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Document management — AFP/Archive

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National foreword

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 171, *Document management applications*, Subcommittee SC 2, *Application issues*.

INTERNATIONAL STANDARD ISO 18565:2015(E)

Document management — AFP/Archive

1 Scope

This International Standard specifies the AFP document architecture by defining a subset appropriate for long-term preservation and retrieval. This subset will avoid ambiguity by assuring page independence and eliminating the use of resolution dependent fonts and images, device default fonts and external resources.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 12651-1, *Electronic document management — Vocabulary — Part 1: Electronic document imaging*

ISO 19005-1, *Document management — Electronic document file format for long-term preservation — Part 1: Use of PDF 1.4 (PDF/A-1)*

Mixed Object Document Content Architecture (MO:DCA) Reference (AFPC-0004-08) Ninth Edition (July 2011)

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12651-1, ISO 19005-1 and the following apply.

3.1
advanced function presentation
AFP
overall term used to describe architecture and solutions derived from the Mixed Object Document Content Architecture and its companion print protocol IPDS (Intelligent Printer Data Stream)

Note 1 to entry: AFP and its associated architecture was originally defined by IBM and is currently managed by the AFP Consortium http://www.afpcinc.org.

3.2
mixed object document content architecture
MO:DCA
presentation architecture including syntax, semantics and processing requirements capable of integrating native and non-native content objects into a single document or data stream

3.3
AFPC TIFF
subset of TIFF defined for printing as part of a collection of presentation object subsets for AFP

Note 1 to entry: See http://afpcinc.org/wp-content/uploads/2014/04/AFPC-Subsets-v2.0.pdf.

3.4
AFPC JPEG
subset of JPEG defined for printing as part of a collection of presentation object subsets for AFP

Note 1 to entry: See http://afpcinc.org/wp-content/uploads/2014/04/AFPC-Subsets-v2.0.pdf.

4 Conformance

4.1 General

The MO:DCA architecture definition of compliance with the AFP/A interchange set is limited to what compliance means for MO:DCA print files, it does not include definitions of AFP/A compliance for product compliance classes, e.g. generators and receivers. The architecture defines the content of AFP/A-compliant print files in terms of what is permitted (MAY), what is recommended (SHOULD), what is mandatory (SHALL), and what is prohibited (SHALL NOT).

A MO:DCA print file is compliant with the AFP/A interchange set definition if all the following conditions are met:

— all objects and their content shall be in AFP/A and shall comply with the AFP/A object structure definitions;

— all structured fields shall be in AFP/A and shall comply with the AFP/A parameter and triplet definitions;

— all structured field triplets shall be in AFP/A and shall comply with applicable AFP/A restrictions;

— all parameter values shall fall within the ranges defined by AFP/A;

— the print file shall not include any migration functions (as defined in the MO:DCA Reference, Appendix C) unless they are explicitly allowed in AFP/A (see Clause 9);

— the maximum structured field length shall be limited to X'7FF0' = 32752;

— all Begin Document (BDT) structured fields shall specify the MO:DCA Interchange Set (X'18') triplet with IStype = X'05' (archive/presentation) and one of the following:

  — ISid = X'0001' (AFP/A), or

  — ISid = X'0D01' (AFP/A, IS/3);

— the print file shall be enveloped with Begin Print File (BPF) and End Print File (EPF) structured fields and the BPF shall specify the MO:DCA Interchange Set (X'18') triplet with IStype = X'05' (archive/presentation), and one of the following:

  — ISid = X'0001' (AFP/A), or

  — ISid = X'0D01' (AFP/A, IS/3); in this case the same value shall be specified on the BDT for each document in the print file.

4.2 Migration functions

In general, AFP/A does not include any obsolete, retired, or coexistence MO:DCA parameters, triplets, structured fields, or objects as defined in MO:DCA Reference, Appendix C – MO:DCA Migration Functions. For exceptions, see Clause 9.

4.3 Structured field introducer

The Flag byte (byte 5) in the Structured Field Introducer (SFI) shall be set to X'00'. AFP/A does not include support for the following MO:DCA functions:

— SFI extension;

— Structured field segmentation;

— Structured field padding.

The maximum structured field length in AFP/A is limited to X'7FF0' = 32752.

4.4 Exception conditions

In general, no exception conditions are defined within the AFP/A definition for structured fields or their parameters above and beyond what the general MO:DCA architecture defines. The following general rules apply.

Exception conditions should not be generated solely due to non-compliance with AFP/A. When a valid print file is non-compliant with AFP/A, it should always be processed to the best of a receiver's capabilities. That is, any object, object content, structured field, or structured field triplet that is valid in the general architecture but that is not included in the AFP/A definition, should be processed to the best of a receiver's capability. For example, a receiver may generate an exception because it detected an error while processing an MCF-1 structured field, but not because the print file claimed to be AFP/A compliant and the MCF-1 structured field is not part of AFP/A.

4.5 Restrictions to avoid device dependence

To ensure that an AFP/A print file can be presented accurately and consistently in the future, functions that are allowed in IS/3 but that are inherently device-dependent are not included in AFP/A. The IS/3 functions that shall not appear in AFP/A print files are the following:

— Device-dependent colours

  — Use of the CMYK colour space (ColSpce = X'04') in Color Specification Triplet and equivalent OCA structures, when not qualified with an audit Color Conversion CMR;

  — Use of the Highlight Color Space (ColSpce = X'06') in Color Specification Triplet and equivalent OCA structures, when not qualified with an Indexed CMR that specifies a substitute CIELab value;

— Device-dependent fonts

  — Use of the device default font in PTOCA text (local ID = X'FF' in SCFL control sequence);

  — Use of the device default font in GOCA graphics (local ID = X'00' or X'FF' in GSCS drawing order);

  — BCOCA allows the use of a default font to print HRI, and since the HRI is not the actual bar code, AFP/A allows the use of the default font for HRI. However, this may lead to a slightly different appearance when the archived file is re-printed. If it is mandatory that the HRI is reproduced the same way each time the AFP file is printed, the default font should not be used. Instead, a TrueType/OpenType font that is carried in the print file resource group should be referenced and used;

— Images without clearly defined resolution

  — AFPC JPEG and GIF images normally do not inherently specify their resolution. This resolution is needed to properly size the object for image presentation space mapping options other than: the following:

    — Scale to fit;

    — Scale to fill.

  When a mapping option, other than these is specified, these images cannot be included in AFP/A print files unless they specify an Image Resolution (X'9A') triplet.

— Device-dependent medium map functions — the following MMC keywords:

  — X'90nn', X'91nn': high/low media destination selector;

  — X'A0nn': fixed medium information;

— X'A1nn': fixed perforation cut;

— X'A2nn': fixed separation cut;

— X'B4nn', X'B5nn': high/low presentation subsystem set-up ID;

— X'E0nn': media source selector;

— X'E1nn': media source ID;

— X'F8nn': print quality control.

In general, archiveability is improved by avoiding resolution dependent data since presentation device resolutions will change over time. For example, it is preferable to archive bar code data as a BCOCA object, which is resolution independent, instead of as an image or a raster font.

4.6 Page independence

In AFP/A it is imperative that a single page can be retrieved from a document and viewed or printed exactly as it appears when printed within the context of the complete archived print file. This means that the last invoked medium map (the "active" medium map for the page) shall be known, and the numerical order of the page with respect to the last invoked medium map shall be known. As a result, the following triplets, which are optional in the general MO:DCA architecture and in IS/3, are mandatory on BPG structured fields in AFP/A.

— FQN type X'8D' — Begin Medium Map Reference. This triplet points to the last medium map that was invoked before the given page; that is it points to the active medium map for the page. Note that the referenced medium map may be an internal medium map, and this medium map takes precedence over a medium map in the print file resource group.

— Either the Medium Map Page Number (X'56') triplet or the Page Position Information (X'81') triplet. If both are specified the X'81' triplet overrides. These triplets specify the sequence number of the page in the set of pages controlled by the active medium map.

NOTE The Presentation Control (X'83') triplet remains optional on the BPG in AFP/A; if not specified, the page is both viewable and indexable.

To ensure that colours are rendered properly, a page shall specify all CMRs and rendering intents required for presentation; the page cannot rely on inheriting these functions from higher levels in the document hierarchy.

4.7 Availability of correct resources

All resources that are referenced within the AFP/A print file shall be carried in the print file resource group. AFP/A does not support referencing a resource that is stored in an external resource library. This ensures that

— the resource is available whenever the print file is processed and

— the same version of the resource is used whenever the print file is processed.

5 Data stream object structure

This clause defines the objects that make up an AFP/A data stream (see p. 79 of the MO:DCA Reference for a definition of the syntax used to describe object structure).

NOTE 1 The MO:DCA Begin Print File (BPF) and End Print File (EPF) structured fields are required in an AFP/A data stream.

NOTE 2 The MO:DCA Begin Document (BDT) and End Document (EDT) structured fields are required in an AFP/A data stream.

NOTE 3 The MO:DCA No Operation (NOP) structured field may appear within any begin-end domain and thus is not listed in the structured field groupings.

NOTE 4 Object content shall not include functions that are not in AFP/A. This is, a print file is not AFP/A compliant if it includes such content.

NOTE 5 Table 1 contains summaries of the AFP/A object structure. All syntax, semantics, and notes in the object structure definitions in the MO:DCA Reference, Chapter 4 "MO:DCA Objects" apply, unless explicitly specified otherwise.

Table 1 — AFP/A objects

AFP/A data stream object structure		
Object name	**Object envelope**	**Summary of AFP/A object structure; differences from general MO:DCA architecture noted**
Print File	Begin Print File (BPF) X'D3A8A5' – End Print File (EPF) X'D3A9A5'	The print file: — shall be enveloped by the Begin Print File (BPF) and End Print File (EPF) structured fields; — shall specify the MO:DCA Interchange Set (X'18') triplet with IStype = X'05' (archive/presentation), and one of the following: — ISid = X'0001' (AFP/A), or — ISid = X'0D01' (AFP/A, IS/3); in this case the same value shall be specified on the BDT for each document in the print file. The print file contains only the following objects, as defined in the general architecture subject to all applicable AFP/A restrictions: **Print file** (BPF, D3A8A5) [(Resource Grp)] (Index + Doc) (S) (EPF, D3A9A5) **Index + document** [(Index)] (Document) (S) NOTE AFP/A compliant consumers must consider a physical file, which is an operating system file that, when it contains AFP data, is printed with a single Form Definition, as a single MO:DCA (AFP) print file that contains at most one BPF/EPF pair and at most one print-file-level resource group. Such consumers should generate a product-specific exception if the physical file contains more than one BPF/EPF pair.
Resource group (print file)	Begin Resource Group (BRG)	The resource group may only contain the following resource objects, as defined in the general architecture subject to all applicable AFP/A restrictions:

Table 1 *(continued)*

AFP/A data stream object structure		
Object name	**Object envelope**	**Summary of AFP/A object structure; differences from general MO:DCA architecture noted**
	X'D3A8C6' - End Resource Group (ERG) X'D3A9C6'	(BRG, D3A8C6) + [(Overlay) (S)] + [(MO:DCA Pseg) (S)] + [(Form Map) (S)] + [(BCOCA) (S)] + [(GOCA) (S)] + [(IOCA) (S)] + [(Object Cont) (S)] + [(FOCA Object) (S)] (ERG, D3A9C6) Each resource referenced in an AFP/A print file shall be carried in the resource group and shall be enveloped by the Begin Resource (BRS) and End Resource (ERS) structured fields. AFP/A may limit the function in objects that are carried as resources; for details see the individual AFP/A object definitions in this table. If an object container in the resource group contains a Metadata Object (MO), it shall be specified first in the resource group. Multiple MO containers may be specified in a contiguous sequence; their collection specifies the metadata for the print file. If MOs are specified anywhere else in the resource group, they are ignored.
Resource object (in print file resource group)	Begin Resource (BRS) X'D3A8CE' - End Resource (ERS) X'D3A9CE'	The resource object shall be enveloped by the Begin Resource (BRS) and End Resource (ERS) structured fields: (BRS, D3A8CE) (Res Object) (ERS, D3A9CE)
Document index	Begin Document Index (BDI) X'D3A8A7' - End Document Index (EDI) X'D3A9A7'	The document index contains only the following structured fields, as defined in the general architecture subject to all applicable AFP/A restrictions. (BDI, D3A8A7) + (IEL, D3B2A7) (S) + [(LLE, D3B490) (S)] + [(TLE, D3A090) (S)] (EDI, D3A9A7)

Table 1 *(continued)*

AFP/A data stream object structure		
Object name	**Object envelope**	**Summary of AFP/A object structure; differences from general MO:DCA architecture noted**
Document	Begin Document (BDT) X'D3A8A8' - End Document (EDT) X'D3A9A8'	The document contains only the following structured fields and objects, as defined in the general architecture subject to all applicable AFP/A restrictions. The BDT for the document shall specify the MO:DCA Interchange Set (X'18') triplet with IStype = X'05' (archive/presentation), and one of the following: — ISid = X'0001' (AFP/A), or — ISid = X'0D01' (AFP/A, IS/3) (BDT, D3A8A8) + [(IMM, D3ABCC) (S)] + [(LLE, D3B490) (S)] + [(Medium Map) (S)] + [(REG) (S)] + [(Page) (S)] + [(Page Group) (S)] (EDT, D3A9A8)
Resource Environment Group (REG)	Begin Resource Environment Group (BSG) X'D3A8D9' - End Resource Environment Group (ESG) X'D3A9D9'	The Resource Environment Group contains only the following structured fields, as defined in the general architecture subject to all applicable AFP/A restrictions. (BSG, D3A8D9) [(MDR, D3ABC3) (S)] [(MPO, D3ABD8) (S)] [(PPO, D3ADC3) (S)] (ESG, D3A9D9)
Page	Begin Page (BPG) X'D3A8AF' - End Page (EPG) X'D3A9AF'	The page contains only the following structured fields and objects, as defined in the general architecture subject to all applicable AFP/A restrictions.

Table 1 *(continued)*

AFP/A data stream object structure		
Object name	**Object envelope**	**Summary of AFP/A object structure; differences from general MO:DCA architecture noted**
		Page (BPG, D3A8AF) (AEG) + [(IOB, D3AFC3) (S)] + [(IPO, D3AFD8) (S)] + [(IPS, D3AF5F) (S)] + [(LLE, D3B490) (S)] + [(TLE, D3A090) (S)] + [(BCOCA) (S)] + [(GOCA) (S)] + [(IOCA) (S)] + [(PTOCA) (S)] + [(Object Cont) (S)] (EPG, D3A9AF) **AEG** (BAG, D3A8C9) [(PEC, D3A7A8)] [(MCF, D3AB8A) F2 (S)] [(MDR, D3ABC3) (S)] [(MPO, D3ABD8) (S)] [(MPS, D3B15F) (S)] (PGD, D3A6AF) [(OBD, D3A66B)] [(OBP, D3AC6B)] (PTD, D3B19B) F2 (EAG, D3A9C9)

Table 1 *(continued)*

AFP/A data stream object structure		
Object name	**Object envelope**	**Summary of AFP/A object structure; differences from general MO:DCA architecture noted**
		Notes: 1. The OBD is only used for PTOCA objects without an OEG, and if specified, — the measurement units shall match the units in the PGD and — the extents shall match the extents in the PGD. These are the architected defaults if the OBD is not specified, and will cause the text object area to have the same units and extents as the page presentation space. 2. The OBP is only used for PTOCA objects without an OEG, and if specified — the object area origin shall be set to zero, — the object content origin shall be set to zero and — the object area orientation shall be set to (0°,90°). These are the architected defaults if the OBP is not specified, and will cause the text object area to be positioned coincident with the page presentation space. 3. The PTD is only mandatory if the page contains one or more PTOCA objects without an OEG. It is strongly recommended that the measurement units in the PTD match the units in the PGD. AFP/A may limit the function in the objects; for details see the individual AFP/A object definitions in this table.
Page group	Begin Named Page Group (BNG) X'D3A8AD' - End Named Page Group (ENG) X'D3A9AD'	The page group contains only the following structured fields and objects, as defined in the general architecture subject to all applicable AFP/A restrictions. (BNG, D3A8AD) [(TLE, D3A090) (S)] + [(IMM, D3ABCC) (S)] + [(LLE, D3B490) (S)] + [(Medium Map) (S)] + [(REG) (S)] + [(Page) (S)] + [(Page Group) (S)] (ENG, D3A9AD)

Table 1 *(continued)*

AFP/A data stream object structure		
Object name	**Object envelope**	**Summary of AFP/A object structure; differences from general MO:DCA architecture noted**
Overlay	Begin Overlay (BMO) X'D3A8DF' - End Overlay (EMO) X'D3A9DF'	The overlay contains only the following structured fields and objects, as defined in the general architecture subject to all applicable AFP/A restrictions. **Overlay** (BMO, D3A8DF) (AEG) + [(IOB, D3AFC3) (S)] + [(IPS, D3AF5F) (S)] + [(LLE, D3B490) (S)] + [(TLE, D3A090) (S)] + [(BCOCA) (S)] + [(GOCA) (S)] + [(IOCA) (S)] + [(PTOCA) (S)] + [(Object Cont) (S)] (EMO, D3A9DF) **AEG** (BAG, D3A8C9) [(PEC, D3A7A8)] [(MCF, D3AB8A) F2 (S)] [(MDR, D3ABC3) (S)] [(MPS, D3B15F) (S)] (PGD, D3A6AF) [(OBD, D3A66B)] [(OBP, D3AC6B)] (PTD, D3B19B) F2 (EAG, D3A9C9)

Table 1 *(continued)*

AFP/A data stream object structure		
Object name	**Object envelope**	**Summary of AFP/A object structure; differences from general MO:DCA architecture noted**
		Notes: 1. The OBD is only used for PTOCA objects without an OEG, and if specified — the measurement units shall match the units in the PGD and — the extents shall match the extents in the PGD. These are the architected defaults if the OBD is not specified, and will cause the text object area to have the same units and extents as the overlay presentation space. 2. The OBP is only used for PTOCA objects without an OEG, and if specified — the object area origin shall be set to zero, — the object content origin shall be set to zero and — the object area orientation shall be set to (0°,90°). These are the architected defaults if the OBP is not specified, and will cause the text object area to be positioned coincident with the overlay presentation space. 3. The PTD is only mandatory if the overlay contains one or more PTOCA objects without an OEG. It is strongly recommended that the measurement units in the PTD match the units in the PGD. AFP/A may limit the function in the objects; for details see the individual AFP/A object definitions in this table.
Page segment	Begin Page Segment (BPS) X'D3A85F' - End Page Segment (EPS) X'D3A95F'	The page segment shall be a MO:DCA page segment and contains only the following structured fields and objects, as defined in the general architecture subject to all applicable AFP/A restrictions. **Page segment** (BPS, D3A85F) + [(BCOCA) (S)] + [(GOCA) (S)] + [(IOCA) (S)] (EPS, D3A95F) AFP/A may limit the function in the objects; for details see the individual AFP/A object definitions in this table.

Table 1 *(continued)*

AFP/A data stream object structure		
Object name	**Object envelope**	**Summary of AFP/A object structure; differences from general MO:DCA architecture noted**
Bar code object	Begin Bar Code Object (BBC) X'D3A8EB' - End Bar Code Object (EBC) X'D3A9EB'	The object content shall comply with the BCOCA BCD2 subset definition. The bar code object contains only the following structured fields, as defined in the general architecture subject to all applicable AFP/A restrictions. **Bar code object** (BBC, D3A8EB) (OEG) [(BDA, D3EEEB) (S)] (EBC, D3A9EB) **OEG** (BOG, D3A8C7) (OBD, D3A66B) (OBP, D3AC6B) [(MBC, D3ABEB)] [(MCF, D3AB8A) F2 (S)] [(MDR, D3ABC3) (S)] (BDD, D3A6EB) (EOG, D3A9C7)
Graphics object	Begin Graphics Object (BGR) X'D3A8BB' - End Graphics Object (EGR) X'D3A9BB'	The object content shall comply with the AFP GOCA GRS3 subset definition. The graphics object contains only the following structured fields, as defined in the general architecture subject to all applicable AFP/A restrictions. **Graphics object** (BGR, D3A8BB) (OEG) [(GAD, D3EEBB) (S)] (EGR, D3A9BB) **OEG** (BOG, D3A8C7) [(PEC, D3A7A8)] (OBD, D3A66B) (OBP, D3AC6B) [(MGO, D3ABBB)] [(MCF, D3AB8A) F2 (S)] [(MDR, D3ABC3) (S)] (GDD, D3A6BB) (EOG, D3A9C7) NOTE If the boundary for an area is to be drawn but is not properly closed, AFP/A receivers should not draw a line to close the figure.

Table 1 *(continued)*

AFP/A data stream object structure		
Object name	**Object envelope**	**Summary of AFP/A object structure; differences from general MO:DCA architecture noted**
Image object	Begin Image Object (BIM) X'D3A8FB' - End Image Object (EIM) X'D3A9FB'	The object content shall comply with the IOCA FS10 or FS45 subset definitions. Note that compliance with IOCA FS45 includes compliance with IOCA FS40 and FS42. The image object contains only the following structured fields, as defined in the general architecture subject to all applicable AFP/A restrictions. **Image object** (BIM, D3A8FB) (OEG) [(IPD, D3EEFB) (S)] (EIM, D3A9FB) **OEG** (BOG, D3A8C7) [(PEC, D3A7A8)] (OBD, D3A66B) (OBP, D3AC6B) [(MIO, D3ABFB)] [(MDR, D3ABC3) (S)] (IDD, D3A6FB) (EOG, D3A9C7) The object content includes support for the following additional IOCA functions: — IDD Set Extended Bilevel Image Color self-defining field; — MO:DCA colour spaces, subject to AFP/A restrictions, for bilevel tiles on the Tile Set Color parameter.
Presentation text object	Begin Presentation Text Object (BPT) X'D3A89B' - End Presentation Text Object (EPT) X'D3A99B'	The object content shall comply with the PTOCA PT3 subset definition, with support for the following additional PTOCA functions: — Set Text Color (STC) control sequence "Precision" parameter (byte 6) is retired; — New Exception id EC-1A03: Invalid Unicode Data; — Highlight Color Space, range X'0100' - X'FFFF', for Indexed CMRs; — Support for the full range of colour values, as defined in the Standard OCA Color Value Table (Appendix A, MO:DCA Reference), in the STC control sequence; — Support for the full PTOCA parameter ranges in the DBR, DIR, SIA, and SVI control sequences. The text object contains only the following structured fields, as defined in the general architecture subject to all applicable AFP/A restrictions. **Text object** (BPT, D3A89B) [(PTX, D3EE9B) (S)] (EPT, D3A99B)

Table 1 *(continued)*

AFP/A data stream object structure		
Object name	**Object envelope**	**Summary of AFP/A object structure; differences from general MO:DCA architecture noted**
Object container – Presentation object	Begin Object Container (BOC) X'D3A892' - End Object Container (EOC) X'D3A992'	See Table 2 for the presentation object containers included in AFP/A. The object container contains only the following structured fields, as defined in the general architecture subject to all applicable AFP/A restrictions. **Presentation object container** (BOC, D3A892) [(OEG)] [(OCD, D3EE92) (S)] (EOC, D3A992) **OEG** (BOG, D3A8C7) [(PEC, D3A7A8)] [(OBD, D3A66B)] [(OBP, D3AC6B)] [(MCD, D3AB92)] [(MDR, D3ABC3) (S)] [(CDD, D3A692)] (EOG, D3A9C7) — If included directly on a page/overlay, BOC/EOC is mandatory, OEG with OBD, OBP, CDD is mandatory, and all object data shall be carried in OCDs. — If included with an IOB and located in the resource group, BOC/EOC is mandatory and all object data shall be carried in OCDs; OEG is optional. See Table 4 for the AFP/A presentation object containers that can be referenced with an IOB structured field.
Object Container – Non-Presentation Object	Begin Object Container (BOC) X'D3A892' - End Object Container (EOC) X'D3A992'	See Table 3 for the non-presentation object containers included in AFP/A. The object container contains only the following structured fields, as defined in the general architecture subject to all applicable AFP/A restrictions. **Non-presentation object container** (BOC, D3A892) [(OCD, D3EE92) (S)] (EOC, D3A992) — If located in the resource group, BOC/EOC is mandatory and all object data shall be carried in OCDs.

Table 1 *(continued)*

AFP/A data stream object structure		
Object name	**Object envelope**	**Summary of AFP/A object structure; differences from general MO:DCA architecture noted**
FOCA Objects	FOCA objects can occur in the print file resource group within following container: Begin Resource (BRS) X'D3A8CE' - End Resource (ERS) X'D3A9CE'	The following FOCA objects are supported and may be referenced with an MDR structured field that specifies the name of the code page or an MCF structured field that specifies the name of the object. — Font character sets — Code pages — Single-byte and double-byte — Single-byte and double-byte with Unicode values — Coded fonts

Table 2 — AFP/A containers — Presentation objects

Component ID	Object type	Encoded object-type OID
14	TIFF	X'06072B12000401010E'
22	GIF	X'06072B120004010116'
23	JFIF (JPEG) Superseded by *AFPC JPEG Subset*	X'06072B120004010117'
60	TIFF without Transparency	X'06072B12000401013C'
61	TIFF Multiple Image File	X'06072B12000401013D'
62	TIFF Multiple Image — without Transparency — File	X'06072B12000401013E'
66	AFPC TIFF Subset	X'06072B120004010142'

Table 3 — AFP/A containers — Non-presentation objects

Component ID	Object type	Encoded object-type OID
20	Color Mapping Table (CMT)	X'06072B120004010114'
47	IOCA Tile Resource	X'06072B12000401012F'
51	TrueType/OpenType Font: — TrueType shapes (Unicode Cmap) — CFF Type 1 shapes (Unicode Cmap) — CFF CID shapes (Unicode Cmap)	X'06072B120004010133'
53	TrueType/OpenType Font Collection	X'06072B120004010135'
57	Color Management Resource (CMR) Baseline support as defined in the CMOCA reference, plus support for Indexed (IX) CMRs. Therefore, the following CMR types are supported: — Color Conversion (CC) CMRs; — Generic Halftone (HT) CMRs; — Generic Tone Transfer Curves (TTC) CMRs; — Indexed (IX) CMRs. Support for the CMYK passthru function.	X'06072B120004010139'

Table 3 *(continued)*

Component ID	Object type	Encoded object-type OID
67	Metadata Object (MO) Support for the Metadata Object, as defined in the MOCA reference: — MOType: — DES (descriptive) — MOFormat: — XMP (Extensible Metadata Platform) MOs are specified in object containers and shall be specified first in the resource group. Multiple MO containers may be specified in a contiguous sequence, their collection specifies the metadata for the print file. If MOs are specified anywhere else in the resource group they are ignored.	X'06072B120004010143'

Table 4 lists the AFP/A presentation object containers that can be referenced for presentation by the Include Object (IOB) structured field with ObjType = X'92'— other object data.

Table 4 — AFP/A IOB presentation object containers

Component ID	Object type	Encoded object-type OID
14	TIFF	X'06072B12000401010E'
22	GIF	X'06072B120004010116'
23	JFIF (JPEG) Superseded by *AFPC JPEG Subset*	X'06072B120004010117'
60	TIFF without Transparency	X'06072B12000401013C'
61	TIFF Multiple Image File	X'06072B12000401013D'
62	TIFF Multiple Image - without Transparency - File	X'06072B12000401013E'
66	AFPC TIFF Subset	X'06072B120004010142'

Table 5 lists the secondary resources that are supported by various AFP/A data object resources.

Table 5 — AFP/A data objects and secondary resources

Data object resource	Secondary resource	Internal resource identifier
IOCA Image	IOCA Tile Resource	4-byte local ID
	Color Management Resource	None
PTOCA Text; see Note in last row	TrueType/OpenType Font	1-byte local ID
AFP GOCA; see Note in last row	TrueType/OpenType Font	1-byte local ID
	Color Management Resource	None
BCOCA Text; see Note in last row	TrueType/OpenType Font	1-byte local ID
	Color Management Resource	None
TIFF – all formats	Color Management Resource	None
GIF	Color Management Resource	None
JFIF (JPEG) Superseded by *AFPC JPEG Subset*	Color Management Resource	None
NOTE These table entries are not formal primary resource/secondary resource pairs since PTOCA, AFP GOCA, and BCOCA objects currently cannot be processed as resource objects. However, the resources for these objects are processed like other secondary resources.		

6 Print control object structure

This clause defines the objects that are used to control the presentation of an AFP/A data stream.

Table 6 — AFP/A print control objects

AFP/A print control object structure		
Object name	**Object envelope**	**Summary of AFP/A object structure; differences from general MO:DCA architecture noted**
Form Map	Begin Form Map (BFM) X'D3A8CD' - End Form Map (EFM) X'D3A9CD'	The form map contains only the following objects, as defined in the general architecture subject to all applicable AFP/A restrictions. (BFM, D3A8CD) [(DEG)] (Medium Map) (S) (EFM, D3A9CD)

Table 6 *(continued)*

AFP/A print control object structure		
Object name	**Object envelope**	**Summary of AFP/A object structure; differences from general MO:DCA architecture noted**
Document Environment Group	Begin Document Environment Group (BDG) X'D3A8C4' - End Document Environment Group (EDG) X'D3A9C4'	The Document Environment Group (DEG) contains only the following structured fields, as defined in the general architecture subject to all applicable AFP/A restrictions. (BDG, D3A8C4) [(PFC, D3B288) (S)] [(PEC, D3A7A8) (S)] [(MMO, D3B1DF)] [(MSU, D3ABEA)] (PGP, D3B1AF) F2 (MDD, D3A688) [(MFC, D3A088) (S)] [(MDR, D3ABC3) (S)] (EDG, D3A9C4) Notes: 1. The PGP and MDD are mandatory in either the DEG or the Medium Map. 2. When the same structured field is specified in both the DEG and the Medium Map, the Medium Map overrides. 3. AFP/A does not include support for UP3i finishing operations.
Medium Map	Begin Medium Map (BMM) X'D3A8CC' - End Medium Map (EMM) X'D3A9CC'	The Medium Map contains only the following structured fields, as defined in the general architecture subject to all applicable AFP/A restrictions. (BMM, D3A8CC) [(MMO, D3B1DF)] [(MPO, D3ABD8) (S)] [(MMT, D3AB88) (S)] [(MDR, D3ABC3) (S)] (PGP, D3B1AF) F2 (MDD, D3A688) (MCC, D3A288) [(MMC, D3A788) (S)] [(PMC, D3A7AF) (S)] [(MFC, D3A088) (S)] [(PEC, D3A7A8)] (EMM, D3A9CC)

Table 6 *(continued)*

AFP/A print control object structure		
Object name	**Object envelope**	**Summary of AFP/A object structure; differences from general MO:DCA architecture noted**
		Notes: 1. The PGP and MDD are mandatory in either the DEG or the Medium Map. 2. When the same structured field is specified in both the DEG and the Medium Map, the Medium Map overrides. 3. AFP/A does not include support for UP3i finishing operations.

7 Structured fields and triplets

7.1 General

This clause lists the AFP/A structured fields and their supported triplets. Triplets that are not listed but that are allowed in the general architecture shall not be specified in an AFP/A-compliant print file.

Unless otherwise noted, all non-migration structured field positional parameters are supported in AFP/A. Also, unless otherwise noted, the complete architected parameter range is supported in AFP/A for all structured field positional parameters and triplets. In general, AFP/A does not include any obsolete, retired, or coexistence parameters or triplets as defined in Appendix C - MO:DCA Migration Functions; for exceptions, see Clause 9. For brevity, the tables in this clause are only intended to summarize the triplets that are allowed on a structured field; for a complete definition of how these triplets are used on a structured field and what restrictions may apply, the general architecture shall be consulted. Note that if a triplet is allowed to have 0 occurrences, it is an optional triplet. If it is allowed to have 1 or 1 or more occurrences but not 0 occurrences, it is a mandatory triplet.

The following rules apply to all AFP/A structured fields.

— The Local Date and Time Stamp (X'62') triplet is not included in AFP/A; it is replaced by the ISO-based Universal Date and Time Stamp (X'72') triplet and shall not be specified.

— The Presentation Space Mixing Rules (X'71') triplet is not included in AFP/A and shall not be specified.

— The Coded Graphic Character Set Global ID (X'01') triplet, while allowed on most structured fields in the general architecture, is only used in AFP/A on the BOC, BRS, IOB, MDR, PPO, and TLE structured fields, as noted explicitly in the following tables. Furthermore, AFP/A does not support the inheritance of the encoding scheme specified by the X'01' triplet on these structured fields to lower-level document components. While this triplet is mandatory on the BDT in the general architecture, it is optional on the BDT in AFP/A, and if specified, shall be ignored. It shall not be specified on any other structured field. The architected default encoding for the AFP/A print file or document is EBCDIC single-byte presentation, which is characterized with encoding scheme ID X'61nn', and which is identified with CCSID 500 (corresponding to the combination of CPGID 500 and GCSGID 697). This default can be overridden on the BOC, BRS, IOB, MDR, PPO, TLE structured fields.

7.2 Begin structured fields

The following rules apply to all Begin structured fields in AFP/A:

— The matching of names using the FQN type X'01' triplets on Begin/End structured fields is not part of AFP/A. MO:DCA AFP/A generators should use the X'FFFF' wild card on End structured fields; this matches any name on the Begin, whether specified as an 8-byte token name or specified using the FQN type X'01' triplet. Therefore, the FQN type X'01' triplet on End structured fields, while allowed in the general architecture on most End structured fields, shall not be specified on End structured fields in an AFP/A print file.

Table 7 — AFP/A begin structured fields

Structured field name	Structured field ID	AFP/A triplets (listed by ID) and their allowed occurrence; differences from general MO:DCA Architecture noted	
Begin Active Environment Group (BAG)	X'D3A8C9'	**X'65'**	0 or more
Begin Bar Code Object (BBC)	X'D3A8EB'	**X'02' Tpe X'01'**	0 or 1
		X'65'	0 or more
		X'72'	0 or 1
Begin Document Environment Group (BDG)	X'D3A8C4'	**X'65'**	0 or more
Begin Document Index (BDI)	X'D3A8A7'	**X'02' Tpe X'01'**	0 or 1
		X'02' Tpe X'83'	0 or 1
		X'65'	0 or more
		X'72'	0 or 1
Begin Document (BDT)	X'D3A8A8'	**X'18'**	1 occurrence; shall specify the MO:DCA Interchange Set (X'18') triplet with IStype = X'05' (archive/presentation), and one of the following: — ISid = X'0001' (AFP/A), or — ISid = X'0D01' (AFP/A, IS/3)
		X'01'	0 or more; shall be ignored
		X'02' Tpe X'01'	0 or 1
		X'65'	0 or more
		X'72'	0 or 1
		AFP/A does not include support for the inheritance by lower-level document components of the encoding scheme specified in the CGCSGID (X'01') triplet on the BDT. While this triplet is mandatory on the BDT in the general architecture, it is optional on the BDT in AFP/A, and if specified, shall be ignored. The architected default encoding for the document is EBCDIC single-byte presentation, which is characterized with encoding scheme ID X'61nn', and which is identified with CCSID 500 (corresponding to the combination of CPGID 500 and GCSGID 697). This default can be overridden on those structured fields where the X'01' triplet is supported in AFP/A (BOC, BRS, IOB, MDR, PPO, TLE). Note 1 A document can be made compliant both with the AFP/A encoding rules and with encoding scheme inheritance if the CGCSGID (X'01') triplet is specified last on the BDT, and if it specifies CCSID 500 (corresponding to the combination of CPGID 500 and GCSGID 697). Note 2 When generating documents that contain mailpieces, it is strongly recommended that each mailpiece is enveloped with BNG/ENG, not BDT/EDT. This allows the mailpieces to be indexed properly (using page group IELs and TLEs).	
Begin Form Map (BFM)	X'D3A8CD'	**X'65'**	0 or more
		X'72'	0 or 1
Begin Graphics Object (BGR)	X'D3A8BB'	**X'02' Tpe X'01'**	0 or 1
		X'65'	0 or more
		X'72'	0 or 1
Begin Image Object (BIM)	X'D3A8FB'	**X'02' Tpe X'01'**	0 or 1
		X'65'	0 or more
		X'72'	0 or 1

Table 7 *(continued)*

Structured field name	Structured field ID	AFP/A triplets (listed by ID) and their allowed occurrence; differences from general MO:DCA Architecture noted	
Begin Medium Map (BMM)	X'D3A8CC'	**X'45'**	0 or 1
		X'65'	0 or more
Begin Overlay (BMO)	X'D3A8DF'	**X'02' Tpe X'01'**	0 or 1. The overlay name shall be less than or equal to 8 characters (bytes) in length.
		X'65'	0 or more
		X'72'	0 or 1
Begin Named Page Group (BNG)	X'D3A8AD'	**X'02' Tpe X'01'**	0 or 1
		X'02' Tpe X'8D'	0 or 1
		X'56'	0 or 1
		X'5E'	0 or 1 occurrence for pages counted
		X'65'	0 or more
		X'83'	0 or 1
		NOTE When generating documents that contain mailpieces, it is strongly recommended that each mailpiece is enveloped with BNG/ENG, not BDT/EDT. This allows the mailpieces to be indexed properly (using page group IELs and TLEs) and limits the number of MOs in an AFP/A print file.	
Begin Object Container (BOC)	X'D3A892'	**X'10'**	1
		X'01'	0 or more Note 1: AFP/A requires full support of the CGCSGID (X'01') triplet on the BOC. Note 2: AFP/A does not include support for the inheritance by lower-level objects of the encoding scheme specified in the CGCSGID (X'01') triplet on the BOC. Note 3: It is strongly recommended that this triplet is specified even if the parameter on the BOC defines a fixed encoding. For example, if the parameter defines a fixed UTF-16BE encoding, the triplet can be specified using the CCSID form with CCSID = 1200 (X'04B0').
		X'02' Tpe X'01'	0 or 1
		X'02' Tpe X'41'	0 or more
		X'02' Tpe X'6E'	0 or more
		X'02' Tpe X'7E'	0 or more
		X'57'	0 or 1
		X'65'	0 or more
		X'72'	0 or 1
Begin Object Environment Group (BOG)	X'D3A8C7'	**X'65'**	0 or more

Table 7 *(continued)*

Structured field name	Structured field ID	AFP/A triplets (listed by ID) and their allowed occurrence; differences from general MO:DCA Architecture noted	
Begin Print File (BPF)	X'D3A8A5'	**X'18'**	1 occurrence; shall specify the MO:DCA Interchange Set (X'18') triplet with IStype = X'05' (archive/presentation), and one of the following: — ISid = X'0001' (AFP/A); — ISid = X'0D01' (AFP/A, IS/3); in this case the same value shall be specified on the BDT for each document in the print file.
		X'02' Tpe X'01'	0 or 1
		X'65'	0 or more
		X'72'	0 or 1
		AFP/A does not include support for the inheritance by lower-level document components of the encoding scheme specified in the CGCSGID (X'01') triplet on the BPF. The architected default encoding for the print file is EBCDIC single-byte presentation, which is characterized with encoding scheme ID X'61nn', and which is identified with CCSID 500 (corresponding to the combination of CPGID 500 and GCSGID 697). This default can be overridden on those structured fields where the X'01' triplet is supported in AFP/A (BOC, BRS, IOB, MDR, PPO, TLE).	
Begin Page (BPG)	X'D3A8AF'	**X'02' Tpe X'8D'**	1
		X'02' Tpe X'01'	0 or 1
		X'56'	0 or 1; one occurrence of either the X'56' or X'81' triplets is mandatory
		X'65'	0 or more
		X'81'	0 or 1; one occurrence of either the X'56' or X'81' triplets is mandatory
		X'83'	0 or 1
Begin Page Segment (BPS)	X'D3A85F'	**X'65'**	0 or more
		X'72'	0 or 1
		Note: The page segment shall be a MO:DCA page segment; see Table 1.	
Begin Presentation Text (BPT)	X'D3A89B'	**X'02' Tpe X'01'**	0 or 1
		X'65'	0 or more
		X'72'	0 or 1
Begin Resource Group (BRG)	X'D3A8C6'	**X'02' Tpe X'01'**	0 or 1
		X'65'	0 or more
		X'72'	0 or 1
Begin Resource (BRS)	X'D3A8CE'	**X'02' Tpe X'6E'**	1 or more if resource is a TTC; otherwise, it should not be specified
		X'10'	1 occurrence if ObjType = X'92' - Object Container; otherwise, it should not be specified
		X'21'	1 NOTE This is the Resource Object Type triplet that was formerly retired but is now part of the general architecture.

Table 7 *(continued)*

Structured field name	Structured field ID	AFP/A triplets (listed by ID) and their allowed occurrence; differences from general MO:DCA Architecture noted	
		X'01'	0 or more Note 1: AFP/A requires full support of the CGCSGID (X'01') triplet on the BRS. Note 2: AFP/A does not include support for the inheritance by lower-level objects of the encoding scheme specified in the CGCSGID (X'01') triplet on the BRS. Note 3: It is strongly recommended that this triplet is specified even if the parameter on the BRS defines a fixed encoding. For example, if the parameter defines a fixed UTF-16BE encoding, the triplet can be specified using the CCSID form with CCSID = 1200 (X'04B0').
		X'02' Tpe X'01'	0 or more; 1 occurrence mandatory if resource is a CMR or an MO
		X'02' Tpe X'41'	0 or more if resource is a CMR; otherwise, it should not be specified
		X'02' Tpe X'7E'	0 or more if resource is a TTF/TTC; otherwise, it should not be specified
		X'65'	0 or more
Begin Resource Environment Group (BSG)	X'D3A8D9'	**X'65'**	0 or more

7.3 End structured fields

The following rules apply to all end structured fields in AFP/A:

— The matching of names using the FQN type X'01' triplets on Begin/End structured fields is not part of AFP/A. MO:DCA AFP/A generators should use the X'FFFF' wild card on End structured fields; this matches any name on the Begin, whether specified as an 8-byte token name or specified using the FQN type X'01' triplet. Therefore, the FQN type X'01' triplet on End structured fields, while allowed in the general architecture on most End structured fields, shall not be specified on End structured fields in an AFP/A print file.

Table 8 — AFP/A end structured fields

Structured field name	Structured field ID	AFP/A triplets (listed by ID) and their allowed occurrence; differences from general MO:DCA Architecture noted
End Active Environment Group (EAG)	X'D3A9C9'	
End Bar Code Object (EBC)	X'D3A9EB'	
End Document Environment Group (EDG)	X'D3A9C4'	
End Document Index (EDI)	X'D3A9A7'	
End Document (EDT)	X'D3A9A8'	
End Form Map (EFM)	X'D3A9CD'	
End Graphics Object (EGR)	X'D3A9BB'	
End Image Object (EIM)	X'D3A9FB'	
End Medium Map (EMM)	X'D3A9CC'	

Table 8 *(continued)*

Structured field name	Structured field ID	AFP/A triplets (listed by ID) and their allowed occurrence; differences from general MO:DCA Architecture noted
End Overlay (EMO)	X'D3A9DF'	
End Named Page Group (ENG)	X'D3A9AD'	
End Object Container (EOC)	X'D3A992'	
End Object Environment Group (EOG)	X'D3A9C7'	
End Print File (EPF)	X'D3A9A5'	
End Page (EPG)	X'D3A9AF'	
End Page Segment (EPS)	X'D3A95F'	NOTE The page segment shall be a MO:DCA page segment; see Table 1.
End Presentation Text (EPT)	X'D3A99B'	
End Resource Group (ERG)	X'D3A9C6'	
End Resource (ERS)	X'D3A9CE'	
End Resource Environment Group (ESG)	X'D3A9D9'	

7.4 Structured fields without triplets

The following AFP/A structured fields do not support any triplets.

Table 9 — AFP/A structured fields without triplets

Structured field name	Structured field ID	Differences from general MO:DCA architecture
Bar Code Data (BDA)	X'D3EEEB'	
Graphics Data (GAD)	X'D3EEBB'	The GAD content shall comply with the AFP GOCA GRS3 subset definition. Note: If the boundary for an area is to be drawn but is not properly closed, AFP/A receivers should not draw a line to close the figure.
Graphics Data Descriptor (GDD)	X'D3A6BB'	GDD content as defined by the AFP GOCA GRS3 subset definition. Measurement unit restrictions: — unit base = 10 inches — X units per unit base = Y units per unit base — range for X units per unit base and Y units per unit base is 1–32767.
Image Data Descriptor (IDD)	X'D3A6FB'	IDD content as defined for MO:DCA data streams by IOCA, with the following optional self-defining fields (listed by ID) and their allowed occurrences: **X'F4'** 0 or more **X'F6'** 0 or more **X'F7'** 0 or 1 Measurement unit restrictions: — X unit base = Y unit base = 10 inches — X units per unit base and Y units per unit base can be different — range for X units per unit base and Y units per unit base is 1–32767.
Image Picture Data (IPD)	X'D3EEFB'	The content shall comply with the IOCA FS10 or FS45 subset definitions. NOTE Compliance with IOCA FS45 includes compliance with IOCA FS40 and FS42.

Table 9 *(continued)*

Structured field name	Structured field ID	Differences from general MO:DCA architecture
Medium Copy Count (MCC)	X'D3A288'	
Medium Modification Control (MMC)	X'D3A788'	The following are keywords, with allowed occurrences: **X'D1nn'** 0 or 1 **X'E8nn'** 0 or 1; shall be paired with X'E9nn' **X'E9nn'** 0 or 1; shall be paired with X'E8nn' **X'F2nn'** 0 or more, up to a maximum of 8 **X'F3nn'** 0 or more, up to a maximum of 8 **X'F4nn'** 0 or 1 **X'F9nn'** 0 or 1 **X'FCnn'** 0 or 1
Map Medium Overlay (MMO)	X'D3B1DF'	
Map Page Segment (MPS)	X'D3B15F'	The page segment shall be a MO:DCA page segment subject to all applicable AFP/A restrictions; see Table 1.
Map Suppression (MSU)	X'D3ABEA'	
No Operation (NOP)	X'D3EEEE'	
Object Area Position (OBP)	X'D3AC6B'	Note: AFP/A does not impose any restrictions on object area position or object content position as was done in IS/1. Since AFP/A also supports MO:DCA page segments, it includes support for positioning objects in a page segment at the IPS reference point using RefCSys = X'00', which IS/1 did not support.
Object Container Data (OCD)	X'D3EE92'	Content as defined by the object types listed in Table 2 for presentation object containers and in Table 3 for non-presentation object containers.
Page Position Format 2 (PGP)	X'D3B1AF'	
Presentation Text Data Descriptor Format 2 (PTD)	X'D3B19B'	PTD content as defined for MO:DCA data streams by PTOCA, with the following optional control sequences. Each can have 0 or more occurrences: — AMB, AMI, SBI, SCFL, SEC, SIA, SIM, STC, STO Measurement unit restrictions: — X unit base = Y unit base = 10 inches — X units per unit base = Y units per unit base — range for X units per unit base and Y units per unit base is 1–32767.
Presentation Text Data (PTX)	X'D3EE9B'	The content shall comply with the PTOCA PT3 subset definition.

7.5 Structured fields with triplets

The following AFP/A structured fields support triplets.

Table 10 — AFP/A structured fields with triplets

Structured field name	Structured field ID	AFP/A triplets (listed by ID) and their allowed occurrence; differences from general MO:DCA Architecture noted
Bar Code Data Descriptor (BDD)	X'D3A6EB '	BDD content as defined by the BCOCA BCD2 subset definition **X'4E'** 0 or 1 Measurement unit restrictions: — unit base = 10 inches — X units per unit base = Y units per unit base — range for X units per unit base and Y units per unit base is 1–32767.
Container Data Descriptor (CDD)	X'D3A692'	**X'5A'** 0 or 1 occurrences with ObjTpe = X'AF' if the container contains one of the multi-page TIFF object types supported in AFP/A (see Table 2); otherwise, it should not be specified. **X'9A'** 0 or 1 occurrences if the container contains one of the object types listed in Table 2; otherwise, it should not be specified. Measurement unit restrictions:. — X unit base = Y unit base = 10 inches — Image points in the x and y direction can be different — range for image points per unit base in X and Y directions is 1-32767
Index Element (IEL)	X'D3B2A7'	**X'02' Tpe X'CA'** 1 **X'2D'** 1 **X'02'** 0 or 1 occurrence of one of the following: — Type X'0D' — Type X'87' **X'02' Tpe X'8D'** 0 or 1 **X'56'** 0 or 1 **X'57'** 0 or 1 **X'58'** 0 or 1 **X'59'** 0 or 1 **X'5A'** 0 or 1 occurrences for each object type counted **X'5E'** 0 or 1 for pages counted **X'81'** 0 or 1 **X'83'** 0 or 1
Invoke Medium Map (IMM)	X'D3ABCC'	

Table 10 *(continued)*

Structured field name	Structured field ID	AFP/A triplets (listed by ID) and their allowed occurrence; differences from general MO:DCA Architecture noted	
Include Object (IOB)	X'D3AFC3'	**X'10'**	1 occurrence if ObjType = X'92' – Other object data; otherwise, it should not be specified.
		X'4B'	1 occurrence if the IOB specifies an override for any of the following: — XocaOset; — YocaOset; — XoaSize; — YozSize. Otherwise, it should not be specified. Measurement unit restrictions: — X unit base = Y unit base = 10 inches — X units per unit base = Y units per unit base — range for X units per unit base and Y units per unit base is 1–32767
		X'01'	0 or more NOTE AFP/A requires full support of the CGCSGID (X'01') triplet on the IOB
		X'02' Tpe X'01'	0 or 1
		X'02' Tpe 'DE'	0 or more
		X'02' Tpe 'BE'	0 or more
		X'04'	0 or 1
		X'4C'	0 or 1
		X'4E'	0 or 1
		X'5A'	0 or 1 occurrences with ObjTpe = X'AF' if the IOB includes one of the multi-page TIFF object types supported in AFP/A (see Table 2); otherwise, it should not be specified
		X'70'	0 or 1
		X'91'	1 occurrence for each FQN type X'DE' that references a CMR; otherwise, it should not be specified
		X'95'	0 or 1
		X'9A'	0 or 1 occurrence if the container contains one of the object types listed in Table 2; otherwise should not be specified. Measurement unit restrictions: — X unit base = Y unit base = 10 inches — X units per unit base and Y units per unit base can be different — range for X units per unit base and Y units per unit base is 1–32767

Table 10 *(continued)*

Structured field name	Structured field ID	AFP/A triplets (listed by ID) and their allowed occurrence; differences from general MO:DCA Architecture noted	
Include Page Overlay (IPO)	X'D3AFD8'	**X'02' Tpe X'01'**	0 or 1 The overlay name shall be less than or equal to 8 characters (bytes) in length
		NOTE AFP/A does not impose any restrictions on the page overlay orientation and origin, as was done in IS/1.	
Include Page Segment (IPS)	X'D3AF5F'	The page segment shall be a MO:DCA page segment subject to all applicable AFP/A restrictions; see Table 1.	
Link Logical Element (LLE)	X'D3B490'	**X'02' Tpe X'09'**	0 or 1 in source and target RG
		X'02' Tpe X'0A'	0 or 1 in source and target RG
		X'02' Tpe X'0C'	0 or 1 in each RG
		X'02' Tpe X'0D'	0 or 1 in source and target RG
		X'02' Tpe X'83'	0 or 1 in source and target RG
		X'02' Tpe X'87'	0 or 1 in source and target RG
		X'02' Tpe X'B0'	0 or 1 in source and target RG
		X'02' Tpe X'CE'	0 or 1 in source and target RG
		X'10'	1 occurrence in source and target RG that specifies FQN Type X'CE'; otherwise shall not be specified
		X'4B'	0 or 1 occurrences in source or target RG that specifies X'4D' triplet; otherwise should not be specified. Measurement unit restrictions: — X unit base = Y unit base = 10 inches — X units per unit base = Y units per unit base — range for X units per unit base and Y units per unit base is 1–32767
		X'4D'	0 or more in source and target RG
		X'82'	0 or more in attribute RG
Map Bar Code Object (MBC)	X'D3ABEB'	**X'04'**	1 Mapping options: X'00' Position
Map Container Data (MCD)	X'D3AB92'	**X'04'**	1 Mapping options: X'00' Position X'10' Position and trim X'20' Scale to fit X'30' Center and trim X'60' Scale to fill
Map Coded Font Format 2 (MCF)	X'D3AB8A'	**X'02'**	1 occurrence in each RG of one of the following: — Type X'85' + Type X'86' — Type X'8E'

Table 10 *(continued)*

Structured field name	Structured field ID	AFP/A triplets (listed by ID) and their allowed occurrence; differences from general MO:DCA Architecture noted	
		X'02' Tpe X'07'	0 or 1 in each RG
		X'02' Tpe X'08'	0 or 1 in each RG
		X'1F'	0 or 1 occurrences in each RG
		X'20'	0 or 1 occurrences in each RG
		X'24'	0 or 1 occurrences in each RG
		X'25'	0 or 1 occurrences in each RG
		X'26'	0 or 1 occurrences in each RG
		X'50'	0 or 1 occurrences in each RG
		X'5D'	0 or 1 occurrences in each RG
		X'84'	0 or 1 occurrences in each RG
Medium Descriptor (MDD)	X'D3A688'	**X'68'**	0 or 1
		Measurement unit restrictions: — X unit base = Y unit base = 10 inches — X units per unit base = Y units per unit base — range for X units per unit base and Y units per unit base is 1–32767	
Map Data Resource (MDR)	X'D3ABC3'	**X'02'**	1 occurrence in each RG of one of the following: — Type X'84' — Type X'CE' — Type X'DE'
		X'10'	1 occurrence if RG specifies FQN Type X'CE' or X'DE'; otherwise, it should not be specified.
		X'01'	0 or more NOTE AFP/A requires full support of CGCSGID (X'01') triplet on the MDR.
		X'02' Tpe X'BE'	0 or 1 occurrences in each RG that specifies FQN Type X'DE'; otherwise should not be specified.
		X'02' Tpe X'85'	0 or 1 occurrences in each RG that references a TTF/OTF with FQN Type X'DE'; otherwise should not be specified.
		X'50'	0 or 1 occurrences in each RG that references a TTF/OTF with FQN Type X'DE'; otherwise should not be specified.
		X'5A'	0 or 1 occurrences with ObjTpe = X'A8' in each RG that references a CMR with FQN Type X'DE'; otherwise should not be specified.
		X'8B'	1 occurrence in each RG that references a TTF/OTF with FQN Type X'DE'; otherwise should not be specified.
		X'91'	1 occurrence in each RG that references a CMR with FQN Type X'DE'; otherwise should not be specified

Table 10 *(continued)*

Structured field name	Structured field ID	AFP/A triplets (listed by ID) and their allowed occurrence; differences from general MO:DCA Architecture noted	
		NOTE AFP/A does not include the FOCA code page reference using the combination of CPGID/GCSGID specified with the Font Coded Graphic Character Set Global Identifier X'20' triplet. AFP/A does include the FOCA code page reference using the code page name specified with the FQN type X'85' triplet.	
Medium Finishing Control (MFC)	X'D3A088'	**X'85'**	1 or more
		X'5A'	0 or 1 occurrence with ObjTpe = X'A8' when MFC specified in DEG; otherwise should not be specified.
Map Graphics Object (MGO)	X'D3ABBB'	**X'04'**	1 Mapping options: X'10' Position and trim X'20' Scale to fit X'30' Center and trim
		NOTE The Scale to fill mapping option is not included in AFP/A.	
Map Image Object (MIO)	X'D3ABFB'	**X'04'**	1 Mapping options: X'10' Position and trim X'20' Scale to fit X'30' Center and trim X'60' Scale to fill
Map Media type (MMT)	X'D3AB88'	**X'02' Tpe X'11'**	1 in each RG; may occur twice in each RG if specified using FQN formats X'00' and X'10'
		X'22'	1 in each RG
Map Page Overlay (MPO)	X'D3ABD8'	**X'02' Tpe X'84'**	1 in each RG
		X'24'	1 in each RG. The LID range is limited to X'01' – X'7F'
Object Area Descriptor(OBD)	X'D3A66B'	**X'43'**	1
		X'4B'	1 occurrence Measurement unit restrictions: — X unit base = Y unit base = 10 inches — X units per unit base = Y units per unit base — range for X units per unit base and Y units per unit base is 1–32767
		X'4C'	1
		X'4E'	0 or 1
		X'70'	0 or 1
Presentation Environment Control (PEC)	X'D3A7A8'	**X'5A'**	0 or 1 occurrences with ObjTpe = X'A8' when PEC specified in DEG; otherwise should not be specified.
		X'95'	0 or 1
		X'97'	0 or 1 occurrences. Only the following value is supported: Dev App = X'0000'

Table 10 *(continued)*

Structured field name	Structured field ID	AFP/A triplets (listed by ID) and their allowed occurrence; differences from general MO:DCA Architecture noted	
Presentation Fidelity Control (PFC)	X'D3B288'	**X'75'**	0 or 1
		X'78'	0 or 1
		X'86'	0 or 1
		X'87'	0 or 1
		X'88'	0 or 1
		X'96'	0 or 1
Page Descriptor (PGD)	X'D3A6AF'	**X'4E'**	0 or 1
		X'70'	0 or 1
		Measurement unit restrictions: — X unit base = Y unit base = 10 inches — X units per unit base = Y units per unit base — range for X units per unit base and Y units per unit base is 1–32767	
Page Modification Control (PMC)	X'D3A7AF'	**X'4B'**	0 or 1 occurrence Measurement unit restrictions: — X unit base = Y unit base = 10 inches — X units per unit base = Y units per unit base — range for X units per unit base and Y units per unit base is 1–32767
		X'6C'	0 or more
Preprocess Presentation Object (PPO)	X'D3ADC3'	**X'02'**	1 in each RG of one of the following: — Type X'84' — Type X'CE'
		X'10'	1 occurrence in the RG if ObjType = X'92' – Other object data; otherwise should not be specified.
		X'4B'	1 occurrence if the RG specifies any of the following: — XocaOset — YocaOset — XoaSize — YoaSize. Otherwise, it should not be specified. Measurement unit restrictions: — X unit base = Y unit base = 10 inches — X units per unit base = Y units per unit base — range for X units per unit base and Y units per unit base is 1–32767.
		X'01'	0 or more in each RG. NOTE AFP/A requires full support of the CGCSGID (X'01') triplet on the PPO.
		X'02' Tpe X'DE'	0 or more in each RG
		X'02' Tpe X'BE'	0 or more occurrences in each RG that also specifies a FQN Type X'DE'.

Table 10 *(continued)*

Structured field name	Structured field ID	AFP/A triplets (listed by ID) and their allowed occurrence; differences from general MO:DCA Architecture noted	
		X'04'	0 or 1 in each RG
		X'4C'	0 or 1 in each RG
		X'5A'	0 or 1 occurrences with ObjTpe = X'AF' if the RG processes one of the multi-page TIFF object types supported in AFP/A (see Table 2); otherwise should not be specified
		X'91'	1 occurrence for each FQN type X'DE' in the RG that references a CMR; otherwise should not be specified.
		X'95'	0 or 1 in each RG
		X'9A'	0 or 1 occurrences in the RG if the container contains one of the object types listed in Table 2; otherwise should not be specified. Measurement unit restrictions: — X unit base = Y unit base = 10 inches — image points in the x and y direction can be different — range for image points per unit base in X and Y directions is 1–32767.
TAG Logical Element (TLE)	X'D3A090'	**X'02' Tpe X'0B'**	1
		X'36'	1
		X'01'	0 or more. Note: AFP/A requires full support of the CGCSGID (X'01') triplet on the TLE.
		X'02'	0 or 1 occurrence of one of the following: — Type X'0D' — Type X'87'
		X'02' Tpe X'0C'	0 or 1
		X'80'	0 or 1

8 Architected tables

8.1 General

The following tables are part of the AFP/A definition.

8.2 Standard OCA Color Value Table

All colour values.

8.3 Color Mapping Table (CMT)

All parameters.

9 Migration functions included in AFP/A

9.1 General

MO:DCA migration functions are defined in MO:DCA Reference, Appendix C – MO:DCA Migration Functions.

9.2 Obsolete functions

No obsolete parameters, triplets, structured fields, or objects are included in the AFP/A definition.

9.3 Retired functions

No retired parameters, triplets, structured fields or objects are included in the AFP/A definition.

9.4 Coexistence functions

No coexistence parameters, triplets, structured fields, or objects are included in the AFP/A definition.

10 MO:DCA functions not included in AFP/A

10.1 General

A number of non-migration functions are not included in the AFP/A definition. Table 11 lists these functions.

Table 11 — MO:DCA functions not in AFP/A

Saved pages — Include Page (IPG) — Map Page (MPG) — Document resource in print file resource group
FOCA font reference on MCF using the Global Resource ID (GRID) — Fully Qualified Name (X'02') type X'84' triplet on MCF
FOCA code page reference on MDR using the CPGID/GCSGID — Font Coded Graphic Character Set Global Identifier X'20' triplet on MDR
UP3i Finishing — UP3i Finishing Operation (X'8E') triplet on MFC
Support for Encoding Scheme Inheritance using the CGCSGID (X'01') triplet Support for the inheritance of encoding scheme from Begin structured fields to lower levels of the MO:DCA hierarchy using the CGCSGID (X'01') triplet is not included in AFP/A. Support for the X'01' triplet in AFP/A is limited to those structured fields where such support is a requirement for TTF/OTF references, CMR references, object container references, and indexing, as follows: — The CGCSGID (X'01') triplet shall be supported on the following structured fields in AFP/A: BOC, BRS, IOB, MDR, PPO, TLE. — Support of the X'01' triplet on these structured fields shall be in full compliance with the architecture by both generators and receivers. — The CGCSGID (X'01') triplet is optional on the BDT in AFP/A, and if specified, shall be ignored. — The CGCSGID (X'01') triplet shall not be specified on any other structured fields in AFP/A.
Matching FQN type X'01' triplets on begin/end pairs — FQN type X'01' triplet on EBC, EDI, EDT, EGR, EIM, EMO, ENG, EOC, EPF, EPG, EPT, ERG

Table 11 *(continued)*

Object function set specification (X'21') triplet — on BDT — This triplet has been retired.	
Local date and time stamp (X'62') triplet — on BBC, BDI, BFM, BGR, BIM, BMO, BOC, BPS, BPT, BRG	
Toner saver (X'74') triplet — on PFC	
Presentation space mixing rules (X'71') triplet — on IOB, OBD, PGD	
Locale Selector (X'8C') triplet — on MDR	
Support for Dev App = X'01' - Device default monochrome appearance — on Device Appearance (X'97') triplet on PEC	
MMC keywords — X'90nn' - X'91nn' (Media Destination Selector) — X'A0nn' (Fixed Medium Information) — X'A1nn' (Perforation Cut) — X'A2nn' (Separation Cut) — X'B4nn' - X'B5nn' (Presentation Subsystem Set-up ID) — X'E0nn' (Media Source Selector) — X'E1nn' (Media Source ID) — X'F8nn' (Print Quality Control)	
Presentation containers	
EPS	X'06072B12000401010D'
DIB, Windows Version	X'06072B120004010111'
DIB, OS/2 pm Version	X'06072B120004010112'
PCX	X'06072B120004010113'
PDF Single-page Object	X'06072B120004010119'
PCL Page Object	X'06072B120004010122'
EPS with Transparency	X'06072B120004010130'
PDF Single-page Object with Transparency	X'06072B120004010131'
UP3i Print Data	X'06072B120004010138'
JPEG 2000 (JP2) Object	X'06072B12000401013A'
PDF Multiple Page File	X'06072B12000401013F'
PDF Multiple Page – with Transparency – File	X'06072B120004010140'
Non-presentation containers	
COM Set-up	X'06072B12000401010F'
Tape label set-up	X'06072B120004010110'
AnaStak control record	X'06072B120004010118'

11 AFP/A functions not included in MO:DCA IS/3

11.1 General

A number of functions that are not supported in IS/3 are included in AFP/A definition. Table 12 lists these functions.

Table 12 — AFP/A functions not in IS/3

FOCA font reference using the MCF	
Support for IStype = X'05' (archive/presentation), ISid = X'0001' (AFP/A) and ISid = X'0D01' (AFP/A, IS/3) — on MO:DCA Interchange Set (X'18) triplet	
Support for carrying a Metadata Object (MO) in a resource group MO shall be wrapped with BRS/BOC wrapper. Multiple MOs may be specified in the Resource Group in a contiguous sequence. MOs shall appear first in the Resource Group otherwise they are ignored. The collection of MOs apply to the complete print file.	
Non-presentation containers	
Metadata Object	X'06072B120004010143'

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