nested repeating groups of
 data items; and
- Structured data must be transferred together with any associated files necessary to verify the validity of the data, e.g., DTDs, schemas, and data dictionaries.



Preferred Formats	Format Versions	Format Specifications
Comma Separated Value (CSV)	N/A	Common Format and MIME Type for Comma-Separated Values (CSV) Files: (http://tools.ietf.org/html/rfc4180 ☑)
OpenDocument Format Spreadsheet (ODS)	All versions	ISO/IEC 26300-1:2015 Information technology — Open Document Format for Office Applications (OpenDocument) v1.2 — Part 1: OpenDocument Schema: (https://www.iso.org/standard/66363.html ばり
ASCII Text	7 bit	ISO/IEC 646:1991 Information technology ISO 7-bit coded character set for information interchange: (http://www.iso.org/iso/catalogue_detail.htm?csnumber=4777 🗗)
JavaScript Object Notation (JSON)		The application/json Media Type for JavaScript Object Notation (JSON): (http://www.ietf.org/rfc/rfc4627.txt?number=4627 🗷)

Extensible Markup
Language (XML)

1.1

Extensible Markup Language (XML) 1.1 (Second Edition): (http://www.w3.org/TR/2006/REC-xml11-20060816/ 🗷)

Software Independent

Archiving of Relational

SIARD Format Specification:

(https://siard.dilcis.eu/specification/SIARD_2_2.pdf ✓)



Databases (SIARD)

Acceptable Formats

Acceptable Formats	Format Versions	Format Specifications
Microsoft Excel Office Open XML	OOXML Workbook Excel 2007-2010 XLSX Microsoft Excel for Windows, version 2007	[MS-OI29500]: Office Implementation Information for ISO/IEC 29500 Standards Support: (http://msdn.microsoft.com/en-us/library/ee908652%28v=office.12%29 🗷)
Microsoft Excel 97 Binary Document Format (XLS)	Version 8.0	[MS-XLS]: Excel Binary File Format (.xls) Structure: (http://msdn.microsoft.com/en-us/library/cc313154(v=office.12).aspx (27)



Acceptable for Imminent Transfer Formats

Acceptable for Imminent Transfer Formats	Format Versions	Format Specifications
Extended Binary Coded Decimal Interchange Code (EBCDIC)	U.S. EBCDIC	IBM EBCDIC: (https://en.wikipedia.org/wiki/EBCDIC ご)

Email

Email is defined as discrete electronic communications transmitted over the Simple Mail Transfer Protocol (SMTP), between two or more people or entities, in compliance with applicable IETF's Request for Comments (RFC) specifications. Email does not include other functions commonly available via email programs such as calendars, tasks, appointments, newsgroups, or instant messaging. In order for information in a calendar, contact list, address book etc. to be transferred to NARA, it must be scheduled as a separate item.

Please note that NARA considers email attachments to be a component of the email record and does not require that unseparated email attachments meet the transfer standards specified by the format category under which the attachment alone would fall.

General requirements for email:

- Transfers of email records must consist of an identifiable, organized body of records (not necessarily a traditional series);
- Email messages should include delimiters that indicate the beginning and end of each message and the beginning and end of each attachment, if any. Each attachment must be differentiated from the body of the message, and uniquely identified;
- Email messages transferred as XML files must be accompanied by any associated document type definitions (dtds), schemas, and/or data dictionaries;

- Labels to identify each part of the message (Date, To [all recipients, including cc: and bc: copies], From, Subject, Body, and Attachment) including transmission and receipt information (Time Sent, Time Opened, Message Size, File Name, and similar information, if available). To ensure identification of the sender and addressee(s), agencies that use an email system that identifies users by codes or nicknames, or identifies addressees only by the name of a distribution list should include information with the transfer-level documentation; and
- Email converted to formats not natively used by the email program, and which do not maintain header information (such as RTF or Word documents) are not accepted. Printouts of emails are also not accepted under this Bulletin.







Preferred Formats for Individual Messages

Preferred Formats for Individual Messages	Format Versions	Format Specifications
		Internet Message Format: (http://www.ietf.org/rfc/rfc2822.txt 🗷)
Internet Message Format (EML)		And MIME: (http://tools.ietf.org/html/rfc2045), (http://tools.ietf.org/html/rfc2046), (http://tools.ietf.org/html/rfc2047), (http://tools.ietf.org/html/rfc4288), (http://tools.ietf.org/html/rfc4289), (http://tools.ietf.org/html/rfc4289), (
		MBOX Email Format: (https://tools.ietf.org/html/rfc4155 ♂)
MBOX Email Format (MBOX)		And MIME: (http://tools.ietf.org/html/rfc2045), (http://tools.ietf.org/html/rfc2046), (http://tools.ietf.org/html/rfc2047), (http://tools.ietf.org/html/rfc4288), (http://tools.ietf.org/html/rfc4289), (http://tools.ietf.org/html/rfc4289), (





Acceptable Formats for Individual Messages

Acceptable Formats for Individual Messages	Format Versions	Format Specifications
Extensible Markup Language (XML)	1.1	Extensible Markup Language (XML) 1.1 (Second Edition): (http://www.w3.org/TR/2006/REC-xml11-20060816/ 🗷)
Microsoft Outlook Item Message Format (MSG)		Microsoft Outlook Item Message Format: (http://msdn.microsoft.com/en- us/library/cc463912(v=exchg.80).aspx ☑)







Preferred Formats for Aggregations of Email

Preferred Formats

for Aggregations of **Email**

Format Versions

Format Specifications

Outlook Personal Folders File Format:

(http://msdn.microsoft.com/enus/library/ff385210%28v=office.12%29.aspx ②)

MBOX Email Format: (https://tools.ietf.org/html/rfc4155 ③)

And MIME:
(http://tools.ietf.org/html/rfc2045 ⑤),
(http://tools.ietf.org/html/rfc2046 ⑥),
(http://tools.ietf.org/html/rfc2047 ⑥),
(http://tools.ietf.org/html/rfc4288 ⑥),
(http://tools.ietf.org/html/rfc4289 ⑥),
(http://tools.ietf.org/html/rfc2049 ⑥)

Web Records

Web records consist of web sites and social media sites created and maintained to provide information and services of the United States Government via the World Wide Web. This Bulletin applies to web records managed by an agency that have been appraised and scheduled for permanent retention by NARA. Agencies should harvest websites using a utility that will package component files in a manner that meets the following general requirements.

General requirements for web content records:

- Web records must be accessible via Hypertext Transfer Protocol (HTTP) from a server to a client *browser* when a *URL* has been activated;
- Web content records that share a domain name including content managed under formal agreement and residing on another site must be transferred together;
- All component parts of web content records that have been appraised as permanent including image, audio, video and all other proprietary formats, must be transferred in a manner that maintains all of the original links, functionality and data integrity;
- Dynamic content such as calendars or databases either must be transferred in an acceptable format, or be made accessible as static content;
- All internally referenced URLs must be included with the transfer set; and
- All control information from the harvesting protocol must be maintained.

The following will not be accepted for transfer under this Bulletin:

- Program or administrative records documenting the management of web sites;
- Externally referenced content (e.g., accessed via hyperlink) that resides in a different domain and is not managed for an agency under a formal agreement;
- · Static images, (such as screen shots), of web content records, because they do not retain hypertext functionality.



Preferred Formats	Format Versions	Format Specifications
Web ARChive Format (WARC)	1.0	WARC file format: (https://iipc.github.io/warc-specifications/specifications/warc-format/warc-1.0/index.html)

Web ARChive Format (WARC)	1.1	WARC file format: (https://iipc.github.io/warc-specifications/specifications/warc-format/warc-1.1/index.html)
Web Archive Collection Zipped (WACZ)	All versions	WACZ file format: (https://specs.webrecorder.net/wacz/1.1.1/ 🗷)

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Acceptable Formats	Format Versions	Format Specifications
Archive File Format	1.0	Arc File Format:
(ARC)		(http://archive.org/web/researcher/ArcFileFormat.php ☑)

Calendars

Electronic calendars allow users or groups to create events that can be exchanged between applications or systems. Users can manage and view events across defined time periods, such as hours, days, weeks, months, and years. The format, iCalendar or iCal, contains a variety of functions: events, to-do lists, journal entries, time zone, availability designated as free or busy, and notifications. The format can be exchanged through a variety of methods including Simple Mail Transfer Protocol (SMTP), HyperText Transfer Protocol (HTTP), a file system, and protocols, such as memory-based clipboard or drag and drop functions.

Calendar events can include attachments in multiple file formats, such as documents or spreadsheets or other file formats not specified within this appendix. Attachments are not required to be transferred separately. As components of the calendar record, attachments are transferred within the calendar file.

General requirements for calendar files:

- Transfers of calendar records must consist of an identifiable, organized body of records (not necessarily a traditional series);
- Calendars must include labels to identify each component. Delimiters must indicate the beginning and end of each event and the beginning and end of each attachment, if any. Each attachment must be differentiated from the body of the calendar. Each attachment must be uniquely identified; and
- NARA will not accept transfers of calendars converted to PDF files.



Preferred Formats	Format Versions	Format Specifications
iCalendar / iCal (ICS)	N/A	Internet Calendaring and Scheduling Core Object Specification (iCalendar). RFC 5545. Internet Engineering Task Force, September 2009. (https://www.ietf.org/rfc/rfc5545.txt 🗷)

Navigational Charts

Electronic navigational charts are tools used to provide safe navigation for all classes of vessels. Official charts, issued by a government, hydrographic office, or other government institution, comply with standards developed by the International Hydrographic Organization (IHO). These charts show detailed configurations of the seabed, characteristics of the coast, routes, and aids to navigation.

There are two types of electronic navigational charts—raster charts and vector charts:

- Electronic Navigational Charts (ENC) are vector data sets of all the objects (points, lines, and areas) represented on a chart in a digital database.
- Raster Navigational Charts (RNC) are digitized raster copies of official paper charts.







Preferred Formats

Preferred Formats	Format Versions	Format Specifications
Electronic Navigational Chart	S/57	IHO Transfer Standard for Digital Hydrographic Data, Special Publication No. 57 (https://iho.int/uploads/user/pubs/standards/s-57/31Main.pdf 🗷)
Raster Navigational Chart	BSB	Product Specification for Raster Navigational Charts (RNC), Special Publication No. 61 (https://iho.int/uploads/user/pubs/standards/s-61/S61E.pdf 🗗)

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