



Adobe®

Introduction to the Insides of PDF

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Adobe Systems Incorporated
IS&T Archiving Conference
April 26-29, 2005





References

- PDF Language Reference Manual (1.5 & 1.4)
<http://partners.adobe.com/asn/tech/pdf>
(under Technologies/PDF Reference)
- PDF/A Draft Specifications
<http://www.aiim.org/standards>
(Select PDF-Archive, ISO PDF-Archive, CD)
- PDF Tutorial (Inside PDF)
<http://home.comcast.net/~jk05/presentations>



PDFs are Composite Documents

■ Collecting many instances of many things

Page contents

Images

Graphics

Fonts

Colorspaces

Metadata

Annotations

Links

Digital signatures

<and more>



Composite Documents

SUMMER 2002



The Company Voice

I am thrilled and excited to announce the publication of the first edition of *The Sentinel*, a communications tool to keep employees, clients, partners, consultants and supporters informed of our progress and accomplishments.

The mission of *The Sentinel* is to highlight, on a quarterly basis, MZM, Inc. achievements, communicate critical policy issues and recognize employees who exceed company and client expectations. Not only will *The Sentinel* cover administrative, legal, personnel and security issues, but our own subject matter experts will illuminate technical areas within their span of knowledge.

Additionally, employee welfare is an important concern for MZM, Inc. Thus, *The Sentinel* will endeavor to publish articles on health, financial and educational developments to promote the full potential of all employees. This medium will also highlight employee accomplishments and personal significant events such as birthdays, anniversaries and weddings.

The arrival of *The Sentinel* on the MZM, Inc. horizon marks significant growth within the company—we have tripled in size, both in terms of personnel and revenue in the first six months of 2002, with the remainder of 2002 proceeding at the same pace. Further, MZM, Inc. plans to expand not only its functional support to its national security clients, but also its facility capacity in early calendar year 2003.


Lastly, this first edition is a credit to the initiative and creativity of its Editor and our Communications Director, Christopher Rosché and the dedication of its Production Director, Jenny Lau. Please direct feedback and input to these two competent MZM members. It is with sincere gratitude that I wish our employees and partners a healthy and safe summer.

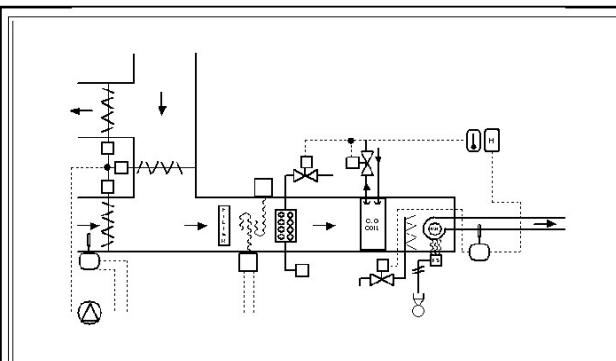
John J. Smith
President/CEO


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Project Designer:	
Mr. W. W. W.	
Project Contact:	
Mrs. N. N. N.	
Project #	
44771	
Date	
05/08/00	

Approval Signature

Company _____

Name _____

Title _____ Date _____



The Basics

Inside PDF





Looking Inside

- PDF files are made from “objects”
- Objects are numbered
- Objects can occur in any order in a file
- Objects can refer to each other by number
- References can create a cross-linked set of objects (mathematical graph)
- Cross reference table maps object numbers to places within the file



Hello World



Hello World

```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj

2 0 obj
<<
  /Length 51
>>
stream
  BT
    /F1 24 Tf
    1 0 0 1 260 254 Tm
    (Hello World)Tj
  ET
endstream
endobj
```

```
3 0 obj
<<
  /ProcSet [/PDF/Text]
  /Font <</F1 4 0 R >>
>>
endobj

4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```

```
5 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 446 ]
>>
endobj

6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj

trailer
<<
  /Root 6 0 R
>>
```




Hello World

%PDF-1.2

1 0 obj

```
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj
```

2 0 obj

```
<<
  /Length 51
>>
stream
  BT
  /F1 24 Tf
  1 0 0 1 260 254 Tm
  (Hello World)Tj
  ET
endstream
endobj
```

3 0 obj

```
<<
  /ProcSet [/PDF/Text]
  /Font <</F1 4 0 R >>
>>
endobj
```

4 0 obj

```
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```

5 0 obj

```
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 446 ]
>>
endobj
```

6 0 obj

```
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj
```

trailer

```
<<
  /Root 6 0 R
>>
```



Hello World

%PDF-1.2

1 0 obj

<<
 /Type /Page
 /Parent 5 0 R
 /Resources 3 0 R
 /Contents 2 0 R

>>
endobj

2 0 obj

<<
 /Length 51
>>
stream
 BT
 /F1 24 Tf
 1 0 0 1 260 254 Tm
 (Hello World)Tj
 ET
endstream
endobj

3 0 obj

<<
 /ProcSet [/PDF/Text]
 /Font <</F1 4 0 R >>
>>
endobj

4 0 obj

<<
 /Type /Font
 /Subtype /Type1
 /Name /F1
 /BaseFont/Helvetica
>>
endobj

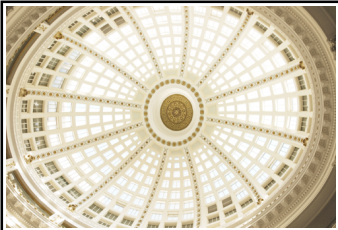
5 0 obj

<<
 /Type /Pages
 /Kids [1 0 R]
 /Count 1
 /MediaBox
 [0 0 612 446]
>>
endobj

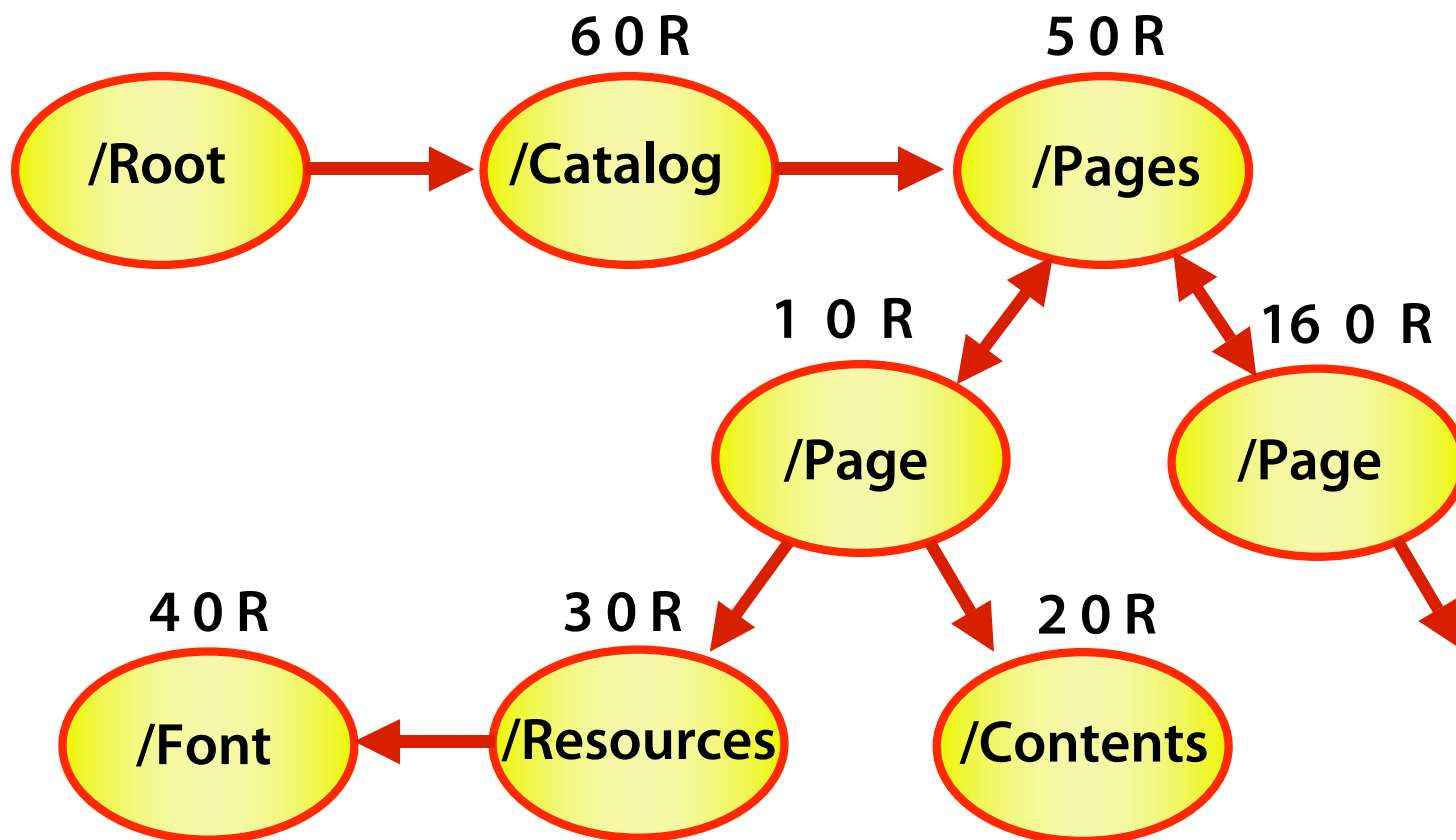
6 0 obj

<<
 /Type /Catalog
 /Pages 5 0 R
>>
endobj

trailer
<<
 /Root 6 0 R
>>



Objects Form a Graph





Hello World



Hello World - 50% Gray

```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj

2 0 obj
<<
  /Length 51
>>
stream
  BT
    /F1 24 Tf
    1 0 0 1 260 254 Tm
    0.5 g
    (Hello World)Tj
  ET
endstream
endobj
```

```
3 0 obj
<<
  /ProcSet [/PDF/Text]
  /Font <</F1 4 0 R >>
>>
endobj

4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```

```
5 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 446 ]
>>
endobj

6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj

trailer
<<
  /Root 6 0 R
>>
```



Postfix Notation

operand-1 operand-2 operand-3 operator

3 4 add --> 7
3 4 add 3 mult --> 21

scale-x skew-x skew-y scale-y move-x move-y Tm

1 0 0 1 260 254 Tm

gray-level g

0.5 g

string Tj

(Hello World) Tj

font-internal-name size Tf

/F1 24 Tf



Hello World - 50% Gray

```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj

2 0 obj
<<
  /Length 51
>>
stream
BT
  /F1 24 Tf
  1 0 0 1 260 254 Tm
  0.5 g
  (Hello World)Tj
ET
endstream
endobj
```

```
3 0 obj
<<
  /ProcSet [/PDF/Text]
  /Font <</F1 4 0 R >>
>>
endobj

4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```

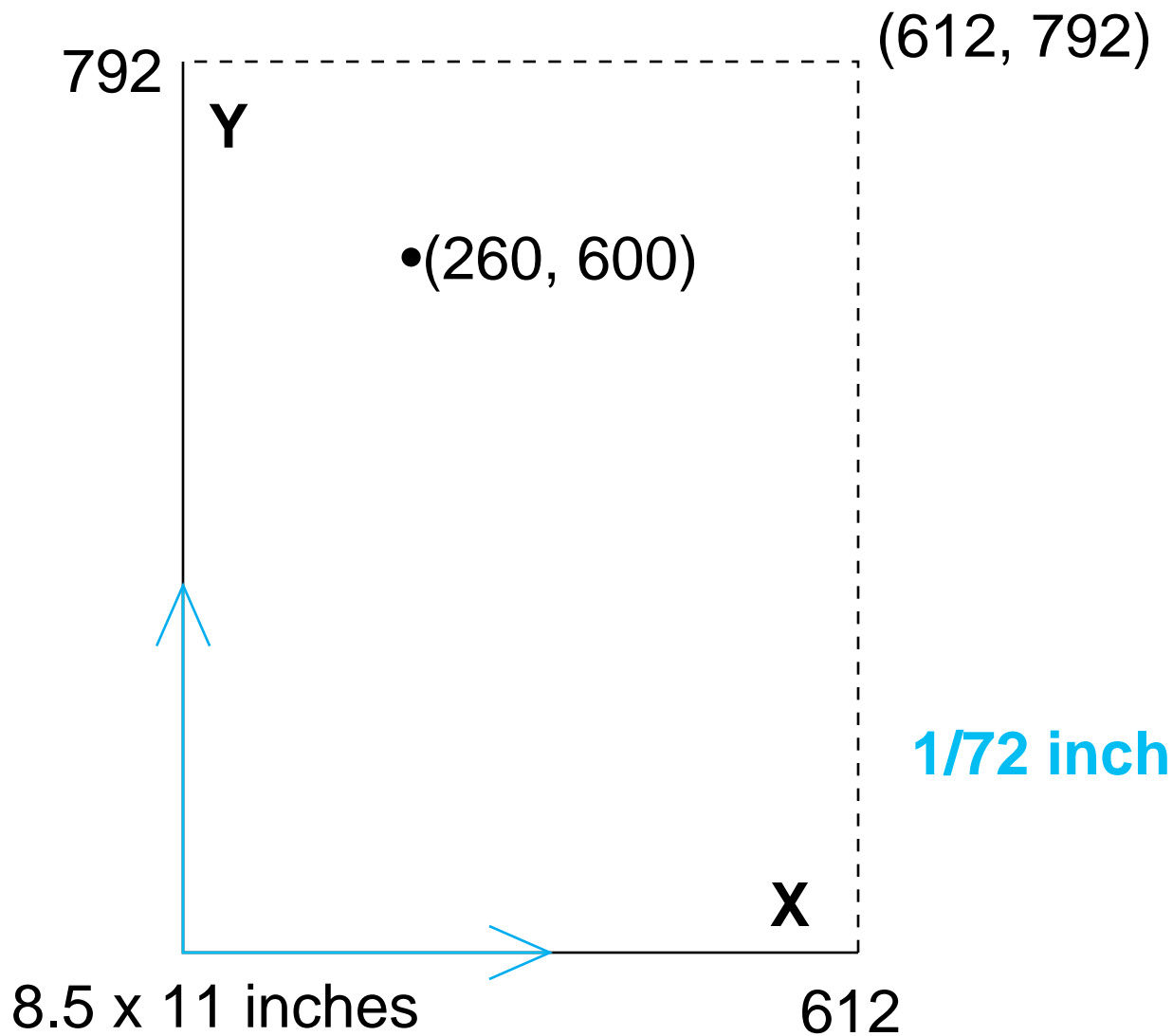
```
5 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 446 ]
>>
endobj

6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj

trailer
<<
  /Root 6 0 R
>>
```



Hello World



Hello World - 50% Gray



```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj

2 0 obj
<<
  /Length 51
>>
stream
BT
  /F1 24 Tf
  1 0 0 1 260 254 Tm
  0.5 g
  (Hello World)Tj
ET
endstream
endobj
```

```
3 0 obj
<<
  /ProcSet [/PDF/Text]
  /Font <</F1 4 0 R >>
>>
endobj

4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```

```
5 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 446 ]
>>
endobj

6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj

trailer
<<
  /Root 6 0 R
>>
```



Basic PDF Building Blocks

(Hello World)	Strings -- enclosed in ()
12 4.55	Numbers
/Dog	Names
[/Dog 12 (a word)]	Arrays -- enclosed in []
<< /Size 12 /Color /red >>	Dictionaries -- enclosed in << >>
<u>1 0 R</u> <u>5 2 R</u> <u>129 0 R</u> ...	References (pointers)



Nesting

```
[  
  <<  
    /Name (Jim)  
    /Age 39  
    /Children [(Heather) (Timothy) (Rebecca)]  
  >>  
    22  
    44.55  
]
```

```
<<  
  /MORE [ 22 33 44 55 1 ]  
  /LESS [ (dog) (cat) (mule) ]  
  /count 88  
>>
```



Objects

```
3 0 obj
(a string object)
endobj
```

Direct versus Indirect Objects

```
<< /dog (a labrador) >>
```

can also be

```
<< /dog 4 0 R >>
```

...

```
4 0 obj
(a labrador)
endobj
```



Stream Objects

```
55 1 obj
<<
  /Length 31
  /Type /Content
  /special (true)
>>
stream
  this is the stream's content
endstream
endobj
```



Hello World - 50% Gray

```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj

2 0 obj
<<
  /Length 51
>>
stream
BT
  /F1 24 Tf
  1 0 0 1 260 254 Tm
  0.5 g
  (Hello World)Tj
ET
endstream
endobj
```

```
3 0 obj
<<
  /ProcSet [/PDF/Text]
  /Font <</F1 4 0 R
>>
>>
endobj

4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```

```
5 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 446 ]
>>
endobj

6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj

trailer
<<
  /Root 6 0 R
>>
```



Hello World



Hello World - Device Dependent 100% Red

```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj

2 0 obj
<<
  /Length 51
>>
stream
  BT
    /F1 24 Tf
    1 0 0 1 260 254 Tm
    1 0 0 rg
    (Hello World) Tj
  ET
endstream
endobj
```

```
3 0 obj
<<
  /ProcSet [/PDF/Text]
  /Font <</F1 4 0 R >>
>>
endobj

4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```

```
5 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 446 ]
>>
endobj

6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj

trailer
<<
  /Root 6 0 R
>>
```



Hello World



Hello World -- L*a*b* Red

```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj

2 0 obj
<< /Length 51
>>
stream
  BT
    /F1 24 Tf
    1 0 0 1 260 254 Tm
    /CS1 cs
    /AbsoluteColormetric
                                ri
    63 127 127 sc
    (Hello World)Tj
  ET
endstream
endobj
```

```
3 0 obj
<<
  /ProcSet [/PDF/Text]
  /Font <</F1 4 0 R>>
  /ColorSpace
  <</CS1
    [ /Lab <<
      /Range
      [-128 127 -128 127]
      /WhitePoint
      [0.951 1 1.089]
      >> ]
    >>
  >>
endobj

4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```

```
5 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 446 ] >>
endobj

6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj

trailer
<<
  /Root 6 0 R
>>
```



```
3 0 obj
<<
  /ProcSet [/PDF/Text]
  /Font <</F1 4 0 R>>
  /ColorSpace
    <</CS1
      [ /Lab <<
        /Range [-128 127 -128 127]
        /WhitePoint [0.951 1 1.089]
      >>
    ]
  >>
>>
endobj
```



Hello World



Hello World -- Calibrated RGB Red

```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj

2 0 obj
<< /Length 51
>>
stream
  BT
    /F1 24 Tf
    1 0 0 1 260 254 Tm
    /CS2 cs
    1 0 0 sc
    (Hello World)Tj
  ET
endstream
endobj
```

```
3 0 obj
<</ProcSet [/PDF/Text]
  /Font <</F1 4 0 R>>
  /ColorSpace << /CS2
  [ /CalRGB << /Gamma
    [2.222 2.222 2.222]
    /Matrix
    [0.412 0.213 0.019
     0.358 0.715 0.119
     0.181 0.072 0.951
    ] /WhitePoint
    [0.951 1 1.089]>>
  ]
>> >>
endobj

4 0 obj
<</Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```

```
5 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 446 ] >>
endobj

6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj

trailer
<<
  /Root 6 0 R
>>
```



```
3 0 obj
<<
  /ProcSet [/PDF/Text]
  /Font <</F1 4 0 R>>
  /ColorSpace
  <</CS2
    [ /CalRGB <<
      /Gamma [2.222 2.222 2.222]
      /Matrix [0.412 0.213 0.019
                0.358 0.715 0.119
                0.181 0.072 0.951]
      /WhitePoint[0.951 1 1.089]
    >>
    ]
  >>
endobj
```



Hello World





Blue Star

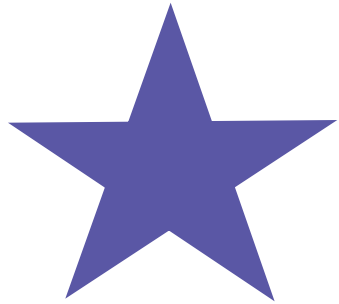
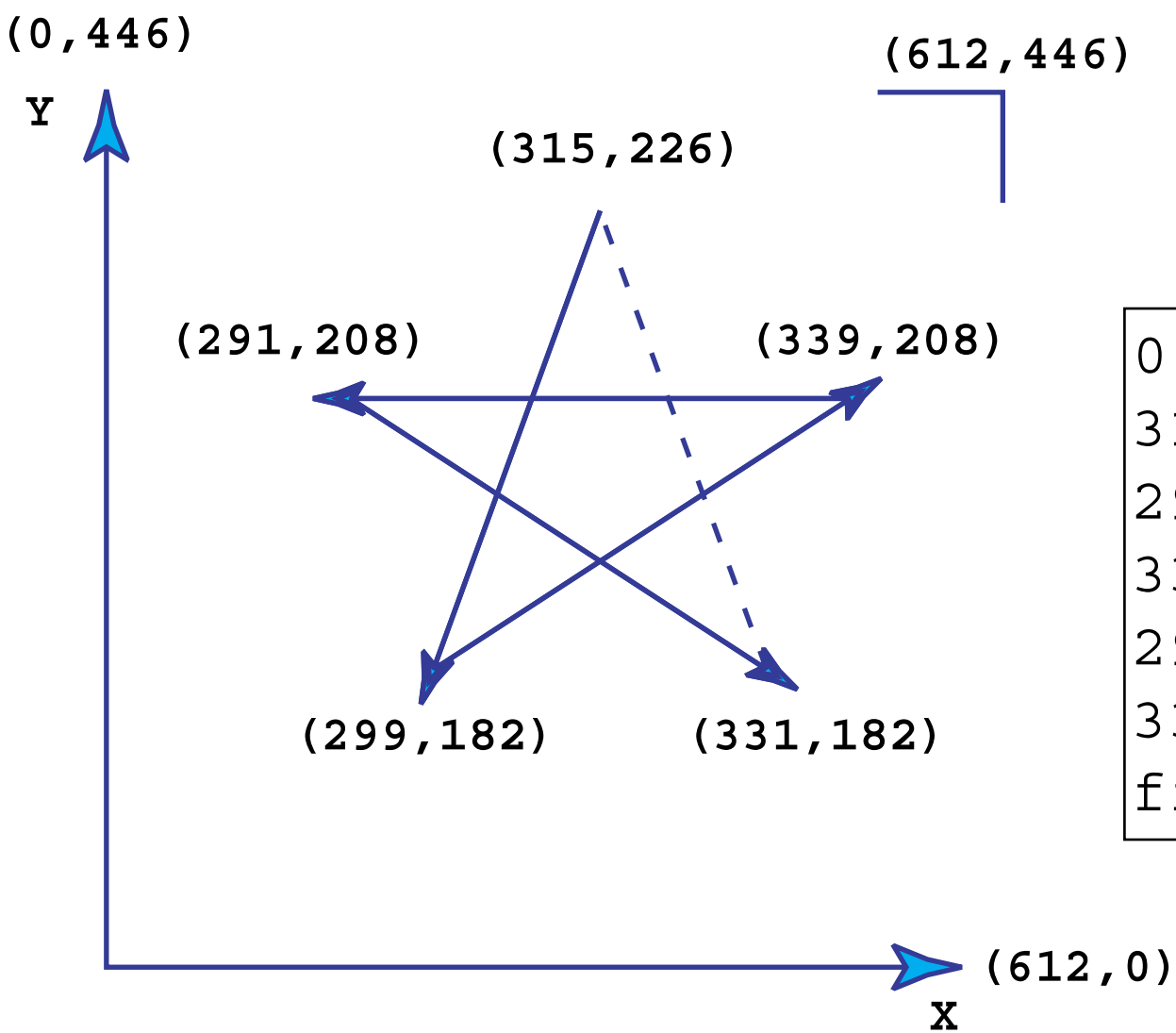
```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj
```

```
2 0 obj
<< /Length 51 >>
stream
  BT
  /F1 24 Tf
  1 0 0 1 260 254 Tm
  (Hello World)Tj
  ET

  0 0 1 rg
  315 226 m
  299 182 l
  339 208 l
  291 208 l
  331 182 l
  f
endstream
endobj
```

```
3 0 obj
<<
  /ProcSet [/PDF/Text]
  /Font <</F1 4 0 R >>
>>
endobj

4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```



```
0 0 1 setrgbcolor
315 226 moveto
299 182 lineto
339 208 lineto
291 208 lineto
331 182 lineto
fill
```



Blue Star

```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj
```

```
2 0 obj
<< /Length 51 >>
stream
  BT
    /F1 24 Tf
    1 0 0 1 260 254 Tm
    (Hello World)Tj
  ET

  0 0 1 rg
  315 226 m
  299 182 l
  339 208 l
  291 208 l
  331 182 l
  f
endstream
endobj
```

```
3 0 obj
<<
  /ProcSet [/PDF/Text]
  /Font <</F1 4 0 R >>
>>
endobj

4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```



```
5 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 446 ] >>
endobj
```

```
6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj
```

```
trailer
<<
  /Root 6 0 R
>>
```



Hello World





Hello World -- **filled** with L*a*b* Red /// Star -- **stroked** with Calibrated RGB Cyan

```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj
```

```
2 0 obj
<< /Length 51 >>
stream
  BT
  /F1 24 Tf
  1 0 0 1 260 254 Tm
  /CS1 cs
  /RelativeColormetric
                                ri
  63 127 127 sc
  (Hello World)Tj
  ET

  /CS2 CS
  /Saturation ri
  0 1 1 SC
  315 226 m
  299 182 l
  339 208 l
  291 208 l
  331 182 l
  s
endstream
endobj
```

```
3 0 obj
<</ProcSet [/PDF/Text] /
Font <</F1 4 0 R>>
/ColorSpace
<</CS1
  [ /Lab << /Range
    [-128 127 -128 127]
    /WhitePoint
    [ 0.951 1 1.089]
    >> ] >>
<</CS2
  [ /CalRGB <<
    /Gamma
    [2.222 2.222 2.222]
    /Matrix
    [0.412 0.213 0.019
      0.358 0.715 0.119
      0.181 0.072 0.951]
    /WhitePoint
    [0.951 1 1.089]
    >> ] >>
>>
endobj
4 0 obj
<<
```



Hello World -- **filled** with L*a*b* Red /// Star -- **stroked** with Calibrated RGB Cyan

```
/Type /Font
/Subtype /Type1
/Name /F1
/BaseFont/Helvetica
>>
endobj

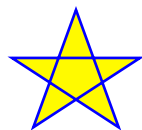
5 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 446 ] >>
endobj

6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj

trailer
<<
  /Root 6 0 R
>>
```



Hello World





Star -- **filled** with L*a*b* Yellow /// Star -- **stroked** with Calibrated RGB Blue

```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj
```

```
2 0 obj
<< /Length 51 >>
stream
  BT
    /F1 24 Tf
    1 0 0 1 260 254 Tm
    /CS1 cs
    63 127 127 sc
    (Hello World)Tj
  ET

  100 0 127 sc

  /CS2 CS
  0 0 1 SC
  315 226 m
  299 182 l
  339 208 l
  291 208 l
  331 182 l
  b
endstream
endobj
```

```
3 0 obj
<</ProcSet [/PDF/Text]
/Font <</F1 4 0 R>>
/ColorSpace
  <</CS1
    [ /Lab << /Range
      [-128 127 -128 127]
      /WhitePoint
      [ 0.951 1 1.089]
      >> ] >>
  <</CS2
    [ /CalRGB <<
      /Gamma
      [2.222 2.222 2.222]
      /Matrix
      [0.412 0.213 0.019
        0.358 0.715 0.119
        0.181 0.072 0.951]
      /WhitePoint
      [0.951 1 1.089]
      >> ] >>
  >>
endobj
```



Star -- **filled** with L*a*b* Yellow /// Star -- **stroked** with Calibrated RGB Blue

```
4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj

5 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 446 ] >>
endobj
```

```
6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj

trailer
<<
  /Root 6 0 R
>>
```



Hello World





Star -- in new coordinate system (device dependent RGB blue)

```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj
```

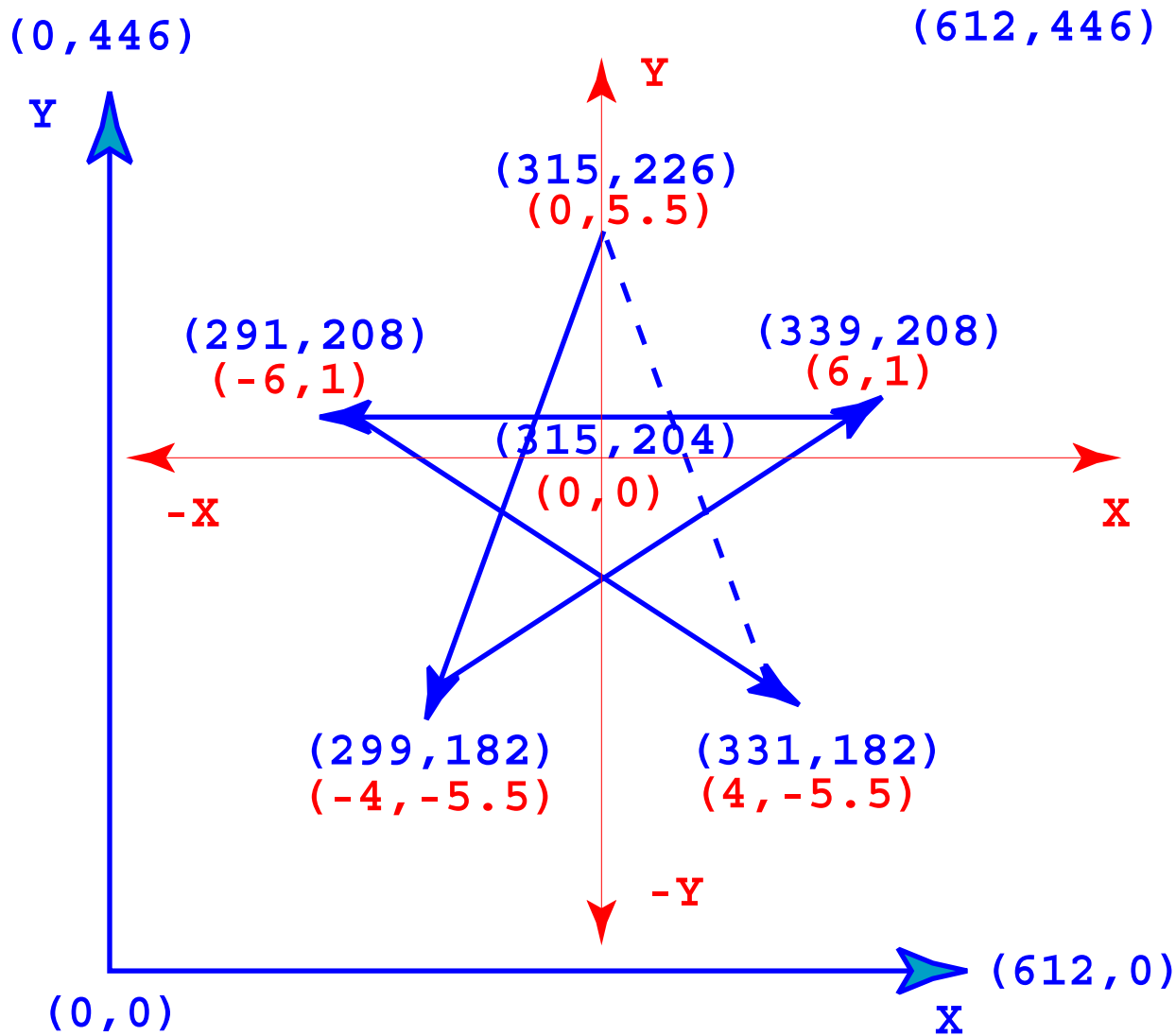
```
2 0 obj
<< /Length 51 >>
stream
  BT
    /F1 24 Tf
    1 0 0 1 260 254 Tm
    (Hello World)Tj
  ET

  0 0 1 rg

  4 0 0 4 315 204 cm
    0 5.5 m
    -4 -5.5 l
    6 1 1
    -6 1 1
    4 -5.5 l
  f
endstream
endobj
```

```
3 0 obj
<<
  /ProcSet [/PDF/Text]
  /Font <</F1 4 0 R >>
>>
endobj

4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```



```
315 204 translate
4 4 scale
0 0 1 setrgbcolor
0 5.5 moveto
-4 -5.5 lineto
6 1 lineto
-6 1 lineto
4 -5.5 lineto
fill
```

```
0 0 1 setrgbcolor
315 226 moveto
299 182 lineto
339 208 lineto
291 208 lineto
331 182 lineto
fill
```



Star -- in new coordinate system (device dependent RGB blue)

```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj
```

```
2 0 obj
<< /Length 51 >>
stream
  BT
    /F1 24 Tf
    1 0 0 1 260 254 Tm
    (Hello World)Tj
  ET

  0 0 1 rg

  4 0 0 4 315 204 cm
    0 5.5 m
    -4 -5.5 l
    6 1 1
    -6 1 1
    4 -5.5 l
  f
endstream
endobj
```

```
3 0 obj
<<
  /ProcSet [/PDF/Text]
  /Font <</F1 4 0 R >>
>>
endobj

4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont/Helvetica
>>
endobj
```

Star -- in new coordinate system (device dependend RGB blue)

```
5 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox
    [ 0 0 612 446 ] >>
endobj
```

```
6 0 obj
<<
  /Type /Catalog
  /Pages 5 0 R
>>
endobj
```

```
trailer
<<
  /Root 6 0 R
>>
```



Hello World





A Heart -- Using Bezier Curves (filled with L*a*b* and stroked in device black)

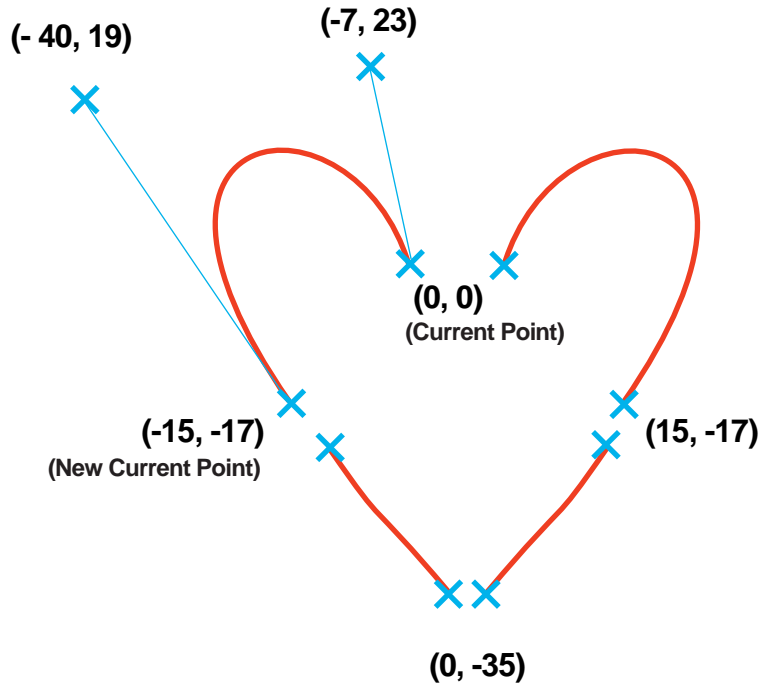
```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj
```

```
2 0 obj
<< /Length 51 >>
stream
  BT
    /F1 24 Tf
    1 0 0 1 260 254 Tm
    (Hello World)Tj
  ET
  q
  0 0 1 rg
  4 0 0 4 315 204 cm
  0 5.5 m
  -4 -5.5 l
  6 1 l
  -6 1 l
  4 -5.5 l
  f
  Q
```

```
/CS1 cs
63 127 127 sc
1 0 0 1 315 144 cm
0 0 m
-7 23 -40 19
-15 -17 c
-7.5 -27.8 -11 -22
0 -35 c
11 -22 7.5 -27.8
15 -17 c
40 19 7 23
0 0 c
b
endstream
endobj
```



Bezier Curves



x1 y1 x2 y2 x3 y3 c

1 0 0 1 315 144 cm

0 0 m

-7	23	-40	19	-15	-17	c
-7.5	-27.8	-11	-22	0	-35	c
11	-22	7.5	-27.8	15	-17	c
40	19	7	23	0	0	c



A Heart -- Using Bezier Curves (filled with L*a*b* and stroked in device black)

```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj
```

```
2 0 obj
<< /Length 51 >>
stream
  BT
    /F1 24 Tf
    1 0 0 1 260 254 Tm
    (Hello World)Tj
  ET
  q
  0 0 1 rg
  4 0 0 4 315 204 cm
  0 5.5 m
  -4 -5.5 l
  6 1 l
  -6 1 l
  4 -5.5 l
  f
  Q
```

```
/CS1 cs
63 127 127 sc
1 0 0 1 315 144 cm
0 0 m
-7 23 -40 19
-15 -17 c
-7.5 -27.8 -11 -22
0 -35 c
11 -22 7.5 -27.8
15 -17 c
40 19 7 23
0 0 c
b
endstream
endobj
```

A Heart -- Using Bezier Curves (filled with L*a*b* and stroked in device black)

```
3 0 obj
<</ProcSet [/PDF/Text] /
Font <</F1 4 0 R>>
/ColorSpace
<</CS1 [ /Lab <<
/Range
[-128 127 -128 127]
/WhitePoint
[ 0.951 1 1.089]
>> ] >>

<</CS2 [ /CalRGB <<
/Gamma
[2.222 2.222 2.222]
/Matrix
[0.412 0.213 0.019
0.358 0.715 0.119
0.181 0.072 0.951 ]
/WhitePoint
[0.951 1 1.089]
>> ] >>
>>

endobj
```

```
4 0 obj
<<
/Type /Font
/Subtype /Type1
/Name /F1
/BaseFont/Helvetica
>>
endobj
```

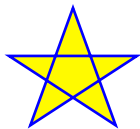
```
5 0 obj
<<
/Type /Pages
/Kids [ 1 0 R ]
/Count 1
/MediaBox
[ 0 0 612 466 ] >>
endobj

6 0 obj
<<
/Type /Catalog
/Pages 5 0 R
>>
endobj

trailer
<<
/Root 6 0 R
>>
```



Hello World





```
2 0 obj
<< /Length 51 >>
stream
BT
/F1 24 Tf
1 0 0 1 260 254 Tm
/CS1 cs
63 127 127 sc
(Hello World)Tj
ET
100 0 127 sc
/CS2 CS
0 0 1 SC
315 226 m
299 182 l
339 208 l
291 208 l
331 182 l
b
100 0 0 100 65 326 cm
```

```

EI
  endstream
endobj

```



Adobe Logo as Sampled Image Data (included directly in page contents)

```
3 0 obj
<</ProcSet[/PDF/Text]
/Font <</F1 4 0 R>>
/ColorSpace
<</CS1 [ /Lab <<
/Range
[-128 127 -128 127]
/WhitePoint
[ 0.951 1 1.089]
>> ] >>

<</CS2 [ /CalRGB <<
/Gamma
[2.222 2.222 2.222]
/Matrix
[0.412 0.213 0.019
0.358 0.715 0.119
0.181 0.072 0.951 ]
/WhitePoint
[0.951 1 1.089]
>> ] >>
>>
endobj
```

```
4 0 obj
<<
/Type /Font
/Subtype /Type1
/Name /F1
/BaseFont/Helvetica
>>
endobj

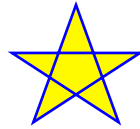
5 0 obj
<<
/Type /Pages
/Kids [ 1 0 R ]
/Count 1
/MediaBox
[ 0 0 612 446 ] >>
endobj
```

```
6 0 obj
<<
/Type /Catalog
/Pages 5 0 R
>>
endobj

trailer
<<
/Root 6 0 R
>>
```



Hello World





Adobe Logo as Sampled Image Data -- No New Lines

```
%PDF-1.2
% based on e08.pdf
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj
```

```
2 0 obj
<< /Length 1343 >>
stream
  BT
    /F1 24 Tf
    1 0 0 1 260 254 Tm
    /CS1 cs
    63 127 127 sc
    (Hello World)Tj
  ET
  100 0 127 sc
  /CS2 CS
  0 0 1 SC
  315 226 m
  299 182 l
  339 208 l
  291 208 l
  331 182 l
  b
```

100 0 0 100 65 326 cm

```
BI
  /W 35 /H 32 /BPC 8
  /CS /DeviceGray
ID
  ccccccP~Pcccccccccccc
  ccccccI~Icccccccccccc
  ccc~cccccccccccccccc
  ~~~~~'ccccccccccccccf~
  ~~~~~iccccccccccccccø~
  øccccccccccccccø~øccc
  ccccccccccc±~±ccccccc
  cccccccce~Eccccccccccc
  cccø~øccccccccccccΔ
  ~~~~~Δcccccccccc~
  ~~~~~ccccccccccP~P
  ~~~~~Pccccccccccc,~f~
  ~~~~~,ccccccccccc~PeP~
  ~~~~~'ccccccccccc~ccc~'cc
  cccccccci~Δcccø~icccccc
  cccø~øcccø~øccccccccø
  ~~~~~'ccccc~øcccccccc~
  ~~~~~TM'cccc~TM'cccc~
  øccccccø~ccccccc~Pccc
  cccø~øccccccΔ~iccccccf
  ~~~~~Δccccccø~øccccccc
  ~~~~~øccccccP~øcccccccø
  ~Pccc,~øΔΔΔΔΔcccc,~c
  ccø~'ccccP~'ccc'~
  ~~~~~'ccccø~'ci~
  ~~~~~iccccΔ~iP~
  ~~~~~øcccci~Pi~
  ~~~~~øcccc~ø~
  TM'cccc~
EI
endstream
endobj
```

Adobe Logo as Sampled Image Data -- No New Lines



```
3 0 obj
<</ProcSet [/PDF/Text]
/Font <</F1 4 0 R>>
/ColorSpace
<</CS1 [ /Lab <<
/Range
[-128 127 -128 127]
/WhitePoint
[ 0.951 1 1.089]
>> ] >>

<</CS2 [ /CalRGB <<
/Gamma
[2.222 2.222 2.222]
/Matrix
[0.412 0.213 0.019
0.358 0.715 0.119
0.181 0.072 0.951 ]
/WhitePoint
[0.951 1 1.089]
>> ] >>
>>
endobj
```

```
4 0 obj
<<
/Type /Font
/Subtype /Type1
/Name /F1
/BaseFont/Helvetica
>>
endobj

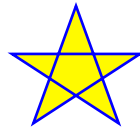
5 0 obj
<<
/Type /Pages
/Kids [ 1 0 R ]
/Count 1
/MediaBox
[ 0 0 612 446 ] >>
endobj
```

```
6 0 obj
<<
/Type /Catalog
/Pages 5 0 R
>>
endobj

trailer
<<
/Root 6 0 R
>>
```



Hello World





Hello World, Star, Logo -- Page Contents Compressed

```
%PDF-1.2
% based on e12.pdf
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj
```

```
2 0 obj
<<
  /Filter /FlateDecode
  /Length 452
>>
stream
ÄÄÄ-yb
C060D
„!¥B+*`Ñ2úΔsF√1f
d7í...f34PH2ö
ÜÖ\fir6%CP4ãå")T≤
6S#Ä/î@S!ÉFc®Äj7§
ΔÜCëÖXd8*C:Ë`k±V†^k
EéØ ∞ÉLPÍFÌAãUF'Åé4B
$î, ÷H¬†Ñ"Å@8£à%C)
ÿ"c2ëEF»41D#tZ=&âp`
ju+ç.Σ]≠ujðN≠~ØZçÿnT[m
,5©πÿ57ªTßrî·Îó,mí`ì≠
xû50-~ëc"ÿ,zJ&flcT€Ì¶°€
$flUç„'1JØé7>Ä-ÁÈ-fl.≥Ü
,„m6<p`ëØ£tfiΣÔ{F~7.
lJA
î`-Økê/πn3 -
<N3ú/Ĵ.-
ªÆ®ØîNaT`fÆ4NØ@#ÃF`√∞
```

```
K]æÆSÔ
¥è;fl ¥∞cç¥ëädfð±ke¥-
ªk7/≥D,DF4●)¥≤Ér.√CQ
...0≥E#;-°E!5N}--
Ö·7'î)=€D,æo<-
$7Æ4...-KÑlR†'Ã
endstream
endobj
```

Hello World, Star, Logo -- Page Contents Compressed



```
3 0 obj
<</ProcSet [/PDF/Text] /
Font <</F1 4 0 R>>
/ColorSpace
<</CS1 [ /Lab <<
/Range
[-128 127 -128 127]
/WhitePoint
[ 0.951 1 1.089]
>> ] >>

<</CS2 [ /CalRGB <<
/Gamma
[2.222 2.222 2.222]
/Matrix
[0.412 0.213 0.019
0.358 0.715 0.119
0.181 0.072 0.951 ]
/WhitePoint
[0.951 1 1.089]
>> ] >>
>>
endobj
4 0 obj
<<
```

```
/Type /Font
/Subtype /Type1
/Name /F1
/BaseFont/Helvetica
>>
endobj

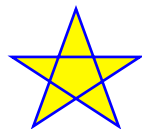
5 0 obj
<<
/Type /Pages
/Kids [ 1 0 R ]
/Count 1
/MediaBox
[ 0 0 612 446 ] >>
endobj
```

```
6 0 obj
<<
/Type /Catalog
/Pages 5 0 R
>>
endobj

trailer
<<
/Root 6 0 R
>>
```



Hello World



Hello World, Star, Logo -- With Cross Reference



```
%PDF-1.2
% based on e12.pdf
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj
```

```
2 0 obj
<<
  /Filter /FlateDecode
  /Length 452
>>
stream
ÄÄÄ-yb
C060D
„!¥B+*`Ñ2úΔsF√1fd7
í...f34PH2ö
ÜÖ\fir6%CP4ãå")T≤6S
#Ä/î@S!ÉFc®Äj7§ΔÜCë
ÕXd8*C:Ë`k±V‡^kEé∅_∞
ÉLPÍFÌÀãUF'Åé4B$; , ò
÷H¬†Ñ"Å@8£à%C)ÿ`c2ëÆ
F»4íD#tZ=&âp`'ju+ç.Σ
]≠ujðN≠~∅ZçŸnT[m,5°πŸ5
7ªTßrî·Îó,mí~î≠xÛ5O--
ëc"Ÿ,z|&flcT€ì¶°€$flUç„'
1|∅é7≥Ä-ÄÈ-fl.≥Ü,,m6<
p~ë∅£tfiΣÔ{F~7.1JA
î`-∅kê/πn3-<N3ú/|.-
ªÆ®∅ïNaT"fÆ4N∅@≠ÃF"√∞
```

```
K]æÆSÔ
¥è;fl¥∞cç¥ëädfð±ke¥-
ªk7/≥D,DF4•)¥≤Ér,√CQ
...0≥E#;-°E!5N}--
Ö·7' ; )=€D,æo<-
$7Æ4...-KÑlR‡'Ã
endstream
endobj
```

Hello World, Star, Logo -- With Cross Reference



3 0 obj

```
<</ProcSet[/PDF/Text]
/Font <</F1 4 0 R>>
/ColorSpace
<</CS1 [ /Lab <<
/Range
[-128 127 -128 127]
/WhitePoint
[ 0.951 1 1.089]
>> ] >>

<</CS2 [ /CalRGB <<
/Gamma
[2.222 2.222 2.222]
/Matrix
[0.412 0.213 0.019
0.358 0.715 0.119
0.181 0.072 0.951 ]
/WhitePoint
[0.951 1 1.089]
>> ] >>
>>
endobj
```

4 0 obj

```
<<
/Type /Font
/Subtype /Type1
/Name /F1
/BaseFont/Helvetica
>>
endobj

5 0 obj
<<
/Type /Pages
/Kids [ 1 0 R ]
/Count 1
/MediaBox
[ 0 0 612 446 ] >>
endobj
```

6 0 obj

```
<<
/Type /Catalog
/Pages 5 0 R
>>
endobj
```

7 0 obj

```
<<
/ModDate
(D:19980307173849)
>>
endobj
```

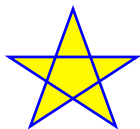



Hello World, Star, Logo -- With Cross Reference

```
xref
0 8
0000000000 65535 f
0000000016 00000 n
0000000102 00000 n
0000000626 00000 n
0000000947 00000 n
0000001033 00000 n
0000001124 00000 n
0000001177 00000 n
trailer
<</Size 8
  /Info 7 0 R
  /Root 6 0 R
  /ID[
    <516b0039a4e03b90b
      d0a72f349225b02>
    <516b0039a4e03b90b
      d0a72f349225b02>]
>>
startxref
1228
%%EOF
```



Hello World





One Adobe Logo Imaged Twice (sharing)

```
%PDF-1.2
% based on e12.pdf
1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj
```

```
2 0 obj
<< /Length 239 >>
stream
  BT
    /F1 24 Tf
    1 0 0 1 260 254 Tm
    /CS1 cs
    63 127 127 sc
    (Hello World)Tj
  ET
  100 0 127 sc
  /CS2 CS
  0 0 1 SC
  315 226 m
  299 182 l
  339 208 l
  291 208 l
  331 182 l
b
endstream
endobj
```

```
0 0 m
q
100 0 0 100
65 326 cm

/AdobeLogo Do

Q
100 0 0 100
365 326 cm

/AdobeLogo Do

endstream
endobj

3 0 obj
<</ProcSet [
  /PDF/Text]
  /Font <</F1 4 0 R>>

  /XObject
<</AdobeLogo 7 0 R >>
```



One Adobe Logo Imaged Twice (sharing)

<pre>/ColorSpace <</CS1 [/Lab << /Range [-128 127 -128 127] /WhitePoint [0.951 1 1.089] >>] >> <</CS2 [/CalRGB << /Gamma [2.222 2.222 2.222] /Matrix [0.412 0.213 0.019 0.358 0.715 0.119 0.181 0.072 0.951] /WhitePoint [0.951 1 1.089] >>] >> >> endobj</pre>	<pre>4 0 obj << /Type /Font /Subtype /Type1 /Name /F1 /BaseFont/Helvetica >> endobj 5 0 obj << /Type /Pages /Kids [1 0 R] /Count 1 /MediaBox [0 0 612 446] >> endobj</pre>	<pre>6 0 obj << /Type /Catalog /Pages 5 0 R >> endobj</pre>
--	---	---

One Adobe Logo Imaged Twice (sharing)

```
7 0 obj
<<
  /Type /XObject
  /Subtype /Image
  /Name /AdobeLogo
  /Width 35
  /Height 32
  /BitsPerComponent 8
  /ColorSpace
    /DeviceGray
  /Length 1120
>>
stream
```

cccccccccccfP ~~~~~ Pcccccccccccccccc
 ccccccccccf1 ~~~~~ 1cccccccccccccccccccc
 ccccf ~~~~~ ccccccccccccccccccccccf
 ~~~~~ ccccccccccccccccccccccf1  
 1cccccccccccccccccccccccccc0  
 ~~~~~ 0cccccccccccccccccccccccc0 ~~~~~ 0ccc  
 ccccccccccccccccccccccc± ~~~~~ ±cccccccc
 ccccccccccccfE ~~~~~ Ecccccccccccccc
 ccccccc0 ~~~~~ 0cccccccccccccccccc
 Δ ~~~~~ Δcccccccccccccccccc
 ~~~~~ cccccccccccccccP  
 ~~~~~ P ~~~~~ Pcccccccccccccc, ~~~~~ 1cf  
 ~~~~~ ,ccccccccccccccf ~~~~~ PccP  
 ~~~~~ fcccccccccccccc ~~~~~ ~~~~~ ccc  
 ~~~~~ ccccccccccccf1 ~~~~~ Δcc0 ~~~~~ 1c  
 ccccccccccc0 ~~~~~ 0cccf0 ~~~~~ 0cccccc  
 ccccf0 ~~~~~ ccccfE ~~~~~ 0cccccccccc™  
 ~~~~~ ccccf™ ~~~~~ ccccfcccf™  
 0cccccccc0 ~~~~~ ccccccc0

P ccccccø ΔcccccfΔ -īcc
 cccfi Δccccfδ δccccccfc
 c! δcccfP δccfccffcfδ
 P cfff, δΔΔΔΔΔcffff,
 ,ccfd' fcccfP
 δcf' ccccd cfi
 īcccfΔ iP
 øcccfi Pf
 δcccf' ð

"cccc"

endstream

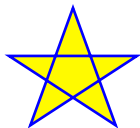
endobj

trailer

```
<<
/Root 6 0 R
>>
```

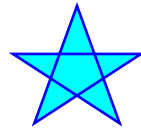


Page 1





Page 2





Two Page Document (“Hello World” becomes “Page 1”, “Page 2”)

```
%PDF-1.2
% based on e14.pdf
5 0 obj
<<
  /Type /Pages
  /Kids
    [1 0 R 8 0 R]
  /Count 2
  /MediaBox
    [ 0 0 612 446 ]
>>
endobj

1 0 obj
<<
  /Type /Page
  /Parent 5 0 R
  /Resources 3 0 R
  /Contents 2 0 R
>>
endobj

2 0 obj
<< /Length 220 >>
stream
  BT
    /F1 24 Tf
    1 0 0 1 260 254 Tm
    /CS1 cs
    63 127 127 sc
    (Page 1)Tj
  ET
  100 0 127 sc
  /CS2 CS
  0 0 1 SC
  315 226 m
  299 182 l
  339 208 l
  291 208 l
  331 182 l
  b
  0 0 m
  q
  100 0 0 100
  65 326 cm
  /AdobeLogo Do

  Q
  100 0 0 100
  365 326 cm
  /AdobeLogo Do

endstream
endobj

3 0 obj
<</ProcSet [
  /PDF/Text]
  /Font <</F1 4 0 R>>

  /XObject
  <</AdobeLogo 7 0 R >>
```




```
/ColorSpace
<</CS1 [ /Lab <<
/Range
[-128 127 -128 127]
/WhitePoint
[ 0.951  1  1.089]
>> ]

/CS2 [ /CalRGB <<
/Gamma
[2.222 2.222 2.222]
/Matrix
[0.412 0.213 0.019
0.358 0.715 0.119
0.181 0.072 0.951 ]
/WhitePoint
[0.951  1  1.089]
>> ] >>
>>
endobj
```



Two Page Document (“Hello World” becomes “Page 1”, “Page 2”)

```
8 0 obj
```

```
<<
```

```
  /Type /Page
```

```
  /Parent 5 0 R
```

```
  /Resources 9 0 R
```

```
  /Contents 10 0 R
```

```
>>
```

```
endobj
```

```
10 0 obj
```

```
<< /Length 220 >>
```

```
stream
```

```
BT
```

```
/F1 24 Tf
```

```
1 0 0 1 260 254 Tm
```

```
/CS1 cs
```

```
63 0 127 sc
```

```
(Page 2)Tj
```

```
ET
```

```
90 -100 -50 sc
```

```
/CS2 CS
```

```
0 0 1 SC
```

```
315 226 m
```

```
299 182 l
```

```
339 208 l
```

```
291 208 l
```

```
331 182 l
```

```
b
```

```
0 0 m
```

```
q
```

```
100 0 0 100
```

```
65 326 cm
```

```
/AdobeLogo Do
```

```
Q
```

```
100 0 0 100
```

```
365 326 cm
```

```
/AdobeLogo Do
```

```
endstream
```

```
endobj
```

```
9 0 obj
```

```
<</ProcSet [
```

```
  /PDF/Text]
```

```
  /Font <</F1 4 0 R>>
```

```
  /XObject
```

```
<</AdobeLogo 7 0 R >>
```



Two Page Document (“Hello World” becomes “Page 1”, “Page 2”)

```
/ColorSpace
<</CS1 [ /Lab <<
/Range
[-128 127 -128 127]
/WhitePoint
[ 0.951 1 1.089]
>> ]
```

```
/CS2 [ /CalRGB <<
/Gamma
[2.222 2.222 2.222]
/Matrix
[0.412 0.213 0.019
0.358 0.715 0.119
0.181 0.072 0.951 ]
/WhitePoint
[0.951 1 1.089]
>> ] >>
>>
endobj
```

```
4 0 obj
<<
/Type /Font
/Subtype /Type1
/Name /F1
/BaseFont/Helvetica
>>
endobj
```

```
6 0 obj
<<
/Type /Catalog
/Pages 5 0 R
>>
endobj
```



cccccccccccfP ~~~~~ Pcccccccccccccccc
 ccccccccccf1 ~~~~~ 1cccccccccccccccccccc
 ccccf ~~~~~ ccccccccccccccccccccccf1
 ~~~~~ 1cccccccccccccccccccccccccc  
 ~~~~~ 0cccccccccccccccccccccccc0 ~~~~~ 0ccc  
 cccccccccccccccccccf± ~~~~~ ±cccccccc
 ccccccccccccfE ~~~~~ Ecccccccccccccc
 ccccccf ~~~~~ 0cccccccccccccccccc
 Δ ~~~~~ Δcccccccccccccccccf
 ~~~~~ ccccccccccccccfP  
 ~~~~~ P ~~~~~ Pcccccccccccccccf, ~~~~~ 1cf1  
 ~~~~~ ,cccccccccccccccf ~~~~~ PcfP  
 ~~~~~ fcccccccccccccf ~~~~~ ~~~~~ ccf ~~~~~ 1cf  
 ~~~~~ ccccccccccccf1 ~~~~~ Δcccf ~~~~~ 1cf  
 ccccccccccf0 ~~~~~ 0cccf ~~~~~ 0cccccccf  
 ccccf ~~~~~ ccccfE ~~~~~ 0cccccccccf™  
 ~~~~~ ccccf™ ~~~~~ ccccf™ ~~~~~ ccccf™  
 0ccccccccf ~~~~~ ccccccccf

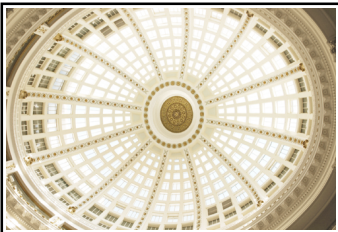
```
trailer
<<
  /Root 6 0 R
>>
```



Archiving PDFs

PDF/A





Features That Impact Archiving

■ Troublesome

- Device dependent color
- Fonts not embedded
- External sound and movie data (not included)
- Embedded JavaScripts

■ Desirable

- Metadata (standardized)
- Structural Information (Tagged PDF)
- Frozen forms entries



PDF/A



- Committee defined a PDF subset
- Organized through AIIM
 - <http://www.aiim.org>
- ISO.TC.171/SC 2/WG.5.
 - Official “DIS” (Draft International Standard)
 - Submitted November 2004
- Addressing the issues
 - Prohibiting the use of certain features
 - Requiring the use of others
- See: <http://www.aiim.org/standards>

A Look at Some Prohibited Features

PDF/A





PDF Fill-in Forms

JavaScript

Name: _____

Refund value: _____



JavaScript



```
%PDF-1.2
1 0 obj
<<
  /Type /Page
  /Parent 6 0 R
  /Resources 3 0 R
  /Contents 2 0 R
  /Annots [ 5 0 R 12 0 R ]
>>
endobj


2 0 obj
<<
  /Length 73
>>
stream
BT
  /F1 24 Tf
  0 g
  1 0 0 1 50 360 Tm
  (Name: _____) Tj
  1 0 0 1 50 280 Tm
  (Refund value: _____) Tj
ET
endstream
endobj
```

```
5 0 obj
<<
  /Type /Annot
  /Subtype /Widget
  /Rect [ 125 361 451 382 ]
  /F 4
  /T (FullName)
  /FT /Tx /AP << /N 9 0 R >>
  /AA << /E 10 0 R /X 11 0 R >>
>>
endobj

10 0 obj
<< /S /JavaScript
  /JS
  (getField("FullName").fillColor=
    color.yellow;
    getField("Worth").value="$500,000.00";
  ) >>
endobj

11 0 obj
<< /S /JavaScript
  /JS
  (getField("FullName").fillColor=
    color.white;
    getField("Worth").value = "$5.00";
  ) >>
endobj
```

JavaScript




```
12 0 obj
<<
  /Type /Annot
  /Subtype /Widget
  /Rect [ 200 281 355 302 ]
  /F 4
  /T (Worth)
  /FT /Tx
  /Q 2
  /AP << /N 13 0 R >>
>>
endobj

9 0 obj
<<
  /Length 64
  /BBox [ 0 0 326 21 ]
  /Resources <</ProcSet [/PDF] >>
  /MK
  <</BC [0.2 0.2 1] /BG [1 0.75 1]>>
>>
stream
  1 0.75 1 rg
  0 0 326 21 re f
  0.7 0.7 1 RG 1 w
  0.5 0.5 325 20 re
  s
endstream
endobj
```

```
13 0 obj
<<
  /Length 64
  /BBox [ 0 0 326 21 ]
  /Resources << /ProcSet [ /PDF ] >>
  /MK
  <</BC [0.2 0.2 1] /BG [1 0.75 1] >>
>>
stream
  1 0.75 1 rg
  0 0 326 21 re f
  0.7 0.7 1 RG 1 w
  0.5 0.5 325 20 re
  s
endstream
endobj

7 0 obj
<<
  /Fields [ 5 0 R 12 0 R]
  /DR << /Font << /Helv 4 0 R >> >>
  /DA (/Helv 0 Tf 0 g )
>>
endobj
```



JavaScript



```
8 0 obj
<<
  /Type /Catalog
  /Pages 6 0 R
  /AcroForm 7 0 R
>>
endobj

3 0 obj
<<
  /ProcSet [ /PDF /Text ]
  /Font << /F1 4 0 R >>
>>
endobj

4 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont /Helvetica
>>
endobj
```

```
6 0 obj
<<
  /Type /Pages
  /Kids [ 1 0 R ]
  /Count 1
  /MediaBox [ 0 0 612 446 ]
>>
endobj

trailer
<<
  /Root 8 0 R
>>
```



Structure

Tagged PDF





1.0 Important Notice

This is a paragraph.

1.1 Second Notice

Another paragraph.

1.3 Third Notice

And my final paragraph.



Structure Information

```
%PDF-1.5
16 0 obj
<<
  /Type /Catalog
  /Pages 10 0 R
  /Lang (EN-US)
  /StructTreeRoot 18 0 R
  /PieceInfo <</MarkedPDF
<</LastModified (D:20040401160307)>> >>
  /LastModified (D:20040401160307)
  /MarkInfo <</Marked true
/LetterspaceFlags 0>>
>>
endobj

18 0 obj
<<
  /Type /StructTreeRoot
  /K 41 0 R
  /ClassMap 22 0 R
  /ParentTree 43 0 R
  /ParentTreeNextKey 1
  /RoleMap 19 0 R>>
endobj

19 0 obj
<<
  /Outline /Span
  /Underline /Span
```

```
/Normal /P
/Strikeout /Span
/Heading#201 /H1
/Heading#202 /H2
/Heading#203 /H3
/TextBox /Div
/Frame /Div
/Footnote /Note
/Endnote /Note
/Shape /Figure
/InlineShape /Figure
/TOA /TOC
/TOAI /TOCI
/TOF /TOC
/TOFI /TOCI
/Superscript /Span
/Subscript /Span
/DropCap /Figure
>>
endobj

22 0 obj
<<
  /Normal 26 0 R
  /Heading#201 23 0 R
  /Heading#202 29 0 R
  /Heading#203 34 0 R
>>
endobj
```




Structure Information

```
26 0 obj
<<
  /O /Layout
  /EndIndent 0.0
  /SpaceAfter 0.0
  /SpaceBefore 0.0
  /StartIndent 0.0
  /TextAlign /Start
  /TextIndent 0.0
  /WritingMode /LrTb
>>
endobj
```

```
23 0 obj
<<
  /O /Layout
  /EndIndent 0.0
  /SpaceAfter 3.0
  /SpaceBefore 12.0
  /StartIndent 0.0
  /TextAlign /Start
  /TextIndent 0.0
  /WritingMode /LrTb
>>
endobj
```

```
29 0 obj
<</O/Layout
  /EndIndent 0.0
  /SpaceAfter 3.0
  /SpaceBefore 12.0
  /StartIndent 0.0
  /TextAlign/Start
  /TextIndent 0.0
  /WritingMode /LrTb
>>
endobj
```

```
34 0 obj
<<
  /O /Layout
  /EndIndent 0.0
  /SpaceAfter 3.0
  /SpaceBefore 12.0
  /StartIndent 0.0
  /TextAlign /Start
  /TextIndent 0.0
  /WritingMode /LrTb
>>
endobj
```

Structure Information



```
55 0 obj
<<
  /Length 892
>>
stream
```

```
/P <</MCID 0 >>
```

```
BDC
0 g
1 i
BT
  /TT0 1 Tf
  -0.00079 Tc 0.00011 Tw 0   Ts
  100   Tz 0 Tr
  16.02 0 0 16.02 90 693.06 Tm
  [(1.0 Import) 15 (ant N) -5
   (o) 1 (tice )]TJ
```

```
ET
EMC
```

```
/P <</MCID 1 >>
```

```
BDC
BT
  /TT0 1 Tf
  -0.00011 Tc 0.0023 Tw 12 0 0 12 90
675.47998 Tm
  (This is a paragraph. )Tj
```

```
ET
EMC
```

```
/P <</MCID 2 >>
```

```
BDC
BT
  /TT0 1 Tf
  0.00079 Tc 0.00031 Tw 13.98 0 0
13.98 90 647.70007 Tm
  (1.1 Second Notice )Tj
```

```
ET
EMC
```

```
/P <</MCID 3 >>
```

```
BDC
BT
  /TT0 1 Tf
  -0.00011 Tc 0.0023 Tw 12 0 0 12 90
630.60004 Tm
  (Another paragraph. )Tj
```

```
ET
EMC
```

```
/P <</MCID 4 >>
```

```
BDC
BT
  /TT0 1 Tf
  0.0002 Tc -0.0038 Tw 13.02 0 0 13.02
90 603.77997 Tm
  (1.3 Third Notice )Tj
```

```
ET
```

Structure Information

EMC



/P <</MCID 5 >>

BDC

BT

/TT0 1 Tf

0 Tc 0.0022 Tw 12 0 0 12 90

586.85999 Tm

(And my final paragraph.)Tj

ET

EMC

/P <</MCID 6 >>

BDC

BT

/TT0 1 Tf

0 Tw 12 0 0 12 90 573.06006 Tm

()Tj

ET

EMC

/P <</MCID 7 >>

BDC

BT

/TT0 1 Tf

12 0 0 12 90 559.26013 Tm

()Tj

ET

EMC

endstream

endobj

20 0 obj

<<

/K 0

/C /Heading#201

/P 41 0 R

/S /Heading#201

/Pg 1 0 R

>>

endobj

24 0 obj

<<

/K 1

/C /Normal

/P 41 0 R

/S /Normal

/Pg 1 0 R

>>

endobj

Structure Information

```
27 0 obj
<<
  /K 2
  /C /Heading#202
  /P 41 0 R
  /S /Heading#202
  /Pg 1 0 R
>>
endobj
```

```
30 0 obj
<<
  /K 3
  /C /Normal
  /P 41 0 R
  /S /Normal
  /Pg 1 0 R>>
endobj
```

```
32 0 obj
<<
  /K 4
  /C /Heading#203
  /P 41 0 R
  /S /Heading#203
  /Pg 1 0 R
>>
endobj
```

```
35 0 obj
<<
  /K 5
  /C /Normal
  /P 41 0 R
  /S /Normal
  /Pg 1 0 R
>>
endobj
```

```
37 0 obj
<<
  /K 6
  /C /Normal
  /P 41 0 R
  /S /Normal
  /Pg 1 0 R
>>
endobj
```

```
39 0 obj
<<
  /K 7
  /C /Normal
  /P 41 0 R
  /S /Normal
  /Pg 1 0 R
>>
endobj
```



Structure Information

```
41 0 obj
<<
  /Lang (EN-GB)
  /K [20 0 R 24 0 R 27 0 R 30 0 R
      32 0 R 35 0 R 37 0 R 39 0 R]
  /P 18 0 R
  /S /Sect
>>
endobj

43 0 obj
<< /Nums [0 44 0 R] >>
endobj

44 0 obj
[20 0 R 24 0 R 27 0 R 30 0 R 32 0 R 35
0 R 37 0 R 39 0 R]
endobj

1 0 obj
<<
  /Contents 55 0 R
  /Type /Page
  /Parent 10 0 R
  /Resources <</Font <</TT0 8 0 R>>
                /ProcSet [/PDF/Text] >>
  /StructParents 0
>>
endobj
```

```
10 0 obj
<<
  /Type /Pages
  /Count 1
  /Kids[1 0 R]
  /MediaBox[0 0 612 792]
>>
endobj

8 0 obj
<<
  /Type /Font
  /Subtype /Type1
  /Name /F1
  /BaseFont /Helvetica
>>
endobj

trailer
<<
  /Root 16 0 R
>>
```



Meta Data

XMP - Extensible Metadata Platform



1.0 Important Notice

This is a paragraph.

1.1 Second Notice

Another paragraph.

1.3 Third Notice

And my final paragraph.



Meta Data

```
%PDF-1.5
16 0 obj
<<
  /Type /Catalog
  /Metadata 56 0 R
  /Pages 10 0 R
  /Lang (EN-US)
  /StructTreeRoot 18 0 R
  /PieceInfo <</MarkedPDF
<</LastModified (D:20040401160307)>> >>
  /LastModified (D:20040401160307)
  /MarkInfo <</Marked true
/LetterspaceFlags 0>>
>>
endobj
```

```
56 0 obj
<<
  /Type/Metadata
  /Subtype/XML
  /Length 3931
>>
stream
```

```
<?xpacket begin='Ôªø'
id='W5M0MpCehiHzreSzNTczkc9d'?>
<?adobe-xap-filters esc="CRLF"?>
```

```
<x:xmpmeta xmlns:x='adobe:ns:meta/'
x:xmptk='XMP toolkit 2.9.1-13,
framework 1.6'>

<rdf:RDF
xmlns:rdf='http://www.w3.org/1999/02/22
-rdf-syntax-ns#'
xmlns:iX='http://ns.adobe.com/iX/1.0/'>

<rdf:Description
rdf:about='uuid:cb29237f-8d0c-4464-
9df1-de9e3db78aba'
xmlns:pdf='http://ns.adobe.com/pdf/1.3/'
' pdf:Producer='Acrobat Distiller 6.0.1
(Windows)''></rdf:Description>

<rdf:Description
rdf:about='uuid:cb29237f-8d0c-4464-
9df1-de9e3db78aba'
xmlns:pdfx='http://ns.adobe.com/pdfx/1.
3/' pdfx:Company='Adobe Systems'
pdfx:SourceModified='D:20040402000249'/'
>

<rdf:Description
rdf:about='uuid:cb29237f-8d0c-4464-
9df1-de9e3db78aba'
xmlns:photoshop='http://ns.adobe.com/ph
```




Meta Data

```
otoshop/1.0/'><photoshop:headline><rdf:
Seq><rdf:li></rdf:li></rdf:Seq>
</photoshop:headline></rdf:Description>
```

```
<rdf:Description
rdf:about='uuid:cb29237f-8d0c-4464-
9df1-de9e3db78aba'
xmlns:xap='http://ns.adobe.com/xap/1.0/'
xap:CreatorTool='Acrobat PDFMaker 6.0
for Word' xap:ModifyDate='2004-04-
01T16:12:29-08:00'
xap:CreateDate='2004-04-01T16:02:53-
08:00' xap:MetadataDate='2004-04-
01T16:12:29-08:00'></rdf:Description>
```

```
<rdf:Description
rdf:about='uuid:cb29237f-8d0c-4464-
9df1-de9e3db78aba'
xmlns:xapMM='http://ns.adobe.com/xap/1.
0/mm/' xapMM:DocumentID='uuid:f52755c8-
ad06-4534-b0e1-
538e1722f21e'><xapMM:VersionID><rdf:Seq
><rdf:li>4</rdf:li></rdf:Seq></xapMM:Ve
rsionID></rdf:Description>
```

```
<rdf:Description
rdf:about='uuid:cb29237f-8d0c-4464-
9df1-de9e3db78aba'
xmlns:dc='http://purl.org/dc/elements/1
```

```
.1/'
dc:format='application/pdf'><dc:title><
rdf:Alt><rdf:li xml:lang='x-
default'>Important
Notice</rdf:li></rdf:Alt></dc:title><dc
:creator><rdf:Seq><rdf:li>James C.
King</rdf:li></rdf:Seq></dc:creator><dc
:subject><rdf:Seq><rdf:li></rdf:li></rd
f:Seq></dc:subject></rdf:Description>
```

```
</rdf:RDF>
```

```
</x:xmpmeta>
```

```
<?xpacket end='w'?>
```

```
endstream
```

```
endobj
```

```
18 0 obj
```

```
<<
```

```
  /Type /StructTreeRoot
```

```
  /K 41 0 R
```

```
  /ClassMap 22 0 R
```

```
  /ParentTree 43 0 R
```

```
  /ParentTreeNextKey 1
```

```
  /RoleMap 19 0 R>>
```

```
endobj
```

Meta Data

```
19 0 obj
<<
  /Outline /Span
  /Underline /Span
  /Normal /P
  /Strikeout /Span
  /Heading#201 /H1
  /Heading#202 /H2
  /Heading#203 /H3
  /TextBox /Div
  /Frame /Div
  /Footnote /Note
  /Endnote /Note
  /Shape /Figure
  /InlineShape /Figure
  /TOA /TOC
  /TOAI /TOCI
  /TOF /TOC
  /TOFI /TOCI
  /Superscript /Span
  /Subscript /Span
  /DropCap /Figure
>>
endobj

22 0 obj
<<
  /Normal 26 0 R
```

```
    /Heading#201 23 0 R
    /Heading#202 29 0 R
    /Heading#203 34 0 R
>>
endobj
26 0 obj
<<
  /O /Layout
  /EndIndent 0.0
  /SpaceAfter 0.0
  /SpaceBefore 0.0
  /StartIndent 0.0
  /TextAlign /Start
  /TextIndent 0.0
  /WritingMode /LrTb
>>
endobj

23 0 obj
<<
  /O /Layout
  /EndIndent 0.0
  /SpaceAfter 3.0
  /SpaceBefore 12.0
  /StartIndent 0.0
  /TextAlign /Start
  /TextIndent 0.0
  /WritingMode /LrTb
>>
```

Meta Data

endobj

```
29 0 obj
<</O/Layout
/EndIndent 0.0
/SpaceAfter 3.0
/SpaceBefore 12.0
/StartIndent 0.0
/TextAlign/Start
/TextIndent 0.0
/WritingMode /LrTb
>>
endobj
```

```
34 0 obj
<<
/O /Layout
/EndIndent 0.0
/SpaceAfter 3.0
/SpaceBefore 12.0
/StartIndent 0.0
/TextAlign /Start
/TextIndent 0.0
/WritingMode /LrTb
>>
endobj
```

```
55 0 obj
<<
/Length 892
>>
stream

/P <</MCID 0 >>
BDC
0 g
1 i
BT
/TT0 1 Tf
-0.00079 Tc 0.00011 Tw 0 Ts
100 Tz 0 Tr
16.02 0 0 16.02 90 693.06 Tm
[(1.0 Import) 15 (ant N) -5
(o) 1 (tice )]TJ
ET
EMC

/P <</MCID 1 >>
BDC
BT
/TT0 1 Tf
```

Meta Data

-0.00011 Tc 0.0023 Tw 12 0 0 12 90
675.47998 Tm
(This is a paragraph.)Tj
ET
EMC

/P <</MCID 2 >>
BDC
BT
/TT0 1 Tf
0.00079 Tc 0.00031 Tw 13.98 0 0
13.98 90 647.70007 Tm
(1.1 Second Notice)Tj
ET
EMC

/P <</MCID 3 >>
BDC
BT
/TT0 1 Tf
-0.00011 Tc 0.0023 Tw 12 0 0 12 90
630.60004 Tm
(Another paragraph.)Tj
ET
EMC

/P <</MCID 4 >>
BDC
BT

/TT0 1 Tf
0.0002 Tc -0.0038 Tw 13.02 0 0 13.02
90 603.77997 Tm
(1.3 Third Notice)Tj
ET
EMC

/P <</MCID 5 >>
BDC
BT
/TT0 1 Tf
0 Tc 0.0022 Tw 12 0 0 12 90
586.85999 Tm
(And my final paragraph.)Tj
ET
EMC

/P <</MCID 6 >>
BDC
BT
/TT0 1 Tf
0 Tw 12 0 0 12 90 573.06006 Tm
()Tj
ET
EMC

/P <</MCID 7 >>
BDC
BT

Meta Data

```
/TT0 1 Tf
12 0 0 12 90 559.26013 Tm
( )Tj
ET
EMC
```

```
endstream
endobj
```

```
20 0 obj
<<
  /K 0
  /C /Heading#201
  /P 41 0 R
  /S /Heading#201
  /Pg 1 0 R
>>
endobj
```

```
24 0 obj
<<
  /K 1
  /C /Normal
  /P 41 0 R
  /S /Normal
  /Pg 1 0 R
>>
```

```
endobj
```

```
27 0 obj
<<
  /K 2
  /C /Heading#202
  /P 41 0 R
  /S /Heading#202
  /Pg 1 0 R
>>
endobj
```

```
30 0 obj
<<
  /K 3
  /C /Normal
  /P 41 0 R
  /S /Normal
  /Pg 1 0 R>>
endobj
```

```
32 0 obj
<<
  /K 4
  /C /Heading#203
  /P 41 0 R
```

Meta Data

```
/S /Heading#203
/Pg 1 0 R
>>
endobj

35 0 obj
<<
  /K 5
  /C /Normal
  /P 41 0 R
  /S /Normal
  /Pg 1 0 R
>>
endobj

37 0 obj
<<
  /K 6
  /C /Normal
  /P 41 0 R
  /S /Normal
  /Pg 1 0 R
>>
endobj

39 0 obj
<<
  /K 7
  /C /Normal
```

```
/P 41 0 R
/S /Normal
/Pg 1 0 R
>>
endobj
41 0 obj
<<
  /Lang (EN-GB)
  /K [20 0 R 24 0 R 27 0 R 30 0 R
    32 0 R 35 0 R 37 0 R 39 0 R]
  /P 18 0 R
  /S /Sect
>>
endobj

43 0 obj
<< /Nums [0 44 0 R] >>
endobj

44 0 obj
[20 0 R 24 0 R 27 0 R 30 0 R 32 0 R 35
0 R 37 0 R 39 0 R]
endobj

1 0 obj
<<
  /Contents 55 0 R
  /Type /Page
  /Parent 10 0 R
```

Meta Data

```
/Resources <</Font <</TT0 8 0 R>>
    /ProcSet [/PDF/Text] >>
/StructParents 0
>>
endobj

10 0 obj
<<
    /Type /Pages
    /Count 1
    /Kids[1 0 R]
    /MediaBox[0 0 612 792]
>>
endobj

8 0 obj
<<
    /Type /Font
    /Subtype /Type1
    /Name /F1
    /BaseFont /Helvetica
>>
endobj

trailer
<<
    /Root 16 0 R
>>
```



Meta Data

```
<?adobe-xap-filters esc="LF"?>
<x:xmpmeta xmlns:x='adobe:ns:meta/'
  x:xmptk='XMP toolkit 2.9.1-14, framework 1.6'>

  <rdf:RDF xmlns:rdf='http://www.w3.org/1999/02/22-rdf-syntax-ns#'
    xmlns:iX='http://ns.adobe.com/iX/1.0/'>

    <rdf:Description rdf:about='uuid:ad0dab0d-84e1-11d8-8dfc-
00306577a5e6'
      xmlns:pdf='http://ns.adobe.com/pdf/1.3/'>
      <pdf:Producer>Acrobat Distiller 6.0.1 (Windows)</pdf:Producer>
    </rdf:Description>

    <rdf:Description rdf:about='uuid:ad0dab0d-84e1-11d8-8dfc-
00306577a5e6'
      xmlns:pdfx='http://ns.adobe.com/pdfx/1.3/'>
      <pdfx:Company>Adobe Systems</pdfx:Company>
      <pdfx:SourceModified>D:20040402000249</pdfx:SourceModified>
    </rdf:Description>

    <rdf:Description rdf:about='uuid:ad0dab0d-84e1-11d8-8dfc-
00306577a5e6'
      xmlns:photoshop='http://ns.adobe.com/photoshop/1.0/'>
      <photoshop:headline>
      <rdf:Seq>
```




Meta Data

```
<rdf:li></rdf:li>
</rdf:Seq>
</photoshop:headline>
</rdf:Description>

<rdf:Description rdf:about='uuid:ad0dab0d-84e1-11d8-8dfc-
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Meta Data



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