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# MO:DCA Reference (SC31-6802-07) Addendum 2 - Multi-page Containers

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## Date

September 3, 2008

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## Background

The current AFP architecture only allows single-page objects to be carried in AFP Object Containers. However formats such as TIFF and PDF, which are supported as containers in AFP, can contain many images or pages. This requires that a multi-page PDF or multi-image TIFF must be split up into a series of single page or single image objects that are then packaged individually into AFP Object Containers.

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## Change Details:

The base document level used for the changes is the May 2006 edition of the MO:DCA -07 Reference, SC31-6802-07.

1. Add the following to the section on "Objects" in ch. 2, following the section on "Secondary Resource Objects".

### Multi-page Resource Objects

A resource object may be a file that contains multiple pages or paginated objects for presentation. Such an object is appropriately characterized in the Object Registry. That is, it is registered with an object-type OID that identifies it as a file that may contain multiple pages or paginated objects. When a multi-page file is referenced in the data stream with a structured field like an Include Object (IOB), it must be indexed to select only a single paginated object for presentation. Similarly, when a multi-page file is carried in a container that is specified directly within a page or overlay, the Container Data Descriptor (CDD) structured field must select a single paginated object for presentation. Examples of multi-page resource objects are PDF files that contain multiple pages and TIFF files that contain multiple paginated image objects.

**Architecture Note:** When a page, such as a PDF page, or a paginated object is included on a MO:DCA page, it becomes a data object on that MO:DCA page and is no longer considered a "page". That is, it is not subject to MO:DCA page-level functions such as page-level indexing.

**Implementation Note:** When a resource-collection application like ACIF processes multi-page resource objects, it may choose to collect the complete file, not just the pages in the file that are actually selected for presentation.

2. Register the following new object types in the Registry in appendix D.

- *TIFF Multiple Image File*. This is a TIFF file containing multiple TIFF images in bi-level, grayscale, or color format. Each TIFF image is assumed to be a paginated object and is defined by object-type OID X'06072B12000401010E' (component ID 14). Image-like structures such as thumbnails and image masks are considered to be a part of the paginated image object but are not themselves considered paginated objects.

**Definition** See object-type OID X'06072B12000401010E'

**Presentation Space Size** See object-type OID X'06072B12000401010E'

**Foreground** See object-type OID X'06072B12000401010E'

**Background** See object-type OID X'06072B12000401010E'

**Component ID** (61)

**Object-type OID** X'06072B12000401013D'

- *TIFF without Transparency*: Tag Image File Format. This is a raster image format for bi-level, grayscale, and color images. The object contains a single, paginated image, defined by TIFF fields.

**Definition** TIFF is defined in *TIFF Revision 6.0* (Aldus Corporation, June 3, 1992).

**Presentation Space Size** Specified by the ImageLength (Tag 257), ImageWidth (Tag 256), and ResolutionUnit (Tag 296) TIFF tags.

**Foreground** All significant image points

**Background** None

**Component ID** (60)

**Object-type OID** X'06072B12000401013C'

- *TIFF Multiple Image - without Transparency - File.* This is a TIFF file containing multiple TIFF images in bi-level, grayscale, or color format. Each TIFF image is assumed to be a paginated object and is defined by object-type OID X'06072B12000401013C' (component ID 60). Image-like structures such as thumbnails and image masks are considered to be a part of the paginated image object but are not themselves considered paginated objects.

**Definition** See object-type OID X'06072B12000401013C'

**Presentation Space Size** See object-type OID X'06072B12000401013C'

**Foreground** See object-type OID X'06072B12000401013C'

**Background** See object-type OID X'06072B12000401013C'

**Component ID** (62)

**Object-type OID** X'06072B12000401013E'

- *PDF Multiple Page File.* This is a PDF file containing multiple PDF page objects. Each PDF page object is defined by object-type OID X'06072B120004010119' (component ID 25). A PDF page object is selected for presentation by its page number; other identifiers such as object numbers in the PDF file are not used for selection.

**Definition** See object-type OID X'06072B120004010119'

**Presentation Space Size** See object-type OID X'06072B120004010119'

**Foreground** See object-type OID X'06072B120004010119'

**Background** See object-type OID X'06072B120004010119'

**Component ID** (63)

**Object-type OID** X'06072B12000401013F'

- *PDF Multiple Page - with Transparency - File.* This is a PDF file containing multiple PDF page objects. Each PDF page object is defined by object-type OID X'06072B120004010131' (component ID 49). A PDF page object is selected for presentation by its page number; other identifiers such as object numbers in the PDF file are not used for selection.

**Definition** See object-type OID X'06072B120004010131'

**Presentation Space Size** See object-type OID X'06072B120004010131'

**Foreground** See object-type OID X'06072B120004010131'

**Background** See object-type OID X'06072B120004010131'

**Component ID** (64)

**Object-type OID** X'06072B120004010140'

3. Extend the definition of the "count pages" parameter in the Object Offset (X'5A') triplet to include "paginated objects" as well as pages. Only the changed portions of the triplet are shown; changes are indicated with revision code "|".

## Triplet X'5A' Syntax

Offset	Type	Name	Range	Meaning	M/O	Exc
2	CODE	ObjTpe	X'A8', X'AF'	Object type to be counted: X'A8' Document X'AF' Page or paginated object	M	X'06'

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## Triplet X'5A' Semantics

**ObjTpe** Specifies the object type to be counted. An object may occur at multiple levels. For instance, a page object may occur directly in a document, which would be considered a first-level occurrence of the page object, or it may occur in a page group in the document, which would be considered a second-level occurrence of the page object, and so on.

Value	Description
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X'AF'	The object is a page or a paginated object. The ObjOset and optional ObjOstHi parameters specify the number of pages or paginated objects that precede the selected object in the document or file.
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**Architecture Note:** A paginated object is a data object that can be rendered on a single page and that can be treated as a single page. An example of a paginated object is a single image in a multi-image TIFF file. Note that in TIFF files, image-like structures such as thumbnails and image masks are considered to be a part of the paginated image object but are not themselves considered paginated objects. Another example is a single page object in a PDF file. Such a page object is selected for presentation by its page number; other identifiers such as object numbers in the PDF file are not used for selection.

**Implementation Note:** The ordering of paginated image objects in a TIFF file may be defined explicitly with page numbers, or implicitly based on the position of the image object in the file. The page offset specified by this triplet can be applied to either ordering, but the explicit page numbering, if specified, always has higher priority.

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## Structured Fields Using Triplet X'5A'

- CDD
- IEL
- IOB
- IPG
- MDR
- MFC
- PEC
- PPO

4. Allow the Object Offset (X'5A') triplet on the IOB to select a single paginated object in the referenced multi-page file. Only the changed portion of the IOB is shown; changes are indicated with revision code "|".

**Triples** Appear in the Include Object structured field as follows:

Triplet	Type	Usage
X'5A'	Object Offset	<p>Optional. If this IOB references a file with <i>ObjType</i> = X'92' that contains multiple pages or paginated objects, may occur once with <i>ObjTpe</i>=X'AF' to specify that pages or paginated objects are the objects to be counted. The triplet is ignored in all other cases. Selects a single paginated object to be included by specifying how many paginated objects in the referenced file precede that object. The offset is measured from the beginning of the file, so that the first paginated object has offset 0, the second has offset 1, and the nth has offset (n-1). Only the selected object is included. The IOB triplet overrides any Object Offset triplet specified on the CDD. If this triplet is not specified when the IOB references a file with <i>ObjType</i> = X'92' that contains multiple paginated objects, the default is to include the first paginated object in the file. For more information on selecting paginated objects, see the Object Offset triplet definition in the MO:DCA Triplets chapter.</p> <p><b>Architecture Note:</b> While only the selected paginated object in the file is actually presented on the page or overlay, the file referenced by the IOB can be processed by the presentation system as a complete entity. This means that the complete file can be downloaded to the presentation device and multiple paginated objects in the file can be processed using the environment defined by the file. For example, if the file is a multi-page PDF, pages included from that file can be processed by the presentation device with the same PDF RIP initialization.</p>

5. Add a flag to the PPO to indicate that all paginated objects in a multi-page file are to be pre-processed. Only the changed portions of the PPO are shown; changes are indicated with revision code "1".

## PPO (X'D3ADC3') Syntax

Offset	Type	Name	Range	Meaning	M/O	Exc
5	BITS	ProcFlgs		Processing flags; see "PPO Semantics" for bit definitions	M	X'06'

## PPO Semantics

**ProcFlgs** Specify additional processing information for the PPO structured field

### 0 - 3: Object Orientation

Specify one or more orientations, measured in a clockwise direction, of the X-axis of the object with respect to the leading edge of the media.

**Application Note:** Many factors, such as media selection, media side, media loading, media orientation, page rotation, and object area rotation affect the orientation of an object with respect to the media leading edge. Proper specification of this parameter may require visual inspection of physical output.

#### Bit Description

0 0 degrees

**B'0'** Do not preprocess the object at 0 degree orientation.

**B'1'** Preprocess and cache the object at 0 degree orientation with respect to the leading edge of the media.

- 1      90 degrees
  - B'0'**    Do not preprocess the object at 90 degree orientation.
  - B'1'**    Preprocess and cache the object at 90 degree orientation with respect to the leading edge of the media.
- 2      180 degrees
  - B'0'**    Do not preprocess the object at 180 degree orientation.
  - B'1'**    Preprocess and cache the object at 180 degree orientation with respect to the leading edge of the media.
- 3      270 degrees
  - B'0'**    Do not preprocess the object at 270 degree orientation.
  - B'1'**    Preprocess and cache the object at 270 degree orientation with respect to the leading edge of the media.

If no orientations are specified, the object is preprocessed at a 0 degree orientation with respect to the leading edge of the media.

**4: Preprocess all objects**

If this PPO references a file with *ObjType* = X'92' that contains multiple pages or paginated objects, specifies whether only the selected paginated object or all paginated objects in the file should be preprocessed. This bit is ignored in all other cases.

- B'0'**    Preprocess only the selected paginated object.
- B'1'**    Preprocess all paginated objects in the file.

5-7      Reserved; all bits must be B'0'.

6. Allow the Object Offset (X'5A') triplet on the PPO to select a single paginated object in the referenced multi-page file. Only the changed portion of the PPO is shown; changes are indicated with revision code "|".

**Triplets**      Appear in the Preprocess Presentation Object structured field repeating groups as follows:

Triplet	Type	Usage
X'5A'	Object Offset	<p>Optional. If this PPO references a file with <i>ObjType</i> = X'92' that contains multiple pages or paginated objects, may occur once with <i>ObjTpe</i>=X'AF' to specify that pages or paginated objects are the objects to be counted. The triplet is ignored in all other cases. Selects a single paginated object to be preprocessed by specifying how many paginated objects in the referenced file precede that object. The offset is measured from the beginning of the file, so that the first paginated object has offset 0, the second has offset 1, and the nth has offset (n-1). Only the selected object is preprocessed. The PPO triplet overrides any Object Offset triplet specified on the CDD. If this triplet is not specified when the PPO references a file with <i>ObjType</i> = X'92' that contains multiple paginated objects, the default is to preprocess the first paginated object in the file. For more information on selecting paginated objects, see the Object Offset triplet definition in the MO:DCA Triplets chapter.</p> <p><b>Architecture Note:</b> While only the selected paginated object in the file is actually presented on the page or overlay, the file referenced by the IOB can be processed by the presentation system as a complete entity. This means that the complete file can be downloaded to the presentation device and multiple paginated objects in the file can be processed using the environment defined by the file. For example, if the file is a multi-page PDF, pages included from that file can be processed by the presentation device with the same PDF RIP initialization.</p>

7. Allow the Object Offset (X'5A') triplet on the CDD to select a single paginated object in the multi-page file in the container. Only the changed portion of the CDD is shown; changes are indicated with revision code "1".

**Triplets** Appear in the CDD structured field as follows:

Triplet	Type	Usage
X'5A'	Object Offset	<p>Optional. If this container is specified directly within a page or overlay and carries a file that contains multiple pages or paginated objects, may occur once with <i>ObjTpe</i>=X'AF' to specify that pages or paginated objects are the objects to be counted. The triplet is ignored in all other cases. Selects a single paginated object to be presented by specifying how many paginated objects in the file precede that object. The offset is measured from the beginning of the file, so that the first paginated object has offset 0, the second has offset 1, and the nth has offset (n-1). Only the selected object is presented. If this triplet is not specified on a container that is specified directly within a page or overlay and that contains a file with multiple paginated objects, the default is to present the first paginated object in the file. For more information on selecting paginated objects, see the Object Offset triplet definition in the MO:DCA Triplets chapter.</p>

8. Add the following glossary definition for "paginated object".

**paginated object**

A data object that can be rendered on a single page or overlay. An example of a paginated object is a single image in a multi-image TIFF file.