

Miramo[®]

Automated Publishing

mmDraw Drawing Guide

VERSION 9.2

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CHAPTER 1

Introduction

This *mmDraw Drawing Guide* contains a description of the special markup codes which may be used within the `<mmDraw>` and `</mmDraw>` markup codes.

CHAPTER 2

Drawing markup codes

Drawing markup codes may be used within `<mmDraw>` and `</mmDraw>` inline markup codes (see the *Miramo Reference Guide*, pages [R-217–218](#)).

Table 2.1 Summary of drawing markup codes

Code name	Page
Basic codes	
<code><ALine ... ></code>	MD-5–9
<code><Arc ... /></code>	MD-10–13
<code><Circle ... /></code>	MD-14–16
<code><Ellipse ... /></code>	MD-17–18
<code><Frame ... ></code>	MD-19
<code><Image ... /></code>	MD-20
<code><PLineto ... /></code>	MD-21–22
<code><Point ... /></code>	MD-23
<code><Polygon ... ></code>	MD-24–29
<code><PolyLine ... ></code>	MD-30–38
<code><Rectangle ... /></code>	MD-39–41
<code><TextLine ... ></code>	MD-45–49
<code><TextFrame ... ></code>	MD-42–44

Two of the 13 drawing codes above, `<Frame ... >` and `<Image ... />`, may also be used outside the scope of `<mmDraw>` and `</mmDraw>` codes. `<Frame ... >` and `<Image ... />` are described in detail in the *Miramo Reference Guide*.

Usage rules for drawing markup codes

The following are some general usage rules for drawing markup codes.

- Drawing codes, with the exception of the `<Frame ... >` and `<Image ... />` codes, may only appear between `<mmDraw>` and `</mmDraw>` codes.
- All drawing codes start with a `<` character followed by the literal markup code name, followed by two or more `option=value` pairs which are terminated by the `>` character or a `/>` string.

In addition the scope of a drawing markup code may be terminated by a `</` string followed by literal markup code name, followed by the `>` character.

The following is an example of a drawing markup code:

```
<TextLine L=22pt T=14pt > .. </TextLine>
```

- In all cases scope-terminating markup is mandatory. For example, in the following:

```
<PolyLine color=Blue >
  <Point L=22pt T=22pt />
  <Point L=42pt T=22pt />
</PolyLine>
```

the terminating `</PolyLine>` cannot be omitted.

- All drawing codes may include one or more *option=value* pairs. For example, a `<P ... >` code may have no *option=value* pairs, or may have over fifty.

The following are examples of option value pairs:

```
<Textline fmt=F_Body><Textline fmt="F_Body"><Textline fmt='F_Body'>
```

- All drawing codes *must* contain at least one *option=value* pair.

For example, the `<Image ... />` code must contain an *option=value* pair specifying the image file name to be referenced or copied. In many cases additional *option=value* pairs will be included within the inline code.

Option values may be surrounded by ' (single quotation mark) or " (double quotation mark) characters. White space (spaces and tabs) is permitted around the = sign in *option=value* pairs and *option=value* pairs may be separated by spaces, tabs and newlines, e.g.

```
<Line L="20pt"
          T=14pt >
```

Option string or file name values containing spaces *must* be surrounded by single or double quotation marks. Options and their values must be on the same line.

- Options may be repeated any number of times. Later option values override earlier option values. The following will result in a blue circle:

```
<Circle color=Red L=20pt T=8pt D=6pt color=Blue >
```

- In certain cases the order of options is significant. For example, if a 'fmt' option appears after override options, the override options will be ineffective.

In the following example the option preceding the 'fmt' option is ineffective:

```
<TextLine p=8pt fmt=Body >
```

<ALine ... >

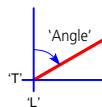
Summary

Use the <ALine ... > code to draw an angled line with optional annotation text at its mid-point.

Annotation text may be included between the <ALine ... > and </ALine> codes.

Syntax

Option	Value	Description
<ALine		
<u>Line options</u>		
L [lineLeft]	<i>dim</i>	Left offset of start point (tail) of line from left edge of enclosing frame.
T [lineTop]	<i>dim</i>	Top offset of start point (tail) of line from top edge of enclosing frame.
lineLen	<i>dim</i>	Length of line.
Angle [lineAngle]	<i>number</i>	Line angle. Positive values of 'Angle' are measured in degrees clockwise from the positive Y-axis. Negative values of 'Angle' are measured in degrees counterclockwise from the positive Y-axis. <i>Default: 0</i>
ArrowNum	1 - 4	Arrow style number. See Note 1 on page MD-8 . <i>Default: 1</i>
Arrow [arrowHead]	None Head Tail Both	Arrowhead placement. <i>Default: None</i>
color [lineColor]	<i>name</i>	Color name. <i>Default: Black</i>
pen [penNum]	0 - 15	Pen style. <i>Default: 0</i>
pw [penWidth]	<i>dim</i>	Pen width. <i>Default: 0.5pt</i>
<u>Text options</u>		
textLen	<i>dim</i>	Length of break in line for annotation text.



<ALine ... >

Option	Value	Description
textPos [textPosition]	I H T	Text position. I = inline, H = at head, T = at tail. <i>Default:</i> I
textAlign	C L R	Text position. C = centered, L = left aligned, R = Right aligned. If the value of 'textPos' is set to I, inline, the text is always centered. <i>Default:</i> C
textAngle	<i>number</i>	Angle of text. Positive values of 'Angle' are measured in degrees clockwise from the positive Y-axis. Negative values of 'Angle' are measured in degrees counterclockwise from the positive Y-axis. <i>Default:</i> value of 'Angle' (see page MD-5).

Reference pre-defined font format

fnt [fontFormat]	<i>name</i>	Font format name. See page R-137 in the <i>Miramo Reference Guide</i>
---------------------	-------------	---

Font selection

ff [fontFamily]	<i>name</i>	Font family. See page R-137 in the <i>Miramo Reference Guide</i> .
fa [fontAngle]	<i>name</i>	Font angle. See page R-137 in the <i>Miramo Reference Guide</i> .
fw [fontWeight]	<i>name</i>	Font weight. See page R-138 in the <i>Miramo Reference Guide</i> .
fv [fontVariation]	<i>name</i>	Font variation. See page R-138 in the <i>Miramo Reference Guide</i> .

Text size and color

p [textSize]	<i>dim</i> <i>rdim</i>	Text size. See Note 1 on page R-142. Default units are points (1/72 inches). See page R-138 in the <i>Miramo Reference Guide</i> .
fcolor [textColor]	<i>name</i>	Font color. See page R-138 in the <i>Miramo Reference Guide</i> .

Underline and overline

uline [textUnderline]	N S D M	Underline style. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>N</td> <td>No underline.</td> </tr> <tr> <td>S</td> <td>Single (normal) underline.</td> </tr> </tbody> </table>	Value	Description	N	No underline.	S	Single (normal) underline.
Value	Description							
N	No underline.							
S	Single (normal) underline.							

<ALine ... >

Option	Value	Description										
		D Double underline. M Numeric (low) underline. See page R-138 in the <i>Miramo Reference Guide</i> . Default: N										
o [textOverline]	N Y	Overline. See page R-139 in the <i>Miramo Reference Guide</i> . Default: N										
<u>Strike through and change bar</u>												
t [strikeThrough]	N Y	Strike through. See page R-139 in the <i>Miramo Reference Guide</i> . Default: N										
C [changeBar]	N Y	Change bar. See page R-139 in the <i>Miramo Reference Guide</i> . Default: N										
<u>Capitalization</u>												
fc [textCase]	T S L U	Capitalization. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>T</td> <td>As typed.</td> </tr> <tr> <td>S</td> <td>Small caps.</td> </tr> <tr> <td>L</td> <td>Lower case.</td> </tr> <tr> <td>U</td> <td>Uppercase.</td> </tr> </tbody> </table> See page R-139 in the <i>Miramo Reference Guide</i> . Default: T	Value	Description	T	As typed.	S	Small caps.	L	Lower case.	U	Uppercase.
Value	Description											
T	As typed.											
S	Small caps.											
L	Lower case.											
U	Uppercase.											
<u>Vertical and horizontal shift</u>												
u [superscript]	N Y	Superscript. See page R-139 in the <i>Miramo Reference Guide</i> . Default: N										
d [subscript]	N Y	Subscript. See page R-139 in the <i>Miramo Reference Guide</i> . Default: N										
Ky [vertShift]	percent	Vertical displacement of text. See page R-140 in the <i>Miramo Reference Guide</i> . Default: 0										
Kx [horizShift]	percent	Horizontal text displacement. See page R-140 in the <i>Miramo Reference Guide</i> . Default: 0										
<u>Kerning, character spread and stretch</u>												
K [textKern]	Y N	Enable pair kerning and character spread. Also: enable ligatures (Unix only). See page R-141 in the <i>Miramo Reference Guide</i> .										

<ALine ... >

Option	Value	Description
Ks [textSpread]	<i>percent</i>	Inter-character spread, or tracking. See page R-141 in the <i>Miramo Reference Guide</i> . <i>Default: 0</i>
fs [textStretch]	<i>percent</i>	Horizontally expand or compress characters. See page R-141 in the <i>Miramo Reference Guide</i> . <i>Default: 100</i>
textBGColor	<i>name</i>	Apply a background color to text. FrameMaker 10 and above only. See page R-141 in the <i>Miramo Reference Guide</i> . <i>Default: no background text color</i>
<u>Text language</u>		
lang [textLanguage]	<i>key</i>	Language. See page R-142 in the <i>Miramo Reference Guide</i> .
<u>Metadata for graphic object (ALine)</u>		
GOid	<i>string</i>	<i>string</i> may contain up to 512 bytes of metadata associated with this instance of the ALine code. This metadata is shown in FrameMaker MIF files in the <ObjectAttributes > statement and can be extracted from or viewed in FrameMaker document (binary) files, or post-processed, using a custom API to access the FP_ObjectAttributes property. The 'GOid' option is shorthand for <Attribute name="GOid"> <i>string</i> </Attribute>. See the <Attribute ... > code, described on pages R-71–73 . <i>Default: none</i>
>		<i>Required</i> <ALine options must be terminated by >.
</ALine>		<i>Required</i> Every <ALine ... > code must be terminated by a </ALine> code.

Notes

- The four different arrow styles are:

ArrowNum	Filled	Base Angle	Tip Angle	Length
1	yes	60	18	2.0 mm
2	yes	60	18	1.4 mm
3	yes	90	42	4.6 mm
4	yes	90	30	0.8 mm

<ALine ... >**Examples**

Example:

```

<mmDraw>
<ALine L="4mm" T="3mm" Angle="90" Arrow="Head" ArrowNo="1"
  lineLen="25mm" textLen="08mm"
  >Flight</ALine>

<ALine L="05mm" T="18mm" Angle="45"
  lineLen="15mm" Ky="0" textPos="T" color="Red"
  >45 deg</ALine>

<ALine L="12mm" T="18mm" Angle="45"
  lineLen="15mm" textLen="0mm" Ky="0" textPos="T" color="Red"
  Kx="-100"
  >45 deg</ALine>

<ALine L="19mm" T="18mm" Angle="45"
  lineLen="15mm" textLen="0mm" Ky="0" textPos="H" color="Red"
  >45</ALine>

<ALine L="28mm" T="18mm" Angle="45" textAngle="90"
  textAlign="C" lineLen="15mm" textPos="T" color="Red"
  Ky="100"
  >45 degrees</ALine>
</mmDraw>

```

Example 2.1 Using the <ALine ... > code

Example 2.1 produces the output shown in Figure 2.1.

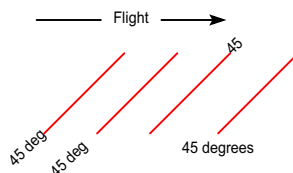


Figure 2.1 Output from Example 2.1

<Arc ... />

Summary

Use the <Arc ... /> code to draw an arc segment of an ellipse (or circle).

The axes of the arc ellipse are specified using the 'W' and 'H' options (see page [MD-11](#)). A circular arc is produced if the values of the 'W' and 'H' options are identical.

Syntax

Option	Value	Description
<Arc		
<u>Generic drawing options</u>		
pen [penNum]	0 - 15	Pen style. <i>Default:</i> 0
pw [penWidth]	<i>dim</i>	Pen width. <i>Default:</i> 0.5pt
pstyle [penStyle]	P " <i>dim dim ...</i> "	Pen style. Solid or dashed. Setting 'pstyle' to P results in a plain, solid border or line. Setting 'pstyle' to a series comprising an even number of <i>dim</i> values sets the border to have a dashed pattern. The first <i>dim</i> value specifies the length of a solid line segment, the next <i>dim</i> value specifies the length of a white segment, and so on. The pen pattern specification must be surrounded by double quotation marks. See Examples 2.14 and 2.15 on pages MD-34 and MD-35 . <i>Default:</i> P
fill [fillNum]	0 - 15	Fill style. <i>Default:</i> 15
a [rotate]	<i>number</i>	Angle of rotation. <i>Default:</i> 0
color	<i>name</i>	Color name. <i>Default:</i> Black
o [overprint]	Y N	Overprint. <i>Default:</i> N
tint	<i>percent</i>	Tint per cent. <i>Default:</i> 100

<Arc ... />

Option	Value	Description
sep [separation]	<i>int</i>	Separation number. <i>Default: 1</i>
<u>Text runaround</u>		
RA [runAround]	N B C	Text runaround type.
	<u>Value</u>	<u>Description</u>
	N	No runaround
	B	Box runaround
	C	Contour runaround
		<i>Default: N</i>
RAgap [runAroundGap]	<i>dim</i>	Specify the gap between the Arc and text flowing around it. The value of <i>dim</i> may be negative. Effective only if the 'RA' option (see above) is set to C or B. <i>Default: 6pt</i>
rotate [arcRotate]	<i>number</i>	Rotation angle. Positive values of 'rotate' are measured in degrees clockwise from the positive Y-axis. Negative values of 'rotate' are measured in degrees counterclockwise from the positive Y-axis. See Note 2 on page MD-13 .
<u>Arc options</u>		
L [arcLeft]	<i>dim</i>	Distance of left point of arc ellipse from left side of enclosing frame. See Note 1 on page MD-13 .
T [arcTop]	<i>dim</i>	Distance of top point of arc ellipse from top of enclosing frame.
W [arcWidth]	<i>dim</i>	Width of arc ellipse.
H [arcHeight]	<i>dim</i>	Height of arc ellipse.
StartAngle [arcStartAngle]	<i>number</i>	Starting angle of arc segment in degrees. Positive values of 'StartAngle' are measured in degrees clockwise from the positive Y-axis. Negative values of 'StartAngle' are measured in degrees counterclockwise from the positive Y-axis.
ArcAngle [arcAngle]	<i>number</i>	Arc angle of arc segment in degrees, measured clockwise.

<Arc ... />

Option	Value	Description
<u>Line termination options</u>		
LineCap [lineCap]	Round Butt Square	Line termination style. <i>Default:</i> Round
Arrow [arrowHead]	None Head Tail Both	Arrowhead placement. <i>Default:</i> None
<u>Arrowhead options</u>		
See Note 1 on page MD-32 .		
ArrowType [arrowType]	Filled Stick Hollow	Arrow type. <i>Default:</i> Filled
ArrowLen [arrowLength]	<i>dim</i>	Length of arrow head. <i>Default:</i> 30
ArrowTip [arrowTipAngle]	<i>number</i>	Angle of arrow tip. <i>Default:</i> 30
ArrowBase [arrowBaseAngle]	<i>number</i>	Angle of arrow base. <i>Default:</i> 90
ScaleHead [arrowHeadScale]	N Y	Enable arrow head scaling. <i>Default:</i> N
<u>Metadata for graphic object (Arc)</u>		
GOid	<i>string</i>	<i>string</i> may contain up to 512 bytes of metadata associated with this instance of the Arc code. This metadata is shown in FrameMaker MIF files in the <ObjectAttributes > statement and can be extracted from or viewed in FrameMaker document (binary) files, or post-processed, using a custom API to access the FP_ObjectAttributes property. The 'GOid' option is shorthand for <Attribute name="GOid"> <i>string</i> </Attribute>. See the <Attribute ... > code, described on pages R-71–73 . <i>Default:</i> none
/>		<i>Required</i> <Arc options must be terminated by />. (Alternatively <Arc options may be terminated by > followed by </Arc> with no text between the <Arc ... > and the </Arc>.)

<Arc ... />

Notes

- 1 The major parameters affecting the location and shape of an arc are shown in Figure 2.2. The <Arc ... /> code options used to draw the arc in Figure 2.2 are shown below.

```
<Arc L=06mm T=06mm W=30mm H=20mm
color=Red
pw=1.5pt
StartAngle=52
ArcAngle=92
/>
```

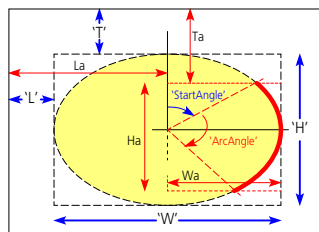


Figure 2.2 <Arc ... /> code parameters

- 2 If the 'rotate' option is set to a value other than zero, the arc is rotated around the center point of the arc's bounding rectangle. The arc bounding rectangle is the smallest rectangle that contains all the points on the arc *and* the center point of the arc ellipse, i.e. the point: ('L' + 'W' / 2), ('T' + 'H' / 2).

The bounding rectangle of the arc shown in Figure 2.2 is indicated by the dimensions Wa and Ha. Its rotation point is: (La + Wa / 2), (La + Wa / 2).

Examples

Example 2.2 illustrates simple arc drawing.

```
1 <AFrame W=40mm H=20mm P=R A=R fill=15 >
2 <mmDraw>
3 <Arc pstyle="3mm .6mm" L=-13mm T=1mm W=30mm H=20mm pw=0.5pt
4 StartAngle=0 ArcAngle=120.2 />
5 <Arc L=6mm T=1mm W=30mm H=20mm pw=3pt StartAngle=0 ArcAngle=120 a=30
6 />
7 </mmDraw>
8 </AFrame>
```

Example 2.2 Drawing arcs

Example 2.2 produces the output shown in Figure 2.3.

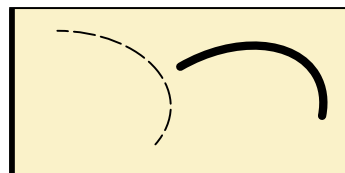


Figure 2.3 Output from Example 2.2

<Circle ... />

Summary

Use the <Circle ... /> code to draw a circle.

Syntax

Option	Value	Description
<Circle		
<u>Generic drawing options</u>		
pen [penNum]	0 - 15	Pen style. <i>Default:</i> 0
pw [penWidth]	<i>dim</i>	Pen width. <i>Default:</i> 0.5pt
pstyle [penStyle]	P " <i>dim dim ...</i> "	Pen style. Solid or dashed. Setting 'pstyle' to P results in a plain, solid border or line. Setting 'pstyle' to a series comprising an even number of <i>dim</i> values sets the border to have a dashed pattern. The first <i>dim</i> value specifies the length of a solid line segment, the next <i>dim</i> value specifies the length of a white segment, and so on. The pen pattern specification must be surrounded by double quotation marks. See Examples 2.14 and 2.15 on pages MD-34 and MD-35 . <i>Default:</i> P
fill [fillNum]	0 - 15	Fill style. <i>Default:</i> 15
a [rotate]	<i>number</i>	Angle of rotation. <i>Default:</i> 0
color	<i>name</i>	Color name. <i>Default:</i> Black
o [overprint]	Y N	Overprint. <i>Default:</i> N
tint	<i>percent</i>	Tint per cent. <i>Default:</i> 100
sep [separation]	<i>int</i>	Separation number. <i>Default:</i> 1

<Circle ... />

Option	Value	Description								
<u>Text runaround</u>										
RA [runAround]	N B C	Text runaround type. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>N</td> <td>No runaround</td> </tr> <tr> <td>B</td> <td>Box runaround</td> </tr> <tr> <td>C</td> <td>Contour runaround</td> </tr> </tbody> </table> <i>Default:</i> N	Value	Description	N	No runaround	B	Box runaround	C	Contour runaround
Value	Description									
N	No runaround									
B	Box runaround									
C	Contour runaround									
RAgap [runAroundGap]	<i>dim</i>	Specify the gap between the Circle and text flowing around it. The value of <i>dim</i> may be negative. Effective only if the 'RA' option (see above) is set to C or B. <i>Default:</i> 6pt								
<u>Circle options</u>										
L [centerLeft]	<i>dim</i>	Distance from left side of the enclosing frame to the center of the circle.								
T [centerTop]	<i>dim</i>	Distance from top of the enclosing frame to the center of the circle.								
D [diameter]	<i>dim</i>	Diameter of circle.								
<u>Metadata for graphic object (Circle)</u>										
GOid	<i>string</i>	<i>string</i> may contain up to 512 bytes of metadata associated with this instance of the Circle code. This metadata is shown in FrameMaker MIF files in the <ObjectAttributes > statement and can be extracted from or viewed in FrameMaker document (binary) files, or post-processed, using a custom API to access the FP_ObjectAttributes property. The 'GOid' option is shorthand for <Attribute name="GOid"> <i>string</i> </Attribute>. See the <Attribute ... > code, described on pages R-71–73. <i>Default:</i> none								
/>		<i>Required</i> <Circle options must be terminated by />. (Alternatively <Circle options may be terminated by > followed by </Circle> with no text between the <Circle ... > and the </Circle>.)								

<Circle ... />

Examples

Example:

```
<AFrame W=30mm H=30mm P=R A=L fill=15 >  
<mmDraw>  
  <Circle L=15mm T=15mm D=20mm pw=4mm color=Red />  
  <Circle L=15mm T=15mm D=20mm pw=1pt color=Black pstyle="12pt 2pt" />  
</mmDraw>  
</AFrame>
```

Example 2.3 Drawing circles

Example 2.3 produces the output shown in Figure 2.4.

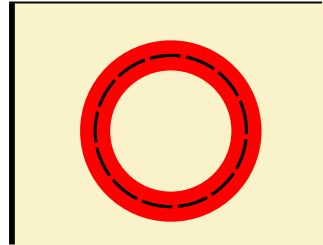


Figure 2.4 Output from Example 2.3

<Ellipse ... />

Summary

Use the <Ellipse ... /> code to draw an ellipse.

Syntax

Option	Value	Description
<Ellipse		
<u>Generic drawing options</u>		
pen [penNum]	0 - 15	Pen style. <i>Default:</i> 0
pw [penWidth]	<i>dim</i>	Pen width. <i>Default:</i> 0.5pt
pstyle [penStyle]	P " <i>dim</i> <i>dim</i> ..."	Pen style. Solid or dashed. Setting 'pstyle' to P results in a plain, solid border or line. Setting 'pstyle' to a series comprising an even number of <i>dim</i> values sets the border to have a dashed pattern. The first <i>dim</i> value specifies the length of a solid line segment, the next <i>dim</i> value specifies the length of a white segment, and so on. The pen pattern specification must be surrounded by double quotation marks. See Examples 2.14 and 2.15 on pages MD-34 and MD-35 . <i>Default:</i> P
fill [fillNum]	0 - 15	Fill style. <i>Default:</i> 15
a [rotate]	<i>number</i>	Angle of rotation. <i>Default:</i> 0
color	<i>name</i>	Color name. <i>Default:</i> Black
o [overprint]	Y N	Overprint. <i>Default:</i> N
tint	<i>percent</i>	Tint per cent. <i>Default:</i> 100
sep [separation]	<i>int</i>	Separation number. <i>Default:</i> 1

<Ellipse ... />

Option	Value	Description								
<u>Text runaround</u>										
RA [runAround]	N B C	Text runaround type. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>N</td> <td>No runaround</td> </tr> <tr> <td>B</td> <td>Box runaround</td> </tr> <tr> <td>C</td> <td>Contour runaround</td> </tr> </tbody> </table> <i>Default:</i> N	Value	Description	N	No runaround	B	Box runaround	C	Contour runaround
Value	Description									
N	No runaround									
B	Box runaround									
C	Contour runaround									
RAgap [runAroundGap]	<i>dim</i>	Specify the gap between the Ellipse and text flowing around it. The value of <i>dim</i> may be negative. Effective only if the 'RA' option (see above) is set to C or B. <i>Default:</i> 6pt								
<u>Ellipse options</u>										
L [ellipseLeft]	<i>dim</i>	Distance from the left side of the enclosing frame to the left side of the ellipse.								
T [ellipseTop]	<i>dim</i>	Distance from the top side of the enclosing frame to the top side of the ellipse.								
W [ellipseWidth]	<i>dim</i>	Width of ellipse.								
H [ellipseHeight]	<i>dim</i>	Height of ellipse.								
<u>Metadata for graphic object (Ellipse)</u>										
GOid	<i>string</i>	<i>string</i> may contain up to 512 bytes of metadata associated with this instance of the Ellipse code. This metadata is shown in FrameMaker MIF files in the <ObjectAttributes > statement and can be extracted from or viewed in FrameMaker document (binary) files, or post-processed, using a custom API to access the FP_ObjectAttributes property. The 'GOid' option is shorthand for <Attribute name="GOid"> <i>string</i> </Attribute>. See the <Attribute ... > code, described on pages R-71–73 . <i>Default:</i> none								
/>		<i>Required</i> <Ellipse options must be terminated by />. (Alternatively <Ellipse options may be terminated by > followed by </Ellipse> with no text between the <Ellipse ... > and the </Ellipse>.)								

<Frame ... >

Summary

Use the <Frame ... > code to include a graphic frame.

Syntax

See the description of the <Frame ... > code in the *Miramo Reference Guide*, pages [R-145–147](#).

<Image ... />

Summary

Use the <Image ... /> code to include an image.

Syntax

See the description of the <Image ... /> code in the *Miramo Reference Guide*, pages R-180–190.

Examples

Example:

```
<AFrame W=72mm H=30mm P=R A=R >
  <mmDraw>
    <Image file="{IMAGES}/031633-m.jpg" flip="Y" W=72mm H=3cm />
    <Circle X=55mm Y=15mm D=15mm pw=2mm color=Red />
  </mmDraw>
</AFrame>
```

Example 2.4 Including an image

Example 2.4 produces the output shown in Figure 2.5.



Figure 2.5 Output from Example 2.4

<PLineto ... />

Summary

One or more <PLineto ... /> codes may be used within a <Polygon ... > code or a <PolyLine ... > code to draw a straight line segment within a smoothed polyline or polygon (i.e. when the 'Smooth' option on the <Polygon ... > code or the <PolyLine ... > code is set to S).

Syntax

Option	Value	Description
<PLineto		
<u>Line continuation location</u>		
L [Left]	<i>dim</i>	Distance from left side of the enclosing frame.
T [Top]	<i>dim</i>	Distance from top of the enclosing frame.
/>		<i>Required</i> <PLineto options must be terminated by />. (Alternatively <PLineto options may be terminated by > followed by </ PLineto> with no text between the <PLineto ... > and the </ PLineto>.)

Examples

Example:

```

1 <AFrame W=38mm H=24mm P=R A=R fill=15 >
2 <mmDraw>
3 <Polygon pw=4pt color=Olive fill=13 Smooth=Y >
4 <Point L=2mm T=20mm/> <!-- Bottom left corner -->
5 <PLineto L=2mm T=10mm/> <!-- Top left corner -->
6 <!-- Smoothed points start -->
7 <Point L=6mm T=13mm/> <Point L=10mm T=8mm/>
8 <Point L=14mm T=9mm/> <Point L=18mm T=4mm/>
9 <Point L=28mm T=6mm/> <Point L=32mm T=1mm/>
10 <!-- Smoothed points end -->
11 <Point L=36mm T=3mm/> <!-- Top right corner -->
12 <PLineto L=36mm T=20mm/> <!-- Bottom right corner -->
13 <PLineto L=2mm T=20mm/> <!-- Bottom left corner -->

```

<PLineto ... />

```
14 </Polygon>  
15 </mmDraw>  
16 </AFrame>
```

Example 2.5 Partially smoothed polygon

Example 2.5 produces the output shown in Figure 2.6.

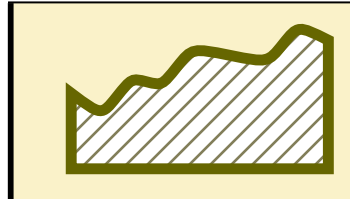


Figure 2.6 Output from Example 2.5

<Point ... />

Summary

Two or more <Point ... /> codes must follow a <Polygon ... > code or a <PolyLine ... > code.

Syntax

Option	Value	Description
<Point		
<u>Point location</u>		
L [Left]	<i>dim</i>	Distance from left side of the enclosing frame.
T [Top]	<i>dim</i>	Distance from top of the enclosing frame.
/>		<i>Required</i> <Point options must be terminated by />. (Alternatively <Point options may be terminated by > followed by </Point> with no text between the <Point ... > and the </Point>.)

<Polygon ... >

<Point ... /> <PLineto ... /> <PolyArc ... />

Summary

Use the <Polygon ... > code to draw a closed polygon.

Three or more <Point ... /> codes must be included between the <Polygon ... > and </Polygon> codes.

Syntax

Option	Value	Description
<Polygon		
<u>Generic drawing options</u>		
pen [penNum]	0 - 15	Pen style. <i>Default:</i> 0
pw [penWidth]	<i>dim</i>	Pen width. <i>Default:</i> 0.5pt
pstyle [penStyle]	P " <i>dim dim ...</i> "	Pen style. Solid or dashed. Setting 'pstyle' to P results in a plain, solid border or line. Setting 'pstyle' to a series comprising an even number of <i>dim</i> values sets the border to have a dashed pattern. The first <i>dim</i> value specifies the length of a solid line segment, the next <i>dim</i> value specifies the length of a white segment, and so on. The pen pattern specification must be surrounded by double quotation marks. See Examples 2.14 and 2.15 on pages MD-34 and MD-35 . <i>Default:</i> P
fill [fillNum]	0 - 15	Fill style. <i>Default:</i> 15
a [rotate]	<i>number</i>	Angle of rotation. <i>Default:</i> 0
color	<i>name</i>	Color name. <i>Default:</i> Black
o [overprint]	Y N	Overprint. <i>Default:</i> N
tint	<i>percent</i>	Tint per cent. <i>Default:</i> 100

<Polygon ... >

<Point ... /> <PLineto ... /> <PolyArc ... />

Option	Value	Description								
sep [separation]	<i>int</i>	Separation number. <i>Default: 1</i>								
<u>Text runaround</u>										
RA [runAround]	N B C	Text runaround type. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>N</td> <td>No runaround</td> </tr> <tr> <td>B</td> <td>Box runaround</td> </tr> <tr> <td>C</td> <td>Contour runaround</td> </tr> </tbody> </table> <i>Default: N</i>	Value	Description	N	No runaround	B	Box runaround	C	Contour runaround
Value	Description									
N	No runaround									
B	Box runaround									
C	Contour runaround									
RAgap [runAroundGap]	<i>dim</i>	Specify the gap between the Polygon and text flowing around it. The value of <i>dim</i> may be negative. Effective only if the 'RA' option (see above) is set to C or B. <i>Default: 6pt</i>								
<u>Polygon options</u>										
Smooth [smooth]	N Y	Smooth polygon. <i>Required</i>								
>		<Polygon options must be terminated by >.								
</Polygon>		<i>Required</i> Every <Polygon ... > code must be terminated by a </Polygon> code.								

Examples

Example:

```

1 <AFrame W=40mm H=28mm P=R A=R fill=15 >
2 <mmDraw>
3 <Polygon pw=1pt color=Olive fill=0 >
4 <Point L=2mm T=20mm/> <Point L=2mm T=10mm/> <Point L=6mm T=13mm/>
5 <Point L=10mm T=8mm/> <Point L=14mm T=9mm/> <Point L=18mm T=4mm/>
6 <Point L=28mm T=6mm/> <Point L=32mm T=1mm/> <Point L=36mm T=3mm/>
7 <Point L=36mm T=20mm/> </Polygon>
8 <Polygon pw=1pt color=Maroon fill=0 >
9 <Point L=4mm T=24mm/> <Point L=4mm T=14mm/> <Point L=8mm T=17mm/>
10 <Point L=12mm T=12mm/> <Point L=16mm T=13mm/> <Point L=20mm T=8mm/>
11 <Point L=30mm T=10mm/> <Point L=34mm T=5mm/> <Point L=38mm T=7mm/>
12 <Point L=38mm T=24mm/> </Polygon>

```

<Polygon ... >

<Point ... /> <PLineto ... /> <PolyArc ... />

```
13 </mmDraw>
14 </AFrame>
```

Example 2.6 Drawing polygons

Example 2.6 produces the output shown in Figure 2.7.

Drawing a 3-D area using external data

Examples 2.7 through 2.10 contain a series of *mmpp* macro definitions that illustrate multiple <Polygon ... > code usage. All the macros are ultimately called by the <showIllustration> macro (see Example 2.10 on page MD-28). The *mmpp* macro pre-processor is described in Chapter 6, pages R-463–529, in the *Miramo Reference Guide*.

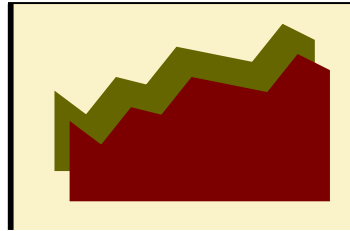


Figure 2.7 Output from Example 2.6

If this series of macros is run through the *mmpp* pre-processor the effect is to add a new markup code, <showIllustration>, to standard Miramo. The markup code may be included within Miramo input any number of times within a <P ... > and </P> code pair, as illustrated in Example MD-29.

The readAreaVals macro in Example 2.7 loads the X and Y data values contained in the file area1.csv, shown in Figure 2.8, into two arrays, X[n] and Y[n], and adds shadow points into two further arrays, dX[n] and dY[n]. The readAreaVals macro is called on line 24 in the doArea macro shown in Example 2.9 on page MD-27. The name of the data file is passed as an option (attribute) value on the new <showIllustration/> markup code within the sample runIllustration input (see line 3 in Example 2.11 on page MD-29).

```
"00", "11"   "20", "17"
"07", "16"   "25", "15"
"10", "15"   "32", "21"
"15", "10"   "35", "19"
```

Figure 2.8 CSV file 'area1.csv' (see line 24 in Example 2.9)

```
1 @-----
2 @- areaVals: Assign values from data set file
3 @-----
4 <@macro> readAreaVals {
5   <#ifndef> pc      0
6   <#def> pc        @eval(<#pc> + 1)
7   <#def> X          $1
8   <#def> Y          $2
9   <#def> X          @eval(<#X> + <#doArea.LM>)
10  <#def> Y          @eval($Y[0] - <#Y>)
11  <#def> X[<#pc>]   <#X>
12  <#def> Y[<#pc>]   <#Y>
13  <#def> dX[<#pc>] @eval(<#X> + <#doArea.dX>)
14  <#def> dY[<#pc>] @eval(<#Y> - <#doArea.dY>)
15 }
```

Example 2.7 File 'readAreaVals.mmp'—Put data values into arrays

<Polygon ... >

<Point ... /> <PLineto ... /> <PolyArc ... />

The drawShadow macro shown in Example 2.8 uses the values from the arrays defined in Example 2.7 to draw the visible polygons needed to create a 3-D shadow effect.

```

1  <@xmacro> drawShadow {
2      <Polygon color=<#doArea.Color> tint=<#doArea.STint>
3          fill=<#doArea.SFill> >
4          @--- Previous point
5          <Point L=$X[<#ppoint>] T=$Y[<#ppoint>] />
6          <Point L=$dX[<#ppoint>] T=$dY[<#ppoint>] />
7          @--- Current point
8          <Point L=$dX[<#cpoint>] T=$dY[<#cpoint>] />
9          <Point L=$X[<#cpoint>] T=$Y[<#cpoint>] />
10         </Polygon>
11     }
12     @-----

```

Example 2.8 File 'drawShadow.mmp'—Draw visible shadows

The doArea macro shown in Example 2.9 contains most of the logic required to draw an 'area' representing a single data series.

```

1  <@xmacro> doArea {
2      <#def> doArea.file      {}          @- Name of data file
3      <#def> doArea.W        120mm      @- Plot area width
4      <#def> doArea.H        80mm      @- Plot area height
5      <#def> doArea.LM       3mm        @- Plot area Left margin
6      <#def> doArea.TM       5mm        @- Plot area Top margin
7      <#def> doArea.RM       5mm        @- Plot area Right margin
8      <#def> doArea.BM       5mm        @- Plot area Bottom margin
9      <#def> doArea.SA       40         @- Shadow angle
10     <#def> doArea.D        4mm        @- Shadow depth
11     <#def> doArea.Color    Green      @- Area color
12     <#def> doArea.STint    47         @- Shadow tint
13     <#def> doArea.SFill    0          @- Shadow Fill
14     @-----
15     @xgetvals(doArea.)
16     @-----
17     <#def> doArea.dX        @eval(@sin(<#doArea.SA>) * <#doArea.D>)
18     <#def> doArea.dY        @eval(@cos(<#doArea.SA>) * <#doArea.D>)
19     <#def> X[0]             <#doArea.LM>
20     <#def> Y[0]             @eval(<#doArea.H> - <#doArea.BM>)
21     @-----
22     @if(len(<#doArea.file>)) {
23         <#def> doArea.file      ${DATASETS}/<#doArea.file>
24         <@readfile>(<#doArea.file>, csv) readAreaVals @- Read data file
25     }
26     @else {
27         <@write> error {Error: doArea requires data set filename}
28     }
29     <#def> lineAngle        0
30     @for(point = 1 to <#pc>) {
31         <#def> cpoint        $$point    @--- Current point
32         <#def> ppoint        @eval($$point - 1) @--- Previous point
33         @if($$point > 1) {

```

<Polygon ... >

<Point ... /> <PLineto ... /> <PolyArc ... />

```

34             <#def> lineAngle      @atan(($X[$$point] - $X[<#ppoint>]) /
35                                     ($Y[<#ppoint>] - $Y[$$point]))
36         }
37     @if(<#lineAngle> < 0 OR <#lineAngle> > <#doArea.SA>) {
38         <b><drawShadow/>
39     }
40 }
41 @--- Last shadow
42 <#def> ppoint      <#pc>
43 <#def> cpoint      @eval(<#cpoint> + 1 )
44 <#def> dX[<#cpoint>] @eval($X[<#pc>] + <#doArea.dX>)
45 <#def> dY[<#cpoint>] @eval($Y[0] - <#doArea.dX>)
46 <#def> X[<#cpoint>]  $X[<#pc>]
47 <#def> Y[<#cpoint>]  $Y[0]
48 <b><drawShadow/>
49
50 @--- Sidewall
51 <Polygon fill=0 color=<#doArea.Color> >
52 @for(point = 0 to <#pc>) {
53     <Point L=$X[$$point] T=$Y[$$point] />
54 }
55     <Point L=$X[<#pc>] T=$Y[0] />
56 </Polygon>
57 }
58 @-----

```

Example 2.9 File 'doArea.mmp'—Draw area for a data series

The showIllustration macro shown in Example 2.10 is a simple wrapper for the doArea macro.

```

1  @-----
2  <@xmacro> showIllustration {
3      <#def> sil.W      61mm
4      <#def> sil.H      50mm
5      <#def> sil.Color  Blue
6      <#def> sil.file   {}
7      @xgetvals(sil.)
8      <AFrame W=<#sil.W> H=<#sil.H> P=R A=R fill=15 >
9      <mmDraw>
10     <doArea W="<#sil.W>" H="<#sil.H>"
11         Color="<#sil.Color>" file="<#sil.file>"
12     />
13     </mmDraw>
14 </AFrame>
15 }
16 @-----

```

Example 2.10 File 'showIllustration.mmp'—Wrapper for doArea macro

Example 2.11 contains sample Miramo input that illustrates the usage of the showIllustration macro.

```

1  <P><showIllustration
2      W="44mm" H="30mm"

```

<Polygon ... >`<Point ... /> <PLineto ... /> <PolyArc ... />`

```
3      Color="Olive" file="area1.csv"  
4      /></P>
```

Example 2.11 Sample Miramo input

The output from Example 2.11 is shown in Figure 2.9.

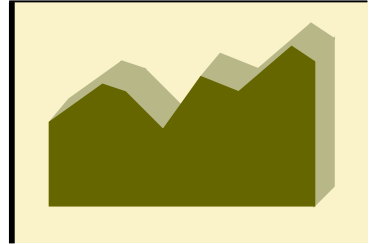


Figure 2.9 Output from Example 2.11

<PolyLine ... >

<Point ... /> <PLineto ... /> <PolyArc ... />

Summary

Use the <PolyLine ... > code to draw a single line segment, or multiple line segments.

Two or more <Point ... /> or <PLineto ... /> codes must be included between the <PolyLine ... > and </PolyLine> codes.

Syntax

Option	Value	Description
<PolyLine		
<u>Generic drawing options</u>		
pen [penNum]	0 - 15	Pen style. <i>Default:</i> 0
pw [penWidth]	<i>dim</i>	Pen width. <i>Default:</i> 0.5pt
pstyle [penStyle]	P " <i>dim dim ...</i> "	Pen style. Solid or dashed. Setting 'pstyle' to P results in a plain, solid border or line. Setting 'pstyle' to a series comprising an even number of <i>dim</i> values sets the line to have a dashed pattern. The first <i>dim</i> value specifies the length of a solid line segment, the next <i>dim</i> value specifies the length of a white segment, and so on. The pen pattern specification must be surrounded by double quotation marks. See Examples 2.14 and 2.15 on pages MD-34 and MD-35 . <i>Default:</i> P
fill [fillNum]	0 - 15	Fill style. <i>Default:</i> 15
a [rotate]	<i>number</i>	Angle of rotation. <i>Default:</i> 0
color	<i>name</i>	Color name. <i>Default:</i> Black
o [overprint]	Y N	Overprint. <i>Default:</i> N
tint	<i>percent</i>	Tint per cent. <i>Default:</i> 100

<PolyLine ... >

<Point ... /> <PLineto ... /> <PolyArc ... />

Option	Value	Description
sep [separation]	<i>int</i>	Separation number. <i>Default: 1</i>
<u>Text runaround</u>		
RA [runAround]	N B C	Text runaround type.
	<u>Value</u>	<u>Description</u>
	N	No runaround
	B	Box runaround
	C	Contour runaround
	<i>Default: N</i>	
RAgap [runAroundGap]	<i>dim</i>	Specify the gap between the PolyLine and text flowing around it. The value of <i>dim</i> may be negative. Effective only if the 'RA' option (see above) is set to C or B. <i>Default: 6pt</i>
<u>Line termination options</u>		
LineCap [lineCap]	Round Butt Square	Line termination style. <i>Default: Round</i>
Arrow [arrowHead]	None Head Tail Both	Arrowhead placement. <i>Default: None</i>
<u>Arrowhead options</u>		
See Note 1 on page MD-32 .		
ArrowType [arrowType]	Filled Stick Hollow	Arrow type. <i>Default: Filled</i>
ArrowLen [arrowLength]	<i>dim</i>	Length of arrow head. <i>Default: 30</i>
ArrowTip [arrowTipAngle]	<i>number</i>	Angle of arrow tip. <i>Default: 30</i>
ArrowBase [arrowBaseAngle]	<i>number</i>	Angle of arrow base. <i>Default: 90</i>
ScaleHead [arrowHeadScale]	N Y	Enable arrow head scaling. <i>Default: N</i>
<u>Polyline option</u>		
Smooth [smooth]	N Y	Smooth polyline. <i>Default: N</i>

<PolyLine ... >

<Point ... /> <PLineto ... /> <PolyArc ... />

Option	Value	Description
>		<i>Required</i> <PolyLine options must be terminated by >.
</PolyLine>		<i>Required</i> Every <PolyLine ... > code must be terminated by a </PolyLine> code.

Notes

- 1 An arrowhead may be one of three types, Filled, Hollow Stick, as specified by the 'ArrowHead' option and as illustrated in Figures 2.10 through 2.12. The precise size and shape of the arrowhead is determined by the values of the 'arrowTipAngle', 'arrowBaseAngle' (except when the arrow type is Stick), 'arrowLength', and 'arrowHeadScale' options.

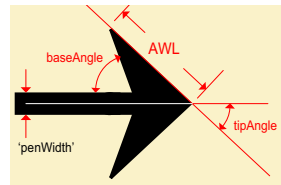


Figure 2.10 Filled arrowhead shape and size parameters

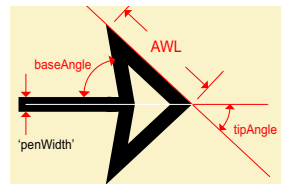


Figure 2.11 Hollow arrowhead shape and size parameters

In Figures 2.10 through 2.12 'tipAngle' corresponds to the value of the 'arrowTipAngle' option. In Figures 2.10 and 2.11 'baseAngle' corresponds to the values of the 'arrowBaseAngle' option. 'AWL' indicates the actual arrow single-wing length.

The value of 'AWL' may be identical to or close to or significantly different from the value specified by the 'arrowLength' option.

Equation E 2.1 shows the relationship between actual arrow wing length (AWL) and 'arrowLength' for arrowheads when 'arrowHeadScale' is set to N.

$$E\ 2.1\ AWL \cong 'arrowLength'$$

Equation E 2.2 shows the relationship between actual arrow wing length (AWL) and 'arrowLength' when 'arrowHeadScale' is set to Y.

$$E\ 2.2\ AWL \cong 'arrowLength' (1 + ('penWidth' / 4))$$

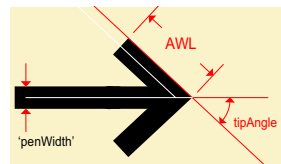


Figure 2.12 Stick arrowhead shape and size parameters

Examples

Example:

<PolyLine ... >

<Point ... /> <PLineto ... /> <PolyArc ... />

```

<AFrame W=66mm H=24mm fill=15 P=R A=R >
<mmDraw>
<PolyLine color=Blue pw=2pt pen=0 fill=0 >
  <Point L=01mm T=15mm /> <Point L=06mm T=05mm />
  <Point L=16mm T=15mm /> <Point L=21mm T=05mm />
  <Point L=23mm T=15mm /> <Point L=27mm T=05mm />
  <Point L=31mm T=15mm /> </PolyLine>

<PolyLine color=Red pw=2pt fill=15 a=30 >
  <Point L=01mm T=15mm /> <Point L=06mm T=05mm />
  <Point L=16mm T=15mm /> <Point L=21mm T=05mm />
  <Point L=23mm T=15mm /> <Point L=27mm T=05mm />
  <Point L=31mm T=15mm /> </PolyLine>

<PolyLine color=Blue pw=2pt pen=0 fill=15 >
  <Point L=35mm T=15mm /> <Point L=40mm T=05mm />
  <Point L=50mm T=15mm /> <Point L=55mm T=05mm />
  <Point L=57mm T=15mm /> <Point L=61mm T=05mm />
  <Point L=65mm T=15mm /> </PolyLine>

<PolyLine color=Red pw=2pt fill=15 Smooth=Y >
  <Point L=35mm T=15mm /> <Point L=40mm T=05mm />
  <Point L=50mm T=15mm /> <Point L=55mm T=05mm />
  <Point L=57mm T=15mm /> <Point L=61mm T=05mm />
  <Point L=65mm T=15mm /> </PolyLine>
</mmDraw>
</AFrame>

```

Example 2.12 Using the <PolyLine ... > code

Example 2.12 produces the output shown in Figure 2.13.

Example:

```

<AFrame W=91mm
  H=40mm
  P=b A=R
  fill=15 >
<mmDraw>
<PolyLine color=Blue pw=3mm >
  <Point L=05mm T=04mm /> <Point L=47mm T=04mm /> </PolyLine>
<PolyLine color=Blue pw=3mm LineCap=Square >
  <Point L=05mm T=10mm /> <Point L=47mm T=10mm /> </PolyLine>
<PolyLine color=Blue pw=3mm LineCap=Butt >
  <Point L=05mm T=16mm /> <Point L=47mm T=16mm /> </PolyLine>
<PolyLine color=Blue pw=3mm Arrow=Head >
  <Point L=05mm T=24mm /> <Point L=47mm T=24mm /> </PolyLine>
<PolyLine color=Blue pw=3mm LineCap=Butt Arrow=Tail >
  <Point L=05mm T=32mm /> <Point L=47mm T=32mm /> </PolyLine>
</mmDraw>
</AFrame>

```

Example 2.13 Line termination styles

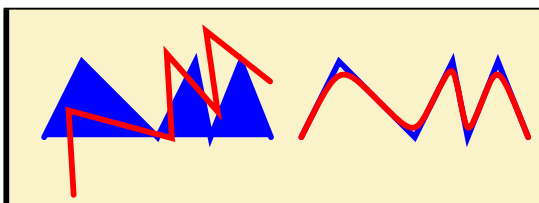


Figure 2.13 Output from Example 2.12

<PolyLine ... >

<Point ... /> <PLineto ... /> <PolyArc ... />

Example 2.13 produces the output shown in Figure 2.14.

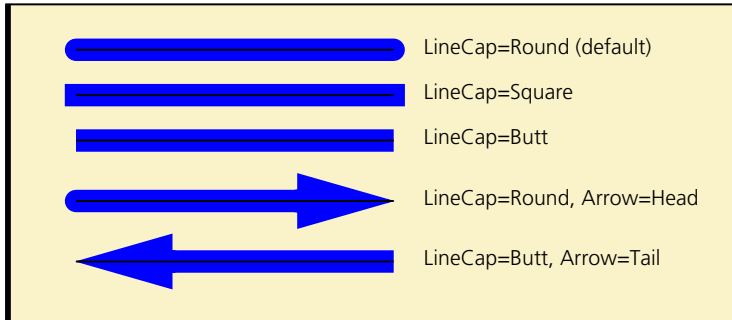


Figure 2.14 Line termination styles (output from Example 2.13)

```
<AFrame W=91mm H=31.5mm P=b A=R fill=15 >
<mmDraw>
<PolyLine color=Blue pw=1mm pstyle="2mm 4mm 4mm" >
  <Point L=05mm T=06mm /> <Point L=47mm T=06mm /> </PolyLine>
<PolyLine color=Blue pw=1mm LineCap=Square pstyle="2mm 4mm 4mm" >
  <Point L=05mm T=11mm /> <Point L=47mm T=11mm /> </PolyLine>
<PolyLine color=Blue pw=1mm LineCap=Butt pstyle="2mm 4mm 4mm" >
  <Point L=05mm T=16mm /> <Point L=47mm T=16mm /> </PolyLine>
<PolyLine color=Blue pw=1mm Arrow=Head pstyle="2mm 4mm 4mm" >
  <Point L=05mm T=22mm /> <Point L=47mm T=22mm /> </PolyLine>
<PolyLine color=Blue pw=1mm LineCap=Butt Arrow=Tail pstyle="2mm 4mm 4mm" >
  <Point L=05mm T=28mm /> <Point L=47mm T=28mm /> </PolyLine>
</mmDraw>
</AFrame>
```

Example 2.14 Dashed patterns (1)

Example 2.14 produces the output shown in Figure 2.15.

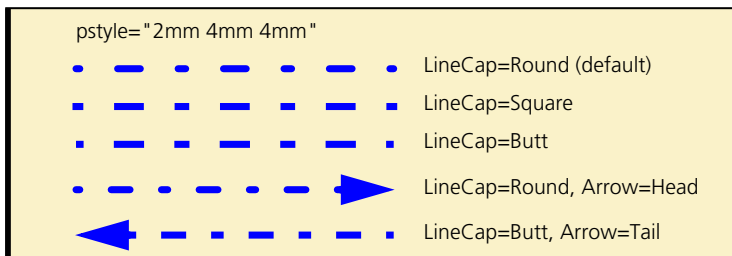


Figure 2.15 Dashed patterns (1) — output from Example 2.14

```
<AFrame W=92.5mm H=31.5mm P=b A=R fill=15 >
<mmDraw>
<PolyLine color=Blue pw=1mm pstyle="6mm 1mm 1mm 1mm" LineCap=Butt >
  <Point L=01mm T=06mm /> <Point L=43mm T=06mm /> </PolyLine>
<PolyLine color=Blue pw=1mm LineCap=Butt pstyle="6mm 1mm" >
```

<PolyLine ... >

<Point ... /> <PLineto ... /> <PolyArc ... />

```

<Point L=01mm T=11mm /> <Point L=43mm T=11mm /> </PolyLine>
<PolyLine color=Blue pw=1mm pstyle="0mm 3mm" >
  <Point L=01mm T=21mm /> <Point L=43mm T=21mm /> </PolyLine>
<PolyLine color=Blue pw=1.5pt pstyle="9pt 2pt 2pt 2pt 2pt 2pt" >
  <Point L=01mm T=26mm /> <Point L=43mm T=26mm /> </PolyLine>
</mmDraw>
</AFrame>

```

Example 2.15 Dashed patterns (2)

Example 2.15 produces the output shown in Figure 2.16.

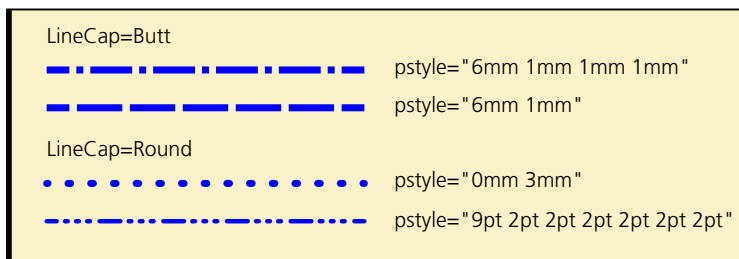


Figure 2.16 Dashed patterns (2) — output from Example 2.15

Drawing a line using external data

This section illustrates drawing a line using data contained in an external file.

The input data is contained in a 28-line CSV file, 'line1.csv', shown (in two columns) in Figure 2.17.

Example 2.16 contains an *mmpp* X macro, 'doBackground', to include an background image and draw grid lines. The *mmpp* macro pre-processor is described in Chapter 6, pages R-463–529, in the *Miramo Reference Guide*.

"0", "38"	"56", "29"
"4", "33"	"60", "43"
"8", "62"	"64", "30"
"12", "43"	"68", "33"
"16", "7"	"72", "29"
"20", "33"	"76", "43"
"24", "29"	"80", "50"
"28", "43"	"84", "67"
"32", "33"	"88", "55"
"36", "67"	"92", "60"
"40", "33"	"96", "65"
"44", "29"	"100", "59"
"48", "43"	"104", "70"
"52", "33"	"108", "74"

Figure 2.17 CSV file 'line1.csv' (see lines 30 and 33 in Example 2.17)

```

1 <@xmacro> doBackground {
2   @-----
3   @--- Set default values -----
4   @-----
5   <#def> dbg.W      112pt  @- Plot area width
6   <#def> dbg.H      80pt   @- Plot area height
7   <#def> dbg.L      03pt   @- Plot area left margin
8   <#def> dbg.T      03pt   @- Plot area right margin
9   <#def> dbg.hGrid  10pt   @- Horizontal grid spacing
10  <#def> dbg.vGrid  16pt   @- Vertical grid spacing
11  <#def> dbg.image  {}      @- Filename for background image
12  <#def> dbg.color  {White} @- Color of grid lines
13  <#def> dbg.hLines 7      @- Num of horizontal grid lines
14  <#def> dbg.vLines 8      @- Num of vertical grid lines
15  <#def> dbg.glw   .3pt   @- Width of grid lines
16  @-----
17  @xgetvals(dbg.)      @- Get overrides, when macro called

```

<PolyLine ... >

<Point ... /> <PLineTo ... /> <PolyArc ... />

```

18  @-----
19  <Frame L=<#dbg.L> T=<#dbg.T> W=<#dbg.W> H=<#dbg.H>
20    pen=0 pw=0.5pt color=Black fill=15 >
21    @if(@len(<#dbg.image>)) { @- Include image
22      <Image file=${IMG}/<#dbg.image> W=<#dbg.W> H=<#dbg.H> />
23    }
24  <mmDraw>
25  @--- Horizontal grid lines
26  @for(horiz = 1 to <#dbg.hLines> ) {<PolyLine pw=<#dbg.glw>
    color=<#dbg.color> >
27    <Point L=0 T=@eval(<#dbg.hGrid> * $$horiz ) />
28    <Point L=<#dbg.W> T=@eval(<#dbg.hGrid> * $$horiz ) /></PolyLine> }
29  @--- Vertical grid lines
30  @for(vert = 1 to <#dbg.vLines> ) {<PolyLine pw=<#dbg.glw>
    color=<#dbg.color> >
31    <Point T=0 L=@eval(<#dbg.vGrid> * $$vert ) />
32    <Point T=<#dbg.H> L=@eval(<#dbg.vGrid> * $$vert ) /></PolyLine> }
33  </mmDraw>
34  </Frame>
35  }
36  @-----

```

Example 2.16 File 'doBackground.mmp'—Include image and draw grid lines

The file 'doLine.mmp', shown in Example 2.17 contains two macro definitions. The first macro, 'lineVals', called by 'doLine', is a standard macro that outputs <Point ... /> codes, one for each data point in the data set file.

The second macro, 'doLine', is an *mmpp* X macro that may be called with one or more arguments, or optional attributes. One argument, the name of the file containing the line data values, is mandatory (see line 36 in Example 2.17). The optional arguments refer to the data line widths, file name of a background image, and several other settable parameters. The 'doLine' X macro may be subject to efficiency improvements, e.g. a change to read the data set file once only, as well as many additional refinements and extensions: its form in Example 2.17 is for illustration only.

```

1  @-----
2  <@include> ${MACROS}/doBackground.mmp
3  @- lineVals: Assign values from data set file
4  @-----
5  <@macro> lineVals {
6    <#def> X          $1
7    <#def> Y          $2
8    <#def> X          @eval(<#X> + <#dbg.L>)
9    <#def> Y          @eval(<#dbg.H> - <#Y> + <#dbg.T>)
10   <Point L="<#X>" T="<#Y>" />
11  }
12  @-----
13  <@xmacro> doLine {
14    <#def> dln.file   {}          @- Data file name
15    <#def> dln.image  {}          @- Filename for background image
16    <#def> dln.gColor {White}    @- Grid color

```

<PolyLine ... >

<Point ... /> <PLineto ... /> <PolyArc ... />

```

17 <#def> dln.Width1 4pt @- Background data line thickness
18 <#def> dln.Width2 1.5pt @- Foreground data line thickness
19 <#def> dln.Color1 Red @- Background data line color
20 <#def> dln.Color2 White @- Foreground data line color
21 <#def> dln.hGrid 10pt @- Horizontal grid spacing
22 <#def> dln.vGrid 16pt @- Vertical grid spacing
23 @xgetvals(dln.)
24 <doBackground image="#dln.image">
25 hGrid="#dln.hGrid" vGrid="#dln.vGrid"
26 color="#dln.gColor"
27 />
28 @if(@len(<#dln.file>)) {
29 <PolyLine color=<#dln.Color1> pw=<#dln.Width1> fill=15 Smooth=Y >
30 <@readfile>${DATASETS}/<#dln.file>, csv) lineVals @--- Read data file
31 </PolyLine>
32 <PolyLine color=<#dln.Color2> pw=<#dln.Width2> fill=15 Smooth=Y >
33 <@readfile>${DATASETS}/<#dln.file>, csv) lineVals @--- Read data file
34 </PolyLine>
35 }
36 @else {<@write> error {Error: doLine requires data set filename}}
37 }
38 @-----

```

Example 2.17 File 'doLine.mmp'—Line plotting macros

The 'doLine' macro may be called as shown in Examples 2.18 and 2.19.

```

1 <AFrame W= "43mm" H="32mm" >
2 <mmDraw>
3 <doLine file="line1.csv"
4 gColor="Black"
5 Color1="Blue"
6 Width1="1.6pt"
7 Color2="White"
8 Width2="0.4pt"
9 />
10 </mmDraw>
11 </AFrame>

```

Example 2.18 Calling 'doLine' macro (2)

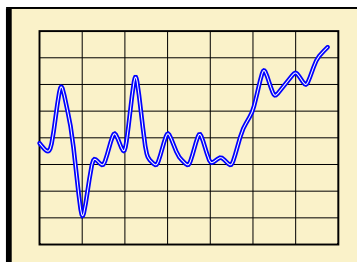


Figure 2.18 Output from Example 2.18

Example 2.18 produces the output shown in Figure 2.18.

The 'doLine' macro may also be called as shown in Example 2.19.

<PolyLine ... >

<Point ... /> <PLineto ... /> <PolyArc ... />

```

1 <AFrame W= "43mm" H="32mm" >
2 <mmDraw>
3 <doLine file="line1.csv"
4   image="031639.jpg"
5   Color1="Red"
6   Color2="White"
7   Width1="4pt"
8   Width2="1.5pt"
9   hGrid="20pt"
10  vGrid="28pt"
11  />
12 </mmDraw>
13 </AFrame>

```

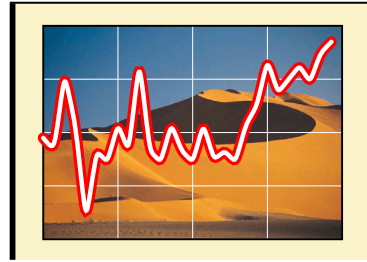


Figure 2.19 Output from Example 2.19

Example 2.19 Calling 'doLine' macro (1)

Example 2.19 produces the output shown in Figure 2.19.

<Rectangle ... />

Summary

Use the <Rectangle ... /> code to draw a regular (square-cornered) or rounded rectangle.

Syntax

Option	Value	Description
<Rectangle		
<u>Generic drawing options</u>		
pen [penNum]	0 - 15	Pen style. <i>Default: 0</i>
pw [penWidth]	<i>dim</i>	Pen width. <i>Default: 0.5pt</i>
pstyle [penStyle]	P " <i>dim dim ...</i> "	Pen style. Solid or dashed. Setting 'pstyle' to P results in a plain, solid border or line. Setting 'pstyle' to a series comprising an even number of <i>dim</i> values sets the border to have a dashed pattern. The first <i>dim</i> value specifies the length of a solid line segment, the next <i>dim</i> value specifies the length of a white segment, and so on. The pen pattern specification must be surrounded by double quotation marks. See Examples 2.14 and 2.15 on pages MD-34 and MD-35 . <i>Default: P</i>
fill [fillNum]	0 - 15	Fill style. <i>Default: 15</i>
a [rotate]	<i>number</i>	Angle of rotation. <i>Default: 0</i>
color	<i>name</i>	Color name. <i>Default: Black</i>
o [overprint]	Y N	Overprint. <i>Default: N</i>
tint	<i>percent</i>	Tint per cent. <i>Default: 100</i>
sep [separation]	<i>int</i>	Separation number. <i>Default: 1</i>

<Rectangle ... />

Option	Value	Description								
<u>Text runaround</u>										
RA [runAround]	N B C	Text runaround type. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>N</td> <td>No runaround</td> </tr> <tr> <td>B</td> <td>Box runaround</td> </tr> <tr> <td>C</td> <td>Contour runaround</td> </tr> </tbody> </table> <i>Default:</i> N	Value	Description	N	No runaround	B	Box runaround	C	Contour runaround
Value	Description									
N	No runaround									
B	Box runaround									
C	Contour runaround									
RAgap [runAroundGap]	<i>dim</i>	Specify the gap between the Rectangle and text flowing around it. The value of <i>dim</i> may be negative. Effective only if the 'RA' option (see above) is set to C or B. <i>Default:</i> 6pt								
<u>Rectangle options</u>										
L [Left]	<i>dim</i>	Distance from the left side of the enclosing frame to the left side of the rectangle.								
T [Top]	<i>dim</i>	Distance from the top side of the enclosing frame to the top side of the rectangle.								
W [Width]	<i>dim</i>	Width of rectangle.								
H [Height]	<i>dim</i>	Height of rectangle.								
radius [cornerRadius]	<i>dim</i>	Radius of rectangle corners. <i>Default:</i> 0								
<u>Metadata for graphic object (Rectangle)</u>										
GOid	<i>string</i>	<i>string</i> may contain up to 512 bytes of metadata associated with this instance of the Rectangle code. This metadata is shown in FrameMaker MIF files in the <ObjectAttributes > statement and can be extracted from or viewed in FrameMaker document (binary) files, or post-processed, using a custom API to access the FP_ObjectAttributes property. The 'GOid' option is shorthand for <Attribute name="GOid"> <i>string</i> </Attribute>. See the <Attribute ... > code, described on pages R-71–73. <i>Default:</i> none								
/>		<i>Required</i> <Rectangle options must be terminated by />. (Alternatively <Rectangle options may be terminated by > followed by </Rectangle> with no text between the <Rectangle ... > and the </Rectangle>.)								

<Rectangle ... />

Examples

Example:

```
<AFrame W=66mm H=28.5mm P=R A=R fill=15 >  
<mmDraw>  
<Rectangle L=01mm T=3mm W=30mm H=20mm fill=8 radius=5mm pw=3pt />  
<Rectangle L=38mm T=4.5mm W=24mm H=16mm pw=3pt a=17.5 />  
</mmDraw>  
</AFrame>
```

Example 2.20 Drawing rectangles

Example 2.20 produces the output shown in Figure 2.20.

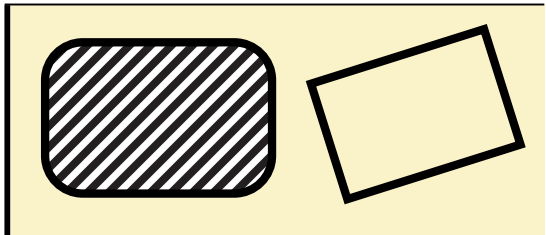


Figure 2.20 Output from Example 2.20

<TextFrame ... >

Summary

Use the <TextFrame ... > code to create a text frame.

Syntax

Option	Value	Description
<TextFrame		
<u>Generic drawing options</u>		
pen [penNum]	0 - 15	Pen style. <i>Default:</i> 0
pw [penWidth]	<i>dim</i>	Pen width. <i>Default:</i> 0.5pt
pstyle [penStyle]	P " <i>dim dim ...</i> "	Pen style. Solid or dashed. Setting 'pstyle' to P results in a plain, solid border or line. Setting 'pstyle' to a series comprising an even number of <i>dim</i> values sets the border to have a dashed pattern. The first <i>dim</i> value specifies the length of a solid line segment, the next <i>dim</i> value specifies the length of a white segment, and so on. The pen pattern specification must be surrounded by double quotation marks. See Examples 2.14 and 2.15 on pages MD-34 and MD-35 . <i>Default:</i> P
fill [fillNum]	0 - 15	Fill style. <i>Default:</i> 15
a [rotate]	<i>number</i>	Angle of rotation. <i>Default:</i> 0
color	<i>name</i>	Color name. <i>Default:</i> Black
o [overprint]	Y N	Overprint. <i>Default:</i> N
tint	<i>percent</i>	Tint per cent. <i>Default:</i> 100
sep [separation]	<i>int</i>	Separation number. <i>Default:</i> 1

<TextFrame ... >

Option	Value	Description								
<u>Text runaround</u>										
RA [runAround]	N B C	Text runaround type. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>N</td> <td>No runaround</td> </tr> <tr> <td>B</td> <td>Box runaround</td> </tr> <tr> <td>C</td> <td>Contour runaround</td> </tr> </tbody> </table> <i>Default:</i> N	Value	Description	N	No runaround	B	Box runaround	C	Contour runaround
Value	Description									
N	No runaround									
B	Box runaround									
C	Contour runaround									
RAgap [runAroundGap]	<i>dim</i>	Specify the gap between the TextFrame and text flowing around it. The value of <i>dim</i> may be negative. Effective only if the 'RA' option (see above) is set to C or B. <i>Default:</i> 6pt								
<u>Location and dimensions</u>										
L [frameLeft]	<i>dim</i>	Distance from the left side of the enclosing frame to the left side of the frame.								
T [frameTop]	<i>dim</i>	Distance from the top side of the enclosing frame to the top side of the frame.								
W [frameWidth]	<i>dim</i>	Width of text frame.								
H [frameHeight]	<i>dim</i>	Height of text frame.								
<u>Metadata for graphic object (TextFrame)</u>										
GOid	<i>string</i>	<i>string</i> may contain up to 512 bytes of metadata associated with this instance of the TextFrame code. This metadata is shown in FrameMaker MIF files in the <ObjectAttributes > statement and can be extracted from or viewed in FrameMaker document (binary) files, or post-processed, using a custom API to access the FP_ObjectAttributes property. The 'GOid' option is shorthand for <Attribute name="GOid"> <i>string</i> </Attribute>. See the <Attribute ... > code, described on pages R-71–73. <i>Default:</i> none								
>		<i>Required</i> <TextFrame options must be terminated by >.								
</TextFrame>		<i>Required</i> Every <TextFrame ... > code must be terminated by a </TextFrame> code.								

<TextFrame ... >

Examples

Example:

```

<AFrame W=50mm H=22mm P=R A=R fill=15>
  <mmDraw>
  <PolyLine pen=0 color=Blue pw=3pt >
  <Point L=0mm T=0mm />
  <Point L=24mm T=8mm />
  <Point L=0mm T=16mm />
  </PolyLine>
  <TextFrame L=20mm T=2mm W=28mm H=17mm pen=15 fill=15 >
  <P p=5.5pt A=L l=1.5pt >Humpty Dumpty sat on the wall.
Humpty Dumpty had a great fall.
What a sad story indeed ...
  <br/>
  But why should we worry about that now?
  </TextFrame>
  </mmDraw>
</AFrame>

```

Example 2.21 Using the <TextFrame ... > code

Example 2.21 produces the output shown in Figure 2.21.

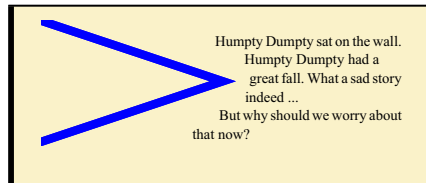


Figure 2.21 Output from Example 2.21

<TextLine ... >

Summary

Use the <TextLine ... > code to output a line of text. and <FontRef ... > codes may be used between <TextLine ... > and </TextLine> codes.

Syntax

Option	Value	Description
<TextLine		
<u>Text line location options</u>		
L [textLeft]	<i>dim</i>	Distance of text line anchor point from left side of enclosing frame. See Note 1 on page MD-48 .
T [textTop]	<i>dim</i>	Distance of text line anchor point from top of enclosing frame. See Note 1 on page MD-48 .
<u>Text line alignment and rotation</u>		
A [horizAlign]	L C R	Text line alignment. L = left, C = centered, R = right aligned. See Note 1 on page MD-48 .
a [textAngle]	<i>number</i>	Angle of rotation of text line. See Note 1 on page MD-48 .
<u>Reference pre-defined font format</u>		
fnt [fontFormat]	<i>name</i>	Font format name. See page R-137 in the <i>Miramo Reference Guide</i> .
<u>Font selection</u>		
ff [fontFamily]	<i>name</i>	Font family. See page R-137 in the <i>Miramo Reference Guide</i> .
fa [fontAngle]	<i>name</i>	Font angle. See page R-137 in the <i>Miramo Reference Guide</i> .
fw [fontWeight]	<i>name</i>	Font weight. See page R-138 in the <i>Miramo Reference Guide</i> .
fv [fontVariation]	<i>name</i>	Font variation. See page R-138 in the <i>Miramo Reference Guide</i> .

<TextLine ... >

Option	Value	Description										
<u>Text size and color</u>												
p [textSize]	dim rdim	Text size. See Note 1 on page R-142. Default units are points (1/72 inches). See page R-138 in the <i>Miramo Reference Guide</i> .										
fcolor [textColor]	name	Font color. See page R-138 in the <i>Miramo Reference Guide</i> .										
<u>Underline and overline</u>												
uline [textUnderline]	N S D M	Underline style. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>N</td> <td>No underline.</td> </tr> <tr> <td>S</td> <td>Single (normal) underline.</td> </tr> <tr> <td>D</td> <td>Double underline.</td> </tr> <tr> <td>M</td> <td>Numeric (low) underline.</td> </tr> </tbody> </table> See page R-138 in the <i>Miramo Reference Guide</i> . Default: N	Value	Description	N	No underline.	S	Single (normal) underline.	D	Double underline.	M	Numeric (low) underline.
Value	Description											
N	No underline.											
S	Single (normal) underline.											
D	Double underline.											
M	Numeric (low) underline.											
o [textOverline]	N Y	Overline. See page R-139 in the <i>Miramo Reference Guide</i> . Default: N										
<u>Strike through and change bar</u>												
t [strikeThrough]	N Y	Strike through. See page R-139 in the <i>Miramo Reference Guide</i> . Default: N										
C [changeBar]	N Y	Change bar. See page R-139 in the <i>Miramo Reference Guide</i> . Default: N										
<u>Capitalization</u>												
fc [textCase]	T S L U	Capitalization. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>T</td> <td>As typed.</td> </tr> <tr> <td>S</td> <td>Small caps.</td> </tr> <tr> <td>L</td> <td>Lower case.</td> </tr> <tr> <td>U</td> <td>Uppercase.</td> </tr> </tbody> </table> See page R-139 in the <i>Miramo Reference Guide</i> . Default: T	Value	Description	T	As typed.	S	Small caps.	L	Lower case.	U	Uppercase.
Value	Description											
T	As typed.											
S	Small caps.											
L	Lower case.											
U	Uppercase.											
<u>Vertical and horizontal shift</u>												
u [superscript]	N Y	Superscript. See page R-139 in the <i>Miramo Reference Guide</i> . Default: N										

<TextLine ... >

Option	Value	Description
d [subscript]	N Y	Subscript. See page R-139 in the <i>Miramo Reference Guide</i> . <i>Default:</i> N
Ky [vertShift]	percent	Vertical displacement of text. See page R-140 in the <i>Miramo Reference Guide</i> . <i>Default:</i> 0
Kx [horizShift]	percent	Horizontal text displacement. See page R-140 in the <i>Miramo Reference Guide</i> . <i>Default:</i> 0

Kerning, character spread and stretch

K [textKern]	Y N	Enable pair kerning and character spread. Also: enable ligatures (Unix only). See page R-141 in the <i>Miramo Reference Guide</i> .
Ks [textSpread]	percent	Inter-character spread, or tracking. See page R-141 in the <i>Miramo Reference Guide</i> . <i>Default:</i> 0
fs [textStretch]	percent	Horizontally expand or compress characters. See page R-141 in the <i>Miramo Reference Guide</i> . <i>Default:</i> 100
textBGColor	name	Apply a background color to text. FrameMaker 10 and above only. See page R-141 in the <i>Miramo Reference Guide</i> . <i>Default:</i> no background text color

Text language

lang [textLanguage]	key	Language. See page R-142 in the <i>Miramo Reference Guide</i> .
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Metadata for graphic object (TextLine)

GOid	string	<p><i>string</i> may contain up to 512 bytes of metadata associated with this instance of the TextLine code.</p> <p>This metadata is shown in FrameMaker MIF files in the <ObjectAttributes > statement and can be extracted from or viewed in FrameMaker document (binary) files, or post-processed, using a custom API to access the FP_ObjectAttributes property.</p> <p>The 'GOid' option is shorthand for <Attribute name="GOid"><i>string</i></Attribute>. See the <Attribute ... > code, described on pages R-71–73.</p> <p><i>Default:</i> none</p> <p><i>Required</i></p> <p><TextLine options must be terminated by >.</p>
------	--------	--

>

<TextLine ... >

Option	Value	Description
</TextLine>		<i>Required</i> Every <TextLine ... > code must be terminated by a </TextLine> code.

Notes

- Examples 2.22 through 2.27 illustrate the relationship between the 'L', 'T', 'A' and 'a' options and the location of text output using the <TextLine ... > code.

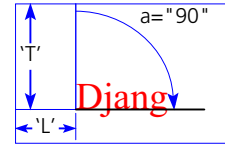


Figure 2.22 A="L"

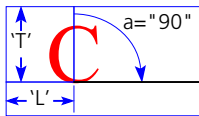


Figure 2.23 A="C"

In the default case, when the alignment option 'A' (see page MD-45) is set to L, the 'L' origin, i.e. the horizontal offset of the origin from the left side of the enclosing object, is at the leftmost end of the text string

The relationship between the values of 'L', 'T' and the <TextLine ... > string when the 'A' option is set to L is illustrated in Example 2.22.

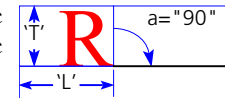


Figure 2.24 A="R"

The <TextLine ... > text angle option 'a' (see page MD-45) is set to 90 degrees in Examples 2.22 through 2.24.

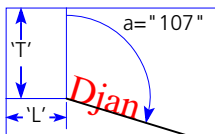


Figure 2.25 A="L"

If the <TextLine ... > 'A' option is set to C, the text 'L' origin is located at the center point of the text string, as illustrated in Example 2.23. (The <TextLine ... > text string in Example 2.23 contains the character C only.)

If the <TextLine ... > 'A' option is set to R, the text 'L' origin is located at the end (rightmost) point of the text string, as illustrated in Example 2.24. (The <TextLine ... > text string in Example 2.24 contains the character R only.)

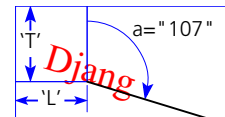


Figure 2.26 A="C"

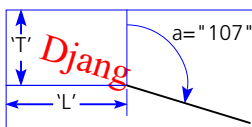


Figure 2.27 A="R"

The <TextLine ... > text angle option 'a' (see page MD-45) is set to 107 degrees in Examples 2.25 through 2.27, which illustrate the positioning of angled text using the <TextLine ... > code.

<TextLine ... >

Examples

Example:

```
<AFrame W="51mm" H="18mm" P="R" A="R" fill="15">  
  <mmDraw>  
    <TextLine L="02mm" T="14mm" fcolor="Blue" ff="Arial" p="9" a="75" >  
    Humpty Dumpty had a great<Font Ky="400">fall  
  </TextLine>  
  </mmDraw>  
</AFrame>
```

Example 2.22 Using the <TextLine ... > code

Example 2.22 produces the output shown in Figure 2.28.

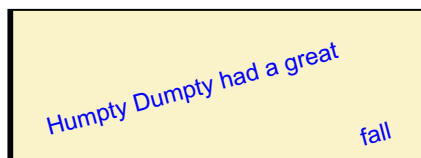


Figure 2.28 Humpty Dumpty
(output from Example 2.22)

List of drawing markup codes and options

<ALine ... >

Line options

L	lineLeft	<i>dim</i>	MD-5
T	lineTop	<i>dim</i>	MD-5
lineLen	lineLen	<i>dim</i>	MD-5
Angle	lineAngle	<i>number</i>	MD-5
ArrowNum	ArrowNum	1 - 4	MD-5
Arrow	arrowHead	None Head Tail Both	MD-5
color	lineColor	<i>name</i>	MD-5
pen	penNum	0 - 15	MD-5
pw	penWidth	<i>dim</i>	MD-5

Text options

textLen	textLen	<i>dim</i>	MD-5
textPos	textPosition	I H T	MD-6
textAlign	textAlign	C L R	MD-6
textAngle	textAngle	<i>number</i>	MD-6

Reference pre-defined font format

fmt	fontFormat	<i>name</i>	MD-6
-----	------------	-------------	------

Font selection

ff	fontFamily	<i>name</i>	MD-6
fa	fontAngle	<i>name</i>	MD-6
fw	fontWeight	<i>name</i>	MD-6
fv	fontVariation	<i>name</i>	MD-6

Text size and color

p	textSize	<i>dim</i> <i>rdim</i>	MD-6
fcolor	textColor	<i>name</i>	MD-6

Underline and overline

uline	textUnderline	N S D M	MD-6
o	textOverline	N Y	MD-7

Strike through and change bar

t	strikeThrough	N Y	MD-7
C	changeBar	N Y	MD-7

<ALine ... > (Continued)

<i>Capitalization</i>			
fc	textCase	T S L U	MD-7
<i>Vertical and horizontal shift</i>			
u	superscript	N Y	MD-7
d	subscript	N Y	MD-7
Ky	vertShift	percent	MD-7
Kx	horizShift	percent	MD-7
<i>Kerning, character spread and stretch</i>			
K	textKern	Y N	MD-7
Ks	textSpread	percent	MD-8
fs	textStretch	percent	MD-8
textBGColor	textBGColor	name	MD-8
<i>Text language</i>			
lang	textLanguage	key	MD-8
<i>Metadata for graphic object (ALine)</i>			
GOid	GOid	string	MD-8

<Arc ... />

<i>Generic drawing options</i>			
pen	penNum	0 - 15	MD-10
pw	penWidth	dim	MD-10
pstyle	penStyle	P "dim dim ..."	MD-10
fill	fillNum	0 - 15	MD-10
a	rotate	number	MD-10
color	color	name	MD-10
o	overprint	Y N	MD-10
tint	tint	percent	MD-10
sep	separation	int	MD-11
<i>Text runaround on/off</i>			
RA	runAround	N B C	MD-11
<i>Text runaround gap (if 'RA' option set to C or B)</i>			
RAgap	runAroundGap	dim	MD-11
rotate	arcRotate	number	MD-11
<i>Arc options</i>			
L	arcLeft	dim	MD-11
T	arcTop	dim	MD-11
W	arcWidth	dim	MD-11
H	arcHeight	dim	MD-11
StartAngle	arcStartAngle	number	MD-11
ArcAngle	arcAngle	number	MD-11
<i>Line termination options</i>			
LineCap	lineCap	Round Butt Square	MD-12
Arrow	arrowHead	None Head Tail Both	MD-12
<i>Arrowhead options</i>			
ArrowType	arrowType	Filled Stick Hollow	MD-12
ArrowLen	arrowLength	dim	MD-12
ArrowTip	arrowTipAngle	number	MD-12
ArrowBase	arrowBaseAngle	number	MD-12
ScaleHead	arrowHeadScale	N Y	MD-12
<i>Metadata for graphic object (Arc)</i>			
GOid	GOid	string	MD-12

<Circle ... />*Generic drawing options*

pen	penNum	0 - 15	MD-14
pw	penWidth	<i>dim</i>	MD-14
pstyle	penStyle	P " <i>dim dim ...</i> "	MD-14
fill	fillNum	0 - 15	MD-14
a	rotate	<i>number</i>	MD-14
color	color	<i>name</i>	MD-14
o	overprint	Y N	MD-14
tint	tint	<i>percent</i>	MD-14
sep	separation	<i>int</i>	MD-14

Text runaround on/off

RA	runAround	N B C	MD-15
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Text runaround gap (if 'RA' option set to C or B)

RAgap	runAroundGap	<i>dim</i>	MD-15
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Circle options

L	centerLeft	<i>dim</i>	MD-15
T	centerTop	<i>dim</i>	MD-15
D	diameter	<i>dim</i>	MD-15

Metadata for graphic object (Circle)

GOid	GOid	<i>string</i>	MD-15
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<Ellipse ... />*Generic drawing options*

pen	penNum	0 - 15	MD-17
pw	penWidth	<i>dim</i>	MD-17
pstyle	penStyle	P " <i>dim dim ...</i> "	MD-17
fill	fillNum	0 - 15	MD-17
a	rotate	<i>number</i>	MD-17
color	color	<i>name</i>	MD-17
o	overprint	Y N	MD-17
tint	tint	<i>percent</i>	MD-17
sep	separation	<i>int</i>	MD-17

Text runaround on/off

RA	runAround	N B C	MD-18
----	-----------	-----------	-------

Text runaround gap (if 'RA' option set to C or B)

RAgap	runAroundGap	<i>dim</i>	MD-18
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Ellipse options

L	ellipseLeft	<i>dim</i>	MD-18
T	ellipseTop	<i>dim</i>	MD-18
W	ellipseWidth	<i>dim</i>	MD-18
H	ellipseHeight	<i>dim</i>	MD-18

Metadata for graphic object (Ellipse)

GOid	GOid	<i>string</i>	MD-18
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<PLineto ... />*Line continuation location*

L	Left	<i>dim</i>	MD-21
T	Top	<i>dim</i>	MD-21

<Point ... />*Point location*

L	Left	<i>dim</i>	MD-23
T	Top	<i>dim</i>	MD-23

<Polygon ... >*Generic drawing options*

pen	penNum	0 - 15	MD-24
pw	penWidth	<i>dim</i>	MD-24
pstyle	penStyle	P "dim dim ..."	MD-24
fill	fillNum	0 - 15	MD-24
a	rotate	<i>number</i>	MD-24
color	color	<i>name</i>	MD-24
o	overprint	Y N	MD-24
tint	tint	<i>percent</i>	MD-24
sep	separation	<i>int</i>	MD-25

Text runaround on/off

RA	runAround	N B C	MD-25
----	-----------	-----------	-------

Text runaround gap (if 'RA' option set to C or B)

RAgap	runAroundGap	<i>dim</i>	MD-25
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Polygon options

Smooth	smooth	N Y	MD-25
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<PolyLine ... >*Generic drawing options*

pen	penNum	0 - 15	MD-30
pw	penWidth	<i>dim</i>	MD-30
pstyle	penStyle	P "dim dim ..."	MD-30
fill	fillNum	0 - 15	MD-30
a	rotate	<i>number</i>	MD-30
color	color	<i>name</i>	MD-30
o	overprint	Y N	MD-30
tint	tint	<i>percent</i>	MD-30
sep	separation	<i>int</i>	MD-31

Text runaround on/off

RA	runAround	N B C	MD-31
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Text runaround gap (if 'RA' option set to C or B)

RAgap	runAroundGap	<i>dim</i>	MD-31
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Line termination options

LineCap	lineCap	Round Butt Square	MD-31
Arrow	arrowHead	None Head Tail Both	MD-31

Arrowhead options

ArrowType	arrowType	Filled Stick Hollow	MD-31
ArrowLen	arrowLength	<i>dim</i>	MD-31
ArrowTip	arrowTipAngle	<i>number</i>	MD-31
ArrowBase	arrowBaseAngle	<i>number</i>	MD-31
ScaleHead	arrowHeadScale	N Y	MD-31

Polyline option

Smooth	smooth	N Y	MD-31
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<Rectangle ... />*Generic drawing options*

pen	penNum	0 - 15	MD-39
pw	penWidth	<i>dim</i>	MD-39
pstyle	penStyle	P " <i>dim dim ...</i> "	MD-39
fill	fillNum	0 - 15	MD-39
a	rotate	<i>number</i>	MD-39
color	color	<i>name</i>	MD-39
o	overprint	Y N	MD-39
tint	tint	<i>percent</i>	MD-39
sep	separation	<i>int</i>	MD-39

Text runaround on/off

RA	runAround	N B C	MD-40
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Text runaround gap (if 'RA' option set to C or B)

RAgap	runAroundGap	<i>dim</i>	MD-40
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Rectangle options

L	Left	<i>dim</i>	MD-40
T	Top	<i>dim</i>	MD-40
W	Width	<i>dim</i>	MD-40
H	Height	<i>dim</i>	MD-40
radius	cornerRadius	<i>dim</i>	MD-40

Metadata for graphic object (Rectangle)

GOid	GOid	<i>string</i>	MD-40
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<TextFrame ... >*Generic drawing options*

pen	penNum	0 - 15	MD-42
pw	penWidth	<i>dim</i>	MD-42
pstyle	penStyle	P " <i>dim dim ...</i> "	MD-42
fill	fillNum	0 - 15	MD-42
a	rotate	<i>number</i>	MD-42
color	color	<i>name</i>	MD-42
o	overprint	Y N	MD-42
tint	tint	<i>percent</i>	MD-42
sep	separation	<i>int</i>	MD-42

Text runaround on/off

RA	runAround	N B C	MD-43
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Text runaround gap (if 'RA' option set to C or B)

RAgap	runAroundGap	<i>dim</i>	MD-43
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Location and dimensions

L	frameLeft	<i>dim</i>	MD-43
T	frameTop	<i>dim</i>	MD-43
W	frameWidth	<i>dim</i>	MD-43
H	frameHeight	<i>dim</i>	MD-43

Metadata for graphic object (TextFrame)

GOid	GOid	<i>string</i>	MD-43
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<TextLine ... >*Text line location options*

L	textLeft	<i>dim</i>	MD-45
T	textTop	<i>dim</i>	MD-45

<TextLine ... > (Continued)

Text line alignment and rotation

A	horizAlign	L C R	MD-45
a	textAngle	<i>number</i>	MD-45

Reference pre-defined font format

fmt	fontFormat	<i>name</i>	MD-45
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Font selection

ff	fontFamily	<i>name</i>	MD-45
fa	fontAngle	<i>name</i>	MD-45
fw	fontWeight	<i>name</i>	MD-45
fv	fontVariation	<i>name</i>	MD-45

Text size and color

p	textSize	<i>dim rdim</i>	MD-46
fcolor	textColor	<i>name</i>	MD-46

Underline and overline

uline	textUnderline	N S D M	MD-46
o	textOverline	N Y	MD-46

Strike through and change bar

t	strikeThrough	N Y	MD-46
C	changeBar	N Y	MD-46

Capitalization

fc	textCase	T S L U	MD-46
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Vertical and horizontal shift

u	superscript	N Y	MD-46
d	subscript	N Y	MD-47
Ky	vertShift	<i>percent</i>	MD-47
Kx	horizShift	<i>percent</i>	MD-47

Kerning, character spread and stretch

K	textKern	Y N	MD-47
Ks	textSpread	<i>percent</i>	MD-47
fs	textStretch	<i>percent</i>	MD-47
textBGColor	textBGColor	<i>name</i>	MD-47

Text language

lang	textLanguage	<i>key</i>	MD-47
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Metadata for graphic object (TextLine)

GOid	GOid	<i>string</i>	MD-47
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