

Goal: describe geometrical object like lines and rectangles mainly for a barcode drawing library

## 1 ga grammar

A graphic data specification format called 'ga' *generic graphic assembler*.

```
ga<DIM, UINT> := generic graphic assembler
  <DIM> := numeric type parameter for dimension, for example f64 or i32
  <UINT> := numeric type parameter for quantity, an unsigned integer, i.e. u8

ga<DIM, UINT> := +Elem<DIM, UINT>

Elem<DIM, UINT> := Code<u8> +Args<DIM, UINT>

Code<u8> := End<u8> | State<u8> | Object<u8> | Fn<u8>

End<u8>      := 0          -- end sequence symbol (reserved for string serialization)
State<u8>    := 1 -> 31 -- graphic properties
Object<u8>   := 32 -> 239 -- graphic object
Fn<u8>       := 240 -> 255 -- functions

Args<DIM, UINT> : <x: DIM> | <e: u8> | <n: UINT>
  <x: DIM> a dimension value of type DIM
  <e: u8> an enumeration value of type u8 (unsigned byte)
  <n: UINT> an unsigned integer for multiplicity
```

## 2 Properties

Colors, linecap style etc...

Code/Mnemonic key	Graphic property	Operation
1 - pen_thick	Line thick	1 <w: DIM>
2 - pen_cap_style	Line cap style	2 <e: u8>
8 - color		
30 - start_bbox_group	Stop to check the bounding box	30
31 - end_bbox_group	Pick bbox and restart to check	31 <x1: DIM> <y1: DIM> <x2: DIM> <y2: DIM>

## 3 Objects

### 3.1 Lines

A segment that starts from point P1 (x1, y1) and ends in P2 (x2, y2).

Code/Mnemonic key	Graphic object	Operation
32 - line	Line	32 <x1: DIM> <y1: DIM> <x2: DIM> <y2: DIM>
33 - line_thick	Line with a thick	33 <w: DIM> <x1: DIM> <y1: DIM> <x2: DIM> <y2: DIM>
36 - vbar	Vertical bars	36 <y1: DIM> <y2: DIM> <b: UINT> <x1: DIM> <t1: DIM> ...
37 - hbar	Horizontal bars	37 <x1: DIM> <x2: DIM> <b: UINT> <y1: DIM> <t1: DIM> ...
38 - polyline	Open polyline	38 <n: UINT> <x1: DIM> <y1: DIM> <x2: DIM> <y2: DIM> ...
39 - c_polyline	Closed polyline	39 <n: UINT> <x1: DIM> <y1: DIM> <x2: DIM> <y2: DIM> ...

## 3.2 Rectangles

Code/Mnemonic key	Graphic object	Operation
48 - rect	Rectangle	48 <x1: DIM> <y1: DIM> <x2: DIM> <y2: DIM>
49 - f_rect	Filled rectangle	49 <x1: DIM> <y1: DIM> <x2: DIM> <y2: DIM>
50 - rect_size	Rectangle	50 <x1: DIM> <y1: DIM> <w: DIM> <h: DIM>
51 - f_rect_size	Filled rectangle	51 <x1: DIM> <y1: DIM> <w: DIM> <h: DIM>

## 3.3 Function

Code/Mnemonic key	Function	Operation
240 - move	Translate objects	240 <n: UINT> <dx: DIM> <dy: UINT>
241 - copy	Copy object	241 <n: UINT> <c: UINT> <dx1: DIM> <dy1: UINT> ...
242 - and_copy	Place and copy objects	242 <n: UINT> <c: UINT> <dx1: DIM> <dy1: UINT> ...
243 - grid	Copy next <i>n</i> objects on a grid	243 <n: UINT> <col: UINT> <row: UINT> <dx: DIM> <dy: DIM>
244 - sl_grid		
250 - mirror		
255 - comment	A string comment	255 <b1: u8> <b2: u8> .. 0